Lemmon Valley – Spanish Springs Connector Study

AUGUST 2021

Prepared for:

RTC

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Executive Summary

The Lemmon Valley – Spanish Springs Connector Plan developed potential corridor connections through a Planning and Environmental Linkages (PEL) study between the two growing communities. The plan includes analysis of safety improvements based on existing traffic operations along Eagle Canyon Drive from SR-445 (Pyramid Way) to West Calle De La Plata. The corridors investigated are shown in Table I. The Improvement recommendations for the roadway and intersections are listed in Tables II below.

Table I: Potential Corridor Recommendations

Connection	Corridor	Spanish Springs Connection	Lemmon Valley Connection	Planning Level Cost
Lemmon Connection 1	Eagle Canyon–Lemmon Dr	Eagle Canyon at West Calle de la Plata	Near Chickadee Drive	$ 77,844,000
Lemmon Connection 2	Sha Neva–Lemmon Dr	Sha Neva Road	Near Chickadee Drive	$ 91,234,000
Lazy 5 Connection – Alternative 1	Lazy 5–Deodar Way	Lazy 5 Parkway	Deodar Way at Lemmon Drive	$ 129,480,000
Lazy 5 Connection – Alternative 2	Lazy 5–Lemmon Dr	Lazy 5 Parkway	Near Chickadee Drive	$ 146,744,000

Table II: Eagle Canyon Safety Improvements

Description	Limits	Planning Level Cost
ADA Upgrades	Pyramid Way to W. Calle De La Plata	$ 327,000
Curb and Gutter	Both sides of roadway along Spanish Springs High School and Shaw Middle School	$ 579,000
Standardize Striping	Southbound Alena Way approach	$ 27,000
Shared Use Path	North side of roadway from Pyramid Way to W. Calle De La Plata	$ 498,000
Median Refuge	Intersection of Richard Springs Blvd and Eagle Canyon Drive	$ 43,000
Goldeneye Improvements	Remove existing crosswalk, improve lighting, and add signage	$ 43,000
Lighting Improvements	High-T merge at Eagle Canyon Park	$ 44,000

Acknowledgments

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1.0 Introduction

1.1 Purpose and Goals

The RTC completed the North Valleys Multimodal Transportation Study in February 2017. One of the long-term improvements this study identified was a "North Valleys Connector" to link the North Valleys and Spanish Springs communities. The plan identified a preliminary concept to connect the Spanish Springs community at Eagle Canyon Drive to the Lemmon Valley community at Chickadee Drive. The 2040 Regional Transportation Plan (RTP), adopted in May 2018, subsequently identified the "Eagle Canyon Extension" as a new four-lane arterial on its list of Regional Road Improvement Projects for the 2027 to 2040 planning horizon. This goal of this study is to identify and evaluate alignment alternatives referred to as the "Lemmon Valley – Spanish Springs Connector Study." The project was also incorporated into the 2050 RTP, which was adopted in March 2021.

The purpose is to compile a planning and environmental linkages (PEL) checklist for a potential roadway between Lemmon Valley and Spanish Springs and analyze existing traffic operations to examine capacity improvements and safety improvements, as necessary. The PEL investigation considers community input, environmental issues, and a narrow the range of alternatives that will be included in future analysis under the National Environmental Policy Act (NEPA). Specific goals of this study include:

- Identify potential corridor alignments
- Planning and Environment Linkages (PEL) checklist
- Provide recommendations for operational/safety improvements on the existing Eagle Canyon Drive
- Enhance connectivity/emergency access
- Provide infrastructure/economic development opportunities

1.2 Vision Statement

The following vision statement was developed for this study through stakeholder and community input:

> "Enhance mobility and connectivity between growing communities and facilitate safe and equitable access to economic and recreational opportunities while preserving the character and heritage of the area."

With these goals and vision in mind, this study is generally divided up into two primary sections, the first concentrating on the alignment study for a new roadway facility providing connectivity between Lemmon Valley and Spanish Springs, and the second concentrating on an operational and safety analysis of existing Eagle Canyon Drive between Pyramid Highway and Spanish Springs High School.

2.0 Regional Context

Northern Nevada has experienced significant growth in recent years, which has been accelerated through the development of the Tahoe Regional Industrial Center (TRIC) in Story County. Companies that support the technology industry coupled with growth in logistics and manufacturing have created unprecedented demand for commercial land and housing, not heretofore experienced. According to US Census, between 2008 to 2018 Washoe County's population grew by over 150,000 to 464,000 people. The Reno-Sparks metropolitan region is forecast to add 129,000 more residents over the next 30 years, increasing the population to 591,000. The number of jobs is also expected to increase from 290,000 to 389,000 during the same 30-year time period. Growth in employment and residents equates to growth in travel demands. According to the RTC's regional travel demand model, daily vehicle miles of travel is forecast to increase 44% from 10.3 million in 2020 to 14.8 million in 2050.

The Lemmon Valley community consists of a wide range of housing types, including rural residential on large lots with livestock to traditional single-family subdivisions on small lots and multifamily development. Some portions of Lemmon Valley are incorporated within the City of Reno while others are in unincorporated Washoe County. The primary geographic feature is Swan Lake. The major transportation facilities serving Lemmon Valley include Lemmon Drive running generally north-south providing connectivity to US 395. Military Road and Lear Boulevard running generally east-west provide connectivity to the Stead region.

The Spanish Springs community also consists of both rural to suburban neighborhoods supported by employment, commercial, religious, and cultural facilities. Portions of Spanish Springs consist of areas within unincorporated Washoe County. Pyramid Highway is the primary corridor along the west side that directly connects travelers to I-80. There are other collectors and arterials available to access I-80 if users follow more circuitous routes.

Between the Lemmon Valley and Spanish Springs communities is Hungry Valley. Although the residents of Hungry Valley are mostly concentrated within a 170-acre area, Hungry Valley itself consists of over 15,000 acres that are considered the Reno-Sparks Indian Colony (RSIC). Eagle Canyon Drive, a paved two-lane road, connects Hungry Valley from the east to Spanish Springs. Hungry Valley Road, currently unpaved, connects Lemmon Valley to the west. Portions of Hungry Valley Road are rough and primarily suited to high clearance or off-highway vehicles.

The remaining area between Lemmon Valley and Spanish Springs is generally undeveloped public land managed by the Bureau of Land Management (BLM). The primary geographic feature is a low mountainous region separating Lemmon Valley and the Spanish Springs Valley.

Figure 2.1 on the following page illustrates the spatial relationship between Lemmon Valley, Hungry Valley, and the Spanish Springs Valley. The RSIC land area is labeled as "Tribal Land" within Hungry Valley.

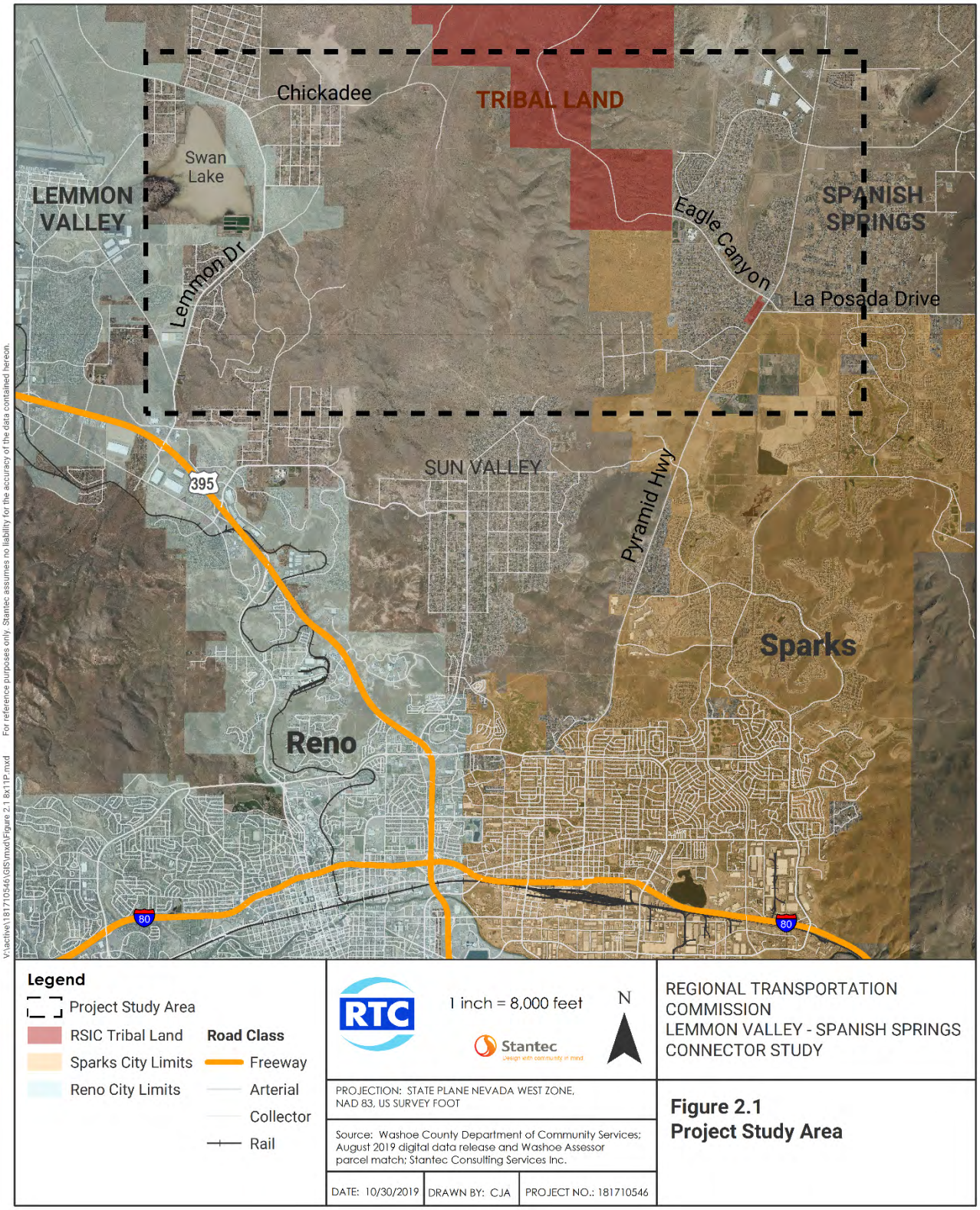


Figure 2-1: Project Study Area

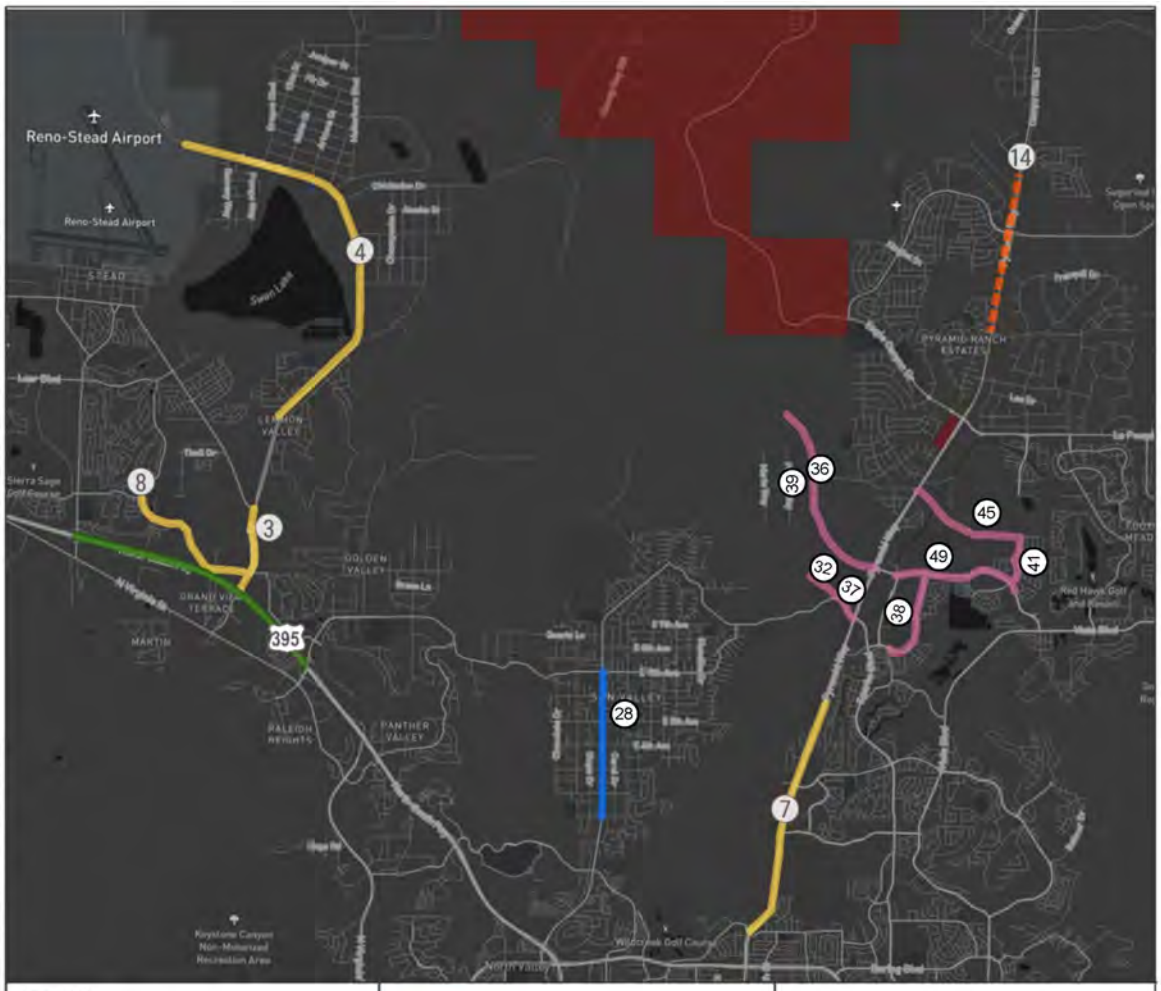
2.1 Future Planned Projects

RTC's 2050 Regional Transportation Plan includes future projects to improve mobility and add safety features. Projects within the study's regional area are listed below by project year interval.

2.1.1 2021-2025 Projects

- Lemmon Drive Segment 1– Widen 4 to 6 lanes from US-395 to Military Road (3)
- Lemmon Drive – Segment 2 Traffic Improvements/Reconstruct from Fleetwood Drive to Ramsey Way (4)
- Pyramid Hwy (Phase 1) – Widen & Safety Improvements from Queen Way to Golden View (7)
- Sky Vista Pkwy – Widen 2 to 4 lanes from Silver Lake Road to Lemmon Drive (8)
- Pyramid Hwy – Add Southbound lane from Egyptian Drive to Ingenuity Avenue (14)
- Sun Valley Blvd Multimodal Improvements – 7th Ave to Scottsdale (28)
- 5 Ridges Pkwy – Highland Ranch Pkwy to 2nd roundabout (32)
- Dolores Drive Extension – West to Lazy 5 Pkwy (36)
- Highland Ranch Pkwy – Widening from Pyramid Hwy to 5 Ridges entrance (37)
- Kiley Pkwy – Wingfield Hills Rd to Henry Orr Pkwy (38)
- Lazy 5 Pkwy – W Sun Valley Arterial to Pyramid Hwy (39)
- N/S Connector Rd – Stonebrook Pkwy to Wingfield Hills Rd (41)
- Stonebrook Pkwy – N/S Connector Rd to Pyramid Hwy (45)
- Wingfield Hills Rd Extension – West to David Allen Pkwy (49)

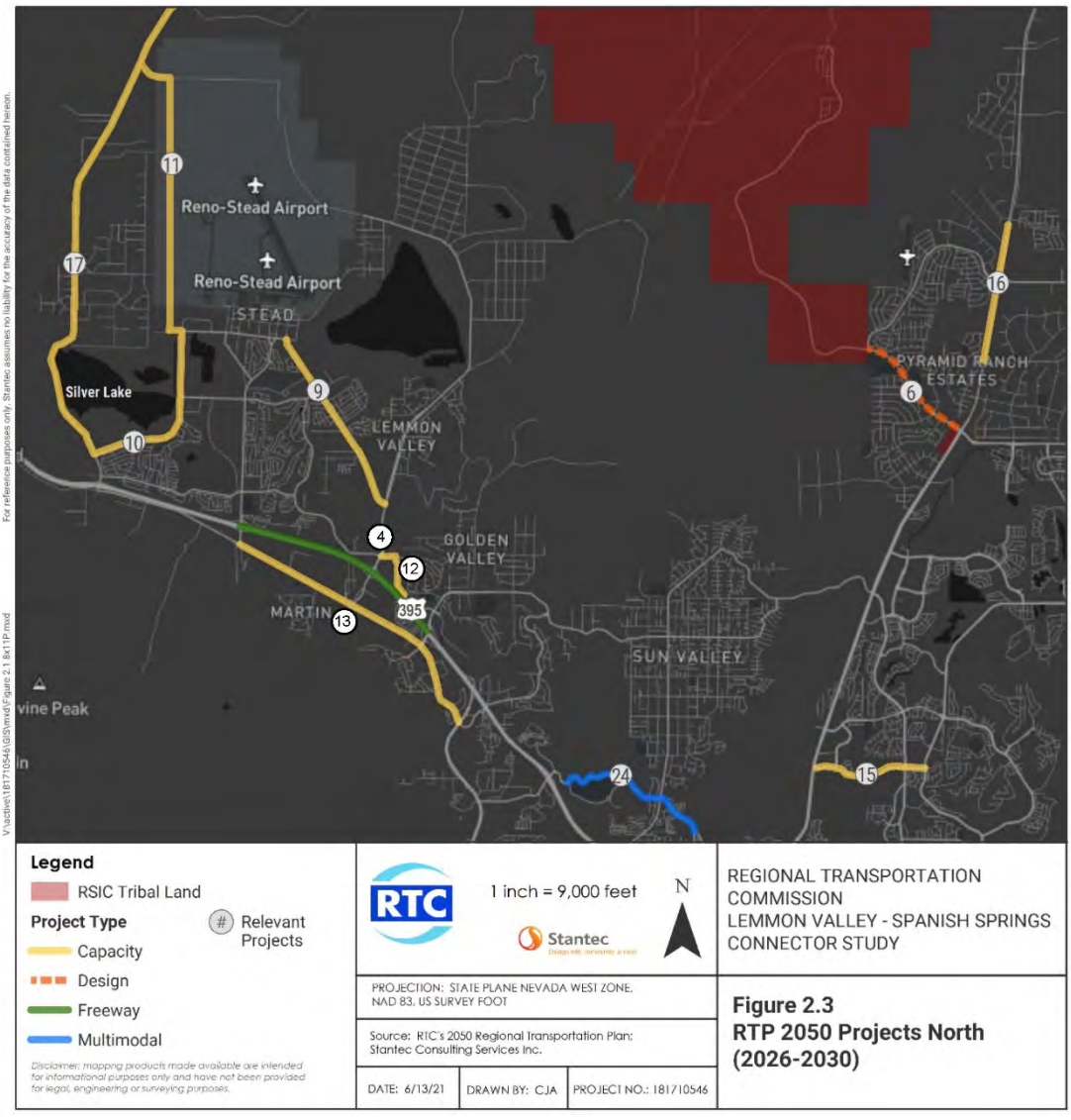
Numbers for each project indicated in parathesis above correspond to the project numbers shown on Figure 2-2 on the following page as identified in the RTC's 2050 Regional Transportation Plan.


Reno-Stead Airport
Reno-Stead Airport
STEAD
Swan Lake
LEMMON VALLEY
GOLDEN VALLEY
GRANDVIEW TERRACE
MARTIN
RALEIGH HEIGHTS
PANTHER VALLEY
SUN VALLEY
PYRAMID RANCH ESTATES
Keystone Canyon Non-Motorized Recreation Area
Wildcreek Golf Course
4
14
8
3
395
28
7
36
45
49
32
97
38
Legend
RSIC Tribal Land
Project Type
Capacity
Freeway
Design
Multimodal
Privately Funded Road Projects
Relevant Projects
Disclaimer: mapping products made available are intended for informational purposes only and have not been provided for legal, engineering or surveying purposes.
RTC
1 inch = 8,000 feet
Stantec
N
REGIONAL TRANSPORTATION COMMISSION
LEMMON VALLEY - SPANISH SPRINGS CONNECTOR STUDY
PROJECTION: STATE PLANE NEVADA WEST ZONE, NAD 83, US SURVEY FOOT
Source: RTC's 2050 Regional Transportation Plan; Stantec Consulting Services Inc.
DATE: 6/13/21
DRAWN BY: CJA
PROJECT NO.: 181710546
Figure 2.2
RTP 2050 Projects North (2021-2025)

2.1.2 2026-2030 Projects

- Buck Drive – Add capacity widen 2 to 4 lanes from Lemmon Drive to N. Hills Blvd (4)
- Eagle Canyon – Widen 2 to 4 Lanes from Pyramid Hwy to W Calle de la Plata (6)
- Military Road – Add capacity widen 2 to 4 lanes from Lemmon Drive to Echo Avenue (9)
- Moya Boulevard – Add capacity widen 2 to 4 lanes from Red Rock Road to Echo Avenue (10)
- Moya Boulevard Extension to add capacity from Red Rock Drive to Echo Avenue (11)
- N Hills Blvd – Golden Valley Rd to Buck Dr (12)
- N Virginia St – Widen 2 to 4 lanes from Panther Dr to Stead Blvd (13)
- Pyramid Hwy/US395 Connector Phase 2 to add capacity from Pyramid Way to Vista Blvd (15)
- Pyramid Hwy – Add capacity with a southbound lane from Egyptian Drive to Ingenuity Avenue (16)
- Red Rock Road – Add capacity Widen 2 to 4 lanes from US-395 to Placerville Drive (17)
- El Rancho Drive/Dandini Boulevard – Add sidewalks from Raggio Parkway to Sullivan Lane (24)

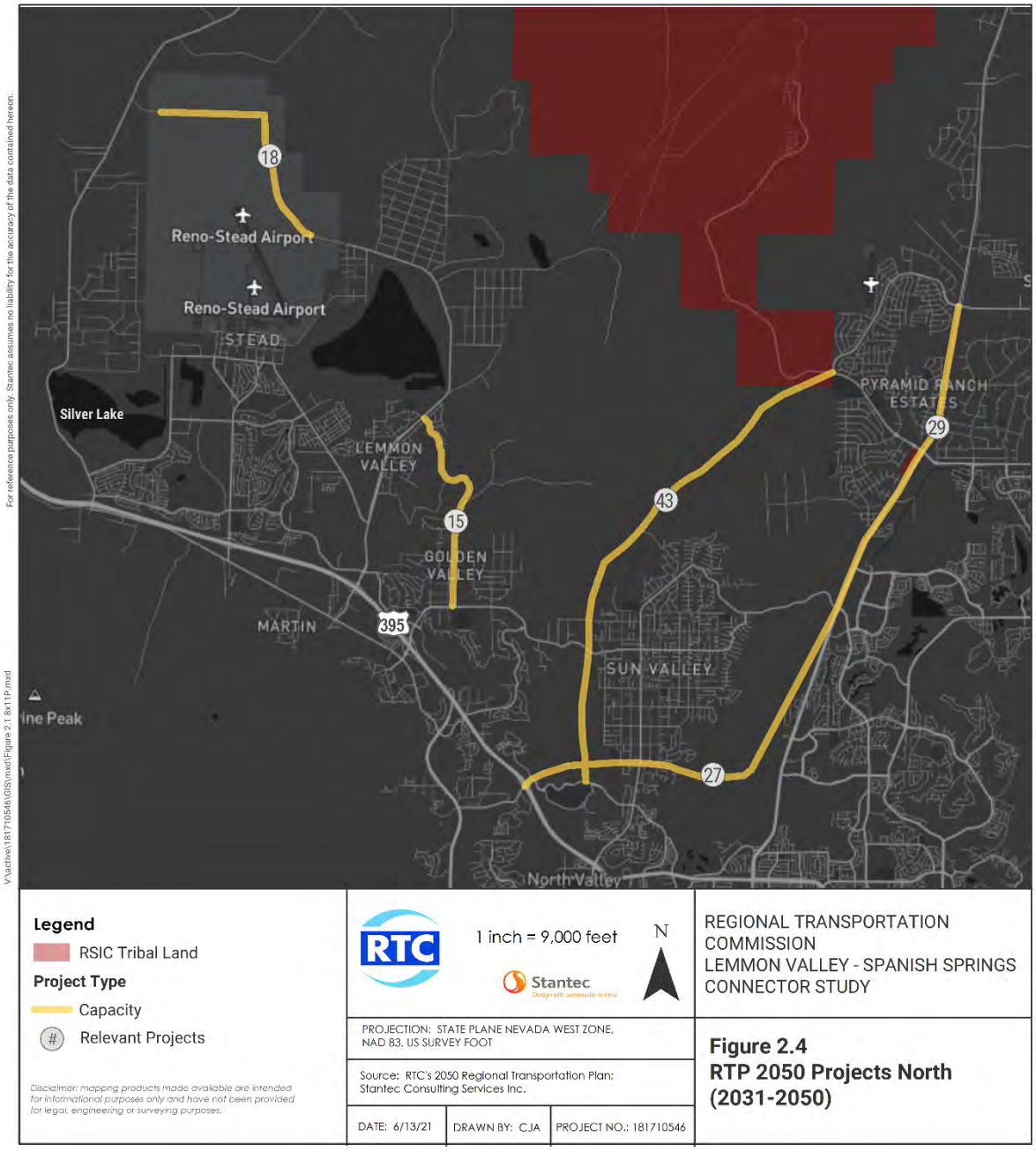
Numbers for each project indicated in parathesis above correspond to the location shown in Figure 2.3 below.



2.1.3 2031-2050 Projects

- Estates Road-Reconstruct Lemmon Drive to Golden Valley Road to add capacity (15)
- Lemmon Drive Extension to Red Rock Road to add capacity (18)
- Pyramid/395 Connector Phase 3 Construct Connector from US-395 to Pyramid Hwy south of Sparks Blvd to add capacity (27)
- Pyramid Hwy Phase 5 – Widen 2 to 4 lanes from Sparks Blvd to Calle de la Plata (29)
- West Sun Valley – Add new arterial 4 lane road from Dandini Blvd to Eagle Canyon Road (43)

Numbers for each project indicated in parathesis above correspond to the location shown in Figure 2.4 below.



3.0 Public Outreach

3.1 Stakeholder Meetings

Project Technical Advisory Committee (TAC) meetings were held throughout the planning study to discuss issues and community concerns and share progress results. Four meetings, including the initial kick-off, were held to identify stakeholders, roles, and responsibilities, review alternative evaluations and preliminary screenings, explore environmental impacts, and identify potential mitigation identification strategies.

3.1.1 TAC Kick-Off Meeting

The initial project kick-off meeting occurred in October of 2019 and consisted of the design team members and RTC. Project objectives and analyses for planning of existing and future conditions included:

- Traffic
- Land Use
- Safety
- Transit
- Pedestrian/Bicycle
- Environmental
- Right-of-way
- Storm Drainage and Flood Control

This kick-off meeting also helped identify key members to be invited for future TAC meetings and stakeholders in this project. Key stakeholders identified for this project included:

- Elected officials, RTC Committees
- Property owners
- Washoe County School District (WCSD)
- Washoe County
- Federal Highway Administration (FHWA)
- Nevada Department of Transportation (NDOT)
- Reno-Sparks Indian Colony (RSIC)
- Bureau of Land Management (BLM)
- Nevada Department of Wildlife (NDOW)
- City of Reno
- City of Sparks
- Truckee Meadows Water Authority (TMWA)
- Truckee Meadows Regional Planning Agency (TMRPA)
- Reno Tahoe Airport Authority (RTAA)

3.1.2 TAC Meeting 1

The first TAC meeting was conducted in November of 2019. This meeting served as an introduction between the consulting team staff, lead agency staff, and the TAC members. The project study area was introduced and the goals/objectives for the project discussed. The team reviewed the connector study approach which consists of conducting an existing and future conditions analysis. The team also reviewed existing studies and traffic and safety, multimodal, land use, and environmental analysis to support the PEL. Future TAC and public meetings were reviewed for scheduling purposes.

3.1.3 TAC Meeting 2

The second Technical Advisory Committee meeting was conducted in February of 2020. This meeting served as a time to discuss preliminary field observations, an inventory of existing conditions in the corridor and non-motorized data along the existing Eagle Canyon Drive. These categories consisted of traffic counts, preliminary crash data, pedestrian facilities, and bicycle facilities. A summary of observations is listed below. Detailed findings along Eagle Canyon Drive are highlighted in Section 5.6.1: Notable Findings of this report.

- Southbound approach at Goldeneye and at Alena are LOS F in the AM period (school zone condition)
- Eastbound-thru (EBT), Westbound-left (WBL), and Northbound-left (NBL) at Eagle Canyon and Pyramid Hwy are LOS E in the AM
- All approaches fail at Eagle Canyon and Pyramid Hwy under 2040 traffic forecast
- Neighborhood Way approach encourages high speed entry into roundabout
- All school-related traffic clears within 7-10 minutes
- Spanish Springs High School Issues: parents parking in bike lane, students jaywalk to cars

Additionally, eight (8) alignment alternatives were discussed along with the conflicts and current conditions within these corridors. Existing conditions within the study area are identified in Appendix D as a series of technical memoranda that provide analyses to address the following topics:

- Wildlife habitat
- Environmental justice populations
- Land ownership
- Parks and Recreation
- Wetlands/Hydrology

3.1.4 TAC Meeting 3

A third TAC meeting was conducted in May 2020, after the two initial public meetings. Due to Covid-19, this meeting was held virtually. The meeting reiterated the purpose and need for this study and a connection that facilitates movement between the two growing areas, improving regional traffic circulation and access which thereby will reduce emergency evacuation and/or emergency response times.

3.1.5 TAC Meeting 4

The fourth and final TAC meeting was held virtually in November 2020. The final meeting reiterated the purpose and needs. The meeting focused on reviewing the potential alignments, and traffic and pedestrian safety improvements along Eagle Canyon Drive.

3.2 Tribal Coordination

Coordination with the Reno Sparks Indian Colony (RSIC) regarding this project began with the North Valleys Area Multimodal Transportation Study. RTC staff presented the proposed roadway concept, along with other regional projects, to the Tribal Council in April 2017 and sought input. RSIC staff subsequently reached out to the RTC in support of a more detailed study of the proposed roadway connection between Lemmon Valley and Spanish Springs through Hungry Valley. While the RSIC has not made a determination regarding support of the project, staff prior to initiation of the Planning and Environmental Linkages (PEL) study expressed interest in potential economic development and utility improvement opportunities with the proposed Lemmon Valley-Spanish Springs Connector through Hungry Valley. These potential opportunities were identified along with concerns over limited access to/from Hungry Valley and resulting emergency response. As previously stated, RSIC staff were included on the LV-SS project Technical Advisory Committee (TAC) to provide input throughout the development of the study.

The COVID-19 pandemic shutdown during 2020, which was particularly challenging for the residents in Hungry Valley, made it difficult to engage with the RSIC Tribal Council and greater community. Initial feedback presented by staff indicated that members of the Tribal Council were willing to consider a potential corridor alignment through Hungry Valley. In addition, the RSIC had begun an update of their Master Plan for the Hungry Valley community and were still going through the process of soliciting feedback from their Tribal members on what the future vision of the community should look like.

RTC staff most recently had an opportunity in July 2021 to interact with members of the Tribal Council directly, along with RSIC staff, and re-confirmed that the Tribal Council is interested in further study and consideration of the proposed alignments through Hungry Valley. They acknowledged an interest in participating in further studies during future phases of the environmental analysis. They also stated that not all members of the RSIC are supportive of an alignment through the community, and that further discussion would need to take place within the community. The Tribal Council and staff anticipate being able to provide a more formal response on the alignment alternatives in September 2021.

3.3 Public Meetings

During the planning study design, two public meetings were held to conduct outreach to area residents, business/property owners, and community groups. These public meetings focused on the seven potential alignment alternatives to get feedback from the community regarding their interests and concerns. Exhibits, design information, and feedback from each meeting is compiled in Appendix A: Public Meetings.

3.4 Online Public Information Survey

The RTC deployed an online survey using the MetroQuest tool between March 10, 2020 and May 1, 2020. The RTC promoted the survey through social media outlets as well as during two of the public meetings held at Lemmon Valley Elementary School and Spanish Springs High School, respectively. A total of 621 responses were received.

Figure 3.3-1: Online Public Information Survey Welcome Page
Source: RTC

The focus of the survey was to identify concerns of residents and visitors with regard to any of the potential connections between the two valleys and overall safety issues in these areas. Respondents predominately lived in either Spanish Springs (37%) or the North Valleys (43%). Sixteen responses originated from Hungry Valley households. The results also indicate the respondents work outside of the areas in which they live. Only 10% reported working in the North Valleys and 9% in Spanish Springs. Commutes to Reno (outside of the North Valleys) constituted nearly half of all workplace destinations. Surprisingly, only 1% of respondents indicated Storey County as their workplace destination. Unsurprisingly, both US 395 and Pyramid Lake Highway took the top two spots for longest commute segments, accounting for 71% of roadway options.

Respondents were asked how often a new road between the two valleys would be used. Approximately one in four stated "never" and the remaining respondents indicated, daily (17%), weekdays (8%), weekends (13%), weekly (20%) or monthly (19%). The primary reasons cited for wanting to access a connector road is to travel to shopping/dining destinations (26%), for convenience (23%), travel between work and home (14%), and other (22%).

The survey respondents were given an opportunity to drop a variety of geo-located markers by type on a Google map and add comments if they wished to do so. The marker types included safety concerns, operations, transit/carpool, bike/pedestrian, recreation, and wildlife. Nearly 40% of the 1,134 markers placed on the maps were attributed to a safety concern. Another 25% reflected concerns about traffic operations. In an emergency situation, a direct connection would alleviate the significant anticipated congestion on the roadways out of either valley and help safely evacuate communities and/or bring emergency vehicles into and between the valleys more quickly.

Complete results from the online surveys were prepared by the RTC and are compiled in Appendix B: MetroQuest Survey Summary.

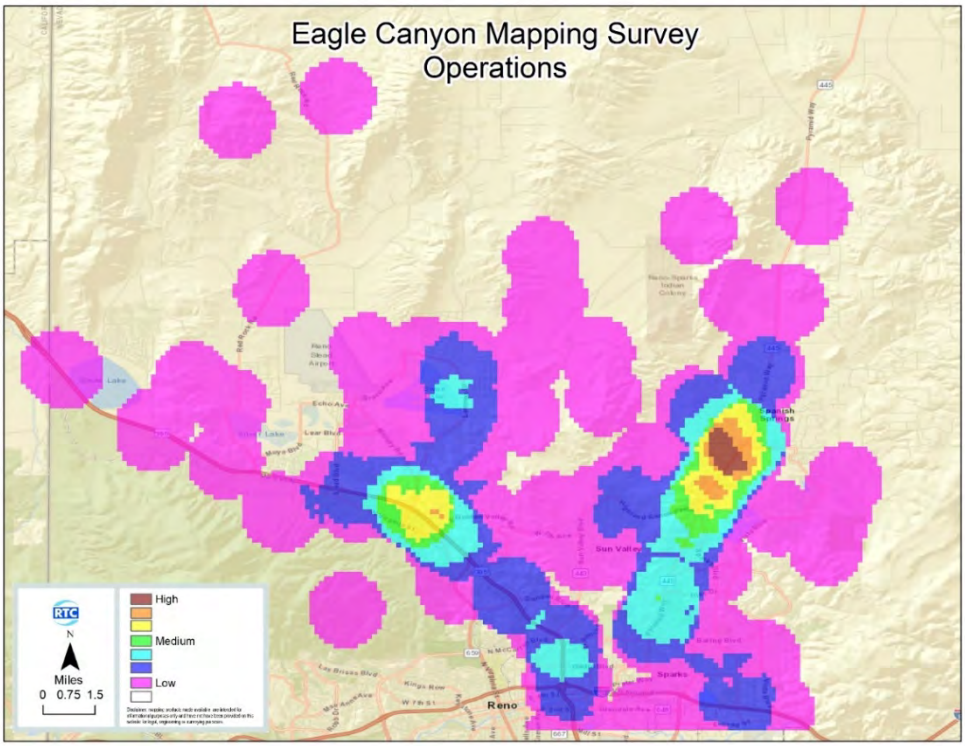


Figure 3.3-2: Survey Output regarding Traffic Operations
Source: RTC

4.0 Planning and Environmental Linkages

The project team followed a Planning and Environmental Linkages (PEL) process. PEL provides the opportunity to identify and consider potential concerns of a project, such as environmental resource impacts and stakeholder involvement, earlier and outside of the NEPA regulatory framework. This will enable the RTC to leverage the planning phase to improve early decision making and expedite the NEPA phase if they follow procedures as part of a PEL process. Decisions made as part of the PEL process could be used in NEPA. The following summarizes that process.

4.1 Alignment Investigation and Analysis

Stantec utilized the Quantm alignment planning software to identify and analyze multiple routes between Spanish Springs and Lemmon Valley. The software generated a large number of corridors using route optimization technology which were then reduced to eleven (11) initial conceptual alternatives for consideration by the Technical Advisory Committee (TAC). The TAC's preferred eight (8) alignments were presented to the public for input. Based on feedback and existing environmental concerns, the alternatives were narrowed to three (3) different alignments with five (5) connection options for final recommendation. The following section outlines the refinement process.

Initial alignments evaluated connections from Spanish Springs at the intersection of Eagle Canyon Drive and West Calle de la Plata to the intersection of Lemmon Drive and Chickadee Drive in Lemmon Valley. Additional alternatives included extensions from the intersections of Pyramid Way and Lazy 5 Parkway and Sha Neva Road and Pyramid Way in Spanish Springs to the intersections of Deodar Way and Lemmon Drive in Lemmon Valley. The Hungry Valley residents and geographic area are important to the process of connecting with Lemmon Valley. Below is a list of potential tie-in locations for the Lemmon Valley – Spanish Springs Connector.

Lemmon Valley Connection Options shown in blue include:

- Lemmon Drive near Chickadee Drive
- Deodar Way

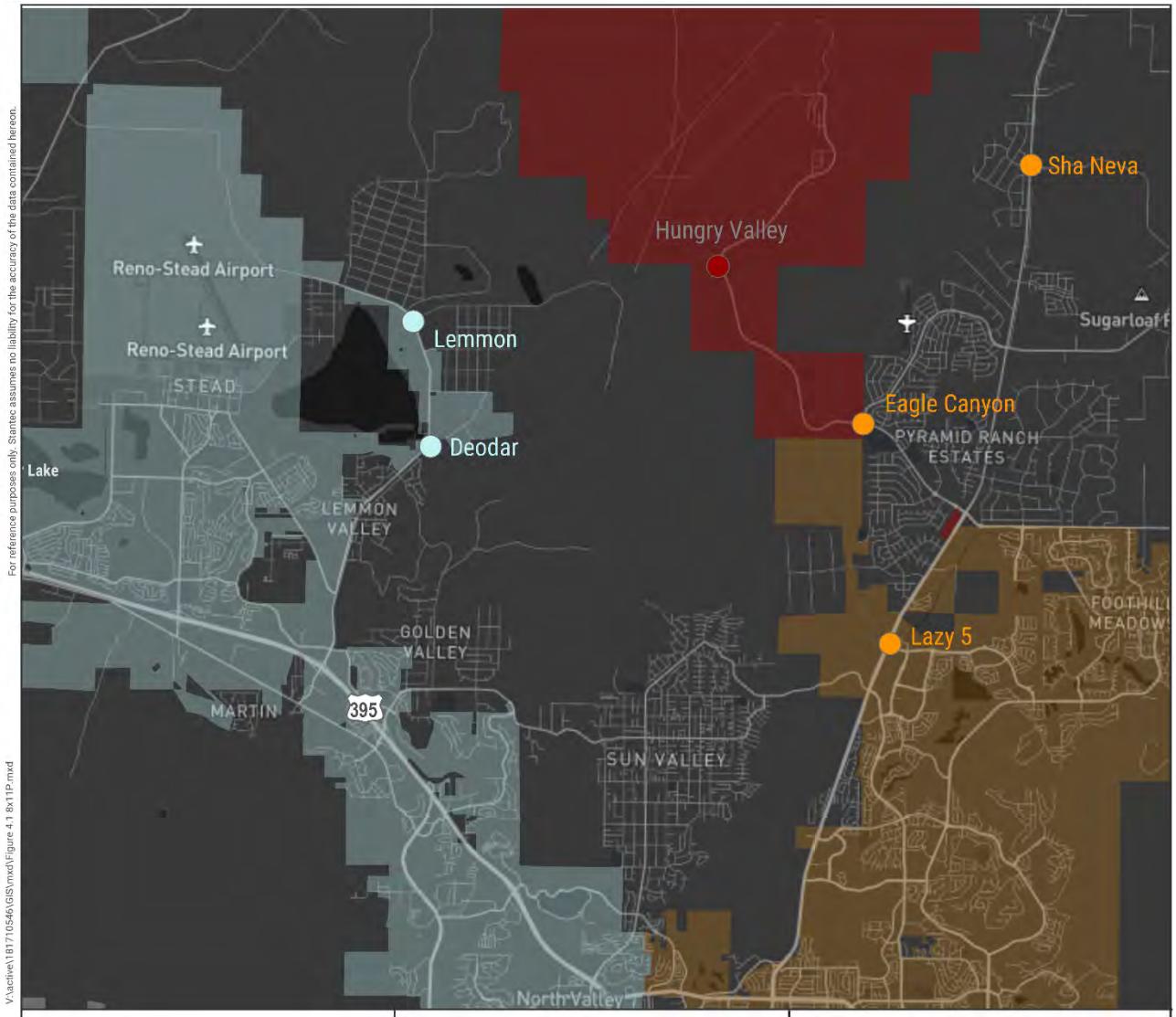
Spanish Springs Connection Options shown in orange

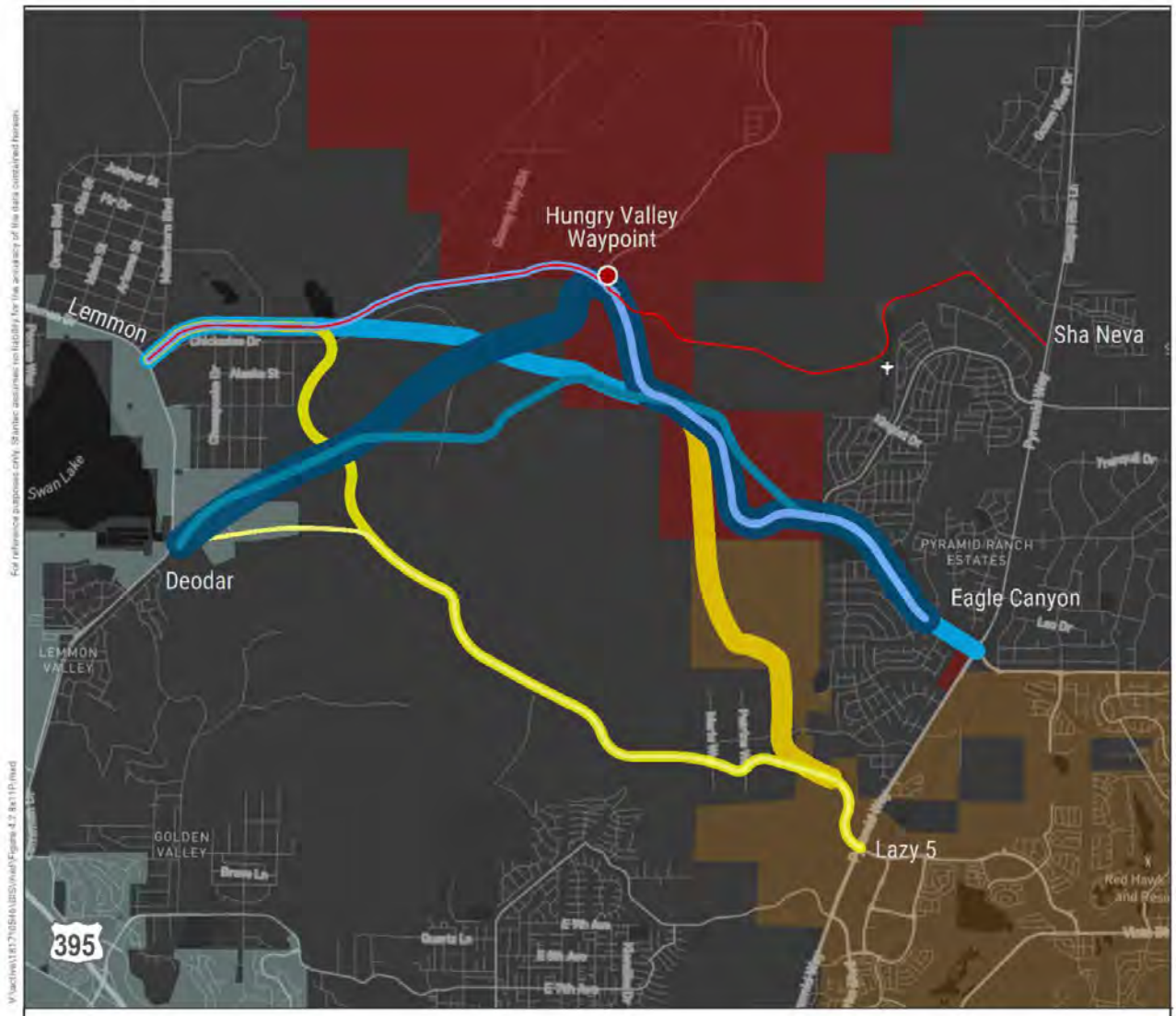
- Eagle Canyon Drive
- Sha Neva Way
- Lazy 5

Waypoint shown in red

- Hungry Valley (located at the end of Existing Eagle Canyon Drive)

Figure 4-1 on the following page illustrates the selected subset of potential points of connection within the larger geographic area. Figure 4-2 displays the eight (8) corridors generated by Quantm put forth to the Stakeholders and general public with Lazy 5, Eagle Canyon and Sha Neva as connection points in Spanish Springs to Deodar Drive, and Lemmon Drive (near Chickadee Drive) as connection points in Lemmon Valley. Appendix C provides all the alignment information and analysis generated by Quantm.


Sha Neva
Hungry Valley
Reno-Stead Airport
Reno-Stead Airport
STEAD
Lemmon
Deodar
Eagle Canyon
PYRAMID RANCH ESTATES
Lake
LEMMON VALLEY
GOLDEN VALLEY
MARTIN
395
SUN VALLEY
Lazy 5
North Valley
Legend
RSIC Tribal Land
Sparks City Limits
Reno City Limits
Connection Points
Lemmon Valley
Spanish Springs
Hungry Valley Waypoint
RTC
1 inch = 9,000 feet
N
Stantec
REGIONAL TRANSPORTATION COMMISSION
LEMMON VALLEY - SPANISH SPRINGS CONNECTOR STUDY
PROJECTION: STATE PLANE NEVADA WEST ZONE, NAD 83, US SURVEY FOOT
Source: RTC's 2050 Regional Transportation Plan; Stantec Consulting Services Inc.
DATE: 6/13/21
DRAWN BY: CJA
PROJECT NO.: 181710546
Figure 4.1
Potential Connection Options
For reference purposes only. Stantec assumes no liability for the accuracy of the data contained hereon.
V:\active\181710546\GIS\mxd\Figure 4.1 8x11P.mxd



Legend

- RSIC Tribal Land
- Sparks City Limits
- Reno City Limits

Potential Corridors by No. and Alignment Name

- 1 - Eagle Canyon to Lemmon Dr
- 2 - Eagle Canyon to Lemmon via Hungry Valley Waypoint
- 3 - Eagle Canyon to Deodar Way
- 4 - Eagle Canyon to Deodar Way via Hungry Valley Waypoint
- 5 - Lazy 5 to Lemmon Dr
- 6 - Lazy 5 to Deodar Way
- 7 - Lazy 5 to Lemmon via Hungry Valley Waypoint
- 8 - ShaNeva to Lemmon via Hungry Valley Waypoint

RTC

1 inch = 6,000 feet

Stantec

N

REGIONAL TRANSPORTATION COMMISSION
LEMMON VALLEY - SPANISH SPRINGS CONNECTOR STUDY

PROJECTION: STATE PLANE NEVADA WEST ZONE, NAD 83, US SURVEY FOOT

Source: RTC's 2050 Regional Transportation Plan; Stantec Consulting Services Inc.

DATE: 6/13/21 | DRAWN BY: CJA | PROJECT NO.: 181710546

Figure 4.2
Potential Corridors Identified

4.1.1 Existing Environmental Impacts

After the eight (8) alignment alternatives were determined through the process outlined above, additional considerations were investigated to further identify a prospective corridor. Much consideration revolved around potential impacts corresponding to certain corridors. These impacts include the following:

- Environmental Justice
- Cultural Resources
- Biological Resources
- Parks and Recreational Resources

A detailed evaluation for each of above referenced impacts is discussed in Appendix D: Existing Environmental Impacts.

Environmental Justice

Environmental Justice (EJ) involves identifying and addressing disproportionately high and adverse effects of the programs, policies, and activities on minority populations and low-income populations to achieve an equitable distribution of benefits and burdens.

Existing Conditions

Census and land use data indicate that both minority and low-income populations have the potential to occur within the Study Area. Native Americans are considered minority populations, notable because of the presence of the Reno-Sparks Indian Colony (RSIC). Minority populations occupy the east and west edges of the Study Area where residential and business development are present. One low-income population is located on the southern edge of the Study Area, the northernmost edge of Sun Valley.

Potential Environmental Consequences

Of the proposed alignment alternatives, only the Lazy 5 to Deodar alignment alternative (Figure 4.2), may impact both the minority and low-income populations potentially present in the Sun Valley area. There are no potential impact differentiators between the remaining proposed alignment alternatives with regard to environmental justice. All of the alignment alternatives could potentially impact minority populations.

Potential impacts on minority and low-income populations, from right-of-way needs, increased noise levels, and changes to the visual environment, may occur and will need to be further assessed as project improvements are carried forward into the National Environmental Policy Act (NEPA) evaluation process.

Temporary construction-related impacts could occur and may include roadway congestion in and around the Study Area, noise from construction equipment, emissions from diesel equipment, fugitive dust from earthmoving activities, temporary detours, and out-of-direction travel.

Next Steps

NEPA studies for future projects will assess whether proposed improvements will result in disproportionate effects on minority and low-income populations. The analysis conducted during the NEPA evaluation process should be more in-depth and included in the determination of potential impacts and mitigation. The 2020 U.S. Census and U.S. Department of Housing and Urban Development data should be used to identify minority and/or low-income populations. If impacts are expected, the analysis will assess whether the impacts are disproportionately high and adverse, as defined by FHWA guidance (FHWA 2011). For any adverse effects, measures to avoid and minimize impacts on disadvantaged communities should be evaluated. If impacts cannot be avoided, mitigation measures to affected communities should be developed to offset the impacts which will require outreach to these communities to determine their needs and concerns.

Cultural Resources

Existing Conditions

The alternative alignments cross the broad undeveloped expanse with roughly parallel valleys and mountains between Pyramid Highway and Lemmon Drive (Figure 4.2). The valleys are structural depressions partly filled with material eroded from the mountains and are near the western margin of the Great Basin Section of the Basin and Range physiographic province (Fenneman 1931; Rush and Glancy 1967). Mountains to the south are underlain by granitic rock, and those to the north are comprised of volcanic rock with andesite in addition to other inclusions. The steppe climate ranges between desert and humid and the landscape is sparse juniper woodland with a shrubby aspect dominated by sagebrush and rabbitbrush. Natural springs are a feature of the landscape, which has historically proven more suitable for ranching than cultivation.

In 2016 the Obama administration transferred 13,400 acres of Bureau of Land Management land to the existing northern unit of the Reno-Sparks Indian Colony (RSIC) and portions of the northern alignment alternatives pass through the southern boundary of the RSIC. Members of the Paiute, Shoshone, and Washoe tribes combined to form the RSIC in 1900 and RSIC was federally recognized in 1934.

Potential Cultural Resources

Results of the preliminary cultural resources inventory are presented fully in the Appendix with relation to both the Area of Potential Effect (APE) and the broader Study Area and discussed broadly by alignment alternative.

A search of both the National Register of Historic Places (NRHP) and the State Register of Historic Places failed to identify cultural resources within the APE or Study Area. The Nevada Cultural Resource Information System (NVCRIS) records search yielded significantly more information. A total of 52 cultural resources identified within the APE and Study Area. These include 38 sites or structures, and 14 isolated finds. Of the sites and structures, 19 are located within the APE, and 19 are in the broader Study Area.

Only three prehistoric archaeological sites and no historic era resources have been recommended as eligible for listing in the NRHP.

There are 15 prehistoric archaeological sites. Two of these have been determined eligible for listing in the NRHP. The archaeological sites are primarily flaked stone scatters, and/or groundstone scatters on the ground surface. A single site has also yielded a subsurface component, including midden, or cultural soil, which is rare in this portion of the Great Basin.

There are 18 historic resources. Six of these are road segments, all but one of which have been evaluated as not eligible for listing in the NRHP. The historic Anderson Toll Road has not been evaluated. The other 12 historic resources include 11 refuse scatters and one mining site with a prospect pit, claim marker, and refuse scatter. No historic era resources have been evaluated as eligible for listing in the National Register.

Finally, there are six archaeological sites that have both prehistoric and historic components. One of these has been determined to be eligible for listing in the NRHP. The other five are not eligible for listing. All six sites are composed of flaked stone scatters and historic refuse.

Next Steps

Section 106 and the NEPA require a more thorough cultural resources inventory than is provided by this preliminary analysis. The next steps required during future planning studies or NEPA documentation include:

- More extensive archival and literature review (for example, county land records, General Land Office maps, county assessor's office maps, Nevada State Library and Archives online aerial photos and other databases).
- Outreach to local libraries, museums, historical societies, and other groups and institutions that curate information about the past in the Study Area.
- Intensive pedestrian cultural resources survey of the APE with appropriate permits.
- A combined desktop and field-based geoarchaeological study of the potential for buried archaeological resources.
- Native American/tribal outreach and consultation to discover Traditional Cultural Properties or other resources of interest to tribes.

Biological Resources

Existing Conditions

The project area is located in the Sierra Nevada-Influenced Semiarid Hills and Basins sub-ecoregion within the greater Central Basin and Range ecoregion, as defined by the Environmental Protection Agency (EPA). This sub-ecoregion includes the basins and lower mountain slopes immediately east of the Sierra Nevada that are affected by its climate or that have its characteristic granitic substrate. Three large river systems, the Truckee, Carson, and Walker, flow eastward through this region from the Sierra Nevada, providing water for agriculture and urban development. Their floodplains support some of the best remaining riparian cottonwood forest in the state, which has been degraded in many areas by grazing, agriculture, and invasive weeds. Heavy agricultural water consumption and many stream diversions for agriculture occur in lower elevation areas. Much of the vegetative land cover throughout the sub-ecoregion is dominated by shrubs and

grasses. Extensive, active sand, gravel, clay, limestone, and gold mining have historically occurred, and residential and commercial areas have continued to expand (Bryce et al. 2003).

Potential Environmental Consequences

Impacts on general wildlife and special-status species can result from the permanent and temporary loss of habitat. Permanent impacts generally include habitat that could potentially be destroyed due to construction of one of the alignment alternatives. Temporary impacts occur from the potential short-term disturbance of areas that can be revegetated, including areas needed for construction access. Direct impacts may include loss of habitat, increased stress due to construction activities and roadway use, and/or death caused by vehicles or vegetation removal. Indirect impacts may include the addition of an impervious road surface and introduction of associated traffic fragmenting habitat, which may cause animal vehicle collisions or interrupt typical behaviors such as movement patterns, foraging, and breeding.

Based on mapping from the Nevada State Wildlife Action Plan, sagebrush habitat is the predominant land cover type in the project area and, therefore, is the habitat that would potentially be most impacted. Potential short-term impacts from construction activities could include removing vegetation and topsoil to construct the roadway prism. Land disturbance where noxious and invasive weed species exist may greatly increase seedling establishment, creating or increasing infestations. Therefore, all areas potentially disturbed by construction of one of the alignment alternatives would provide potential substrate for these species to become established. Adverse impacts from noxious and invasive species could potentially include, at a minimum, loss or degradation of wildlife habitat and reduction of native landscapes.

Construction during migratory birds' breeding or migration seasons could potentially impact migratory birds, causing disturbance or displacement-related impacts on migratory birds nesting, or migration near construction areas. General wildlife species may also be potentially impacted by construction noise, ground disturbance, and increased human presence.

Construction of one of the alignment alternatives may potentially lead to temporary and permanent impacts on aquatic resources (e.g., wetlands, drainages), some of which may be considered jurisdictional by the USACE. Potential impacts to these aquatic resources may require permit coverage under Section 404 of the Clean Water Act.

Next Steps

Field surveys should be conducted to delineate the extent of aquatic resources (wetlands and other waters) that could be impacted by project-related activities. To the greatest extent practicable, future planning and design will be required to incorporate avoidance and minimization of impacts on known wetlands and waters of the United States. Where avoidance would not be practicable, impacts on wetlands and waters of the United States could be minimized by using temporary and permanent best management practices to reduce direct and indirect impacts on these resources.

Potential impacts on special-status species outlined in the Appendix should be carefully considered when developing the design of future projects that may result from this study. Comprehensive and updated special-status species lists will be obtained during the National Biological and Aquatic Resources Environmental Protection Act phase of subsequent future projects. Based on the special-status species list, surveys for

federal- and state-listed species should be conducted during the appropriate seasons, per USFWS and other regulatory agency recommendations. If species of concern are found to be within the Study Area, further coordination with the appropriate regulatory agencies must take place and suitable measures will need to be developed to avoid and/or minimize impacts to these sensitive resources. Depending on the presence of habitat and potential impacts on those habitats, formal consultation with the USFWS and other regulatory agencies may be required.

Parks and Recreation Resources

Existing Conditions

The project area offers a variety of recreational opportunities protected by Section 4(f) or Section 6(f) the Land and Water Conservation Fund (LWCF) Act. There are nine parks and open spaces, seven public schools, and eight trails located in the project vicinity. Additionally, two LWCF properties are located within the project vicinity. During the NEPA phase, further research and coordination with the appropriate jurisdiction officials over these recreational resources would help determine whether Section 4(f) would apply in accordance with FHWA's Section 4(f) Policy Paper (FHWA 2012). This technical memorandum provides preliminary observations in that regard.

Of the nine parks and open spaces, eight are owned and maintained by Washoe County: Desert Winds Park, Eagle Canyon Park, Gator Swamp Park, Lazy 5 Regional Park, Lemmon Valley Horseman's Arena, Lemmon Valley Open Space, Lemmon Valley Park, and the Sun Valley Regional Park. The county community of Sun Valley owns and maintains Highland Ranch Park. All of these properties, with the exception of the Lemmon Valley Open Space, are designated recreational facilities owned by, and open to the public. Therefore, these eight properties may qualify for protection under Section 4(f). Lemmon Valley Open Space is publicly owned; however, the property is not designated as a recreational property and may not warrant protection under Section 4(f).

Four schools, Alyce Taylor Elementary School, Esther Bennet Elementary School, Jesse Hall Elementary School, and Lemmon Valley Elementary School, have recreational facilities including playgrounds, ball fields, and ball courts. The recreational areas of these properties could qualify for protection under Section 4(f). Desert Skies Middle School, Yvonne Shaw Middle School, and Spanish Springs High School all have recreational facilities including ball fields, track and field areas, or ball courts. The primary purpose of these recreational facilities is for organized school sports; however, at least portions of each property's recreational facilities are open for public use. The recreational areas of these properties likely would qualify for protection under Section 4(f).

Many trails, including David Allen Parkway Trail, Fortunato Loop Trail, Lazy Five Parkway Trail, Pyramid Way Trail, and the W Calle De La Plata Trail, are all on-road trails located within a transportation right-of-way. The primary use of the trails is likely transportation and, if confirmed, they would not warrant protection under Section 4(f). Sugarloaf Peak Open Space and Trail, owned by Washoe County, provides recreational users with access to Sugarloaf Peak. This trail could qualify for protection under Section 4(f). Lemmon Valley Trail is a paved path that parallels County Highway 165 in Lemmon Valley. This trail likely would qualify for protection under Section 4(f). The remaining trail, Eagle Canyon Drive Trail, has two parts, urban and rural. The urban section is a paved path located in Spanish Springs along the south side of Eagle Canyon Drive. The rural section is a network of natural paths and staging areas that roughly follow Eagle Canyon Drive west from

Spanish Springs and north through the Reno-Sparks Indian Colony. This entire trail system is likely to be protected under Section 4(f).

Potential Environmental Consequences

The existing Eagle Canyon segment intersects with six potential Section 4(f) properties, Desert Winds Park, Eagle Canyon Park, Spanish Springs High School, Yvonne Shaw Middle School, and Eagle Canyon Drive Trail and W. Calle De La Plata Trail. Desert Winds Park is located along the south side of the eastern terminus of the proposed alignment; Eagle Canyon Park and Yvonne Shaw Middle School are located along the north side of the proposed alignment; Spanish Springs High School is located along the south side of the western terminus of the proposed alignment; and Eagle Canyon Drive Trail parallels the south side entire proposed alignment. Based on the current design, impacts would be anticipated on the Desert Winds Park property, but not on any of the park facilities. Impacts on the access and parking for Eagle Canyon Park are anticipated; however, these impacts can be minimized and/or mitigated. Similarly, impacts on the parking lot and access roads to Yvonne Shaw Middle School are anticipated; however, this would not impact the recreational facilities on the property. The northwest portion of the Spanish Springs High School property contains ball fields and a track that could be eligible for Section 4(f) protection. Impacts on the recreational facilities are possible. Further design would be needed to determine the extent of impacts on the respective properties. The proposed alignment would intersect with the southern terminus of W. Calle De La Plata Trail.

The existing Chickadee segment intersects with two Section 4(f) properties, Lemmon Valley Horseman's Arena and Lemmon Valley Trail. Lemmon Valley Horseman's Arena is located approximately 1,200 feet south of the proposed alignment. Based on the current design, there would be no impacts on or access restrictions to the property, and therefore no Section 4(f) use. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Further design would be needed to determine impacts on the property.

The existing Sha Neva segment buffer intersects with one potential Section 4(f) property, Sugarloaf Peak Open Space and Trail. At the closest point, the trail and open space are located 1,100 feet east and northeast of the eastern terminus of the proposed alignment. Based on the current design, no impacts on the properties are anticipated.

Based on the conceptual alignment alternatives, there is one segment that is not anticipated to impact any Section 4(f) properties. The Eagle Canyon to Chickadee segment has no properties within ¼ mile of the alignment.

The Eagle Canyon to Lemmon via Chickadee Dr segment buffer intersects with two potential Section 4(f) properties, Eagle Canyon Trail and Spanish Springs High School, and two potential Section 4(f) properties, Lemmon Valley Open Space and W. Calle De La Plata Trail. Based on the current design, the proposed alignment would cross through Lemmon Valley Open Space resulting in a permanent impact on the property. This property likely does not warrant protection under Section 4(f). The eastern terminus of the proposed alignment is located at the northwest corner of the Spanish Springs High School property. The northwest portion of the property contains ball fields and a track that might be eligible for Section 4(f) protection. Impacts on the recreational facilities on the property are possible, however, further design would be needed to determine the extent of the impacts. The eastern terminus of the proposed alignment would intersect with

the western terminus of Eagle Canyon Drive Trail. Based on current design, an impact on the trail would be likely; however, further design would be Parks and Recreational Resources needed to determine the extent of the impact. The proposed alignment would intersect with the southern terminus of W. Calle De La Plata Trail.

The Eagle Canyon to Deodar Dr segment buffer intersects with one potential Section 4(f) property, Lemmon Valley Trail. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Further design would be needed to determine impacts on the resource.

The Lazy 5 to Deodar Dr segment buffer intersects with three Section 4(f) properties, Lemmon Valley Trail, Sun Valley Regional Park, and Desert Skies Middle School. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Further design would be needed to determine impacts on the property. The proposed alignment crosses through the northeast portion of Sun Valley Regional Park. Based on the current design, a permanent Section 4(f) use of the park would result. The proposed alignment passes along the north side of Desert Skies Middle School. Based on current design and the location of the school's recreational facilities, impacts on the property could be avoided.

The Lazy 5 to Lemmon via Chickadee Dr segment buffer intersects with three likely Section 4(f) properties: Lazy 5 Regional Park, Lazy Five Parkway Trail, and David Allen Parkway Trail, as well as two potential Section 4(f) properties, Fortunato Loop Trail, and Pyramid Way Trail. Lazy 5 Regional Park is also protected under the LWCF Act. The Lazy 5 Regional Park is located north and east of the eastern terminus of the proposed alignment. Based on the current design, no Section 4(f) impacts or LWCF conversions would be anticipated at this property. The western terminus of Lazy Five Parkway Trail abuts the eastern terminus of the proposed alignment. Based on current design, impacts on the trail are possible; however, further design would be needed. David Allen Parkway Trail is located approximately 1,200 feet east of the eastern terminus of the proposed alignment. Based on the current design, impacts on the trail are not anticipated. Pyramid Way Trail is an on-road designated bike lane along each shoulder of Pyramid Way. Fortunato Loop Trail is an on-road bike route located north and east of the eastern terminus of the proposed alignment. The Eagle Canyon at HV to Sha Neva segment buffer intersects with one potential Section 4(f) property, W. Calle De La Plata Trail. The trail is located approximately 1,200 feet east of the proposed alignment.

The Lazy 5 to Lemmon Waypoint segment buffer intersects with one Section 4(f) property, Lemmon Valley Trail. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Although further design would be needed to determine impacts on the property, a Section 4(f) "use" of the trail is possible.

The Lazy 5 to Eagle Canyon segment buffer intersects with one potential Section 4(f) property, Jesse Hall Elementary School. The school is located approximately ¼ mile east of the proposed alignment. Based on current design, impacts to the school would be avoidable and a use of the property would not be required.

Next Steps

During subsequent NEPA reviews of projects, existing and potential park and recreational facilities that could be impacted should be evaluated for Section 4(f) applicability and use. Permanent incorporation, temporary occupancy (potentially exempt for construction), and constructive use should be evaluated, and avoidance and measures to minimize harm should be considered. If it is determined that a project as proposed would use a Section 4(f) property and there are no feasible or prudent alternatives that avoid use of Section 4(f)

resources, there are three methods available to approve the use: 1) preparing a de minimis Impact Finding when there are no adverse effects on the activities, features, or attributes of the Section 4(f) resource; 2) applying a programmatic Section 4(f) evaluation for minor involvements with parks and recreational areas if the use meets specific criteria; and 3) through preparation of an individual Section 4(f) evaluation if the use would result in adverse effects on the activities, features, or attributes of the 4(f) resource. If the proposed improvements result in a use of a Section 4(f) property, one of these approval processes must be completed.

Visual Resources

Existing Conditions

The Study Area is surrounded by five valleys located within the hills north of Reno, Nevada: Spanish Springs, Sun Valley, Golden Valley, Lemmon Valley, and Lemmon Valley–Golden Valley. Study Area vegetation includes interspersed grasses, shrubs, scattered trees typical of semi-arid environments, and commercial and residential landscaping. Views from county roads within the Study Area consist of hillsides and, occasionally at higher elevations, scattered commercial and residential areas interspersed with undeveloped areas. Existing views into the Study Area from developments on the surrounding the hillsides reveal rolling topography sparsely covered by sagebrush and grasses. Surrounding development dominates and blocks views from the surrounding valleys looking toward the Study Area's center. The rolling topography and varied elevations result in varied views throughout the Study Area.

