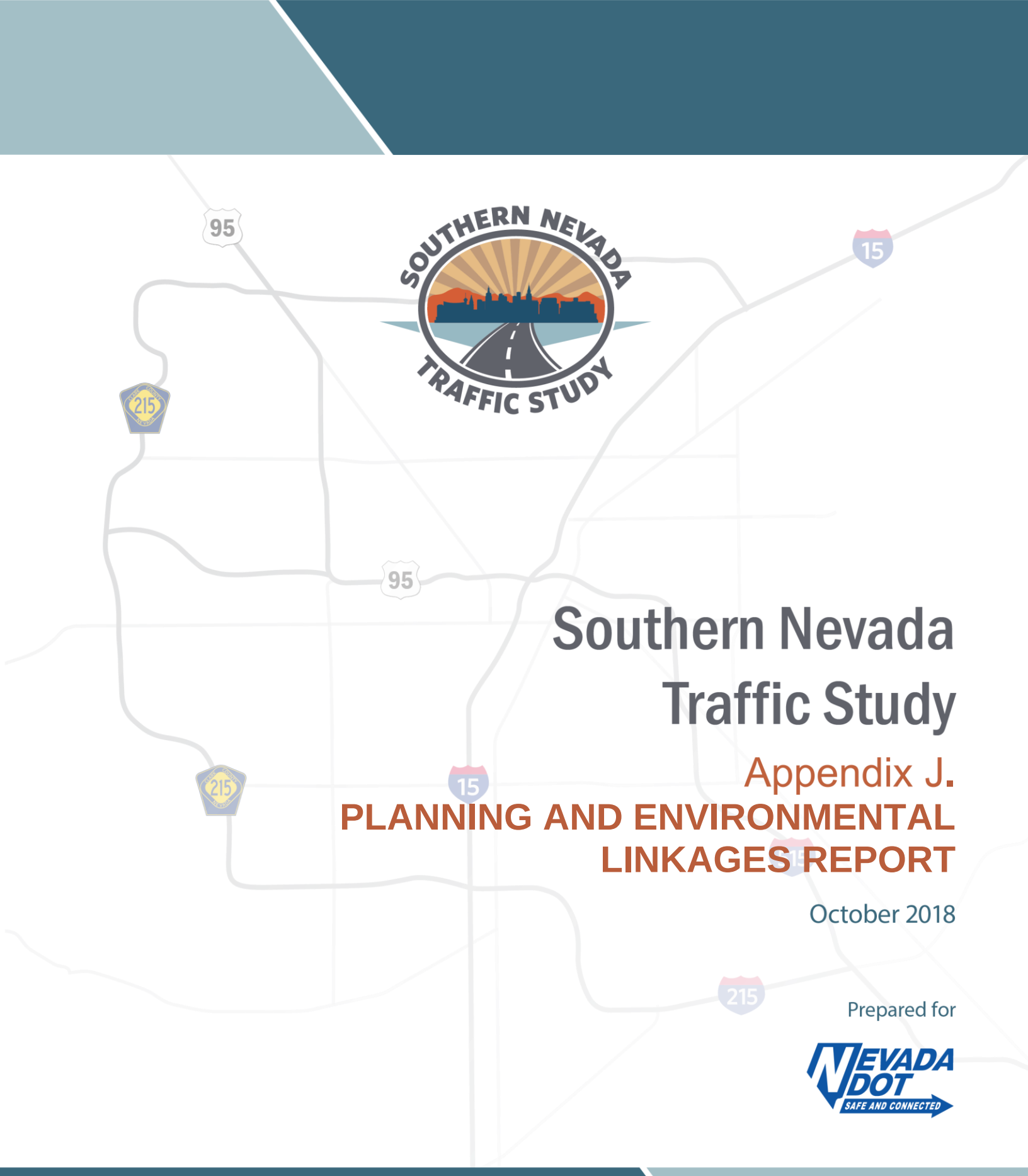


Southern Nevada Traffic Study

Appendix J.

PLANNING AND ENVIRONMENTAL LINKAGES REPORT

October 2018

Prepared for

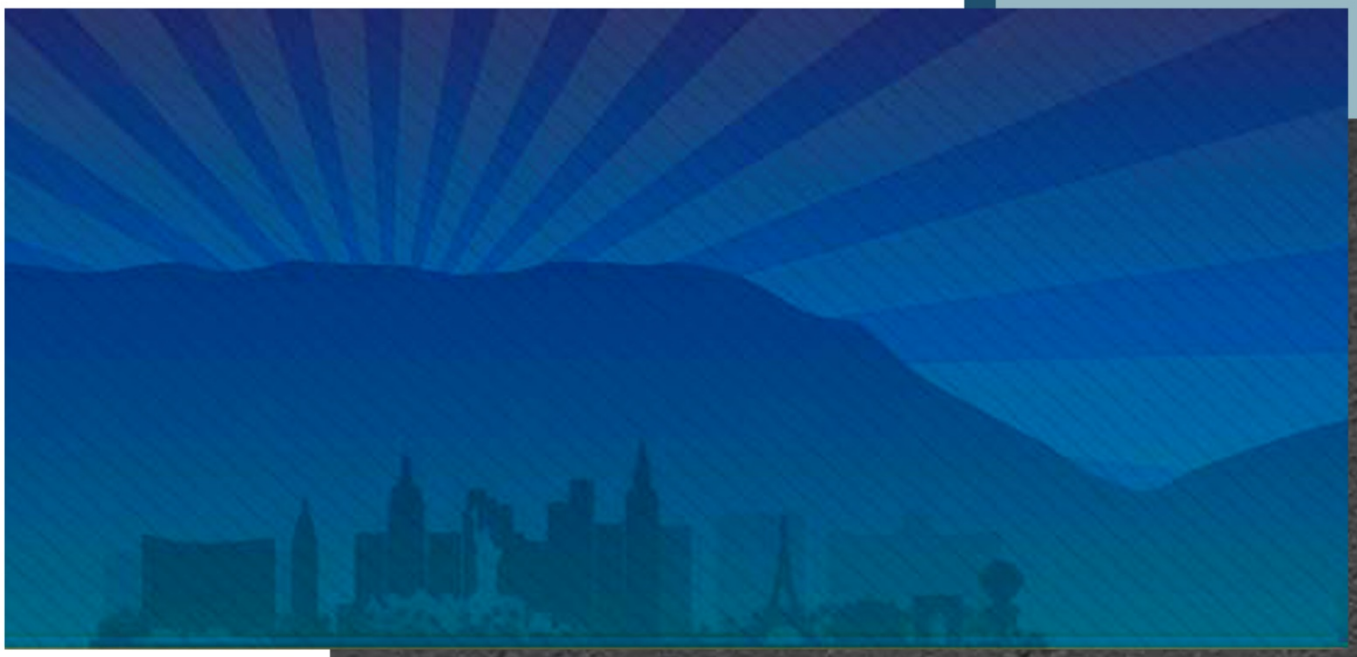
NEVADA DOT
SAFE AND CONNECTED

Prepared by HDR

SOUTHERN NEVADA TRAFFIC STUDY

PLANNING AND ENVIRONMENTAL LINKAGES REPORT

October 2018



NEVADA DOT

Prepared by HDR

in conjunction with
Jacobs and CA Group

Contents

Figures

Tables

Appendices

Acronyms and Abbreviations

Acronym or Abbreviation	Definition
ACS	American Community Survey
AGC	Associated General Contractors
AM	Ante Meridiem (before noon)
CC	Clark County
CE	Categorical Exclusion
CFR	Code of Federal Regulations
CMF	Crash Modification Factors
CO	Carbon Monoxide
DDI	Diverging Diamond Interchange
DEIS	Draft Environmental Impact Statement
DOI	United States Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment or Endangered Species Act
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	Geographic Information Systems
GP	General Purpose
HOV	High-Occupancy Vehicle
HUD	United States Department of Housing and Urban Development
I-	Interstate
MOVES	MOtor Vehicle Emission Simulator Model
mph	miles per hour
MSATs	Mobile Source Air Toxics
NDEP	Nevada Department of Environmental Protection

Acronym or Abbreviation	Definition
NDOT	Nevada Department of Transportation
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
PEL	Planning and Environmental Linkages
PM	Post Meridiem (after noon)
PM_{10}	Particulate matter less than ten microns in diameter
RTCSNV	Regional Transportation Commission of Southern Nevada
SHPO	State Historic Preservation Officer
SNTS	Southern Nevada Traffic Study
STIP	Statewide Transportation Improvement Program
TDM	Transportation Demand Model
TIP	Transportation Improvement Program
TSM	Transportation Systems Management
TUDI	Tight Urban Diamond Interchange
U.S. DOT	United States Department of Transportation
US or U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V/C	Volume to Capacity

Executive Summary

Introduction and Study Background

The Nevada Department of Transportation (NDOT) initiated the Southern Nevada Traffic Study (SNTS) that involved a system-wide traffic analysis for a majority of the freeway system in the Las Vegas Valley[1] in Clark County, Nevada (see Figure 8). NDOT conducted this Planning and Environmental Linkages (PEL) Study to develop and evaluate alternatives to address traffic and safety issues identified at three locations within the SNTS area. A PEL approach was used to evaluate these areas because it represents a collaborative and integrated approach that uses the information, analysis, and products developed during planning to inform the environmental review process. These areas were identified for a PEL Study because of their potential for future funding and environmental studies that are planned to be initiated for these locations. These areas (referred to as PEL Study Areas in this report) are listed below and shown on Figure 8.

- I-515 from Charleston Boulevard to I-215
- I-215/I-515 system interchange
- I-15/CC 215/I-215 system interchange

The Study team included the Federal Highway Administration (FHWA); NDOT; and the consultant team of HDR, Inc., Jacobs Engineering Group, and CA Group. As part of this PEL approach, the Study team developed a Purpose and Need statement, evaluated and screened improvement alternatives, and recommended alternatives for each of the three PEL Study Areas. The team also solicited public and agency input on the process and study findings. This PEL Study serves as the foundation for future National Environmental Policy Act (NEPA) studies that will be undertaken for the recommended alternatives.

Purpose and Need

A Purpose and Need statement is used in PEL and NEPA studies to articulate and focus on the specific problems to be addressed. The Purpose and Need of this PEL Study is to address existing and future traffic congestion issues in the PEL Study Areas while improving safety conditions. Based on the analysis conducted as part of the study, the three PEL Study Areas exhibit similar travel conditions and characteristics. These include existing congestion during peak travel hours, with congestion worsening considerably by 2040. Safety issues also have been identified in each of the PEL Study Areas, and are largely attributable to congested traffic conditions.

[1] The Las Vegas Valley metropolitan area includes the cities of Las Vegas, North Las Vegas, and Henderson, and the unincorporated towns of Summerlin South, Paradise, Spring Valley, Sunrise Manor, Enterprise, Winchester, and Whitney.

Figure 1: SNTS and PEL Study Areas

Environmental Conditions

The environmental conditions section in this PEL Study summarizes existing data collected for environmental resources within the PEL Study Areas that could influence or affect the development and evaluation of alternatives based on their likely presence. These included biological resources, environmental justice (EJ), floodplains, hazardous materials, historic resources and park/recreation facilities. This information helped inform the evaluation of alternatives summarized below. Notable resources in the PEL Study Areas include EJ

communities and historic resources along portions of I-515 and hazardous materials issues at the I-215/I-515 system interchange.

PEL Area Conditions

The PEL Study Areas experience congestion during peak travel hours caused by high traffic volumes, conflicting vehicle movements such as weaving and merging, and/or interchange configurations such as narrow ramps. By 2040, travel delays are expected to increase considerably and average speeds are forecasted to substantially decrease (see Table 1). In addition, PEL Study Areas have higher than average crash rates compared to Clark County averages.

Table 1: Existing and Baseline (2040) Average Travel Delay

PEL Study Area	Existing Delay (seconds)	Future Baseline Delay (seconds)	Percent Increase in Delay
I-515	8	51	537%
I-215/I-515 System Interchange	6	51	750%
I-15/I-215 System Interchange	5	25	400%

Alternatives Identification and Evaluation

To identify and evaluate alternatives within the PEL Study Areas, the Study team considered a range of reasonable improvements to meet the Purpose and Need of this PEL Study.