Potential Environmental Consequences

The various alignment alternatives include design elements that would result in a change from the existing visual environment. Depending on the location, this level of change would be minor (not attracting attention or deviating from the overall visual setting), moderate (noticeable, but subordinate to the setting), or strong (attracting attention and dominate in the setting). This impact analysis considers the potential predicted viewer response to visual changes resulting from proposed alignment alternatives. Viewers' activity can affect their sensitivity to the views of and from the proposed alignment alternatives. Individuals driving for pleasure or engaging in recreational activities, and residents have a higher sensitivity to visual changes. Residents' sensitivity to changes in visual quality is high because of the longer duration of their views and more frequent exposure to the Study Area's visual setting.

Like residents, recreationists are highly sensitive to the visual environment because the purpose of their activities is for pleasure. Visual sensitivity is lower for people driving to and from work who experience the visual environment as part of their work commute. Preliminary visualizations were prepared for four alignment alternatives and key views are described in the Appendix D.

Next Steps

If potential improvements from this PEL study are moved forward into the NEPA process, the following analyses are recommended for future projects:

- More detailed evaluation, characterization, and photo documentation of the existing visual environment including the potential impact of vehicles using a new roadway and the visual effects caused by the introduction of new roadway lighting and/or vehicle headlight use.

- In areas with sensitive land uses, consider the development of renderings to depict the anticipated visual changes as more detailed engineering design becomes available.
- Conduct a formal visual impact assessment in accordance with FHWA's Visual Impact Assessment for Highway Projects (1998) and Guidelines for the Visual Impact Assessment of Highway Projects (2015).
- Conduct visual assessment for lands owned and managed by the BLM following BLM guidance in BLM Manual 8431 – Visual Resource Contrast Rating.
- Develop additional mitigation measures and design guidelines.

Mitigation measures to address visual impacts could include the following:

- Integrate the project alternatives into the existing landscape with the use of color, texture, and other design features.
- Minimize the project footprint and cut and fill activities.
- Incorporate signage and architectural features that promote continuity within the Study Area.
- Review, develop, and apply visual guidelines in conjunction with local communities.

4.2 Conclusion and Recommendations

Table 4.1 summarizes the alignment evaluation criteria for each of the eight (8) alignments and a no build scenario. The small pie charts visualize the qualitative information to compare each parameter or criteria for evaluating each alignment. Exceptional performance receives a full ball, poor performance an empty one, with a range in between. The explanations that support each the performance rating is located in Table 4-2 on the following page. Appendix C provides the alignment analysis generated by Quantm refined through AutoCAD.

Table 4-1 Alignment Evaluation Criteria

No.	Alignment Name	Lemmon Dr Connection	Pyramid Way Connection	Hungry Valley Waypoint	Public Comment Rank	Fiscal Considerations	Potential Residential Units Impacted	Regional Connectivity	Community Connectivity	Emergency Access	Human Environmental Impacts	Natural Environmental Impacts
1	EAGLE CANYON to LEMMON	Lemmon	Eagle Canyon	No	3	●	13	◑	◕	◕	◑	◑
2	EAGLE CANYON to LEMMON VIA HV	Lemmon	Eagle Canyon	Yes	7	●	14	◑	●	●	◑	◑
3	EAGLE CANYON to DEODAR	Deodar Way	Eagle Canyon	No	2	◕	0	◑	◕	◕	◑	◕
4	EAGLE CANYON to DEODAR VIA HV	Deodar Way	Eagle Canyon	Yes	5	◕	11	◑	●	●	◑	◑
5	LAZY 5 to LEMMON	Lemmon	Lazy 5	No	4	○	10	◕	◑	◑	◕	◕
6	LAZY 5 to DEODAR	Deodar Way	Lazy 5	No	1	◔	0	◕	◑	◑	◔	◕
7	LAZY 5 to Lemmon VIA HV	Lemmon	Lazy 5	Yes	6	○	5	◕	◕	◕	◕	◕
8	SHA NEVA to LEMMON VIA HV	Lemmon	Sha Neva	Yes	-	◕	32	◔	◕	◕	◑	◕
9	NO BUILD					●		○	○	○	●	●

Table 4-2: Matrix of Alternatives Legend

Symbology	Regional Connectivity	Community Connectivity	Traffic Impacts	Emergency Access	Human Environmental Impacts	Natural Environmental Impacts
● 100% ◕ 75% ◑ 50% ◔ 25% ○ 0%	This was assigned symbology based on relative impact of improved connectivity to: - travel time/distance for users outside of Lemmon Valley, Hungry Valley, and Eagle Canyon compared to alternative routes including Highland Ranch Road, McCarran, and I-80. **Example:** ◕ = Equivalent secondary route between US 395/ Lemmon and Pyramid/ Eagle Canyon. More direct access to commercial destinations south on Pyramid Way. ◔ = Secondary route between US 395/ Lemmon and Pyramid/ Eagle Canyon but longer travel distance than alternative routes. ○ = No change to existing conditions.	This was assigned symbology based on relative impact of improved connectivity to: - the community surrounding and accessing Eagle Canyon Drive - the community of Lemmon Valley - the community of Hungry Valley	This was assigned symbology based on relative impact of: - Potential noise impacts to residences/parks - Potential proximity to minority neighborhoods - Proximity to parks and open space	This was assigned symbology based on contribution to improved: - Emergency access to Hungry Valley - Emergency access to Eagle Canyon area - Emergency access to Lemmon Valley **Example:** ● = New secondary emergency access route to Hungry Valley, Eagle Canyon, and Lemmon Valley. ◑ = No improvement to emergency access for Hungry Valley, indirect secondary access to Eagle Canyon, new direct secondary emergency access to Lemmon Valley. ○ = No change to existing conditions.	This was assigned symbology based on relative impact of: - Potential noise impacts to residences/parks - Potential proximity to minority neighborhoods - Proximity to parks and open spaces **Example:** ◕ = Potential noise impacts to residential uses south of Delores Drive (eastern terminus), avoids parks, potential minority neighborhoods at east/west termini (-) ◔ = Potential noise impacts to homes near middle school and residential south of Delores Drive; bisects Sun Valley Regional Park and trails onsite; potential for minority neighborhoods at east/west termini; approaches Sun Valley residences which may be minority/low-income. ○ = No change to existing conditions.	This was assigned symbology based on relative impact of: - Proximity to critical habitat - Stream/potential wetland crossings - Encroachment on 100-year floodplain **Example:** ◕ = Avoids critical habitat, multiple streams, and potential wetlands crossings. ◑ = Runs adjacent to critical habitat, multiple streams, potential wetland crossings; runs through 100-year floodplain. ○ = No change to existing conditions.

The process to take the approximate eight (8) alignments down to three took place during a meeting with the project team and RTC staff. In an effort to eliminate some of the duplication within those eight (8) alignments, the project team refined the alignments to a total of three, with alternatives. The process wasn't a reduction in the number as much as a reclassification and grouping of the initial eight (8) corridors. A summary of the refinement process includes:

- Alignments involving the same two origin and destination connections that included RSIC lands or avoided the RSIC lands were considered duplicates
- Alignments were combined into northern corridors: Eagle Canyon or Sha Neva to/from Lemmon Drive; and a southern corridor Lazy 5 to/from Deodar Way
- A route through Hungry Valley for the southern corridor wasn't considered practical or meeting the project goals.

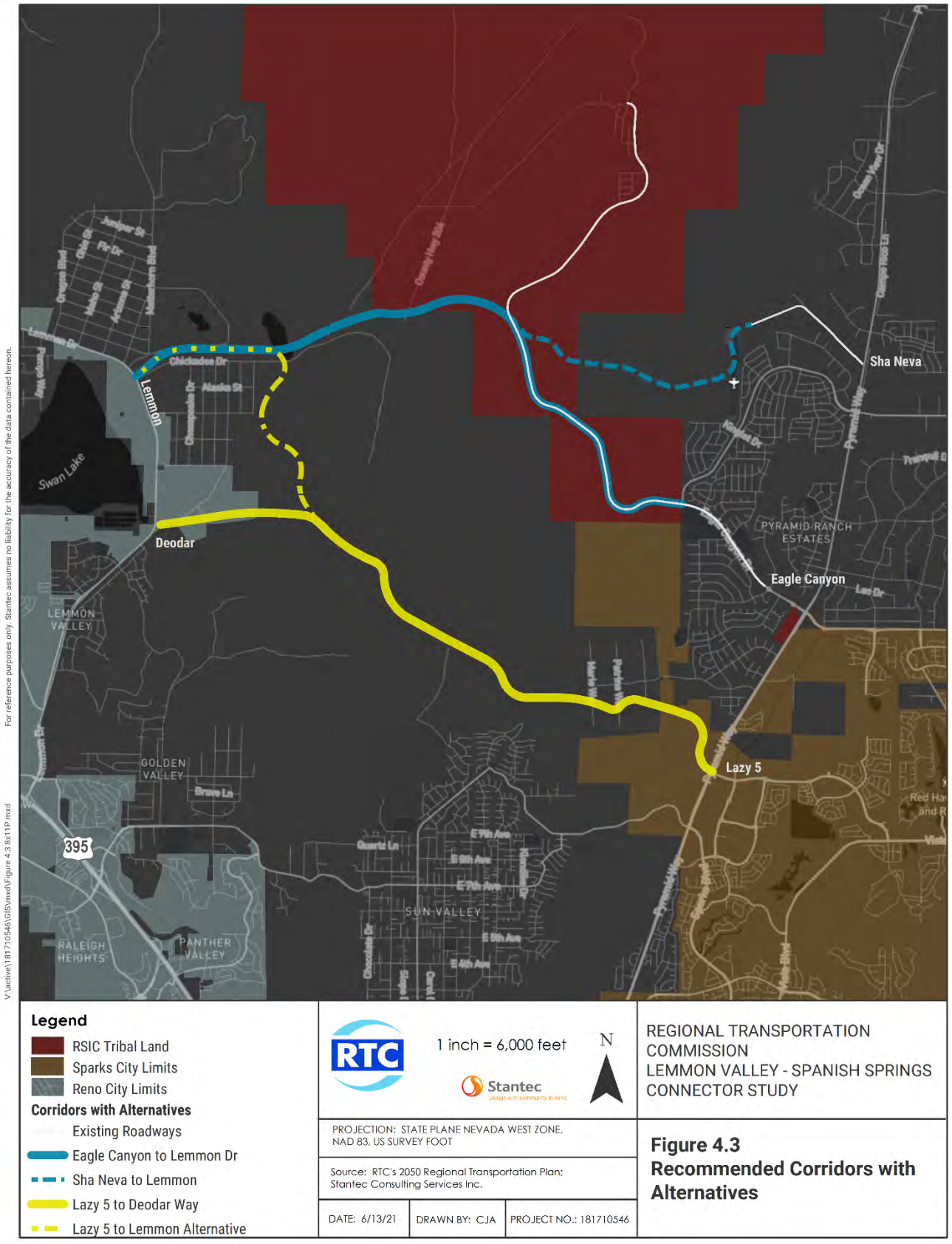
Through the process outlined in this section, three final corridors, the third of which containing two separate Lemmon Valley connection options, were identified as best meeting the project goals while still avoiding sensitive environmental and cultural areas. These corridors and connections are presented in Table 4-3 and Figure 4-3.

1. Eagle Canyon and Lemmon Corridor
2. Sha Neva and Lemmon Corridor
3. Lazy 5 Corridor

To advance the project, additional environmental analysis under the National Environmental Policy Act would be conducted on the three alternatives identified in this recommendation.

Table 4-3: Final Potential Corridors

No.	Connection	Corridor	Spanish Springs Connection	Lemmon Valley Connection
1	Lemmon Connection 1	Eagle Canyon–Lemmon Dr	Eagle Canyon at West Calle de la Plata	Near Chickadee Drive
2	Lemmon Connection 2	Sha Neva–Lemmon Dr	Sha Neva Road	Near Chickadee Drive
3A	Lazy 5 Connection – Alternative 1	Lazy 5–Deodar Way	Lazy 5 Parkway	Deodar Way at Lemmon Drive
3B	Lazy 5 Connection – Alternative 2	Lazy 5–Lemmon Dr	Lazy 5 Parkway	Near Chickadee Drive


Sha Neva
Eagle Canyon
Deodar
Lazy 5
Swan Lake
Lemmon
Chickadee Dr
Alaska St
PYRAMID RANCH ESTATES
LEMMON VALLEY
GOLDEN VALLEY
Brave Ln
395
SUN VALLEY
RALEIGH HEIGHTS
PANTHER VALLEY
Legend
RSIC Tribal Land
Sparks City Limits
Reno City Limits
Corridors with Alternatives
Existing Roadways
Eagle Canyon to Lemmon Dr
Sha Neva to Lemmon
Lazy 5 to Deodar Way
Lazy 5 to Lemmon Alternative
RTC
1 inch = 6,000 feet
Stantec
N
REGIONAL TRANSPORTATION COMMISSION
LEMMON VALLEY - SPANISH SPRINGS CONNECTOR STUDY
PROJECTION: STATE PLANE NEVADA WEST ZONE, NAD 83, US SURVEY FOOT
Source: RTC's 2050 Regional Transportation Plan; Stantec Consulting Services Inc.
DATE: 6/13/21
DRAWN BY: CJA
PROJECT NO.: 181710546
Figure 4.3
Recommended Corridors with Alternatives
For reference purposes only. Stantec assumes no liability for the accuracy of the data contained hereon.
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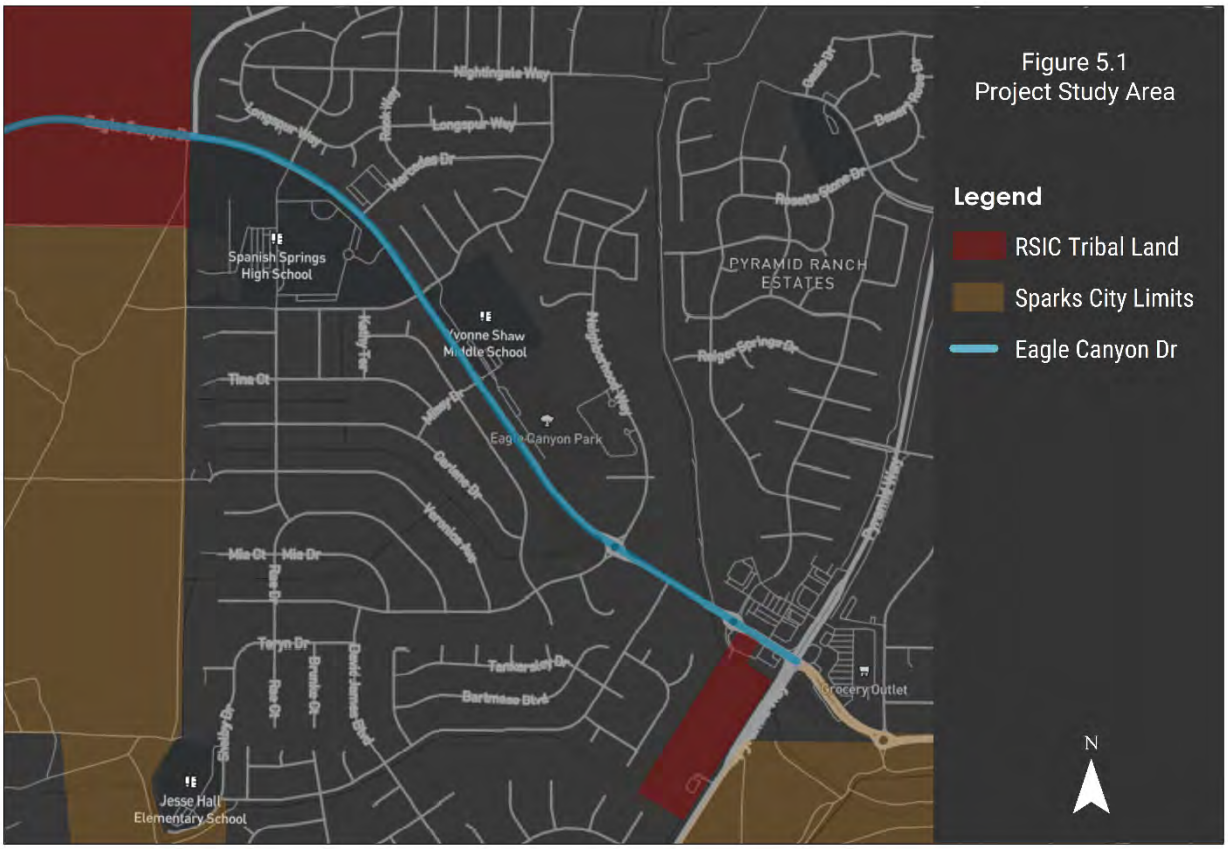
5.0 Eagle Canyon Drive Safety Improvements

5.1 Project Study Area

Apart from the alternate alignment analysis to connect Lemmon Valley and Spanish Springs, the roadway segment of Eagle Canyon Drive from Pyramid Way to West Calle De La Plata, including the intersections along this section, were investigated for potential safety improvements. Below is a list of the study intersections:

- Eagle Canyon Drive/Pyramid Way
- Eagle Canyon Drive/Richard Springs Boulevard
- Eagle Canyon Drive/Ember Drive & Neighborhood Way
- Eagle Canyon Drive/Missy Drive
- Eagle Canyon Drive/Alena Way
- Eagle Canyon Drive/Mercedes Drive
- Eagle Canyon Drive/Goldeneye Parkway
- Eagle Canyon Drive/West Calle De La Plata Drive

The location of this roadway segment and corresponding intersections is shown in Figure 5.1.



The project site is generally serviced by the following transportation facilities:

5.2 Roadways

A brief description of the major roadways within this traffic study is provided below.

Eagle Canyon Drive – Existing Eagle Canyon Drive is a northwest to southeast two to four-lane undivided arterial (with portions of striped two-way left turn lane). Eagle Canyon Drive is posted for a 35 MPH speed limit. The 2050 Regional Transportation Plan classifies Eagle Canyon Drive as a Medium Access Control Arterial.

Pyramid Way – Existing Pyramid Way in the vicinity of Eagle Canyon Drive between Queen Way and Calle de la Plata Drive is a north to south four-lane divided arterial. Pyramid Way transitions to an undivided two-lane road north of the study area near Calle de la Plata. Pyramid Way is posted for a 55 MPH speed limit. The 2050 Regional Transportation Plan classifies Pyramid Way as a High Access Control Arterial.

5.3 Intersections

La Posada and Eagle Canyon/Pyramid – The intersection of Pyramid Way and Eagle Canyon Drive/La Posada Drive is a signalized four-leg intersection. The northbound approach (Pyramid Way) consists of two through lanes, two exclusive left turn lanes, and an exclusive yield condition right turn slip lane with raised porkchop island. The southbound approach (Pyramid Way) consists of two through lanes, two exclusive left turn lanes, and a yield condition right turn slip lane with raised porkchop island. The westbound approach (La Posada Drive) consists of two through lanes with the right lane being a shared through-right turn lane and two exclusive left turn lanes. The eastbound approach (Eagle Canyon) consists of one through lane, two exclusive left turn lanes, and an exclusive right turn slip lane (free right) with raised porkchop island. All four approaches utilize “protected only” left turn phases. Pedestrian crosswalks with crosswalk markings exist across all four segments.

Eagle Canyon/Richard Springs – The intersection of Richard Springs Boulevard and Eagle Canyon Drive is a three-leg, minor-road only stop controlled intersection. The northbound approach (Richard Springs Boulevard) consists of one shared left-right turn lane. The westbound approach (Eagle Canyon Drive) consists of two through lanes and one exclusive left turn lane. The eastbound approach (Eagle Canyon Drive) consists of two through lanes with the right lane being a shared through-right turn lane. Richard Springs Boulevard is stop-controlled. Pedestrian crosswalks with crosswalk markings exist across the Richard Springs northbound approach and the Eagle Canyon Drive eastbound approach.

Eagle Canyon/Ember & Neighborhood – The intersection of Ember Drive/Neighborhood Way and Eagle Canyon Drive is a four-leg roundabout intersection. The westbound approach (Eagle Canyon Drive) consists of one through lane and one exclusive right turn lane. The eastbound approach (Eagle Canyon Drive) consists of one shared through-right turn lane. The northbound approach (Ember Drive) consists of one shared through-right turn lane. The southbound approach (Neighborhood Way) consists of one through lane and one exclusive right turn lane. All approaches are yield controlled and include raised pork chop islands. Pedestrian crosswalks with crosswalk markings exist across all approaches.

Eagle Canyon/Missy – The intersection of Missy Drive and Eagle Canyon Drive is a four-leg, two-way stop-controlled intersection. The westbound approach (Eagle Canyon Drive) consists of one through lane, one exclusive left turn lane, one exclusive right turn lane, and a striped bike through lane. The eastbound approach (Eagle Canyon Drive) consists of one exclusive left-turn lane and one shared through-right turn lane. The northbound approach (Missy Drive) consists of one shared through-left-right turn lane. The southbound approach (Shaw MS) consists of one exclusive right turn only lane with raised pork chop island. The Missy Drive northbound and Shaw MS southbound approaches are stop controlled. Pedestrian crosswalks with markings exist across the Missy Drive northbound approach, the Shaw MS southbound approach, and the Eagle Canyon Drive eastbound approach.

Eagle Canyon/Alena – The intersection of Alena Way and Eagle Canyon Drive is a two-way stop controlled four-leg intersection. The westbound approach (Eagle Canyon Drive) consists of one shared through-right turn lane and an exclusive left turn lane. The eastbound approach (Eagle Canyon Drive) consists of one shared through-right turn lane and an exclusive left turn lane. The northbound approach (Alena Way) consists of a through-right shared lane and an exclusive left turn lane. The southbound approach (Alena Way) consists of a through-right shared lane and an exclusive left turn lane. Pedestrian crosswalks with crosswalk markings exist across the Eagle Canyon Drive eastbound approach, Alena Way northbound approach and the Alena Way southbound approach.

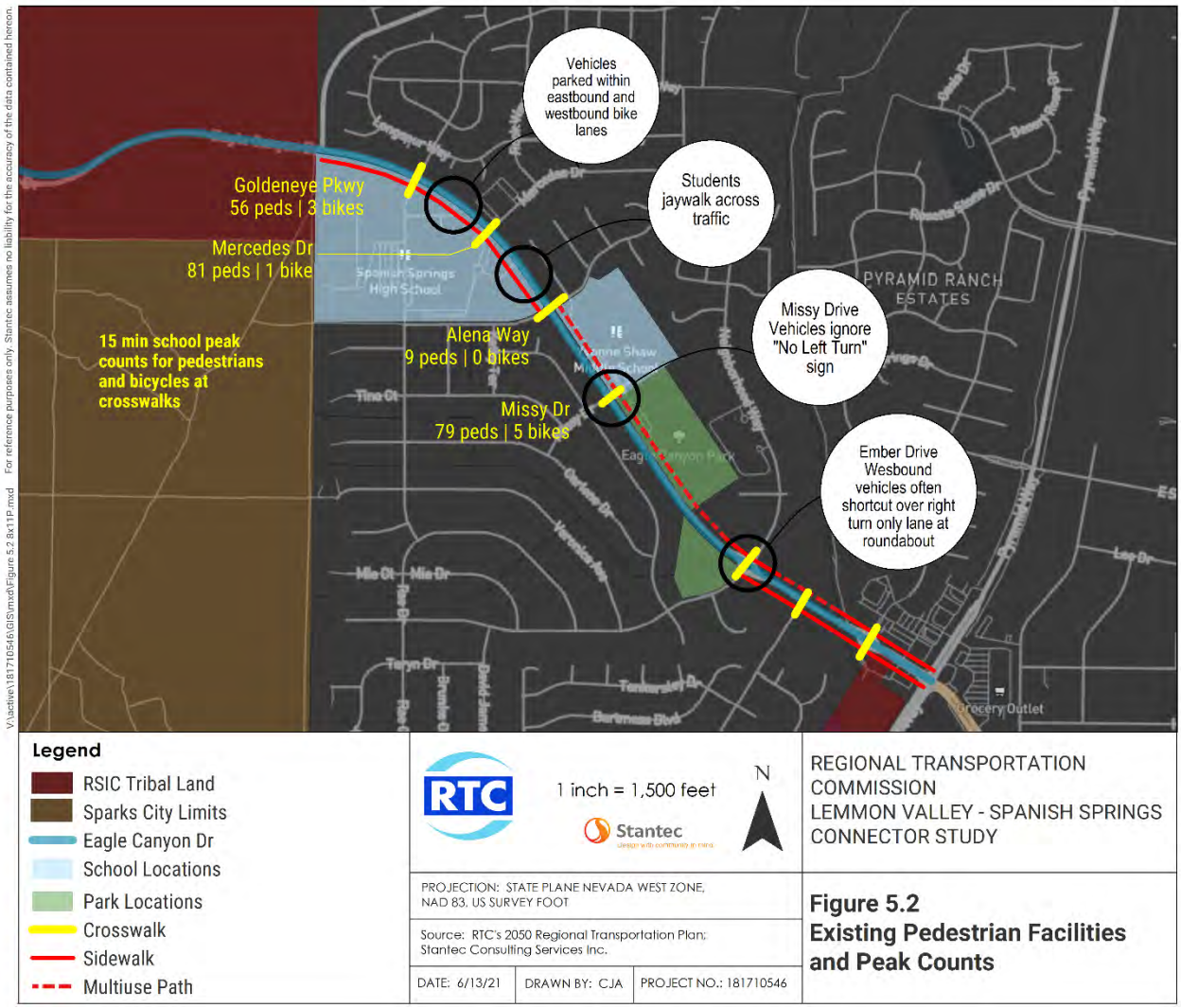
Eagle Canyon/Mercedes – The intersection of Mercedes Drive and Eagle Canyon Drive is a three-leg, minor road stop-controlled intersection. The westbound approach (Eagle Canyon Drive) consists of one through-right lane and a two-way left turn lane (effectively a striped median), shared with opposing traffic. The eastbound approach (Eagle Canyon Drive) consists of one exclusive left turn lane and one through lane. The southbound approach (Mercedes Drive) consists of one shared left-right turn lane. A pedestrian crosswalk with crosswalk markings exists across the Eagle Canyon Drive westbound approach.

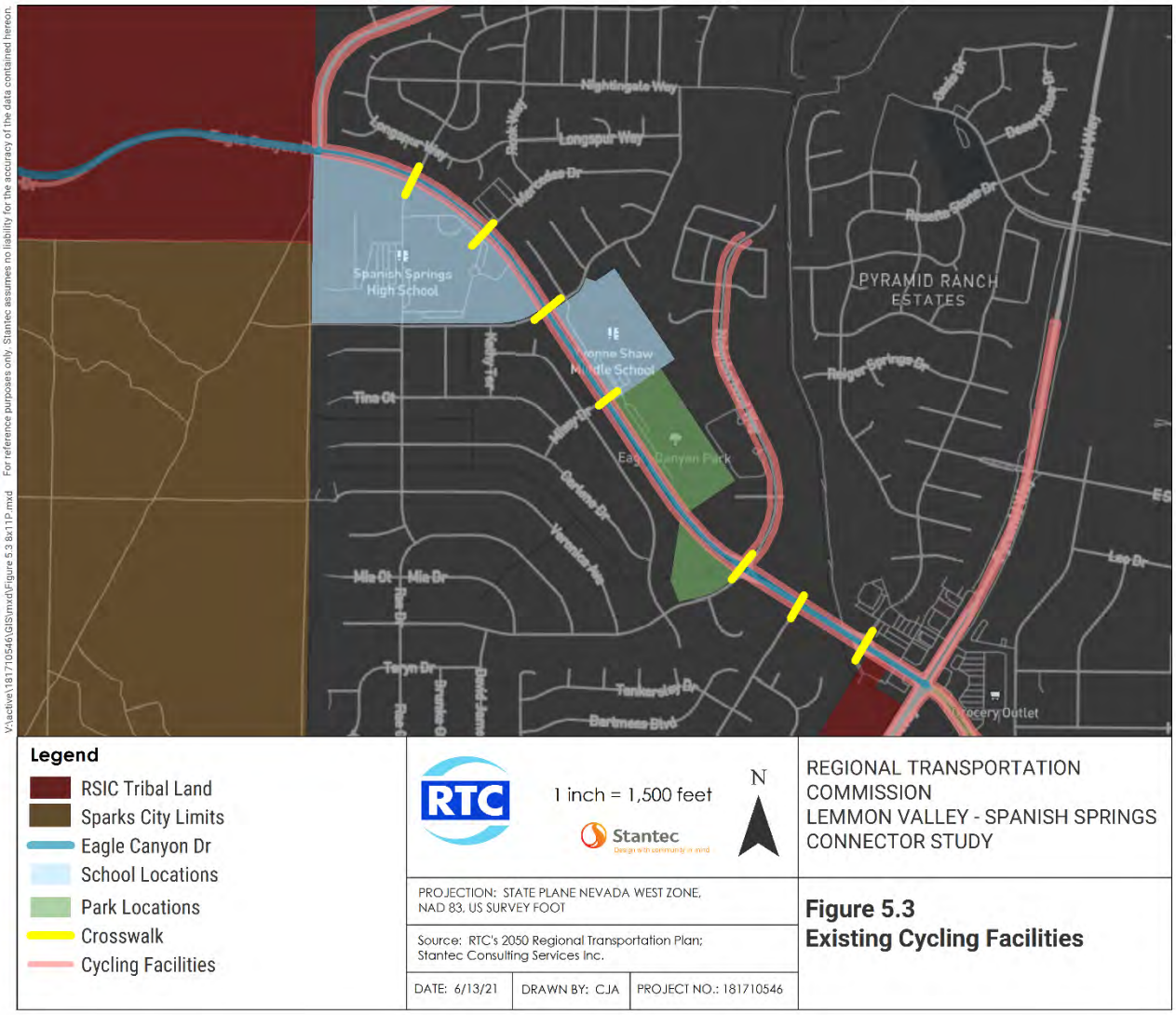
Eagle Canyon/Goldeneye – The intersection of Goldeneye Parkway and Eagle Canyon Drive is a four-leg, two-way stop-controlled intersection. The westbound approach (Eagle Canyon Drive) consists of one exclusive left turn lane and one through-right lane. The eastbound approach (Eagle Canyon Drive) consists of one exclusive left turn lane and one through-right lane. The northbound approach (two-lane road leading to Spanish Springs High School) consists of one shared through-left-right turn lane. The southbound approach (Goldeneye Parkway) consists of one shared through-left-right turn lane. Pedestrian crosswalks with crosswalk markings exist across both the westbound and eastbound approaches along Eagle Canyon Drive and the northbound approach coming from the high school.

Eagle Canyon/West Calle De La Plata – The intersection of West Calle De La Plata and Eagle Canyon Drive is a three-leg, minor-road only stop-controlled intersection. The eastbound approach (Eagle Canyon Drive) consists of one through-right turn lane. The westbound approach (Eagle Canyon Drive) consists of one through-left turn lane. The southbound approach (West Calle De La Plata) consists of one left-right turn lane. A pedestrian crosswalk with crosswalk markings exists across the southbound approach along West Calle De La Plata.

5.4 Pedestrian and Cycling Facilities

Pedestrian and cycle travel infrastructure are important aspects of the transportation system. Figures 5.2 and 5.3 illustrate the existing pedestrian facilities and bicycle facilities, respectively, within the project study area. Observations of existing conditions, including travel behaviors, are also noted within the figures.





5.5 Microtransit - FlexRIDE

This section details the existing public transportation facilities that serve the study area. FlexRIDE is a "microtransit" service that allows passengers to request rides at their closest curbside location and get dropped off at another curbside spot within their microtransit area.

The initial RTC FlexRIDE pilot in Sparks started in November 2019 and tripled the ridership of the fixed route it replaced within just a few months. Following this success, other RTC FlexRIDE zones were established in the North Valleys, Somersett/Verdi, and the Sparks zone was expanded to include Spanish Springs. During November and December of 2019, RTC FlexRIDE served an average of 4.7 passengers per revenue service hour.

Figure 5.4 and 5.5 illustrates the existing microtransit service areas for North Valleys and Sparks/Spanish Springs.

Source: RTC

Hours of Operation: North Valleys

- Weekday – 5:30 AM to 11:00 PM
- Saturday & Sunday – 6:20 AM to 9:00 PM

Figure 5.4: FlexRIDE Service Area - North Valleys

Hours of Operation: Sparks/Spanish Springs

- Weekday – 5:30 AM to 11:00 PM
- Saturday & Sunday – 6:00 AM to 10:30 PM

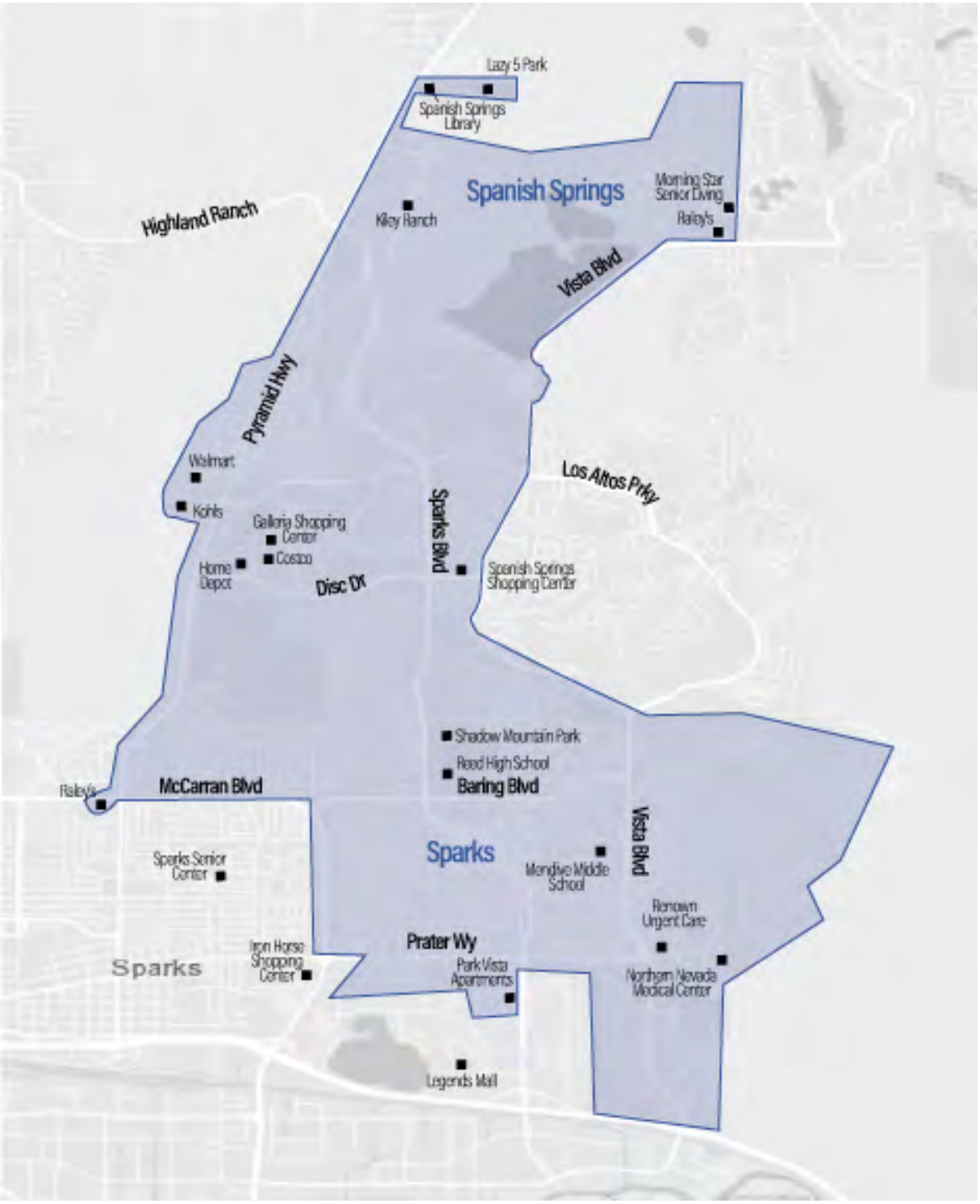
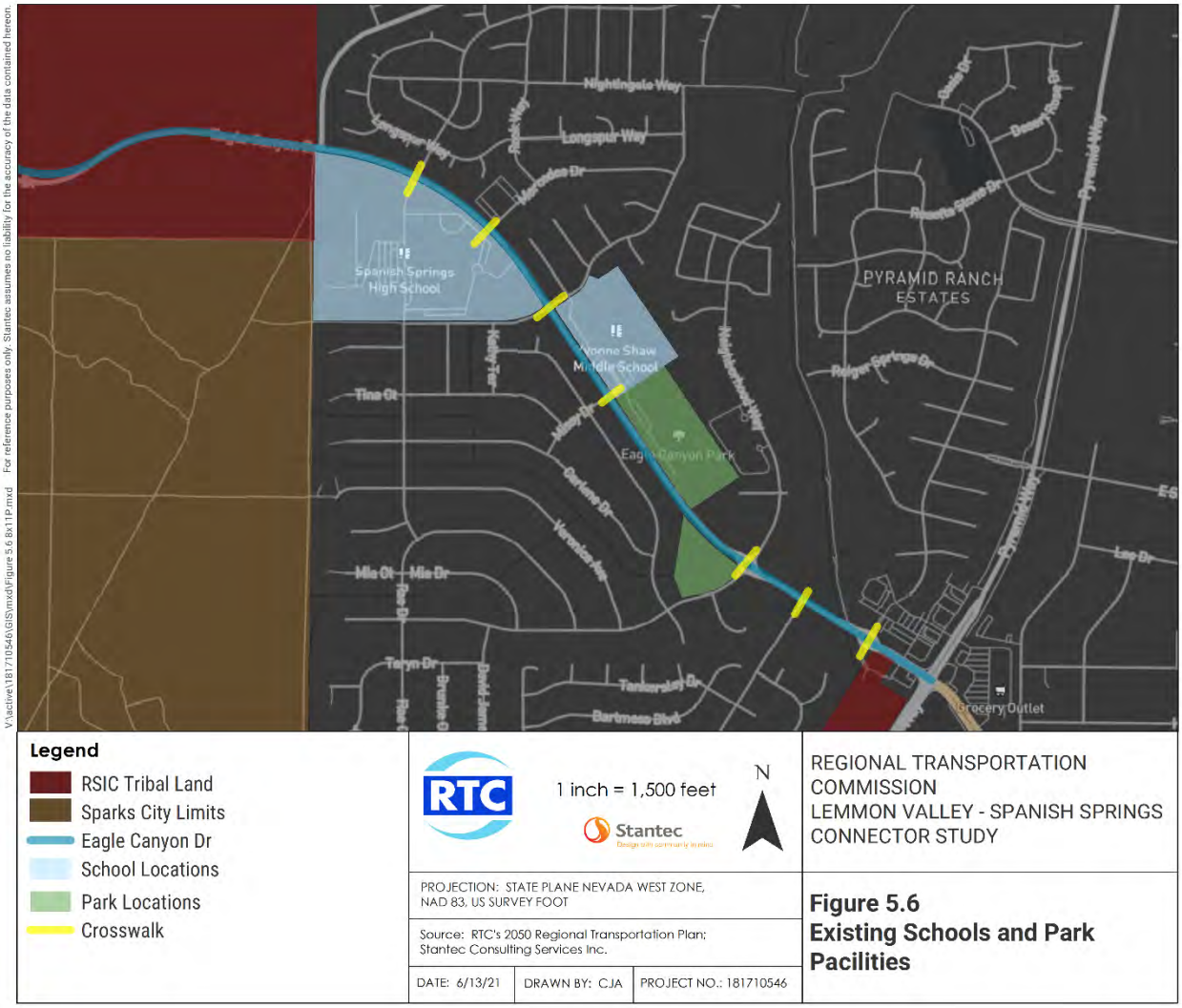


Figure 5.5: FlexRIDE Service Area - Sparks/Spanish Springs

5.6 Schools and Recreational Facilities

This section details the existing education facilities located within the project study area.

The roadway segment of Eagle Canyon Drive from Pyramid Way to West Calle De La Plata includes two schools, Shaw Middle School and Spanish Springs High School. Figure 5.6 shows the locations of these two facilities. The roadway is also adjacent to two parks: Eagle Canyon Park and Desert Winds Park (access on Ember Drive).



5.6.1 Drone Footage

During the design process, the consulting team utilized an aerial drone to record approximately 30 minutes of video at multiple locations to help identify the modal patterns and safety issues associated with the egress at Spanish Springs High School and Shaw Middle School at the end of the school day. The drone helped to identify typical bike, pedestrian, and vehicle routes, volumes, and queues. Drone footage was conducted at the following locations:

- Ember Drive/Neighborhood Way and Eagle Canyon roundabout
- Shaw Middle School crosswalks and vehicle exits at Missy Drive and Alena Way
- Shaw Middle School park exit
- Spanish Springs High School crosswalk and vehicle exit at Mercedes Drive
- Spanish Springs High School Goldeneye Parkway crosswalk
- Calle De La Plata/Eagle Canyon Drive intersection

Field observed findings from the drone footage at each of the schools are outlined below:

5.6.1.1 Ember Drive/Neighborhood Way & Eagle Canyon Roundabout

Based on the drone footage views, it was very common for cars traveling westbound to be in the right-turn only lane and abruptly change lanes to the through lane. It appeared that drivers were unaware the lane they were initially traveling in was a right-turn only lane. Therefore, the drivers would swerve into the through lane at the last-minute and possibly cut-off additional cars already traveling in the through lanes.

Figure 5.7: Drone Footage - Ember Dr./Neighborhood Way & Eagle Canyon Roundabout

5.6.1.2 Shaw Middle School – Park Exit

During the end of school day, this exit is extremely popular due to it being the only way to head eastbound from Shaw Middle School. It is common for vehicles to be backed-up for up to 10 minutes at times, as shown in the image from the drone footage, below. The number of vehicles congested, during the time of the drone footage (December 12, 2019 from 2:06 PM to 2:22 PM), ranged from 4 to up to 13 vehicles.

Figure 5.8: Drone Footage – Car Back-up at Shaw Middle School

5.6.1.3 Shaw Middle School – Missy Drive Crosswalk

At the end of school day, a supervisor arrived to assist students in crossing the busy crosswalk. Many students/pedestrians chose to cut through landscape adjacent to the Eagle Canyon Drive roadway, as opposed to following the designated pathway to the crosswalk. At this intersection, an eastbound left-turn is not permitted for traveling vehicles; however, one driver was observed to turn left regardless. Additionally, the existing crosswalk lacks any pedestrian lighting or pedestrian push buttons to assist in crossing, which contributes to unsafe crossing conditions.

5.6.1.4 Shaw Middle School – Alena Way Crosswalk

A second crosswalk exists for students and pedestrians to cross Eagle Canyon Drive from Shaw Middle School. Based on field observations, pedestrian volumes at this crosswalk are substantially lower than Missy Drive crosswalk. Like the Missy Drive Crosswalk, the Alena Way Crosswalk does not contain any pedestrian push buttons for ease of crossing, nor are there any signage to warn vehicles of potential crossing pedestrians. Additionally, neither ramp at each end of the crosswalk is currently ADA compliant. Overall, safety is lacking for pedestrians crossing Eagle Canyon Drive at Alena Way due to the lack of warning measures.

Figure 5.9: Drone Footage – Missy Drive & Eagle Canyon Drive Crosswalk

Figure 5.10: Drone Footage – Alena Way & Eagle Canyon Drive Crosswalk

5.6.1.5 Spanish Springs High School – Mercedes Drive Crosswalk

The crosswalk across Eagle Canyon Drive at Mercedes Drive was inspected through the drone footage. Counts for pedestrians and bikes were taken for those using the crosswalk and walking along the sides of Eagle Canyon Drive. Additional counts were taken of pedestrians using the landscaped areas to get from the school to crosswalk and/or roadway. Although the video footage determined that most of the pedestrians and cyclists used the sidewalk along the south side of Eagle Canyon Drive, there were several individuals walking off the sidewalk. Their paths led them either through existing landscaping or within the bike lane along the north side Eagle Canyon Drive. There are currently no paths along the north side of Eagle Canyon Drive; therefore, the implementation of a shared use path (further discussed at the end of the section) would be greatly beneficial within this area.

Figure 5.11: Spanish Springs High School – Mercedes Drive Crosswalk Drone Footage

5.6.1.6 Spanish Springs High School – Goldeneye Parkway Crosswalks

At the Goldeneye Parkway crosswalks, it appeared common for cars to park along the northbound and southbound shoulders/bike lanes on Eagle Canyon Drive while waiting for students. Additionally, students commonly crossed through landscaped hills from the high school to get to the cars parked along Eagle Canyon Drive, as opposed to using the existing pathway. Due to the large amount of vehicles parking along the roadway, the implementation of a shared use path (a safety improvement described more in depth later in this section) would be beneficial for the safety of pedestrians and cyclists heading along Eagle Canyon Drive on the northern side of the road.

Figure 5.12: Goldeneye Parkway Crosswalks Drone Footage

5.7 Crash History

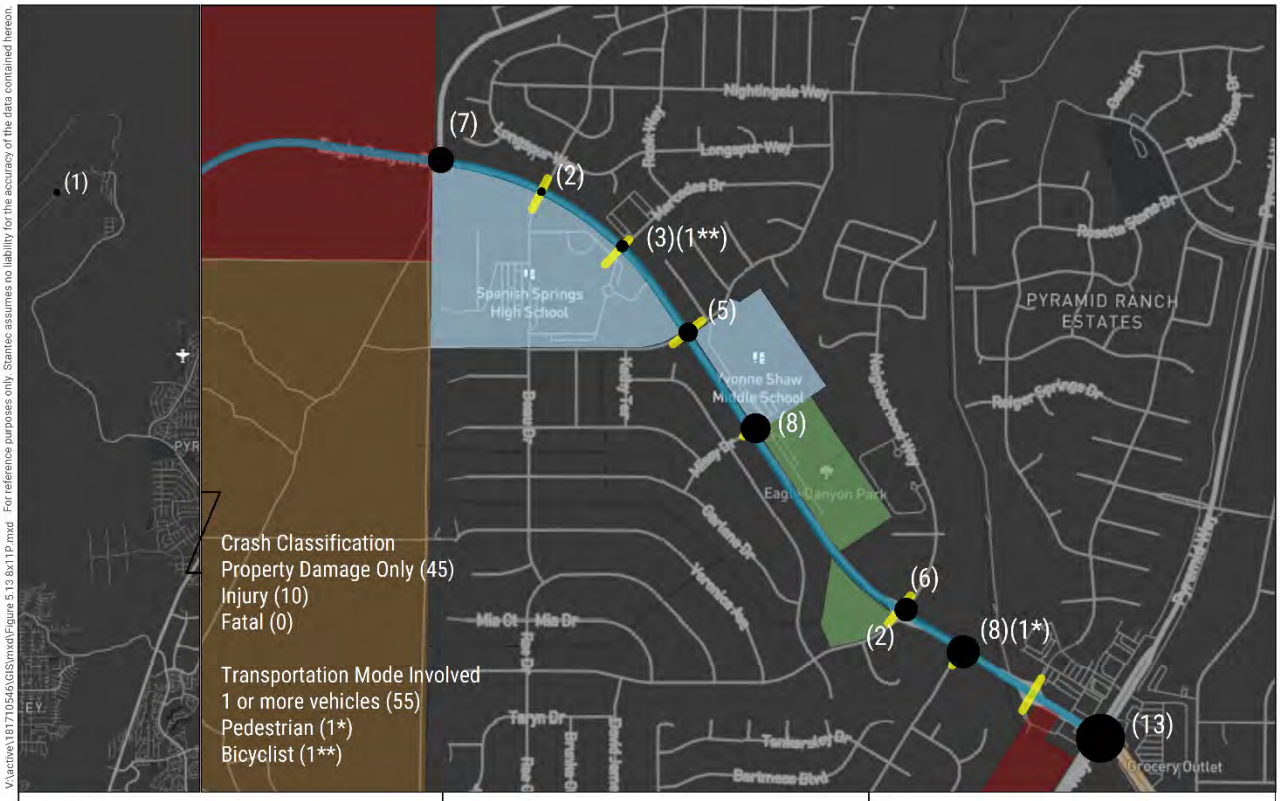
This section details crash history on Eagle Canyon Drive and intersections along the project study area.

Crash data obtained from the Nevada Department of Transportation (NDOT) for the previous seven years (July 1, 2013 to January 1, 2020) was used to help identify high-crash locations and possible trends. Table 5.1 shows a summary of the data at each intersection from the past five years. Figure 5.13 shows the relative distribution of crashes at their corresponding intersection locations.

Table 5.1: Crash Summary on Eagle Canyon Drive from July 2013 to January 2020

Location	Travel Mode			Crash Severity		
	Vehicle [1]	Bicycle	Pedestrian	Fatality	Injury	PDO [2]
Alena Way	5				2	3
Calle De La Plata	7				2	6
Ember Drive	2				1	1
Goldeneye Parkway	2				1	1
Hungry Valley Road	1				1	
Mercedes Drive	3	1			1	2
Missy Drive	8					8
Neighborhood Way	6					6
Richard Springs Blvd	8		1		2	5
SR445	13					13
TOTAL	55	1	1	0	10	45

1. At least one vehicle (potentially more) involved in the crash
2. PDO: Property Damage Only

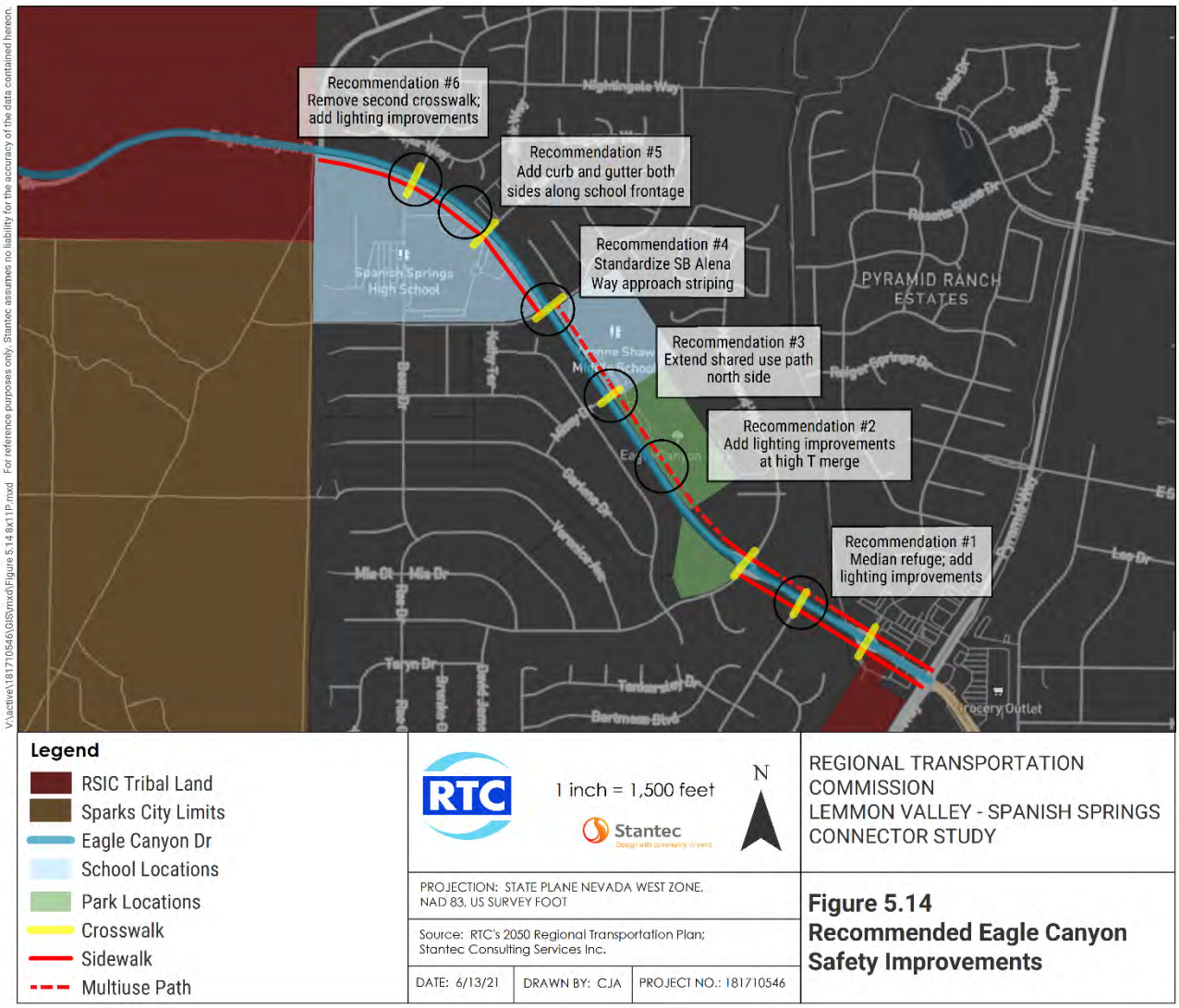


V:\active\181710546\GIS\mxd\Figure 5.13 8x11P.mxd For reference purposes only. Stantec assumes no liability for the accuracy of the data contained hereon.

5.8 Safety Improvements

Based upon the field observations and traffic analysis, a list of proposed safety improvements along Eagle Canyon Drive are illustrated in Figure 5.14 below and include the following:

1. Add a median refuge island and lighting improvements at the intersection of Richard Springs Boulevard and Eagle Canyon Drive.
2. Improve the lighting at High-T merge located at Eagle Canyon Park exit to Eagle Canyon Drive.
3. Extend the Standard Use Path (SUP) along the north side of Eagle Canyon Drive.
4. Standardize the southbound Alena Way approach striping.
5. Add curb and gutter along both sides of roadway at Spanish Springs High School and Shaw Middle School.
6. Remove one of the crosswalks across Goldeneye Parkway. Improve lighting of crosswalk.
7. ADA upgrades throughout.



5.8.1 Median Island Refuge Improvements

Median island refuges are a pedestrian and bicycle safety measure at street crossings. The medians are configured to protect the crosswalk and those using it on either side from vehicles. The existing intersection of Richard Springs Blvd and Eagle Canyon Drive includes a crosswalk across the west side of the intersection crossing Eagle Canyon Drive. This crosswalk crosses four lanes of traffic and a two-way left turn lane. Due the size of the road section at this intersection, it is recommended to include a median refuge at this crossing. In addition, the lack of lighting reduces the visibility of drivers during the early and late hours of the day. Implementing lighting improvements will increase the safety of potential pedestrians and cyclists using the crossing.

5.8.2 High-T Merge Improvements

The existing High-T merge located at the Eagle Canyon Park exit onto Eagle Canyon Drive was field-observed to lack lighting. Due to the lack of visibility during the early and late hours, and since this exit is a high-trafficked exit onto Eagle Canyon Drive during peak hours and at the beginning and end of school days, lighting improvements are recommended. Adding lighting to enhance the visibility of drivers is not only helpful for vehicles but is safer for pedestrians crossing the park exit.

5.8.3 Shared Use Path Improvements

The north side of Eagle Canyon Drive from Richard Springs Boulevard to Alena Way contains an existing asphalt concrete pathway, see images (Figure 5.15) below. A shared use path (SUP) requires a minimum of 8-ft width pathway. The existing path meets this qualification for a SUP. Improvements of the existing SUP involve updating the existing asphalt path to comply with ADA and installing striping and signage for pedestrians and cyclists. In addition to improving the existing asphalt pathway, it is recommended to extend the SUP on the north side of Eagle Canyon Drive from Alena Way to West Calle De La Plata. This extension will continue the pathway to the edge of Spanish Springs High School.

Figure 5.15: Existing Shared Use Path North side of Eagle Canyon Drive

5.8.4 Alena Way Approach Striping Improvements

At the intersection of Alena Way and Eagle Canyon Drive, the Alena Way southbound approach striping includes a boarder-outlined crosswalk for pedestrians with a stop bar past the crosswalk. This layout, shown in Figure 5.16 at right, is unsafe due to the potential for vehicles to block the crosswalk, forcing pedestrians to walk outside the walkway and reducing visibility for drivers turning into Alena Way. To improve the safety at this intersection, the design team proposes standardizing the southbound approach striping. A layout potential striping updates is shown in Figure 5.17.

Figure 5.16: Alena Way Southbound Approach Crosswalk Striping

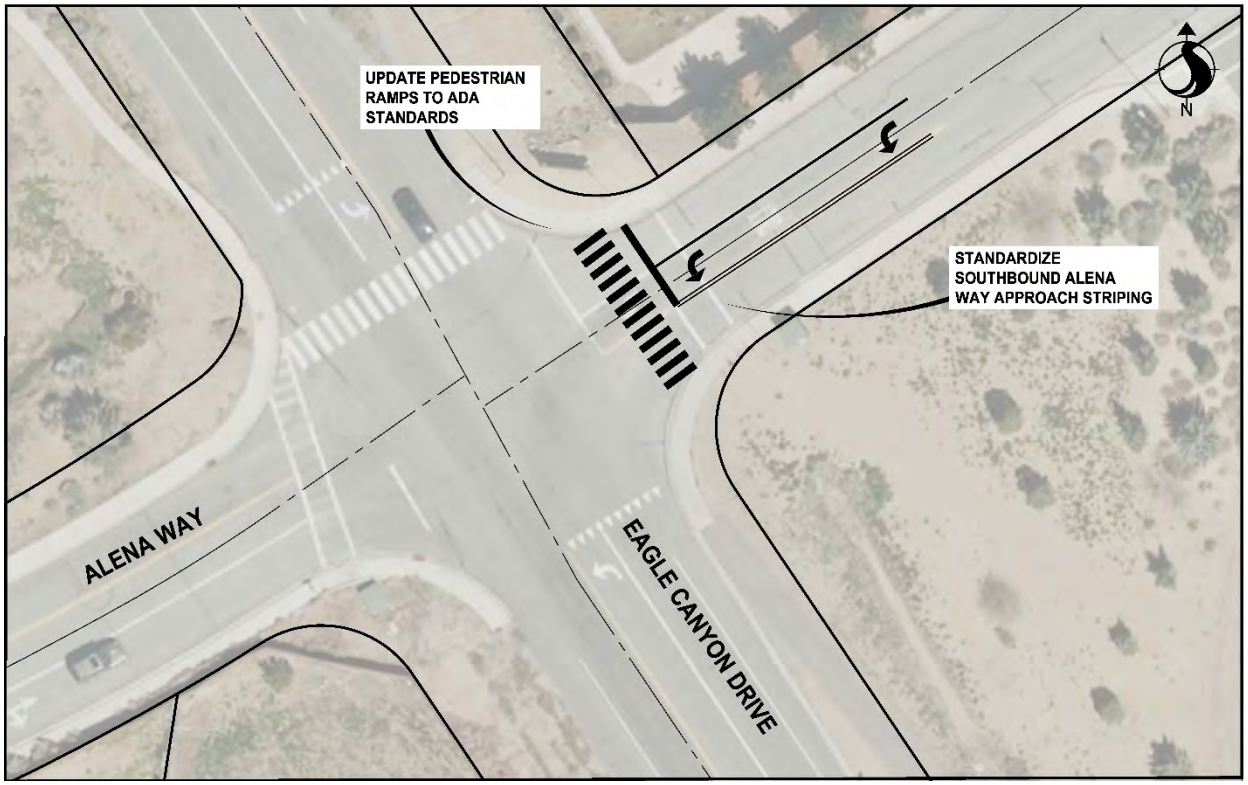


Figure 5.17: Alena Way Potential Striping Layout

5.8.5 Curb and Gutter Improvements

The existing section of Eagle Canyon Drive at Shaw Middle School and Spanish Springs High School lack curb and gutter separating the roadway and dirt path, see Figure 5.18. The design team proposes the construction of curb and gutter for safety and efficiency. The primary benefit for implementing curb and gutter is to provide a physical barrier, preventing illegal parking blocking the bike lanes, an occurrence that was observed through the drone footage. Additional benefits to implementing curb and gutter along these sections of roadway include:

1. Improved integrity for the edges of traffic, reducing the potential for raveling of the asphalt pavement
2. Improved drainage along the gutter pathway, preventing water from entering the pavement area
3. Improved visibility for drivers at night due to the reflective surfaces of the concrete curb against the pavement edges.
4. Improved visibility for drivers at night due to the reflective surfaces of the concrete curb against the pavement edges.

Figure 5.18: Eagle Canyon Drive Pavement Shoulder along Shaw Middle School

5.8.6 Goldeneye Parkway Crosswalk Improvements

The existing intersection of Goldeneye Parkway and Eagle Canyon Drive contains two crosswalks across Eagle Canyon Drive on the east and west sides of the intersection (Figure 5.19 and Figure 5.20). Both crosswalks lack signage or lighting to indicate potential crossing pedestrians. To improve safety at this crossing, the team proposes reducing the number of crosswalks to one main crosswalk across Eagle Canyon Drive at Goldeneye Parkway. Additionally, adding lighting at the ends of each crosswalk, installing pedestrian crosswalk signage, and updating the ramps to meet ADA requirements.

Figure 5.19: Goldeneye Crosswalk No. 1

Figure 5.20: Goldeneye Crosswalk No. 2

5.8.7 ADA Upgrades

Along the existing Eagle Canyon Drive from Ember Drive/Neighborhood Way to West Calle De La Plata contains various areas of sidewalk, shared use pathways (SUP), and dirt paths. The majority of ramps along the north and east side of Eagle Canyon Drive were field observed to not meet ADA requirements. Figure 5.21 and Figure 5.22 illustrate the existing conditions at a few ramps. For safety and standardization, it is recommended to improve upon each of the ramps along this stretch of roadway. Use of sidewalk and pathways would greatly increase in safety and efficiency with such improvements.

Figure 5.21: Non ADA Compliant Ramp @ Calle de la Plata

Figure 5.22: Non ADA Compliant Ramp @ Shaw Middle School

5.8.8 Cost Estimate

The above-described safety improvements and estimate of costs are shown in Table 5.2 below.

Table 5.2: Cost Estimate of Safety Improvements

Item	Unit	Total Cost
Median Refuge at Richard Springs Blvd	LS	$ 43,000
Lighting Improvement at High-T merge	LS	$ 44,000
Extend SUP	LS	$ 498,000
Standardize SB Alena striping	LS	$ 27,000
Curb and Gutter	LS	$ 579,000
Remove Crosswalk at Goldeneye, improve lighting, add signage	LS	$ 43,000
ADA upgrades throughout	LS	$ 327,000
Total Cost of Project Improvements	**LS**	**$ 1,561,000**

5.9 Existing Eagle Canyon Widening

In addition to the proposed improvements outlined above, the project team also investigated the impacts and potential benefits of widening the existing Eagle Canyon Drive roadway between Ember Drive and West Calle de la Plata. Figure 5.23 below illustrates the proposed typical cross section of this widened roadway.

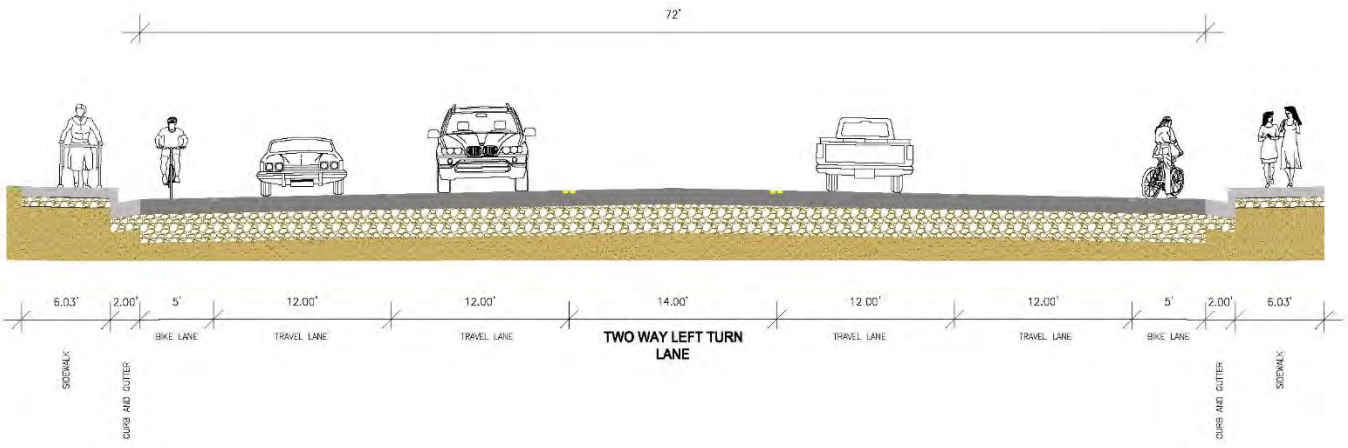


Figure 5.23: Proposed Eagle Canyon Drive Widening Section

Widening of the existing Eagle Canyon Drive road from Ember Dr/Neighborhood Way to West Calle de la Plata involves converting the existing two-lane road to four lanes with a two-way left turn lane. Additionally, 5-ft bike lanes and 6-ft sidewalks, separated by 2-ft curb and gutter, are included along both sides of the road. The proposed improvements result in 1.2 miles of widening and an estimated cost of approximately $14M. A complete engineer's estimate breakdown of costs to complete this widening is compiled in Appendix E.

The process to take the existing two-lane road and widen to four-lanes requires right-of-way acquisition of ~22,000 sq. ft., primarily from existing Homeowners Association (HOA) owned drainage ways and slivers of property. The maximum amount of right-of-way acquisition needed is 7-ft and are located in the back yard portions of approximately 23 residential parcels. Additionally, approximately $4M of the total cost is directly related to propagating the existing drainages.

6.0 Eagle Canyon Traffic Operations

6.1 Existing Traffic Operations

6.1.1 Policy Level of Service

The 6th Edition of the Highway Capacity Manual (HCM), published by the Transportation Research Board, provides standard traffic operational analysis methods for intersections, freeways, and ramps. Level of Service (LOS) is the fundamental HCM parameter describing operational conditions within a traffic stream. LOS is an A-through-F letter ranking scale with LOS A indicating free-flow, low density, or nearly negligible delay conditions and LOS F indicating facility breakdown with low speeds, high densities, and high delay.

For intersections, LOS is based on the average control delay per entering vehicle measured in seconds. Control delay includes not only stops at intersections, but also slower speeds as vehicles advance in queue or decelerate upstream of an intersection. For signalized and all-way stop controlled intersections, individual approach delays as well as an overall average delay are calculated for each intersection. For two-way stop-controlled intersections, individual approach delays are calculated. The description of level of service for signalized intersections and stop controlled intersections are show in Table 6.1.

Table 6.1: Level of Service Criteria for Signalized Intersections

LOS	Description of Condition	Average Delay Signalized Intersections (sec/vehicle)	Average Delay for Stop Controlled Intersections (sec/vehicle)
A	Free flow	0-10	0-10
B	Reasonably free flow	>10-20	>10-15
C	Stable Flow	>20-35	>15-25
D	Approaching unstable flow	>35-55	>25-35
E	Unstable flow	>55-80	>35-50
F	Forced or breakdown flow	>80	>50

Source: HCM 2018.

According to Appendix E of the 2050 Regional Transportation Plan (RTP), the Regional Level of Service (LOS) Standards for all regional roadway facilities projected to carry less than 27,000 ADT at the latest RTP horizon is LOS D. All regional roadway facilities projected to carry 27,000 or more ADT at the latest RTP horizon is LOS E. Based on these standards, RTC states all intersections shall be designed to provide a level of service consistent with maintaining the policy level of service of the intersecting corridors. Therefore, for the purpose of this study, the Policy LOS for the study intersections shall be LOS E for Pyramid Way north and south of Eagle Canyon, and LOS D for the remaining roadway segments.

Table 6.2: RTC 2050 Travel Demand Model ADTs

Roadway Segment	Location	Class	Lanes	Access Control	2050 ADT
Intersection of Eagle Canyon/Pyramid					
Eagle Canyon Drive	w/o Pyramid	Arterial	4	MAC	17,225
La Posada Drive	e/o Pyramid	Arterial	4	MAC	26,885
Pyramid Way	n/o Eagle Canyon	Arterial	4	HAC	38,291
Pyramid Way	s/o Eagle Canyon	Arterial	4	HAC	60,469
Intersection of Eagle Canyon/Richard Springs					
Eagle Canyon Drive	w/o Richard Springs	Arterial	4	MAC	16,527
Eagle Canyon Drive	e/o Richard Springs	Arterial	4	MAC	17,225
Richard Springs Boulevard	n/o Eagle Canyon	Arterial	2	MAC	505
Richard Springs Boulevard	s/o Eagle Canyon	Arterial	2	MAC	1,793
Intersection of Eagle Canyon/Ember and Neighborhood					
Eagle Canyon Drive	w/o Ember/Neighborhood	Arterial	4	MAC	13,555
Eagle Canyon Drive	e/o Ember/Neighborhood	Arterial	4	MAC	16,527
Ember Drive	s/o Eagle Canyon		2		3,977
Intersection of Eagle Canyon/Missy					
Eagle Canyon Drive	w/o Missy	Arterial	4	MAC	10,893
Eagle Canyon Drive	e/o Missy	Arterial	4	MAC	13,555
Missy Drive	n/o Eagle Canyon		2		5,380
Intersection of Eagle Canyon/Alena					
Eagle Canyon Drive	w/o Alena	Arterial	4	MAC	9,119
Eagle Canyon Drive	e/o Alena	Arterial	4	MAC	10,893
Alena Way	s/o Eagle Canyon		2		3,691
Intersection of Eagle Canyon/Goldeneye					
Eagle Canyon Drive	w/o	Arterial	4	MAC	8,079
Eagle Canyon Drive	e/o	Arterial	4	MAC	9,119
Goldeneye Parkway	e/o Eagle Canyon		2		4,346
Intersection of Eagle Canyon/West Calle De La Plata					
Eagle Canyon Drive	w/o West Calle De La Plata	Arterial	4	MAC	8,742
Eagle Canyon Drive	e/o West Calle De La Plata	Arterial	4	MAC	8,079
West Calle De La Plata	n/o Eagle Canyon		2		7,361
West Calle De La Plata	s/o Eagle Canyon		2		8,801

n/o = North of; s/o = South of; e/o = East of; w/o = West of.

6.1.2 Existing Traffic Volumes

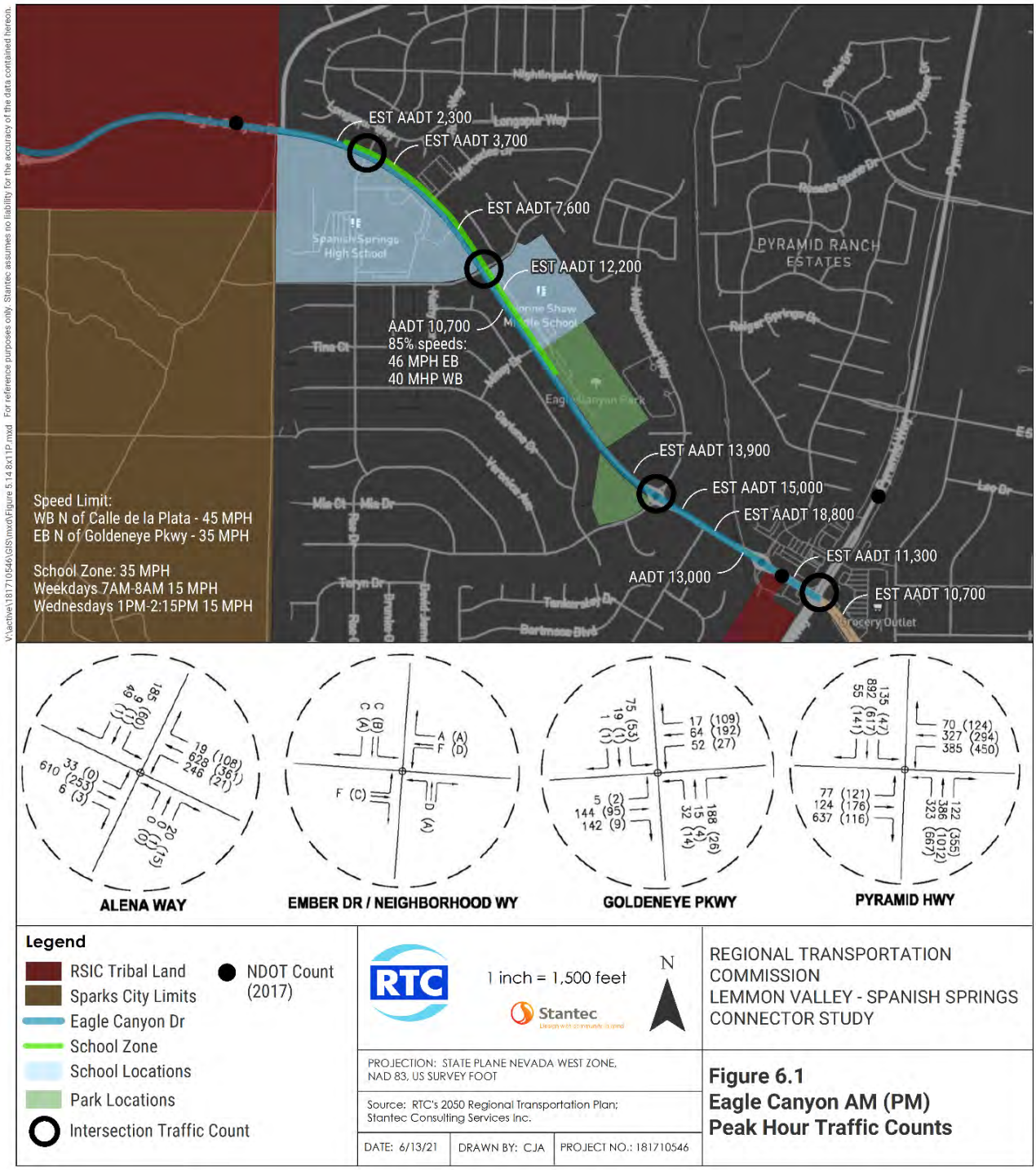
Existing daily traffic data for Eagle Canyon along the study area was obtained from the Nevada Department of Transportation (NDOT) Annual Traffic Report. Turning movement counts were collected at the following intersections:

- La Posada Drive/Eagle Canyon Drive & Pyramid Way
- Eagle Canyon Drive & Ember Drive/Neighborhood Way
- Eagle Canyon Drive & Alena Way
- Eagle Canyon Drive & Goldeneye Parkway

Turning movement counts were collected on a typical weekday, from 7:00 AM to 9:00 AM and 4:30 PM to 6:30 PM. This data was used to determine the one-hour heaviest traffic volume count (referred to as peak hour) for the morning and evening traffic conditions at each intersection. The following provides the hours of study and identified peak hour. Figure 6-1 on the following page depicts the existing AM and PM peak hour traffic volumes in the study area. Appendix F contains the full traffic count data.

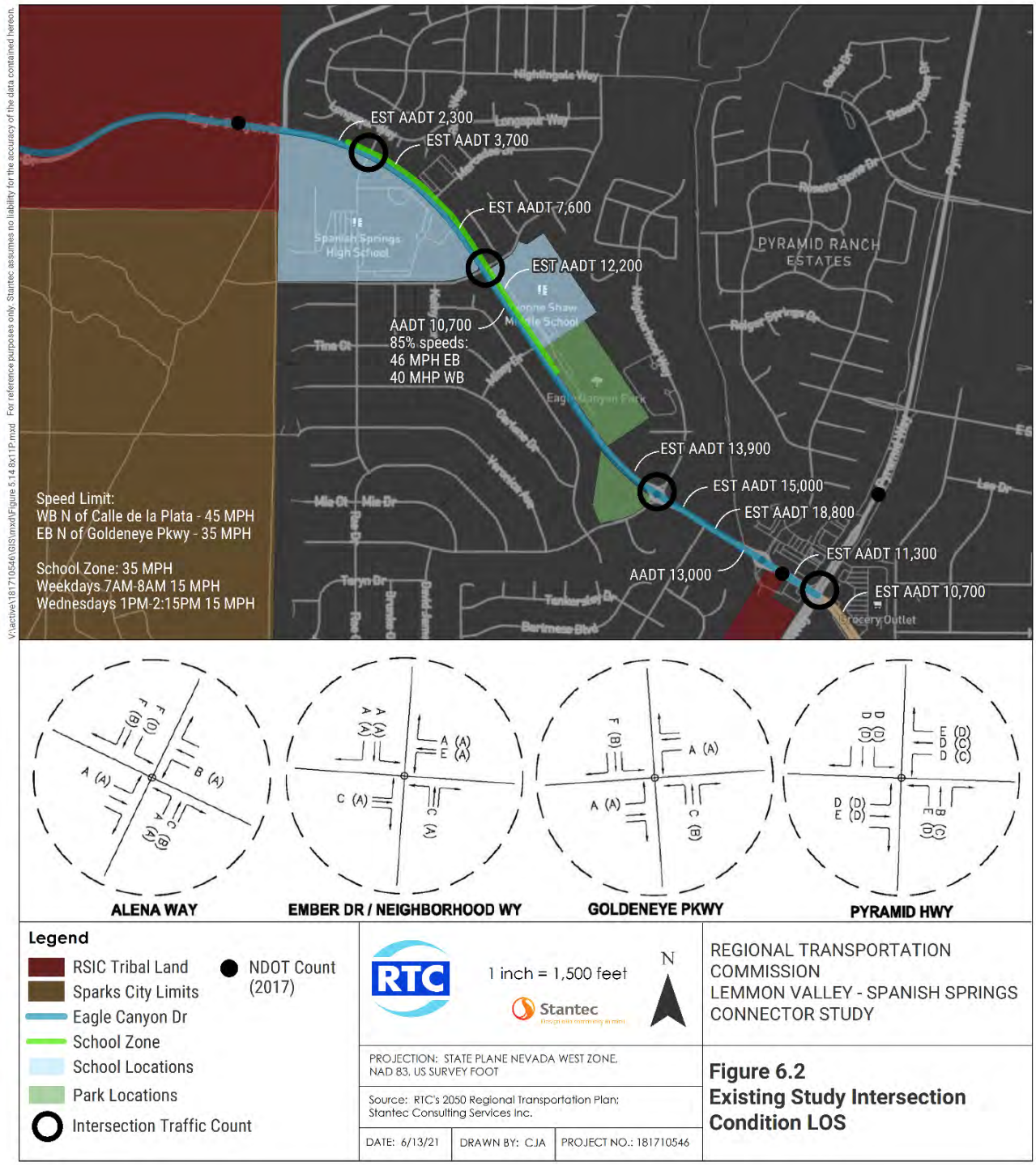
- AM Count – From 7:00 to 9:00.
  - Pyramid peak hour 7:00 to 8:00.
  - Ember/Neighborhood peak hour 7:00 to 8:00.
  - Alena peak hour 7:00 to 8:00.
  - Goldeneye peak hour 7:00 to 8:00.
- PM Count – From 4:30 to 6:30.
  - Pyramid peak hour 4:45 to 5:45.
  - Ember/Neighborhood peak hour 4:30 to 5:30.
  - Alena peak hour 4:45 to 5:45.
  - Goldeneye peak hour 4:45 to 5:45.

For the traffic operational analysis, the peak hour counts for each intersection were scaled at a factor of 99.7%, consistent with November traffic patterns developed from data collected from NDOT ATR Station 312220.


EST AADT 2,300
EST AADT 3,700
EST AADT 7,600
EST AADT 12,200
AADT 10,700
85% speeds:
46 MPH EB
40 MHP WB
EST AADT 13,900
EST AADT 15,000
EST AADT 18,800
EST AADT 11,300
AADT 13,000
EST AADT 10,700
Speed Limit:
WB N of Calle de la Plata - 45 MPH
EB N of Goldeneye Pkwy - 35 MPH
School Zone: 35 MPH
Weekdays 7AM-8AM 15 MPH
Wednesdays 1PM-2:15PM 15 MPH
Spanish Springs High School
PYRAMID RANCH ESTATES
ALENA WAY
EMBER DR / NEIGHBORHOOD WY
GOLDENEYE PKWY
PYRAMID HWY
Legend
RSIC Tribal Land
Sparks City Limits
Eagle Canyon Dr
School Zone
School Locations
Park Locations
Intersection Traffic Count
NDOT Count (2017)
RTC
1 inch = 1,500 feet
Stantec
N
REGIONAL TRANSPORTATION COMMISSION
LEMMON VALLEY - SPANISH SPRINGS CONNECTOR STUDY
PROJECTION: STATE PLANE NEVADA WEST ZONE, NAD 83, US SURVEY FOOT
Source: RTC's 2050 Regional Transportation Plan; Stantec Consulting Services Inc.
DATE: 6/13/21
DRAWN BY: CJA
PROJECT NO.: 181710546
Figure 6.1
Eagle Canyon AM (PM)
Peak Hour Traffic Counts

6.1.3 Existing Level of Service

The peak hour traffic volumes and resulting Synchro-determined intersection delays were compared to the thresholds depicted in Table 6-1 to determine current service levels for each roadway segment. Figure 6-2 demonstrates the existing LOS at each of the four study intersections.



Appendix G depicts the LOS of the existing traffic movements and corresponding LOS for the four study intersections. Appendix H contains the full background condition LOS worksheets, as calculated by Synchro 10 applying the HCM 6th Edition methodology.

The LOS values for the four intersections were compared to the previously determined Policy LOS for the study intersections (Section 6.1.1) to determine operation levels. Below summarizes the results:

The intersection of Pyramid Way and Eagle Canyon Drive/La Posada Drive currently operates at LOS D or better during the AM and PM peak hours, meeting the Policy LOS of LOS D for eastbound and westbound approaches, and Policy LOS E for northbound and southbound approaches.

The intersection of Ember Drive/Neighborhood Way and Eagle Canyon Drive currently operates at a LOS D or better for eastbound, northbound, and southbound approaches during the AM and PM peak hours. The westbound approach PM LOS operates at a LOS of D or better as well, meeting the Policy LOS of LOS D. However, the westbound approach AM peak hour operates at LOS E, which does not meet the Policy LOS of LOS D. This is most likely due to the large number of vehicles traveling from the eastbound direction after dropping off students to the local schools, causing more vehicles heading westbound to wait until they are sure it is safe to enter the roundabout. The overall intersection of Ember Drive/Neighborhood Way and Eagle Canyon Drive produces a current LOS of LOS D; therefore, the combined traffic movements meet the Policy LOS of LOS D.

At the intersection of Alena Way and Eagle Canyon Drive, the eastbound, northbound, and southbound approaches currently operate at a LOS D or better during the AM and PM peak hours, meeting the Policy LOS of LOS D. However, the westbound approach at the intersection operates at LOS F during the AM peak hour and LOS D for the PM peak hour.

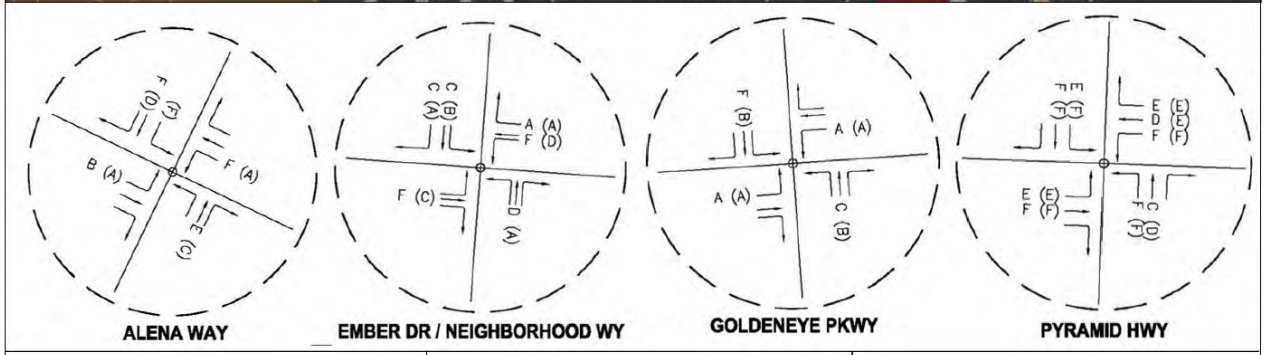
At the intersection of Goldeneye Parkway and Eagle Canyon Drive, the eastbound, westbound, and northbound approaches currently operate at a LOS D or better during the AM and PM peak hours, meeting the Policy LOS of LOS D. However, the southbound approach at the intersection operates at LOS F during the AM peak hour and LOS B for the PM peak hour.

6.2 Future Traffic Conditions

Based on the classification of existing conditions, future generated traffic conditions given a 20-year projection, if no improvements were made, were determined through Synchro 10 applying the HCM 6th Edition methodology. The following illustrates those findings.

6.2.1 2040 Traffic Operations

Existing Level of Service (LOS) calculated in the previous sections were used to determine future traffic operations. A 20-year projection, if no improvements were made to the existing roadway segments and intersections, were calculated through Synchro. Appendix I depicts the LOS of the existing traffic movements and corresponding LOS for the four study intersections. Appendix J contains the full background condition LOS worksheets, as calculated by Synchro 10 applying the HCM 6th Edition methodology. Figure 6.3 demonstrates the future LOS at each of the intersections.



Legend

- RSIC Tribal Land
- Sparks City Limits
- Eagle Canyon Dr
- School Zone
- School Locations
- Park Locations
- Intersection Traffic Count
- NDOT Count (2017)

1 inch = 1,500 feet

N

Stantec

REGIONAL TRANSPORTATION COMMISSION
LEMMON VALLEY - SPANISH SPRINGS CONNECTOR STUDY

PROJECTION: STATE PLANE NEVADA WEST ZONE, NAD 83, US SURVEY FOOT

Source: RTC's 2050 Regional Transportation Plan; Stantec Consulting Services Inc.

DATE: 6/13/21 | DRAWN BY: CJA | PROJECT NO.: 181710546

Figure 6.3
20-year Projection Future Study Intersection LOS

The future LOS values for the four intersections were compared to the previously determined Policy LOS for the study intersections (Section 6.1.1) to determine future operation levels. Below summarizes the results:

The 20-year projected future traffic movement for the intersection of Pyramid Way and Eagle Canyon Drive/La Posada Drive do not meet the Policy LOS of LOS D. The AM peak hour is projected to operate at LOS E and the PM peak hour is projected to operate at LOS F.

The future traffic movement at the Ember Drive/Neighborhood Way and Eagle Canyon Drive roundabout is projected to operate at a LOS D or better for all approaches during the PM peak hour and for the northbound and southbound approaches during the AM peak hour, meeting the Policy LOS of LOS D. However, the eastbound and westbound approaches during the AM peak hour are projected to operate at LOS F, which does not meet the Policy LOS.

At the two-way stop-controlled intersection of Alena Way and Eagle Canyon Drive, the 20-year projected future traffic movement for southbound approach during the AM peak hour and the eastbound, northbound, and southbound approaches during the PM peak hour are projected to operate at LOS D or better, meeting the Policy LOS of LOS D. However, the eastbound, westbound, and northbound approaches during the AM peak hour and the westbound approach during the PM peak hour are projected to operate at LOS E or lower, which does not meet the Policy LOS.

At the two-way stop-controlled intersection of Goldeneye Parkway and Eagle Canyon Drive, the eastbound and westbound approaches are projected to operate at LOS D or better during the AM and PM peak hours. In addition, the northbound and southbound approaches during the PM peak hour are also projected to operate at LOS D or better, meeting the Policy LOS of LOS D. However, the northbound and southbound approaches during the AM peak hour at the intersection are projected to operate at LOS F, which does not meet the Policy LOS.

6.3 Conclusions

The following conclusions have been derived from this traffic study:

1. The study intersections of Pyramid Way/Eagle Canyon Drive & La Posada Drive and Ember Drive & Neighborhood Way/Eagle Canyon Drive currently operate at an acceptable LOS.

2. The study intersection of Goldeneye Parkway/Eagle Canyon Drive currently operates at an acceptable LOS, except for the southbound approach during AM peak hours, which operates at LOS F.

3. The study intersection of Alena Way/Eagle Canyon Drive currently operates at an acceptable LOS, except for the westbound approach during AM peak hours, which operates at LOS F.

4. The overall delay at the intersection of Pyramid Way/Eagle Canyon Drive & La Posada Drive is projected to increase by 19 seconds per vehicle during the AM peak hour, resulting in a change of LOS from LOS D to LOS E, and 53 seconds per vehicle during the PM peak hour, resulting in a change of the LOS from LOS D to LOS F.

5. The overall delay at the intersection of Ember Drive & Neighborhood Way/Eagle Canyon Drive is projected to increase by greater than 3 minutes per vehicle during the AM peak hour, resulting in a change of LOS from LOS D to LOS F, and 15 seconds per vehicle during the PM peak hour, resulting in a change of LOS from LOS A to LOS F.

6. Roundabout operation analysis is complex and requires additional data than this study called for. For an accurate representation of existing and future volume impacts at the Ember Drive/Neighborhood Way and Eagle Canyon Drive roundabout, a more detailed analysis is recommended using more advanced traffic analysis tools such as Sidra Intersection, Rodel Interactive, or Vissum Simulation Software.

7.0 References

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https://www.rtcwashoe.com/public-transportation/flexride/

Appendix A Public Meetings

The two public meetings were held on March 10, 2020 at Lemmon Drive Elementary School and March 12, 2020 at Spanish Springs High School. In addition to the in-person public meetings, a survey with potential alignments was released to solicit feedback from the public on their concerns regarding the alignment alternatives. The meetings and survey resulted in a total of 631 participants. A breakdown of the number of participants and their resident location and travel mode is listed in Table A-1.

Table A-1: Survey Participant Resident Locations

Resident Area	Number of Residents	% of Residents
North Valleys	263	42%
Spanish Springs	230	36%
Other	138	22%
TOTAL	631	

Of the 631 participants, 45% work in Reno outside of North Valleys. Nineteen of the respondents live in North Valleys and work in Spanish Springs. Conversely, 17 live in Spanish Springs and work in North Valleys. Over 95% of participants' primary mode of travel is driving alone in a personal vehicle. The images below illustrate the potential concerns or preferences collected. Additional information regarding public response of the proposed corridors can be found in Appendix B: Metroquest.

Pedestrian Safety and Improvements

Bicycle Safety and Improvements

Safety Concerns Operations: Roadway and Intersection

Wildlife Concerns: Conflict or Avoidance Areas

Recreation Access: OHV, Hiking, Biking, Horseback

Operations: Roadway or Intersection

Potential Transit or Park & Ride Locations

Appendix B MetroQuest Survey

The RTC conducted an online survey using the MetroQuest tool between March 10, 2020 and May 1, 2020. The survey was promoted through RTC social media outlets as well as at two public meetings held at Lemmon Valley Elementary School and Spanish Springs High School, respectively. During this time, there were 631 participants, 933 comments received, and 8,280 data points collected.

The survey was divided into four sections. The first section asked participants about their travel behavior and mode choice. The second section asked participants to indicate various desired improvements by identifying a location on a map of the project area with a map marker and description. The third section asked participants to rank the proposed alignment alternatives in order from most desirable to least desirable. The last (fourth) section was a "wrap up" page, which allowed participants to provide demographic information as well as any open-ended comments. Each of these sections, as well as the results of the survey, are presented in more detail as follows.

Section 1 – Where and How You Travel

When asked, "where do you live?", survey respondents were given a menu of options for several locations within the region to select as their primary residence. Figure 1 indicates the breakdown of the 621 responses received.

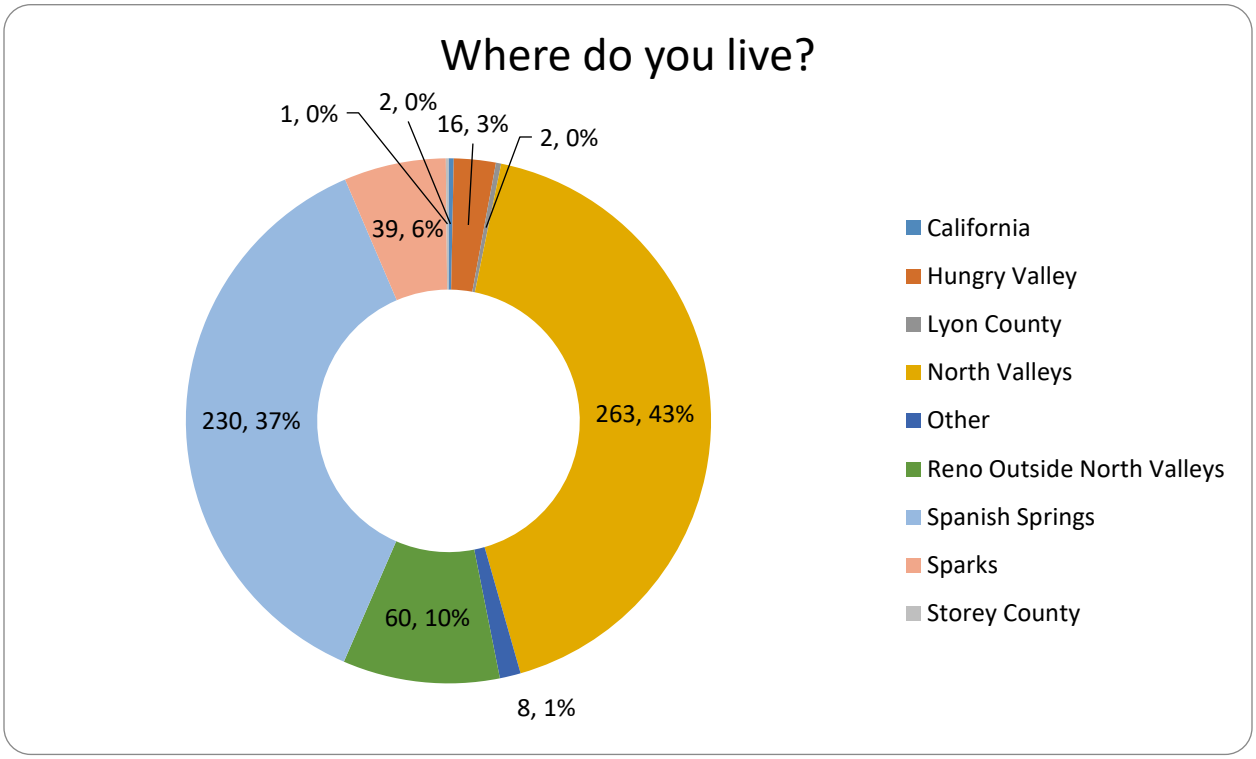

Figure 1: Where do you live?

As shown, the majority of respondents live within one of the two communities of the project area (North Valleys or Spanish Springs at 43% and 37%, respectively). It should be noted that three percent of respondents (16) indicated that they live in Hungry Valley, presumably in the Reno-Sparks Indian Colony (RSIC). However, when asked "where do you work?", of the 604 people who responded, the majority (45%) indicated in Reno, outside of the North Valleys (Figure 2)

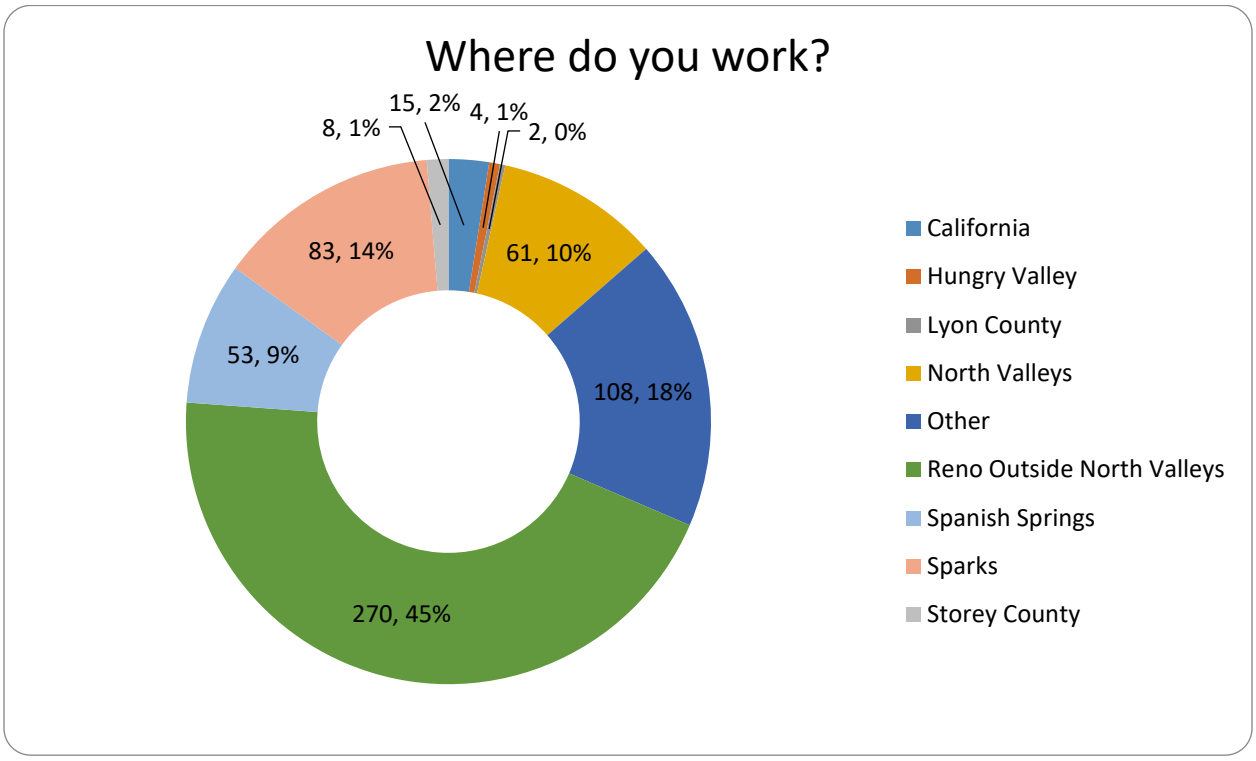

Figure 2: Where do you work?

The survey also asked participants what schools their children attended (if applicable). As shown in Figure 3, over half of respondents selected "Other or Not Applicable." This would suggest that most respondents did not have school-aged children. However, of those respondents that did have children in school, Spanish Springs High School received the most responses with 74, followed by North Valleys High School and Shaw Middle School (located on Eagle Canyon Drive in Spanish Springs) with 47 and 43, respectively.

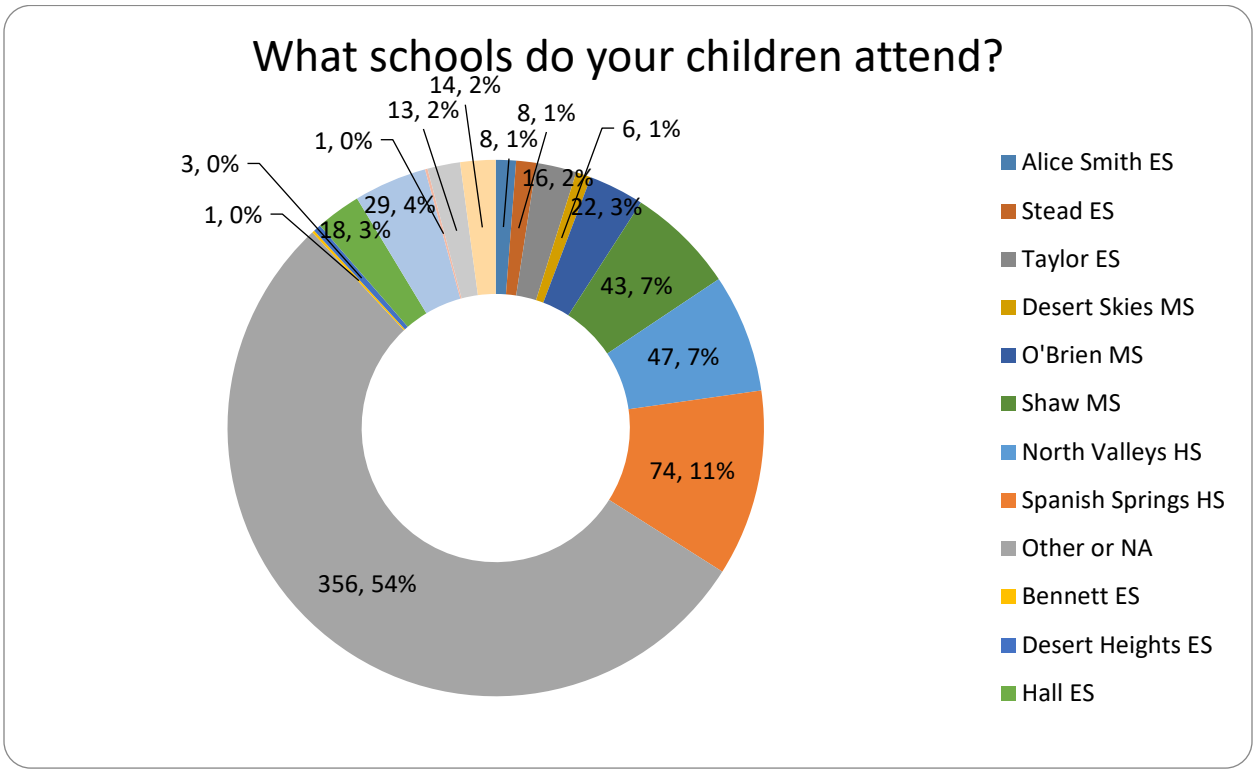

Figure 3: Where do your children attend?

Similarly, a question was asked regarding "Which shopping areas do you frequent?" As shown in Figure 4, the majority of responses were for the Sparks Galleria at 28%, with the remaining choices distributed fairly equally in terms of a selection.

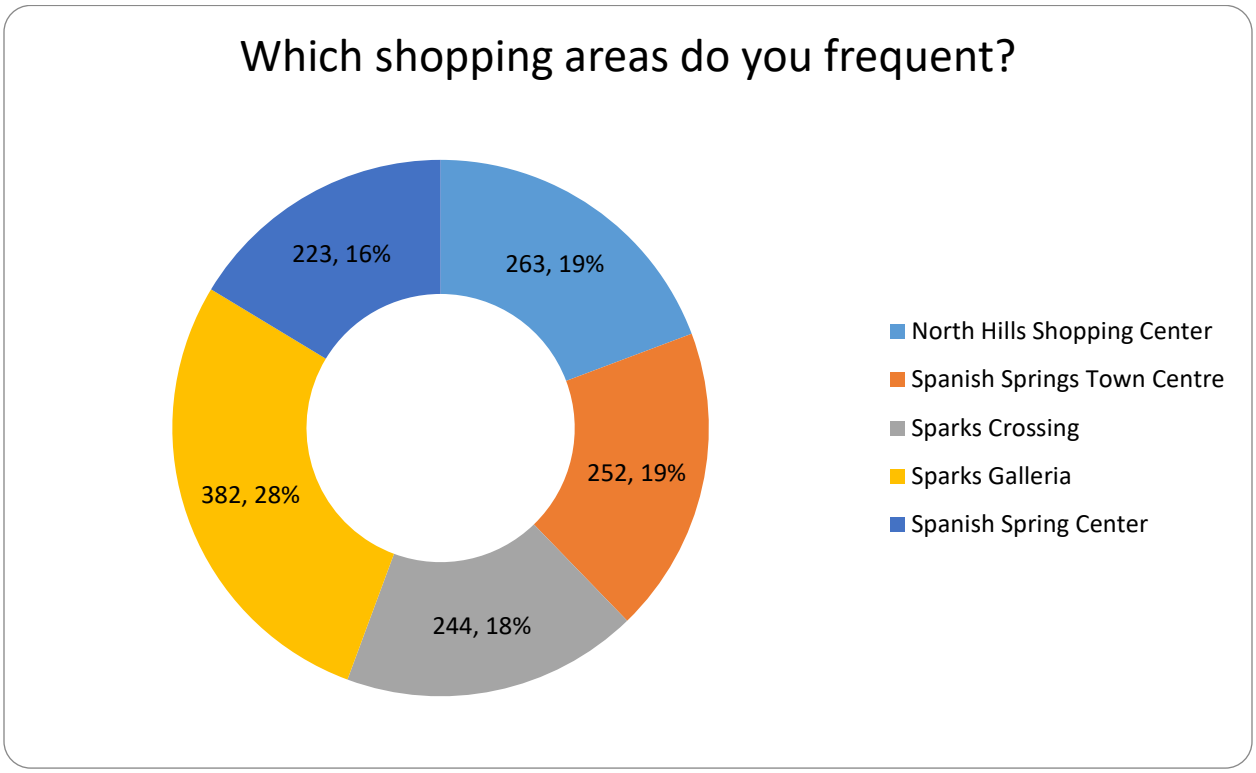

Figure 4: Where shopping areas do you frequent?

Regarding travel patterns, participants were asked about the roadway that represented the longest segment of their commute. The breakdown is shown in Figure 5. The category with the most responses was "Other," however, out of the named roadway segments, Pyramid Highway received the majority of responses. With the exception of a couple of the corridors, most of the responses were fairly evenly split among the other roadways.

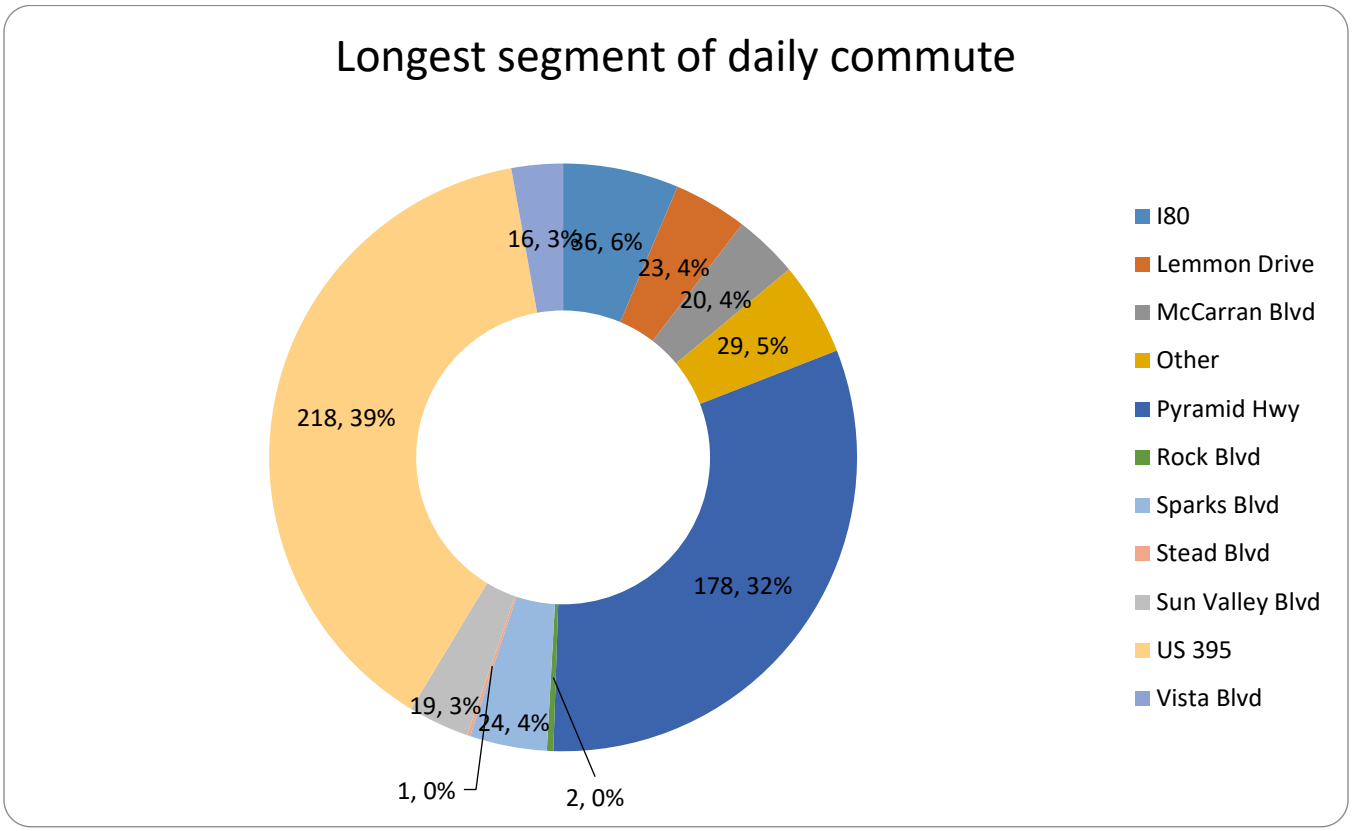

Figure 5: Longest Segment of Daily Commute

The second part of the travel patterns question asked participants how often they would use a new roadway connecting Spanish Springs and North Valleys. As shown in Figure 6, the majority of respondents (23%) indicated that they would never use a new road. This was followed closely by 20% of respondents whom said they would use the new road once per week, and 19% whom said they would use it once per month.

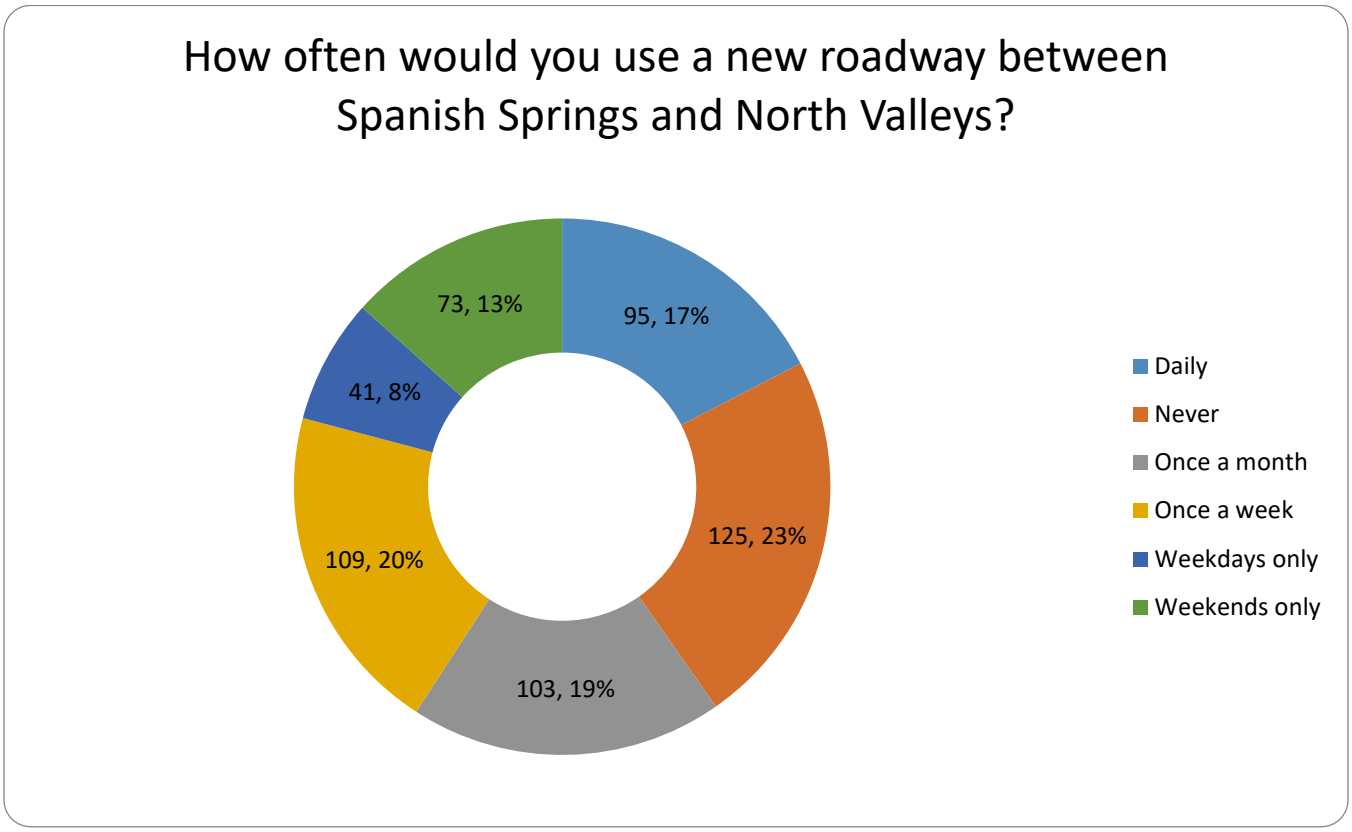

Figure 6: How often would you use a new roadway between Spanish Springs and North Valleys?

The next set of questions pertained to travel preferences. The first question asked what the primary purpose is of the participant's transit trip, if transit is available. At the time of the survey, over half of respondents indicated that transit service was not available near their home and/or destination. Twenty-five percent of respondents indicated that they do not use transit even though it is available. Of the remaining respondents, most indicated that they use transit to travel between home and work only, or a combination of trips between home and work, shopping, or school. Figure 7 shows the breakdown of responses.

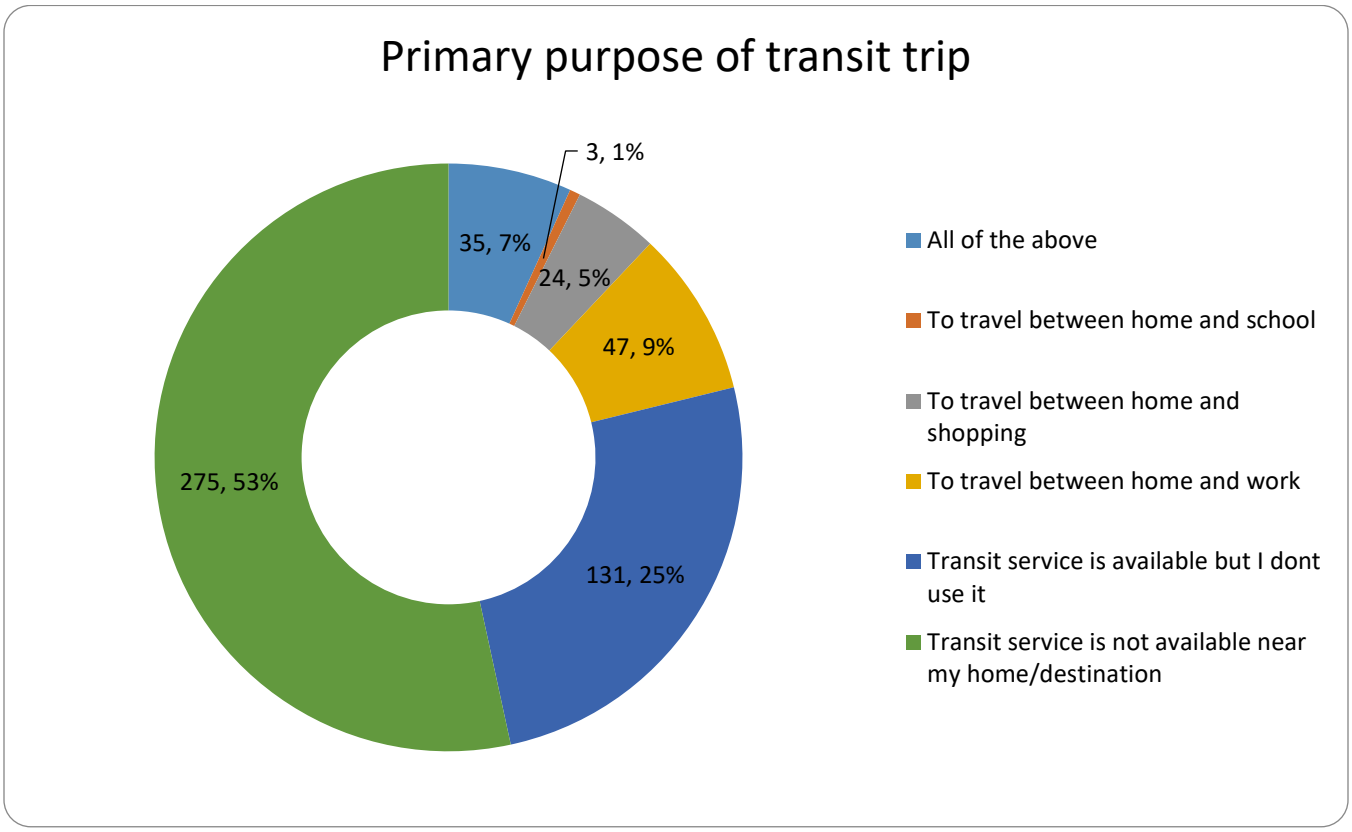

Figure 7: Primary purpose of transit trip?

The last travel preference question asked what the primary reason would be for using a new roadway between Spanish Springs and North Valleys. Just over 70% of responses are split roughly evenly between the reasons of for travel to shopping/dining destinations, convenience/time savings, and the "other" category. Fourteen percent of respondents indicated that they would use the roadway to travel between home and work. The remaining responses are shown in Figure 8.

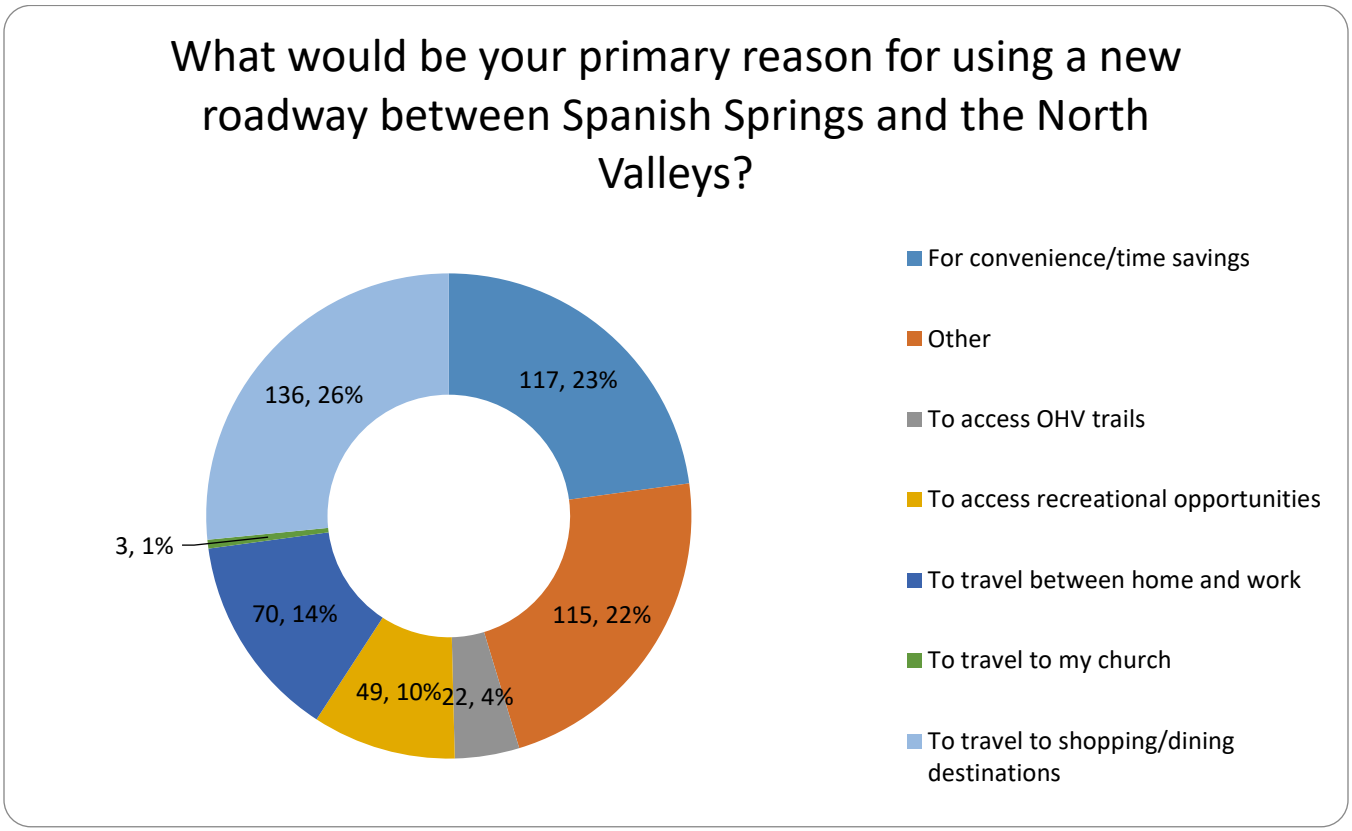

Figure 8: What would be your primary reason for using a new roadway between Spanish Springs and the North Valleys?

Section 2 – What Can be Improved?

This section of the survey gave participants the opportunity to place markers on an interactive map indicating the types of concerns or desired improvements they had. Participants placed 1,134 markers, consisting of several attributes, and provided 675 typed comments.

The map marker icons and attributes that were available for selection are listed below.

- Safety Concern
  - Area of concern as…
    - Driver
    - Pedestrian
    - Bicyclist
    - Lack of access/emergency response time
    - Other
- Operations
  - What kind of issue?
    - Traffic signal
    - Traffic congestion area
  - What time?
    - AM
    - PM

        - Midday
        - Both AM and PM
- Transit/Carpool
    - Ideal location for…
        - Bus stop
        - Park & ride
- Bike/Pedestrian
    - What needs improvement?
        - Bike lane
        - Multiuse path
        - Sidewalk (new/repair)
        - Crosswalk/signs
        - ADA improvement
        - Other
- Recreation
    - Where is access needed for…
        - OHV
        - Mountain bike
        - Horseback
        - Hiking
        - Other
- Wildlife
    - Wildlife conflicts?
        - Near existing roadway
        - Potential avoidance area (new road)

A summary of the number of times that each marker type was placed, along with the number of comments received, is shown in Figure 9. Nearly 40% of the 1,134 markers placed are attributed to a safety concern. Another 25% are attributed to a traffic operations concern.

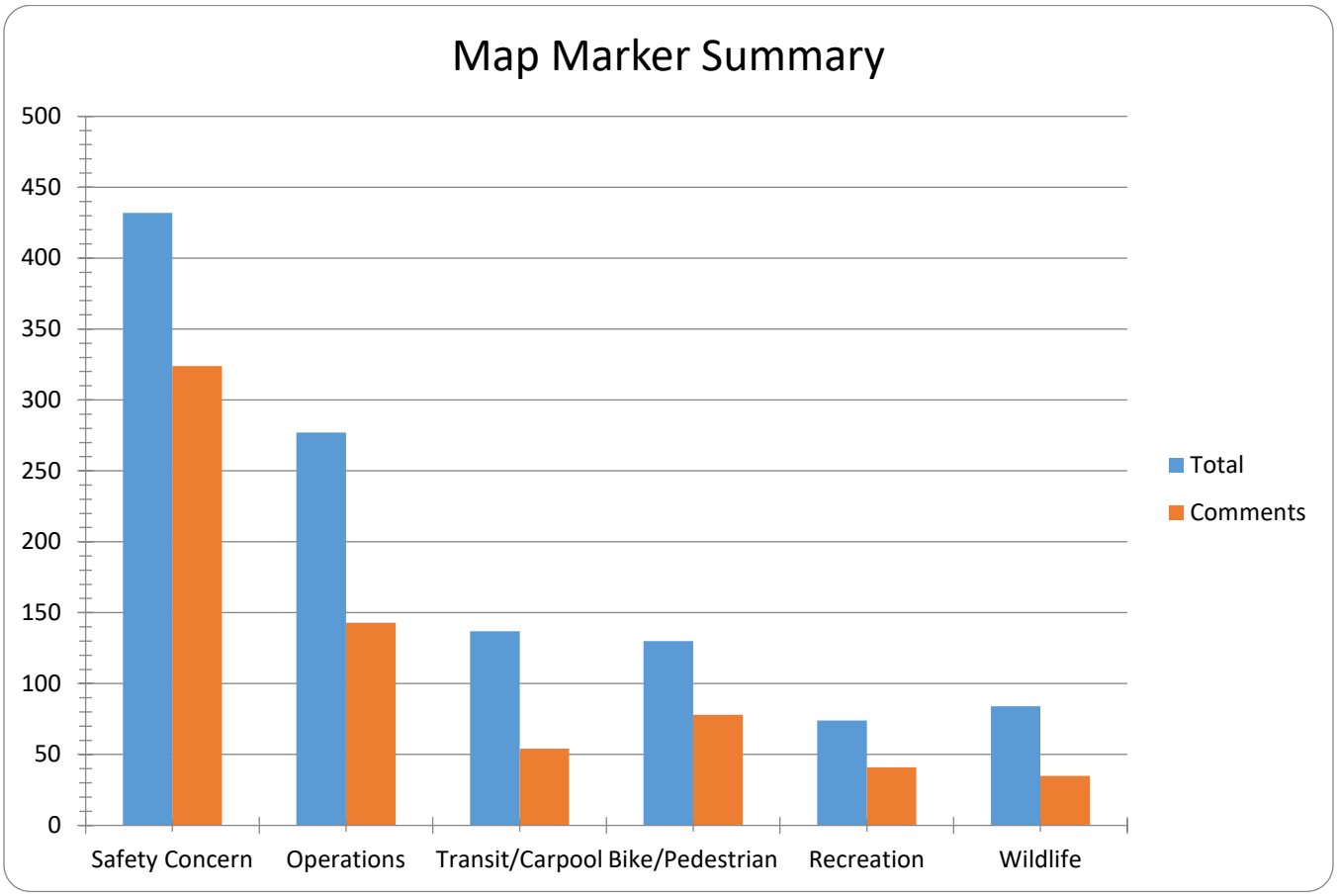

Figure 9: Map Marker Summary?

Figures 10-16 show the breakdown of each of the attributes related to the six primary map marker options.