No-Action Alternative

A No-Action Alternative was established to serve as a baseline comparison for operational, safety, and environmental analysis purposes. It assumes completion of ongoing or reasonably foreseeable transportation, development, and infrastructure projects.

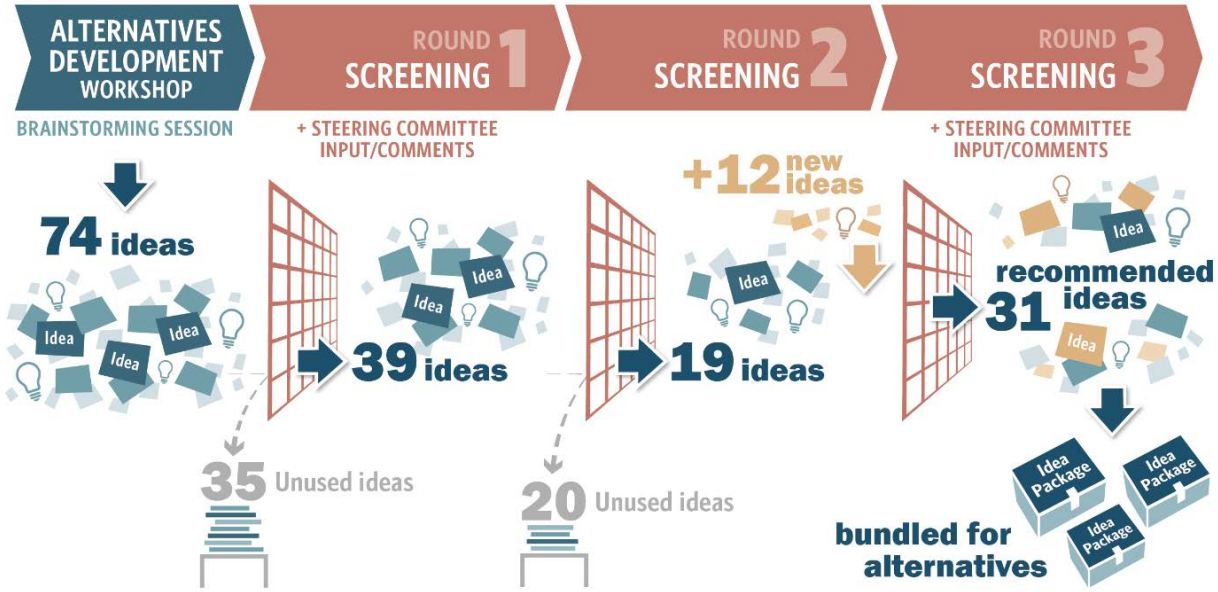
Alternatives Development and Evaluation

Traffic modeling was used to evaluate how each idea or alternative would affect traffic flow in the PEL Study Areas and, therefore, determine which alternatives would meet the Purpose and Need. Alternatives included corridor-wide ideas, such as providing additional capacity by adding lanes, and improvements at specific locations. The results of the traffic analysis presented in Chapter 2.0 clearly showed that each of the PEL Study Areas will exceed capacity by 2040. Under the 2040 Baseline traffic network condition, the extent of the congestion was so extreme that more localized improvements would not measurably provide the needed congestion relief. Because of the need for additional capacity along the entire SNTS network, the Study team began the alternatives design process by adding one lane in each direction to the traffic model for all of the SNTS corridors. This allowed the traffic model to attract so-called latent traffic that was not using the interstate because of its congested condition. This “Build” scenario allowed the traffic model to better show future traffic movements and specific problem locations. In turn, this allowed designers to develop ideas beyond capacity improvements that would mitigate

congestion. These other ideas formed the basis for the alternatives analysis. Despite this alternatives analysis building on the Build scenario, the improvements identified do not necessarily depend or rely on an additional general purpose (GP) lane. Therefore, the range of alternatives for the PEL Study Areas encompassed one additional GP lane in each direction, interstate auxiliary lanes, interchange reconfigurations, new interchange ramps, and concepts such as eliminating left turns at ramp terminals and providing opportunities for U-turns. Also, Transportation Systems Management approaches, including ramp metering, were considered. The Study team determined that the additional GP lane could be used as a high-occupancy vehicle (HOV) or express lane in the future, but it was modeled as a GP lane.

Alternatives were carried through three levels, or rounds, of screening, with each successive round involving further detail, refinement, and screening (i.e., identifying alternatives to eliminate or advance to the next round) to arrive at a set of recommended alternatives for each PEL Study Area (see Figure 2).

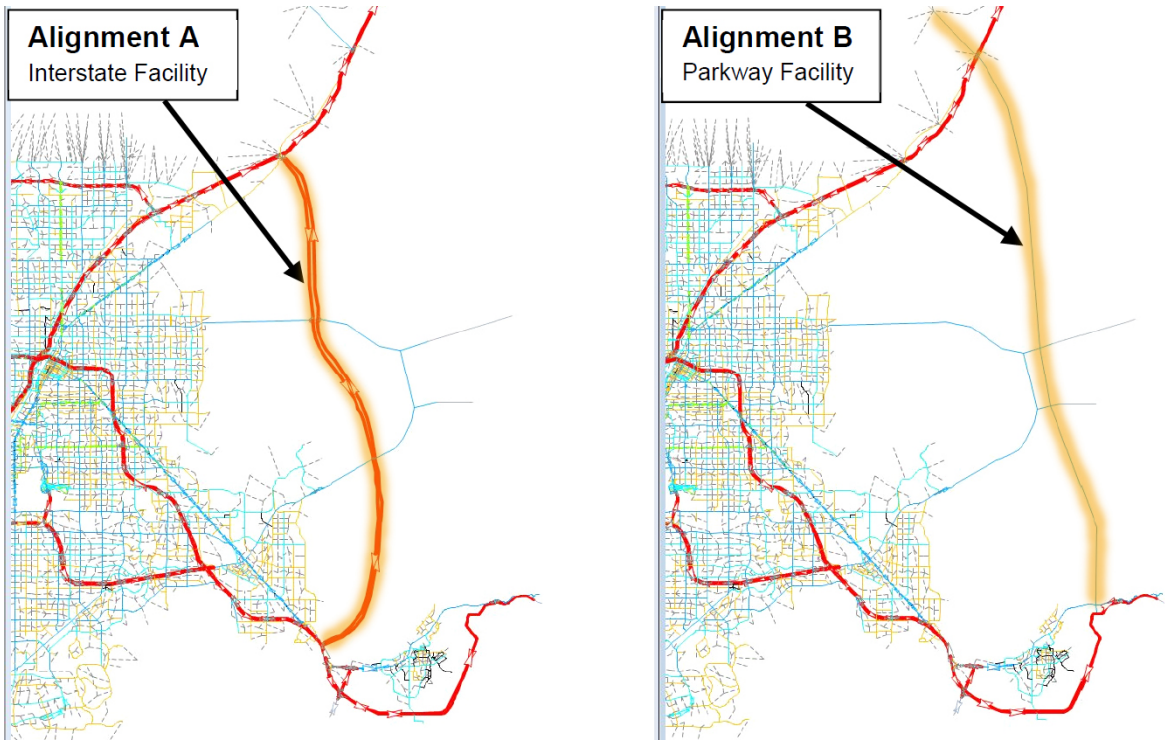
Figure 2: Alternatives Development and Screening Process



Eastern Bypass Alternatives

Two potential alignments for an eastern bypass alternative were evaluated that would connect I-15 to the northeast and I-515 or US 93 to the southeast of the Las Vegas metropolitan area. The analysis confirmed that a future eastern bypass would have considerable capacity to accommodate more traffic. However, a future eastern bypass would not result in sizeable congestion relief in the PEL Study Areas and, therefore, not address the Purpose and Need. Therefore, this alternative was eliminated from further consideration.

Figure 3: Eastern Bypass Alternatives



Round 1 Evaluation

The Round 1 evaluation was based on five criteria: mainline operations, local operations, maintainability, construction impacts, and environmental impact. Ideas were added to the traffic model individually, and results at a network level were reviewed in comparison to Baseline conditions. Each idea was assigned a rating between 0 and 3 for each of these criteria. Ideas that scored 0 or 1 were eliminated and remaining ideas were advanced to Round 2. Alternatives evaluated and screening results are listed in Table 5.

Table 2: Round 1 Screening Results

PEL Study Area	Alternatives Considered	Screening Results
I-515 Corridor	Add one GP lane in both directions	Advanced to Round 2
	Add auxiliary lanes in each direction	Advanced to Round 2 as standalone alternatives
	Add ramp metering	Eliminated
I-15/CC 215/I-215 System Interchange	Add one GP lane in both directions	Advanced to Round 2
	Ramp improvements	Advanced to Round 2
	Add ramp to Decatur Avenue	Advanced to Round 2 as a design consideration
	Add HOV flyover	Eliminated, but will be considered as part of a long-term HOV study
I-215/I-515 System Interchange	Add one GP lane in both directions	Advanced to Round 2
	Remove local traffic from through interstate traffic	Advanced to Round 2
	Reconfigure interchange	Advanced to Round 2

Round 2 Evaluation

Round 2 focused on differentiating alternatives based on their ability to meet the Purpose and Need and, therefore, focused on two criteria—mainline and local operations. Ideas were combined into sets, or a package of ideas for each PEL Study Area, largely based on alternatives that complement each other. This process also generated new ideas to include in some of the packages. Each alternative was rated based on the criteria of mainline operations and local operations, and assigned a numerical score between 1 to 10. In general, alternatives found to not be effective at reducing corridor congestion at a network level were discarded. Those that produced the highest overall positive benefits were advanced to Round 3. Alternatives evaluated and screening results are listed in Table 3.

Table 3: Round 2 Screening Results

PEL Study Area	Alternatives Considered	Screening Results
I-515 Corridor	Add one GP lane in both directions	Advanced to Round 3
	Add auxiliary lanes between Tropicana Avenue and Russell Road	Advanced to Round 3
	Add auxiliary lanes between Auto Show Road and Russell Road plus two-lane Auto Show northbound on-ramp	Advanced to Round 3
	Join Flamingo Road southbound on ramps plus braid with Tropicana Avenue dual off ramp	Advanced to Round 3
I-15/CC 215/I-215 System Interchange	Add one GP lane in both directions	Advanced to Round 3
	Ramp improvements (unchanged from Round 1)	Advanced to Round 3
	Add ramp to Decatur Avenue (unchanged from Round 1)	Advanced to Round 3 as a design consideration
I-215/I-515 System Interchange	Add one GP lane in both directions	Advanced to Round 3
	Remove local traffic from through interstate traffic	Advanced to Round 3
	Reconfigure interchange	Eliminated
	Free flow alternative combining ramp improvements and ramp “braiding” (adding a lane to most of the direct connect ramps and modifying location for on and off ramp merge/diverge areas to eliminate weaving)	Advanced to Round 3

Round 3 Evaluation

The Round 3 screening was conducted by subjecting the packages of ideas to refined review and assessment based on more detailed design, and considered the following three criteria:

- An assessment of the long-term maintainability of the transportation facility.
- A review of construction impacts based on developing conceptual layouts at the 10 percent level of design; and
- Review of environmental resources using geographic information system (GIS) mapping.

Although not considered in the ratings, crash modification factors were developed for specific improvement types and considered. Each package or alternative was assigned a numerical score between 1 and 10. Alternatives evaluated and screening results are listed in Table 4.