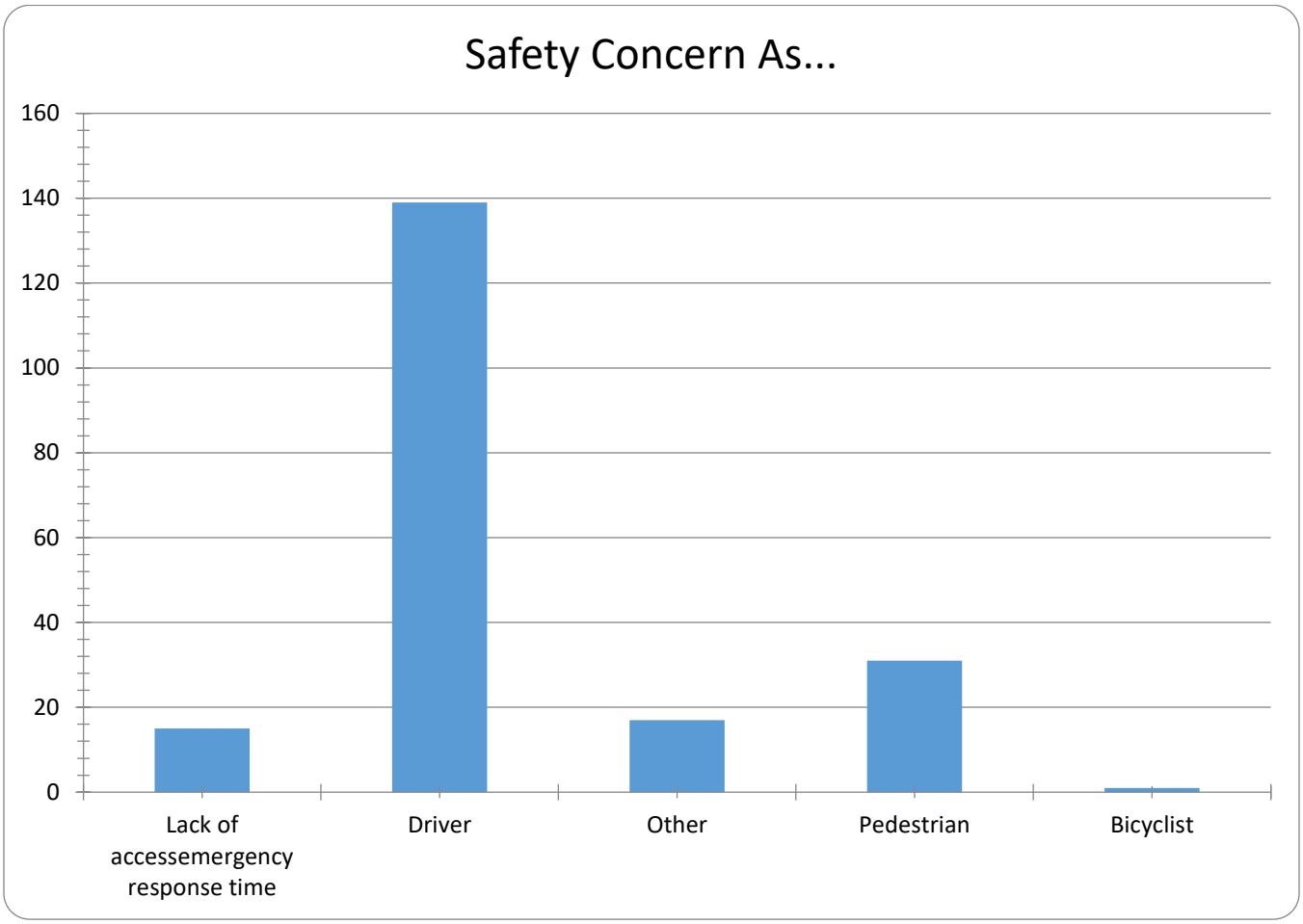

Figure 10: Safety Concern As…

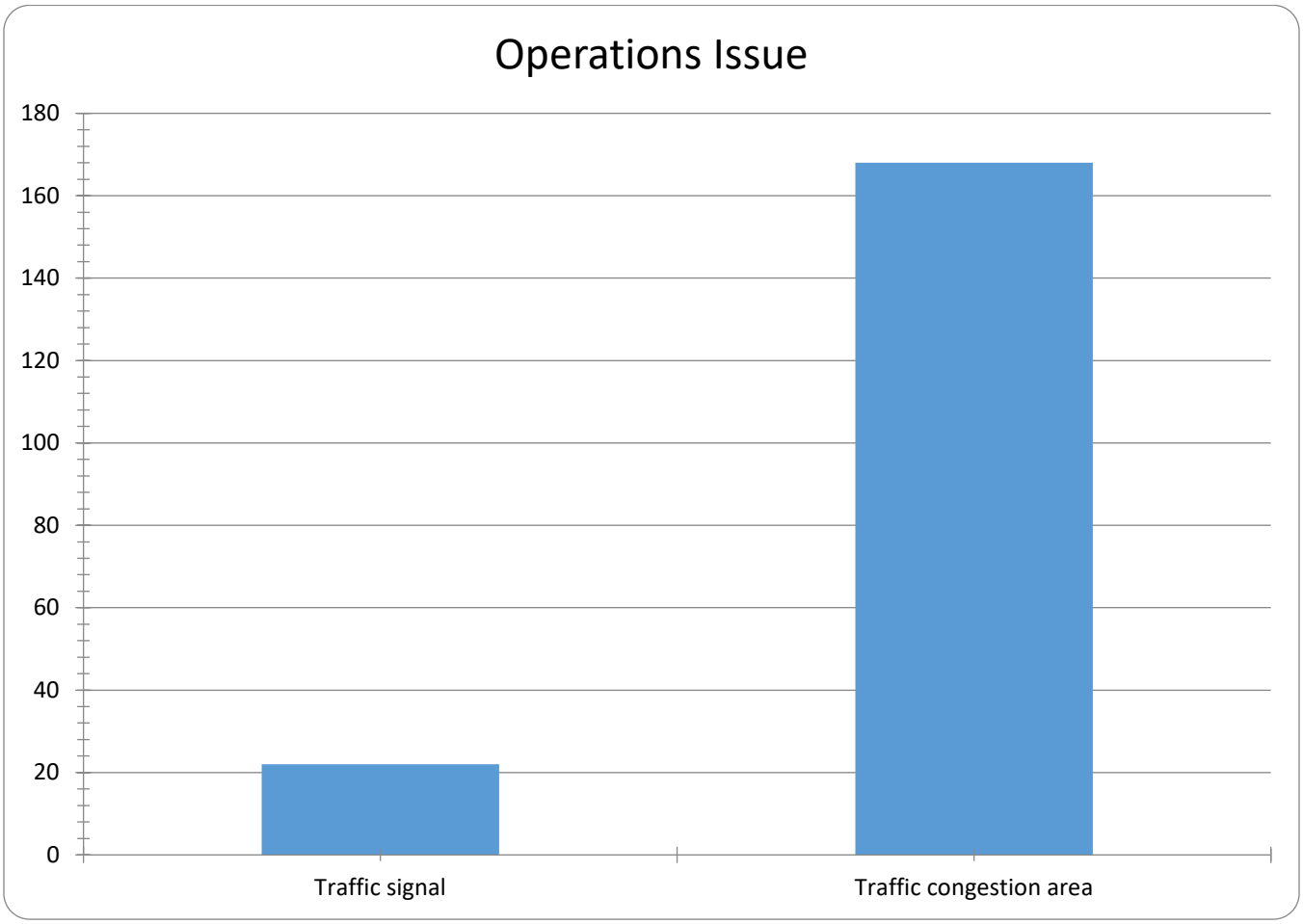

Figure 11: Operations Issue

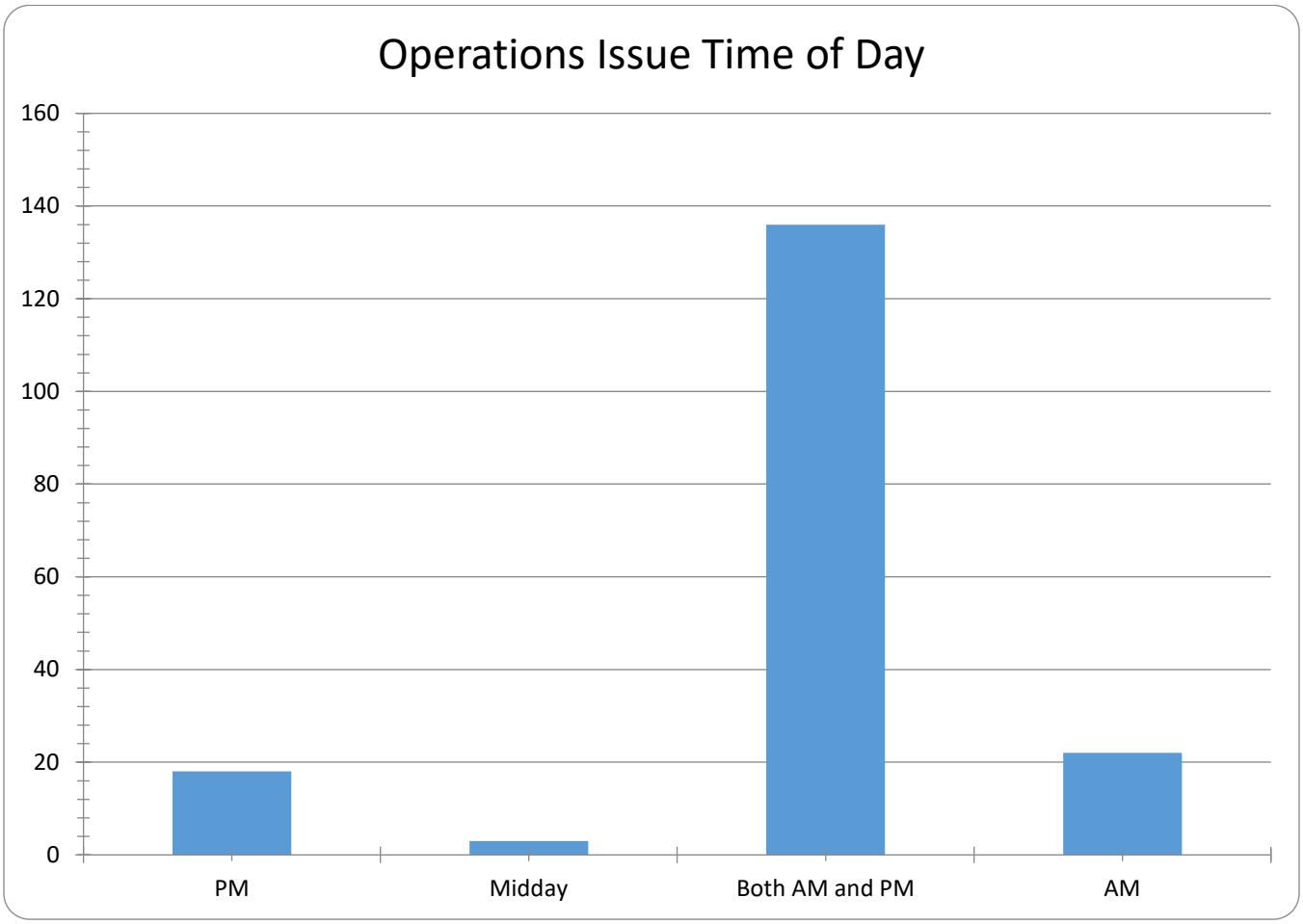

Figure 12: Operations Issue Time of Day

Figure 13: Ideal Location for…

Figure 14

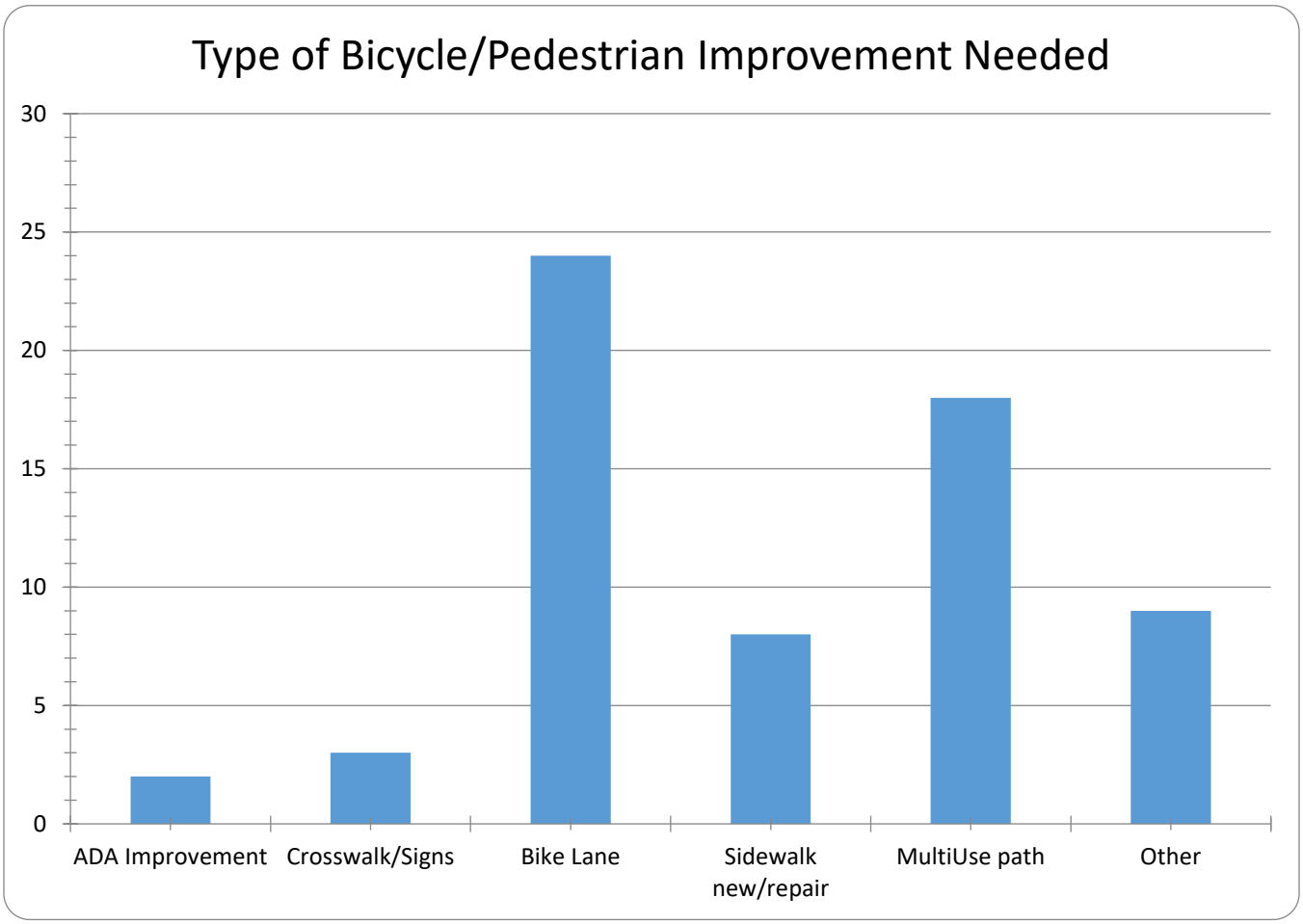

Figure 14: Type of Bicycle/Pedestrian Improvement Needed

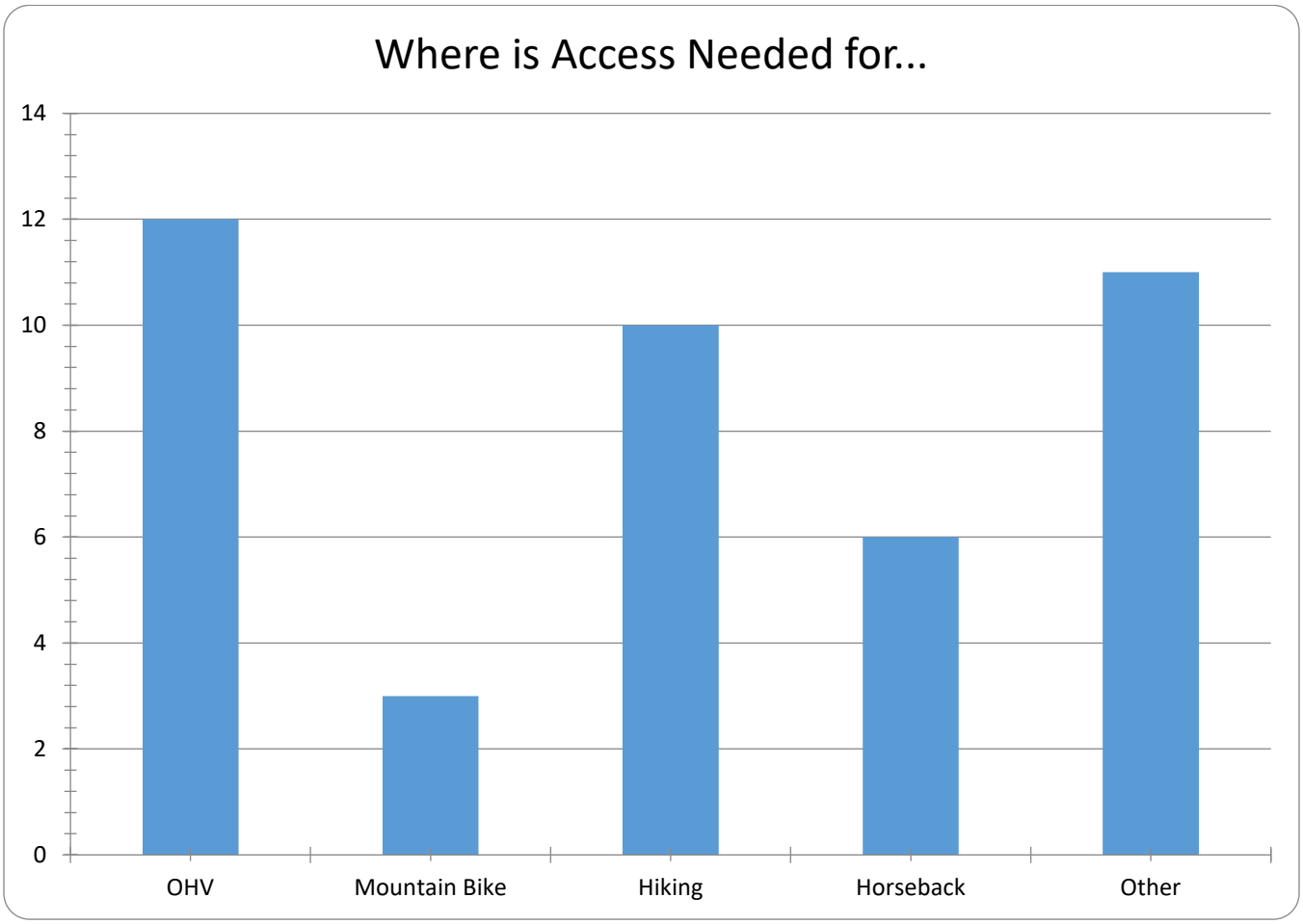

Figure 15: Where is Access Needed for…

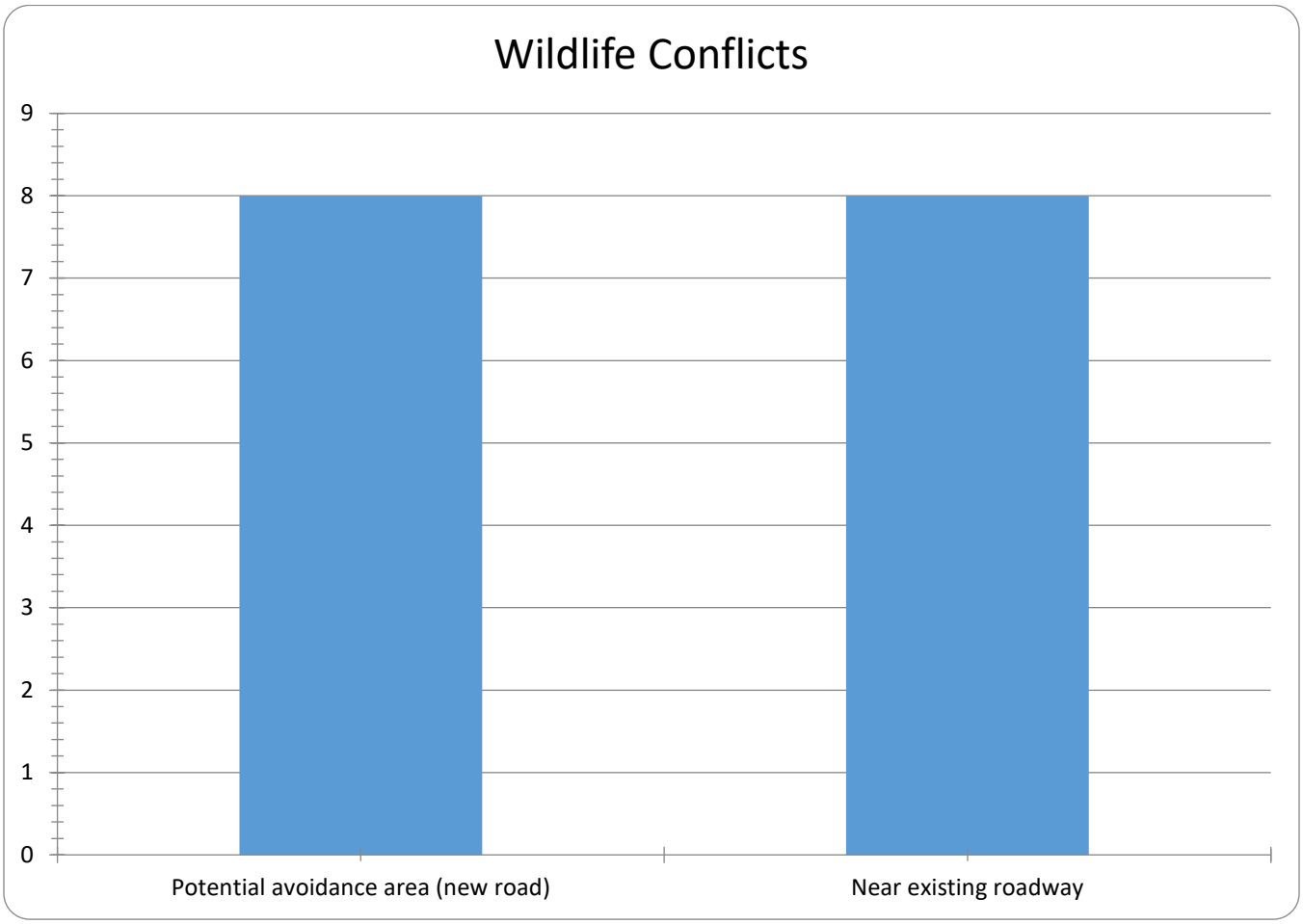

Figure 16: Wildlife Conflicts

As previously mentioned, participants had the opportunity to provide individual comments for any of the makers and/or attributes placed. Table 1 lists all of the 675 comments received.

Table 1: Comments Received

MarkerType	Comment
Bike/Pedestrian	Needs one to connect other bike lanes for Valley loop and better bike access to industrial area.
Bike/Pedestrian	There is no safe area for children or adults to safely travel via bicycle on Lemmon Drive
Bike/Pedestrian	and ADA use
Bike/Pedestrian	bike lanes
Bike/Pedestrian	Pedestrian and bike path needs to be repaired along Lemmon Dive
Bike/Pedestrian	There are times here high school student cross the freeway here on foot. I have seen a major accident caused my high school students crossing here. We need another way for them to cross the freeway. Maybe a pedestrian bride?
Bike/Pedestrian	See Safety Concern
Bike/Pedestrian	Eagle canyon dr. Has lots of kids walking and on bikes and cars speeding and not stopping for pedestrians now. Too much congestion...roundabouts are a joke.
Bike/Pedestrian	Too hard to see the pedestrian...blind spots
Bike/Pedestrian	There is no side walk an either side and the bike lane could be improved heading south at the stoplight by the Maverick
Bike/Pedestrian	All of the above!!!!
Bike/Pedestrian	Bike and pedestrian access to the library from anything on the west side of pyramid highway is dangerous.

Bike/Pedestrian	children crossing to Shaw Middle school from anything south and west of eagle canyon face a lot of traffic.
Bike/Pedestrian	1) u-turns to go back to the library are ridiculous. 2) drivers from Sparks use the shoulder north to pass traffic on Pyramid. The bike lane needs to be separated from Pyramid Hwy. It is dangerous/unusable due to CA drivers! Put in large speed bumps periodically or make a mandatory merge with speed bumps beyond that merge!!
Bike/Pedestrian	Too narrow a road to add more traffic congestion, especially for pedestrians (school aged children).
Bike/Pedestrian	Wider bike lanes
Bike/Pedestrian	Common area for near miss
Bike/Pedestrian	need working bike trail in good repair
Bike/Pedestrian	There is no sidewalk on a significant portion of sun valley boulevard, meaning pedestrians must walk right next to cars. In this spot specifically, if two cars are passing from both directions, there is not enough room to give bikers the 3 feet required passing space
Bike/Pedestrian	Bike turn lane at stead and silver lake towards west. Cars always pull into it for turn lane
Bike/Pedestrian	No sidewalks
Bike/Pedestrian	This crosswalk is dangerous. Often run.
Bike/Pedestrian	pedestrian pathway
Bike/Pedestrian	pedestrian path
Bike/Pedestrian	pedestrian path
Bike/Pedestrian	no pedestrian path to shopping

Bike/Pedestrian	Damned narrow roadway for the number of bikers and peds
Bike/Pedestrian	Need a bike lane on Sparks Blvd. to connect from the SouthEast Connector (Veteran's Parkway) to Baring Blvd. (there is already a bike lane from Baring Blvd. North to Pyramid).
Bike/Pedestrian	Need a bike lane, or even a sidewalk on Vista Blvd. to connect from Veteran's Parkway to Los Altos (There is already bike lane from Los Altos North to Spanish Springs).
Bike/Pedestrian	Need a bike lane on all of Baring Blvd.
Bike/Pedestrian	Needs a multi use path
Bike/Pedestrian	The bike lane needs improvement
Bike/Pedestrian	The bike lane needs improvement
Bike/Pedestrian	There are no bike lanes
Bike/Pedestrian	More bike lanes and sidewalks
Bike/Pedestrian	With TWO large schools on that street, we need some solid, dedicated sidwalk ALL THE WAY UP THE ROAD!!
Bike/Pedestrian	We need sidewalks. Kids have to walk ride up beside the street or down in a drainage ditch!
Bike/Pedestrian	No place for bikes or pedestrians to safely travel.
Bike/Pedestrian	Please rework the Lemmon Valley Road Bike Path. That is a wonderful recreational addition to the area. Would be fun to make a loop connection around Swan Lake.
Bike/Pedestrian	No bike path
Bike/Pedestrian	No bike path

Bike/Pedestrian	bike lane is tiny, no space for pedestrians, no sidewalk
Bike/Pedestrian	too much congestion due to excess building!!!
Bike/Pedestrian	High school crossing point to neighborhood. Will be deadly for children.
Bike/Pedestrian	This area needs bike paths
Bike/Pedestrian	Red rock needs bike patgs
Bike/Pedestrian	Little to no room for bikes and pedestrians
Bike/Pedestrian	Access to multi-use, safe route to school blocked. No sidewalks to school on other side of development.
Bike/Pedestrian	Eagle Canyon needs to be widened.
Bike/Pedestrian	More secure bike lanes all over the city.
Bike/Pedestrian	sidewalks/bikelane from the shopping center to the back of Lemmon valley
Bike/Pedestrian	Sidewalks for children walking to and from schools
Bike/Pedestrian	Not a safe road to be on for bikers or autos at this point with as many people are in the Valleys trying to get to work or elsewhere
Bike/Pedestrian	Repair from flooding it is not safe for our teens
Bike/Pedestrian	A road like this needs to be farther away from residents.
Bike/Pedestrian	The bike lane on the road, and the lack of a shoulder makes this area unsafe for bikes. The pedestrian/bike path is for casual riders and not for bikers. Also the bike path ends and is not safe.

Bike/Pedestrian	Bike Trail on Lemmon Valley Drive needs fixing or replacement
Bike/Pedestrian	Bikes need to be separated from Pyramid Highway for safety
Bike/Pedestrian	Bikes need separate space to ride off highway for all of pyramid
Bike/Pedestrian	For the safety of our children and to aid school administration we need cross walk signals to alert busy commuters
Bike/Pedestrian	No bike lane on Sparks Blvd
Bike/Pedestrian	No bike lanes on Vista
Bike/Pedestrian	No shoulder or bike lane
Bike/Pedestrian	No bike lane on Oddie
Bike/Pedestrian	Separated bicycle track - bike lanes aren't safe enough for most riders
Bike/Pedestrian	Separated bicycle track - bike lanes aren't safe enough for most riders
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Bike/Pedestrian	Separated bicycle track - bike lanes aren't safe enough for most riders
Bike/Pedestrian	Separated bicycle track - bike lanes aren't safe enough for most riders
Bike/Pedestrian	If you have to build the eagle canyon road, please add a separated bicycle path. AND if it needs to be a mixed use path, please make it wider than usual so it's easy for pedestrians and bicyclers to both use it
Bike/Pedestrian	Separated bicycle track - bike lanes aren't safe enough for most riders

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Bike/Pedestrian	Separated bicycle track - bike lanes aren't safe enough for most riders
Bike/Pedestrian	Roads built for capacity/congestion relief by RTC do not take into account other uses and create dangerous situations
Bike/Pedestrian	There is none
Bike/Pedestrian	Adequate sidewalks and bike Lanes added the length of Lemmon drive. There are currently NO bike Lanes at all
Bike/Pedestrian	There are currently NO bike lanes the length of Lemmon Drive and the sidewalk does not extend the whole way.
Operations	The Pyramid intersection is great, but it simply moves the back up further up to Disc Dr.
Operations	Expand to 6 lanes (3 each direction) from Farr to Los Altos
Operations	Expand to at least 4 lanes (2 each direction) from Pyramid to Lemmon Valley Dr.
Operations	Poor design ingress/egress to park/library
Operations	We need a road here to get out of Cold Springs if 395 is blocked
Operations	Needs to be an expressway to Disk Dr. at a minimum and eventualy to Pyramid Hwy.
Operations	Needs to be an expressway to the N-S connector.
Operations	If Sparks Blvd. were turned into an experssway to the N-S connector the congestion here would be drasticaly improved.

Operations	This should be the start point of an expressway connection to the N-S connector. ti should also be the starting point of access to 395 north at Lemmon around North highlands Ranch. Not Eagle Canyon
Operations	This on-ramp is flat dangerous! There is already to much traffic coming from North valleys dumping SS traffic in here even metered doesn't work. creation of an expressway in SS from Pyramid and Sparks Blvd. to the new N-S connector would greatly improve traffic congestion in this area by providing another and more direct route to south Reno.
Operations	Golden Valley has traffic at the 395 interchange at almost all times of the day. 2 new stop lights would help.
Operations	Congestion at the Stead and 395 interchange at all times of the day. 2 new stop lights are needed
Operations	Cold Springs on and off ramp could use a traffic light
Operations	Cold Springs/ Bordertown on and off ramp could use a traffic light
Operations	Lemmon drive at Red Rock road should be paved across the valley to the Lemmon valley entrance, for the sole purpose of transit between valley in the event of another emergency like wildfire. It gives a alternative route to the northern area residents in such cases.
Operations	A paved connector from Echo to Osage should be built, as stated for an alternative route to connect for emergency operations at the least.
Operations	A connector from here to Fish Springs would allow greater transit opportunities for the present and future, along with OHV access.
Operations	A Multi Bridge connector should be built in phases, to branch out Southwest to i 80 and South east to South McCarran with various on and off ramps. A huge undertaking project, but we need to take lessons from Salt lake city and apply those road and highway ideas here, as we have very similar city structures.
Operations	A new highway connector from cold springs to I 80 at Verdi may be a good idea for future planning
Operations	need one here to meter traffic flow.
Operations	great place for the connector road to be placed.
Operations	Current congestion on 395 from N valleys into town is a nightmare, even the future expansion to 3 lanes wont be enough to handle even more traffic

Operations	This 4-way stop can get pretty congested during rush hours. Seems like a roundabout would make more sense here.
Operations	Speed limit is way to slow on Lemmon Drive from Water Ash to Deodar.
Operations	Nb off ramp backs up
Operations	The recent construction and introduction of stop signs has greatly increased the congestion at this intersection. More lanes should have been added to N. Hills Blvd and use of a roundabout would have greatly improved the traffic flow at this location.
Operations	On ramp is ineffective
Operations	down to two lanes in a high-traffic area
Operations	Cutting across 5 travel lanes in order to merge out of traffic exiting 395 in a very short distance during high-congestion periods is not feasible or safe
Operations	too many people attempting to cut into the 395N lanes at the last minute and holding up cars for the 395S ramps
Operations	Need westbound on ramp and eastbound off ramp here
Operations	A yield sign instead of a stop sign would greatly enhance flow of traffic. Perhaps the stop sign could be for those after they cross the freeway heading north on White Lake.
Operations	A yield for traffic exiting freeway and turning right. A stop sign for those crossing the freeway and heading north on White Lake.
Operations	Too much traffic/frequent collisions
Operations	Timing on this light is off, causing excessive morning traffic
Operations	Metering light is on when it doesnt need to be. Not on when it should be. Merging lane needs to be extended to alleviate slowdown...
Operations	Left hand turns

Operations	People speed around it and those using the back side of 7-11 seldom yield as they drive across or go up eagle canyon.
Operations	Two lanes goes down to one lane here..drivers in the slow lane do not realize their lane turns right. Have had near misses and ran off the road..cars that know speed up tp push their way in which causes near rear end domino effect collisions
Operations	Way too much traffic on Pyramid...many new subdivisions have opened and the building continues by cascade and will be 500 new homes slated right off losAltos..two car families
Operations	People living east of calla de la plata only in the eagle canyon subdivision onlyhave eagle canyon as our way out of our neighborhood.
Operations	Traffic is heavy. They cut through from Spanish Spring to Golden Valley.
Operations	Traffic heading north on pyramid during rush hour is back up, especially when the lanes merge from three to two. A third lane from McCarran north to Disc that turns into a dedicated right hand turn lane onto Disc drive would ease congestion.
Operations	It flashes yellow continuously. Needs to operate like the rest of the lights that turn to flashing before the light changes.
Operations	East-west travel is prioritized too high over north-south travel.
Operations	Cars making u-turn exiting library and neighborhood next to library because a signal was not placed at the library/locked neighborhood
Operations	Private property and noise will be a factor for residence.
Operations	There are too many people living in the North Valleys. I work in South Meadows. I have no options when there are accidents. I am going to sell my house and move because I can't take it anymore.
Operations	Hard to get out of neighborhood way during rush hour and school times
Operations	shorten travel to CA
Operations	This signal just backs up traffic and pushes it on to the surface street without helping the merging process
Operations	To many commuters for this infrastructure to handle.

Operations	Merging from 3 lanes to 2 causes major issues. Many times cars are backing up through the traffic lights and blocking traffic.
Operations	Propose new roadway to be carried further up north on 445. Otherwise its useless, especially if building will not happen for 20 years...LAME!!!
Operations	High school, sporting events, recreational events- lots of existing traffic.
Operations	This single lane for Eagle Canyon isn't sufficient. The left turn lane from Pyramid merges to one lane too quickly for the amount of traffic.
Operations	Traffic merges from 3 to 2 lanes just north or Queen Way. Pyramid Hill congestion doesn't ease until traffic turns East on Disc. There needs to be a 3rd lane from Queen to Disc Way.
Operations	water undermined road
Operations	Commute Traffic M-F
Operations	Commute Traffic M-F
Operations	Commute Traffic M-F
Operations	Commute M-F traffic
Operations	OHV all day and night. The race trucks go over 100 mph all hours of the day and night on current roads in Hungry Valley. Very DANGEROUS
Operations	Because we maintain the dirt road to our house we get about 5-10 vehicles a week driving into our home. No-one can read private property or no trespassing signs.
Operations	Basically one way in one way out up to this point. Creates congestion which usually involves unsafe drivers. Need a road that goes over parts of peavine to connect to NW Reno and a road that's more direct to Spanish Springs to help alleviate some of the traffic.
Operations	before you do anything you need to take care of the roadway in the north valley going to town
Operations	Remove metering device. It causes traffic backup onto Lemmon Dr. Serves no useful purpose

Operations	FLOODING
Operations	no shoulder
Operations	traffic must drive through community
Operations	Improve 395
Operations	3 way stop to allow for traffic to flow during busy school times.
Operations	3 way stop to allow for traffic to flow during busy school times.
Operations	Extend Lemmon on ramp to combine with Golden off ramp to allow for better merge time for entering and exiting SB 395
Operations	this plan is flawed-traffic needs to go to downtown reno-not north valleys to spanish springs
Operations	395 southbound and northbound road always in need of repair and needs more lanes and maybe some beautification, but that would be last on the list. And, better patrolled for motorcyclists that constantly split lanes.
Operations	Another bad design, coming out of Walgreens onto Lemmon Dr turning left or right very unsafe! Road also always in need of repair. And, what happened to the bridge that was being built? All of a sudden no more work on it and what a waste of money!
Operations	395, both southbound and northbound. Needs more lanes, needs roads that don't need constant repair. Maybe double decker since some areas may not handle more lanes? You all want to add more roads snd homes and warehouses so we can have more traffic, we need to fix our infrastructure here in Lemmon Valley before moving forward with anything!!!
Operations	Where 395 goes from 3 lanes to 2 suddenly, traffic gets really bad. At best there are delays, at worst there are wrecks because people don't pay attention to where the lane ends.
Operations	Pretty much every day there is a wreck near the Oddie exit, the on ramp is too close to the off ramp.
Operations	Too many cars trying to merge into a confined two lane road. Too much traffic for the infastructure.

Operations	Too many card trying to merge onto the freeway. Not enough lanes. Too many people and vehicles for the infrastructure.
Operations	Poor design. Vehicles exiting and merging on to 395. Infastructure unable to handle the rapid growth.
Operations	Flood area not addressed adequately. Poor road way.
Operations	Increased traffic will overload an already taxed and overcrowded road way. Infrastructure unable to handle increased traffic as the damage from the flood area has not been addressed.
Operations	Expand the highway to 3 lanes instead of forcing traffic to 2 lanes which causes a traffic jam every day.
Operations	Adding multiple neighborhoods of town houses next to the park without expanding the road and leaving the current 1 lane road is short sighted and will cause traffic issues.
Operations	Get rid of this insane exit structure where there are 3 on ramp-off ramps within a mile of each other causing accidents and traffic every day. Remove Oddie exit.
Operations	WB Left turn volumes on Greg to Sparks Blvd
Operations	US 395 congestion; Parr Bridge redesign should consider US 395/Pyramid E/W connector alignment
Operations	Recent construction didn't fix the issues just moved them further up Pyramid a mile or so now.
Operations	Area should have been widen when construction was done recently. Number of new homes being built without updated/widened highway is only going to cause more accidents/issues. The line to now turn on to Calla de la Plata early in the morning for shifts at the warehouses is getting longer and longer it seems
Operations	During school and work commute, this area gets almost grid locked because it's 2 lanes on either side of the highway
Operations	need more lanes to accommodate the many vehicles traveling to and from the north valleys, mainly during the work week M-F
Operations	Adding 2 lanes would help with new construction being built. This section of road is only 1/2 mile or so away from 4 lane highway. Also this stoplight could use the same redlight warning system the rest of the highway uses.
Operations	Widen highway from 4 to 6 lanes would help. It gets backed up from the eagle canyon intersection to maccarran

Operations	Slow and very indirect route to lemon valley .
Operations	Come on people fix the traffic in the spaghetti bowl already.
Operations	Spaghetti Bowl
Operations	Widen prymed hwy
Operations	Too much additional traffic dropped onto Pyramid Hwy which even with improvements planned will not handle it.
Operations	Too many cars, not enough lanes
Operations	Traffic light needed
Operations	Also the area around swan lake
Operations	ndot took away our entrance to erin drive!!!!
Operations	One lane on Eagle Canyon 2 schools. Cannot get out of parking lots or stop signs due to heavy traffic. Have to wait at Light 3 times to get through. If an accident happens you are delayed for hours. Need 2 lanes all the way down Eagle Canyon. Too much traffic for one lane each way.
Operations	Congestion during rush hour during leaving and going to Hungry Valley
Operations	coming out of Ryder homes
Operations	transit travel from Highland Ranch/Sparks Blvd to west 7th/Golden Valley is a mess. As these aras buiild out, it will get worse. Signal at Sun Valley/Highland with free right turn has helped some.
Operations	The signals in this area are not synced and the traffic backs up. Better signal timing is needed.
Operations	Capacity projects only provide temporary (3-5 years) relief until growth catches up and LOS drops back towards F.

Operations	Pyramid Highway is over crowded.
Operations	Speed limit is 20 mph. Ridiculous, how am i supposed to get anywhere. Got 2 tickets for going 35, stupid and dangerous as everyone goes 35 to 45 anyways.
Operations	This needs to be 4 lanes all the way to ramsey...
Operations	Also ridiculous, needs to be 4 lanes each side from bordertown til spagetti bowl. Way way way too much traffic already, without spanish springs adding to it. It would be beyond ridiculous
Operations	The off ramp NEEDS to be at least two lanes. Traffic currently backs up on the freeway at different times of the day.
Operations	This on ramp should be modeled after the Stead on ramp. With the extra "Truck lane" extending well onto the freeway.
Operations	This third lane should extend PAST the Lemmon exit.
Operations	Westbound traffic on Baring Blvd, crossing Sparks Blvd, traffic backs up quite a bit in the afternoon between 2-6pm. The traffic light in this direction only allows for about 5 cars to pass when it turns green, then quickly back to red, regardless of how many cars are in queue.
Operations	I80 westbound offramp on Vista Blvd only has one exit lane. Most vehicles exiting are turning right onto Vista Blvd, and most are using the shoulder to create a second right turn lane. Please just create a two lane offramp, one dedicated to turn right. Also, add a third northbound lane on Vista Blvd to accomodate this right turning traffic.
Operations	The i80 westbound offramp at Sparks Blvd needs a dedicated free right hand turn lane directly onto Sparks Blvd northbound. Traffic backs up severely on this offramp.
Operations	This is a bottleneck area and is usually congested, but it is really bad in the evening.
Operations	Want to go from Spanish Springs to Stead airport more efficiently
Operations	lets time the lights at school rush hours
Operations	The Truck Drivers that are leaving the truck stop routinely run yellow and red lights blocking the intersection.

Operations	There is no good way to make the intersection bigger when the traffic gets outrageous as it already seems to be heading that way without a connector.
Operations	No way to expand this roadway to 3 lanes each way if/when the traffic is too much. Properties on one side and a school on the other. Getting kids out of school and traffic at those times would be murder as well.
Operations	A light is needed at this intersection.
Operations	We need to expedite the time frame for the Lemmon Drive Interchange improvements. Too many accidents and traffic delays in this area.
Operations	too much traffice
Operations	coming home from work going nb on Pyramid
Operations	Interchange
Operations	Interchange dangerous
Operations	South-bound right-hand traffic on N. Wingfield Pkwy triggers the red light too often for west-bound traffic on Vista Blvd.
Operations	East-west traffic on Baring/N D'Andrea Pkwy triggers the red light too often for south-bound traffic on Vista Blvd.
Operations	only car both ways. no other mode of transport.
Operations	Hard to see oncoming traffic if turning left off BlackBear.
Operations	Should have better lighting, dedicated right turn lanes. At night it's nearly impossible to see people crossing.
Operations	Should have dedicated turn lanes all along this stretch to reduce congestion and risk of collision when dark.
Operations	4 lanes to 2

Operations	US 395/580 southbound in the morning and northbound in the evening is congested nearly every week day.
Operations	This shopping center parking lot is very difficult to get out of. Cars exiting here and wanting to turn left frequently cause congestion.
Operations	Southbound traffic in the morning and northbound traffic in the evening is a huge problem. It is increased even more in inclement weather.
Recreation	No sidewalk, lots of kids walk. There is a park with multiple activities.
Recreation	Literally hundreds of people use these hills for recreational horseback riding and hiking. Putting a road through this area would be horrible for local residents.
Recreation	This area in the Peterson mountain range holds a strong presence of equine activities, along with the residents who cherish this area. Keeping this area maintained for truck and trailer is vital for not only equine activity, but also wildlife. A equine park like structure should be built for overnight equine camping.
Recreation	Lots of equine use in this area, and is staged for base camps. Water features and corrals would be a benifit.
Recreation	Springs in this area are crucial for equine and wildlife activities
Recreation	Entrance and exit points on mud springs road need to be maintained for truck and trailer for equine activities, cattle allotment, etc.
Recreation	A designated firearms range should be incorporated into this area, as people are now using congested areas further south west to use, and could cause a fire that would be detrimental to surrounding neighborhoods/ homes and lands
Recreation	A simple access road to this point would allow for many typrs of recreational activities that will be needed as population grows.
Recreation	Better trail systems will help desert restoration
Recreation	Safety signs are needed from this point north on Red Rock road, stating that this is a horseback riding area, cattle on roadways, etc. As people are new to this area and constantly speeding with no regard or idea that activity takes place
Recreation	develop the park for multi use picnicking, sports and rec.

Recreation	There would be a lot of recreation areas though out here and needs accessibility from new extension.
Recreation	Shooting
Recreation	hiking
Recreation	Don't take my mountains
Recreation	Frequented by dirt bikes, quads, side by sides.
Recreation	Horse riding
Recreation	Moon Rocks BLM
Recreation	All horse back , dogs , hikers , mtn bikers,
Recreation	There is a need for non motorized activities. Horse back riding, bicycling, hiking.
Recreation	There is a need for a place for people to let their dogs run that is not adjacent to livestock. This area behind Golden Valley is a great non-motorized recreational area. Right now there is a huge conflict of uses as shooters chase out other users and OHV chases out the rest of the users.
Recreation	open lands are invaluable to the community
Recreation	Other
Recreation	More parks with walking trails
Recreation	It would be nice to have more/easier access to hiking trails from the north valleys, without having to drive all the way through Reno. Getting the gun enthusiasts off of Peavine so it is safer for other was a good step!
Recreation	A roadway in this area will interfere with the outdoor recreations that are held in this are.

Recreation	horsemans park had alot of park eguipment taken out dont no why was in good shape still?
Recreation	Add a real shooting range.
Recreation	We don't want to lose OHV access
Recreation	How will this popular recreation area be effected?
Recreation	I would love to keep these people off out private road. They cut through as well as cars to get to the jobs in the North Valley. They are tearing up our road and we are paying a private person to maintain it.
Recreation	Hiking trails would benefit the community.
Recreation	sis
Recreation	This area is frequented by horse back riders and OHV. High traffic will disrupt use. A simple paved road would be acceptable, but a high volume road is inappropriate.
Recreation	Need more parks.
Recreation	access/drop off for Hungry Valley connection to mountain rec opportunity on the reservation land.
Recreation	Putting a road here will increase illegal trash dumping and force wildlife away.
Recreation	The on and offramp area of I80 at E McCarran Blvd in Sparks is the ugliest on/off ramp area in the Truckee Meadows. This needs some major visual upgrades and landscaping work.
Recreation	camping/boating
Recreation	Separated bicycle track must be built with any road through here. would be a great recretional opportunity as well as a nice way to access mountain biking and other road biking destinations
Recreation	There is a significant increase of ATV traffic going through Antelope Valley to Moon Rocks. This is likely to explode when Prado Ranch is built.

Safety Concern	Morning traffic does not allow you to cross Eagle Canyon from Alena
Safety Concern	The merge from 2 lanes to 1 lane in the round-a-bout. Most people cut off traffic in the left lane, not paying attention to which lane goes through the round-a-bout.
Safety Concern	Off ramp speeds impede traffic flow on 395. Merging from off ramp to left hand turn lanes on to sky vista parkway are not optimal and some times unsafe
Safety Concern	Too many cars = too many rear end collisions
Safety Concern	Adding additional cars to Eagle Canyon would put children walking to school in greater danger.
Safety Concern	The bike lane disappears. This route is a common loop through the valley
Safety Concern	design flaws in ingress and egress to park/library
Safety Concern	The way this on ramp merges is going to kill someone. They recently re striped it with zero merge lane.
Safety Concern	Need stop lights
Safety Concern	Need to get rid of the road devider
Safety Concern	Put a walking bridge over the road
Safety Concern	traffic congestion if new roads from Spanish Springs connect here
Safety Concern	Lemmon drive needs to be widened and elevated or bridged.
Safety Concern	This section of red rock road has flooded over in the past during major flooding. A small section of the road should be re routed to the northwest on higher ground, or keep it as existing, but elevate the road by 3 feet minimum.
Safety Concern	The hillside washes out onto red rock road with almost any decent rain storm.

Safety Concern	We need police out in the North Valley area
Safety Concern	Need Traffic control devices traffic lights due to reckless driving, and vehicle crossing hazards
Safety Concern	neighborhood posted speed limit 25mph need speed bumps or enforcement on site. history of near misses of peds, and vehicles accidents.
Safety Concern	Traffic never travels at speed limit making the turn difficult. Traffic Light would pace the traffic bettter
Safety Concern	In the PM if the bus stops here for a long duration traffic can quickly get backed up as the bus blocks the entire lane.
Safety Concern	This merging lane (northbound) ends to early and for some reason a lot of drivers act aggressively and don't merge properly.
Safety Concern	Raise speed limit on Lemmon Drive from Water Ash to Deodar
Safety Concern	N. Bound 395 traffic can rapidly slow as it narrows from 3 lanes to two followed by a short merge from Golden Valley and slowing traffic to Lemmon Dr. This area needs more lanes until at least Stead Blvd in both directions of travel.
Safety Concern	Short on ramp and limited merging space make for dangerous situations. This on ramp needs a longer pace to merge as well as more lanes of travel on the freeway.
Safety Concern	Already too many cars on Pyramid
Safety Concern	So many people slam on their breaks before exiting Lemmon valley causing a phantom intersection and back ups.
Safety Concern	There needs to be only 1 lane going south and one lane going north from i-80East
Safety Concern	We desperately need a 4 way stop sigh, round about or light here because we have to sit for a very long time exiting 395SB turning left onto Golden. There are many near misses here as well because people race to try to turn before the traffic comes.
Safety Concern	Need stop light, too many accidents

Safety Concern	If the Extension happens on Eagle Canyon Dr this will affect traffic to neighborhoods in the area and kids walking, riding bikes and new drivers go to and from school. This new highway would be too close to schools and neighborhoods. It should start off of Pyramid highway instead of deviating from already busy Pyramid into the Eagle Canyon neighborhood.
Safety Concern	The 80E on ramp from rock Blvd immediately turns into an exit only lane, in addition to two lanes of traffic merging on 80E just before the on ramp. It slows cars down, I have seen many near-misses, and I've actually had to exit instead of merging on the highway because I couldn't get over into the other lane.
Safety Concern	The i80w and 395/580 connection area always causes slowdowns and accidents. Plus there's an on ramp there where people are trying to merge while everyone is slowing down or stopped.
Safety Concern	traffice
Safety Concern	Traffic 395 needs to be widend
Safety Concern	395 needs to be widened
Safety Concern	This is open BLM land, lots of target shooting goes on in this area
Safety Concern	Does not give enough visual clearance to merge properly - cannot see oncoming cars in the travel lane as you are merging
Safety Concern	Merging traffic from 395 onto Lemon makes getting to the right on Lemon very difficult. Example: 395 south>exit Lemon drive>turn left at light onto Lemon>need to move to the right to turn into shopping complex or at Buck. Nearly impossible because of 395 north traffic that exited at Lemon. Most want to move to the left or go straight.
Safety Concern	Very difficult to turn left. Drivers confused with two way stop and south bound or straight through traffic being able to free flow.
Safety Concern	Shrubs on left of exit from high school need to be removed! Trimming helps, but still really blind to make the left out of school.
Safety Concern	North bound from 3 to 2 lanes on the bridge makes for difficult traffic. Especially when a lot of that traffic is getting off at Lemon anyway.
Safety Concern	Going from three lanes to two lanes really causes congestion.
Safety Concern	Exit at high school very difficult because shrubs block visability. Better when they are trimmed but removal would be best.

Safety Concern	Really difficult to get from left lane on Lemon to right lane to turn on Buck or into shopping area due to merging traffic from the 395 exit.
Safety Concern	speed
Safety Concern	Pedestrian, bicycles, buses, very icy, slippery two lane downhill road with ditches
Safety Concern	there is a lot of traffic by vehicle and foot during the morning and afternoon for Shaw MS and I'm grately concerned more traffic will come from the east of Pyramid HWY through here to use the new connector road and it's already so crazy and congested and I get so worried someone will get hit and seriously hurt
Safety Concern	there is a lot of traffic by vehicle and foot during the morning and afternoon for Spanish Spring HS and I'm grately concerned more traffic will come from the east of Pyramid HWY through here to use the new connector road and it's already so crazy and congested and I get so worried someone will get hit and seriously hurt
Safety Concern	people have a very hard time getting in and out of the Daycare already anymore cars and it will be impossible.
Safety Concern	This round about going West has a turn lane to Neighborhood Dr or you can continue on to Eagle Canyon and something seriously needs to be done for drivers in the turn lane changing their minds or realizing they are in the wrong lane and deciding to go towards Eagle Canyon more traffic will make this worse
Safety Concern	Round Abouts are already so hard and possible wrecks happen daily very close calls even more traffic will just make a bad situation worse
Safety Concern	Shaw student hit and thrown from his bike into the ditch from a driver exiting the day care center
Safety Concern	Terrible accident at Davis James involving head on collision..two people seriously hurt. 1p.m. On a Friday about a month ago.
Safety Concern	Several festivities are held here that are extremely valuable and loved by all that attend, but drivers face long waits to be able to merge into traffic
Safety Concern	Too much traffic and drivers going too fast all times of the day and no merge lane to even think about joining the highway traffic.
Safety Concern	Congestion...scarey as cars in right lane dangerously switch clear over into turning lane into Walmart. Bumper to bumper traffic moving and then all of a sudden comes to a complete stop.
Safety Concern	Can't see cars coming down this hill from Walmart..too hard to make a right or left turn

Safety Concern	Driving on Pyramid from I80 to calla de la plata and the reverse is a Nightmare. Pyramid is known as the unforgiving highway.
Safety Concern	This is a neighborhood community! We already have too much traffic from just the people already living here, and more homes are being built as I type!
Safety Concern	There is a pedestrian walking sign but no zebra stripes to emphasize that pedestrians have the right to cross.
Safety Concern	With the on ramp you have to go from 25MPH to 65MPH in a short amount of time and Ive almost been hit many times because people don't want to slow down for merging traffic or change lanes.
Safety Concern	Limited access to 395 - congestion
Safety Concern	Congestion
Safety Concern	Accidents
Safety Concern	A lot of school traffic on eagle canyon, the traffic is already a hazard
Safety Concern	accessing side roads from pyramid highway, and accessing pyramid highway from side streets is dangerous
Safety Concern	Needs to be 4 lane. Drivers from north traveling south at excessive speeds. Illegal passing on double yellow.
Safety Concern	More congestion of traffic between schools on main road, more safety hazards for the children walking to and from school.
Safety Concern	Eagle Canyon id already too busy with 2 schools on that road. It's a hazard for kids.
Safety Concern	Main Street to get to and from the High school. No safe walking trails for students. Traffic is already really backed up in the mornings and after school When students get out at the high school and middle school
Safety Concern	Students crossing the street before and after school.
Safety Concern	Traffic is already backed up in the mornings and after school due to traffic. Not safe to students getting to and from school with increased traffic

Safety Concern	Lots of congestion and reckless driving. Needs expansion
Safety Concern	Needs a teaddic light due to offramp drivers cutting off other drivers. There are lots of warehouses on Vieginia and the trucks block traffic
Safety Concern	Too many children crossing. There should be a walking bridge
Safety Concern	No crosswalk for students from new subdivision to cross the street for school. Existist cross walk fuether south needs pedestian lights. It is difficult to see people crossing at night
Safety Concern	Unable to turn eleft on southbound off ramp during high congestion. Needs a light.
Safety Concern	congestion and noise from traffic
Safety Concern	kids use this a lot
Safety Concern	Way too many cars at this intersection. Need better land use planning
Safety Concern	Extremely busy intersection and military road is already too small to accommodate current traffic.
Safety Concern	Heavy traffic at commute hours
Safety Concern	Flooding when it rains
Safety Concern	Children to and from school
Safety Concern	Children to/from school
Safety Concern	Pyramid highway will become less safe and there are kids trying to get to school. People moved out here for a real expierience and we do not need people cutting through Spanish Springs to get to and from work or shopping
Safety Concern	Speed and cross traffic

Safety Concern	Lane reduction and speed
Safety Concern	Line of sight sunset/sunrise speed
Safety Concern	Value engineering Death trap
Safety Concern	School zone driver speed access road northern valleys
Safety Concern	Lane reduction/speed factor cut through for traffic
Safety Concern	Cross traffic Sunday between residential and church
Safety Concern	Left hand turns out of lots
Safety Concern	Speeding and line of site
Safety Concern	Removal of merge lane
Safety Concern	Bottleneck plus on-ramp offramp proximity
Safety Concern	Reduction plus merging
Safety Concern	Hesco Barriers. Roadway is to narrow.
Safety Concern	The traffic light regularly backs up traffic to just the other side of this curve. It is come to see cars slam on there brakes after coming around and discovering stopped traffic.
Safety Concern	No traffic lights
Safety Concern	No traffic lights

Safety Concern	No traffic light
Safety Concern	high speed travel
Safety Concern	This is a place where we often gather medicine plants that are safe for consumption. If a road is built through here, it will contaminate our plants.
Safety Concern	Theee down to two lanes cause safety issues
Safety Concern	395north
Safety Concern	This road does not support more trafiic- shopping , dinning, TWO schools, day care , and elderly living.
Safety Concern	We need more travel lanes on Pyramid hwy to support the amount of commuter traffic
Safety Concern	We need more traffic lanes
Safety Concern	More traffic lanes needed
Safety Concern	More traffic lanes needed
Safety Concern	This is only one of a few ways for students to cross Eagle Canyon and due to traffic quantity, many drivers are not alert. There are no blinking lights to help warn drivers in this blind roundabout(due to vegetation in the center) that there may be a pedestrian on the other side.
Safety Concern	The middle turn lane is not marked well to allow south bound Andelin Farm visitors to turn East and also allow north bound Pyramid traffic to turn west until David James. Recent fatality.
Safety Concern	effluent, school
Safety Concern	flooding
Safety Concern	flooding

Safety Concern	flooding
Safety Concern	Roundabouts are overly busy with people that don't know how to use them.
Safety Concern	Traffic congestion and kids crossing to get to the middle school. Child has already been hit.
Safety Concern	Speeders
Safety Concern	Traffic thru neighborhood
Safety Concern	OHV and shooters pose a threat to wildlife and non- motorized users
Safety Concern	OHV and shooters pose a threat to wildlife and non- motorized users.
Safety Concern	We live here and if we don't maintain the dirt road emergency services cant get in. All the OHV and other traffic on this road makes it impossible for us to keep up with it at our expense.
Safety Concern	Drivers are careless and rarely use an on ramp properly. people speed 75+ mph on a regular basis
Safety Concern	not sufficient for daily use
Safety Concern	I'm concerned about fires on Red Rock. I want a second way out of Red Rock. The traffic congestion is going to be awful when that new subdivision starts going in. We need a connection to Stead that's not around the lake
Safety Concern	The lights need to be time together
Safety Concern	This crosswalk is really dangerous. As a driver I've almost hit several people using it, and most people in our neighborhood are too afraid to use it. My wife goes to a gym just across the street but chooses to drive (going down to disk and doing a u-turn) rather than walk because it's unsafe.
Safety Concern	school kids crossing the street, traffic for drop off and pickup
Safety Concern	need 4 lanes on both sides. accidents every day

Safety Concern	Widen 395 South
Safety Concern	Move hesko barriers off roadway onto shoulder providing ample room for traffic
Safety Concern	There are no alternate route to cold springs. It would be awesome if you all improved Virginia from Red Rock to Cold Springs. Better yet, improve Virginia all the way through Golden Valley
Safety Concern	Virginia to 395S is scary for everyone. The on ramp is way too short
Safety Concern	Gets really crowded here.
Safety Concern	Traffic bottle necks when the lanes drop down from 3 to 2. If any road were to be built going to the Lemmon Exit it would create more traffic at this spot and increase the bottleneck creating more safety issues.
Safety Concern	Not enough lanes to support the current traffic .
Safety Concern	Tracfic
Safety Concern	We have no police substations, one manned fire station to support the entire north valleys
Safety Concern	Need additional stop sign or traffic light. Too many accidents for left turns exiting 395, traffic backs up significantly. I have sat here trying to turn left and waited up to 25 mins due to traffic.
Safety Concern	Needs 4 way stop signs
Safety Concern	to much traffic
Safety Concern	also bicyclists on roadway now
Safety Concern	Too many drivers going way over speed limit
Safety Concern	Congestion/accidents

Safety Concern	Need 3 lanes each direction
Safety Concern	Need more alternative routes
Safety Concern	SPEEDING
Safety Concern	Now unsafe, bike paths/pedestrian paths blocked by water pumps. County and City need to fix infrastructure and exsisting roadways and get sewer and water issues fixed before anything is considered for adding roads.
Safety Concern	Concern that Spanish spring high school would revive more students from north valley. SSHS is already crowded enough
Safety Concern	The turn lane from disc going north is really dangerous of you attempt to turn on a red light
Safety Concern	Bike and pedestrian paths blocked by badly planned placement of pumps that by all rights should have been fixed by Now, has only been 3 yrs.(sarcasm) Arkansas needs to be repaired and opened. Sewer plant needs to be updated. Whole infrastructure needs to be fixed before ANYTHING ELSE! Step up County and City!!!!
Safety Concern	Kids walking to school are already getting hit by cars. Too much traffic
Safety Concern	This part of Pyramid Hwy should be widened from a two lane to at least a 4 lane, but probably 6 lanes is more appropriate for Spanish Springs growth and development.
Safety Concern	All of Pyramid Hwy should be 6 lanes... If we make this change than it would get us commuters to get where we need to go faster.
Safety Concern	NOBODY stops at the new stop sign ... should have put in a free turn lane going right from Buck Drive
Safety Concern	Driver, Pedestrian and wildlife safety. Standing water. Flood are not resolved.
Safety Concern	Too many cars trying to merge onto the freeway.
Safety Concern	Merging traffic and exiting traffic at the same time. Poor infastructure for the rapid growth.
Safety Concern	Safety concern for driver. Flood area and damage not addressed adequately.

Safety Concern	Cars drive fast and someone got hit while on the sidewalk last year.
Safety Concern	Need to put stop light, high traffic volume.
Safety Concern	Need to put stop light, high traffic volume.
Safety Concern	Traffic issues just moved up the road a mile or so with recent construction. No improvement
Safety Concern	narrow lanes on lemon drive no bike path due to flood pumps are in the way not placed for future use of path.dangerouse speed bumps
Safety Concern	This is a whacky way of getting off the freeway and onto Golden Valley Drive. Too many drivers stop when there is no stop or yeild sign. They need to look at the cross traffic and proceed with caution. There are lots of kids that cross here from Alice Smith and N.Valley HS
Safety Concern	No divider on highway has led to many car accidents from people making left hand turns or swerving into on coming traffic.
Safety Concern	See a lot of accident here in the past.
Safety Concern	Traffic backs up at on ramp, causing highway accidents
Safety Concern	395 needs to be expanded. We all know this. If the Interstate 11 construction could be sped up it would probably help everyone very much. And much more NHP presence to slow and ticket speeders.
Safety Concern	Need to consider school zone when bringing in more traffic
Safety Concern	Around the schools on and near Eagle Cannon and Pyramid HWY
Safety Concern	Entering and exiting at mill and glendale are hazardous
Safety Concern	The highways is a nightmare. There are way to many people in the north valleys and not enough road. There are recks daily making the commute awful.
Safety Concern	This is a very narrow broken road that cannot support current travel conditions let alone extension impact

Safety Concern	This on-ramp and subsequent inlets and outlets of the highway are dangerous and do not allow for safe merging or appropriate travel speeds at high peak hours.
Safety Concern	Too many on ramps off ramps and merge lanes here. The lanes are narrow and short and too many people are making lane changes here.
Safety Concern	Short merge and off ramp at 4th street and I-80/580 here. Near accidents constantly.
Safety Concern	Getting on nb395/580 is impossible from Glendale on ramp. Drivers must cross 5 lanes of traffic to continue traveling north and avoid getting pushed into I-80. Further people are trying to merge to I-80 while others are trying to travel north.
Safety Concern	Speeding through school zones
Safety Concern	Bumper to bumper traffic every weekday morning
Safety Concern	Terrible weekday traffic
Safety Concern	How will the kids, horse riders and the neighborhood in general be effected by increased traffic on Chickadee.
Safety Concern	The flooding problems still haven't been fixed permanently. Access to the new road will be impacted by this until it is fixed.
Safety Concern	Heavy auto, bus and student pedestrian traffic 2times a day
Safety Concern	Heavy traffic during rush hours that are beginning earlier each day and lasting later each evening. Need to widen Pyramid Highway to three lanes each direction
Safety Concern	Adding lanes for entire length of Pyramid from McCarran to Calla de LaPlatta. We have lived is Spanish Springs since 1997 and growth has resulted in major delays and increased accidents on Pyramid Highway
Safety Concern	Need stop light
Safety Concern	Need stop light
Safety Concern	Short merge SB 395/Panther

Safety Concern	Windy twisting road in residential area. Road should primarily be left as is with some safety improvements, and an alternative route used to carry traffic.
Safety Concern	This route is heavily used to get over to pyramid highway. Although better than the stretch between Golden Valley and Sun Valley, it is still a windy twisting road. Safety improvements would be to keep traffic manageable here.
Safety Concern	I see a lot of accidents here, and traffic also backs up terribly.
Safety Concern	unsafe crossing for students
Safety Concern	Please make sure the future connector is far away from schools in the Spanish Springs area.
Safety Concern	Students crossing street to get to school
Safety Concern	Pedestrians
Safety Concern	Merging of traffic leaving Hungry Valley
Safety Concern	Better sidewalks up Eagle Canyon for our students
Safety Concern	excessive traffic for two lane highway
Safety Concern	Vehicles puling out in front of highway traffic
Safety Concern	traffic merging into 2 lane road
Safety Concern	The new lights are good, but the addition of more traffic with the new construction is too much for what is already here.
Safety Concern	Continually seeing near misses due to increase in traffic
Safety Concern	Additional traffic without regulations and lack of lighting makes this a dangerous spot

Safety Concern	Hugh issue with safety due to lack of lighting and traffic lights or roundabouts
Safety Concern	Very dangerous area again due to lack of lighting and some way to keep persons from racing through this corridor
Safety Concern	Due to median, it requires drives to seek out places to make u-turns, which are extremely dangerous. With more traffic it just increases the possibility of more accidents
Safety Concern	If the median was removed and replaced with a roundabout it might serve better to slow traffic and allow persons to get to the destination without u-turns and save lives with the anticipated increase of traffic
Safety Concern	These lights are not set well and cause a tremendous back up and increase the risks to accidents because of this. If traffic is increased it will only exacerbate this issue.
Safety Concern	People not understanding roundabouts and merging. Four way stop and drivers ed would help
Safety Concern	Already so conjested. Why not a road over or around Peavine. Mamy mamy people go 80 wrdt.
Safety Concern	Driveway from high school and Golden eye parkway. High congestion and dangerous for pedestrians.
Safety Concern	Another high congestion area by high school. High pedestrian area.
Safety Concern	Crossing point for children
Safety Concern	Dangerous for drivers getting into and out of driveway to day care.
Safety Concern	Crossing point for children. Very dangerous
Safety Concern	Roadway closures
Safety Concern	Flood concerns
Safety Concern	Already too much traffic on the street with schools. Connect this project to Lazy 5, or Highland Ranch, Not Eagle Canyon with schools and children present and congestion at peak travel times for both work and school.

Safety Concern	Highly congested area with 2 schools zones. I do not believe it can safely support more drivers- congestion and pedestrian accidents are an issue in this area
Safety Concern	This area is unsafe already for pedestrians crossing as visibility is limited
Safety Concern	Highly crowded commute with ever growing population
Safety Concern	Proposal to increase traffic through residential neighborhoods concerns me. This is a RURAL area.
Safety Concern	Trucks coming out of the rock quarry coming dowen hill way too fast
Safety Concern	Speeder sthough this canon
Safety Concern	Major School Crossing for children-Not suitable to be an arterial roadway at all!
Safety Concern	Major School Crossing for children-Not suitable to be an arterial roadway at all!
Safety Concern	Major School Crossing for children-Not suitable to be an arterial roadway at all!
Safety Concern	Major School Crossing for children-Not suitable to be an arterial roadway at all!
Safety Concern	Eagle Canyon has both a HS and MS. Traffic is much to congested with school/resident traffic along with children walking to entertain widening to an arterial roadway. Completely unsafe, think of Stead Blvd and the pedestrian incidents their annually. This should not be connected to North Valleys to reduce traffic congestion on 395 and move it to Eagle Canyon and Pyramid Highway
Safety Concern	Back to back school zones. Road is not wide enough by the schools for the increased amount of traffic. Even if you could put in additional lane each direction it would still not be able to handle the additional traffic.
Safety Concern	No sidewalk access
Safety Concern	Too many cars at this intersection better land use planning needed

Safety Concern	People don't know how to drive in roundabouts, very unsafe for all modes of transportation.
Safety Concern	People don't know how to drive in roundabouts its very unsafe for all modes of transportation.
Safety Concern	Needs a stop sign
Safety Concern	2schools on Eagle Canyon Drive.
Safety Concern	Too much traffic during commute time, especially dangerous in winter up the hill and people who don't have AWD or decent tires.
Safety Concern	ALOT of young kids cross here to get to school. We need something more than just a flashing light.
Safety Concern	Freeway reducing to two lanes.
Safety Concern	K rail and hesco barriers narrowing the road.
Safety Concern	Road maintenance needed. Potholes
Safety Concern	Two major school zones
Safety Concern	School zones being primary travel area
Safety Concern	Traffic near schools
Safety Concern	There are 2 schools on eagle canyon and I think drivers will not observe speed limits and endanger the pedestrians
Safety Concern	one lane
Safety Concern	where is this road connecting too??

Safety Concern	During specific times of day, or if there is flooding, or accidents, it is almost impossible to turn in and out of this neighborhood.
Safety Concern	Or safe to turn to get To the school.
Safety Concern	merging issue
Safety Concern	drivers use this turn lane as a passing lane all the way up to the Library
Safety Concern	no warning that this west hand lane ends
Safety Concern	traffic backs up everyday
Safety Concern	School Zone
Safety Concern	Speed vs pedestrian
Safety Concern	Lemmon Dr
Safety Concern	Safety of residents.
Safety Concern	This area of the freeway has always been an issue.
Safety Concern	This section of the freeway, going each way, has always been an issue. It is time to alter the roof top equipment on the Nugget to relive this constriction.
Safety Concern	Lemmon Valley Drive is too narrow and occasionally floods.
Safety Concern	Excess traffic for road conditions.
Safety Concern	Need divided lanes

Safety Concern	Speeding drivers exceeding 55mph posted
Safety Concern	Need two lanes of traffic in each direction!
Safety Concern	traffic/single lane directional traffic/merging
Safety Concern	traffic, unseen stopped traffic at light
Safety Concern	Road narrows from 3 to two lanes
Safety Concern	This intersection should have been an overpass for Pyramid traffic
Safety Concern	The turn to Delores dr. Is used as a u turn spot for the nearby neighborhood north of the Lazy 5 facility. Very dangerous.
Safety Concern	There would be too much traffic at EC & Pyramid intersection. There are stores so close to the road at each corner that the corner could not be expanded to 3 lanes, etc when the traffic gets bad. Its seems like a Pyramid Mccarren disaster all over again!
Safety Concern	Many cars with the schools close by. Difficult to to leave my house and get onto Eagle Canyon. Need a light.
Safety Concern	As more houses are built Highland Ranch will be over used and become congested for cars and bikes
Safety Concern	Lots of traffic with schools nearby. Need a light. I can't get out of my neighborhood onto Eagle Canyon
Safety Concern	As more houses are added more traffic will contest a very busy Highland ranch. T hi s needs to addressed for car and bike safety
Safety Concern	Floods here every time is rains heavilh
Safety Concern	This area is not built to handle the heavy traffic that would happen if a connector was put in through to Lemmon Valley. Find another way!
Safety Concern	Congestion

Safety Concern	Congestion at round-about
Safety Concern	Congestion in front of SSHS.
Safety Concern	The Red Rock Interchange needs to be improved for capacity. This includes the 395 both North Bound and South Bound. Too many accidents will continue to take place unless auxiliary lanes are added with longer on and off ramps.
Safety Concern	is on one lane in and out
Safety Concern	Every year the intersection of Eagle Canyon floods. As the city of Reno and Sparks is now realizing, many of our traditional lands are naturally a flood zone. (Spanish Springs, Lemmon Valley etc.) Development in certain areas are more upkeep then imaginable. Spanish Springs is one of them. There needs to be a permanent fix to the flooding zones.
Safety Concern	Poor barriers between both directions of travel.
Safety Concern	Speed limit is not maintained on Pyramid Highway.
Safety Concern	Speed limit is not maintained on Sparks Blvd.
Safety Concern	Too much traffic going to Lemmon Valley to reduce to 2 lanes just before Lemmon Valley.
Safety Concern	New traffic light doesn't include right turn traffic at exit. Very difficult to get to far lane when exiting from Big Lots parking lot.
Safety Concern	More and more distribution centers mean many more truck drivers, a third lane is needed.
Safety Concern	A much needed traffic light was added, but truckers are not able to move towards the freeway in the ice and snow. It will be worse with a traffic light there. They won't be able to stop at the light and the turning traffic won't know that. The trucks also will not be able to start up the slight incline there when the light turns green.
Safety Concern	395 traffic
Safety Concern	Traffic

Safety Concern	Traffic
Safety Concern	Traffic
Safety Concern	Traffic
Safety Concern	Traffic
Safety Concern	Traffic
Safety Concern	Traffic
Safety Concern	Traffic
Safety Concern	My family and I use the Canoe Hill Trail system frequently. There are always target shooters shooting west over the City-maintained single-track trail. I have tried educating the target shooters, but they continue shooting over the trail and leaving trash in the area.
Safety Concern	Target shooters shooting over roads/trails and leaving trash
Safety Concern	It is almost impossible to get on North bound 395 and cross all the lanes of traffic to stay north on 395
Safety Concern	Almost blind corners and narrow lanes
Safety Concern	Congested during daily drive times
Safety Concern	heavy traffic during peak hours.
Safety Concern	older roads deteriorating
Safety Concern	There should be a traffic light at this intersection. Too much traffic.

Safety Concern	Golden valley rd /7th is very narrow need to widen road, no shoulder no bike path
Safety Concern	ONE LANE ROAD (HIGHLAND)
Safety Concern	ONE LANE ROAD
Safety Concern	4 lanes to 2
Safety Concern	Cars exiting the highway are traveling at fast speeds while cars are trying to turn right out of the shopping center parking lot.
Safety Concern	The narrow, two-lane road does not allow for vehicles to pass if there is construction, or an accident, or any kind of traffic.
Safety Concern	Trying to turn left out of the Walgreens parking lot is very difficult and dangerous.
Safety Concern	If there is anything to affect traffic flow (accident, construction, peak travel time) there is no way to access beyond the blockage. This delays medical response time.
Safety Concern	Cars exiting the highway are traveling at a high rate of speed while drivers are trying to turn right out of the shopping center parking lot.
Safety Concern	The Starbucks line, at times, gets so backed up that it prevents cars from turning from Buck Drive into the shopping center.
Safety Concern	Southbound on-ramp very crowded for morning commute
Safety Concern	Pyramid needs to be widened. There are so many new homes and new travelers that pyramid should not be one lane each way anywhere.
Safety Concern	Highland ranch parkway needs to be widened. A lot of people who have moved out into Spanish springs off pyramid now take this road to work and home and it gets very backed up.
Safety Concern	Is just one lane going straight
Transit/Carpool	NO BUSES HERE

Transit/Carpool	connect to the Sparks hub
Transit/Carpool	Spanish Springs NEEDS a reliable bus service that won't take hours to get to South Reno
Transit/Carpool	Bus Transit would be nice from this area. And Carpooling could help with congestion, including on Pyramid Hwy and the new Extension
Transit/Carpool	We need RTC bus access in Wingfield/Spanish Springs.
Transit/Carpool	We need RTC bus access in Wingfield/Spanish Springs
Transit/Carpool	Park and ride is needed in Spanish Springs
Transit/Carpool	The RTC needs to do a better job of providing bus service in Sparks, the bus has become an endangered species.
Transit/Carpool	Public transportation
Transit/Carpool	bus into Victorian center
Transit/Carpool	need bus route. route can loop from Lemmon then into Stead.
Transit/Carpool	Need more public transport availability into Sparks and Spanish Springs
Transit/Carpool	Bus service to red Rock Rd and silver lake rd
Transit/Carpool	Continue two lanes North
Transit/Carpool	Shopping
Transit/Carpool	.