Table 4: Round 3 Screening Results

PEL Study Area	Alternatives Considered	Screening Results
I-515 Corridor	• Add one GP lane in both directions • Add auxiliary lanes between Tropicana Avenue and Russell Road • Add auxiliary lanes between Auto Show Road and Russell Road plus two-lane Auto Show northbound on-ramp • Join Flamingo Road southbound on ramps plus braid with Tropicana Avenue dual off ramp	Each alternative scored well and they were packaged into one alternative. The alternative was determined to substantially reduce congestion, reduce average travel delay in 2040 from 51 seconds to 8 seconds, and result in decrease of 75 crashes per year through 2040.
I-15/CC 215/I-215 System Interchange	• Widen CC 215 eastbound to I-15 northbound ramp from one to two lanes • Widen the I-15 northbound/Las Vegas Blvd. to CC 215 westbound ramp from one to two lanes.	Each alternative scored well and they were packaged into one alternative. The alternative was determined to reduce travel delay in 2040 from 25 seconds to 8 seconds, and result in decrease of 34 crashes per year through 2040.
I-215/I-515 System Interchange	Alternatives advanced from Round 2 were combined into two alternative packages based on their compatibility and how they complemented each other: • Alternative 1 o Ramp braiding o Additional lanes on select ramps • Alternative 2 o Modified rotary o Separation of local and freeway movements	Although not part of the rating criteria, safety benefits were evaluated, and differ between the alternative packages. While Alternative 1 would result in three fewer crashes per year up to 2040 compared to the Build condition, Alternative 2 would result in 44 fewer crashes in that timeframe. Southbound congestion increases from moderate to severe by end of evening peak period. Congestion at interchange is linked to weaving maneuvers.

Preferred Alternatives

The outcome of Round 3 was the identification of Preferred Alternative packages for I-515 and the I-15/CC 215/I-215 system interchange. Two alternative packages were identified for the I-215/I-515 system interchange. Figure 4 through Figure 7 show these packages. As noted on the figures, the proposed alternatives feature varied combinations of the following types of improvements:

- Braided ramps are grade-separated ramps that preclude traffic merging conflicts.
- Ramp augmentations include lane widening, dual and/or extended turn lanes, and other improvements.
- Direct connect ramps are dedicated ramps for HOV lanes connecting HOV lanes through a system interchange.

- Collector distributor roads are extra lanes between the freeway mainline and the arterial system.
- Auxiliary lanes provide an extra lane between interchanges to improve traffic operations.

Figure 4: I-515 Corridor Preferred Alternative

Figure 5: I-15/CC 215/I-215 System Interchange Preferred Alternative

Figure 6: I-215/I-515 System Interchange Alternative 1

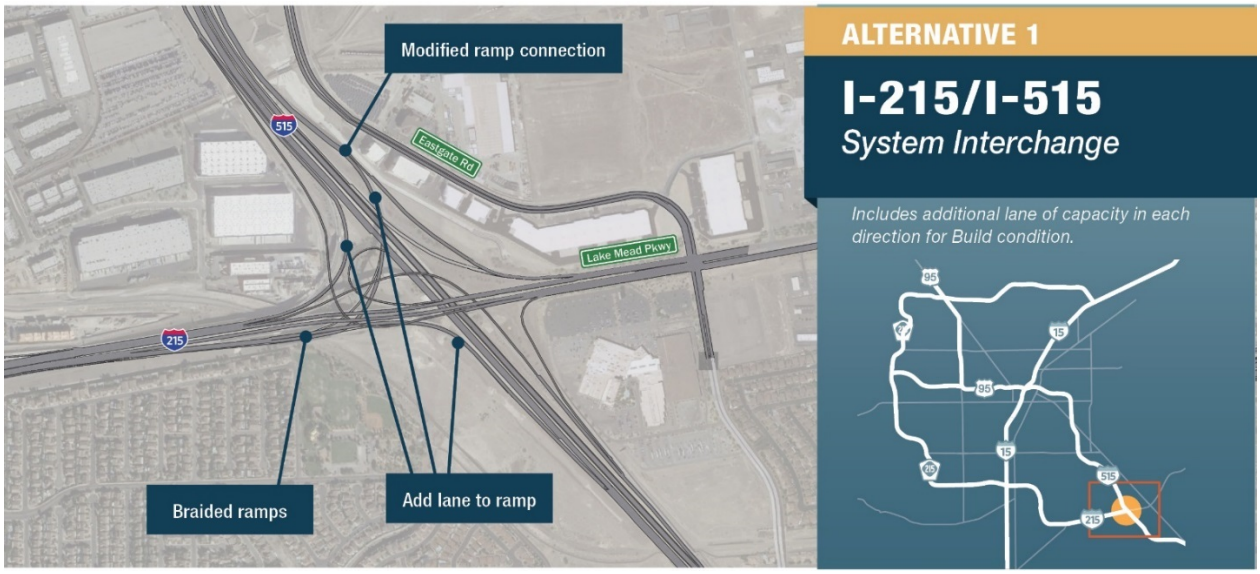
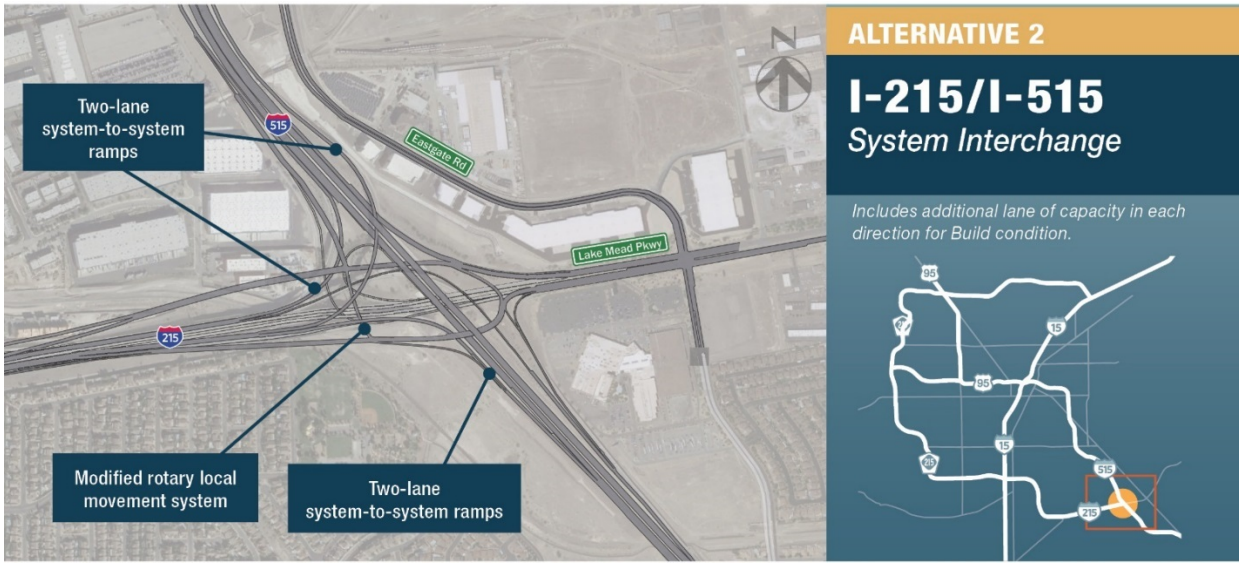


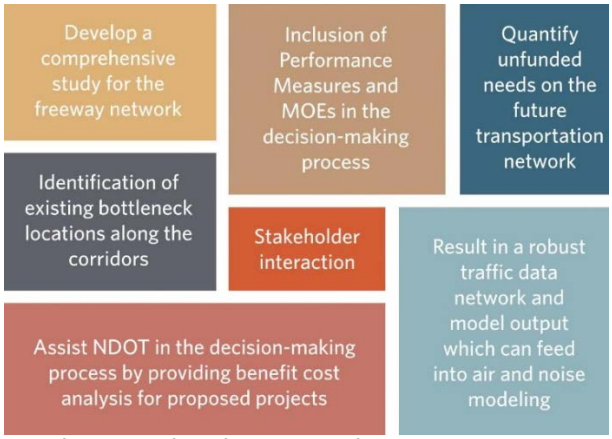
Figure 7: I-215/I-515 System Interchange Alternative 2



Agency Coordination and Public Involvement

NDOT conducted agency, stakeholder, and public outreach for this PEL Study in conjunction with the SNTS to obtain input on issues and needs within the PEL Study Areas. NDOT sent scoping letters in June 2018 to several local, state, and federal resource agencies to obtain their input on any issues or concerns to be considered in this PEL Study (see Appendix C). The United States (U.S.) EPA responded with recommendations for interagency review processes; identifying logical termini and independent utility; identifying future NEPA analyses; the alternatives development and evaluation process; and environmental resources to consider. The Federal Aviation Administration (FAA) responded and voiced no issues or concerns.

A Steering Committee was formed to provide guidance and oversight throughout the course of the study. Committee members included representatives from FHWA; RTCSNV; Clark County; and the cities of Las Vegas, North Las Vegas, and Henderson. The Committee met seven times, typically in half-day workshops, to review the study progress and provide valuable feedback on issues, goals, and projects to be considered.



Steering Committee input on goals

An information booth for this PEL Study was staffed in conjunction with a public meeting held on August 22, 2018 for the I 515

Restripe Slip Ramp at SR 564 and CC 215 project. The NDOT SNTS Project Manager provided attendees with information about this PEL Study, Purpose and Need, alternatives, and a comment form, and discussed the Study with several attendees. In addition, a PEL Study website was established (www.ndotsnts.com) that provided information about the PEL Study, process, and alternatives. The website also announced the public meeting information booth, and provided members of the public the opportunity to provide comments about the Study. No public comments were received at the public meeting or through the website.

Next Steps and Implementation

This PEL Study recommended alternatives for the PEL Study Areas to address the congestion and safety issues identified in those areas. As NDOT identifies funding for the alternatives, projects will advance through project development, which includes NEPA studies and design, right-of-way, and construction phases.

National Environmental Policy Act Process

As NDOT initiates project development, it will coordinate with FHWA to determine environmental clearance requirements under NEPA. In this PEL Study, an environmental analysis was conducted at the planning level based on existing mapping and environmental resource data. As such, future NEPA studies will require more detailed analyses of environmental resources that could be impacted by the projects as they are implemented.

Independent Utility and Logical Termini

Before advancing a project identified in the PEL into project development, NDOT must demonstrate to FHWA that each improvement project has independent utility and logical termini. The purpose of determining independent utility is to confirm that each improvement project is able to operate independent of other projects. The term “logical termini” is related to independent utility and is defined as the rational end points for a transportation improvement (the project limits) and the rational end points for assessing environmental impacts.

1.0 Introduction and Study Background

The Nevada Department of Transportation (NDOT) initiated the Southern Nevada Traffic Study (SNTS) to provide a system-wide traffic analysis for a majority of the freeway system in the Las Vegas Valley[2] in Clark County, Nevada (see Figure 8).

Figure 8: SNTS and PEL Study Areas

[2] The Las Vegas Valley metropolitan area includes the cities of Las Vegas, North Las Vegas, and Henderson, and the unincorporated towns of Summerlin South, Paradise, Spring Valley, Sunrise Manor, Enterprise, Winchester, and Whitney.

As part of the SNTS, NDOT used a Planning and Environmental Linkages (PEL) approach for the three locations within the SNTS area listed below (referred to as PEL Study Areas in this report) (see Figure 8). These areas were evaluated in this PEL Study because of their potential for future funding and environmental studies that are planned to be initiated for these locations.

- I-515 from Charleston Boulevard to I-215
- I-215/I-515 system interchange
- I-15/CC 215/I-215 system interchange

The purpose of this PEL Study is to identify, evaluate, and prioritize future projects to address traffic congestion at the three PEL Study Areas.

The Study team, which included the Federal Highway Administration (FHWA); NDOT; and the consultant team of HDR, Jacobs, and CA Group, used the PEL approach because it represents a collaborative and integrated approach that uses the information, analysis, and products developed during planning to inform the environmental review process. Use of PELs is promoted by FHWA, largely to integrate environmental issues and public involvement with project planning, and to shorten the time required to take projects from planning to implementation. The PEL process identifies and considers environmental constraints early in the planning process. The process also involves soliciting input and feedback from public and agency stakeholders to inform the PEL analyses and results. Recommendations made as part of this PEL Study could be readily carried forward into more detailed National Environmental Policy Act (NEPA) studies when projects move into that phase of planning. More information on PELs can be found at FHWA's PEL website (https://www.environment.fhwa.dot.gov/env_initiatives/pel.aspx).