Transit/Carpool	Would like a connector
Transit/Carpool	Lack of bus service makes it harder for families with teenagers to try to work because everything is so spread out and not many places to ride bikes safely or take buses
Transit/Carpool	Widening the good damn road before building anymore anything!!!!
Transit/Carpool	Private vehicle
Transit/Carpool	hardly any park and ride will be provided-same fault bart is bay area has
Transit/Carpool	increased lanes
Transit/Carpool	Bus service used to be provided further back on Lemmon Dr. and is no longer available. Should be made available through the back of Lemmon Dr. to Stead to all the warehouses for work. Bus stop and park and ride.
Transit/Carpool	Would be nice to be able to get to north valleys without going all the around using pyramid, McCarran and 395
Transit/Carpool	We should have options to travel into the city.
Transit/Carpool	We need a road from lemmon to spanish springs
Transit/Carpool	Traffic in the am
Transit/Carpool	Community needs bus transportation because Pyramid highway is so congested.
Transit/Carpool	Public bus to take people into town. There is nothing in Spanish Springs.
Transit/Carpool	Bus service to shopping centers. Serving up & down Pyramid. Park and ride here would also be highly desirable way to get downtown
Transit/Carpool	We need an outlet from Red Rock to Stead without having to go to the freeway or Silver Lake Rd area

Transit/Carpool	We have no bus service beyond the general store
Transit/Carpool	Spanish Springs needs bus service
Transit/Carpool	traffic to Indian Colony via RTC transit instead of Tribal buses if the oridor goes through this area...
Transit/Carpool	If/when it ever gets RTC bus access to the Spanish Springs
Transit/Carpool	If mass-transit were available in Spanish Springs
Transit/Carpool	There is currently no bus lanes out in Spanish Springs./
Transit/Carpool	Need a park and ride facility in Spanish Springs to get people off of Pyramid Highway. A park and ride for people going to and from work via transit and to go into the City on the weekends would be good.
Transit/Carpool	The transit service in East Sparks is horrible, bring back the buses. Flex Ride sucks
Transit/Carpool	Workers are hard to find because they rely on transit.
Transit/Carpool	more transit options
Transit/Carpool	To help reduce traffic
Transit/Carpool	Having transit to the Spanish Springs area would be good to lessen traffic on Pyramid.
Transit/Carpool	Transit available to seniors would give them more mobility.
Transit/Carpool	Transit to the high school might also lessen the traffic on Eagle Canyon.
Transit/Carpool	Park and RIDE

Transit/Carpool	Tesla and other Industries
Transit/Carpool	Route to Spanish springs
Transit/Carpool	more shopping for people with no car
Transit/Carpool	RTC has allowed the transit system to collapse by a lack of investment in it
Transit/Carpool	NO TRANSIT SERVICE IN SPANISH SPRINGS
Transit/Carpool	Most of the shopping all centrally located for us.
Transit/Carpool	Where we are traveling from to get to shopping and resturaunts. We drive through Lemmon Valley community and then along a narrowed road next to Swan Lake.
Transit/Carpool	Park and Ride for daily or special occasion
Wildlife	Wildlife will be traveling in this area very soon, as the northern part of the Stead airfield is going to be farmed alfalfa fields.
Wildlife	no conflicts bring back the Cows! Cows are good!
Wildlife	Wild goats are seen here often
Wildlife	cars travel too fast
Wildlife	You people put zero thought into wildlife habitat. People move here because it is real and you are totally destroying that way of life
Wildlife	Horses
Wildlife	More traffic thru rural and neighborhoods

Wildlife	Antelope, eagles, burrowing owls, deer, hawks
Wildlife	Antelope, deer, burrowing owls, eagles, hawks
Wildlife	deer, antelope, burrowing owls, golden eagles, hawks
Wildlife	A lot of animals around
Wildlife	Over pass for wild life on 395
Wildlife	By building a community here you will be killing off natural deer, bobcat, beer, and other wildlife natural wintering zones and feed habitat
Wildlife	The numbers of wildlife have already been affected by the growth out here and cannot withstand anymore. Also the flooding in this area is a big concern and with the loss of even more ground for water to soak into and run directly to the bottom of the basin is worrysome.
Wildlife	Displacing the wildlife is a concern
Wildlife	This is going to cause environmental issues with wildlife. Increased traffic.
Wildlife	More wildlife out here than most people think.
Wildlife	Wildlife live in the swampy areas. They should be considered when developing.
Wildlife	Much habitat would become too congested for the wildlife.
Wildlife	In general, all improvements should be evaluated for protecting wildlife. One of the big drawbacks of any project that involves development is people lose beneficial contact with wildlife, and many initially moved there because of the wildlife. OTOH, newcomers to new suburban areas tend to shun wildlife. We need to make sure both positions are accommodated and part of this is through good roadway planning and using that to control where development happens.
Wildlife	I also want to protect the ranchers that use this area for grazing

Wildlife	Dangerous for wildlife. Destroys habitat. We WANT our wiildlife to be protected.
Wildlife	Lots of wildlife and cattle grazing along Eagle Canyon very dangerous.
Wildlife	Problem with coyotes coming into the neighborhoods due to building new homes in open areas
Wildlife	Coyotes, mountain lions, antelope and big horn sheep, avoid accidents and taking their habitat
Wildlife	Loss of habitat
Wildlife	General concerns
Wildlife	general concerns
Wildlife	New growth would disturb wildlife.
Wildlife	As a 15 year resident of Hungry Valley our tribal community has restricted many of the target shooting and off road vehicles. Since the restrictions took place many of our wild life and plant life are coming back to the area. Our land is healing and flourishing once more. Building a road around/through our land for convenience is not favorable.
Wildlife	migratory path
Wildlife	migratory path
Wildlife	migratory path
Wildlife	Preserve coyotes
Wildlife	RELOCATE MARMOTS FROM GOLF AREA

Heat maps were created for the different map markers to show relative geographic density of the comments received and to better identify any areas with a higher number of responses. Figures 17-25 contain the heat maps for the various markers.

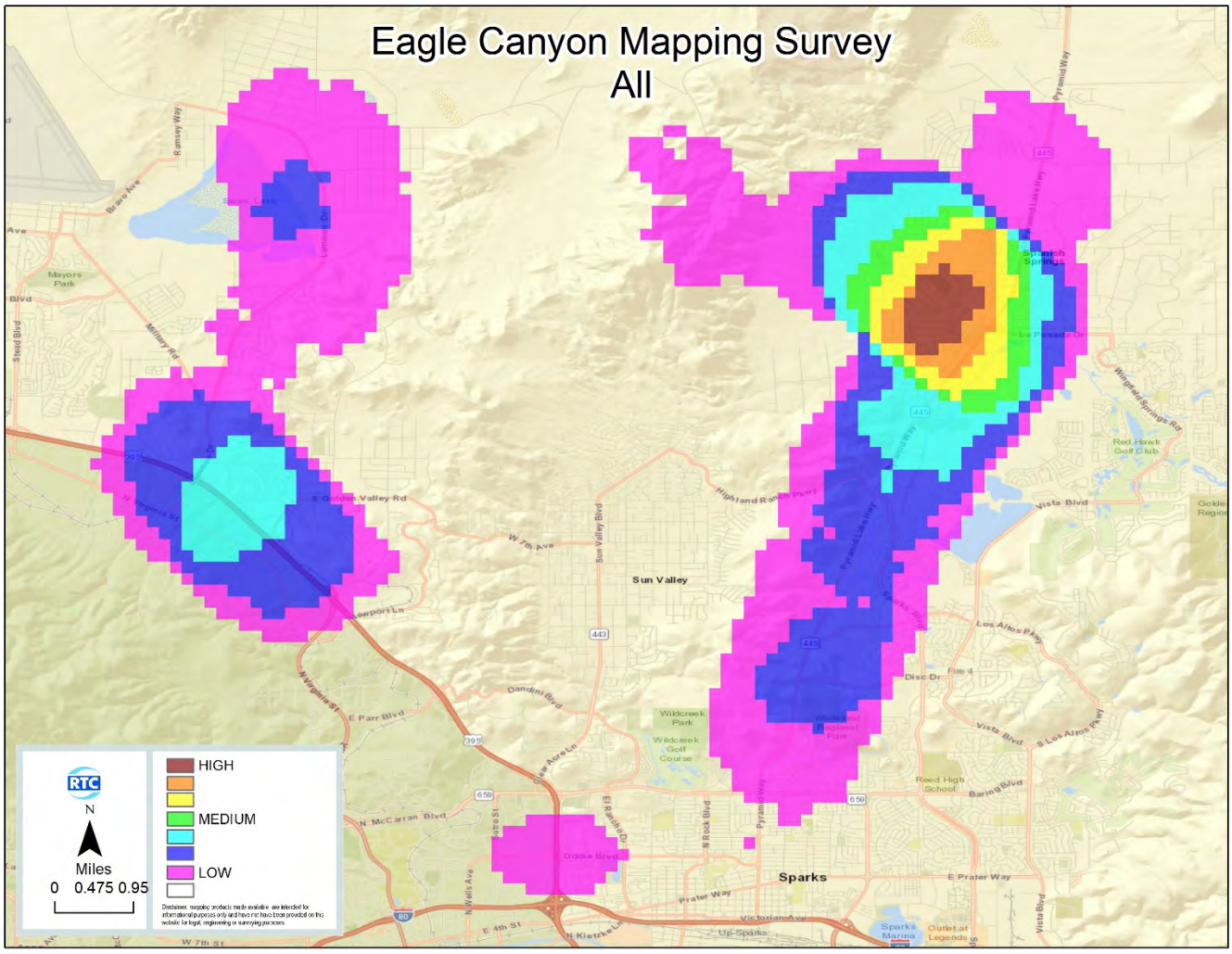


Figure 17: Eagle Canyon Mapping Survey – All Comments

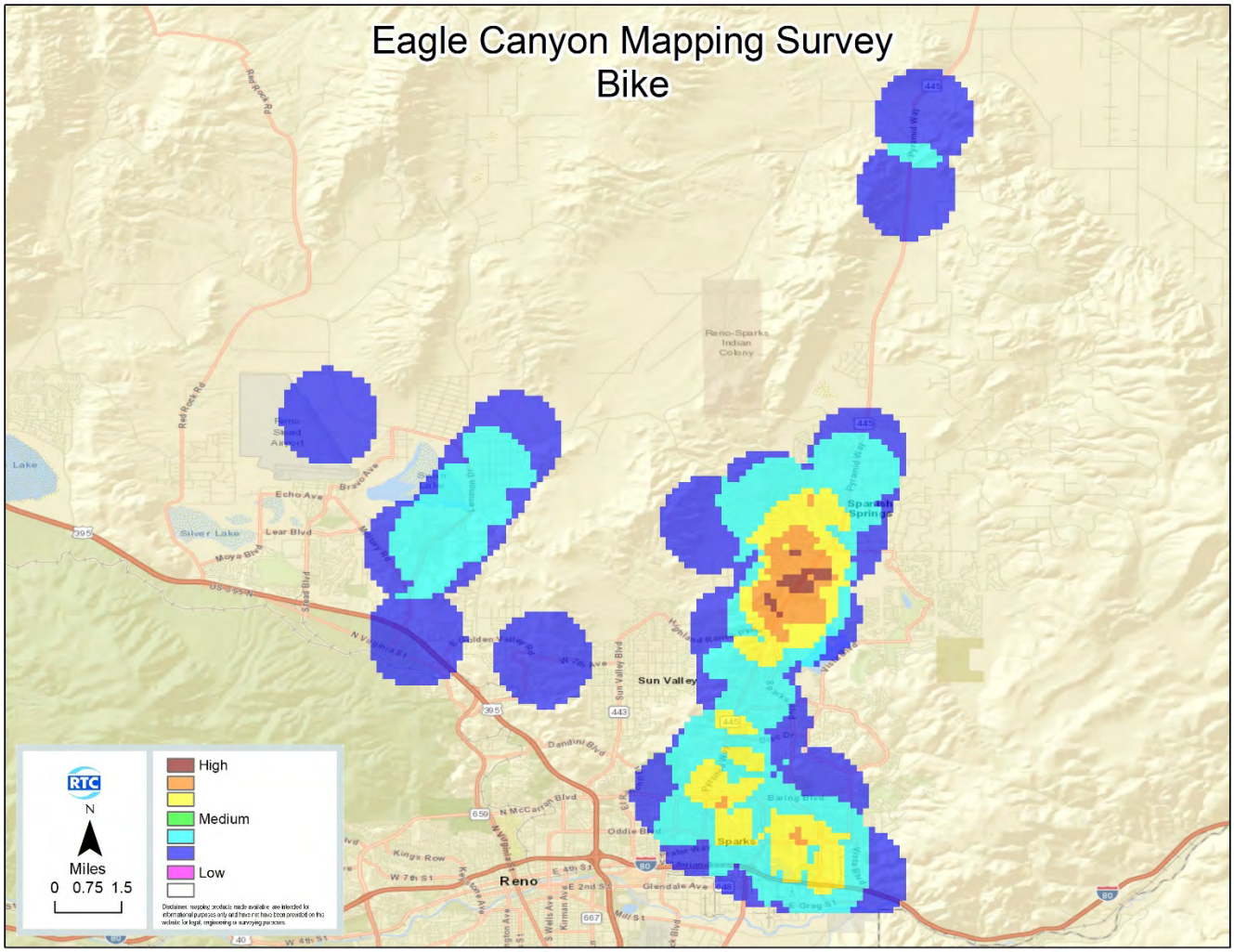


Figure 18: Eagle Canyon Mapping Survey – Bike Comments

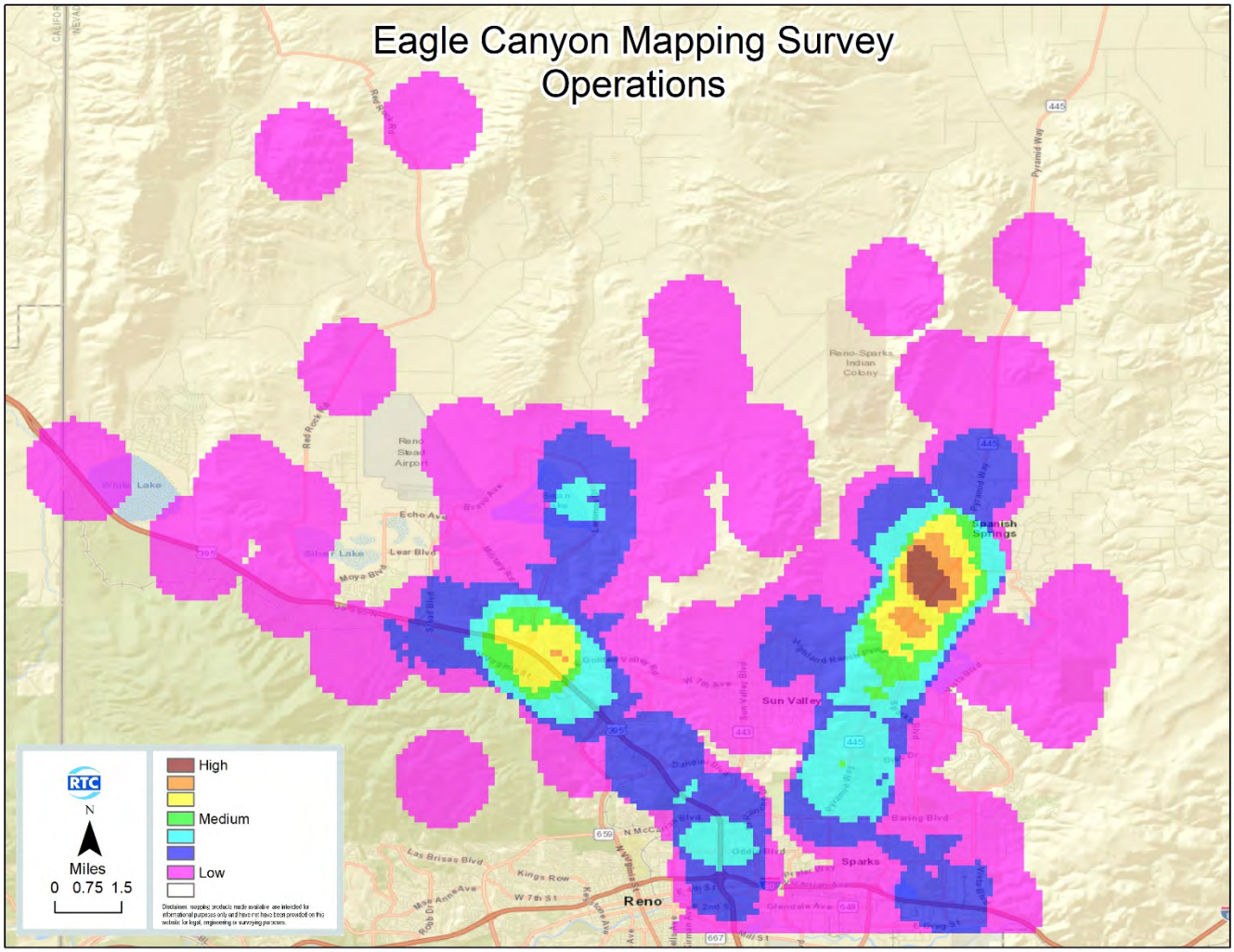


Figure 19: Eagle Canyon Mapping Survey – Operations Comments

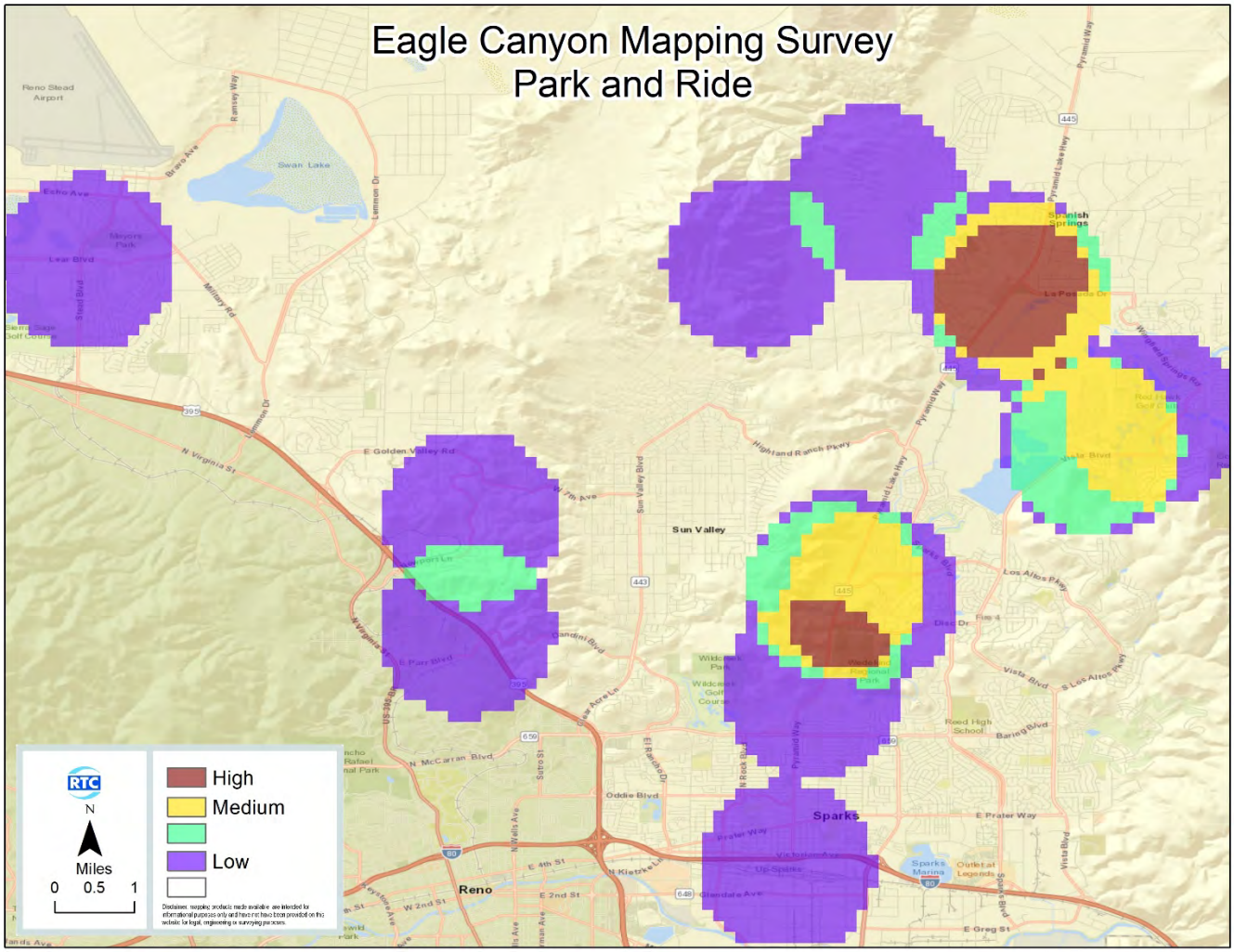


Figure 20: Eagle Canyon Mapping Survey – Park and Ride Comments

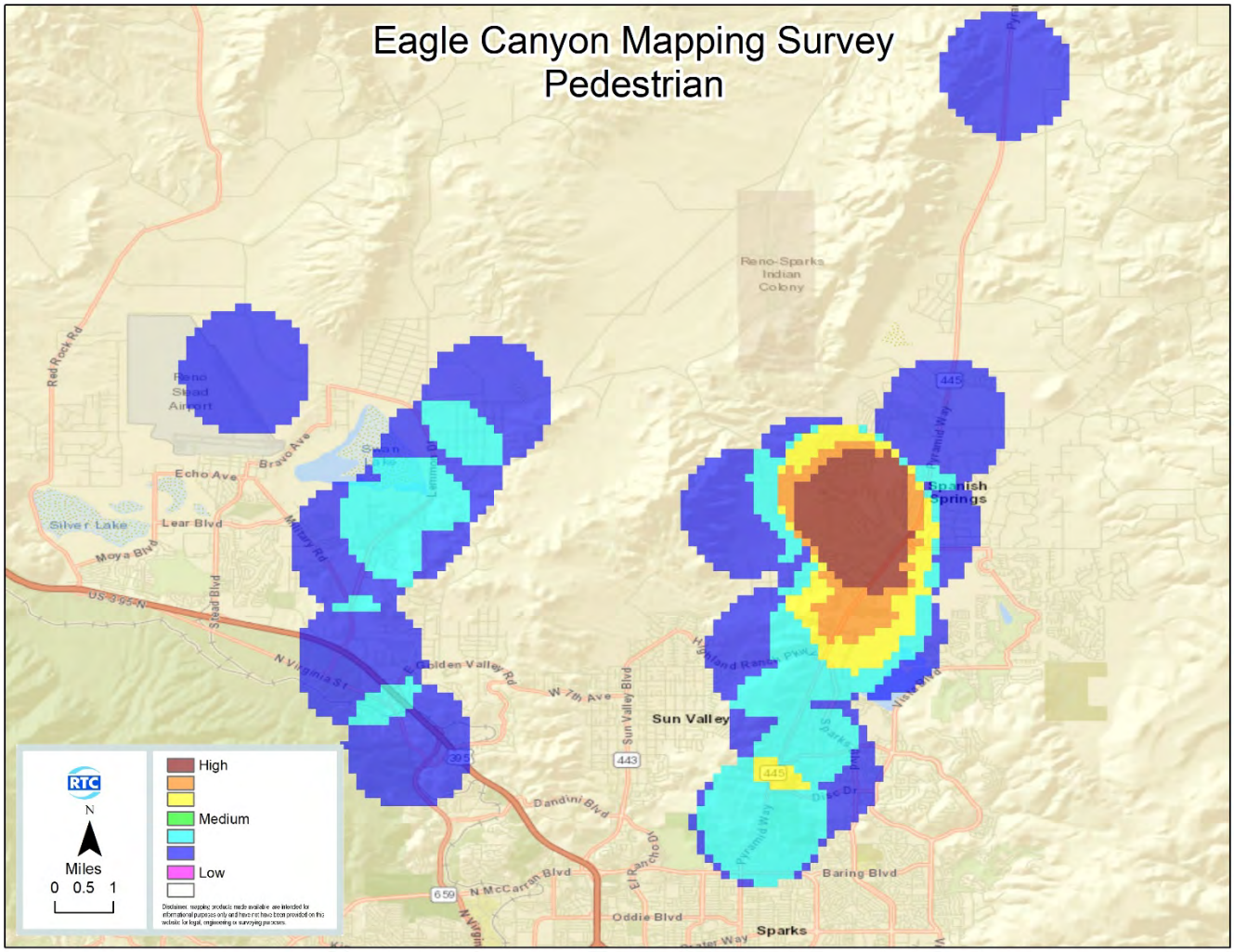


Figure 21: Eagle Canyon Mapping Survey – Pedestrian Comments

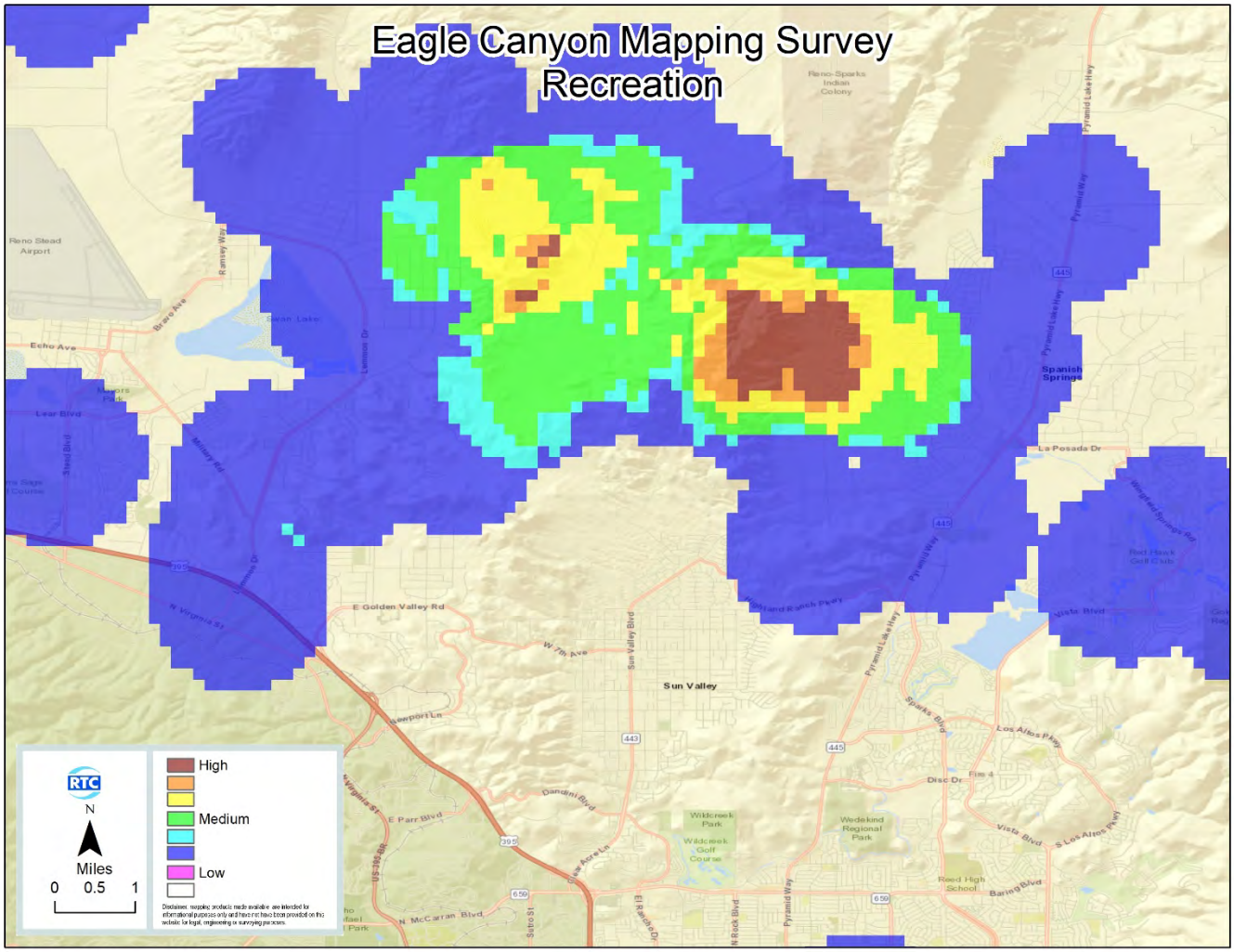


Figure 22: Eagle Canyon Mapping Survey – Recreation Comments

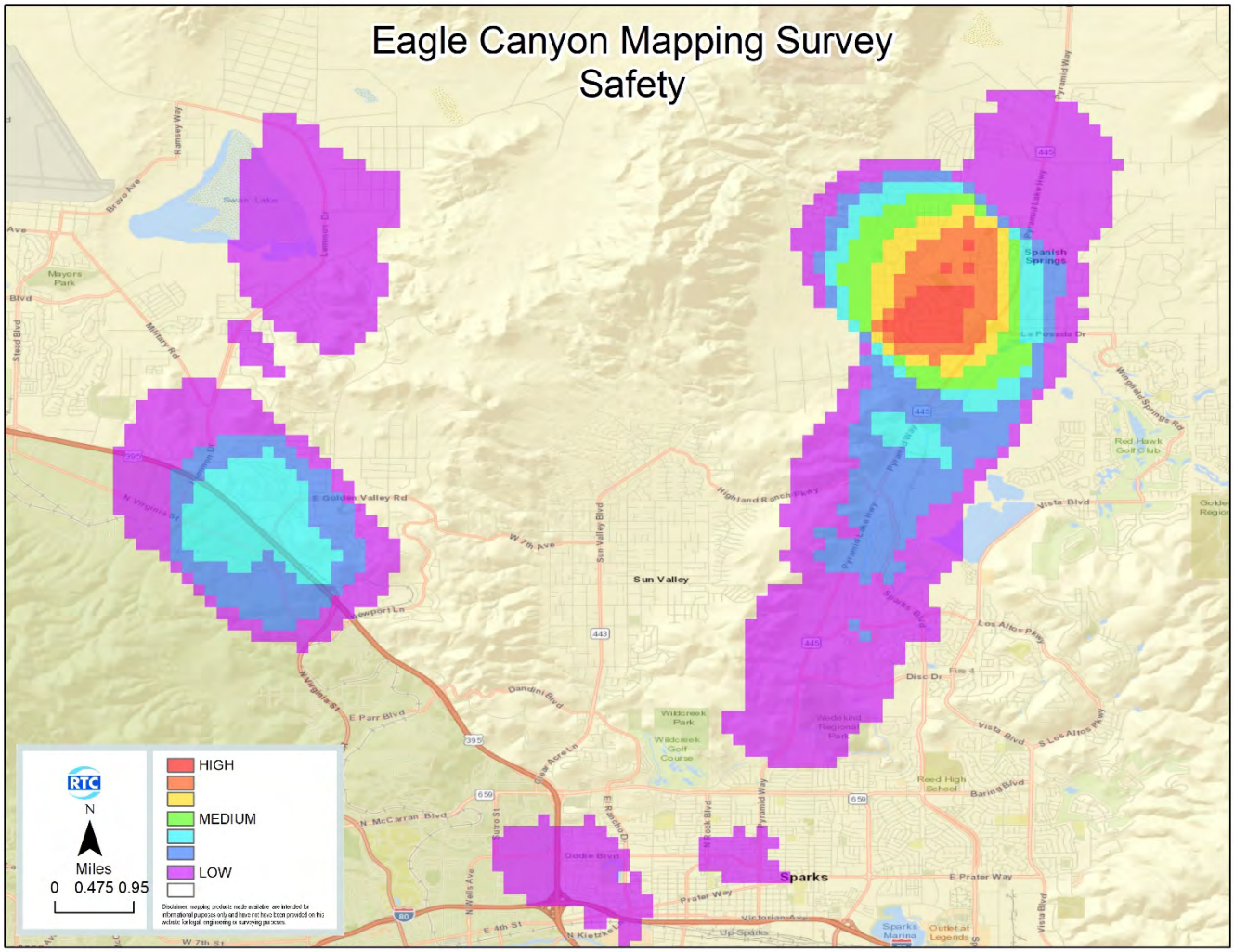


Figure 23: Eagle Canyon Mapping Survey – Safety Comments

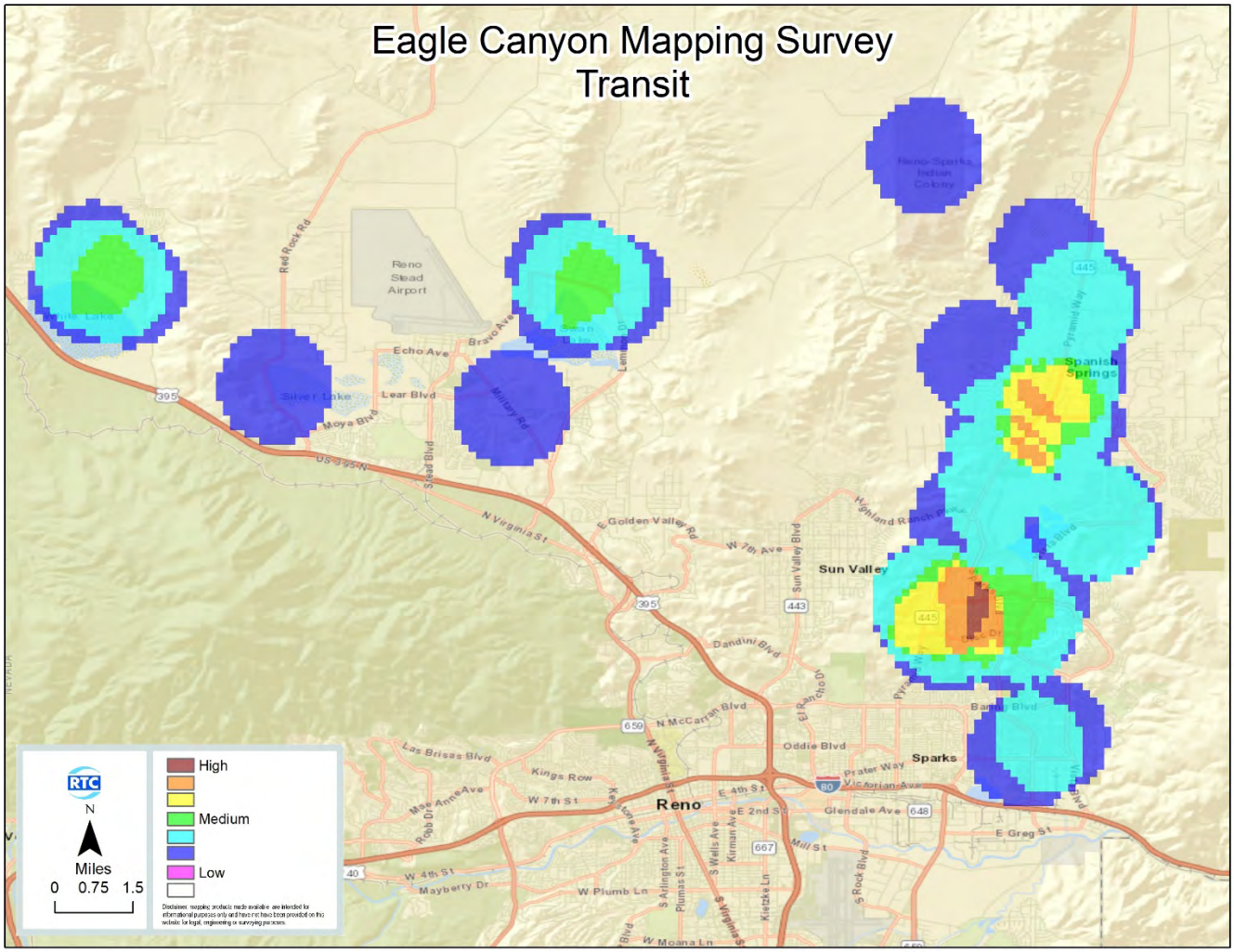


Figure 24: Eagle Canyon Mapping Survey – Transit Comments

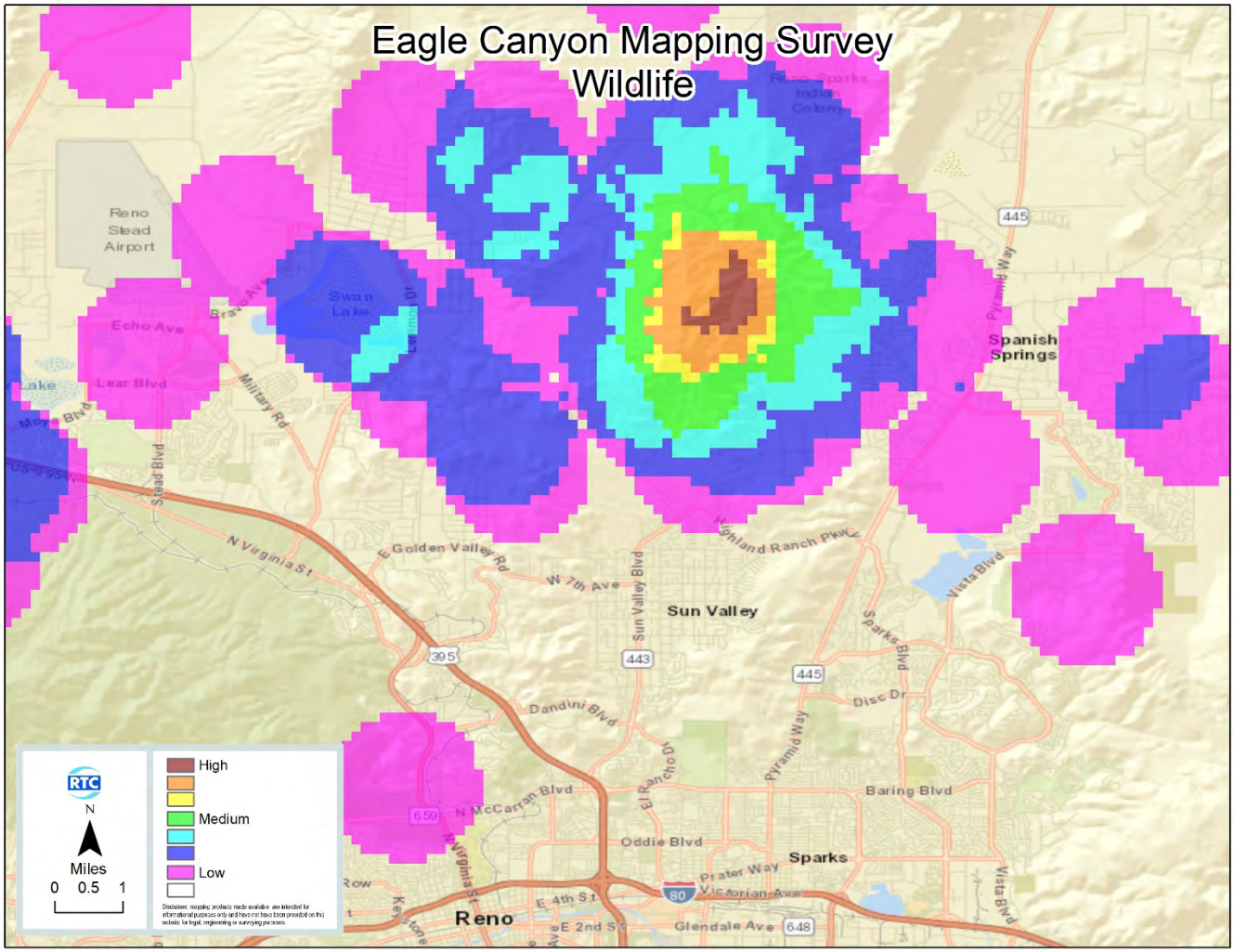


Figure 25: Eagle Canyon Mapping Survey – Wildlife Comments

Section 3 – Alignment Alternatives

This section of the survey asked participants to rank their top five of seven proposed alignments in order of their preference. It should be noted that at the time of this survey, only seven alignments were being considered. As the project team received further input from the public and the Technical Advisory Committee (made up of agency staff), additional alignments were considered and evaluated. The alignments presented in the survey consisted of the following:

- Lazy 5 Pkwy to Lemmon Drive
- Lazy 5 Pkwy to Lemmon Drive through Hungry Valley
- Lazy 5 Pkwy to Deodar Way
- Eagle Canyon Drive to Deodar Way
- Eagle Canyon Drive to Deodar Way through Hungry Valley
- Eagle Canyon Drive to Lemmon Drive
- Eagle Canyon Drive to Lemmon Drive through Hungry Valley

The results are shown by the number of times a particular alignment was selected as well as the average rank overall. Figure 26 and 27 summarize this, respectively. For the ranking results, the lower the number (closer to one), the higher the rank.

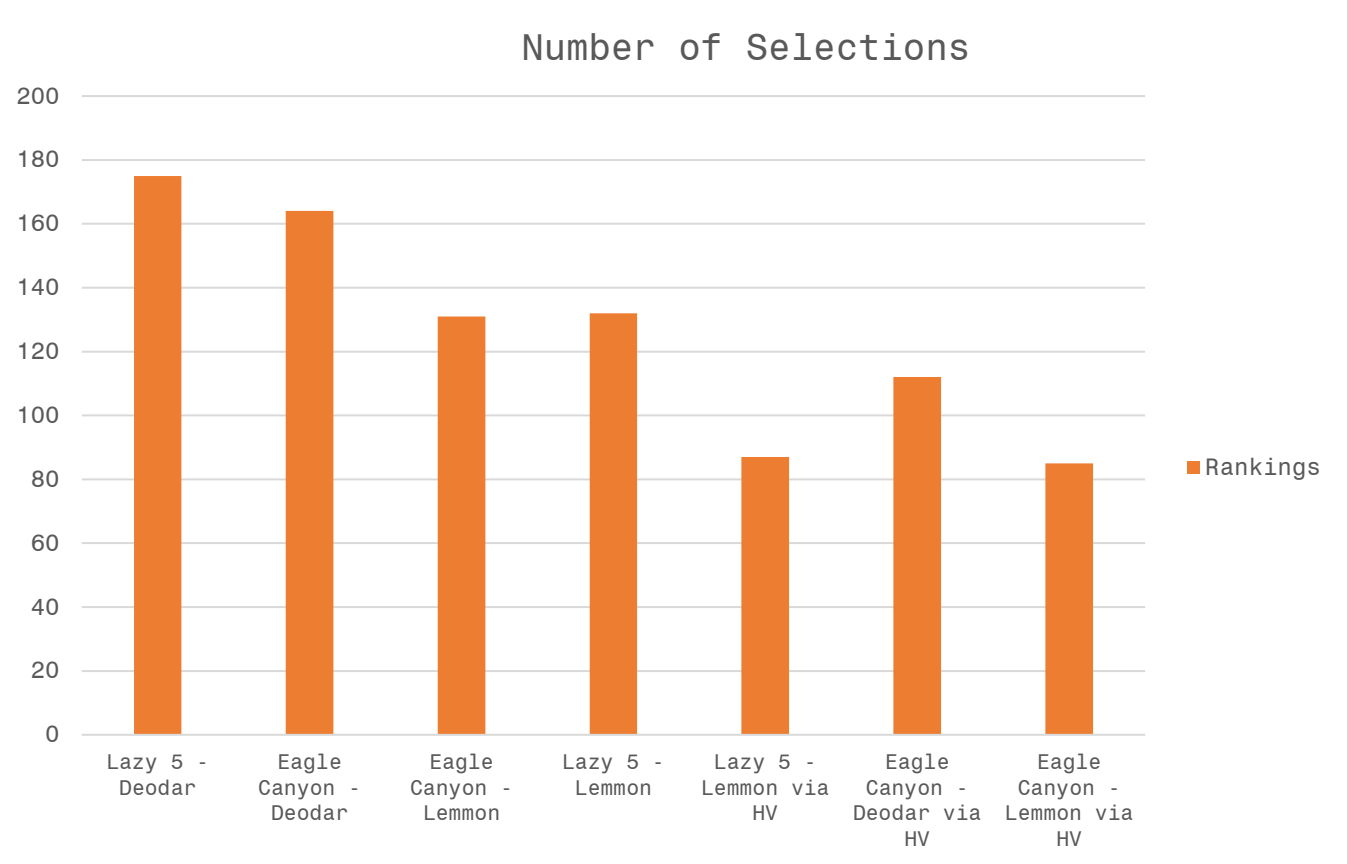


Figure 26: Number of Selections

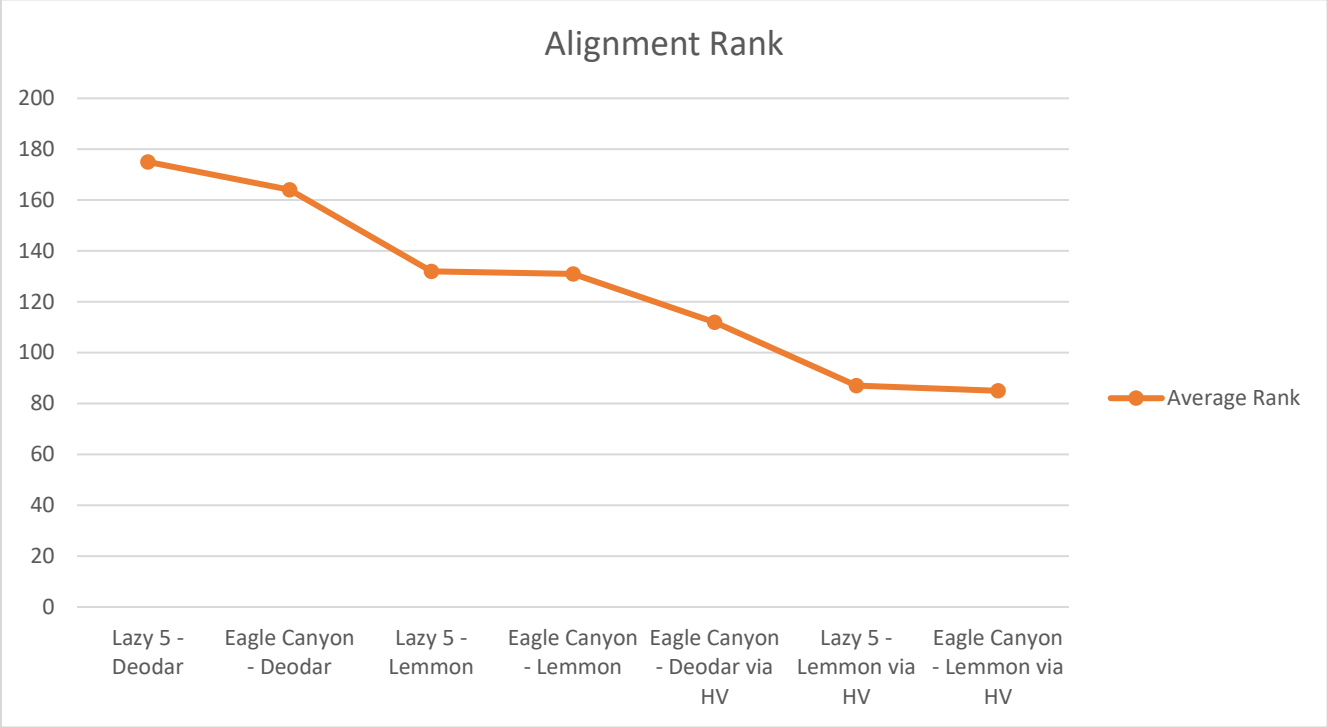


Figure 27: Alignment Rank

As is shown in both figures, the proposed alignment from Lazy 5 Drive to Deodar Way received the highest rank, followed closely by the alignment from Eagle Canyon Drive to Deodar Way. This section of the survey also allowed participants to suggest another alignment that was not presented or provide any comments in general. The 135 comments received are shown in Table 2.

Table 2: Comments Received

Feedback
Sparks Blvd. at Pyramid to Lemon Valley around Highland Ranch. This avoids land issues with the Reservation too.
Pyramid Highway to Parr Blvd area to Highway 395
Lazy 5 to Lemmon Dr at Military Rd, that way it would be closer to N/S 580/395, then it can be used as a short cut to the freeway and the North Valleys without leading so much traffic into neighborhoods.
Improve and take existing road from Spanish Springs area - Highlands Ranch Pkwy to Sun Valley Blvd to W7th Ave to Golden Valley Rd to 395N.
Stay off of Pyramid highway. Intersect it at sparks blvd or Los Altos.
Reno.Sparks needs a beltway.

Feedback
None
How about staying the [expletive] out of Spanish Springs?? People move out here because it is rural and you are destroying our way of life. Move back to Ca.
These new proposed roadways do nothing for me. I need to get to South Meadows every day for work. I never go to Spanish Springs.
Connect to I 80. North valley's traffic is bad enough.
All routes encroach in sensitive flood plain.
I think traffic will still back up on Pyramid HWY. Pyramid is the only way out of Spanish Springs. We need another way to get to Vista and I80.
Sun Valley to Eagle Canyon
A route from Eagle Canyon that goes South toward Golden Valley and then West to Lemmon Valley via the road for the warehouse project proposed off Lemmon.
Stead - N. McCarran near Kings Row
i see absolutely no need for this project...even in the future..we have other priorities in the north valleys...clean up lemmon drive is one..
None of the above already have connection through GoldenValley, Sun Valley
NONE
No road
Come in at golden valley
None of the above. Any of these options will damage our already fragile flood areas
Military/Lemmon to Lazy 5
Disc to 395
Lazy 5 to 395
Disc Drive across to 395, Sun Valley or the North Valley area like mentioned years ago.
Add more lanes and public transit to 395 North.

Feedback
North of Calle de la Platte to 395 to relieve traffic north of Eagle Canyon (area of new housing and work development) wanting timely and easier access to 395 more directly
Add another lane on Highland Ranch Parkway. All of the places that you want to add the connector are difficult to get to in the first place. There is not a whole lot of work in Spanish Springs or Lemmon Valley, so most people are just trying to get home and into town. Sun Valley is relatively easy to get to so that is why a lot of people cut through there causing backup on Highland Ranch.
Lemmon Valley to summerset areas.
I do not want any of them
Lazy 5 to sun valley
Lazy 5 - sun valley
Build the Pyramid-US 395 connector faster or even consider connecting Winnemucca Ranch Road to Lemmon Valley or Red Rock Road somehow.
Widen highland ranch to golden valley
Spend our money and time on improving Pyramid Hwy instead of these proposed routes
none
This whole idea is premature. The current road conditions would have to be greatly improved in Lemmon Valley before this would be feasible.
Not in favor of any.
This road concept is not beneficial to the region. It will facilitate more sprawl development and existing roads are failing because of lack of maintenance.
Do not build it. No connector
EAGLE CANYON TO GOLDEN VALLEY
There needs to be a connection from Pyramid to 395
Traffic crash data needs to be updated. Fatality of student this year and one critical. If presenting to the public be transparent and up to date. Eagle Canyon is not a suitable connection and passing on traffic issues form 395 to Pyramid. No major connections to shopping not already offered in each valley. Not enough major commerical/industrial jobs in each valley to justify the cost/benefit of this type of connection.

Feedback
This option should be renamed Hungry Valley - Eagle Canyon-misleading!
This option should be renamed Hungry Valley - Eagle Canyon-misleading! Eagle Canyon should not be an option
This route makes sense, need to upgrade Eagle Canyon for safety and capacity.
This route makes sense, need to upgrade Eagle Canyon for safety and capacity. Concerned about putting more traffic near Spanish Springs HS and Shaw MS.
Avoid adding increased traffic to Eagle Canyon Drive. This road is not able to handle additional traffic as the road is narrow, has student foot traffic, major school bus usage
Shouldn't increase traffic on existing Eagle Canyon
Infrastructure needs to be fixed!
Please don't
We prefer the connector road is not in front of the homes in Hungry Valley, and feel Chickadee is too residential. Why not go South from Eagle Canyon and cut over to Lemmon Drive via the Oil Dry property down the canyon that will connect to Lemmon and not go through residences. There will already be a road utilized by the warehouses they plan to build and a light at Lemmon. There is going to be a lot of traffic on this connector. Don't clog up the residential roads with this plan please.
This option seems to be to far out of the way. I do not like this one. Counter productive to drive so far out of the way to relieve traffic congestion.
Please do not use any option that includes Chickadee- this needs to remain a protected OHV area and by expanding here we would eventually see increased development leading to reduced OHV areas.
This connector would have multiple benifits as a first choice corridor. Reno can only grow north, so it makes sense to start smart and keep the connector as a first choice to connect the North Valley area to Spanish springs.
Provides access to business at 395 and Lemmon and Golden Valley and Sky Vista
Long overdue.
Don’t [expletive] with the BLM land.
This is a terrible idea
INFRASTRUCTURE

Feedback
Shouldn't increase traffic on existing Eagle Canyon
This seems to be the most direct route, but I'd be concerned about the traffic flow and increase through Eagle canyon and the schools.
Rough terrain but probably the least amount of impact to existing neighborhoods.
Shortest line between two points, sounds good until you have to engineer and build a regional road. This alignment would cost way too much money to build. Concerned about more traffic along Spanish Springs HS and Shaw MS.
NEEDS TO BE CLOSE TO FREEWAY. BACK OF LEMMON VALLEY WILL CAUSE MORE COMMUTER TRAFFIC
Prefer access by dessert sky middle school. I own property next door to the school. I would like to develop the property for housing. it's 165 acres. I would like to rezone from general rural to medium density. I would like to have access to the connector.
This option should be renamed Hungry Valley - Eagle Canyon-misleading!
Traffic crash data needs to be updated. Fatality of student this year and one critical. If presenting to the public be transparent and up to date. Eagle Canyon is not a suitable connection and passing on traffic issues form 395 to Pyramid. No major connections to shopping not already offered in each valley. Not enough major commerical/industrial jobs in each valley to justify the cost/benefit of this type of connection.
It makes sense to connect the road to the existing main road. Not sure what the dog leg is going around.
It makes sense to connect the road to the existing main road.
This route makes sense, need to upgrade Eagle Canyon for safety and capacity. Concerned about putting more traffic near Spanish Springs HS and Shaw MS.
This option should be renamed Hungry Valley - Eagle Canyon-misleading! Eagle Canyon should not be an option
Shouldn't increase traffic on existing Eagle Canyon
Eagle Canyon should not be an option for this alignment. There is already enough traffic on this road with two schools and a day care. To add traffic to this area would cause additional vehicle accidents as well as potential pedestrian accidents.
INFRASTRUCTURE
I don't like this plan. It looks like it would make it take longer to get from one place to the other and will cost the most.
Not practical to get to 395

Feedback
Please do not use any option that includes Chickadee- this needs to remain a protected OHV area and by expanding here we would eventually see increased development leading to reduced OHV areas.
I really feel anything is better than Eagle Canyon that is already congested with two schools and most residents using it as their main road to get out of the neighborhood to Pyramid
2nd least worst
INFRASTRUCTURE
Best route f
Best route for traffic and connection to Spanish Springs area.
Still need to improve traffic flow on 395 before bringing in more traffic to the north valleys
All of the choices go through lemmon valley. Looking at the mapping, it is closer to 395 through sun valley. Upgrade the roadway through sun valley to golden valley.
The alignment doesn't seem realistic and would cost way to much. Lots of existing safety and congestion concerns at Lazy 5 Pkwy and Pyramid Highway already don't think connecting a new regional road to this area would help.
Longer option but does not impact existing neighborhoods or schools. Major Impact by shifting NV traffic on 395 to Pyramid shifting the issue not a good plan.
Again it exits too far south in Spanish Springs.
Better connection than Eagle Canyon but still passing on traffic issues form 395 to Pyramid. No major connections to shopping not already offered in each valley. Not enough major commercial/industrial jobs in each valley to justify the cost/benefit of this type of connection.
Shortest line between two points, sounds good until you have to engineer and build a regional road. This alignment would cost way too much money to build. Concerned about more traffic along Spanish Springs HS and Shaw MS.
The most direct route. There is already a dirt road there. Concerns about impacts to existing neighborhoods and recreation.
The most direct route. There is already a dirt road there.
Lemmon Drive would need to be expanded to at least six lanes to handle the additional traffic
Shouldn't increase traffic on existing Eagle Canyon

Feedback
Please do not use any option that includes Chickadee- this needs to remain a protected OHV area and by expanding here we would eventually see increased development leading to reduced OHV areas.
Terrible - no, just no
Keep length to a minimum
Would need to know how much traffic, again infrastructure needs to be fixed!
Adding more traffic to Eagle Canyon will cause this road to back up more.
This would be a 2nd best choice, as it would save time to travel, yet keep the road way simple
This option would be the most convenient, used and enjoyable for me, but I believe it would mostly increase aggressive driving through residential neighborhoods.
This option would be the most convenient, used and enjoyable for me, but I believe it would mostly increase aggressive driving through residential neighborhoods. I would utilize this road many times a week to visit family and friends, youth sporting events, and dining and evening entertainment and to enjoy pyramid lake more frequently.
Please do not use any option that includes Chickadee- this needs to remain a protected OHV area and by expanding here we would eventually see increased development leading to reduced OHV areas.
INFRASTRUCTURE needs to be fixed for all!
Don’t [expletive] with the BLM land.
None of these options are viable until Lemmon Drive is repaired and 395 expanded .
Longer option but does not impact existing neighborhoods or schools. Major Impact by shifting NV traffic on 395 to Pyramid shifting the issue not a good plan.
This would cost way too much money and would disrupt sensitive cultural and biological areas.
Terrible idea. Cuts my neighborhood in half.
This would cost way too much money and would disrupt sensitive cultural and biological areas. Good thing about this alignment is that it avoids putting more traffic in front of Spanish Springs HS and Shaw MS.
Better connection than Eagle Canyon but still passing on traffic issues form 395 to Pyramid. No major connections to shopping not already offered in each valley. Not enough major commercial/industrial jobs in each valley to justify the cost/benefit of this type of connection.

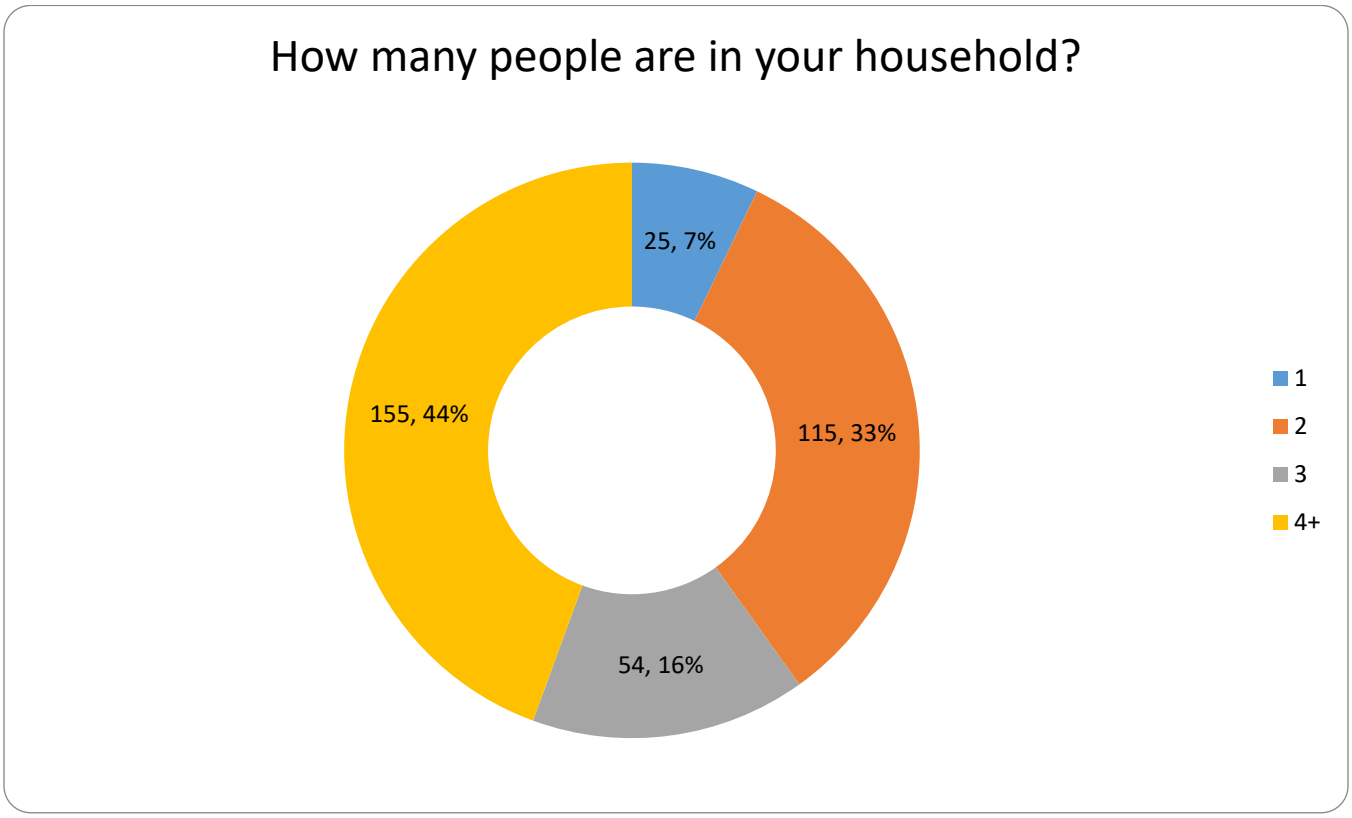
Feedback
You are destroying our recreational areas. This road will make it unsafe for horseback riders dirtbike riders and hikers. You are destroying our peaceful valley for the benefit of spanish springs wealthy people. And once again sweeping lemmon valley residents under the carpet.
Stay away from Chickadee! A road this busy would not be good for the residential area along chickadee.
As a resident of Hungry Valley, I do not favor the Eagle Canyon Extension through our community. There as I stated before our land is healing from the over use of recreational citizens and target shooters. I don't believe in disturbing the land any further.
It doesn't make sense to me to crate a roadway from Eagle Canyon to a Lemmon Valley arterial street when there will be a connection from 395 to Sparks Blvd. Then folks can use Pyramid rather than a small street like Eagle Canyon. Or put it thru to Calle De La Plata so the commercial traffic can use it.
This option looks far better than going to Eagle Canyon. A new road where nothing is now means you can expand it to 3 lanes if it becomes necessary at later dates and you can set houses and businesses back from the road along the route to allocate for future expansion. You can also set a faster speed limit if we're not driving in congestion, schools, and neighborhoods, cutting commute times and making it a more favorable option than alternatives. This route is easily accessible to all in Spanish Springs and is a more direct for N valleys.
This is hands down the most logical route. Closer access to shopping/retail/services, and close enough at Lazy 5 to make most of North Sparks take advantage of the route as well.
Better connection than Eagle Canyon but still passing on traffic issues form 395 to Pyramid. No major connections to shopping not already offered in each valley. Not enough major commercial/industrial jobs in each valley to justify the cost/benefit of this type of connection.
Worst idea yet. Your proposal rolls right over my and my neighbors' homes!
Longer option but does not impact existing neighborhoods or schools. Major Impact by shifting NV traffic on 395 to Pyramid shifting the issue not a good plan.
Lots of terrain and steep slops to cross in this area. Not a good route to consider, way too expensive.
you will cut through dolores and sun valley. sounds like least disruptive route
This maybe the best route. This route has a direct line and would not increase traffic on Eagle canyon but would increase traffic in other areas. Lesser of evils I suppose.
I like this one
I had to choose 5 but this route exits too far south in Spanish Springs.
least worst, but still awful
Long over due

Feedback
Less impact on residential areas
The entry point at Lemmon is too far out, should be closer to Military Rd for ease of access from 395. With the entry point so far out the only people that would uae that road would be those that live in Lemmon or Antelope as it is not out of the way. I live in Cold Springs and work in East Sparks, taking 395 and then heading to the middle of Lemmon Valley would take more rime than I currently travel.
Infrastructure needs to be fixed!
I think this is the best choice. It's direct to the shopping and it wont congest the residential area north of the shopping areas in Spanish Springs.
This is all very speculative until you know how the terrain west of Pyramid Hwy. is going to be developed out
This can be beneficial incase it floods again.
None of these options will work. 580 from north valleys cannot handle additional traffic.
Bad idea

Section 4 – Final Input

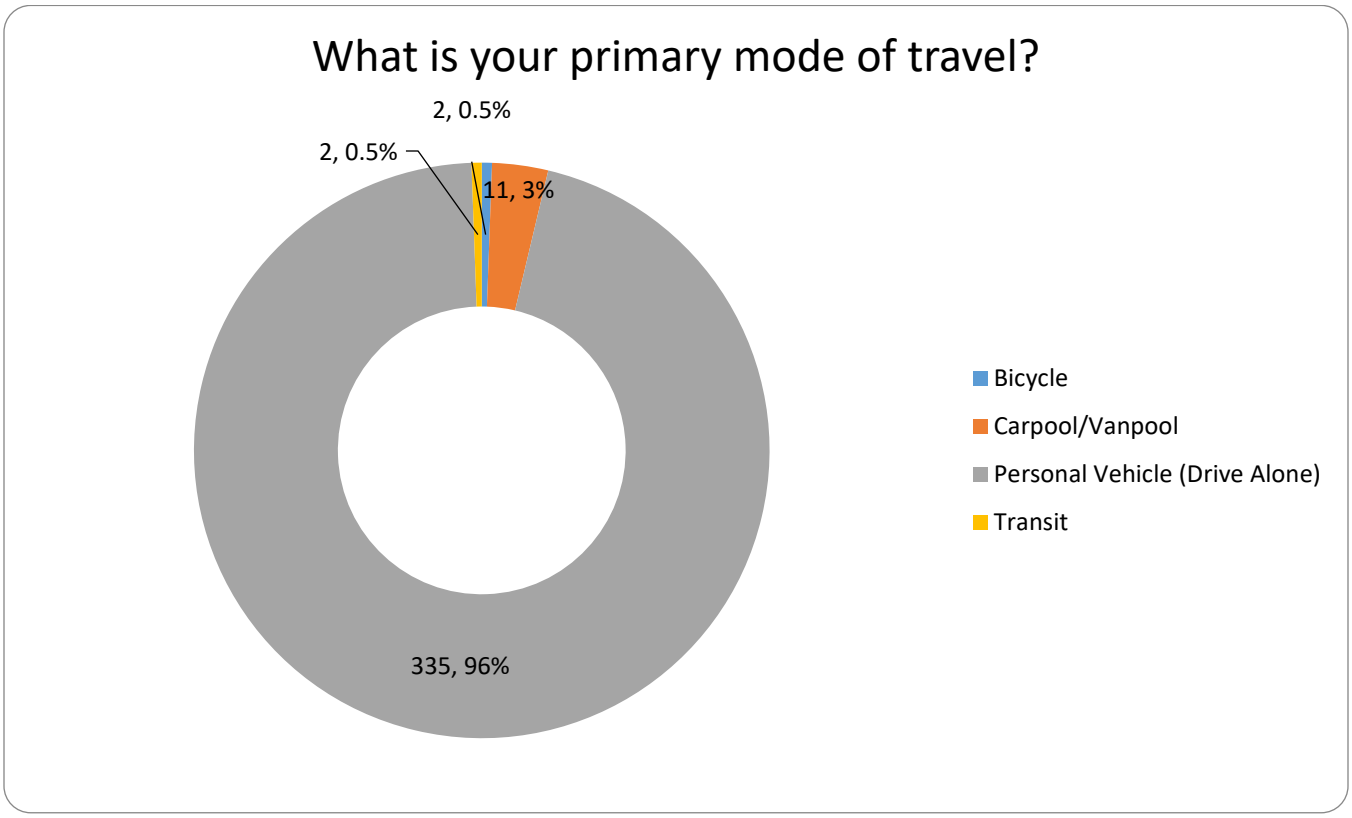
This portion of the survey was an optional "wrap up" section that asked participants about certain demographic information to better understand the characteristics of the residents that would most likely be affected by a new roadway. The first question asked participants how many people are in their household. Figure 27 provides a summary. The majority of respondents indicated four or more people live in their household.