This PEL Study serves as the foundation for future NEPA studies. The PEL approach used for this Study involved:

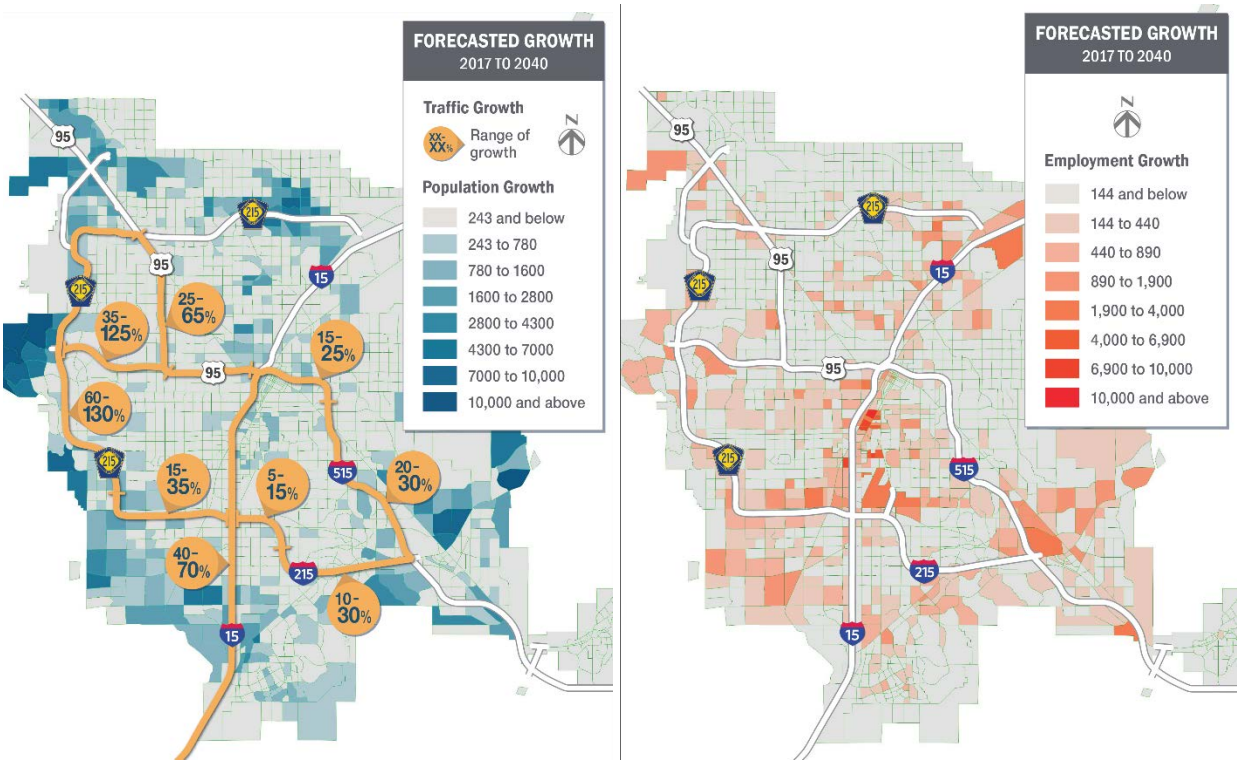
- Collecting and mapping existing data on select environmental resources;
- Outlining the Purpose and Need for the PEL areas using results of the SNTS analysis;
- Conducting fatal-flaw analysis for alternatives developed for PEL areas;
- Conducting more detailed-analysis for remaining alternatives;
- Recommending alternatives to carry forward into future NEPA studies;
- Soliciting and considering feedback from agencies and the public on the Purpose and Need, alternatives analysis, and recommendations.

1.1 Study Background

Population growth in the Las Vegas Valley and unincorporated Clark County over the last several decades has increasingly worsened traffic congestion on the area's freeway system. Transportation infrastructure investments are currently under construction to increase capacity

at the I-15/I-515 interchange and along certain freeway segments, but other portions of the system remain congested. Population increases and development expansion in the Regional Transportation Commission of Southern Nevada (RTCSNV) planning area, which includes the Las Vegas Valley, are projected to continue. Based on RTCSNV's 2014 Regional Travel Demand Model (TDM) projections, the area's population is expected to grow from approximately 2.1 million people in 2017 to over 2.8 million in 2040. As shown on Figure 9, population growth is projected to largely occur on the outskirts of the metropolitan area, while employment growth is projected to occur mostly along the freeway corridors, including central I-15.

Figure 9: Population and Employment Growth Projections, Year 2017 to 2040



Source: RTCSNV 2014 Regional Travel Demand Model, 2016. Year 2017 values were estimated from the 2015 and 2020 models based on a straight-line growth pattern

Recognizing that corridor improvements affect overall traffic patterns on the entire system, and in order to address the growing congestion in other parts of the freeway system, NDOT commissioned the SNTS in 2016 to analyze traffic at a system-wide level, and this PEL Study for the three locations within the SNTS area described earlier. As noted above, NDOT is taking a PEL approach for these three areas because of its intent to initiate future studies in these areas.

1.2 Planning Context

Over the past decade, several transportation-related studies and plans have been prepared that include or are related to the three PEL areas. These documents provide a broader context for

the transportation issues and potential solutions within these areas. Table 5 briefly describes these studies and plans, and how they inform or impact this Study

Table 5: Summary of Previous and Current Transportation Plans and Studies

I-515 Preliminary Draft Environmental Impact Statement (DEIS), 2009, NDOT
Purpose: Assessed impacts of several transportation alternatives to reduce congestion, enhance safety, and improve the performance of the entire I-515 corridor. The preliminary DEIS was never finalized.
Relation to Southern Nevada Traffic Study PEL Report: he alternatives evaluated in the preliminary DEIS included construction of additional lanes and interchanges, local street improvements, reconstruction of the Downtown Las Vegas Viaduct (between N. Eastern Avenue and W. Mesquite Avenue), installation of a Freeway Management System and express lanes, and reconstruction and extension of pedestrian and bicycle facilities along I-515. The PEL Study team used relevant environmental data in the DEIS in the preliminary data collection and analysis for this PEL Study.
Corridor Concept Report, I-11 and Intermountain West Corridor Study ,2014, NDOT and Arizona Department of Transportation (ADOT)
Purpose: Established a vision statement, provided justification, and developed concepts for a new high-capacity, multimodal transportation corridor through Arizona and Nevada. The study used the PEL approach to identify design concepts, and recommended three alternatives for a new corridor within the Las Vegas area for further study.
Relation to Southern Nevada Traffic Study PEL Report: Recommendations from this study included (1) a new corridor on the east side of the valley in combination with CC 215 Northern Beltway, (2) a new corridor along I-515/US 95 through the center of the valley, and (3) co-location with I-215/CC-215 Southern and Western Beltway.
City of Las Vegas, I-515 and Charleston Boulevard Interchange Alternatives Feasibility Study, 2015, City of Las Vegas
Purpose: Evaluated potential alternatives and provided recommendations for improvements at the I-515 and Charleston Boulevard interchange, and 0.75 mile along Charleston Boulevard from Honolulu Street to Lamb Boulevard. An environmental assessment (EA) is in progress that will identify the preferred interchange improvements, along with other improvements within and near the Study Area.
Relation to Southern Nevada Traffic Study PEL Report: Recommended two interchange improvement options: • Tight Urban Diamond Interchange (TUDI) • Diverging Diamond Interchange (DDI) These interchange and other associated improvements are included in the base future conditions for this PEL Study.
Southern Nevada HOV Plan, 2007 (Rev. 2015), NDOT
Purpose: Assessed the effectiveness of constructing high-occupancy vehicle (HOV) lanes in the Las Vegas metropolitan area to alleviate future traffic congestion. The plan was updated in 2015 to include changes in the RTCSNV's Regional TDM, updates to NDOT's *Managed Lanes and Ramp Metering Manual*, short- and long-term HOV recommendations, and an HOV system operational plan.
Relation to Southern Nevada Traffic Study PEL Report: The plan recommends one HOV lane in each direction along the I-515 corridor for the long term (i.e., beyond 2025).
Southern Nevada Strong Regional Plan, 2015, RTCSNV
Purpose: Developed regional support under this regional planning and visioning effort for long-term economic success and stronger communities by integrating reliable transportation, quality housing for all income levels, and job opportunities throughout Southern Nevada. The plan outlines valley-wide goals grouped under three focus areas: 1) improving economic competitiveness and education, 2) investing in complete communities, and 3)

Table 5: Summary of Previous and Current Transportation Plans and Studies

increasing transportation choice. The plan presents a "Vision Map" that conceptually illustrates how the regional vision can be implemented through coordinated land use and transportation planning.

Relation to Southern Nevada Traffic Study PEL Report: The plan recommends several opportunity sites, including Maryland Parkway (between McCarran International Airport and Charleston Boulevard), which is closest to the I-515 corridor. The plan does not have a direct impact on this PEL Study, but its general recommendations and vision are noted.

Southern Nevada Regional Goods Movement Master Plan, 2015, RTCSNV

Purpose: Provided a snapshot of the region's freight transportation system, a forecast of future freight demand, and recommendations to address regional freight deficiencies.

Relation to Southern Nevada Traffic Study PEL Report: The plan lists the following locations as major obstacles to truck movements:

- Freeway-to-Freeway System Interchange Obstacle Areas:
  - I-15/CC 215 (Northern Beltway) interchange: Difficult movement from I-15 north to CC 215 west
  - I-15/I-215 Interchange: Congestion and merging traffic from I-215 east to I-15 north, I-15 north to I-215 west, and I-15 south to I-215 east
  - I-215/I-515 Interchange: Narrow southbound lane on I-515, merging to I-215 west difficult.
- Oversize Vehicle Obstacle Areas:
  - I-515/Charleston Boulevard Interchange: Ramp difficult for truck access.
- The plan also notes that northbound I-515 at the Charleston Boulevard curve is an area of high unreliability (recurring congestion), contributing to the overall congestion of the I-515 corridor.

Plan improvement recommendations to mitigate truck obstacles that fall within the SNTS PEL areas:

- Construct system-to-system direct connector HOV ramps between I-15 and I-215 (Southern Beltway).
- Conduct NEPA process and preliminary engineering on improvements to I-515, Charleston Boulevard to US 95 at Rancho Drive.
- Construct diverging diamond interchange at I-515 and Charleston Boulevard.
- Widen I-515 from Charleston Boulevard to I-15/Spaghetti Bowl interchange to ten lanes, including HOV lanes and new interchanges at Pecos Road and F Street.
- Construct new ramps to complete a system-to-system interchange at I-15/CC 215 (Northern Beltway).
- Construct system-to-system interchange at I-15 and CC 215; widen CC 215 to six lanes.
- Improve I-215/CC 215 at the I-15 interchange to correct congestion and merging traffic from I-215 to I-15 north (auxiliary lane to north of Russell), I-15 north to I-215 west, and I-15 south to I-215 east.
- Improve I-215/I-515 interchange to improve capacity on southbound I-515 to westbound I-215 ramp, and the subsequent merge onto westbound I-215.

Vision 2045 Downtown Las Vegas Master Plan, 2016, City of Las Vegas

Purpose: Provided an overall vision, policy direction, and implementation strategy that support the ongoing recovery and revitalization of downtown Las Vegas. The Master Plan is one of several products of the City by Design initiative – a citywide planning effort focused on the revival of downtown Las Vegas. The Master Plan focuses on three areas: land use and community development, mobility and sustainability, and economic development and strategic planning. The planning process included six planning stages: 1) inventory and analysis, 2) vision plan, 3) alternative master plan concepts, 4) preferred master plan scenario, 5) draft implementation strategy, and 6) final master plan documentation. The Master Plan was adopted by the City Council (Resolution R-25-2016) in June 2016.