Figure 27



The second question asked about the participants' primary mode of travel. Not surprisingly, given the rural and suburban nature of these communities, the predominant response was drive alone in a personal vehicle. Figure 28 shows the breakdown of each of the choices selected. It should be noted that "Scooter" and "Walk" were also available options, but did not receive any selections.

Figure 28



Lastly, participants were given an opportunity to provide any final comments on any subject. Table 3 provides a list of the 123 comments received.

Table 3

Final Comments
I would not like to see any plan move forward that puts additional cars on Eagle Canyon Drive. With the increase in pedestrian/car accidents I would not like to see a plan that would put put our children at additional risk.
I have zero understanding of why you want to drop potentially 1000's of vehicles onto tiny Lemmon Drive that can barely handle the traffic it has now. I think all of these routes suggested are ludicrous. Give us options for over the Sun Valley hills to 395, not from Eagle Canyon Drive which would be a horrible route through the reservation and into a tiny Lemmon Valley residential neighborhood.
The entire North Valley area needs to be connected to each individual valley with paved access . We don't have many options to get places outside of the valley's. Also, just some food for thought, as stated in my mapping, I think a new freeway bridge corridor/ connector needs to be heavily looked into from Panther Valley into the city of Reno... at some level.
We need more parks and built up infrastructure paid for by the developers while they saturate our city with cheap built homes.

Final Comments
Please ASAP something needs to be done to relieve traffic on pyramid highway, either adding lanes increasing speed limit, or alternate routes in and out of the Spanish Springs are
There could be a lot of traffic using the extension. Build for a bigger capacity than anticipated.
Please be mindful of overloading Pyramid Hwy
Thank you for considering responsible commute alternatives while continuing to protect Lemmon Valley (and all North Valley's) from increased flood risk.
If a decision is made to connect the north valleys, there should be land bridges or access points for OHV vehicles to cross. Updating the OHV standards would be helpful considering those vehicles are not allowed on roads with a speed limit over 35MPH and this connection will cut off much of the BLM land the OHV uses like to play in. Please consider making this connection user friendly for all.
Public Transit from Sun Valley and Downtown Reno to Spanish Springs would be an AWESOME opportunity that should be explored. It would be nice for SSHS students who live outside Spanish Springs would have a direct way to get from home to the school and back without relying on relatives or others to get to and from. Not all students parents have access to family or others with a car. Public Transit would give more freedom to the public.
Please incorporate a way to go around Sun Valley And a direct line to the freeway
Expanding pyramid is more important than connecting north valleys to Spanish springs To many people here for Roads buses in students from north valleys will only make worse
Get the traffic under control ASAP

Final Comments
Eagle Canyon is already the main road out to Pyramid for the entire neighborhood and has two schools so it is already so congested making it a connector and having even more people from east of Pyramid travel down Eagle Canyon to get to the connector will be a nightmare please consider the residents and the students at the schools before deciding to go forward with this, thank you for allowing my imput
I live on Eagle Canyon and would not be okay with more traffic. It's loud enough as it is. Also, north valleys cannot handle additional traffic.
The potential of Eagle Canyon servicing more traffic will require massive improvements especially in allowing pedestrian traffic too and from both Shaw M.S. and Spanish Springs H.S. in order to keep kids safe.
I DO NOT want any more vehicular traffic on Eagle Canyon!!!
Build the road !!
Put in transportation before approving all these new subdivisions. It is cheaper to put in new roads and connectors before the subdivisions block everything!
I would hope that you take into consideration the congestion with all new developments that we already face over in Spanish Springs and not create an additional issue with this coming through our area.
Stay the hell away from Eagle Canyon
We need bus access in Wingfield/Spanish Springs!!

Final Comments
Yes WHY do you need to hook the valley up to SS? Makes no sense.They already have easier ways to get to services.There are no services here that they do not already have. This sounds like a way for you to just allow more development as they need more road ways to be allowed to do so. There are so many homes here already and it i overbuilt as it stands.Doing this will only further crowds Pyramid which is at limit now. Delores and Eagle Canyon need the open space left as it isNOT more roadways. So dangerous for the children at all the schools as well. This is a BAD idea.Leave the Hungry MT range alone!
This project needs to occur sooner than 2027, but the road in Lemmon valley need to be widened to accommodate increased traffic before hand.
My family and I would love a connector from north valleys direct to Spanish Springs!!
I think more effort and focus should be spent on dealing with traffic on 395 especially with all the new building in Cold Springs
Yea stay the hell out of Spanish Springs. Quit trying to destroy our way of life out here. Keep your city loving asses in the city.
I would really like 395 widened to four lanes (north and south).
Bus service from Victorian to Eagle Canyon/La Posada
The city of Reno and Washoe County is approving new housing projects that the North Valleys infrastructure cannot handle. If they improved the roads before inappropriately increasing the North Valleys population there would not be a commuting crisis out here.
We need traffic lights installed and more lanes.

Final Comments
Too much traffic by the school zones may cause more accidents and specially during the winter months. Some students also walk home from spanish springs highschool to hungry valley an maybe become more likely to be ran over by the increase of traffic on eagle canyon.
Many parts of the North Valley don't want heavy traffic near their homes.
Direct rout to TMCC would be nice.
Design the road ways to get further north into the North End of Spanish Springs, otherwise its all for nothing. Reduce the speed limit around highly congested areas too prevent all the major accidents that we see every day.
Eagle Canyon is too congested connecting it would be a nightmare for the residence
Adding more roads is just going to piss people off. Leave the BLM land back there alone. That is the main recreational area out there for riding and shooting. Don't [expletive] with our area.
This is a land access scheme ! The school in Spanish Springs is a excuse to accommodate new development properties
I live by Spanish Springs HS and there's not enough of a reason for most of us to use a roadway to Lemmon Valley. Eagle Canyon can't support more vehicles than it already has with the backup of vehicles you see daily.
We are hoping the commuter road doesn't impact the nice quiet rural area where we live. Both goals can be accomplished without impacting residential areas.
take care of what is already here...before starting something new..

Final Comments
I've lived in the state of Nevada most of my life I welcome some of these improvements I've been waiting for a road to connect these two valleys for a very long time
The only problem with connecting to lemon drive is the traffic it will incur. It will need to be fixed and the flooding issues.
Widening Lemmon Dr.
Spend the money elsewhere. No one wants a new road to an over used one like the Pyramid Hwy.
While I am very concerned about what happened in paradise ca happening here, I do not want to ruin the beauty of the Northvalley's with an excess of unnecessary roads and development
Quit trying to turn our wonderful open lands into California!!!!
I would like to know that our open lands will not be developed
Relieve 395 traffic with alternate route and improve Lemmon Dr.
Your killing off natural habitat for wildlife, and have offered no support to the drainage and runoff issue
Expand Highland Pkwy instead!

Final Comments
Get'er done!!
I am also an avid road cyclist, so improving roads with bike lanes is of significant importance. Currently there is no bike lane connection from Spanish Springs to Reno, unless you count riding the shoulder on Pyramid Highway. And there is no bike lane access at the North end of Veteran's Parkway as it enters Sparks.
The traffic and flooding has already reach a point of no return and further damaging development will only continue to add to the problem
I commute to Carson City, but not on list of choices so I had to put "other," There are other people in my neighborhood who commute to Carson as well. Also, the "California" commute option should be more refined - some neighbors in my area commute north to Army Depot before Susanville, but some go east to Truckee.
I commute to Carson City, but not on list of choices so I had to put "other," There are other people in my neighborhood who commute to Carson as well. Also, the "California" commute option should be more refined - some neighbors in my area commute north to Army Depot before Susanville, but some go west to Truckee.
395 needs to be widened ASAP. The water In and outside of Swan Lake needs to be addressed. Lemmon Dr needs to be fixed so we can travel at normal speeds No more Hasco barriers.
Connecting more access to USA Parkway would be amazing. If Eagle Canyon road connected to USA Parkway on one end and Lemmon Drive or Stead Blvd on the other we would connect our community in such a better way.
Please include expansion lanes in you growth as the valley will only increase in size with commercial and residential in the next 15 years.
In Northvalleys 395 needs more lanes heading towards Susanville by Lemmon Valley Exit. Also heading into Downtown needs more lanes. We need to plan ahead for the growth!
It's just very frustrating to see no real progress on our Valley's infrastructure and many new projects keep coming up for approval/consideration. Just don't get it.

Final Comments
PLEASE don't increase the traffic on Eagle Canyon! There are already two LARGE schools and the increase in traffic would be unsafe for the kids!
Thank you for trying to help make commuting from the Valleys easier! It will only get worse as we get more people moving in
I think additional roads out of the valleys are important for emergencies such as fire. For that reason I hope the road in between Cold Springs and Red Rock is built as soon as possible. As well as paving all of Lemon Valley Dr.
Until the existing issues in Lemmon Valley are addressed then this proposal should not be considered. No more housing should be approved until the existing flood damage to Lemmon Valley is repaired. Lemmon Valley is a rural /country type setting and does not need or want heavy traffic running through the community. When traffic was detoured from Lemmon Valley Drive to Waterash and then to Sitka the increased traffic caused great distress and inconvenience to the residents who live on the affected streets. Traffic was heavy, increased speeding, decreased safety to livestock, pets, children pedestrians and drivers . Do you job..Work for the people not the developers and corporations.
I have lived in Reno almost my entire life, and am very excited and open to the change. Much like how Veteran's Parkway opened up South Reno and Spanish Springs, this project will do wonders for the North Valleys, as well as add to property values!
RTC and Washoe County need to work on updated infrastructure - not something that will be outdated before the project is finished. Which seems to be the norm for this area. Take some lessons from how things are done in areas like DFW and what is now being done in Las Vegas, take what works there and find ways to make it work here.
please clean up lemmon drive buy taking down sand walls they were placed too close to the lanes very dangerouse when two vehicles passing at same time .need lemon widened before more traffic is run onto it.
Yeah add a lane on the 395. This is just to open up more houses
Pyramid way should be made into a freeway

Final Comments
I'm retired and try not to travel at peak traffic times.
A RPD substation should be built in the North Valleys. If the city wants the tax revenue they should provide better protection.
If you wait 10 years to do this project your waiting 9 years to long. We need this road now.
There are accidents almost every day during commute times, and too many people using too few main roads to commute. Attention should be given first to expanding lanes on 395 to the north valleys before any additional homes are built.
You're making Pyramid Hwy another 395 and it's already crazy without diverting considerable North Valley traffic over to Pyramid. You need to let the residents of Spanish Springs know that you are eventually going to tear up their once peaceful valley and homes and extend this road clear through the east side of the Pyramid Hwy and down the east side of their valley through the hills to USA Parkway.
Any additional outlets from the valleys will greatly decrease the number of vehicles on the highway. We need alternative methods to get east and west without having to travel 395.
I support the road being built, it's been a long time coming. My main concern is continued access to federal lands. I ride my quad out there.
Please build this connector. It w ok old be great for safety. There are. Ot a lot of ways out in a fire. Thanks
All of Lemmon Valley needs to be fixed first. The swan lake mess needs to be mitigated. Lemmon drive currently cannot handle this volume of traffic currently as well as 395
This is a SCHEME TO ACCESS BLM LAND

Final Comments
Lemmon drive needs to be expanded to two lanes.
Its hard for us on the west side of pyramid to enter our subdivisions due to the traffic. Has this been addressed??
Developers need to think of roads/traffic schools before building. Traffic is a nightmare around here.
One of my biggest issues is the lack of access onto or off Pyramid, ie accidents, backed up traffic or emergencies. There needs to be a complete restructuring of the Pyramid corridor to help with traffic issues before more traffic is placed onto this roadway.
Use the train tracks for a mini two car tolley from north valley into Reno.
Yes. Bus service on Pyramid!!!!
The connectors should run through upgraded existing roads in sun valley and golden valley. A lazy 5 connector to sun valley blvd.
I'll be contacting you for further conversation.
I believe the project should include a connector even further north than Calle de la Plata with Pyramid. By the time this is built we will need something out further to help eliminate the traffic on Pyramid heading south.
Eagle canyon is already overcrowded with the neighborhood traffic and 2 school zones. Please reconsider this option!

Final Comments
Please treat the Lemmon Valley/North Valley's residents with respect. We are tired of being crapped on because we don't live in a rich neighborhood!
Too many cars between Eagle Canyon and Calle de La Platta. Widening the road is needed badly. Too many houses and warehouses being built. The traffic is getting worse.
Both North Valleys & Spanish Springs have similar shopping options within their existing travel patterns. This realignment is to alleviate traffic issues on 395 and shift them to Pyramid Highway and help sales of homes in NV that commuters can travel a different route to TRIC or Sparks. The SS area still has more Residential projects underway that will impact traffic on Pyramid Highway, Sparks Blvd, Vista. This connector should not be considered until those arterial's are widened to handle that development forthcoming. Do not add to an already congested route, especially with two schools on Eagle Canyon, extremely unsafe, especially with the increase of pedestrian issues on the rise
Please indicate on surveys what date it is ending. Thanks!
I am not in favor of the project as a whole due to the congestion of traffic already along Pyramid Highway, but let alone to consider making Eagle Canyon a pass through which would require making it an arterial roadway is a bad idea and unsafe for the residents and students of the nearby schools.
Dont built this crap in our valley
It might be a better idea to route this connector through Stead and not Lemmon Blv.. Stead Blv. is already 4 lanes wide and its on/off ramps are are much better equipted to handle a larger volume of traffic. Also, I just want to say thanks for the great job that you guys do. As a govt. employee I know how quick people are to judge our work without understanding all the aspects of what we can and cant do. So...THANKS!
Our children are just now beginning to use Eagle Canyon as their primary mode of transportation to walk to and from school. More traffic would make this very unsafe, and their have already been pedestrian accidents as it is.
We do not want any major roads going through the reservation.

Final Comments
With the amount of kids being hit by cars, changing a route to go along school zones seems to disregard their safety.
no more development until water issues and 395 backup is resolved
I'm worried that if you take Eagle to Lemmon, and the lake floods again!!?? Just fix the problem!!
There needs to be a freeway out in Spanish Springs for the best solution to the traffic woes. And North Valleys needs expansion...But it is all good-Just keep building!
Lets make sure than unlike the last pyramid connector project which is already undersized please plan and build for 20 years from now not today!
The survey was unclear on the “Desired Improvement” page about what “operations” meant. I would suggest giving more instructions regarding that!
Survey is too long, I had to quit because it is time to go to work.
Houses should not be approved for the area of Lemmon Valley Drive and Swan Lake.
Current infrastructure needs to be improved to handle the traffic that daily causes delays and accidents. After that is taken care of then this could be looked at. It is not a viable solution to existing traffic problems.
Road to Tahoe Reno Industrial Center is as important if not more so.

Final Comments
The priority should be improvement to Pyramid highway not a new project that would disrupt and diminish quality of life in the affected areas. This project has been proposed for 20 years and never has had popular support.
I don't know why this road would be necessary actually. Living in Spanish Springs I don't know when we would ever use it unless Lemmon Valley becomes a hotbed of activity!? My husband works in S Reno and agreed it would have to be a good road/freeway to make this a faster/safer/or less headache route to work. I would rather see funds expand Sparks blvd and Pyramid to help with the forseen traffic on those roads with all the building and people moving here
The infrastructure and residential development out in the Spanish Springs section has been too rapid without thought to cable lines or roads. The safety of residents is not a factor or a police station would be available. It's irresponsible to build this heavily and quickly without increasing the city infrastructure requirements that go along with expansions.
Implement RTC in area now to help alleviate traffic!
eagle canyon is very busy road with a cars we don't need more traffic in our neigborhod
My family and I do not support the Eagle Canyon extension through Hungry Valley. It may need to be renamed as many do not support the Eagle Canyon extension. It seems The Lazy 5 to Chickadee and the Lazy 5 to Lemmon does not disturb as many residents. Please be mindful of our migratory paths as well of our animal life .
When will the project be slated to star?
Please do not build this- life long resident dismayed at our city council facilitating sprawl which benefits a handful of rich developers with too much hair gel.
The use of Eagle Canyon to connect to 395 is a very bad idea. It would interfere with school access and student drop-off. It would be a much better idea to use Sparks Blvd crossing, from Lazy 5 park, or from a location further north of Eagle Canyon. We bought our homes in the Eagle Canyon area because of the quiet and secluded environment. An connector via Eagle Canyon will completely alter that environment and lower property values. I and many others in my neighborhood will oppose an Eagle Canyon extension.

Final Comments
Consideration needs to be given to the disbursement of traffic and of safety evacuation of an area due to fire or other disaster.
Please keep in mind the flood concern when planning to build roads in the back of Lemmon Valley.
I am very concerned for all the Spanish Springs traffic being dumped onto 395 north!!! It is already a problem, and you are going to make it worse!!
First I heard of this input(on final day of input!!) Is this RTC Powered or fed money or what. Will there be briefings on project? Probably by internet now. Suggest info mailed to all affected residents. Especially for anymore input data.
no

Appendix C Geometrics

Quantm Constraints

Quantm is a planning level route optimization software program that allows integration of environmental, community, engineering, and cost considerations within a single analysis to determine alignments possible within a specific corridor. The system allows for users to input necessary constraints into the proprietary software which restricts the corridor and allows Quantm to determine a series of alignments that meet the design constraints. After Quantm calculates the alignments, additional analysis can be performed within Quantm to reduce impacts, mitigate at isolated locations, or further develop the alignments chosen into a preliminary design. The task is an iterative process of refinement.

The Quantm system was utilized for this corridor study to determine a feasible and cost-efficient alignment alternative for the Lemmon Valley – Spanish Springs connection.

Quantm utilizes the basic parameters, including geometric standards and cost parameters, to initially develop alignments within a specific corridor. The following describes the inputs for these parameters.

Geometric standards

- Route Type – Two options are available: road and rail
- Geometric Type – Users can create multiple geometric scenarios for specific areas inside the Quantm program
- Carriageway – A divided or non-divided road can be utilized in Quantm, along with pavement width, shoulder width for fill and cuts, interior separation width for divided roads, and median widths for vertically divided roadways
- Grades – Design and sustained grades can be inputted along with a sustained grade maximum linear distance.
- Curves – Users can input minimum horizontal radius with corresponding super elevation and K-values for crest and sag curves. Also sight distance, eye level, and object level can be added for horizontal curvature. Quantm also adds a value for horizontal and vertical "stiffness." This stiffness values ranges from 0.1 to 1.0 with 0.1 allowing for the alignments to meander to the minimum horizontal and vertical curvature, and 1.0 restricting the alignments to more linear curvature.

A summary of values utilized for the previously described parameters are shown in Table C-1.

Table C-1: Geometric Standards

Parameter	Values Utilized
Route Type	Road Alignment
Geometric Type	A single geometric scenario was created for the entire corridor
Carriageway	The alignment used a non-divided road, with a roadway width of 92 ft, and shoulder widths of 10' to simulate shared use paths
Grades	Design grades: -5% downhill and 5% uphill Sustained grades: -5% downhill and 5% uphill Maximum sustained grade distance: 5280 ft.
Curves	Minimum horizontal radius: 1190 ft with 4% superelevation Stiffness: 0.5 horizontal and 0.5 vertical K-values: 114 crest, 115 sag Coordination: sight distance 495 ft, eye level 3.5 ft, object level 1.5 ft.

Cost Parameters

- Global – These are the base costs for the entire corridor and include user inputs for pavement thickness, earth movement with haul cost, dump and borrow costs, fill costs, fill slope, fill height to require benching and benching width.
- Culvert – Users can input specific pipe costs, headwall costs, pipe diameter and minimum cover for a variety of user specified culverts. The program also allows for two weighting factors depending on how the culvert is being used. The straight distance method is used for a culvert from point A to point B in a straight line. The path distance method is for a culvert that could follow a nonlinear path such as a stream bed or overpass for a curvilinear road.
- Bridge – Bridge costs and abutment slope can be added for many types of bridges.
- Tunnel – Tunnel costs and cross-sectional area of tunnel can be added for multiple tunnels
- Wall – Wall costs and slope of walls can be added for multiple walls.
- Material – Users can input different types of soils with associated cost. Users can also classify the material as either "strip" (waste) or "ordinary" with an associated value from 0 to 100 for the percentage of usable material. The maximum slope and cost can be specified.
- Geology – This is a unique function for the planner/engineer where geologic materials are assigned parameters such as height needed for benching and benching width for cut slopes. Geologic materials are delineated by area and thickness.
- Area – This parameter allows the user to input area costs based on roadway footprint, fill slope, or cut slope with an additional margin to allow for a buffer outside these parameters.
- Linear – This parameter allows the user to add costs to linear features such as roads, utilities, etc.
- Fixed – This cost is for any specific costs that are associated with the corridor to be associated with any alignment generated within Quantm.

A summary of the values used for the cost parameters are shown in Table C-2.

Table C-2: Cost Parameters

Parameter	Values Utilized
Global	Pavement (Structural Section) cost: $80/cy with a thickness of 1.5 ft Earth movement costs: $3.0/cy/mi for haul, $15/cy for dump and $15/cy for borrow Fill: $15/cy fill rate with a fill slope of 6:1, benching height of 33 ft and benching width of 10 ft
Culvert	Sierra Pacific Overhead: Cost of $200/lf to underground existing overhead power for the roadway.
Bridge	$1,260.00/sy for cost of bridge with 2:1 slopes on abutments
Tunnel	Not applicable to the project
Wall	MSE Wall: $450/sy was used for walls on the alignment
Material	SEC Qa: Soil classification mainly within the alignment corridor in the low lying regions. Cost for excavation of $1.50/cy with a 3:1 max slope and 10% usable material. SEC Ta3: Soil Classification mainly within the mountain regions of the alignment corridor. Cost for excavation of $1.50/cy with a 1.5:1 max slope and 75% usable material.
Geology	SEC Qa: Soil classification with benching height of 30 ft and benching width of 10 ft. SEC Ta3: Soil classification with benching height of 30 ft and benching width of 10 ft.
Area	Agricultural Right of Way: Cost of $72/sy Developed Right of Way: Cost of $135/sy Un-developed Right of Way: Cost of $72/sy Wetlands: Cost of $31/sy or $150,000/acre
Linear	No linear costs were established
Fixed	No fixed costs were established

Quantm Analysis

After all geometric, costs, and user parameters for each run, as detailed above, are inserted into Quantm, the program transmits all the information to the main Quantm IT center for analysis. The Quantm IT Center compiles all the information, performs quality control checks on the inputs, performs the analysis, and the data is sent back to the user for review and analysis on each alignment. Millions of alignments are analyzed through Quantm but only fifty (50) representative alignments are returned to the user. When the alignments are returned to the user, Quantm summarizes and arranges each alignment for each alignments cost.

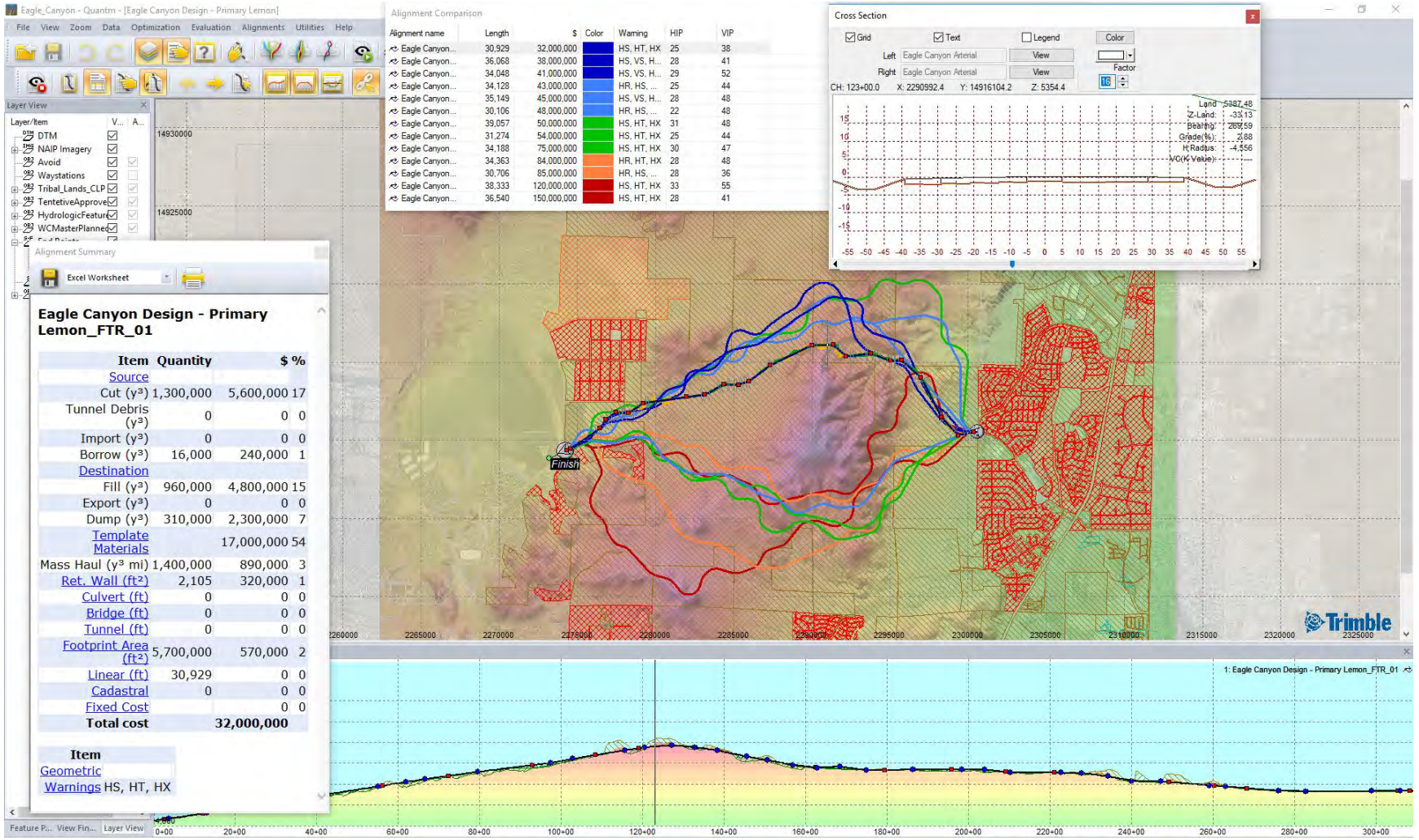


Figure C-1: Quantm Example

AutoCAD Analysis

Since Quantm is a planning level design program, more analysis was necessary on each alignment and performed with engineering models in AutoCAD to analyze the alignments in a more detailed manner. These parameters are described below.

Intersections

Quantm does not have the capability of inputting elements of intersection design into the alignments. The intersections are key elements in the alignment analysis since none of the intersections had the same geometry. Each intersection required analysis for turn lanes, deceleration lanes, acceleration lanes, and through lanes needed to determine a general footprint. Refer to the design memorandum for Task 2.1.C entitled Traffic Analysis Report for a discussion of the traffic analysis and intersection layout figures.

Slopes

Quantm can have multiple slopes, as described in cost parameters, associated with each alignment through specific areas. There is no capability though, to associate additional costs for barrier, guardrail, or slope stability when changing dynamically between slopes. With Quantm the right-of-way is associated with the toe of slope. AutoCAD can determine the right-of-way area based upon the toe of the slope or can determine right-of-way from specific offset distances.

Vertical and Horizontal Alignments

Quantm utilizes vertical and horizontal alignments to minimize cut and fill quantities and horizontal footprint. Quantm is limited in its analysis because the horizontal and vertical alignments are typically curvilinear rather than tangential to minimize impact. AutoCAD needed to be utilized to import the alignments both horizontally and vertically and manipulate these for more realistic values.

Earthwork

Quantm can accurately calculate earthwork quantities for the entire alignment and associated costs. As described above, Quantm does not include intersection design which limits the ability of Quantm to perform accurate earthwork at these locations. With the additional analysis in AutoCAD, a more accurate earthwork quantity can be produced.

Using AutoCAD, eight (8) alignments were refined and presented to RTC and the public. Through the public outreach identified in Section 3: Public Outreach in this report, the 8 alignment alternatives were measured and refined to the final 3 potential alignments with alternatives. An estimate of probable costs for the 8 potential corridors are shown in Table C-3.

Table C-3: Opinion of Probable Costs

Alignment Alternative	Length (ft)	Cost	Earthwork	Residential Units Impacted	Environmental Impacts
Lazy 5 to Lemmon	36,516	$147,000,000	3,500,000 (C), 2,900,000 (F)	11 Developed Parcels	See Appendix D for areas within environmental conditions
Lazy 5 to Deodar	36,805	$130,000,000	2,600,000 (C), 2,000,000 (F)	10 Developed Parcels	See Appendix D for areas within environmental conditions
Lazy 5 to Deodar through Hungry Valley Waypoint	48,993	$157,000,000	3,600,000 (C), 2,800,000 (F)	5 Developed Parcels	See Appendix D for areas within environmental conditions
Eagle Canyon @ SSHS to Lemmon	23,962	$73,000,000	730,000 (C), 480,000 (F)	4 Developed Parcels	See Appendix D for areas within environmental conditions
Eagle Canyon @ SSHS to Lemmon through Hungry Valley Waypoint	26,851	$78,000,000	760,000 (C), 530,000 (F)	0 Developed Parcels	See Appendix D for areas within environmental conditions
EC @ SSHS to Deodar	31,188	$86,000,000	920,000 (C), 630,000 (F)	0 Developed Parcels	See Appendix D for areas within environmental conditions
EC @ SSHS Deodar through Hungry Valley Waypoint	34,822	$98,000,000	1,200,000 (C), 850,000 (F)	0 Developed Parcels	See Appendix D for areas within environmental conditions

* In providing opinions of probable cost, it is recognized that neither the Client nor Stantec has control over the costs of labor, equipment, or materials, or over the Contractor's methods of determining prices or bidding. The opinion of probable costs is based on Stantec's reasonable professional judgment and experience and does not constitute a warranty, express or implied, that the Contractor's' bids or the negotiated price of the Work will not vary from the Client's budget or from any opinion of probable cost prepared by Stantec.
** Note that an opinion of probable construction and right-of-way cost of $144 to $202 million was provided early in the plan line study. Its accuracy was consistent with the level of effort and design details investigated at that time. Additional information obtained during the remainder of the plan line study revised this opinion of probable construction and right-of-way cost to $157 to $207 million.

Appendix D Environmental Investigation

Lemmon Valley to Spanish Springs Connector

Planning and Environmental Linkages (PEL) Study

Environmental Justice Resources Technical Memorandum

PREPARED FOR: Stantec Consulting Services, Inc.

PREPARED BY: Jacobs Engineering Group Inc.

DATE: June 2021

Introduction

Environmental justice is a public policy goal of promoting the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies. Environmental justice was first articulated as a national policy in 1994 under Executive Order 12898 (EO 12898), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. 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 percent, or
- 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.

This technical memorandum presents the methodology and results of the Title VI and environmental justice analysis for the Lemmon Valley to Spanish Springs Connector Planning and Environmental Linkages (PEL) Study.

Regional Context

Northern Nevada experienced significant growth since the announcement of TESLA's plans to build a battery plant in Storey County. Companies that support the technology industry coupled with growth in logistics and manufacturing have created unprecedented demand for commercial land and housing, not heretofore experienced. According to U.S. Census, between 2008 to 2018 Washoe County's population grew by over 150,000 to 464,000 people. The Reno-Sparks metropolitan region is forecast to add 129,000 more residents over the next 30 years, increasing the population to 591,000. The number of jobs is also expected to increase from 290,000 to 389,000 during the same 30-year time period. Growth in employment and residents equates to growth in travel demands. According to the Washoe County Regional Transportation Commission's regional travel demand model, daily vehicle miles of travel is forecast to increase 44% from 10.3 million in 2020 to 14.8 million in 2050.

The Lemmon Valley community consists of a wide range of housing types, including rural residential on large lots with livestock to traditional single family subdivisions on small lots and multifamily development. Some portions of Lemmon Valley are incorporated within the City of Reno while others are in unincorporated Washoe County. The primary geographic feature is Swan Lake. The major

transportation facilities serving Lemmon Valley include Lemmon Drive running generally north-south providing connectivity to US 395. Military Road and Lear Boulevard running generally east-west provide connectivity to the Stead region.

The Spanish Springs community also consists of both rural to suburban neighborhoods supported by employment, commercial, religious, and cultural facilities. Portions of Spanish Springs consist of areas within unincorporated Washoe County. Pyramid Highway is the primary corridor along the west side that directly connects travelers to I-80. There are other collectors and arterials available to access I-80 if users follow more circuitous routes.

Between the Lemmon Valley and Spanish Springs communities is Hungry Valley. Although the residents of Hungry Valley are mostly concentrated within a 170-acre area, Hungry Valley itself consists of over 15,000 acres that are considered the Reno-Sparks Indian Colony (RSIC). Eagle Canyon Drive, a paved two lane road, connects Hungry Valley from the east to Spanish Springs. Hungry Valley Road, currently unpaved, connects Lemmon Valley to the west. Portions of Hungry Valley Road are rough and primarily suited to high clearance or off-highway vehicles.

The remaining area between Lemmon Valley and Spanish Springs is generally undeveloped public land managed by the Bureau of Land Management. The primary geographic feature is a low mountainous region separating Lemmon Valley and the Spanish Springs Valley.

Alignment Alternative Development

Stantec utilized the Quantm alignment planning software to identify and analyze multiple routes between Spanish Springs and Lemmon Valley. The software generated a large number of corridors using route optimization technology which were then reduced to eleven initial conceptual alternatives for consideration by the project's Technical Advisory Committee (TAC). This technical memorandum evaluates the potential environmental justice impacts for the initial conceptual alternatives.

Methodology

Data from the U.S. Census Bureau were evaluated to determine whether minority or low-income populations are present within the Study Area. The analysis relied on the following sources:

- Federal Highway Administration's (FHWA's) Guidance on Environmental Justice and the National Environmental Protection Act (FHWA 2015)
- U.S. Census Bureau, 2011–2015 American Community Survey 5-Year Estimates (U.S. Census 2020)
- U.S. Census Bureau, 2019 Tiger/Line Shapefiles (U.S. Census 2019)

Census data within for the environmental justice analysis was overlaid with land use information to develop mapping of minority and low-income populations within the project Study Area. Large portions of the Study Area are undeveloped; therefore, the census tracts in these areas would not be considered minority or low-income. The resulting data was compared to the various alignment alternatives to determine the potential for impacts on these communities by each.

Applicable Regulations

Title VI of the Civil Rights Act of 1964, as amended, is a non-discrimination stature. Specifically, 42 *United States Code* (USC) 2000d states that:

> *No person in the United States shall, on the ground of race, color, or national origin be excluded form participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.*

Environmental justice, a component of Title VI, is a public policy goal of promoting the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Itis defined through the following principles that, when implemented, help ensure the fair distribution of the benefits and burdens associated with any program or activity receiving federal financial assistance:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic, on minority population and low-income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," placed further emphasis on the Title VI protections of race and national origin by requiring federal agencies to identify and address disproportionately high and adverse effects of their action on minority and low-Income populations. EO 12898 and the United States Department of Transportation and FHWA orders that followed (Order 5610.2 and Order 6640.23, respectively) expanded upon Title VI to include low-income populations and ensure greater public participation in the decision-making process.

Although the non-discrimination principles of EO 12898 and the Title VI statute intersect, they are two separate mandates, and each has unique requirements. The term "minority," which is a protected category under environmental justice, overlaps with "race, color, and national origin," which the Title VI statute protects. Environmental justice principles, however, also apply to low-income populations, which are not covered under the Title VI statues.

Although the Title VI statue protects persons from discrimination solely based on race, color, and national origin, there are other non-discrimination statues that afford legal protection. These statues include Section 162(a) of the Federal-Aid Highway Act of 1973 (23 USC 342) (gender), Age Discrimination Act of 1975 (age), and Section 504 of the Rehabilitation Act of 1973/Americans with Disabilities Act of 1990 (disability). On August 11, 2000, President William Clinton signed EA 13166, "Improving Access to Services for Persons with Limited English Proficiency," requiring federal agencies to examine the services they provide and identify and need for services to Limited English Proficiency (LEP) Populations. Taken together, these requirements define FHWA's Title VI Program, which ensures that FHWA policies, programs, and activities do no discriminated based on race, color, national origin, income, sex, age, disability, or LEP (FHWA 2015).

Existing Conditions

Census and land use data indicate that both minority and low-income populations have the potential to occur within the Study Area. The location of these communities is illustrated on Figure 1. Minority populations occupy the east and west edges of the Study Area where residential and business development is present. One low-income population is present within the Study Area. As shown in Figure 1, This population is located on the southern edge of the Study Area, the northernmost edge of Sun Valley.

Potential Environmental Consequences

Of the proposed alignment alternatives, only the Lazy 5 to Deodar alignment alternative (Figure 1), may impact both the minority and low-income populations potentially present in the Sun Valley area. Figure 1 shows that no potential impact differentiators exist between the remaining proposed alignment alternatives with regard to environmental justice. All of the alignment alternatives could potentially impact minority populations.

Potential impacts on minority and low-income populations, from right-of-way needs, increased noise levels, and changes to the visual environment, may occur and will need to be further assessed as project improvements are carried forward into the National Environmental Policy Act (NEPA) evaluation process.

Temporary construction-related impacts could occur and may include roadway congestion in and around the Study Area, noise from construction equipment, emissions from diesel equipment, fugitive dust from earthmoving activities, and temporary detours and out-of-direction travel.

Next Steps

NEPA studies for future projects will assess whether proposed improvements will result in disproportionate effects on minority and low-income populations. The analysis conducted during the NEPA evaluation process should be more in-depth and included in the determination of potential impacts and mitigation. Current U.S. Census and U.S. Department of Housing and Urban Development data should be used to identify minority and/or low-income populations. If impacts are expected, the analysis will assess whether the impacts are disproportionately high and adverse, as defined by FHWA guidance (FHWA 2011).

For any adverse effects, measures to avoid and minimize impacts on disadvantaged communities should be evaluated. If impacts cannot be avoided, mitigation measures to affected communities should be developed to offset the impacts. This will require outreach to these communities to determine their needs and concerns.

Coordination with local business owners, residents, planners, and other local officials should occur. Ongoing coordination with local planners is an essential part of future project development to ensure that changes resulting from the study recommendations 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.

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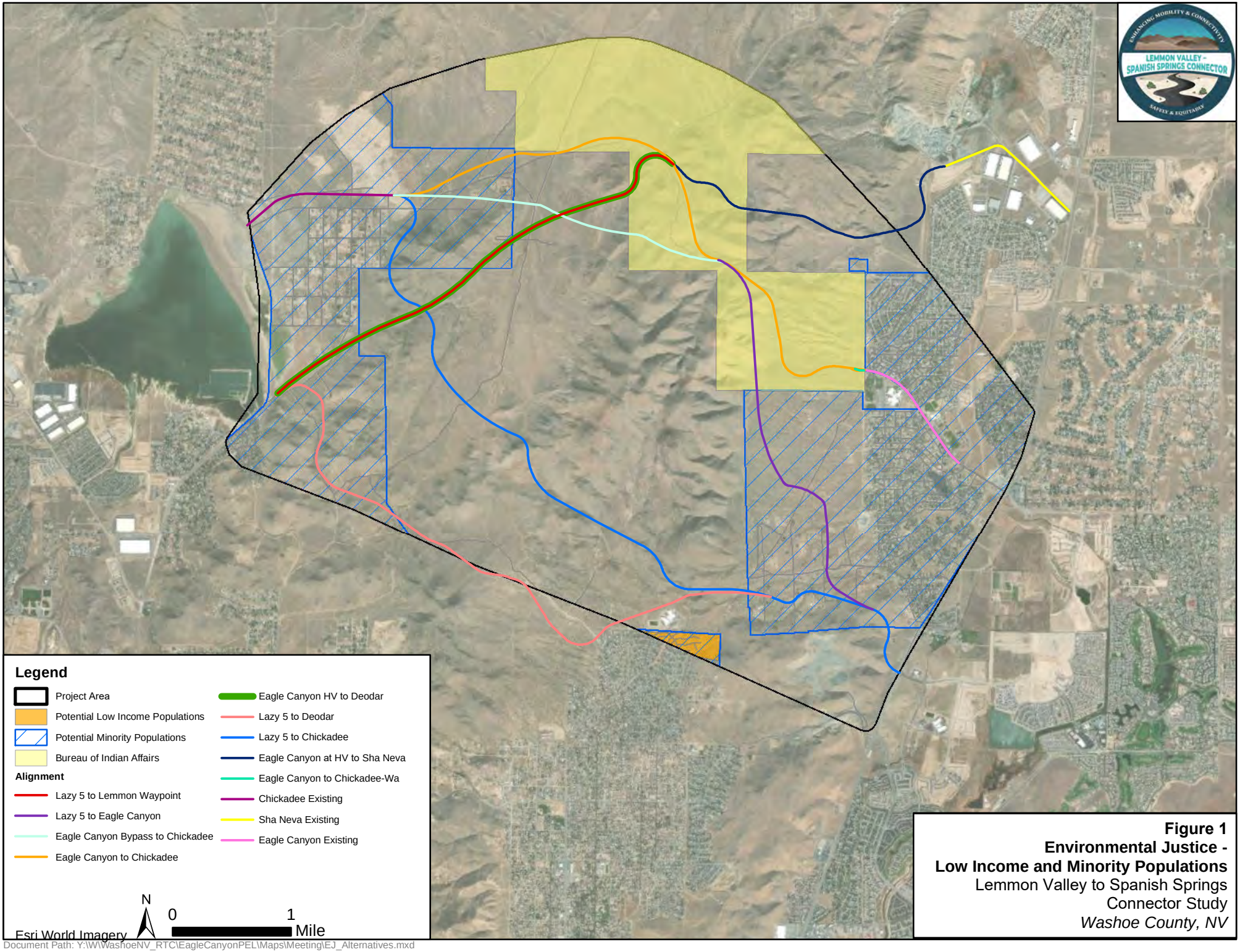

Figure 1
Environmental Justice - Low Income and Minority Populations
Lemmon Valley to Spanish Springs Connector Study
Washoe County, NV

Document Path: Y:\W\WashoeNV_RTC\EagleCanyonPEL\Maps\Meeting\EJ_Alternatives.mxd

Lemmon Valley to Spanish Springs Connector

Planning and Environmental Linkages (PEL) Study

Cultural Resources Technical Memorandum

PREPARED FOR: Stantec Consulting Services Inc.

PREPARED BY: Jacobs Engineering Group Inc. (Jacobs)

DATE: August 2021

Introduction

This preliminary cultural resource analysis for the Lemmon Valley to Spanish Springs Connector Planning and Environmental Linkages (PEL) Study is presented for planning purposes and is designed to help inform the evaluation of preliminary alignment alternatives during preparation of the PEL Study that will be used during subsequent and separate National Environmental Policy Act (NEPA) and Section 106 compliance processes. Cultural resources include archaeological sites from the prehistoric and historic eras, built-environment resources such as roads, bridges, or buildings, and resources of importance to Native Americans.

This analysis is based on the results of a records search in the Nevada Cultural Resources Information System (NVCRIS) database, examination of historic maps, aerial photographs and other online resources, and a database search of the National Register of Historic Places and the State of Nevada Register of Historic Places to identify known cultural resources of historical importance, and provide a preliminary assessment of the sensitivity for potential archaeological sites. No site-specific field surveys, outreach, or formal Native American consultation were conducted as a part of the preliminary cultural resource analysis.

Regional Context

Northern Nevada experienced significant growth since the announcement of TESLA's plans to build a battery plant in Storey County. Companies that support the technology industry coupled with growth in logistics and manufacturing have created unprecedented demand for commercial land and housing, not heretofore experienced. According to U.S. Census, between 2008 to 2018 Washoe County's population grew by over 150,000 to 464,000 people. The Reno-Sparks metropolitan region is forecast to add 129,000 more residents over the next 30 years, increasing the population to 591,000. The number of jobs is also expected to increase from 290,000 to 389,000 during the same 30-year time period. Growth in employment and residents equates to growth in travel demands. According to the Washoe County Regional Transportation Commission's regional travel demand model, daily vehicle miles of travel is forecast to increase 44% from 10.3 million in 2020 to 14.8 million in 2050.

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providing connectivity to US 395. Military Road and Lear Boulevard running generally east-west provide connectivity to the Stead region.

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Alignment Alternative Development

Stantec utilized the Quantm alignment planning software to identify and analyze multiple routes between Spanish Springs and Lemmon Valley. The software generated a large number of corridors using route optimization technology which were then reduced to eleven initial conceptual alternatives for consideration by the project's Technical Advisory Committee (TAC). This technical memorandum evaluates the potential cultural resource impacts for the initial conceptual alternatives.

Methodology

An Area of Potential Effects (APE) and a Study Area were defined to focus the search for cultural resources. The APE typically includes the area that is potentially subject to project-related, ground-disturbing activities. The APE includes the geographic areas where the proposed project may directly or indirectly change the character or use of historic properties (for example, archaeological sites, traditional cultural properties, or built-environment resources). For the purposes of this evaluation, a provisional APE has been defined as an 80-foot-wide corridor centered on each alignment alternative. The Study Area is defined as a larger 500-foot corridor centered on each of the alignment alternatives. This memorandum presents potential cultural resources by both APE and Study Area to not only identify which potential cultural resources may be affected by the alignment alternatives (cultural resources within APE) but also to provide information regarding the density of potential cultural resources and develop a better understanding of the sensitivity, or potential for new discoveries of buried archaeological resources, and to allow for minor adjustments in individual alignment alternatives as the project moves into future NEPA studies and/or Section 106 compliance processes.

A records search of the NVCRIS database was conducted by Jacobs to identify previously recorded cultural resources and previous cultural resource studies within the APE, and within the Study Area. The NVCRIS is a group of online GIS database services maintained by the Nevada State Historic Preservation Office containing recorded archaeological and architectural resources and cultural resource studies for the state of Nevada.

Other sources consulted include:

- Nevada State Register of Historic Places
- National Register of Historic Places (NRHP)
- Online resources on local historical context (for example, emigrant routes, topics such as transportation, mining, ranching)
- Google Earth historic aerial maps
- U.S. Geological Survey topographic quadrangle maps
- David Rumsey Historical Map Collection
- Maps of tribal reservations and land holdings

Applicable Regulations

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to consider the effects of federally funded or federal permit-approved undertakings that have the potential to impact historic properties (historically significant cultural resources, or any district, site, building, structure, or object that is listed in or eligible for listing in the NRHP) and provide the State Historic Preservation Officer (SHPO), affected tribes, and other consulting parties an opportunity to comment. An adverse effect on a historic property is defined as an activity that may alter, directly or indirectly, any of the characteristics of the historic property that render it eligible for inclusion in the NRHP. The alteration of characteristics is considered an adverse effect if it may diminish the integrity of the historic property's location, design, setting, materials, workmanship, feeling, or association.

The Section 106 process is presented in *Code of Federal Regulations* (CFR) Title 36, Part 800, and consists of four basic steps:

1) Initiate the process by coordinating with other environmental reviews, consulting with the SHPO, identifying and consulting with interested parties, and identifying points in the process to seek input from the public and to notify the public of proposed actions (36 CFR 800).
2) Identify cultural resources and evaluate them for NRHP eligibility, resulting in the identification of historic properties (36 CFR 800.4).
3) Assess the effects of the project on historic properties by applying the criteria of adverse effect (36 CFR 800.5).
4) If adverse effects (36 CFR 800.6) on historic properties are foreseen, resolve them through continued consultation with the SHPO and interested parties. This often results in a memorandum of agreement.

National Register of Historic Places

The NRHP was established by the NHPA as an authoritative guide to be used by federal, state, and local governments, private groups, and citizens to identify the nation's cultural resources and to indicate which properties should be considered for protection from destruction or impairment. The NRHP recognizes properties that are significant at the national, state, and local levels. According to NRHP guidelines, the quality of significance in American history, architecture, archaeology, engineering, and

culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that meet any of the following criteria:

A) A property is associated with events that have made a significant contribution to the broad patterns of our history.

B) A property is associated with the lives of persons significant in our past.

C) A property embodies the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.

D) A property yields, or may be likely to yield, information important in prehistory or history.

The NRHP requires that a resource not only meet one of these four criteria, but individually eligible properties and historic districts must retain key character-defining features, or integrity, to convey the significance of a resource. Integrity specifically refers to the ability of a property to convey its significance. In other words, a historic property must have enough intact physical characteristics or features to communicate its significance under one or more of the NRHP criteria. NRHP guidelines recognize seven aspects, or qualities, that define integrity. The Secretary of the Interior defines these aspects as follows (36 CFR 60):

- *Location*. Is the location/site where the resource was originally constructed?
- *Design*. Is the design in its original form, plan, and style of the property intact?
- *Setting*. Have the physical surroundings of a property been compromised?
- *Materials*. Are the physical components used in construction of the property still present?
- *Workmanship*. Is there evidence of craftsmanship?
- *Feeling*. Is the property able to express a sense of time?
- *Association*. Is a clear connection evident between the property and an important event or person?

For archaeological sites, integrity of location, materials, and association are generally most crucial. To address important research topics, archaeological deposits usually must be in their original location, retain depositional integrity, contain adequate quantities and types of materials in suitable condition to address important research topics, and have a clear association. Associations may be defined at different social scales (for example, an activity area, a household, or institution) and across various temporal spans (for example, brief or longer term).

Assessment of Adverse Effects

In accordance with 36 CFR 800.5, Assessment of Adverse Effects, the federal agency shall apply the criteria of adverse effect to historic properties within the APE. Paraphrased from 36 CFR 800.5, an adverse effect is found in consultation with the SHPO or Tribal Historic Preservation Officer when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would reduce any of the seven aspects of integrity listed above. Examples of adverse effects on historic properties include but are not limited to the physical destruction of all or part of the property, or an introduction of visual elements that diminish the integrity of the property's significant historic features.

Nevada Revised Statutes Chapter 383 Historic Preservation and Archaeology

For work being done by a Nevada state agency or municipality without a federal nexus, consultation is conducted under the authority of state statute Nevada Revised Statutes (NRS) 383.121.

Under NRS Chapter 383 pertaining to Historic Preservation and Archaeology, cultural resources are any objects, sites, or information of historic, prehistoric, archaeological, architectural, or paleontological significance. NRS 383 includes sections on the protection of Indian burial sites and the protection of historic and prehistoric sites.

The Nevada SHPO maintains the Nevada State Register of Historic Places, which is a list of cultural resources that have been determined to have historic value for the people and state of Nevada.

Existing Conditions

The alternative alignments cross the broad undeveloped expanse with roughly parallel valleys and mountains between Pyramid Highway and Lemmon Drive. The valleys are structural depressions partly filled with material eroded from the mountains and are near the western margin of the Great Basin Section of the Basin and Range physiographic province (Fenneman 1931; Rush and Glancy 1967). Mountains to the south are underlain by granitic rock, and those to the north are comprised of volcanic rock with andesite and other inclusions. The steppe climate ranges between desert and humid and the landscape is sparse juniper woodland with a shrubby aspect dominated by sagebrush and rabbitbrush. Natural springs are a feature of the landscape, which has historically proven more suitable for ranching than cultivation.

In 2016 the Obama administration transferred 13,4000 acres of Bureau of Land Management land to the existing northern unit of the Reno-Sparks Indian Colony (RSIC) and portions of the northern alignment alternatives pass through the southern boundary of the RSIC. Members of the Paiute, Shoshone, and Washoe tribes combined to form the RSIC in 1900 and RSIC was federally recognized in 1934.

Potential Cultural Resources

Results of the preliminary cultural resources inventory are presented with relation to both the APE and the broader Study Area, and then broken down by alignment alternative.

A search of both the NRHP and the State Register of Historic Places failed to identify cultural resources within the APE or Study Area.

The NVCRIS records search yielded significantly more information. A total of 52 cultural resources have been identified within the APE and Study Area. These include 38 sites or structures, and 14 isolated finds. Of the sites and structures, 19 are located within the APE, and 19 are in the broader Study Area.

Only three prehistoric archaeological sites and no historic era resources have been recommended as eligible for listing in the NRHP.

There are 15 prehistoric archaeological sites. Two of these have been determined eligible for listing in the NRHP. The archaeological sites are primarily flaked stone scatters, and/or groundstone scatters on the ground surface. A single site has also yielded a subsurface component, including midden, or cultural soil, which is rare in this portion of the Great Basin.

There are 18 historic resources. Six of these are road segments, all but one of which have been evaluated as not eligible for listing in the NRHP. The historic Anderson Toll Road has not been evaluated. The other 12 historic resources include 11 refuse scatters and one mining site with a

prospect pit, claim marker, and refuse scatter. No historic era resources have been evaluated as eligible for listing in the National Register.

Finally, there are six archaeological sites that have both prehistoric and historic components. One of these has been determined to be eligible for listing in the NRHP. The other five are not eligible for listing. All six sites are composed of flaked stone scatters and historic refuse.

Isolates

There are eight isolates within the APE and six isolates within the Study Area. There is no additional information provided by NVCRIS identifying the isolates. Isolates are generally not eligible for listing in the National Register.

Area of Sensitivity

Two different clusters of prehistoric archaeological sites and isolates indicate areas of sensitivity for prehistoric-era archaeological resources.

There is a cluster of prehistoric archaeological sites along both the Eagle Canyon Hungry Valley (HV) to Deodar alignment alternative and the Lazy 5 to Lemmon Waypoint alignment alternative where they intersect. Three of these sites are eligible for listing in the NRHP. This complex of sites is located at the southwest end of HV in the area known as the Whispering Pines basin. Sites are situated on lobes of a broad incised fan slightly elevated above the valley floor. The sites are scatters of flaked and ground stone tools and tool-making debris, and fire-affected rock. One of these is also associated with midden deposits, indicating that it was a habitation site (Young 2000).

The five prehistoric archaeological sites distributed along the Eagle Canyon at HV to Sha Neva alignment alternative also suggest an area of sensitivity (two of these are combined prehistoric and historic). Even though none of them has been determined eligible for listing in the NRHP, their presence indicates the potential for other prehistoric resources in the vicinity.

There are no historic era resources that have been determined eligible for listing in the National Register.

Part of a complex of sites in the Whispering Pines basin are located at the southwest end of HV. Each site sits on a slightly elevated lobe of a broad incised fan that coalesces within the Whispering Pines basin. One site is multicomponent and represents repeated occupation over many thousands of years from the prehistoric through the historic period.

Distribution of Cultural Resources by Alignment Alternatives

The results of the NVCRIS record search are summarized in Table 1 by alignment alternative. The resources are divided into prehistoric, prehistoric/historic combined, and historic categories defined earlier in the text. The table prioritizes resources that have been determined eligible for listing in or recommended as eligible for listing in the NRHP

Table 1. Preliminary Analysis of Cultural Resources by Alignment Alternative

Alignment Alternative	Prehistoric	Prehistoric/Historic	Historic	Eligible for the NRHP
Chickadee Existing	None	None	None	None
Eagle Canyon to Chickadee	None	None	4	None (3 not eligible, 1 not evaluated)
Eagle Canyon Existing	None	None	2	None (2 not evaluated)
Eagle Canyon at HV to Sha Neva	2	3	2	None (7 not eligible)
Sha Neva Existing	None	None	1	None (not evaluated)
Lazy 5 to Chickadee	2	1	None	None (3 not eligible)
Eagle Canyon Bypass to Chickadee	3	1	None	1 (3 not eligible)
Eagle Canyon HV to Deodar	6	1	7	3 (7 not eligible, 4 not evaluated)
Lazy 5 to Eagle Canyon	None	None	None	None
Lazy 5 to Deodar	4	1	4	None (8 not eligible, 1 not evaluated)

Previous Studies

This preliminary analysis evaluates the current state of knowledge about cultural resources within the APE. However, of the 33 previous cultural resource studies that have included some portion of the APE (Table 2), and another four that include some portion of the broader Study Area (Table 3), only two are less than 15 years old. Constantly changing conditions may have made some resources more visible and may have resulted in the disturbance or disappearance of other resources. Considering the relative age of most previous surveys, and the large areas that have not previously been surveyed along all alignment alternatives, it is reasonable to expect that most, if not all the APE will require cultural resources surveys.

Table 2. Cultural Resources Surveys Previously Completed Within APE

Report Number	Date	Author	Title
2823	2008	Clay, Vickie; Puckett, Neil and Sarah Rice	A Class III Cultural Resources Inventory, in Specified Locations North of Reno, Washoe County, Nevada
3433	2005	Clay, Vickie and William Reich	Martin Marietta/Broken Hill 640 Acre Cultural Resource Inventory, Washoe County, Nevada

Table 2. Cultural Resources Surveys Previously Completed Within APE

Report Number	Date	Author	Title
4857	2002	Young, D. Craig	Archaeological Testing and Data Recovery Excavations in Hungry Valley, Washoe County, Nevada
5938	2003	Young, D. Craig and Kelly R. McGuire	A Class III Cultural Resource Inventory of Six Alternative Routes for the Proposed Tracy/Silver Lake 120 kV Transmission Line, Washoe County, Nevada
5939	2004	Young, D. Craig et al.	A Class III Cultural Resource Inventory of Six Alternative Routes for the Proposed Tracy/Silver Lake 120 kV Transmission Line, Washoe County, Nevada
8116	2007	Risse, D. and Breitling, R.	A Cultural Resources Inventory for the Proposed Sun Valley Regional Park, Washoe County, Nevada
3-1969	2000	McCabe, Allen and Vickie Clay	A Class III Cultural Resources Inventory of 478 Acres in Hungry Valley, Washoe County, Nevada, Bureau of Land Management (BLM) Report CR3-1969(p)
3-2146	2003	McCabe, Susan	North Valley Fuels Treatment Project
3-2176	2003	McCabe, Susan	Hungry Valley Fuels Treatment Project
16-216	1980	Pope, Charles P.	Cultural Resources Report: Right-Of-Way: Cr Report No. 3-540(N) (from National Archaeological Database [NADB])
16-218	1985	Hatoff, Brian W.	Cultural Resources Report: Sun Valley R/W Owens Rd. N-32650: Cr Report No. 3-605(N) (from NADB)
16-246	1983	Pope, Charles P.	Cultural Resources Report: 030-316 - Whispering Pines Mobile Home Park Leach Field: Cr Report No. 3-870(N) (from NADB)
16-281	1975	Roberts, Nolan W.	Antiquities Site Inventory: Cr Report No. 3-590(N) (from NADB)
16-428	1988	Hufnagle, J.	BLM Cultural Resources Report: Washoe Co. Utility Division Water Tank
16-430	1989	Hatoff, B.W.	BLM Cultural Resources Report: S. Shovel Springs Boundary Fence
16-436	1986	Schmitt, D.	The Cultural Resources Survey of The Proposed Springwood Subdivision, Spanish Springs Valley, Washoe County, Nevada
16-458	1989	Moore, R.	BLM Cultural Resources Report: Lemmon Valley Sand Sale
16-487	1990	McCabe, A.	A Cultural Resources Inventory of a 400 Acre Parcel in Spanish Springs Valley, Washoe County, Nevada
16-489	1989	Kautz, R.	A Class III Cultural Resources Inventory of a Proposed Water Pipeline Route: The Truckee Meadows Water Project from Lemmon Valley to Honey Lake Valley, Nevada
16-507	1982	James, S.	Cultural Resources Survey of a Proposed Cable Emplacement Along Highway 445, Spanish Springs Valley, Washoe Valley, Nevada
16-519	1991	Petersen, F.	Nevada Department of Transportation Cultural Resources Report: Sr445R/W in Spanish Springs Valley
16-731	1996	Markos, J.	Cultural Resources Inventory of the Spanish Springs Valley North Development, A 500 Acre Parcel in Spanish Springs Valley, Washoe County, Nevada

Table 2. Cultural Resources Surveys Previously Completed Within APE

Report Number	Date	Author	Title
16-734	1996	Mecham, P.	BLM Cultural Resources Inventory Negative Report: Spanish Springs Pilots Assoc. Airport Lease Application
16-766	1900	Unknown	Unknown
16-790	1997	Reno. R.	BLM Cultural Resources Inventory Negative Report: Silver West Homes Access
16-877	1999	Hutchins, J. and D. Simmons	A Cultural Resources Inventory for the Spanish Springs High School, Washoe County, Nevada
16-942	1999	McCabe, S.	BLM Cultural Resources Inventory for Fire Rehab Report: Reservoir Fire Rehab Survey
16-988	2000	Hull, Fran	Shane Access Road
16-1091	1900	Unknown	Unknown
22681	2017	Drews, Michael	Class III Cultural Resources Inventory for Washoe County School District RP&P School Site Lease, Sun Valley, Washoe County, Nevada
23273	2015	Stoner, Ed and Teresa Wriston	A Class III Cultural Resources Inventory for the Pyramid Highway/US 395 Connection Project in Washoe County, Nevada
30116	2001	Clay, Vickie L. and Allen McCabe	Class III Inventory for Two Access Road Segments
30185	2003	Hull, Fran	North Valley Fuels Treatment Project

Table 3. Cultural Resources Surveys Previously Completed Within Study Area

Report Number	Date	Author	Title
16-133	1981	Dennis, R. N. and P. Matranga	Cultural Resources Report: Sun Valley Drive from 2nd to 7th Streets, Ea 70970 (from NADB)
16-200	1980	Pope, Charles P.	Cultural Resources Report: Right-Of-Way - N-29606 - U.S. Department of Energy (Calibration Site): Cr Report No. 3-398(N) (from NADB)
16-269	1983	Kuffner, Carmen S.	Preliminary Archaeological Investigation of Pyramid Ranch Homes Development Parcels in Spanish Springs Valley, Washoe County, Nevada (from NADB)
2723	2008	Lane, Elizabeth	A Class III Inventory for Additional Areas Adjacent to the Broken Hills Development Right-of-Way near Spanish Springs, Washoe County, Nevada

Potential Environmental Consequences

Table 4 summarizes the potential for effects on known and potential cultural resources by alignment alternative. Previous survey coverage provides some indication of the degree to which any given area has already been examined. However, it is assumed that updated cultural resource surveys will be

required for all alignment alternatives carried forward into future studies. The number of known cultural resources indicates a relative frequency of past occupation and potential for additional resources to be discovered. The presence of resources that have been recommended as eligible for listing in or are listed in the NRHP increases the potential for effects.

Table 4. Potential for Effects on Cultural Resources by Alignment Alternative

Alignment Alternative	Potential for Effects
Chickadee Existing	None to Low. The alignment exists and there are no known resources.
Eagle Canyon to Chickadee	Low to Moderate. Most of the alignment has not previously been surveyed and it passes through areas potentially inhabited during prehistoric times.
Eagle Canyon Existing	None to Low. The alignment exists and has been previously surveyed—there is little potential for discovery of additional resources.
Eagle Canyon at HV to Sha Neva	Low to Moderate. Previous surveys have yielded prehistoric resources in the terrain of the alignment, and portions have not previously been surveyed. Moderate, because there is potential to encounter more prehistoric resources, and Low because the seven known resources are not eligible for listing in the NRHP.
Sha Neva Existing	None to Low. A single historic route passes through the alignment but it has not been evaluated. The alignment runs through previously disturbed areas, though parts have not previously been surveyed.
Lazy 5 to Chickadee	Low to Moderate. Much of this long alignment has not previously been surveyed, and it passes across mixed terrain known to yield prehistoric sites in other locations. There is a low to moderate potential for discoveries of prehistoric archaeological resources.
Eagle Canyon Bypass to Chickadee	Low to Moderate. Though the alignment has not previously been surveyed, there is a cluster of prehistoric archaeological sites, one of which is eligible for listing in the NRHP.
Eagle Canyon HV to Deodar	Moderate. There is a cluster of prehistoric sites, three of which are eligible for listing in the NRHP. Parts of the alignment that have not yet been surveyed pass through similar terrain and have the potential for additional prehistoric resources.
Lazy 5 to Eagle Canyon	None to Low. The alignment exists and there are no known resources.
Lazy 5 to Deodar	Low to Moderate. There are nine known resources and less than half of the alignment has previously been surveyed. The alignment passes through terrain with the potential to yield prehistoric archaeological resources.

Some of the alignment alternatives have no known cultural resources and because they are already built and have been in use, there is little to no likelihood that they would cause potential effects on cultural resources. Others have clusters of resources indicating that there is the potential for finding more, especially as most of them have not been fully surveyed in the past. Given the nature of known resources and the relatively low frequency of resources that have been evaluated as eligible for listing in the NRHP, there is a low potential for effects on cultural resources for any of the alignment alternatives.

Next Steps

Section 106 and the NEPA require a more thorough cultural resources inventory than is provided by this preliminary analysis. The next steps that would be required during future planning studies or NEPA documentation include:

- More extensive archival and literature review (for example, county land records, General Land Office maps, county assessor's office maps, Nevada State Library and Archives online aerial photos and other databases).
- Outreach to local libraries, museums, historical societies, and other groups and institutions that curate information about the past in the Study Area.
- Intensive pedestrian cultural resources survey of the APE with appropriate permits.
- A combined desktop and field-based geoarchaeological study of the potential for buried archaeological resources.
- Native American/tribal outreach and consultation to discover Traditional Cultural Properties or other resources of interest to tribes.

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Lemmon Valley to Spanish Springs Connector

Planning and Environmental Linkages (PEL) Study

Biological and Aquatic Resources Technical Memorandum

PREPARED FOR: Stantec Consulting Services, Inc.

PREPARED BY: Jacobs Engineering Group Inc.

DATE: June 2021

Introduction

This technical memorandum (TM) identifies biological and aquatic resources, relevant regulations, and evaluates the potential impacts on these resources by the various alignment alternatives proposed as part of the Lemmon Valley to Spanish Springs Planning and Environmental Linkages (PEL) Study. Biological resources evaluated include general habitat types, wildlife species, and the potential for special-status species to be present within the project area. For the purposes of this TM, special-status species are:

- Species listed under the federal Endangered Species Act (ESA)
- Species included on the Nevada Bureau of Land Management (BLM Nevada) 2017 sensitive species list (BLM 2017)
- State of Nevada protected and designated species (Nevada Admirative Code 503 and 527)

Aquatic resources, including wetlands and other potential waters of the United States, are also evaluated for presence and potential impacts within the project area. Non-tidal waters of the United States include lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, and natural ponds. Wetlands are defined for regulatory purposes as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (40 *Code of Federal Regulations* [CFR] 230.3 and 33 CFR 328.3). Wetlands are important ecological resources that perform many functions, including groundwater recharge, flood flow attenuation and conveyance, erosion control, and water quality improvement. They also provide habitat for many plants and animals, including sensitive species.

Regional Context

Northern Nevada experienced significant growth since the announcement of TESLA's plans to build a battery plant in Storey County. Companies that support the technology industry coupled with growth in logistics and manufacturing have created unprecedented demand for commercial land and housing, not heretofore experienced. According to U.S. Census, between 2008 to 2018 Washoe County's population grew by over 150,000 to 464,000 people. The Reno-Sparks metropolitan region is forecast to add 129,000 more residents over the next 30 years, increasing the population to 591,000. The number of jobs is also expected to increase from 290,000 to 389,000 during the same 30-year time period. Growth

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The Lemmon Valley community consists of a wide range of housing types, including rural residential on large lots with livestock to traditional single family subdivisions on small lots and multifamily development. Some portions of Lemmon Valley are incorporated within the City of Reno while others are in unincorporated Washoe County. The primary geographic feature is Swan Lake. The major transportation facilities serving Lemmon Valley include Lemmon Drive running generally north-south providing connectivity to US 395. Military Road and Lear Boulevard running generally east-west provide connectivity to the Stead region.

The Spanish Springs community also consists of both rural to suburban neighborhoods supported by employment, commercial, religious, and cultural facilities. Portions of Spanish Springs consist of areas within unincorporated Washoe County. Pyramid Highway is the primary corridor along the west side that directly connects travelers to I-80. There are other collectors and arterials available to access I-80 if users follow more circuitous routes.

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The remaining area between Lemmon Valley and Spanish Springs is generally undeveloped public land managed by the Bureau of Land Management. The primary geographic feature is a low mountainous region separating Lemmon Valley and the Spanish Springs Valley.

Alignment Alternative Development

Stantec utilized the Quantm alignment planning software to identify and analyze multiple routes between Spanish Springs and Lemmon Valley. The software generated a large number of corridors using route optimization technology which were then reduced to eleven initial conceptual alternatives for consideration by the project's Technical Advisory Committee (TAC). This technical memorandum evaluates the potential impacts to biological and aquatic resources for the initial conceptual alternatives.

Methodology

Existing conditions in the project area with regard to special-status species, general wildlife, wetlands, and surface waters were identified from the following data sources and agencies:

- U.S. Fish and Wildlife Service (USFWS)
  - Federally listed threatened and endangered species potentially occurring within the project area were determined by using the USFWS online Information for Planning and Conservation tool.
- Bureau of Land Management (BLM Nevada)
  - BLM sensitive species list was reviewed for the Carson City District (BLM Nevada 2017).

- Nevada Natural Heritage Program (NNHP)
  - Nevada and NDNH special-status species were gathered from county lists provided by the NDNH website.
- Nevada Department of Wildlife (NDOW)
- Environmental Protection Agency (EPA) Ecoregions
- USFWS National Wetlands Inventory (NWI) mapping (NWI 2020)
- National Hydrography Dataset (NHD) (USGS 2020)

Applicable Regulations

Various federal and state laws and regulations are in place to protect plant and animal species and their habitats, as well as wetlands and waterways. The resources discussed in this TM are protected by the following federal and state laws, regulations, and policies:

Endangered Species Act

Section 7(a)(1) of the ESA of 1973 (as amended) directs all federal agencies to participate in the conservation and recovery of threatened and endangered species. Section 7(a)(2) of the ESA states that each federal agency shall consult with the USFWS on terrestrial species and inland fish, and with National Marine Fisheries Service on marine species and anadromous fish, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

BLM Sensitive Species

The BLM is tasked with conserving and/or recovering ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species; and with initiating proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA (BLM 2008).

The Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act

Originally passed in 1918, the Migratory Bird Treaty Act (MBTA) protects raptors and other migratory birds and their active nest sites. The MBTA stipulates that it is unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. The MBTA stipulates that it is unlawful to destroy an active migratory bird nest, nestling, or eggs. The USFWS allows vacant nests to be destroyed, but active nests with birds, their young, or eggs must be left undisturbed (USFWS 2020).

In addition to the MBTA, the Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c), enacted in 1940, provides for the protection of the bald eagle and the golden eagle by prohibiting the taking, possession, and use of these two species for commerce except under certain specified conditions. The definition of "take" includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect molest, or disturb (USFWS 2018).

Section 404 of the Clean Water Act

The Clean Water Act was enacted to restore and maintain the chemical, physical, and biological integrity of the nation's waters through the elimination of discharges of pollutants. In support of this

goal, the Clean Water Act established permit programs to control discharges into waters of the United States and provided the EPA and U.S. Army Corps of Engineers (USACE) with regulatory authority to issue permits. Section 404 established a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands and streams, and requires the issuance of a permit for any activities resulting in such discharge, unless an exemption applies.

Executive Order 11990 Protection of Wetlands

The purpose of Executive Order 11990 is to "minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands" (42 *Federal Register* 26961).

Existing Conditions

The project area is located in the Sierra Nevada-Influenced Semiarid Hills and Basins sub-ecoregion within the greater Central Basin and Range ecoregion, as defined by the EPA. This sub-ecoregion includes the basins and lower mountain slopes immediately east of the Sierra Nevada that are affected by its climate or that have its characteristic granitic substrate. Three large river systems, the Truckee, Carson, and Walker, flow eastward through this region from the Sierra Nevada, providing water for agriculture and urban development. Their floodplains support some of the best remaining riparian cottonwood forest in the state, which has been degraded in many areas by grazing, agriculture, and invasive weeds. Heavy agricultural water use and many stream diversions for agriculture occur in lower elevation areas. Much of the vegetative land cover throughout the sub-ecoregion is dominated by shrubs and grasses. Extensive, active sand, gravel, clay, limestone, and gold mining have historically occurred, and residential and commercial areas have continued to expand (Bryce et al. 2003).

Wildlife Species

Most of the project area is mapped within sagebrush habitat as identified in the Nevada State Wildlife Action Plan. Sagebrush generally occurs throughout the Great Basin and is most common in valleys and mountain ranges north of the Mojave Desert. Sagebrush habitats generally occur between 4,500 and 10,000 feet, and are widespread throughout valley, foothill, and mountain environments. Sagebrush habitat may support a variety of wildlife, some of which have evolved specially to thrive in this environment (for example, greater sage-grouse, pygmy rabbit, sagebrush lizard, sage thrasher, etc.) (WAPT 2012). The project area is within the occupied distribution for California quail, chukar, mule deer, and pronghorn as mapped by NDOW (Attachment A).

Federally Listed Species

Federally listed species included in the USFWS Information for Planning and Conservation System list generated for the project, and their potential to occur in the project area, are outlined in Table 1 (Attachment B).

Table 1. Federally Listed Species with Potential to Occur in the Project Area

Scientific Name	Common Name	Status (Federal)	General Habitat Requirements	Potential to Occur
Chasmistes cujus	Cui-ui	Endangered	Found only in Pyramid Lake and the lower Truckee River, all within the Pyramid Lake Paiute Reservation (USFWS 2014a).	No. Suitable aquatic habitats not present.
Oncorhynchus clarkii henshawi	Lahontan cutthroat trout	Threatened	Generally occur in cool flowing water with available cover of well-vegetated and stable stream banks, in areas where there are stream velocity breaks, and in relatively silt free, rocky riffle-run areas (USFWS 2019).	No. Suitable aquatic habitats not present.
Danaus plexippus	Monarch butterfly	Candidate	During breeding and migration, adults require a diversity of blooming nectar resources for feeding. Monarchs also need milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat (USFWS 2020).	Yes. Species distribution is relatively broad and suitable nectar resources are likely present.
Pseudocopaeodes eunus obscurus	Carson wandering skipper[a]	Endangered	The larval host plant is saltgrass. Needs open areas near springs or water. Found in grasslands on alkaline substrates in Washoe County (USFWS 2007).	Yes. Known populations are present in the vicinity of the project area.
Ivesia webberi	Webber's ivesia[b]	Threatened	Restricted to sites with sparse vegetation and shallow, rocky, clay soils on mid-elevation flats, benches or terraces between 4,475- and 6,237-foot elevation in Washoe and Douglas Counties (USFWS 2014b).	Yes. Occupied habitat and designated critical habitat are present within the project area.

[a] The Carson wandering skipper is considered critically imperiled, an NNHP at-risk list and BLM-designated sensitive species. This species is not included in Table 2 because it is analyzed here.

[b] The Webber's ivesia is considered a critically endangered flora species and is a BLM designated sensitive species. This species is not included in Table 2 because it is analyzed here.

Based on general habitat requirements and species records, there is the potential for the Carson wandering skipper and the Webber's ivesia to occur in the project area. The USFWS has designated critical habitat and occupied habitat within the project area (Attachment B).

State-, Nevada Natural Heritage Program-, and BLM-Listed Species

Species listed by the State of Nevada or by the NNHP for Washoe County were obtained from the NNHP website. The most current list of BLM sensitive species for the Carson City BLM Field Office and a refined list of plant species provided by the Carson City BLM Field Office were reviewed. Based on analysis of species habitat requirements and mapped plant occurrences, 25 species designated as special status by the State of Nevada, the NNHP, or the BLM have the potential to occur in the project area. These species and their general habitat requirements are outlined in Table 2.

Table 2. State, NDNH, and BLM Sensitive Species with the Potential to Occur in the Project Area

Scientific Name	Common Name	Status: State/BLM/NDNH	General Habitat Requirements[a]
Birds			
Aquila chrysaetos[b]	Golden eagle	NSP/BLM/WL	Open country, especially around mountains, hills, and cliffs; use a variety of habitats ranging from arctic to desert.
Athene cunicularia	Burrowing owl	-/BLM/WL	Live in open habitats with sparse vegetation, such as prairie, pastures, desert, or shrubsteppe. In parts of their range, they are closely associated with prairie dogs and ground squirrels, whose burrows they use for nests.
Buteo regalis	Ferruginous hawk	-/BLM/WL	Open country, sagebrush, saltbush-greasewood shrubland, periphery of pinon-juniper and other woodland, desert. Nests in juniper trees, tufa stacks, and rock outcrops.
Buteo swainsoni	Swainson's hawk	-/BLM/WL	Favor open habitats for foraging. Rely on scattered stands of trees near agricultural fields and grasslands for nesting sites.
Centrocercus urophasianus	Greater sage-grouse	NSP/BLM/WL	Requires foothills, plains, and mountain slopes where sagebrush is present. Project is within mapped general habitat management areas.
Gymnorhinus cyanocephalus	Pinyon jay	-/BLM/AR	Pinyon-juniper woodland, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests.
Lanius ludovicianus	Loggerhead shrike	-/BLM/WL	Breeds in open country with scattered trees and shrubs, savanna, desert scrub, and open woodland. Requires hunting perches.
Oreoscoptes montanus	Sage thrasher	-/BLM/-	Sagebrush, desert.
Spizella breweri	Brewer's Sparrow	-/BLM/WL	Areas dominated by shrubs with high cover and large patch size.
Mammals			
Antrozous pallidus	Pallid bat	NSP/BLM/AR	Found throughout the state, from low desert to brushy terrain to coniferous forest and non-coniferous woodlands; in pinyon-juniper.
Brachylagus idahoensis	Pygmy rabbit	NSP/BLM/AR	Found primarily on big sagebrush dominated plains, and alluvial fans where plants occur in tall, dense clumps. Deep, friable, loamy-type soils are required for burrow excavation.
Myotis thysanodes	Fringed myotis	NSP/BLM/AR	Found in a wide range of habitats from low desert scrub habitats to high elevation coniferous forests.

Table 2. State, NDNH, and BLM Sensitive Species with the Potential to Occur in the Project Area

Scientific Name	Common Name	Status: State/BLM/NDNH	General Habitat Requirements[a]
Myotis volans	Long-legged myotis	-/BLM/WL	Found throughout the state but more widespread and common in the northern half; occurs from mid to high elevations. Absent from the low desert, found in pinyon-juniper, Joshua tree woodland, and montane coniferous forest habitats.
Myotis ciliolabrum	Western small-footed myotis	-/BLM/WL	Inhabits a variety of habitats including desert scrub, grasslands, sagebrush steppe, and blackbrush, greasewood, pinyon-juniper woodlands, pine-fir forests, agriculture, and urban areas.
Myotis yumanensis	Yuma myotis	-/BLM/WL	Found in a wide variety of habitats from low to mid-elevations, including sagebrush, salt desert scrub, agriculture, playa, and riparian habitats.
Eptesicus fuscus	Big brown bat	-/BLM/WL	Found throughout the state, from low to high elevations. Occur in a variety of habitats, including pinyon-juniper, blackbrush, creosote, sagebrush, agriculture, and urban habitats.
Euderma maculatum	Spotted bat	NSP/BLM/AR	Cliffs and canyons, subterranean, developed landscapes.
Corynorhinus townsendii	Townsend's big-eared bat	NSP/BLM/AR	Many types of habitat, but the species is often found near forested areas. Caves, mines, and buildings are used for day roosting and winter hibernation. Consequently, human disturbances of caves and the closures of abandoned mines may constitute threats to the species.
Tadarida brasiliensis	Mexican free-tailed bat	NSP/BLM/WL	Found in a wide variety of habitats through most of the state, ranging from low desert to high mountain habitats.
Reptiles			
Phrynosoma platyrhinos	Desert horned lizard	-/BLM/WL	Found in open sandy areas in deserts, chaparral, grassland, often near ant hills. Often seen basking on asphalt roads or low rocks in the morning or afternoon.
Crotaphytus bicinctores	Great Basin collared lizard	-/BLM/WL	Occurs mainly in xeric, sparsely vegetated rocky areas, alluvial fans, lava flows, hillsides, rocky plains, and in canyons; from sea level to about 7,500 feet.
Gambelia wislizenii	Long-nosed leopard lizard	-/BLM/WL	Found in sandy and gravelly desert and semidesert areas with scattered shrubs or other low plants (e.g., bunch grass, alkali bush, sagebrush, creosote bush) especially areas with abundant rodent burrows; occurs from sea level to approximately 6,000 feet.

Table 2. State, NDNH, and BLM Sensitive Species with the Potential to Occur in the Project Area

Scientific Name	Common Name	Status: State/BLM/NDNH	General Habitat Requirements[a]
Plants			
Camissonia nevadensis	Nevada suncup	-/BLM/WL	Open, sandy, gravelly, or clay slopes and flats in the salt desert, shadscale, and lower sagebrush zones.
Eriogonum alexanderae	Alexander's buckwheat	-/BLM/AR	Light colored clay outcrops, hillsides, and badlands in the shadscale, sagebrush, and pinyon-juniper zones.
Plagiobothrys glomeratus	Altered andesite popcorn-flower	-/BLM/AR	Dry, shallow, mostly acidic (pH 3.3-5.5) gravelly clay soils mainly of the Smallcone series, derived from weathering of hydrothermal sulfide deposits formed in andesite, or sometimes in rhyolitic or granitoid rocks.

State

- = not applicable

NSP = Nevada State Protected Species

BLM

BLM = BLM designated Sensitive Species

NNHP

AR = At-Risk List

WL= Watch List

[a] General habitat requirements source: (BLM, 2017; NNHP, 2020)

[b] Species also protected under the Bald and Golden Eagle Protection Act

Waters of the United States

Based on a review of the NWI and NHD, numerous features are mapped within the project area (Attachment C). These features are characterized by the NWI as being riverine and as ephemeral or intermittent in the NHD. Two playa lake features are also located in the northwest portion of the project area.

Potential Environmental Consequences

Impacts on general wildlife and special-status species can result from the permanent and temporary loss of habitat. Permanent impacts generally include habitat that could potentially be destroyed due to construction of one of the alignment alternatives. Temporary impacts occur from the potential short-term disturbance of areas that can be revegetated, including areas needed for construction access. Direct impacts may include loss of habitat, increased stress due to construction activities and roadway use, and/or death caused by vehicles or vegetation removal. Indirect impacts may include the addition of an impervious road surface and introduction of associated traffic fragmenting habitat, which may cause animal vehicle collisions or interrupt typical behaviors such as movement patterns, foraging, and breeding.

Based on mapping from the Nevada State Wildlife Action Plan, sagebrush habitat is the predominant land cover type in the project area and, therefore, is the habitat that would potentially be most impacted. Potential short-term impacts from construction activities could include removing vegetation and topsoil to construct the roadway prism. Land disturbance where noxious and invasive weed species exist may greatly increase seedling establishment, creating or increasing infestations. Therefore, all areas potentially disturbed by construction of one of the alignment alternatives would provide potential substrate for these species to become established. Adverse impacts from noxious and invasive species could potentially include, at a minimum, loss or degradation of wildlife habitat and reduction of native landscapes.

Construction during migratory birds' breeding or migration seasons could potentially impact migratory birds, causing disturbance or displacement-related impacts on migratory birds nesting or migrating near construction areas. General wildlife species may also be potentially impacted by construction noise, ground disturbance, and increased human presence.

Construction of one of the alignment alternatives may potentially lead to temporary and permanent impacts on aquatic resources (for example, wetlands, drainages), some of which may be considered jurisdictional by the USACE. Potential impacts to these aquatic resources may require permit coverage under Section 404 of the Clean Water Act.

Next Steps

Field surveys should be conducted to delineate the extent of aquatic resources (wetlands and other waters) that could be impacted by project-related activities. To the greatest extent practicable, future planning and design will be required to incorporate avoidance and minimization of impacts on known wetlands and waters of the United States. Where avoidance would not be practicable, impacts on wetlands and waters of the United States could be minimized by using temporary and permanent best management practices to reduce direct and indirect impacts on these resources.

Potential impacts on special-status species outlined in Table 1 and Table 2 (and their habitats) should be carefully considered when developing the design of future projects that may result from this study. Comprehensive and updated special-status species lists will be obtained during the National

Environmental Protection Act phase of subsequent future projects. Based on the special-status species list, surveys for federal- and state-listed species should be conducted during the appropriate seasons, per USFWS and other regulatory agency recommendations. If species of concern are found to be within the Study Area, further coordination with the appropriate regulatory agencies must take place and suitable measures will need to be developed to avoid and/or minimize impacts to these sensitive resources. Depending on the presence of habitat and potential impacts on those habitats, formal consultation with the USFWS and other regulatory agencies may be required.

Attachment A – Biological Resources and Sensitive Habitat Figure

Attachment B – USFWS Species List

Attachment C – Wetlands and Waters Figure

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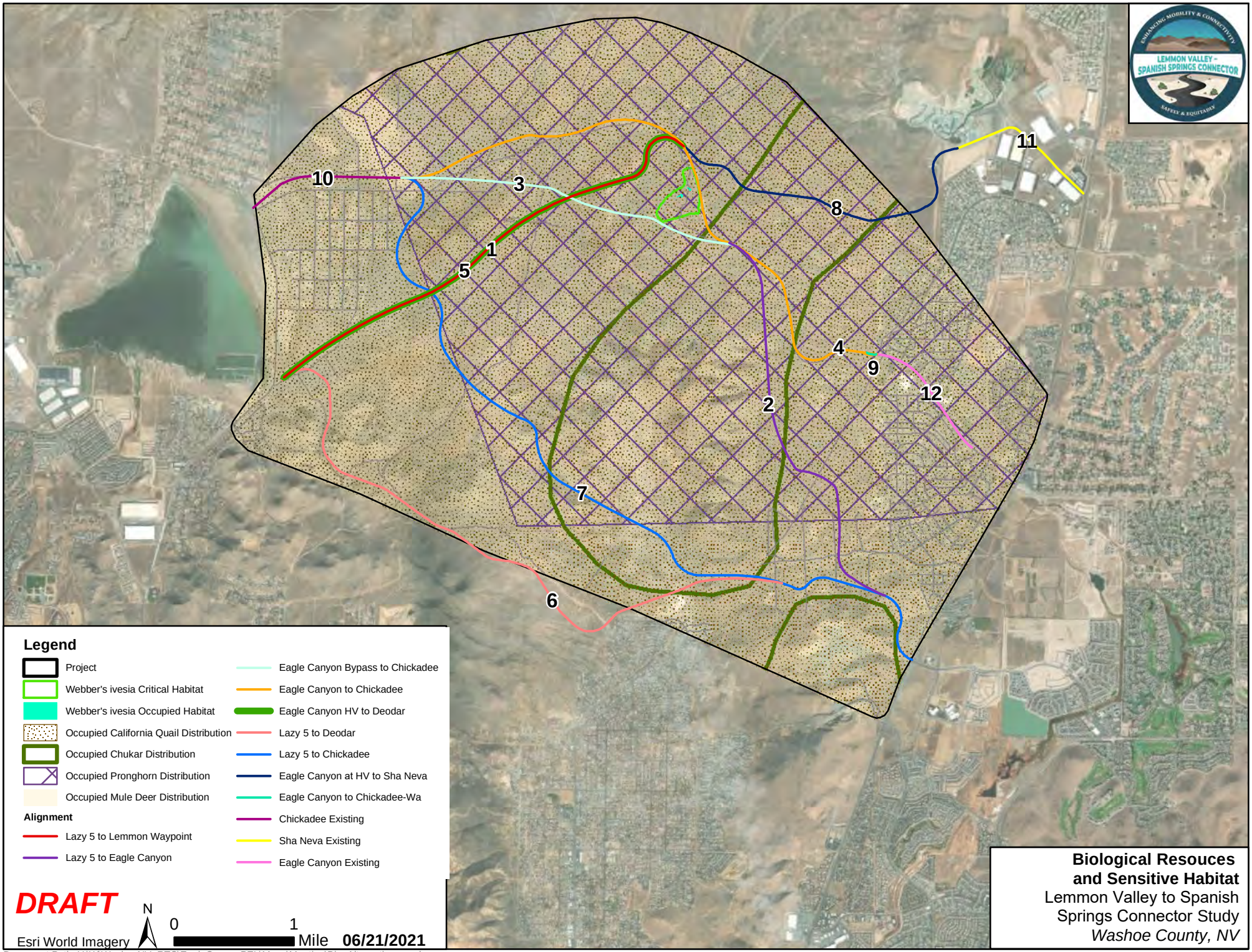
Attachment A
Biological Resources and Sensitive Habitat Figure



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Attachment B
U.S. Fish and Wildlife Service Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
Phone: (775) 861-6300 Fax: (775) 861-6301
http://www.fws.gov/reno/

In Reply Refer To:
Consultation Code: 08ENVD00-2021-SLI-0411
Event Code: 08ENVD00-2021-E-01227
Project Name: Eagle Canyon

June 14, 2021

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The attached species list indicates threatened, endangered, proposed, and candidate species and designated or proposed critical habitat that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act of 1973, as amended (ESA, 16 U.S.C. 1531 *et seq*.), for projects that are authorized, funded, or carried out by a Federal agency. Candidate species have no protection under the ESA but are included for consideration because they could be listed prior to the completion of your project. Consideration of these species during project planning may assist species conservation efforts and may prevent the need for future listing actions. For additional information regarding species that may be found in the proposed project area, visit http://www.fws.gov/nevada/es/ipac.html.

The purpose of the ESA is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 *et seq*.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or

designated or proposed critical habitat. Guidelines for preparing a Biological Assessment can be found at: http://www.fws.gov/midwest/endangered/section7/ba_guide.html.

If a Federal action agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this species list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally listed, proposed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally, as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation, for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the attached list.

The Nevada Fish and Wildlife Office (NFWO) no longer provides species of concern lists. Most of these species for which we have concern are also on the Animal and Plant At-Risk Tracking List for Nevada (At-Risk list) maintained by the State of Nevada’s Natural Heritage Program (Heritage). Instead of maintaining our own list, we adopted Heritage's At-Risk list and are partnering with them to provide distribution data and information on the conservation needs for at-risk species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. In addition, in order to avoid future conflicts, we ask that you consider these at-risk species early in your project planning and explore management alternatives that provide for their long-term conservation.

For a list of at-risk species by county, visit Heritage's website (http://heritage.nv.gov). For a specific list of at-risk species that may occur in the project area, you can obtain a data request form from the website (http://heritage.nv.gov/get_data) or by contacting the Administrator of Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701-5245, (775) 684-2900. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the ESA. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address.

Furthermore, certain species of fish and wildlife are classified as protected by the State of Nevada (http://www.leg.state.nv.us/NAC/NAC-503.html). You must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (NDOW) to

take, or possess any parts of protected fish and wildlife species. Please visit http://www.ndow.org or contact NDOW in northern Nevada (775) 688-1500, in southern Nevada (702) 486-5127, or in eastern Nevada (775) 777-2300.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq*.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Service's wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

The Service's Pacific Southwest Region developed the *Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Wind Energy Facilities* (Interim Guidelines). This document provides energy facility developers with a tool for assessing the risk of potential impacts to wildlife resources and delineates how best to design and operate a bird- and bat-friendly wind facility. These Interim Guidelines are available upon request from the NFWO. The intent of a Bird and Bat Conservation Strategy is to conserve wildlife resources while supporting project developers through: (1) establishing project development in an adaptive management framework; (2) identifying proper siting and project design strategies; (3) designing and implementing pre-construction surveys; (4) implementing appropriate conservation measures for each development phase; (5) designing and implementing appropriate post-construction monitoring strategies; (6) using post-construction studies to better understand the dynamics of mortality reduction (*e.g.*, changes in blade cut-in speed, assessments of blade "feathering" success, and studies on the effects of visual and acoustic deterrents) including efforts tied into Before-After/Control-Impact analysis; and (7) conducting a thorough risk assessment and validation leading to adjustments in management and mitigation actions.

The template and recommendations set forth in the Interim Guidelines were based upon the Avian Powerline Interaction Committee's Avian Protection Plan template (http://www.aplic.org/) developed for electric utilities and modified accordingly to address the unique concerns of wind energy facilities. These recommendations are also consistent with the Service's wind energy guidelines. We recommend contacting us as early as possible in the planning process to discuss the need and process for developing a site-specific Bird and Bat Conservation Strategy.

The Service has also developed guidance regarding wind power development in relation to prairie grouse leks (sage-grouse are included in this). This document can be found at: http://www.fws.gov/southwest/es/Oklahoma/documents/te_species/wind%20power/prairie%20grouse%20lek%205%20mile%20public.pdf.

Migratory Birds are a Service Trust Resource. Based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act of 1918, as amended (MBTA; 16 U.S.C. 703 *et seq*.), we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests with eggs or young of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible,

we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (*i.e.*, mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Guidance for minimizing impacts to migratory birds for projects involving communications towers (*e.g.*, cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

If wetlands, springs, or streams are are known to occur in the project area or are present in the vicinity of the project area, we ask that you be aware of potential impacts project activities may have on these habitats. Discharge of fill material into wetlands or waters of the United States is regulated by the U.S. Army Corps of Engineers (ACOE) pursuant to section 404 of the Clean Water Act of 1972, as amended. We recommend you contact the ACOE's Regulatory Section regarding the possible need for a permit. For projects located in northern Nevada (Carson City, Churchill, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, and Washoe Counties) contact the Reno Regulatory Office at 300 Booth Street, Room 3060, Reno, Nevada 89509, (775) 784-5304; in southern Nevada (Clark, Lincoln, Nye, and White Pine Counties) contact the St. George Regulatory Office at 321 North Mall Drive, Suite L-101, St. George, Utah 84790-7314, (435) 986-3979; or in California along the eastern Sierra contact the Sacramento Regulatory Office at 650 Capitol Mall, Suite 5-200, Sacramento, California 95814, (916) 557-5250.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead.

Lead FWS offices by County and Ownership/Program

County	Ownership/Program	Species	Office Lead*
Alameda	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Alameda	All ownerships but tidal/estuarine	All	SFWO
Alpine	Humboldt Toiyabe National Forest	All	RFWO

Alpine	Lake Tahoe Basin Management Unit	All	RFWO
Alpine	Stanislaus National Forest	All	SFWO
Alpine	El Dorado National Forest	All	SFWO
Colusa	Mendocino National Forest	All	AFWO
Colusa	Other	All	By jurisdiction (see map)
Contra Costa	Legal Delta (Excluding ECCHCP)	All	BDFWO
Contra Costa	Antioch Dunes NWR	All	BDFWO
Contra Costa	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Contra Costa	All ownerships but tidal/estuarine	All	SFWO
Del Norte	All	All	AFWO
El Dorado	El Dorado National Forest	All	SFWO
El Dorado	LakeTahoe Basin Management Unit		RFWO
Glenn	Mendocino National Forest	All	AFWO
Glenn	Other	All	By jurisdiction (see map)
Humboldt	All except Shasta Trinity National Forest	All	AFWO
Humboldt	Shasta Trinity National Forest	All	YFWO
Lake	Mendocino National Forest	All	AFWO
Lake	Other	All	By jurisdiction (see map)
Lassen	Modoc National Forest	All	KFWO
Lassen	Lassen National Forest	All	SFWO
Lassen	Toiyabe National Forest	All	RFWO
Lassen	BLM Surprise and Eagle Lake Resource Areas	All	RFWO

Lassen	BLM Alturas Resource Area	All	KFWO
Lassen	Lassen Volcanic National Park	All (includes Eagle Lake trout on all ownerships)	SFWO
Lassen	All other ownerships	All	By jurisdiction (see map)
Marin	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Marin	All ownerships but tidal/estuarine	All	SFWO
Mendocino	Russian River watershed	All	SFWO
Mendocino	All except Russian River watershed	All	AFWO
Modoc	Modoc National Forest	All	KFWO
Modoc	BLM Alturas Resource Area	All	KFWO
Modoc	Klamath Basin National Wildlife Refuge Complex	All	KFWO
Modoc	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Modoc	All other ownerships	All	By jurisdiction (See map)
Mono	Inyo National Forest	All	RFWO
Mono	Humboldt Toiyabe National Forest	All	RFWO
	All ownerships but tidal/estuarine	All	SFWO
Napa			
Napa	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Nevada	Humboldt Toiyabe National Forest	All	RFWO
Nevada	All other ownerships	All	By jurisdiction (See map)

Placer	Lake Tahoe Basin Management Unit	All	RFWO
Placer	All other ownerships	All	SFWO
Sacramento	Legal Delta	Delta Smelt	BDFWO
Sacramento	Other	All	By jurisdiction (see map)
San Francisco	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Francisco	All ownerships but tidal/estuarine	All	SFWO
San Mateo	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Mateo	All ownerships but tidal/estuarine	All	SFWO
San Joaquin	Legal Delta excluding San Joaquin HCP	All	BDFWO
San Joaquin	Other	All	SFWO
Santa Clara	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
Santa Clara	All ownerships but tidal/estuarine	All	SFWO
Shasta	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Shasta	Hat Creek Ranger District	All	SFWO
Shasta	Bureau of Reclamation (Central Valley Project)	All	BDFWO
Shasta	Whiskeytown National Recreation Area	All	YFWO

Shasta	BLM Alturas Resource Area	All	KFWO
Shasta	Caltrans	By jurisdiction	SFWO/AFWO
Shasta	Ahjumawi Lava Springs State Park	Shasta crayfish	SFWO
Shasta	All other ownerships	All	By jurisdiction (see map)
Shasta	Natural Resource Damage Assessment, all lands	All	SFWO/BDFWO
Sierra	Humboldt Toiyabe National Forest	All	RFWO
Sierra	All other ownerships	All	SFWO
Siskiyou	Klamath National Forest (except Ukonom District)	All	YFWO
Siskiyou	Six Rivers National Forest and Ukonom District	All	AFWO
Siskiyou	Shasta Trinity National Forest	All	YFWO
Siskiyou	Lassen National Forest	All	SFWO
Siskiyou	Modoc National Forest	All	KFWO
Siskiyou	Lava Beds National Volcanic Monument	All	KFWO
Siskiyou	BLM Alturas Resource Area	All	KFWO
Siskiyou	Klamath Basin National Wildlife Refuge Complex	All	KFWO
Siskiyou	All other ownerships	All	By jurisdiction (see map)
Solano	Suisun Marsh	All	BDFWO
Solano	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Solano	All ownerships but tidal/estuarine	All	SFWO
Solano	Other	All	By jurisdiction (see map)

Sonoma	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Sonoma	All ownerships but tidal/estuarine	All	SFWO
Tehama	Mendocino National Forest	All	AFWO
Tehama	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Tehama	All other ownerships	All	By jurisdiction (see map)
Trinity	BLM	All	AFWO
Trinity	Six Rivers National Forest	All	AFWO
Trinity	Shasta Trinity National Forest	All	YFWO
Trinity	Mendocino National Forest	All	AFWO
Trinity	BIA (Tribal Trust Lands)	All	AFWO
Trinity	County Government	All	AFWO
Trinity	All other ownerships	All	By jurisdiction (See map)
Yolo	Yolo Bypass	All	BDFWO
Yolo	Other	All	By jurisdiction (see map)
All	FERC-ESA	All	By jurisdiction (see map)
All	FERC-ESA	Shasta crayfish	SFWO
All	FERC-Relicensing (non-ESA)	All	BDFWO

***Office Leads:**

AFWO=Arcata Fish and Wildlife Office

BDFWO=Bay Delta Fish and Wildlife Office

KFWO=Klamath Falls Fish and Wildlife Office

RFWO=Reno Fish and Wildlife Office

YFWO=Yreka Fish and Wildlife Office

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
(775) 861-6300

Project Summary

Consultation Code: 08ENVD00-2021-SLI-0411
Event Code: 08ENVD00-2021-E-01227
Project Name: Eagle Canyon
Project Type: TRANSPORTATION
Project Description: Road Development
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.6605441,-119.77498823034479,14z

Counties: Washoe County, Nevada

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Fishes

NAME	STATUS
Cui-ui *Chasmistes cujus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/456	Endangered
Lahontan Cutthroat Trout *Oncorhynchus clarkii henshawi* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3964	Threatened

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Webber's Ivesia *Ivesia webberi* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4682	Threatened

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Webber's Ivesia *Ivesia webberi* https://ecos.fws.gov/ecp/species/4682#crithab	Final

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Brewer's Sparrow *Spizella breweri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10

NAME	BREEDING SEASON
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jan 1 to Dec 31
Golden Eagle *Aquila chrysaetos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680	Breeds Dec 1 to Aug 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Pinyon Jay *Gymnorhinus cyanocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15
Sage Thrasher *Oreoscoptes montanus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9433	Breeds Apr 15 to Aug 10
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week

months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

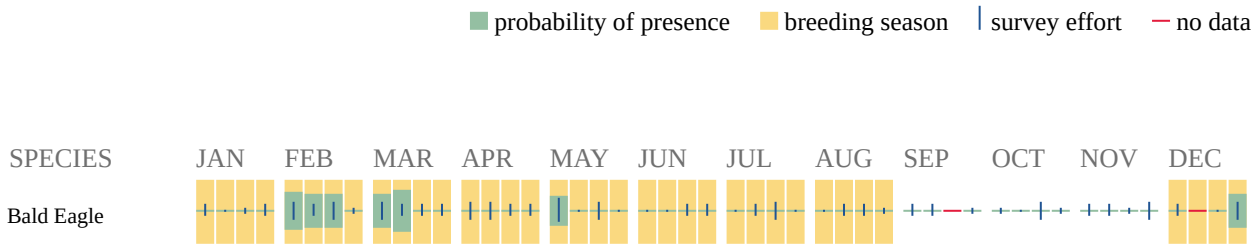
1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very

helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

LAKE

- L2USC

FRESHWATER EMERGENT WETLAND

- PEM1B

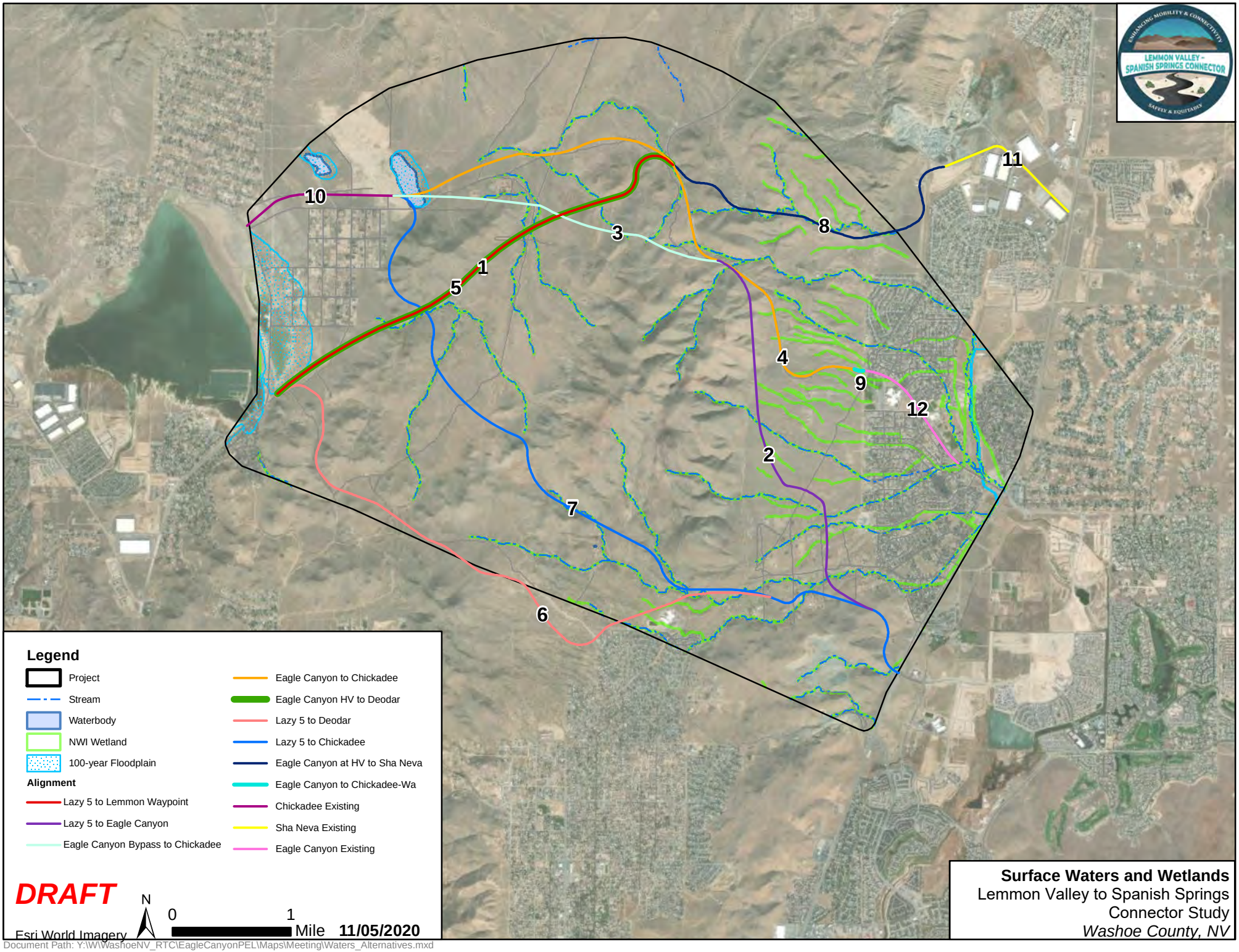
FRESHWATER POND

- PUSAh
- PUSAx

RIVERINE

- R4SBC
- R4SBJ
- R4SBJx

Attachment C
Wetlands and Waters Figure



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Lemmon Valley to Spanish Springs Connector

Planning and Environmental Linkages (PEL) Study

Parks and Recreational Resources Technical Memorandum

PREPARED FOR: Stantec Consulting Services, Inc.

PREPARED BY: Jacobs Engineering Group Inc.

DATE: August 2021

Introduction

Recreational resources are important community facilities that warrant consideration during transportation projects. These resources include publicly owned parks, recreation facilities, and wildlife and waterfowl refuges. This memorandum summarizes the existing park and potential recreation resources and evaluates the potential impacts on these resources by the various alignment alternatives proposed as part of the Lemmon Valley to Spanish Springs Planning and Environmental Linkages (PEL) Study.

Regional Context

Northern Nevada experienced significant growth since the announcement of TESLA's plans to build a battery plant in Storey County. Companies that support the technology industry coupled with growth in logistics and manufacturing have created unprecedented demand for commercial land and housing, not heretofore experienced. According to U.S. Census, between 2008 to 2018 Washoe County's population grew by over 150,000 to 464,000 people. The Reno-Sparks metropolitan region is forecast to add 129,000 more residents over the next 30 years, increasing the population to 591,000. The number of jobs is also expected to increase from 290,000 to 389,000 during the same 30-year time period. Growth in employment and residents equates to growth in travel demands. According to the Washoe County Regional Transportation Commission's regional travel demand model, daily vehicle miles of travel is forecast to increase 44% from 10.3 million in 2020 to 14.8 million in 2050.

The Lemmon Valley community consists of a wide range of housing types, including rural residential on large lots with livestock to traditional single family subdivisions on small lots and multifamily development. Some portions of Lemmon Valley are incorporated within the City of Reno while others are in unincorporated Washoe County. The primary geographic feature is Swan Lake. The major transportation facilities serving Lemmon Valley include Lemmon Drive running generally north-south providing connectivity to US 395. Military Road and Lear Boulevard running generally east-west provide connectivity to the Stead region.

The Spanish Springs community also consists of both rural to suburban neighborhoods supported by employment, commercial, religious, and cultural facilities. Portions of Spanish Springs consist of areas within unincorporated Washoe County. Pyramid Highway is the primary corridor along the west side

that directly connects travelers to I-80. There are other collectors and arterials available to access I-80 if users follow more circuitous routes.

Between the Lemmon Valley and Spanish Springs communities is Hungry Valley. Although the residents of Hungry Valley are mostly concentrated within a 170-acre area, Hungry Valley itself consists of over 15,000 acres that are considered the Reno-Sparks Indian Colony (RSIC). Eagle Canyon Drive, a paved two lane road, connects Hungry Valley from the east to Spanish Springs. Hungry Valley Road, currently unpaved, connects Lemmon Valley to the west. Portions of Hungry Valley Road are rough and primarily suited to high clearance or off-highway vehicles.

The remaining area between Lemmon Valley and Spanish Springs is generally undeveloped public land managed by the Bureau of Land Management. The primary geographic feature is a low mountainous region separating Lemmon Valley and the Spanish Springs Valley.

Alignment Alternative Development

Stantec utilized the Quantm alignment planning software to identify and analyze multiple routes between Spanish Springs and Lemmon Valley. The software generated a large number of corridors using route optimization technology which were then reduced to eleven initial conceptual alternatives for consideration by the project's Technical Advisory Committee (TAC). This technical memorandum evaluates the potential impacts to existing park and potential recreation resources for the initial conceptual alternatives.

Methodology

Several datasets were referenced to identify park and potential recreation resources within ¼ mile of the alignment alternatives, including the following:

- Washoe County parks and schools GIS data (Washoe County 2019; Washoe County 2020a)
- Washoe County Parks and Open Space website (Washoe County 2020b)
- Nevada State Parks – Parks and Recreation Program Manager (Nevada State Parks 2020)
- Google Bicycle Maps (Google Maps, 2020)

Applicable Regulations

Parks and recreation areas of national, state, or local significance that are both publicly owned and open to the public are regulated under Section 4(f) of the Department of Transportation (DOT) Act of 1966 (Section 4[f]). Section 4(f) stipulates that DOT agencies, including the Federal Highway Administration (FHWA), cannot approve the use of land from publicly owned parks, recreational facilities, wildlife and waterfowl refuges, or publicly or privately owned historic sites unless there is no feasible and prudent alternative to avoid the use of Section 4(f) resources and the action includes all possible planning to minimize harm to the Section 4(f) resource, or the project results in a de minimis impact to the Section 4(f) resource. Section 4(f) also applies if publicly owned land has been 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 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 the property acquired or

developed with these funds to a nonrecreational purpose without the approval of the National Park Service.

Existing Conditions

The project area offers a variety of recreational opportunities that are protected by Section 4(f) or Section 6(f) the LWCF Act. There are nine parks and open spaces, seven public schools, and eight trails located in the project vicinity (Figure 1). Additionally, two LWCF properties are located within the project vicinity (Figure 1). During the National Environmental Protection Act (NEPA) phase, further research and coordination with the officials with jurisdiction over these recreational resources would help determine whether Section 4(f) would apply in accordance with FHWA's Section 4(f) Policy Paper (FHWA 2012). This technical memorandum provides preliminary observations in that regard.

Of the nine parks and open spaces, eight are owned and maintained by Washoe County: Desert Winds Park, Eagle Canyon Park, Gator Swamp Park, Lazy 5 Regional Park, Lemmon Valley Horseman's Arena, Lemmon Valley Open Space, Lemmon Valley Park, and the Sun Valley Regional Park. The Sun Valley General Improvement District owns and maintains Highland Ranch Park. All of these properties, with the exception of the Lemmon Valley Open Space, are designated recreational facilities that are owned by, and open to the public. Therefore, these eight properties may qualify for protection under Section 4(f). Lemmon Valley Open Space is publicly owned; however, the property is not designated as a recreational property and may not warrant protection under Section 4(f).

Four of the schools, Alyce Taylor Elementary School, Esther Bennet Elementary School, Jesse Hall Elementary School, and Lemmon Valley Elementary School, have recreational facilities including playgrounds, ball fields, and ball courts. The recreational areas of these properties could qualify for protection under Section 4(f). Desert Skies Middle School, Yvonne Shaw Middle School, and Spanish Springs High School all have recreational facilities including ball fields, track and field areas, or ball courts. The primary purpose of these recreational facilities is for organized school sports; however, at least portions of each property's recreational facilities are open for public use. The recreational areas of these properties likely would qualify for protection under Section 4(f).

Many of the trails, David Allen Parkway Trail, Fortunato Loop Trail, Lazy Five Parkway Trail, Pyramid Way Trail, and the W Calle De La Plata Trail, are all on-road trails located within a transportation right-of-way. The primary use of the trails is likely transportation and, if confirmed, they would not warrant protection under Section 4(f). Sugarloaf Peak Open Space and Trail is owned by Washoe County provides recreational users with access to Sugarloaf Peak. This trail could qualify for protection under Section 4(f). Lemmon Valley Trail is a paved path that parallels County Highway 165 in Lemmon Valley. This trail likely would qualify for protection under Section 4(f). The remaining trail, Eagle Canyon Drive Trail, has two parts, urban and rural. The urban section is a paved path located in Spanish Springs along the south side of Eagle Canyon Drive. The rural section is a network of natural paths and staging areas that roughly follow Eagle Canyon Drive west from Spanish Springs and north through the Reno-Sparks Indian Colony. This entire trail system is likely to be protected under Section 4(f).

Of these properties, Table 1 lists the recreational properties located within a ¼-mile buffer of the alignment alternatives.

Table 1. Recreational Properties Located within 1/4 mile of the Project Alternatives

Alignment Alternative	Parks		Schools		Trails	
	Name	Owner	Name	Owner	Name	Owner
Lazy 5 to Lemmon Waypoint	N/A	N/A	N/A	N/A	Lemmon Valley Trail (on-road)	Lemmon Valley-Golden Valley
Lazy 5 to Eagle Canyon	N/A	N/A	Jesse Hall Elementary School	Washoe County School District	N/A	N/A
Eagle Canyon Bypass to Chickadee	Lemmon Valley Open Space	Washoe County	N/A	N/A	N/A	N/A
Eagle Canyon to Chickadee	Lemmon Valley Open Space	Washoe County	Spanish Springs High School	Washoe County School District	Eagle Canyon Drive Trail	Spanish Springs/Reno-Sparks Indian Colony
	N/A	N/A	N/A	N/A	W Calle De La Plata Trail (on-road)	Spanish Springs
Eagle Canyon HV to Deodar	N/A	N/A	N/A	N/A	Lemmon Valley Trail (on-road)	Lemmon Valley-Golden Valley
Lazy 5 to Deodar	Sun Valley Regional Park	Washoe County	Desert Skies Middle School	Washoe County School District	Lemmon Valley Trail (on-road)	Lemmon Valley-Golden Valley
Lazy 5 to Chickadee	Lazy 5 Regional Park	Washoe County	N/A	N/A	Lazy Five Parkway Trail	Spanish Springs
	N/A	N/A	N/A	N/A	David Allen Parkway Trail	Spanish Springs
	N/A	N/A	N/A	N/A	Fortunato Loop (on-road)	Spanish Springs
	N/A	N/A	N/A	N/A	Pyramid Way (on-road)	Spanish Springs
Eagle Canyon at HV to Sha Neva	N/A	N/A	N/A	N/A	W Calle De La Plata Trail (on-road)	Spanish Springs
Eagle Canyon to Chickadee	N/A	N/A	N/A	N/A	N/A	N/A
Chickadee Existing	Lemmon Valley Horseman's Arena	Washoe County	N/A	N/A	Lemmon Valley Trail (on-road)	Lemmon Valley-Golden Valley
Sha Neva Existing	Sugarloaf Peak Open Space and Trail	Washoe County	N/A	N/A	N/A	N/A

Table 1. Recreational Properties Located within 1/4 mile of the Project Alternatives

Alignment Alternative	Parks		Schools		Trails	
	Name	Owner	Name	Owner	Name	Owner
Eagle Canyon Existing	Desert Winds Park	Washoe County	Spanish Springs High School	Washoe County School District	Eagle Canyon Drive Trail	Spanish Springs
	Eagle Canyon Park	Washoe County	Shaw Middle School	Washoe County School District	W Calle De La Plata Trail (on-road)	Spanish Springs

HV = Hungry Valley

Potential Environmental Consequences

Based on the current design, there is one segment that is not anticipated to impact any Section 4(f) properties. The Eagle Canyon to Chickadee segment has no properties within ¼ mile of the alignment.

The **Lazy 5 to Lemmon Waypoint** segment buffer intersects with one Section 4(f) property, Lemmon Valley Trail. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Although further design would be needed to determine impacts on the property, a Section 4(f) "use" of the trail is possible.

The **Lazy 5 to Eagle Canyon** segment buffer intersects with one potential Section 4(f) property, Jesse Hall Elementary School. The school is located approximately ¼ mile east of the proposed alignment. Based on current design, impacts to the school would be avoidable and a use of the property would not be required.

The **Eagle Canyon Bypass to Chickadee** segment buffer intersects with one potential Section 4(f) property, Lemmon Valley Open Space. The property is located approximately 800 feet north of the proposed alignment. Based on current design, direct impacts on the property are not likely; however, access to the property may be impeded due to construction activities. Further design would be needed to determine if there would be a Section 4(f) use of the property.

The **Eagle Canyon to Chickadee** segment buffer intersects with two potential Section 4(f) properties, Eagle Canyon Trail and Spanish Springs High School, and two potential Section 4(f) properties, Lemmon Valley Open Space and W. Calle De La Plata Trail. Based on the current design, the proposed alignment would cross through Lemmon Valley Open Space resulting in a permanent impact on the property. This property likely does not warrant protection under Section 4(f). The eastern terminus of the proposed alignment is located at the northwest corner of the Spanish Springs High School property. The northwest portion of the property contains ball fields and a track that might be eligible for Section 4(f) protection. Impacts on the recreational facilities on the property are possible, however, further design would be needed to determine the extent of the impacts. The eastern terminus of the proposed alignment would intersect with the western terminus of Eagle Canyon Drive Trail. Based on current design, an impact on the trail would be likely; however, further design would be needed to determine the extent of the impact. The proposed alignment would intersect with the southern terminus of W. Calle De La Plata Trail.

The **Eagle Canyon HV to Deodar** segment buffer intersects with one potential Section 4(f) property, Lemmon Valley Trail. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Further design would be needed to determine impacts on the resource.

The **Lazy 5 to Deodar** segment buffer intersects with three Section 4(f) properties, Lemmon Valley Trail, Sun Valley Regional Park, and Desert Skies Middle School. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Further design would be needed to determine impacts on the property. The proposed alignment crosses through the northeast portion of Sun Valley Regional Park. Based on the current design, a permanent Section 4(f) use of the park would result. The proposed alignment passes along the north side of Desert Skies Middle School. Based on current design and the location of the school's recreational facilities, impacts on the property could be avoided.

The **Lazy 5 to Chickadee** segment buffer intersects with three likely Section 4(f) properties: Lazy 5 Regional Park, Lazy Five Parkway Trail, and David Allen Parkway Trail, as well as two potential Section 4(f) properties, Fortunato Loop Trail, and Pyramid Way Trail. Lazy 5 Regional Park is also protected under the LWCF Act. The Lazy 5 Regional Park is located north and east of the eastern terminus of the proposed alignment. Based on the current design, no Section 4(f) impacts or LWCF conversions would be anticipated at this property. The western terminus of Lazy Five Parkway Trail abuts the eastern terminus of the proposed alignment. Based on current design, impacts on the trail are possible; however, further design would be needed. David Allen Parkway Trail is located approximately 1,200 feet east of the eastern terminus of the proposed alignment. Based on the current design, impacts on the trail are not anticipated. Pyramid Way Trail is an on-road designated bike lane along each shoulder of Pyramid Way. Fortunato Loop Trail is an on-road bike route located north and east of the eastern terminus of the proposed alignment.

The **Eagle Canyon at HV to Sha Neva** segment buffer intersects with one potential Section 4(f) property, W. Calle De La Plata Trail. The trail is located approximately 1,200 feet east of the proposed alignment.

The **Chickadee Existing** segment buffer intersects with two Section 4(f) properties, Lemmon Valley Horseman's Arena and Lemmon Valley Trail. Lemmon Valley Horseman's Arena is located approximately 1,200 feet south of the proposed alignment. Based on the current design, there would be no impacts on or access restrictions to the property, and therefore no Section 4(f) use. The western terminus of the proposed alignment is located adjacent to Lemmon Valley Trail, which parallels County Highway 165. Further design would be needed to determine impacts on the property.

The **Sha Neva Existing** segment buffer intersects with one potential Section 4(f) property, Sugarloaf Peak Open Space and Trail. At the closest point, the trail and open space are located 1,100 feet east and northeast of the eastern terminus of the proposed alignment. Based on the current design, no impacts on the properties are anticipated.

The **Eagle Canyon Existing** segment buffer intersects with six potential Section 4(f) properties, Desert Winds Park, Eagle Canyon Park, Spanish Springs High School, Yvonne Shaw Middle School, and Eagle Canyon Drive Trail and W. Calle De La Plata Trail. Desert Winds Park is located along the south side of the eastern terminus of the proposed alignment; Eagle Canyon Park and Yvonne Shaw Middle School are located along the north side of the proposed alignment; Spanish Springs High School is located along the south side of the western terminus of the proposed alignment; and Eagle Canyon Drive Trail parallels the south side entire proposed alignment. Based on the current design, impacts would be anticipated on the Desert Winds Park property, but not on any of the park facilities. Impacts on the access and parking for Eagle Canyon Park are anticipated; however, these impacts can be minimized and/or mitigated. Similarly, impacts on the parking lot and access roads to Yvonne Shaw Middle School are anticipated; however, this would not impact the recreational facilities on the property. The northwest portion of the Spanish Springs High School property contains ball fields and a track that could be eligible for Section 4(f) protection. Impacts on the recreational facilities are possible.

Further design would be needed to determine the extent of impacts on the respective properties. The proposed alignment would intersect with the southern terminus of W. Calle De La Plata Trail.

Next Steps

During subsequent NEPA reviews of projects, existing and potential park and recreational facilities that could be impacted should be evaluated for Section 4(f) applicability and use. Permanent incorporation, temporary occupancy (potentially exempt for construction), and constructive use should be evaluated, and avoidance and measures to minimize harm should be considered. If it is determined that a project as proposed would use a Section 4(f) property and there are no feasible or prudent alternatives that avoid use of Section 4(f) resources, there are three methods available to approve the use: 1) preparing a de minimis Impact Finding when there are no adverse effects on the activities, features, or attributes of the Section 4(f) resource; 2) applying a programmatic Section 4(f) evaluation for minor involvements with parks and recreational areas if the use meets specific criteria; and 3) through preparation of an individual Section 4(f) evaluation if the use would result in adverse effects on the activities, features, or attributes of the 4(f) resource. If the proposed improvements result in a use of a Section 4(f) property, one of these approval processes must be completed.

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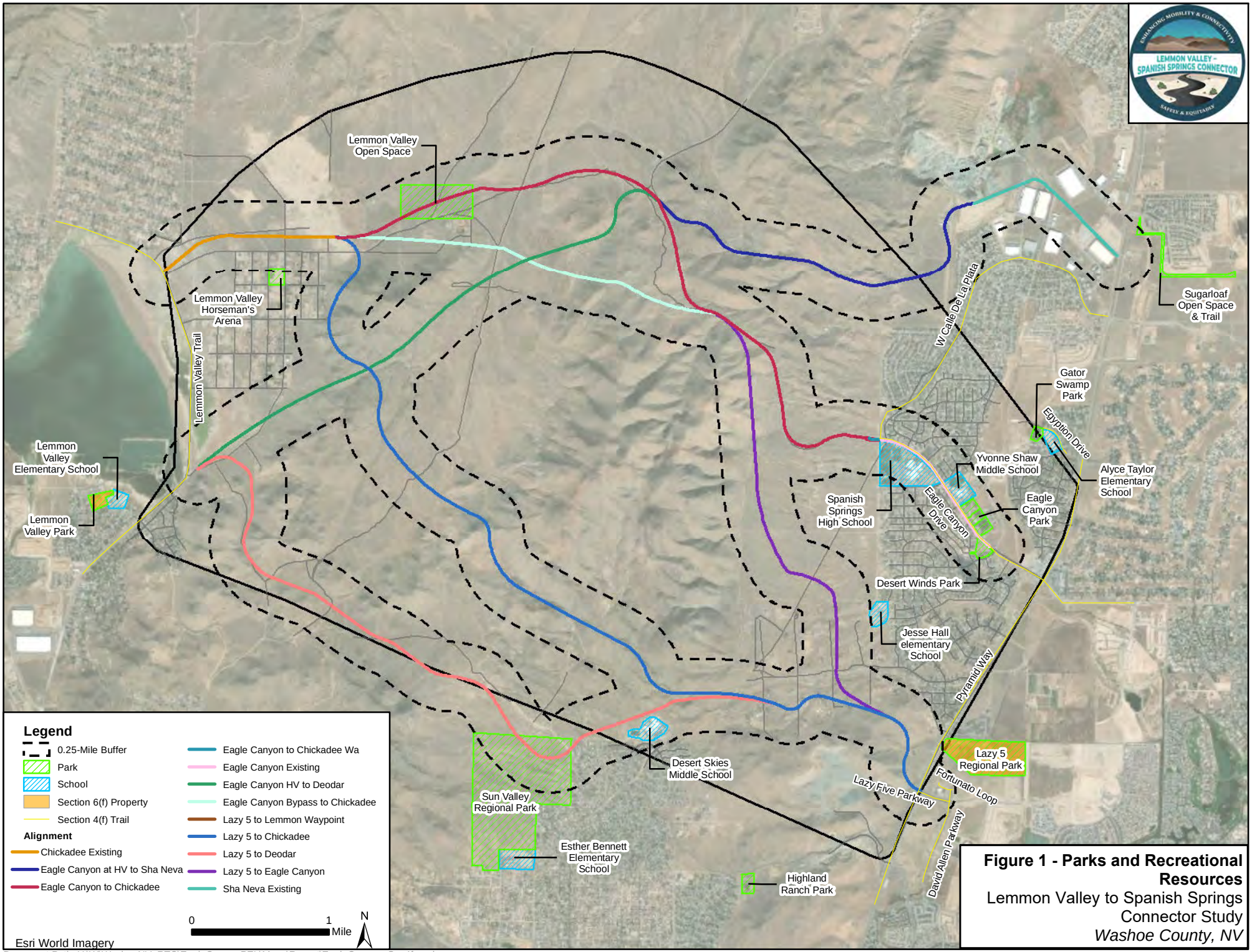

Figure 1 - Parks and Recreational Resources
Lemmon Valley to Spanish Springs Connector Study
Washoe County, NV

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Lemmon Valley to Spanish Springs Connector

Planning and Environmental Linkages (PEL) Study

Visual Resources Technical Memorandum

PREPARED FOR: Stantec Consulting Services, Inc.

PREPARED BY: Jacobs Engineering Group Inc.

DATE: June 2021

Introduction

Visual resources are the natural and cultural features of the landscape that define its aesthetic quality and form the overall impression, or visual character, of an area. Visual impacts can generally be defined in terms of the relationship between a project's physical characteristics, the presence and location of viewers, and the character and quality of the environment in which a project is located. Because public concern over adverse visual impacts can generate controversy, the assessment of visual resources, evaluation of visual impacts, and consideration of mitigation and/or enhancement measures have become important components of the study, design, and implementation of most roadway projects.

This technical memorandum describes the existing visual character and identifies potential visual resources within the Study Area, discusses relevant regulations, and discusses potential visual impacts resulting from the alignment alternatives that will provide for a starting point for an in-depth visual impacts assessment to be conducted during a future National Environmental Protection Act (NEPA) study.

Regional Context

Northern Nevada experienced significant growth since the announcement of TESLA's plans to build a battery plant in Storey County. Companies that support the technology industry coupled with growth in logistics and manufacturing have created unprecedented demand for commercial land and housing, not heretofore experienced. According to U.S. Census, between 2008 to 2018 Washoe County's population grew by over 150,000 to 464,000 people. The Reno-Sparks metropolitan region is forecast to add 129,000 more residents over the next 30 years, increasing the population to 591,000. The number of jobs is also expected to increase from 290,000 to 389,000 during the same 30-year time period. Growth in employment and residents equates to growth in travel demands. According to the Washoe County Regional Transportation Commission's regional travel demand model, daily vehicle miles of travel is forecast to increase 44% from 10.3 million in 2020 to 14.8 million in 2050.

The Lemmon Valley community consists of a wide range of housing types, including rural residential on large lots with livestock to traditional single family subdivisions on small lots and multifamily development. Some portions of Lemmon Valley are incorporated within the City of Reno while others are in unincorporated Washoe County. The primary geographic feature is Swan Lake. The major transportation facilities serving Lemmon Valley include Lemmon Drive running generally north-south providing connectivity to US 395. Military Road and Lear Boulevard running generally east-west provide connectivity to the Stead region.

The Spanish Springs community also consists of both rural to suburban neighborhoods supported by employment, commercial, religious, and cultural facilities. Portions of Spanish Springs consist of areas within unincorporated Washoe County. Pyramid Highway is the primary corridor along the west side that directly connects travelers to I-80. There are other collectors and arterials available to access I-80 if users follow more circuitous routes.

Between the Lemmon Valley and Spanish Springs communities is Hungry Valley. Although the residents of Hungry Valley are mostly concentrated within a 170-acre area, Hungry Valley itself consists of over 15,000 acres that are considered the Reno-Sparks Indian Colony (RSIC). Eagle Canyon Drive, a paved two lane road, connects Hungry Valley from the east to Spanish Springs. Hungry Valley Road, currently unpaved, connects Lemmon Valley to the west. Portions of Hungry Valley Road are rough and primarily suited to high clearance or off-highway vehicles.

The remaining area between Lemmon Valley and Spanish Springs is generally undeveloped public land managed by the Bureau of Land Management. The primary geographic feature is a low mountainous region separating Lemmon Valley and the Spanish Springs Valley.

Alignment Alternative Development

Stantec utilized the Quantm alignment planning software to identify and analyze multiple routes between Spanish Springs and Lemmon Valley. The software generated a large number of corridors using route optimization technology which were then reduced to eleven initial conceptual alternatives for consideration by the project's Technical Advisory Committee (TAC). This technical memorandum evaluates the potential visual impacts for the initial conceptual alternatives.

Methodology

A qualitative review of existing planning documents, land use and zoning maps, readily available GIS information, and aerial photographs were used to identify visual resources and assess how the proposed alignment alternatives could affect them. Six key views were selected for the visual analysis, originating from residential neighborhoods, recreational areas (trails and parks), and educational facilities (schools) (Figure 1).

Four alignment alternatives with the highest potential to impact the visual setting were selected to evaluate preliminary visual effects for the Lemmon Valley to Spanish Springs Connector Planning and Environmental Linkages (PEL) Study. The selected alignment alternatives were Lazy 5 to Eagle Canyon, Lazy 5 to Deodar, Lazy 5 to Chickadee, and Eagle Canyon at Hidden Valley (HV) to Sha Neva.

Six key views were then selected from locations where potential impacts would be most visible to viewers. Simulations of the four arterial alternatives at the six key views were then created (Figures 2 through 7).

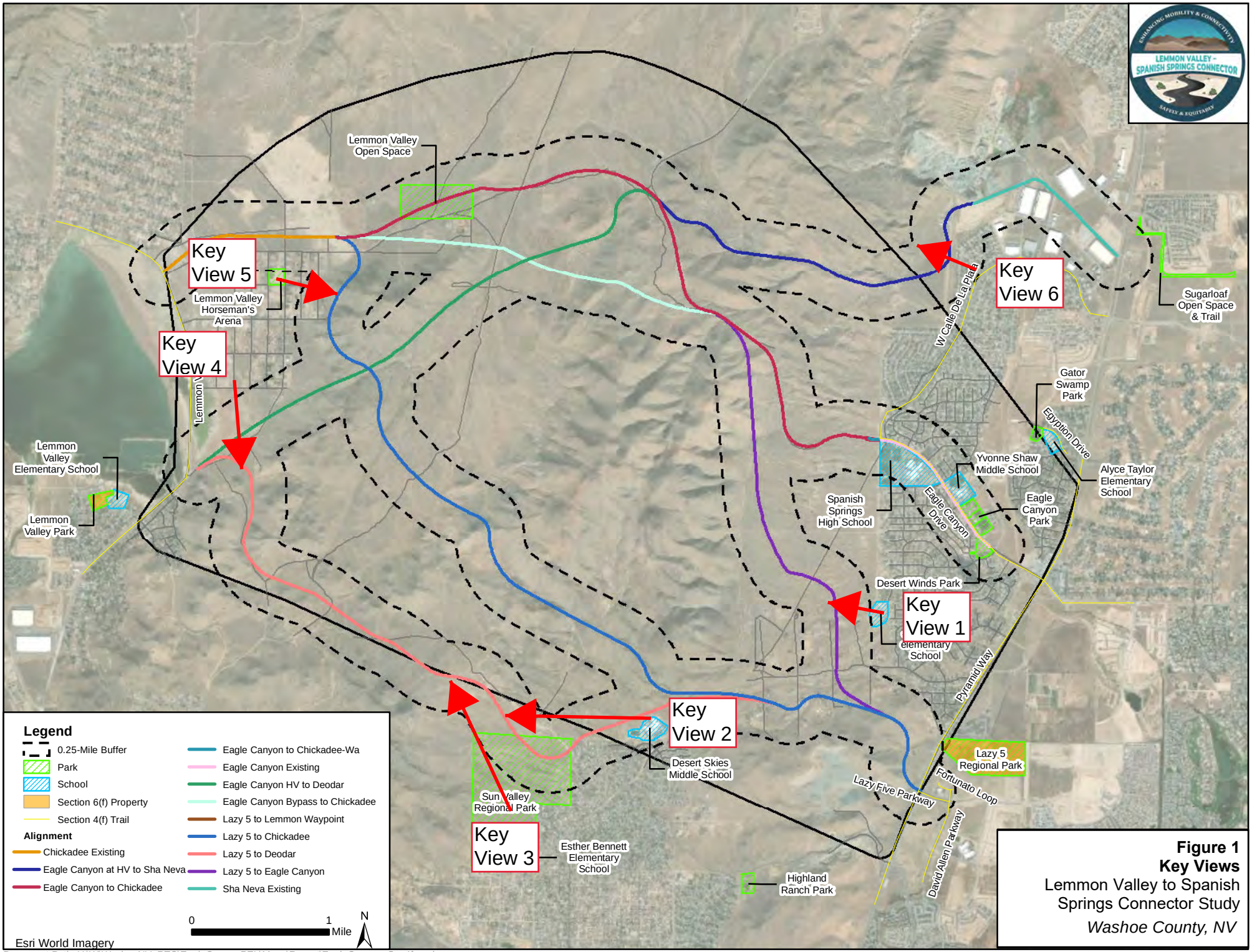

Figure 1
Key Views
Lemmon Valley to Spanish Springs Connector Study
Washoe County, NV

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Applicable Regulations

Federal

The Federal Highway Administration's (FHWA's) Visual Impact Assessment for Highway Projects and Guidelines for the Visual Impact Assessment of Highway Projects (1988; 2015) provide guidance on how to conduct a visual assessment for federal or federal aid highway projects. The methodology outlined in FHWA's guidance is widely recognized as a systematic and standardized approach to a visual impact assessment to be conducted during a future NEPA study.