Relation to Southern Nevada Traffic Study PEL Report: The plan notes heavy traffic and congestion occurring along the I-515 corridor near downtown, as well as along Charleston Boulevard and Las Vegas Boulevard, as issues facing downtown revitalization and calls for related infrastructure improvements.

Table 5: Summary of Previous and Current Transportation Plans and Studies

2040 Regional Transportation Plan (RTP), 2017, Regional Transportation Commission (RTCSNV)
Purpose: Identified the transportation investments needed within the region through 2040. A 20-year long-range plan for the transportation system in Southern Nevada, the current RTP was approved in 2017.
Relation to Southern Nevada Traffic Study PEL Report: The RTP lists projects within the PEL Study Area, including: • I-515 Auxiliary Lanes and SR 159 Charleston Boulevard Improvements: Construct intersection improvements at I-515/Charleston and Auxiliary lanes in fiscal year (FY) 2017-2020. • SR 159 Turn Lane Intersection Improvements Charleston Boulevard: Intersection improvements including trip and dual lefts, exclusive and dual rights, and bus turnouts. • I-15, CC 215, and Tropical Interchange: Completion of the 4th leg of the I-15 and CC 215 interchange to include a Tropical Parkway connection and additional roadway improvements on Tropical to Linn and on Linn to El Campo Grande in FY 2017-2021. • I-15/CC 215 System-to-System Interchange: Construct new ramps to complete a system-to-system interchange at I-15/CC 215 in FYI 2017-2030.
Statewide Transportation Improvement Program (STIP), 2018, 2018-2022, NDOT (at https://estip.nevadadot.com/)
Purpose: NDOT administers and implements programs for the planning, development, construction, and operation of the state's transportation system. NDOT develops an annual Statewide Transportation Improvement Program (STIP) covering all areas of the state (NDOT 2018). The STIP is used to implement the plans resulting from the statewide transportation planning process.
Relation to Southern Nevada Traffic Study PEL Report: The STIP lists projects within the PEL Study Area, including I-515/Charleston Boulevard Interchange and Auxiliary Lane Improvements, I-515 MSE Wall Rehabilitation Viking Grade Separation, I-515 Bridge/Viaduct Maintenance, Project NEON, I-515 Restripe Slip Ramp at SR 564 & CC 215, I-215 Sidewalk Reconstruction and ADA Ramps, I-215 Regional Trail Connectivity, I-15 Mill and Surface Starr Interchange, I-15 Harmon and Hacienda HOV Ramps, CC 215 Bike and Pedestrian Trail, and Centennial/Sky Point/Oso Blanco Local Access, and I-515 NEPA projects.

1.2.1 Planned Projects Near PEL Areas

Some capacity improvements identified in RTCSNV's regional long range plan (Access 2040 Regional Transportation Plan for Southern Nevada 2017-2040) (RTCSNV 2017 amended 2018) and other planned improvements identified in NDOT's Southern Nevada HOV [High-Occupancy Vehicles] Plan (NDOT 2015) are located in or near the PEL Study Areas. These projects are listed in Table 6.

Table 6: Planned Projects Near SNTS PEL Study Areas

Freeway	Estimated Completion	2040 Project / Improvement	Long Range Plan
I-15	2025	Project Neon - I-15 Express Lanes - Conversion to HOV/General Purpose (GP) Lanes	Access 2040
I-15/I-215	2035	HOV Direct Connect Ramps - I-15 HOV lanes (north of interchange) to/from I-215 GP (east of interchange)	Southern Nevada HOV Plan
I-15/CC 215	2035	HOV Direct Connect Ramps - I-15 HOV lanes (north of interchange) to/from CC 215 GP (west of interchange)	Southern Nevada HOV Plan

2.0 Transportation Conditions and Needs

This chapter documents existing and future traffic conditions for the PEL Study Areas. In so doing, it describes the transportation needs to be addressed by the alternatives evaluated as part of this PEL Study. Identifying traffic conditions involved traffic modeling to identify existing and future congestion issues and analysis of crash statistics.

2.1 Methods

2.1.1 Traffic Modeling Approach

Traffic modeling for the PEL corridors was conducted using a so-called “microscopic” level of analysis Aimsun Next traffic simulation software to document existing and future congestion conditions and to identify and develop project alternatives. This software included features such as tracking individual vehicle movements; quantifying individual movements; assessing overall traffic delay; and determining queue lengths for freeways, ramps, and intersections. The existing year conditions model was developed and calibrated using FHWA and NDOT guidelines.

Existing conditions were based on year 2017, and forecasts used year 2040. Model runs were performed with the RTCSNV 2040 travel demand model to project future levels of demand and traffic congestion for the Las Vegas roadway system. NDOT and the Steering Committee directed the Study team to develop a “Baseline” network, similar to a No-Action network. Baseline or No-Action conditions reflect projects that would occur without implementing any of the alternatives evaluated in this PEL Study.

For the overall SNTS, the size of the roadway network under study required specific approaches to traffic modeling in order to analyze and understand future traffic needs. Modeling adjustments were made for the Baseline network to remove some capacity constraints at the interchanges to more accurately represent future interchange traffic. Under a No Build scenario that assumes existing conditions plus only committed improvements, the Aimsun Next modeling indicated that the high traffic volume demand in the future is constrained by the capacity limitations of the interchanges to access the freeway. In other words, the limitations of unimproved intersections limit the amount of traffic that can flow to the mainline corridors. The result of this is a metering effect; the level of traffic congestion on some mainline, interstate sections understates future conditions, while the congestion at the ramp terminals, intersections and certain merge points are extreme. For this reason, the Baseline network included some minor modifications to the future traffic network to more accurately represent future traffic on the interstate. These modifications generally included adjusting traffic signal timing, adding turn lanes at ramps and, in a few instances, adding through lanes at roads accessing the interstate. Any future NEPA studies that use the products of this PEL would need to include updated traffic modeling to identify improvements needed at access points to the interstates.

Therefore, the 2040 Baseline network is used as a benchmark for the comparison of alternatives. In general, traffic model forecast results using the 2040 Baseline network show traffic conditions with no improvements made to the PEL Study Areas.

The 2040 Baseline network includes projects in the Las Vegas Valley that are either short term in the transportation improvement program (TIP)/statewide transportation improvement program (STIP) or were identified as projects that would be included in the Fuel Revenue Indexing Projects and, therefore, would be accelerated to implementation. Specifically, projects included in the Baseline network are currently planned to be constructed before 2035. The 2040 Baseline network is illustrated on Figure 10. The SNTS Baseline projects are listed in Table 7. Projects included in the Baseline network, as they relate to the three PEL Study Areas, are discussed below for each of those areas.

Table 7: SNTS Baseline Projects

Project name	Planning Document
I-15/CC 215 system to system interchange: 4th leg of interchange	Access 2040 TIP 2015-2019
US-96/CC 215 interchange: complete system to system interchange and local improvements	Access 2040 TIP 2015-2019
CC 215 Northern Beltway: widen to 6 lanes from Decatur Boulevard to 5th Street	TIP 2015-2019
CC 215 Northern Beltway: Widen to 6 lanes from Hualapai Way to Decatur Boulevard	Under construction
CC 215 Western Beltway: widen to 6 lanes from Craig Road to Hualapai Way	TIP 2015-2019
Peace Way bridge over CC 215	Access 2040
Sheep Mountain Parkway: construct 4 lane highway and interchanges	Access 2040 TIP 2015-2019
US-95/Kyle Canyon Road: design/construct new interchange	TIP 2015-2019
US-95 North Package 2B: Durango Drive to Kyle Canyon Road: widen to 6 lanes, add auxiliary lanes, HOV drop ramps at Durango Drive, new service interchange	TIP 2015-2019
Elkhorn Road HOV Connection: US-95 HOV ramp direct connects	Access 2040
I-15 at Sloan Road interchange	Access 2040
I-15 at Starr Avenue interchange	Access 2040
I-15 express lanes: conversion to HOV/GP lanes	TIP 2015-2019 (Project Neon)
Tropicana Avenue from Polaris Avenue to I-15: widening and grade separation over Dean Martin Drive	Access 2040
Project Neon: I-15 to US-95	Access 2040
I-15 North Part 2 Packages A, C and D: widen to 6 lanes, Craig Road to Speedway Boulevard	TIP 2015-2019
I-15 North Package 3: widen to 6 lanes, Speedway Boulevard to Apex	Access 2040
I-215 Southern Beltway at Airport Connector: Interchange upgrade	Under construction
Harmon Avenue and Hacienda Avenue HOV Connection: I-15 HOV ramp direct connects	TIP 2015-2019, S Nevada HOV Plan
Via Nobila from New I-15 interchange to Via Insipirada: Via Inspirada from I-15/Sloan Road interchange to Via Inspirada/Bicentennial Parkway	City of Henderson[3]
Baseline Model Adjustments at select interchanges (signal timing, additional ramp lanes)	n/a

[3] This project is reasonably foreseeable based on coordination with City officials.

Figure 10: 2040 Baseline Model Roadway Network

2.1.2 Safety Analysis Approach

A safety evaluation was conducted that included crash data obtained from NDOT for the three-year period from October 1, 2014 through September 31, 2017. Crash density (crashes/mile), crash type distribution, and crash severity distribution were developed and compared to similar roadway functional classes throughout Clark County.

2.2 I-515: Traffic Conditions and Needs

The I-515 PEL Study Area includes the portion of the I-515 corridor from south of Charleston Boulevard to I-215 (see Figure 8). I-515 forms the eastern portion of the beltway encircling the Las Vegas Valley. Traffic modeling was carried beyond the I-515 PEL Study Area, through the I-215/I-515 system interchange and along I-215, to capture traffic effects from planned improvements along these corridors.

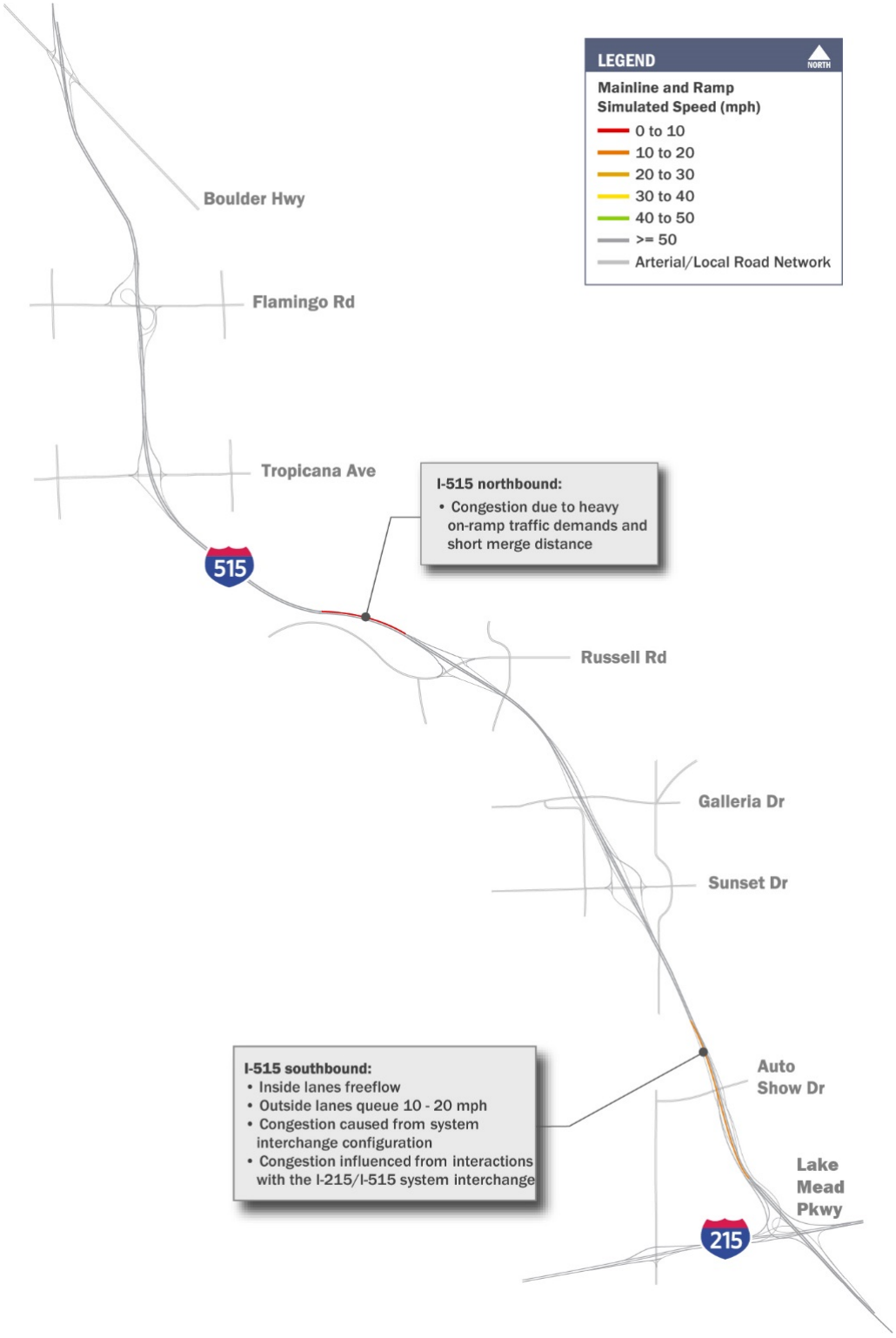
2.2.1 Existing Traffic Issues

The I-515 corridor between Boulder Highway and the I-215/I-515 system interchange has known congestion issues, which were observed and validated in the traffic modeling conducted for the SNTS modeling. Average vehicle speed outputs were extracted along I-515 from the traffic model for the critical peak 15-minute intervals during the morning and evening. Modeling results for the I-515 corridor indicated the following:

- I-515 experiences heavy to moderate congestion during the evening between Auto Show Drive and Lake Mead Drive. This location includes a heavy traffic weaving section to the I-215/I-515 system interchange.
- I-515 northbound experiences the same congestion in the morning and evening peak periods, with congestion between Russell Road and Tropicana Avenue.
- I-515 southbound during the morning peak period experiences slight congestion between Russell Road and Tropicana Avenue and a small amount of congestion at the Auto Show Drive off ramps. Much of the morning peak period experiences free-flow conditions for both directions on I-515.

Figure 11 shows the existing congested areas on I-515. However, it is important to note that the traffic model is limited in its ability to show congestion along this corridor because it only reflects how congestion affects traffic across all lanes of the road. For example, where southbound I-515 nears its interchange with I-215, the inside lanes run free-flow as they bypass the congestion of the outside lanes where drivers are trying to access the ramps. The model reflects the average speeds for the entire segment and does not reflect the severity of congestion on the outside lanes, where speeds often are between 10 mph and 20 mph during peak hours.

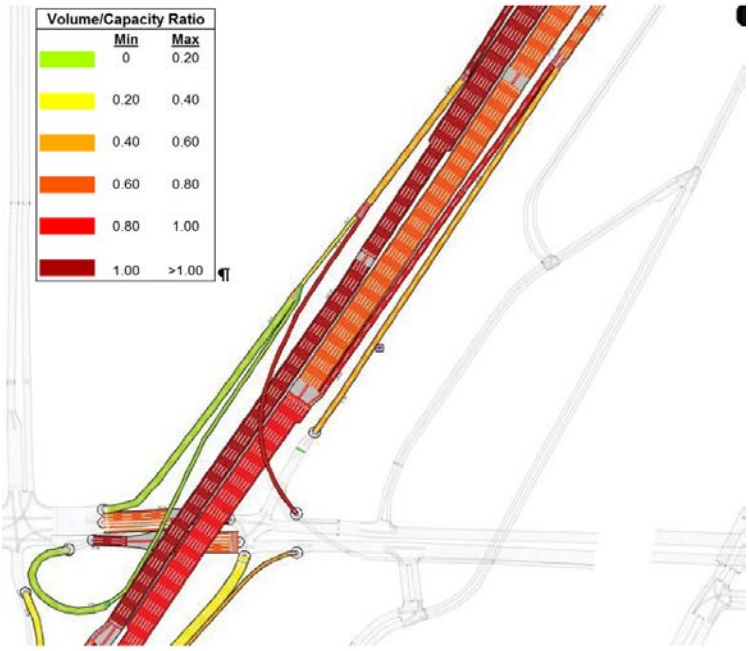
Figure 11: Existing (2017) Peak Period Average Vehicle Speeds along I-515 Corridor



2.2.2 Future Traffic Issues

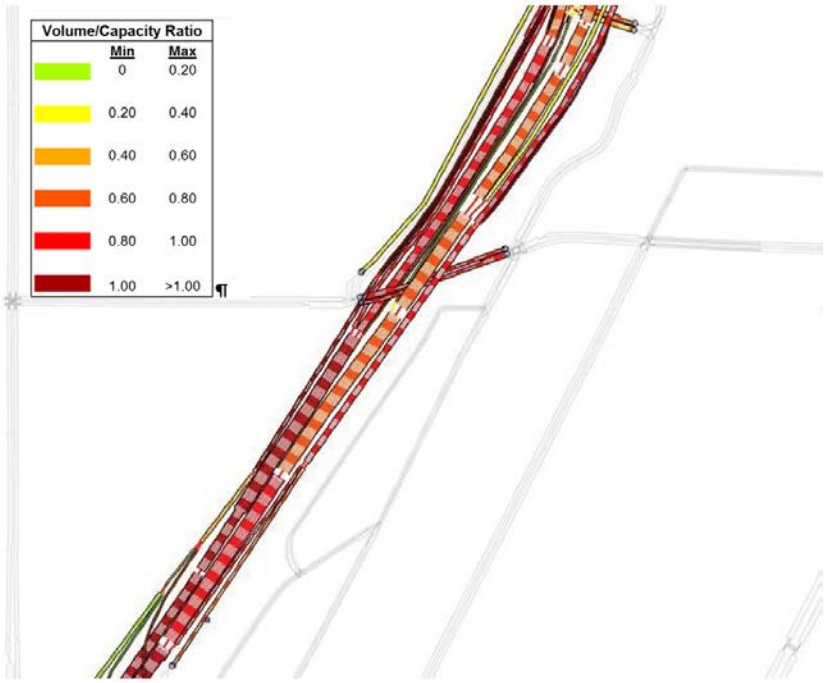
As discussed above, the Baseline network used to project future traffic volumes includes projects that are in the TIP/STIP or have pending TIP amendments.4 Results of the Baseline network analysis indicate that the I-515 corridor will exceed capacity for both the morning and evening peak periods in 2040. However, the results showed that the evening peak will be considerably more congested than the morning peak, causing portions of the mainline to completely shut down. This congestion will increase travel delay for motorists as they travel on I-515 through the I-515 PEL Study Area. This delay is projected to increase to an average of 51 seconds per vehicle, compared to 8 seconds of delay under existing conditions (see Table 8 later in this chapter). By 2040, average speeds in the I-515 PEL Study Area under Baseline network conditions are projected to decrease to less than 17 mph along most of the corridor – a 149 percent decrease. Figure 12 and Figure 13 show examples of this traffic congestion along I-515 using volume to capacity (V/C) ratios. This ratio measures mobility and quality of travel by comparing roadway demand (vehicle volumes) with roadway supply (carrying capacity). For example, a V/C of 1.00 indicates the roadway facility is operating at its capacity.

Figure 12: I-515 Volume to Capacity with Baseline Conditions during the AM Peak Period: North of Sahara Avenue



[4] . These projects include the reconstruction of the Charleston Boulevard interchange, which will add a northbound auxiliary lane between Charleston Boulevard and Eastern Avenue and a southbound auxiliary lane between I-15 and Charleston Boulevard. These projects also include the I-215 and I-515 system interchange improvement project, which involves several ramp improvements to enhance operations for traffic traveling from I-515 southbound to I-215 westbound. The project would move the I-515 southbound to I-215 westbound ramp gore and shift it north to the I-515 southbound Lake Mead ramp gore. The I-215 westbound movement will diverge from the mainline as one lane, connecting into the current bridge infrastructure, which opens to two lanes of travel, and will continue as a two -lane westbound on-ramp. This I-215 westbound on-ramp will conform to the four-lane configuration that currently exists on I-215.

Figure 13: I-515 Volume to Capacity with Baseline Conditions during the PM Peak Period: North of Sahara Avenue



2.2.3 Safety Issues

A crash analysis was conducted for 10.5 miles of mainline I-515 between the I-215/I-515 Interchange in Henderson and 1/3 mile east of the Eastern Avenue Interchange. Crash density (crashes/mile), crash type distribution, and crash severity distribution were compared to similar roadway functional classes throughout Clark County. The I-515 corridor experienced a higher crash density (approximately 55 percent higher) than the Clark County average. A notable increase in crash density occurred along the I-515 corridor from the Boulder Highway interchange to the limits of the safety analysis just north of the Charleston Boulevard interchange.

A review of the types of crashes that occurred shows that “rear end” crashes (43 percent) are the most common type of crash in the I-515 corridor. The next two most common crash types are “non-collision” (30 percent) and “sideswipe-overtaking” (12 percent). Rear end and sideswipe-overtaking crashes account for over half of all crashes in the corridor and are typically related to congestion.

2.3 I-215/I-515 System Interchange: Traffic Conditions and Needs

The I-215/I-515 system interchange PEL Study Area is depicted on Figure 14. This system interchange is located in the southeast corner of the Las Vegas Valley and connects the I-215 beltway facility with I-515. I-515 to the south connects Boulder City and other points south to the Las Vegas metropolitan area. I-515 (also US-95) to the north is the eastern beltway within the Las Vegas Valley. The I-215/I-515 system interchange also serves Lake Mead Parkway, an arterial on the eastern approach leg.

2.3.1 Existing Traffic Issues

The I-215/I-515 system interchange has known congestion issues, which were observed and validated using traffic modeling conducted for this Study. Average vehicle speed outputs were extracted from the traffic model at the interchange for I-215 between Gibson Road and Lake Mead Parkway/Eastgate Road, I-515 between Auto Show Road and Horizon Drive, and all general purpose lanes and ramps. An analysis of average 2017 vehicle speeds at the interchange indicates the following issues:

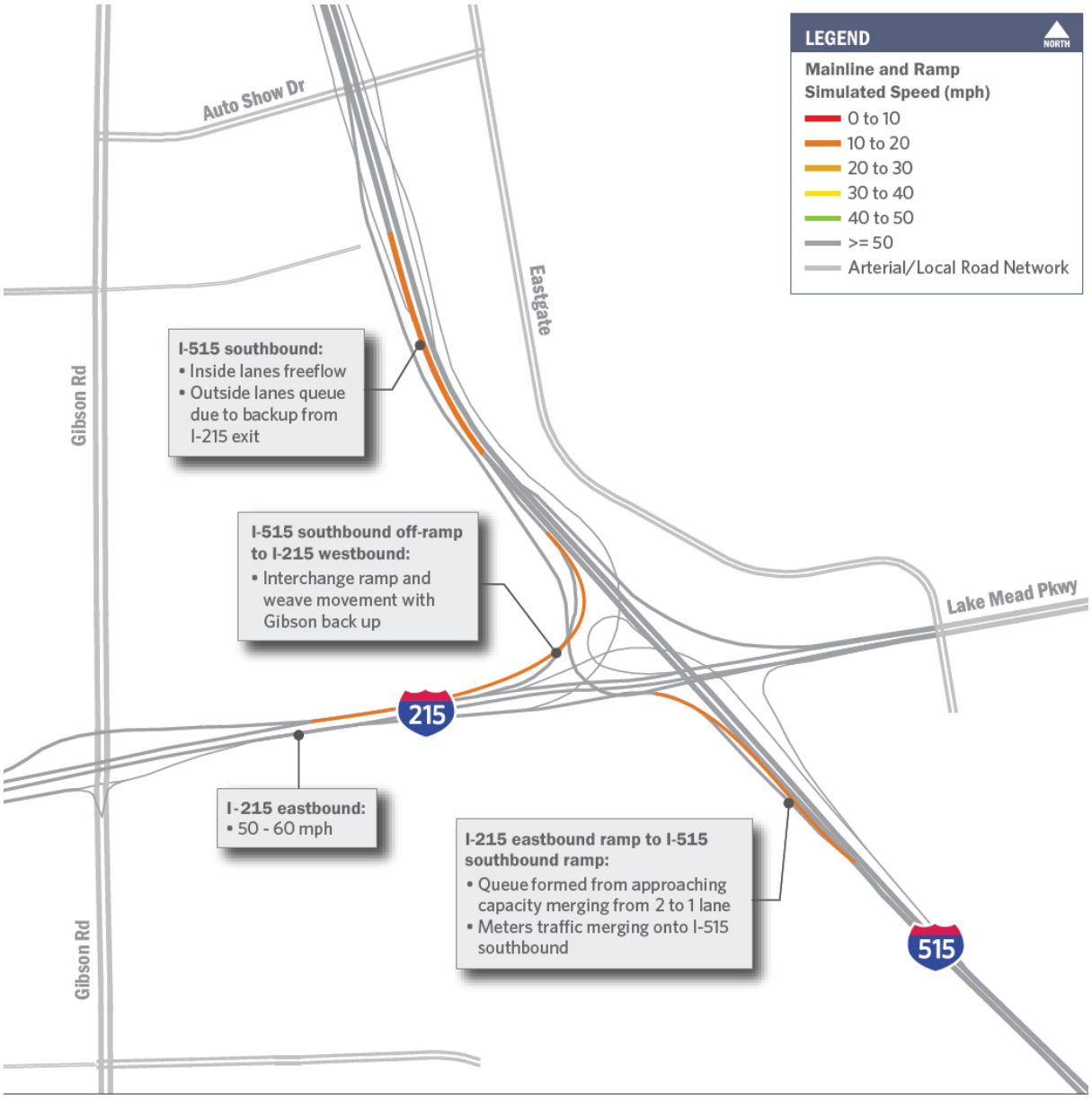
- Weaving and capacity issues occur along I-215 westbound due to conflicting vehicle movements. This includes through traffic from Lake Mead Parkway, weaving traffic from the I-515 southbound on ramp, weaving traffic from I-515 northbound, and diverging traffic toward the Gibson Road westbound off-ramp.
- Considerable traffic diverges from I-515 southbound to I-215 to avoid congestion farther south on I-515. Note that this and the issues above would be partially addressed by the interchange project noted in Section 2.2.2; however, considerable congestion issues would remain.
- Capacity issues occur along the I-215 eastbound to I-515 southbound ramp. This is caused by the ramp merging from two lanes to one lane, which meters traffic merging to I-515 southbound.

2.3.2 Future Traffic Issues

The Baseline network used to model future traffic volumes for the I-215/I-515 system interchange includes projects that are included in the TIP/STIP. These projects include the Airport Connector that is currently in operation, and the I-215/I-515 system interchange improvement project (see Section 2.2.2).

Results of the Baseline network analysis indicate that the I-215/I-515 system interchange will be over capacity for both the morning and evening peak periods in 2040. The evening peak period will experience considerably more congestion compared to the morning peak period, and will cause the mainline to come to a complete standstill, which will impact upstream arterial roads.

Figure 14: Existing (2017) Peak Period Average Vehicle Speeds at I-215/I-515 System Interchange



This congestion will result in increased travel delay for motorists as they pass through the interchange. This delay is projected to increase to an average of 51 seconds in 2040, compared to 6 seconds of delay under existing conditions (see Table 8 later in this chapter).

2.3.3 Safety Issues

A safety evaluation of the I-215/I-515 system interchange indicated that the overall crash and overall injury crash rates experienced at the interchange were higher than the statewide

average for similar facilities. A crash analysis was conducted for approximately 2.7 miles of the I-515 and I-215 mainlines as well as the interchange and its ramps. Overall, 741 crashes occurred in these areas, of which 287 were injury related with no fatalities. The overall crash rate (crashes per 100 million vehicle-miles) and overall injury crash rate for the interchange were higher than statewide averages. Compared to statewide crash rates for urban principal arterial interstates (2015), the total crash rate at the interchange was 9 percent higher while the injury crash rate was 21 percent higher.

Crash density (crashes/mile), crash type distribution, and crash severity distribution at the I-215/I-515 system interchange were also compared to similar interchanges throughout Clark County. The interchange had a slightly higher rate of rear end crashes and B-injury (non-capacitating injury) and C-injury (possible injury) crashes than other similar interchanges in Clark County.

2.4 I-15/CC 215/I-215 System Interchange: Traffic Conditions and Needs

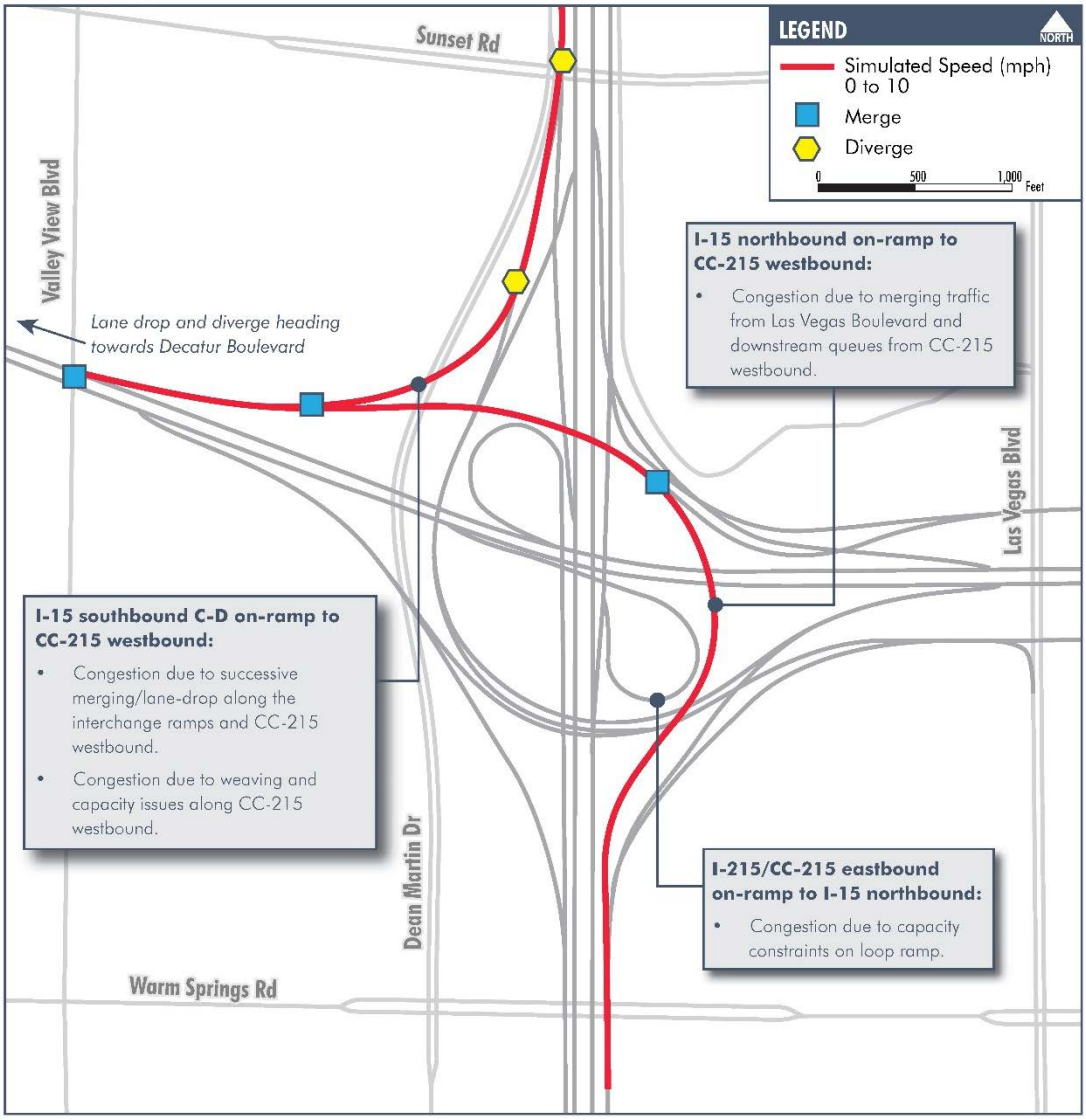
The I-15/CC 215/I-215 system interchange PEL Study Area is shown on Figure 15. The system interchange serves as the south central hub for the Las Vegas freeway system, connecting the CC 215 and I-215 beltways with the central I-15 corridor.

2.4.1 Existing Traffic Issues

The I-15/CC 215/I-215 system interchange has known congestion issues, which were observed and confirmed by traffic modeling conducted for this Study. An analysis of average vehicle speeds at the interchange indicates the following issues:

- The I-15 northbound ramp to CC 215 westbound experiences congestion. Major causes of congestion on this ramp are:
    - The ramp from Las Vegas Boulevard to CC 215 westbound merges onto the I-15 northbound ramp to CC 215 westbound. Vehicles attempting to merge onto the ramp result in slower speeds and potential conflicts. The merging maneuver causes traffic “friction” operations on this ramp. Friction can be described as increased potential for crashes as vehicles try to maneuver into the same lanes.
    - Capacity issues on CC 215 westbound restrict the number of vehicles that can enter from I-15 onto CC 215 westbound. The resulting congestion reduces average vehicle speeds, with queues extending onto the I-15 northbound ramp to CC 215 westbound.

Figure 15: Existing (2017) Peak Period Average Vehicle Speeds at I-15/CC 215/I-215 System Interchange



- The I-15 southbound collector-distributor (CD) road north of I-215 experiences congestion. Major causes of congestion at this location include:
    - Successive merging and lane-drops occur along the I-15 southbound CD to CC 215 westbound ramp, and on CC 215 westbound, which increases congestion and reduces travel speeds as vehicles maneuver through the interchange.
    - Weaving and capacity issues occur along the CC 215 westbound due to conflicting vehicle movements. This includes through traffic on the CC 215 mainline, merging traffic from the I-15 northbound on ramp, and diverging traffic toward the Decatur Boulevard westbound off ramp.

- The weaving and capacity issues on CC 215 westbound (discussed above) restrict the number of vehicles that can enter from the I-15 on ramp onto CC 215 westbound. The resulting congestion reduces average vehicle speeds, with queues extending onto the I-15 southbound CD road.

- Sporadic congestion occurs upstream and along the CC 215 eastbound to I-15 northbound ramp due to capacity constraints on the loop ramp, resulting in reduced average vehicle speeds.

2.4.2 Future Traffic Issues

The Baseline network used to model future traffic volumes for the I-15/CC 215/I-215 system interchange includes projects that are included in the TIP/STIP. These projects include the conversion of the I-15 express lanes into HOV/GP lanes (Project Neon), reconstruction of the I-15 interchange at Tropicana Avenue, HOV direct access ramps at Harmon Avenue and Hacienda Avenue, a new I-15 interchange at Starr Avenue, a new I-15 interchange at Via Nobila, and reconstruction of the I-15 interchange at Sloan Road.

Results of the Baseline network analysis indicate that the I-15/I-215 system interchange will experience slight congestion during the morning peak in the northbound direction and little to no congestion in the southbound direction. However, during the evening peak, the southbound direction will experience heavy congestion from Russell Road to Blue Diamond Road. This section of I-15 is a high-volume weaving segment. The I-15/CC 215/I-215 system interchange will experience moderate congestion in the northbound direction during the evening peak hour.