Bureau of Land Management

Much of the Study Area is comprised of lands owned and managed by the Bureau of Land Management (BLM). Future visual impact assessments for lands in the Study Area owned and managed by the BLM need to follow BLM guidance provided in BLM Manual 8431 – Visual Resource Contrast Rating (BLM 1986). BLM assesses the change in visual quality using the BLM contrast rating system. This involves assessing changes in visual quality for Key Observation Points as representative of visual impacts on BLM land. BLM also prescribes visual resource management objectives and rates the visual contrast for the Key Observation Points. Visual contrast is measured by comparing features of the proposed action with the major features in the existing landscape. The design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by the proposed action. Visual simulations for the Key Observation Points help illustrate and compare alternatives.

Local and Regional Planning

To better predict viewers' responses to potential future project effects, local and regional planning documents can identify community goals and policies concerning visual resources in the Study Area. The following are excerpts from current versions of those plans (as of this writing). The goals and policies in these plans remain representative of the value that communities within the Study Area place on visual and scenic quality.

- **Washoe County Regional Open Space and Natural Resource Management Plan goals, June 24, 2008**:
  - Protect the region's visual and scenic resources.
  - Preserve and protect the visual integrity of the region's hillsides, ridges, and hilltops.
  - Preserve the remaining integrity of the region's dark night sky.
- **City of Sparks Comprehensive Plan, 2016**: Sparks currently regulates hillside development to minimize the potential for erosion, sedimentation, landslides, and scenic degradation.
- **Comprehensive Plan, Spanish Springs Area Plan, Part of Washoe County Comprehensive Plan, March 2020:** Open vistas of the surrounding ridges and more distant mountain ranges are an important identifying characteristic of the Spanish Springs planning area. Maintain open vistas of the surrounding ridges and more distant mountain ranges, and minimize the visual impact of hillside development.
- **Comprehensive Plan, Sun Valley Area Plan, Part of Washoe County Master Plan, December 2018:** Open vistas of surrounding ridges and public lands managed by BLM and Washoe County are an important identifying characteristic of the Sun Valley planning area. Retaining these lands as open space and continued access to these lands are paramount to the valley's character. Maintain the natural, scenic, and recreational values of the public lands surrounding Sun Valley. Maintain open vistas of the surrounding ridges and hills and minimize the visual impact of hillside development.

Existing Conditions

The Study Area is surrounded by five valleys located within the hills north of Reno, Nevada: Spanish Springs, Sun Valley, Golden Valley, Lemmon Valley, and Lemmon Valley–Golden Valley. Study Area vegetation includes interspersed grasses, shrubs, scattered trees typical of semi-arid environments, and commercial and residential landscaping. Views from county roads within the Study Area consist of hillsides and, occasionally at higher elevations, scattered commercial and residential areas interspersed with undeveloped areas. Existing views into the Study Area from developments on the surrounding the hillsides reveal rolling topography sparsely covered by sagebrush and grasses. Surrounding development dominates and blocks views from the surrounding valleys looking toward the Study Area's center. The rolling topography and varied elevations within the Study Area result in varied views throughout the Study Area.

Potential Environmental Consequences

The various alignment alternatives include design elements that would result in a change from the existing visual environment. Depending on the location, this level of change would be minor (not attracting attention or deviating from the overall visual setting), moderate (noticeable, but subordinate to the setting), or strong (attracting attention and dominate in the setting).

This impact analysis considers the potential predicted viewer response to visual changes resulting from proposed alignment alternatives. Viewers' activity can affect their sensitivity to the views of and from the proposed alignment alternatives. Individuals driving for pleasure or engaging in recreational activities, and residents have a higher sensitivity to visual changes. Residents' sensitivity to changes in visual quality is high because of the longer duration of their views and more frequent exposure to the Study Area's visual setting. Like residents, recreationists are highly sensitive to the visual environment because the purpose of their activities is for pleasure. Visual sensitivity is lower for people driving to and from work who experience the visual environment as part of their work. This section presents preliminary visualizations prepared for the four alignment alternatives and key views described previously.

Lazy 5 to Eagle Canyon

Figure 2 provides a simulated illustration of the Lazy 5 to Eagle Canyon alignment alternative as seen from Key View 1 at the Jesse Hall Elementary School facing west-northwest. Based on the simulation, minor visibility of project earthwork would be present in the foreground. The anticipated visibility of the earthwork increases to moderate in the middle ground as the Lazy 5 to Eagle Canyon alignment alternative climbs into the hills.

Figure 2. Simulation of the Lazy 5 to Eagle Canyon Alignment Alternative at Key View 1, Facing West-Northwest

Lazy 5 to Deodar

Three simulations were created for the Lazy 5 to Deodar alignment alternative at three separate key view locations. Key View 2, located at the Desert Sky Middle School, faces west. Figure 3 provides a simulated illustration of this alignment alternative from Key View 2. Minor visibility of earthwork will be present in the foreground. Residents of the nearby neighborhood will likely be screened from visual impacts by the Study Area's rolling topography.

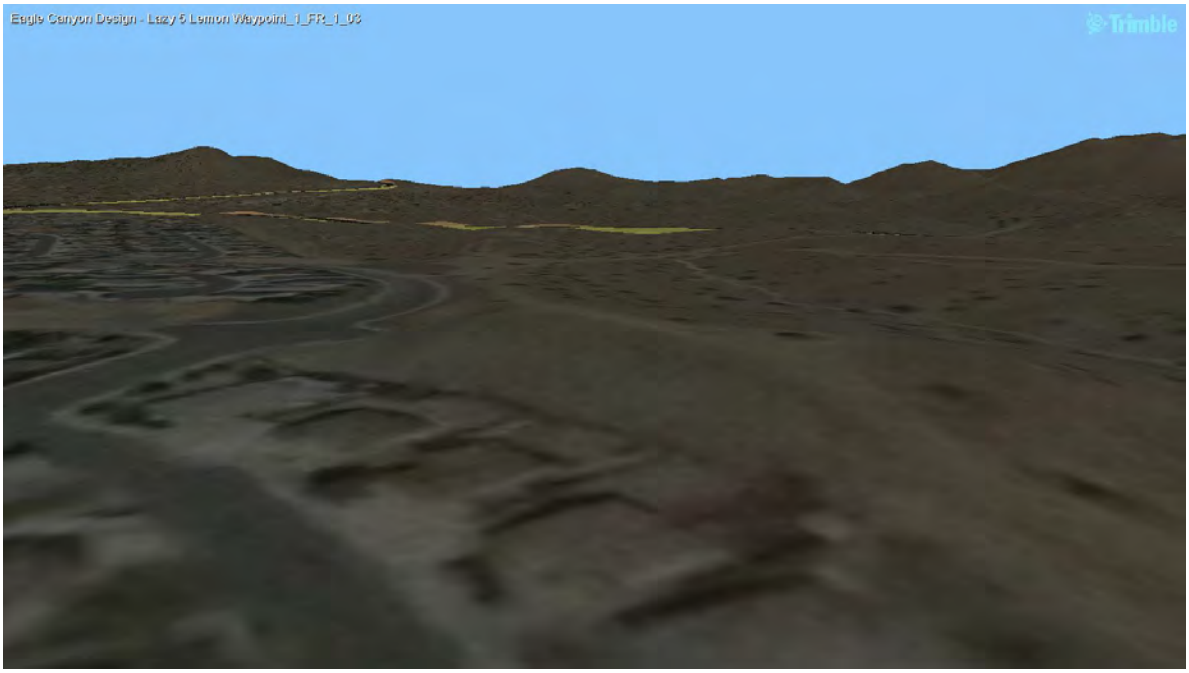

Figure 3. Simulation of the Lazy 5 to Deodar Alignment Alternative from Key View 2, Facing West

Facing north-northwest from the Sun Valley Regional Park at Key View Number 3, the simulation of the Lazy 5 to Deodar alignment alternative shown on Figure 4 illustrates minor to moderate visual impacts

from earthwork, which would be partially shielded from viewers by the natural rolling topography as shown on Figure 4.

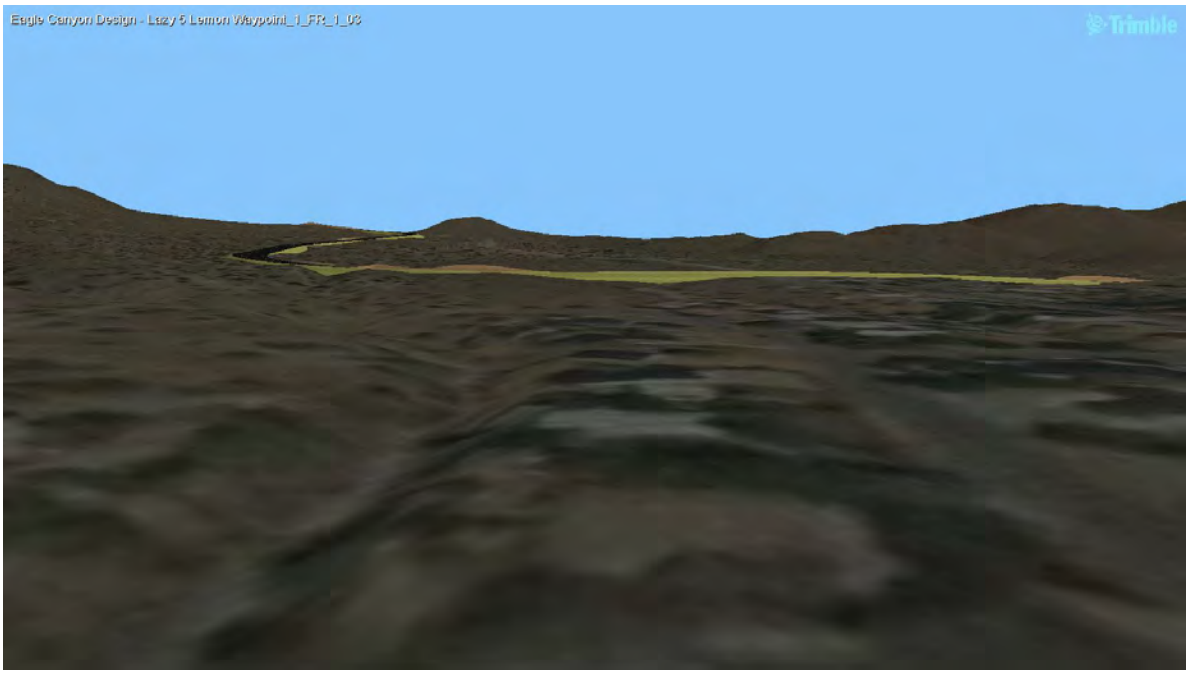

Figure 4. Simulation of Lazy 5 to Deodar Alignment Alternative from Key View 3, Facing North-Northwest

Figure 5 presents the final simulation for the Lazy 5 to Deodar alignment alternative, which looks south from the Lemmon Valley Trail at Key View 4. Here moderate earthwork is visible in the foreground from the southern edge of the neighborhood. Currently, views to the south from Key View 4 are unobstructed by development, which leads to the moderate visibility of the Lazy 5 to Deodar alignment alternative. The visual impacts of the Lazy 5 to Deodar alignment alternative from Key View 4 may be influenced by future developments and will need to be reassessed should this alternative be moved forward into the NEPA process.

Figure 5. Simulation of the Lazy 5 to Deodar Alignment Alternative from Key View 4, Facing South

Lazy 5 to Chickadee

Key View 5 faces the east-southeast from the Lemmon Valley Horse Arena. From this location an illustrated simulation of the Lazy 5 to Chickadee alignment alternative was prepared as shown on Figure 6. Of all the simulations prepared for this technical memorandum, Figure 6 demonstrates a strong change to the visual setting because major earthwork will be required to construct the roadway as it ascends into the hills.

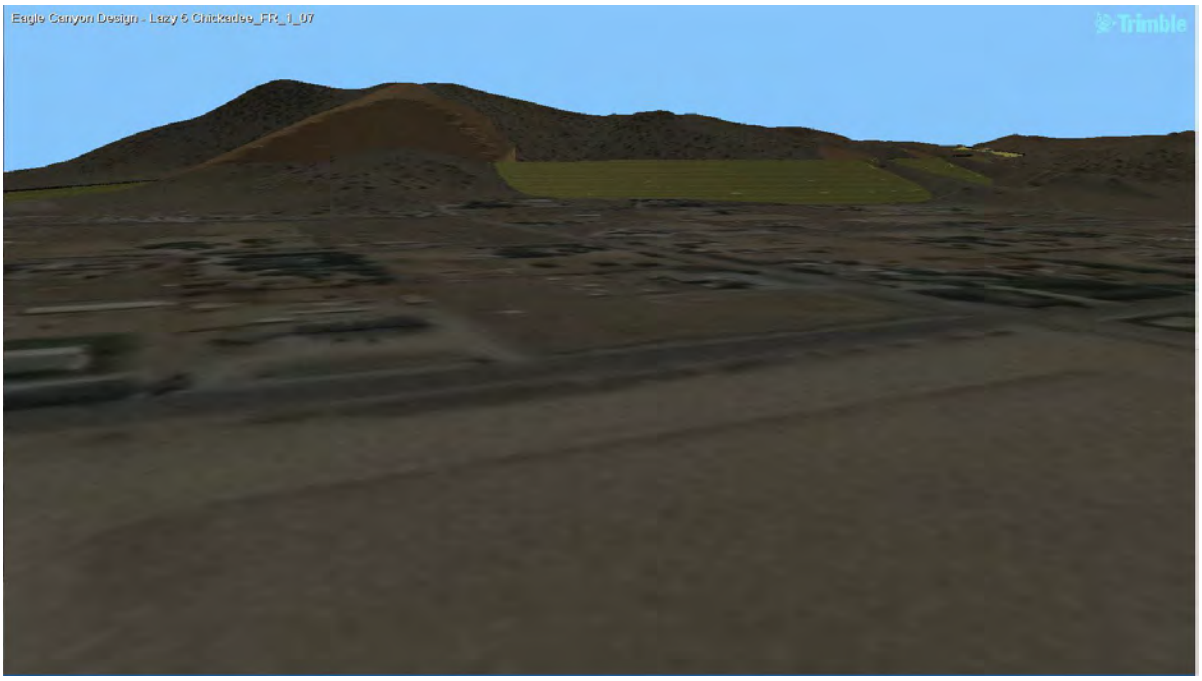

Figure 6. Simulation of the Lazy 5 to Chickadee Alignment Alternative from Key View 5, Facing East-Southeast

Eagle Canyon at Hidden Valley to Sha Neva

The final simulation, shown on Figure 7, illustrates the Eagle Canyon at HV to Sha Neva alignment alternative, looking northeast from W. Calle De La Plata at Key View 6. The majority of the visual impacts resulting from this alternative will be screened by adjacent and neighboring residences and residential landscaping. The Eagle Canyon at HV to Sha Neva alignment alternative will be moderately visible in the foreground by homes with unobstructed views located on the western edge of the neighborhood development.

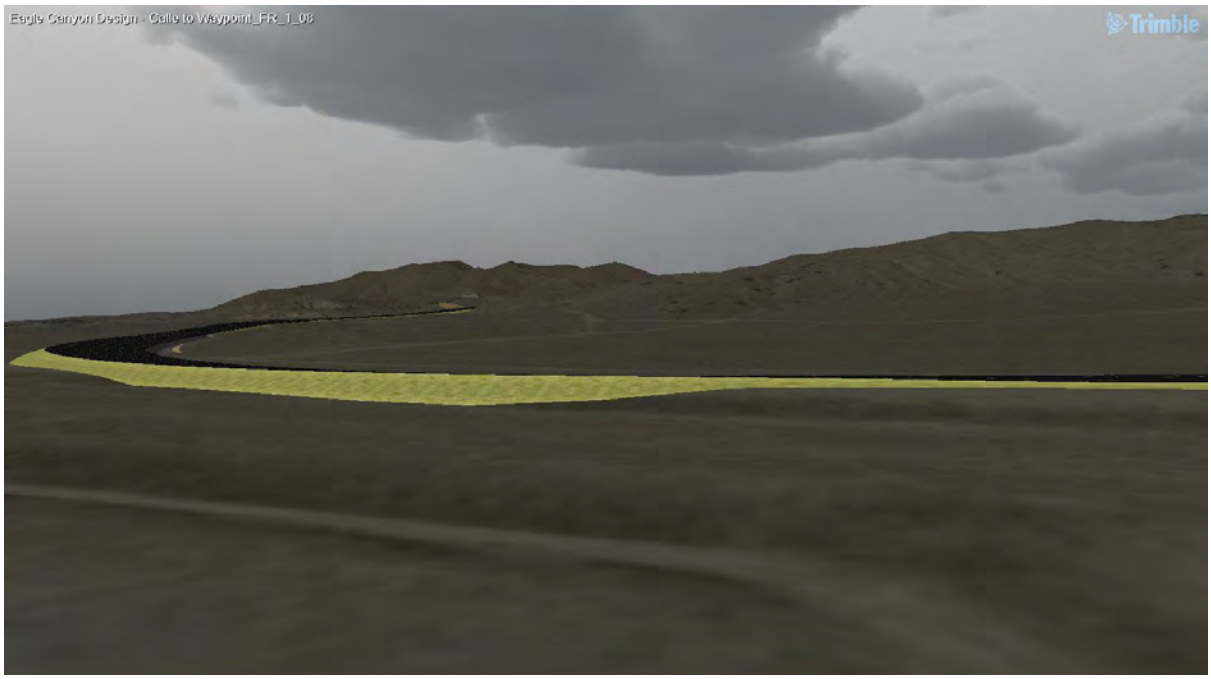

Figure 7. Simulation of Eagle Canyon at HV to Sha Neva from Key View 6, Facing Northeast

Next Steps

If potential improvements from this PEL study are moved forward into the NEPA process, the following analyses are recommended for future projects:

- More detailed evaluation, characterization, and photo documentation of the existing visual environment including the potential impact of vehicles using a new roadway and the visual effects caused by the introduction of new roadway lighting and/or vehicle headlight use.
- In areas with sensitive land uses, consider the development of renderings to depict the anticipated visual changes as more detailed engineering design becomes available.
- Conduct a formal visual impact assessment in accordance with FHWA's Visual Impact Assessment for Highway Projects (1998) and Guidelines for the Visual Impact Assessment of Highway Projects (2015).
- Conduct visual assessment for lands owned and managed by the BLM following BLM guidance in BLM Manual 8431 – Visual Resource Contrast Rating.
- Develop additional mitigation measures and design guidelines.

Mitigation measures to address visual impacts could include the following:

- Integrate the project alternatives into the existing landscape with the use of color, texture, and other design features.
- Minimize the project footprint and cut and fill activities.
- Incorporate signage and architectural features that promote continuity within the Study Area.
- Review, develop, and apply visual guidelines in conjunction with local communities.

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Appendix E Eagle Canyon Widening Cost Breakdown

REGIONAL TRANSPORTATION COMMISSION					
Potential Eagle Canyon Widening Pyramid Way to West Calle De La Plata					
100% OPINION OF PROBABLE CONSTRUCTION COST 06-27-2021					
Item No.	Item and Description		Engineer's Estimate		
		Unit	Unit Cost	Quantity	Total
1	Remove Existing AC Pavement	SY	$35.00	29,381	$1,028,335.00
2	Remove Existing Type 1 PCC Curb and Gutter	LF	$11.00	3,095	$34,045.00
3	Remove Existing Type 2 Median Curb	LF	$8.00	331	$2,648.00
4	Remove Existing Valley Gutter	SF	$5.00	50	$250.00
5	Remove Existing PCC Pedestrian Ramp	SF	$7.00	3,000	$21,000.00
6	Remove Existing PCC Sidewalk	SF	$4.00	17,472	$69,888.00
7	Remove Existing PCC Pedestrian Wall	LF	$4.00	1,005	$4,020.00
8	Remove Existing Catch Basin/Drop Inlet	EA	$1,000.00	8	$8,000.00
9	Remove Existing School Zone Signal - Solar	EA	$5,000.00	5	$25,000.00
10	Remove Existing Electrical Transformer	EA	$5,000.00	5	$25,000.00
11	Remove Existing Street Light	EA	$2,000.00	5	$10,000.00
12	Remove Existing Pull Box	EA	$350.00	5	$1,750.00
13	Construct PCC Pedestrian Ramp with Base	SF	$16.00	4,500	$72,000.00
14	Construct PCC Sidewalk with Base	SF	$8.00	73,015	$584,120.00
15	Construct Type 1 PCC Curb and Gutter with Base	LF	$25.00	12,170	$304,250.00
16	Install 36" dia RCP	LF	$252.00	1,150	$289,800.00
17	Install 48" dia RCP	LF	$336.00	3,700	$1,243,200.00
18	Install 7'wX4'h RCB	LF	$700.00	3,720	$2,604,000.00
19	Install RCB Headwall	EA	$8,000.00	4	$32,000.00
20	Install RCP Headwall	EA	$5,000.00	6	$30,000.00
21	Install Type 4R Catch Basin	EA	$5,000.00	8	$40,000.00
22	Protect and Adjust Gas/Water Valve to New Finished Grade	EA	$650.00	18	$11,700.00
23	Protect and Adjust Storm Drain Manhole to New Finished Grade	EA	$1,250.00	2	$2,500.00
24	Protect and Adjust Electrical Vault to New Finished Grade	EA	$750.00	7	$5,250.00
25	Place _Inch Type 2 PG64-28NV, 75 Blow 4%Air Voids Plantmix Bituminous Pavement	SY	$37.00	48,677	$1,801,049.00
26	Place Roadway Striping	LS	$12,000.00	1	$12,000.00
27	Install New Electrical Transformer	EA	$20,000.00	5	$100,000.00
28	Install New Street Light	EA	$5,000.00	5	$25,000.00
29	Install New Solar RRFB	EA	$25,000.00	5	$125,000.00
30	Install New #5 Traffic Rated Pull Box	EA	$1,200.00	5	$6,000.00
31	Right-of-Way Acquisition for Sidewalk	SF	$4.00	22,292	$89,168.00
32	Right-of-Way Acquisition from B.O.W. to Catch at EG	SF	$4.00	103,602	$414,408.00
33	Existing Material Cut	CY	$20.00	2,434	$48,680.00
34	New Material Fill	CY	$20.00	30,095	$601,900.00
35	Traffic Control	LS	$968,000.00	1	$968,000.00
36	Contingency (30%)	LS	$3,192,000.00	1	$3,192,000.00
	TOTAL				$13,831,961.00

IN PROVIDING OPINIONS OF PROBABLE COST, IT IS RECOGNIZED THAT NEITHER THE CLIENT NOR STANTEC HAS CONTROL OVER THE COSTS OF LABOR, EQUIPMENT OR MATERIALS, OR OVER THE CONTRACTOR'S METHODS OF DETERMINING PRICES OR BIDDING. THE OPINION OF PROBABLE COSTS IS BASED ON STANTEC'S REASONABLE PROFESSIONAL JUDGMENT AND EXPERIENCE AND DOES NOT CONSTITUTE A WARRANTY, EXPRESS OR IMPLIED, THAT THE CONTRACTOR'S BIDS OR THE NEGOTIATED PRICE OF THE WORK WILL NOT VARY FROM THE CLIENT'S BUDGET OR FROM ANY OPINION OF PROBABLE COST PREPARED BY STANTEC.

Appendix F Existing Traffic Counts

Eagle Canyon/La Posada & Pyramid

Eagle Canyon Drive & La Posada Drive/Pyramid Way														
Tuesday, November 19, 2019														
Begin	End	AM Movements												Total
		Eagle Canyon			La Posada			Pyramid			Pyramid			
		EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	NBL	NBT	NR	
7:00 AM	7:15 AM	33	42	252	101	98	15	48	289	12	51	72	19	1032
7:15 AM	7:30 AM	16	16	119	132	114	17	33	253	13	69	126	37	945
7:30 AM	7:45 AM	18	23	124	93	97	17	24	195	8	152	132	35	918
7:45 AM	8:00 AM	10	43	142	59	18	21	30	155	22	51	56	31	638
8:00 AM	8:15 AM	14	21	117	111	17	15	14	182	14	53	165	39	
8:15 AM	8:30 AM	18	19	98	92	26	19	12	213	15	39	112	27	
8:30 AM	8:45 AM	28	16	51	93	20	16	15	191	19	35	146	44	
8:45 AM	9:00 AM	19	17	77	98	25	28	27	202	29	41	137	47	
7:00 AM to 8:00 AM		77	124	637	385	327	70	135	892	55	323	386	122	3533

Eagle Canyon Drive & La Posada Drive/Pyramid Way														
Tuesday, November 19, 2019														
Begin	End	PM Movements												Total
		Eagle Canyon			La Posada			Pyramid			Pyramid			
		EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	NBL	NBT	NR	
4:30 PM	4:45 PM	36	36	45	119	66	43	15	129	34	146	212	90	
4:45 PM	5:00 PM	45	51	37	131	72	35	14	137	35	165	234	92	1048
5:00 PM	5:15 PM	41	55	18	105	81	41	11	145	45	165	262	84	1053
5:15 PM	5:30 PM	20	48	33	122	73	33	13	182	23	141	264	93	1045
5:30 PM	5:45 PM	15	22	28	92	68	15	9	153	38	196	252	86	974
5:45 PM	6:00 PM	16	17	35	88	54	19	13	77	33	138	239	81	
6:00 PM	6:15 PM	24	18	21	76	57	11	8	97	36	134	203	99	
6:15 PM	6:30 PM	1	37	0	71	63	8	4	60	23	154	212	70	
4:45 PM to 5:45 PM		121	176	116	450	294	124	47	617	141	667	1012	355	4120

Eagle Canyon & Ember/Neighborhood

Eagle Canyon Drive/Neighborhood Way & Ember Drive														
Thursday, November 21, 2019														
Begin	End	Movements												Total
		Eagle Canyon			Eagle Canyon			Neighborhood			Ember			
		EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	NBL	NBT	NBR	
7:00 AM	7:15 AM	23	222	16	3	252	3	7	0	10	41	1	6	584
7:15 AM	7:30 AM	22	211	15	3	270	3	7	0	9	45	2	6	593
7:30 AM	7:45 AM	23	219	15	2	193	2	4	0	6	21	1	3	490
7:45 AM	8:00 AM	19	182	13	2	190	2	1	0	2	19	1	3	433
8:00 AM	8:15 AM	6	53	4	2	168	2	3	0	4	19	1	3	
8:15 AM	8:30 AM	5	48	3	1	100	1	5	0	7	24	1	3	
8:30 AM	8:45 AM	4	40	3	1	106	1	5	0	7	19	1	3	
8:45 AM	9:00 AM	6	55	4	1	88	1	4	0	5	20	1	3	
7:00 AM to 8:00 AM		88	834	59	9	906	9	19	1	26	126	4	18	2100

Eagle Canyon Drive/Neighborhood Way & Ember Drive														
Thursday, November 21, 2019														
Begin	End	Movements												Total
		Eagle Canyon			Eagle Canyon			Neighborhood			Ember			
		EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	NBL	NBT	NBR	
4:30 PM	4:45 PM	1	141	1	19	177	12	7	0	1	6	0	8	374
4:45 PM	5:00 PM	2	148	2	14	136	10	20	1	3	6	0	8	349
5:00 PM	5:15 PM	1	122	1	15	145	10	16	1	2	7	0	10	331
5:15 PM	5:30 PM	1	102	1	15	138	10	18	1	3	5	0	7	299
5:30 PM	5:45 PM	1	94	1	14	134	9	14	1	2	5	0	6	
5:45 PM	6:00 PM	1	88	1	14	131	9	20	1	3	3	0	4	
6:00 PM	6:15 PM	1	61	1	16	152	11	9	0	1	2	0	3	
6:15 PM	6:30 PM	1	54	1	14	130	9	5	0	1	3	0	4	
4:30 PM to 5:30 PM		5	513	5	63	596	42	61	2	9	23	1	32	1352

Eagle Canyon & Alena

Eagle Canyon Drive/Alena Way														
Wednesday, November 20, 2019														
Begin	End	Movements												Total
		Alena			Alena			Eagle Canyon			Eagle Canyon			
		EBL	EBT	EBR	WBL	WBT	WBT	SBL	SBT	SBR	NBL	NBT	NBR	
7:00 AM	7:15 AM	0	0	2	59	0	12	10	103	3	77	184	9	459
7:15 AM	7:30 AM	0	0	1	53	3	11	9	125	2	69	149	7	429
7:30 AM	7:45 AM	0	0	4	46	4	17	8	189	0	68	166	0	502
7:45 AM	8:00 AM	0	0	13	27	2	9	6	193	1	32	129	3	415
8:00 AM	8:15 AM	2	0	18	18	0	6	4	147	0	18	119	4	
8:15 AM	8:30 AM	1	0	21	6	0	2	3	156	1	13	113	3	
8:30 AM	8:45 AM	0	0	8	5	1	0	5	115	0	5	93	0	
8:45 AM	9:00 AM	0	0	3	3	0	2	6	108	1	6	81	2	
7:00 AM to 8:00 AM		0	0	20	185	9	49	33	610	6	246	628	19	1805

Eagle Canyon Drive/Alena Way														
Tuesday, November 19, 2019														
Begin	End	Movements												Total
		Alena			Alena			Eagle Canyon			Eagle Canyon			
		EBL	EBT	EBR	WBL	WBT	WBR	SBLR	SBT	SBR	NBL	NBT	NBR	
4:30 PM	4:45 PM	0	0	8	17	1	0	0	53	0	3	73	25	
4:45 PM	5:00 PM	0	0	3	11	0	0	0	59	1	5	88	27	194
5:00 PM	5:15 PM	0	0	7	20	1	0	0	48	0	6	102	35	219
5:15 PM	5:30 PM	0	1	4	15	0	0	0	83	2	7	78	28	218
5:30 PM	5:45 PM	0	0	1	14	0	1	0	63	0	3	93	18	193
5:45 PM	6:00 PM	0	0	2	6	0	0	0	39	0	3	79	36	
6:00 PM	6:15 PM	0	0	1	8	0	0	0	36	0	4	86	23	
6:15 PM	6:30 PM	0	0	3	9	0	0	1	37	0	1	48	18	
4:45 PM to 5:45 PM		0	1	15	60	1	1	0	253	3	21	361	108	824

Eagle Canyon & Goldeneye

Eagle Canyon Drive/Goldeneye Pkwy & Spanish Springs Highschool														
Wednesday, November 20, 2019														
Begin	End	AM Movements												Total
		Eagle Canyon			Eagle Canyon			Goldeneye			Spanish Springs HS			
		EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	NBL	NBT	NR	
7:00 AM	7:15 AM	3	53	26	11	28	10	15	1	0	7	1	46	201
7:15 AM	7:30 AM	1	29	53	15	13	2	28	10	1	9	6	50	217
7:30 AM	7:45 AM	0	35	58	26	11	2	17	7	0	12	6	60	234
7:45 AM	8:00 AM	1	27	5	0	12	3	15	1	0	4	2	32	102
8:00 AM	8:15 AM	2	32	2	0	13	6	20	1	0	0	0	1	
8:15 AM	8:30 AM	1	32	1	1	11	3	13	1	0	0	0	0	
8:30 AM	8:45 AM	2	33	3	1	12	2	9	1	0	0	0	1	
8:45 AM	9:00 AM	2	34	4	2	14	1	11	0	0	0	1	2	
7:00 AM to 8:00 AM		5	144	142	52	64	17	75	19	1	32	15	188	754

Eagle Canyon Drive/Goldeneye Pkwy & Spanish Springs Highschool														
Wednesday, November 20, 2019														
Begin	End	PM Movements												Total
		Eagle Canyon			Eagle Canyon			Goldeneye			Spanish Springs HS			
		EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT	SBR	NBL	NBT	NR	
4:30 PM	4:45 PM	0	22	3	7	28	25	9	0	1	2	1	1	
4:45 PM	5:00 PM	2	19	0	4	50	27	11	0	1	2	1	0	117
5:00 PM	5:15 PM	0	21	5	8	45	33	12	0	0	2	0	8	134
5:15 PM	5:30 PM	0	25	3	12	46	27	13	1	0	8	2	12	149
5:30 PM	5:45 PM	0	30	1	3	51	22	17	0	1	2	1	6	134
5:45 PM	6:00 PM	0	19	1	0	64	16	10	0	2	2	1	1	
6:00 PM	6:15 PM	1	18	1	3	49	22	8	1	1	4	2	12	
6:15 PM	6:30 PM	0	21	2	4	42	20	9	0	0	1	1	4	
4:45 PM to 5:45 PM		2	95	9	27	192	109	53	1	2	14	4	26	534

Appendix G Existing Study Intersection LOS

Intersection LOS

Tables G-1 through G-4 outline the LOS for the existing traffic movements at the study intersections below:

- La Posada Drive/Eagle Canyon Drive & Pyramid Way
- Eagle Canyon Drive & Ember Drive/Neighborhood Way
- Eagle Canyon Drive & Alena Way
- Eagle Canyon Drive & Goldeneye Parkway

Table G-1: Eagle Canyon/La Posada and Pyramid Existing Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Pyramid Way and Eagle Canyon Drive/La Posada Drive	**D**	**48.6**	**D**	**39.9**
Eastbound Approach	*D*	*54.5*	*D*	*43.7*
Left	D	52.4	D	41.8
Through	E	56.1	D	45.3
Right	Note 1	-	-	-
Westbound Approach	*D*	*53.9*	*D*	*40.2*
Left	E	65.5	D	48.7
Through	D	42.2	C	30.7
Right	D	42.6	C	31.4
Northbound Approach	*D*	*50.9*	*D*	*36.2*
Left	E	71.2	D	49.3
Through	B	18.7	C	26.5
Right	Note 1	-	-	-
Southbound Approach	*D*	*41.4*	*D*	*45.4*
Left	D	51.0	D	50.7
Through	D	39.8	D	44.2
Right	Note 1	-	-	-

Note 1. Unsignalized slip lane. Delay excluded from calculations of the approach delay and intersection delay.

Table G-2: Eagle Canyon and Ember/Neighborhood Existing Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Ember Drive/Neighborhood Way and Eagle Canyon Drive	**D**	**26.9**	**A**	**8.4**
Eastbound Approach	*C*	*21.1*	*A*	*8.9*
Left-Through-Right	C	21.1	A	8.9
Westbound Approach	*E*	*35.7*	*A*	*8.4*
Left-Through	E	36.1	A	8.8
Right	A	3.3	A	3.0
Northbound Approach	*C*	*15.4*	*A*	*6.3*
Left-Through-Right	C	15.4	A	6.3
Southbound Approach	*A*	*8.8*	*A*	*6.4*
Left-Through	A	8.7	A	6.6
Right	A	8.8	A	5.3

*Disclaimer: Existing traffic volumes for the roundabout at Ember Drive/Neighborhood Way and Eagle Canyon Drive were field measured for both the AM and PM hours. Turning counts during the peak hours were estimated based on PM drone footage. The AM and PM field measured volumes were scaled by the turning movement factors determined from the PM drone footage. No drone footage was taken during the AM; therefore, the AM traffic counts are estimated based on the PM turning movements. Although the factors are relatively accurate when applied to the PM volumes, the AM turning movements are a general estimate.

Table G-3: Eagle Canyon and Alena Existing Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Alena Way and Eagle Canyon Drive	**Note 1**	**-**	**-**	**-**
Eastbound Approach	*C*	*15.6*	*B*	*11.7*
Left	-	-	-	-
Through-Right	C	15.6	B	11.7
Westbound Approach	*F*	*4689.4*	*D*	*25.8*
Left	F	6298.8	D	26.9
Through-Right	F	127.4	B	14.8
Northbound Approach	*-*	*3.4*	*-*	*0.4*
Left	B	12.0	A	8.1
Through-Right	Note 2	-	-	-
Southbound Approach	*-*	*0.5*	*-*	*0.0*
Left	A	9.6	A	0.0
Through-Right	Note 2	-	-	-

Note 1. Overall intersection delay not calculated for two way stop controlled intersections.
Note 2. Uncontrolled approach with no conflicting movements. Movement delay not calculated.

Table G-4: Eagle Canyon and Goldeneye Existing Intersection Level of Service

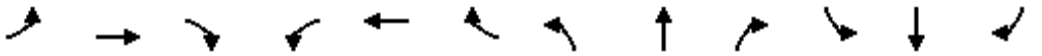
Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Goldeneye Parkway and Eagle Canyon Drive	**Note 1**	**-**	**-**	**-**
Eastbound Approach	*-*	*0.2*	*-*	*0.2*
Left	A	7.6	A	8.0
Through-Right	Note 2	-	-	-
Westbound Approach	*-*	*3.5*	*-*	*0.6*
Left	A	8.6	A	7.5
Through-Right	Note 2	-	-	-
Northbound Approach	*C*	*20.8*	*B*	*10.6*
Left-Through-Right	C	20.8	B	10.6
Southbound Approach	*F*	*77.2*	*B*	*13.3*
Left-Through-Right	F	77.2	B	13.3

Note 1. Overall intersection delay not calculated for two way stop controlled intersections.
Note 2. Uncontrolled approach with no conflicting movements. Movement delay not calculated.

Appendix H Existing LOS Synchro Report

HCM 6th Signalized Intersection Summary
2: SR 445 & Eagle Cyn. Dr./La Posada Dr.

06/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	124	639	386	328	70	324	387	122	135	895	55
Future Volume (veh/h)	77	124	639	386	328	70	324	387	122	135	895	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	133	172	0	529	456	84	611	387	0	193	1162	0
Peak Hour Factor	0.58	0.72	0.63	0.73	0.72	0.83	0.53	1.00	0.82	0.70	0.77	0.63
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	209	220		570	667	122	634	1567		361	1320	
Arrive On Green	0.06	0.12	0.00	0.17	0.23	0.22	0.19	0.45	0.00	0.11	0.38	0.00
Sat Flow, veh/h	3401	1841	1560	3401	2952	540	3401	3497	1560	3401	3497	1560
Grp Volume(v), veh/h	133	172	0	529	269	271	611	387	0	193	1162	0
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1700	1749	1743	1700	1749	1560	1700	1749	1560
Q Serve(g_s), s	4.1	9.7	0.0	16.5	15.1	15.3	19.1	7.4	0.0	5.8	33.2	0.0
Cycle Q Clear(g_c), s	4.1	9.7	0.0	16.5	15.1	15.3	19.1	7.4	0.0	5.8	33.2	0.0
Prop In Lane	1.00		1.00	1.00		0.31	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	220		570	395	394	634	1567		361	1320	
V/C Ratio(X)	0.64	0.78		0.93	0.68	0.69	0.96	0.25		0.53	0.88	
Avail Cap(c_a), veh/h	285	283		570	415	414	634	1567		361	1320	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.2	45.9	0.0	44.0	38.0	38.2	43.3	18.4	0.0	45.4	31.2	0.0
Incr Delay (d2), s/veh	3.2	10.2	0.0	21.5	4.2	4.5	27.9	0.4	0.0	5.6	8.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.0	0.0	8.5	6.8	6.9	10.2	2.9	0.0	2.6	14.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.4	56.1	0.0	65.5	42.2	42.6	71.2	18.7	0.0	51.0	39.8	0.0
LnGrp LOS	D	E		E	D	D	E	B		D	D	
Approach Vol, veh/h		305	A		1069			998	A		1355	A
Approach Delay, s/veh		54.5			53.9			50.9			41.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	52.1	22.0	16.8	24.0	44.5	10.6	28.2
Change Period (Y+Rc), s	5.5	* 5.5	4.5	4.5	4.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	10.9	* 47	17.5	16.0	19.5	38.0	8.5	25.0
Max Q Clear Time (g_c+I1), s	7.8	9.4	18.5	11.7	21.1	35.2	6.1	17.3
Green Ext Time (p_c), s	0.2	7.9	0.0	0.6	0.0	2.5	0.1	3.5

Intersection Summary	
HCM 6th Ctrl Delay	48.6
HCM 6th LOS	D

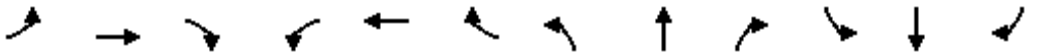
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: SR 445 & Eagle Cyn. Dr./La Posada Dr.

06/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	177	116	451	295	124	669	1015	356	47	619	141
Future Volume (veh/h)	121	177	116	451	295	124	669	1015	356	47	619	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	181	221	0	524	324	163	787	1057	0	168	728	0
Peak Hour Factor	0.67	0.80	0.78	0.86	0.91	0.76	0.85	0.96	0.95	0.84	0.85	0.78
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	276	281		600	562	277	851	1401		263	836	
Arrive On Green	0.08	0.15	0.00	0.18	0.25	0.24	0.25	0.40	0.00	0.08	0.24	0.00
Sat Flow, veh/h	3401	1841	1560	3401	2270	1118	3401	3497	1560	3401	3497	1560
Grp Volume(v), veh/h	181	221	0	524	248	239	787	1057	0	168	728	0
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1700	1749	1639	1700	1749	1560	1700	1749	1560
Q Serve(g_s), s	4.5	10.2	0.0	13.2	10.9	11.3	19.8	22.8	0.0	4.2	17.6	0.0
Cycle Q Clear(g_c), s	4.5	10.2	0.0	13.2	10.9	11.3	19.8	22.8	0.0	4.2	17.6	0.0
Prop In Lane	1.00		1.00	1.00		0.68	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	276	281		600	433	406	851	1401		263	836	
V/C Ratio(X)	0.65	0.79		0.87	0.57	0.59	0.92	0.75		0.64	0.87	
Avail Cap(c_a), veh/h	383	346		600	440	412	851	1401		263	836	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	39.2	35.9	0.0	35.2	29.0	29.3	32.1	22.6	0.0	39.4	32.2	0.0
Incr Delay (d2), s/veh	2.6	9.4	0.0	13.5	1.7	2.1	17.2	3.8	0.0	11.3	12.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.1	0.0	6.4	4.6	4.5	9.6	9.1	0.0	2.1	8.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	45.3	0.0	48.7	30.7	31.4	49.3	26.5	0.0	50.7	44.2	0.0
LnGrp LOS	D	D		D	C	C	D	C		D	D	
Approach Vol, veh/h		402	A		1011			1844	A		896	A
Approach Delay, s/veh		43.7			40.2			36.2			45.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	39.2	19.5	17.4	26.0	25.0	11.1	25.8
Change Period (Y+Rc), s	5.5	* 5.5	4.5	4.5	4.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	6.3	* 34	15.0	16.0	21.5	18.5	9.4	21.6
Max Q Clear Time (g_c+I1), s	6.2	24.8	15.2	12.2	21.8	19.6	6.5	13.3
Green Ext Time (p_c), s	0.0	7.4	0.0	0.7	0.0	0.0	0.2	3.4

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	26.9
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	2	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1102	1038	166	51
Demand Flow Rate, veh/h	1146	1079	173	53
Vehicles Circulating, veh/h	33	255	1099	1217
Vehicles Exiting, veh/h	1237	1017	80	117
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.1	35.7	15.4	8.8
Approach LOS	C	E	C	A

Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.991	0.009	1.000	0.434	0.566
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	1146	1069	10	173	23	30
Cap Entry Lane, veh/h	1334	1126	1126	450	469	469
Entry HV Adj Factor	0.961	0.962	1.000	0.959	0.955	0.967
Flow Entry, veh/h	1102	1028	10	166	22	29
Cap Entry, veh/h	1282	1083	1126	431	448	453
V/C Ratio	0.859	0.949	0.009	0.385	0.049	0.064
Control Delay, s/veh	21.1	36.1	3.3	15.4	8.7	8.8
LOS	C	E	A	C	A	A
95th %tile Queue, veh	12	17	0	2	0	0

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	2	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	582	779	63	80
Demand Flow Rate, veh/h	605	810	65	83
Vehicles Circulating, veh/h	146	34	670	788
Vehicles Exiting, veh/h	725	701	81	56
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.9	8.4	6.3	6.4
Approach LOS	A	A	A	A

Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.940	0.060	1.000	0.880	0.120
Follow-Up Headway, s	2.609	2.535	2.535	2.609	2.535	2.535
Critical Headway, s	4.976	4.544	4.544	4.976	4.544	4.544
Entry Flow, veh/h	605	761	49	65	73	10
Cap Entry Lane, veh/h	1189	1377	1377	697	693	693
Entry HV Adj Factor	0.962	0.961	0.959	0.969	0.958	1.000
Flow Entry, veh/h	582	732	47	63	70	10
Cap Entry, veh/h	1144	1324	1321	675	664	693
V/C Ratio	0.509	0.553	0.036	0.093	0.105	0.014
Control Delay, s/veh	8.9	8.8	3.0	6.3	6.6	5.3
LOS	A	A	A	A	A	A
95th %tile Queue, veh	3	4	0	0	0	0

Intersection	
Int Delay, s/veh	663.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	20	186	9	49	247	630	19	33	612	6
Future Vol, veh/h	0	0	20	186	9	49	247	630	19	33	612	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	79	38	78	56	72	80	85	53	83	79	50
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	53	238	16	68	309	741	36	40	775	12

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2280	2256	781	2265	2244	759	787	0	0	777	0	0
Stage 1	861	861	-	1377	1377	-	-	-	-	-	-	-
Stage 2	1419	1395	-	888	867	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	6.24	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	28	41	392	~ 28	41	403	823	-	-	831	-	-
Stage 1	347	370	-	~ 177	210	-	-	-	-	-	-	-
Stage 2	168	206	-	336	367	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	8	24	392	~ 17	24	403	823	-	-	831	-	-
Mov Cap-2 Maneuver	8	24	-	~ 17	24	-	-	-	-	-	-	-
Stage 1	217	352	-	~ 111	131	-	-	-	-	-	-	-
Stage 2	77	129	-	277	349	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	$ 4689.4	3.4	0.5
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	823	-	-	-	392	17	100	831	-	-
HCM Lane V/C Ratio	0.375	-	-	-	0.134	14.027	0.841	0.048	-	-
HCM Control Delay (s)	12	-	-	0	15.5	$ 6298.8	127.4	9.6	-	-
HCM Lane LOS	B	-	-	A	C	F	F	A	-	-
HCM 95th %tile Q(veh)	1.8	-	-	-	0.5	30.6	4.7	0.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	15	60	1	1	21	362	108	0	254	3
Future Vol, veh/h	0	1	15	60	1	1	21	362	108	0	254	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	25	54	75	25	25	75	88	77	92	76	38
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	4	28	80	4	4	28	411	140	0	334	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	879	945	338	891	879	481	342	0	0	551	0	0
Stage 1	338	338	-	537	537	-	-	-	-	-	-	-
Stage 2	541	607	-	354	342	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	6.24	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	266	260	700	261	284	581	1206	-	-	1009	-	-
Stage 1	672	637	-	524	520	-	-	-	-	-	-	-
Stage 2	522	483	-	659	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	257	254	700	243	277	581	1206	-	-	1009	-	-
Mov Cap-2 Maneuver	257	254	-	243	277	-	-	-	-	-	-	-
Stage 1	657	637	-	512	508	-	-	-	-	-	-	-
Stage 2	502	472	-	629	634	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.7	25.8	0.4	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1206	-	-	-	573	243	375	1009	-	-
HCM Lane V/C Ratio	0.023	-	-	-	0.055	0.329	0.021	-	-	-
HCM Control Delay (s)	8.1	-	-	0	11.7	26.9	14.8	0	-	-
HCM Lane LOS	A	-	-	A	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	1.4	0.1	0	-	-

Intersection	
Int Delay, s/veh	16.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	144	142	52	64	17	32	15	189	75	19	1
Future Vol, veh/h	5	144	142	52	64	17	32	15	189	75	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	68	61	50	57	43	67	63	78	67	48	25
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	12	212	233	104	112	40	48	24	242	112	40	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	152	0	0	445	0	0	715	713	329	826	809	132
Stage 1	-	-	-	-	-	-	353	353	-	340	340	-
Stage 2	-	-	-	-	-	-	362	360	-	486	469	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1417	-	-	1105	-	-	343	355	708	289	312	912
Stage 1	-	-	-	-	-	-	660	627	-	671	636	-
Stage 2	-	-	-	-	-	-	652	623	-	559	557	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1417	-	-	1105	-	-	281	319	708	165	280	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	281	319	-	165	280	-
Stage 1	-	-	-	-	-	-	655	622	-	666	576	-
Stage 2	-	-	-	-	-	-	548	564	-	351	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	3.5	20.8	77.2
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	535	1417	-	-	1105	-	-	189
HCM Lane V/C Ratio	0.587	0.008	-	-	0.094	-	-	0.823
HCM Control Delay (s)	20.8	7.6	-	-	8.6	-	-	77.2
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3.8	0	-	-	0.3	-	-	5.8

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	95	9	27	193	109	14	4	26	53	1	2
Future Vol, veh/h	2	95	9	27	193	109	14	4	26	53	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	2	103	10	29	210	118	15	4	28	58	1	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	113	0	0	441	498	108	455	444	269
Stage 1	-	-	-	-	-	-	112	112	-	327	327	-
Stage 2	-	-	-	-	-	-	329	386	-	128	117	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1220	-	-	1464	-	-	523	471	940	512	505	765
Stage 1	-	-	-	-	-	-	888	799	-	681	644	-
Stage 2	-	-	-	-	-	-	680	607	-	871	795	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1220	-	-	1464	-	-	512	461	940	485	494	765
Mov Cap-2 Maneuver	-	-	-	-	-	-	512	461	-	485	494	-
Stage 1	-	-	-	-	-	-	886	797	-	680	631	-
Stage 2	-	-	-	-	-	-	663	595	-	839	793	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.6	10.6	13.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	691	1220	-	-	1464	-	-	492
HCM Lane V/C Ratio	0.069	0.002	-	-	0.02	-	-	0.124
HCM Control Delay (s)	10.6	8	-	-	7.5	-	-	13.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0.4

Appendix I Future Study Intersection LOS

Future Intersection LOS

Tables I-1 through I-4 outline the future LOS for a 20-year projection of the traffic movements at the study intersections below:

- La Posada Drive/Eagle Canyon Drive & Pyramid Way
- Eagle Canyon Drive & Ember Drive/Neighborhood Way
- Eagle Canyon Drive & Alena Way
- Eagle Canyon Drive & Goldeneye Parkway

Table I-1: Eagle Canyon/La Posada and Pyramid Future Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Pyramid Way and Eagle Canyon Drive/La Posada Drive	**E**	**67.6**	**F**	**92.8**
Eastbound Approach	*F*	*96.3*	*F*	*120.9*
Left	E	74.9	E	75.8
Through	F	109.5	F	151.8
Right	Note 1	-	-	-
Westbound Approach	*E*	*70.1*	*F*	*100.2*
Left	F	85.8	F	139.1
Through	D	54.6	E	57.7
Right	E	55.1	E	58.8
Northbound Approach	*E*	*59.3*	*F*	*82.9*
Left	F	99.3	F	140.9
Through	C	25.8	D	44.8
Right	Note 1	-	-	-
Southbound Approach	*E*	*65.8*	*F*	*95.5*
Left	E	66.9	F	84.3
Through	F	65.7	F	96.4
Right	Note 1	-	-	-

Note 1. Unsignalized slip lane. Delay excluded from calculations of the approach delay and intersection delay.

Table I-2: Eagle Canyon and Ember/Neighborhood Future Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Ember Drive/Neighborhood Way and Eagle Canyon Drive	**F**	**214.4**	**C**	**23.7**
Eastbound Approach	*F*	*150.9*	*C*	*19.1*
Left-Through-Right	F	150.9	C	19.1
Westbound Approach	*F*	*306.0*	*D*	*28.8*
Left-Through	F	309.0	D	30.4
Right	A	4.7	A	3.9
Northbound Approach	*D*	*32.5*	*A*	*9.2*
Left-Through-Right	D	32.5	A	9.2
Southbound Approach	*C*	*19.5*	*B*	*11.9*
Left-Through	C	19.6	B	12.3
Right	C	15.1	A	9.2

Table I-3: Eagle Canyon and Alena Future Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Alena Way and Eagle Canyon Drive	**Note 1**	**-**	**-**	**-**
Eastbound Approach	*E*	*36.0*	*C*	*17*
Left	-	-	-	-
Through-Right	E	36.0	C	17
Westbound Approach	-	-	*F*	*325.5*
Left	-	-	F	355.5
Through-Right	F	50	D	25.5
Northbound Approach	-	*16.0*	-	*0.4*
Left	F	12.3	A	8.8
Through-Right	Note 2	-	-	-
Southbound Approach	-	*0.6*	-	*0.0*
Left	B	12.6	A	0.0
Through-Right	Note 2	-	-	-

Note 1. Overall intersection delay not calculated for two way stop controlled intersections.
Note 2. Uncontrolled approach with no conflicting movements. Movement delay not calculated.

Table I-4: Eagle Canyon and Goldeneye Future Intersection Level of Service

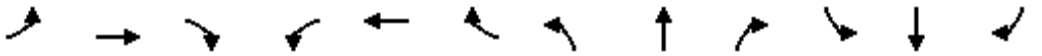
Intersection	AM Peak Hour		PM Peak Hour	
	Level of Service	Delay (sec)	Level of Service	Delay (sec)
Goldeneye Parkway and Eagle Canyon Drive	**Note 1**	**-**	**-**	**-**
Eastbound Approach	-	*0.2*	-	*0.2*
Left	A	7.8	A	8.5
Through-Right	Note 2	-	-	-
Westbound Approach	-	*4.1*	-	*0.6*
Left	B	10.2	A	7.7
Through-Right	Note 2	-	-	-
Northbound Approach	*F*	*472.4*	*B*	*13.4*
Through-Left-Right	F	472.4	B	13.4
Southbound Approach	*F*	*3771.8*	*C*	*22.9*
Through-Left-Right	F	3771.8	C	22.9

Note 1. Overall intersection delay not calculated for two way stop controlled intersections.
Note 2. Uncontrolled approach with no conflicting movements. Movement delay not calculated.

Appendix J Future LOS Synchro Report

HCM 6th Signalized Intersection Summary
2: SR 445 & Eagle Cyn. Dr./La Posada Dr.

06/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	77	124	639	386	328	70	324	387	122	135	895	55
Future Volume (veh/h)	77	124	639	386	328	70	324	387	122	135	895	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	127	205	0	638	542	116	535	639	0	223	1479	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	184	215		654	731	156	533	1612		371	1471	
Arrive On Green	0.05	0.12	0.00	0.19	0.26	0.25	0.16	0.46	0.00	0.11	0.42	0.00
Sat Flow, veh/h	3401	1841	1560	3401	2868	611	3401	3497	1560	3401	3497	1560
Grp Volume(v), veh/h	127	205	0	638	330	328	535	639	0	223	1479	0
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1700	1749	1731	1700	1749	1560	1700	1749	1560
Q Serve(g_s), s	5.2	15.6	0.0	26.3	24.4	24.6	22.1	17.0	0.0	8.8	59.3	0.0
Cycle Q Clear(g_c), s	5.2	15.6	0.0	26.3	24.4	24.6	22.1	17.0	0.0	8.8	59.3	0.0
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	215		654	446	441	533	1612		371	1471	
V/C Ratio(X)	0.69	0.95		0.98	0.74	0.74	1.00	0.40		0.60	1.01	
Avail Cap(c_a), veh/h	193	215		654	446	441	533	1612		371	1471	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	65.5	61.9	0.0	56.6	48.2	48.4	59.5	25.1	0.0	59.9	40.8	0.0
Incr Delay (d2), s/veh	9.4	47.7	0.0	29.2	6.4	6.7	39.9	0.7	0.0	7.0	24.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	10.1	0.0	13.8	11.4	11.4	12.3	7.0	0.0	4.1	29.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.9	109.5	0.0	85.8	54.6	55.1	99.3	25.8	0.0	66.9	65.7	0.0
LnGrp LOS	E	F		F	D	E	F	C		E	F	
Approach Vol, veh/h		332	A		1296			1174	A		1702	A
Approach Delay, s/veh		96.3			70.1			59.3			65.8	
Approach LOS		F			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.4	69.0	31.1	20.5	26.1	63.3	11.6	40.0
Change Period (Y+Rc), s	5.5	* 5.5	4.5	4.5	4.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	14.9	* 64	26.6	16.0	21.6	56.8	7.5	35.1
Max Q Clear Time (g_c+I1), s	10.8	19.0	28.3	17.6	24.1	61.3	7.2	26.6
Green Ext Time (p_c), s	0.3	15.1	0.0	0.0	0.0	0.0	0.0	4.5

Intersection Summary	
HCM 6th Ctrl Delay	67.6
HCM 6th LOS	E

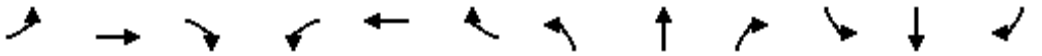
Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
2: SR 445 & Eagle Cyn. Dr./La Posada Dr.

06/10/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	177	116	451	295	124	669	1015	356	47	619	141
Future Volume (veh/h)	121	177	116	451	295	124	669	1015	356	47	619	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	200	292	0	745	487	205	1105	1677	0	78	1023	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	258	261		651	618	259	941	1773		133	967	
Arrive On Green	0.08	0.14	0.00	0.19	0.26	0.25	0.28	0.51	0.00	0.04	0.28	0.00
Sat Flow, veh/h	3401	1841	1560	3401	2403	1005	3401	3497	1560	3401	3497	1560
Grp Volume(v), veh/h	200	292	0	745	354	338	1105	1677	0	78	1023	0
Grp Sat Flow(s),veh/h/ln	1700	1841	1560	1700	1749	1660	1700	1749	1560	1700	1749	1560
Q Serve(g_s), s	8.1	20.0	0.0	27.0	26.5	26.8	39.0	64.0	0.0	3.2	39.0	0.0
Cycle Q Clear(g_c), s	8.1	20.0	0.0	27.0	26.5	26.8	39.0	64.0	0.0	3.2	39.0	0.0
Prop In Lane	1.00		1.00	1.00		0.61	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	261		651	450	427	941	1773		133	967	
V/C Ratio(X)	0.77	1.12		1.14	0.79	0.79	1.17	0.95		0.59	1.06	
Avail Cap(c_a), veh/h	280	261		651	450	427	941	1773		133	967	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.0	60.5	0.0	57.0	48.7	49.0	51.0	32.9	0.0	66.6	51.0	0.0
Incr Delay (d2), s/veh	11.8	91.3	0.0	82.1	8.9	9.8	89.9	11.9	0.0	17.7	45.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	15.9	0.0	18.9	12.6	12.2	27.8	28.3	0.0	1.7	22.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.8	151.8	0.0	139.1	57.7	58.8	140.9	44.8	0.0	84.3	96.4	0.0
LnGrp LOS	E	F		F	E	E	F	D		F	F	
Approach Vol, veh/h		492	A		1437			2782	A		1101	A
Approach Delay, s/veh		120.9			100.2			82.9			95.5	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	75.5	31.0	24.0	43.0	43.0	14.7	40.3
Change Period (Y+Rc), s	5.5	* 5.5	4.5	4.5	4.5	5.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	* 70	26.5	19.5	38.5	36.5	11.1	34.9
Max Q Clear Time (g_c+I1), s	5.2	66.0	29.0	22.0	41.0	41.0	10.1	28.8
Green Ext Time (p_c), s	0.0	3.9	0.0	0.0	0.0	0.0	0.1	3.6

Intersection Summary	
HCM 6th Ctrl Delay	92.8
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	214.4
Intersection LOS	F

Approach	EB	WB	NB	SB
Entry Lanes	1	2	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	1324	1351	178	38
Demand Flow Rate, veh/h	1377	1406	185	40
Vehicles Circulating, veh/h	53	287	1308	1549
Vehicles Exiting, veh/h	1536	1206	122	144
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	150.9	306.0	32.5	19.5
Approach LOS	F	F	D	C

Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.990	0.010	1.000	0.975	0.025
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	1377	1392	14	185	39	1
Cap Entry Lane, veh/h	1072	848	848	305	240	240
Entry HV Adj Factor	0.962	0.961	0.929	0.961	0.950	1.000
Flow Entry, veh/h	1324	1338	13	178	37	1
Cap Entry, veh/h	1030	815	787	294	228	240
V/C Ratio	1.285	1.641	0.017	0.606	0.162	0.004
Control Delay, s/veh	150.9	309.0	4.7	32.5	19.6	15.1
LOS	F	F	A	D	C	C
95th %tile Queue, veh	47	72	0	4	1	0

Intersection	
Intersection Delay, s/veh	23.7
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	2	1	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	697	1014	67	84
Demand Flow Rate, veh/h	724	1054	70	87
Vehicles Circulating, veh/h	172	37	792	1020
Vehicles Exiting, veh/h	935	825	104	71
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	19.1	28.8	9.2	11.9
Approach LOS	C	D	A	B

Lane	Left	Left	Right	Left	Left	Right
Designated Moves	LTR	LT	R	LTR	LT	R
Assumed Moves	LTR	LT	R	LTR	LT	R
RT Channelized						
Lane Util	1.000	0.940	0.060	1.000	0.885	0.115
Critical Headway, s	5.193	5.193	5.193	5.193	5.193	5.193
Entry Flow, veh/h	724	991	63	70	77	10
Cap Entry Lane, veh/h	951	1089	1089	512	407	407
Entry HV Adj Factor	0.962	0.961	0.968	0.957	0.960	1.000
Flow Entry, veh/h	697	953	61	67	74	10
Cap Entry, veh/h	916	1047	1054	490	391	407
V/C Ratio	0.761	0.910	0.058	0.137	0.189	0.025
Control Delay, s/veh	19.1	30.4	3.9	9.2	12.3	9.2
LOS	C	D	A	A	B	A
95th %tile Queue, veh	7	14	0	0	1	0

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	20	186	9	49	247	630	19	33	612	6
Future Vol, veh/h	0	0	20	186	9	49	247	630	19	33	612	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	79	38	78	56	72	80	85	53	83	79	50
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	86	391	26	112	506	1216	59	65	1270	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3737	3697	1280	3711	3678	1246	1290	0	0	1275	0	0
Stage 1	1410	1410	-	2258	2258	-	-	-	-	-	-	-
Stage 2	2327	2287	-	1453	1420	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	6.24	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	2	5	200	~ 2	~ 5	210	531	-	-	538	-	-
Stage 1	170	203	-	~ 54	76	-	-	-	-	-	-	-
Stage 2	49	73	-	~ 160	200	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	0	0	200	0	0	210	531	-	-	538	-	-
Mov Cap-2 Maneuver	0	0	-	0	0	-	-	-	-	-	-	-
Stage 1	8	178	-	~ 3	~ 4	-	-	-	-	-	-	-
Stage 2	-	3	-	~ 80	176	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36		16	0.6
HCM LOS	E	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	531	-	-	-	200	-	210	538	-	-
HCM Lane V/C Ratio	0.954	-	-	-	0.432	-	0.657	0.121	-	-
HCM Control Delay (s)	56.3	-	-	0	36	-	50	12.6	-	-
HCM Lane LOS	F	-	-	A	E	-	F	B	-	-
HCM 95th %tile Q(veh)	12.3	-	-	-	2	-	4	0.4	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	28.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	15	60	1	1	21	362	108	0	254	3
Future Vol, veh/h	0	1	15	60	1	1	21	362	108	0	254	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	250	-	-	100	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	25	54	75	25	25	75	88	77	92	76	38
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	7	46	131	7	7	46	675	230	0	548	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1444	1552	555	1463	1443	790	561	0	0	905	0	0
Stage 1	555	555	-	882	882	-	-	-	-	-	-	-
Stage 2	889	997	-	581	561	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.54	6.24	7.14	6.54	6.24	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.54	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4.036	3.336	3.536	4.036	3.336	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	109	112	527	~ 105	131	387	1000	-	-	743	-	-
Stage 1	513	510	-	338	361	-	-	-	-	-	-	-
Stage 2	335	319	-	496	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	99	107	527	~ 88	125	387	1000	-	-	743	-	-
Mov Cap-2 Maneuver	99	107	-	~ 88	125	-	-	-	-	-	-	-
Stage 1	489	510	-	322	344	-	-	-	-	-	-	-
Stage 2	308	304	-	447	507	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17	$ 325.5	0.4	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1000	-	-	-	353	88	189	743	-	-
HCM Lane V/C Ratio	0.046	-	-	-	0.148	1.491	0.069	-	-	-
HCM Control Delay (s)	8.8	-	-	0	17	$ 355.5	25.5	0	-	-
HCM Lane LOS	A	-	-	A	C	F	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5	10.2	0.2	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	622.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	144	142	52	64	17	32	15	189	75	19	1
Future Vol, veh/h	5	144	142	52	64	17	32	15	189	75	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	42	68	61	50	57	43	67	63	78	67	48	25
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	20	347	382	171	184	65	78	39	397	184	65	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	249	0	0	729	0	0	1173	1169	538	1355	1328	217
Stage 1	-	-	-	-	-	-	578	578	-	559	559	-
Stage 2	-	-	-	-	-	-	595	591	-	796	769	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1305	-	-	866	-	-	167	191	539	~ 125	154	818
Stage 1	-	-	-	-	-	-	498	498	-	510	508	-
Stage 2	-	-	-	-	-	-	487	491	-	378	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1305	-	-	866	-	-	82	151	539	~ 22	122	818
Mov Cap-2 Maneuver	-	-	-	-	-	-	82	151	-	~ 22	122	-
Stage 1	-	-	-	-	-	-	491	491	-	502	408	-
Stage 2	-	-	-	-	-	-	326	394	-	~ 90	402	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	4.1	$ 472.4	$ 3771.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	264	1305	-	-	866	-	-	29
HCM Lane V/C Ratio	1.95	0.015	-	-	0.197	-	-	8.795
HCM Control Delay (s)	$ 472.4	7.8	-	-	10.2	-	-	$ 3771.8
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	36.6	0	-	-	0.7	-	-	31.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	95	9	27	193	109	14	4	26	53	1	2
Future Vol, veh/h	2	95	9	27	193	109	14	4	26	53	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	4	169	16	48	344	194	25	7	46	94	2	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	538	0	0	185	0	0	725	819	177	749	730	441
Stage 1	-	-	-	-	-	-	185	185	-	537	537	-
Stage 2	-	-	-	-	-	-	540	634	-	212	193	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1020	-	-	1378	-	-	338	308	861	326	347	612
Stage 1	-	-	-	-	-	-	812	743	-	524	520	-
Stage 2	-	-	-	-	-	-	522	470	-	786	737	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1020	-	-	1378	-	-	325	296	861	294	333	612
Mov Cap-2 Maneuver	-	-	-	-	-	-	325	296	-	294	333	-
Stage 1	-	-	-	-	-	-	809	740	-	522	502	-
Stage 2	-	-	-	-	-	-	499	454	-	734	734	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.6	13.4	22.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	507	1020	-	-	1378	-	-	300
HCM Lane V/C Ratio	0.155	0.003	-	-	0.035	-	-	0.333
HCM Control Delay (s)	13.4	8.5	-	-	7.7	-	-	22.9
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	1.4