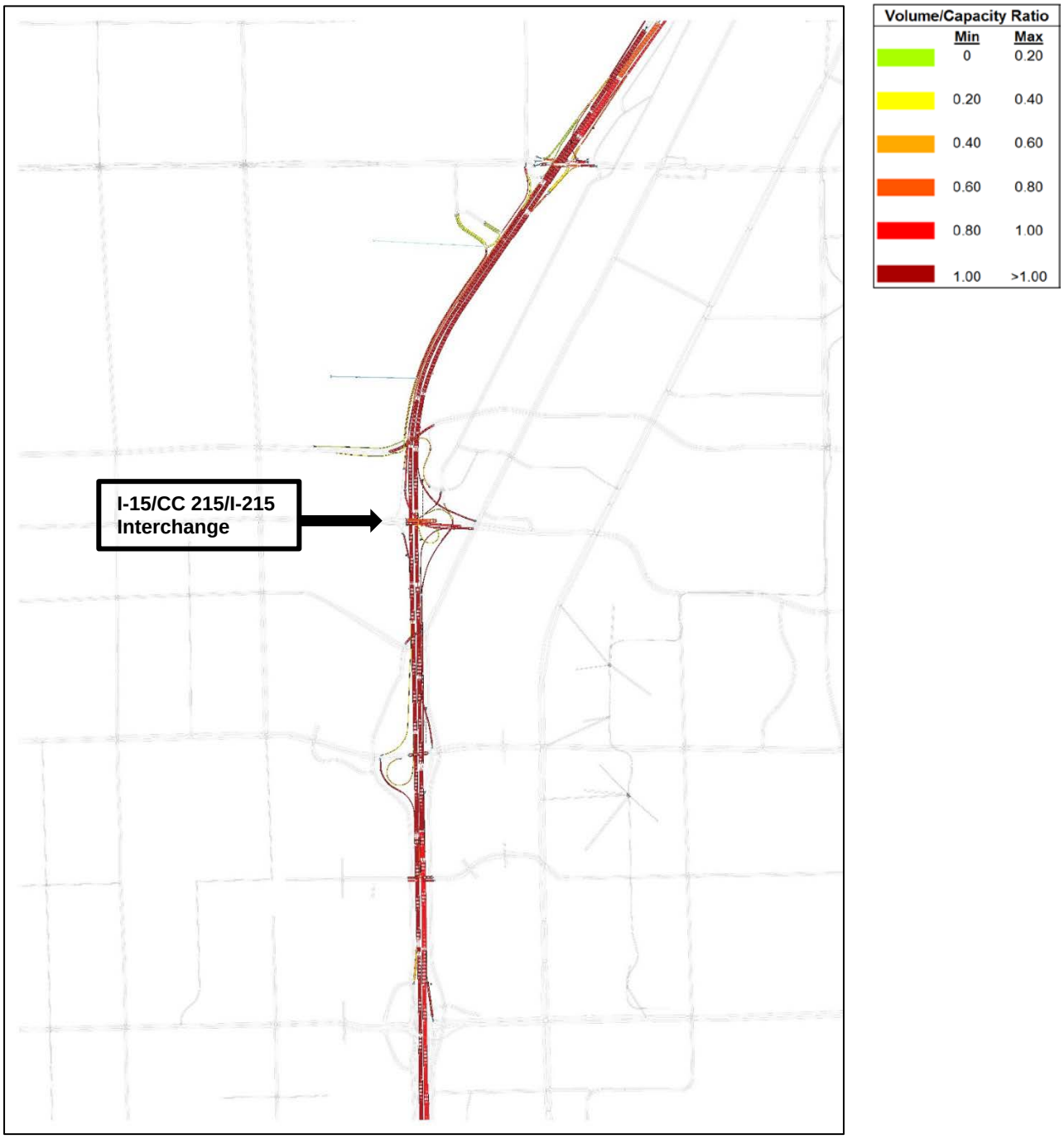
This congestion will result in increased travel delay for motorists as they pass through the interchange. This delay is projected to increase to an average of 25 seconds in 2040, compared to 5 seconds of delay experienced under existing conditions (see Table 8 later in this chapter).

2.4.3 Safety Issues

A safety evaluation of the I-15/CC 215/I-215 system interchange indicated that the overall fatal crash rate (crashes per 100 million vehicle-miles) experienced at the interchange was twice the statewide average. An analysis of crashes was conducted for three miles of the I-15 and I-215 mainlines as well as the interchange and its ramps. Overall, 1,327 crashes occurred within the system interchange (including 1-15 and I-215 mainline through the interchange and all ramp connections), of which 9 resulted in a fatality and 500 were injury related.

Crash density (crashes/mile), crash type distribution, and crash severity distribution at the I-15/CC 215/I-215 system interchange were also compared to similar interchanges throughout Clark County. Overall, the interchange had 9 fatal crashes and 6 incapacitating injury crashes (or 5 fatal and incapacitating injury crashes per year). Most of the fatal crashes occurred on the ramps. Also, non-collision type crashes were slighter higher than the average for other interchanges in Clark County.

Figure 16: I-15 Volume to Capacity with Baseline Conditions during the PM Peak Period in 2040: Mesoscopic Area—Assigned Volume



Similar to I-515 safety issues discussed above, the types of crashes that occur at the I-15/CC 215/I-215 system interchange suggest that safety issues relate to existing congestion issues.

2.5 Purpose and Need

A Purpose and Need statement is used in PEL and NEPA studies to articulate and focus on the specific problems to be addressed. The Purpose and Need is used to develop and evaluate alternatives, but is not mode specific or biased toward a particular solution. The Purpose defines the transportation problem to be solved. The Need provides data to support the problem statement or Purpose.

Based on the issues identified for the three PEL Study Areas in the sections above, the Purpose of this PEL Study is to address existing and future traffic congestion issues in the PEL Study Areas while improving safety conditions. Based on the analysis presented in this chapter, the three PEL Study Areas exhibit similar travel conditions and characteristics. These include existing congestion during peak travel hours, with congestion worsening considerably by 2040. Table 8 shows the average delay that motorists would experience as they travel through the three PEL Study Areas under existing and Baseline network (2040) conditions. As shown, average travel delays are projected to increase between 400 to 750 percent by 2040.

The Purpose of this PEL Study is to address existing and future traffic congestion issues in the PEL Study Areas while improving safety conditions.

Table 8: Existing and Baseline (2040) Average Travel Delay

PEL Study Area	Existing Delay (seconds)	Future Baseline Delay (seconds)	Percent Increase in Delay
I-515	8	51	537%
I-215/I-515 System Interchange	6	51	750%
I-15/I-215 System Interchange	5	25	400%

Safety issues also have been identified in each of the PEL Study Areas, and are largely attributable to congested traffic conditions.

3.0 Environmental Conditions

Potentially affected environmental resources were identified early in the PEL process to help avoid and minimize impacts during the development and evaluation of alternatives. Potential effects to these resources also could influence the level of future NEPA documentation required (see Chapter 6.0). This section summarizes existing data collected for environmental resources within the three PEL Study Areas. This data will be considered and updated during future NEPA studies for each project.

3.1 Data Collection Approach

The Study team collected and mapped data for select environmental resources using readily available mapping resources. Resources mapped included those that could influence or affect the development and evaluation of alternatives based on their likely presence in the PEL Study Areas. Select environmental resources mapped included:

- Biological resources (Mojave desert tortoise habitat)
- Environmental Justice (EJ) populations (low-income and minority populations)
- Floodplains
- Hazardous materials sites
- Historic resources
- Parks, recreation, and trail resources

Geographic information systems (GIS) data from Clark County served as basis for mapping most of these resources. Aerial mapping was reviewed to determine potential habitat areas for the Mojave desert tortoise. The following sections summarize the select environmental resources in each PEL Study Area.

3.1.1 Biological Resources

The PEL Study Areas are highly disturbed due to existing urban development. As such, federal- or state-protected species effects are not expected to occur. However, studies will be conducted during future NEPA studies for proposed improvements to verify the expected occurrence of such species within the Study Area, as well as migratory birds protected under the Migratory Bird Treaty Act.

Due to the high level of urban development within the PEL Study Areas, little natural vegetation is present. According to the Nevada Natural Heritage Program data, most of the vegetation within the PEL Study Areas is classified as developed-medium intensity, with scattered areas classified as developed-high intensity, developed-low intensity, developed-open space, North American Warm Desert Pavement, and Sonoma-Mojave Creosotebush-White Bursage Desert Scrub.

Mojave Desert Tortoise

The Mojave desert tortoise (*Gopherus agassizii*) is listed as threatened under the Endangered Species Act (U.S. Fish and Wildlife Service [USFWS] 1990) and critical habitat for the tortoise was determined in 1994 (USFWS 1994). The distribution of the Mojave desert tortoise includes the Mojave Desert in areas west and north of the Colorado River in California, Arizona, and Nevada, including desert habitats within the Las Vegas Valley. The Mojave desert tortoise is unlikely to occur within the PEL Study Areas, as summarized in Table 9.

Table 9: Mojave Desert Tortoise Habitat in PEL Study Areas

I-515 Study Area	I-215/I-515 Interchange Study Area	I-15/I-215 Interchange Study Area
No areas likely to support Mojave desert tortoise were identified.	No areas likely to support Mojave desert tortoise were identified.	Mojave desert tortoise is not likely to occur within Study Area. Some undeveloped land is located west of the Study Area starting just east of Decatur Blvd. to the south of I-215 that could potentially support Mojave desert tortoise. If staging locations to the east of the Study Area are considered, the area should be investigated for Mojave desert tortoise.

3.1.2 Environmental Justice Populations

Environmental Justice (EJ) was first identified as a national policy in 1994 when President Clinton issued Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which required federal agencies to develop a strategy for incorporating EJ into the NEPA evaluation process. The EO directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.

The Study team collected income and minority data for the PEL Study Areas from the U.S. Census American Community Survey (ACS) between 2011 and 2015 (U.S. Census 2011-2015), Clark County, and NDOT. In Clark County, approximately 30 percent of the population is minority and approximately 16 percent of the population falls below the poverty threshold (U.S. Census 2011-2015). The locations of EJ populations in the PEL Study Areas are summarized in Table 10 and shown on Figure 17 and Figure 18.

Table 10: Environmental Justice Populations in PEL Study Areas

I-515 Study Area	I-215/I-515 Interchange Study Area	I-15/I-215 Interchange Study Area
With the exception of a residential community just south of Galleria Drive, the development adjacent to the southern half of the Study Area is industrial or commercial; most of the northern half of the Study Area is residential. Most Census block groups located either partially or wholly within the I-515 Study Area have low-income population percentages greater than the Clark County. Most Census blocks within the Study Area have higher minority percentages than Clark County.	Residential communities are adjacent to the southwestern quadrant of the Study Area. The southeastern quadrant includes a hotel/casino and residential properties farther south/southeast. Industrial areas are located adjacent to the Study Area on the north. Areas surrounding the Study Area have a higher density of minorities (30-50 percent) than Clark County. However, the poverty level in the Study Area is comparable to Clark County's.	Only the southwest quadrant of the Study Area is adjacent to a residential area. Industrial/warehouses are adjacent to the northwest quadrant, and include a golf course, airport, and retail shopping center. The southeast quadrant contains undeveloped land and industrial/warehouses. The areas to the southwest of the Study Area are comprised of 50-70 percent minorities, which is considerably higher than Clark County. Most Census block groups located either partially or wholly within the Study Area contain low-income population percentages that are greater than Clark County.

3.1.3 Floodplains

Floodplains located in the PEL Study Areas are summarized in Table 11 and shown on Figure 19.

Table 11: Floodplains in PEL Study Areas

I-515 Study Area	I-215/I-515 Interchange Study Area	I-15/I-215 Interchange Study Area
Most of the Study Area is designated as Federal Emergency Management Agency (FEMA) Unshaded Flood Zone X. This zone indicates areas of minimal flood hazard located outside the 500-year floodplain. An area containing the 500-year floodplain is located from about Galleria Drive to south of Warm Springs Road. Several drainages with 100-year floodplains also traverse the Study Area.	A drainage with an associated 100-year floodplain traverses the Study Area. A small 500-year floodplain is also located within the Study Area's northwest quadrant.	No designated floodplains are located in the Study Area. A few drainages are located in the northern half of the Study Area.

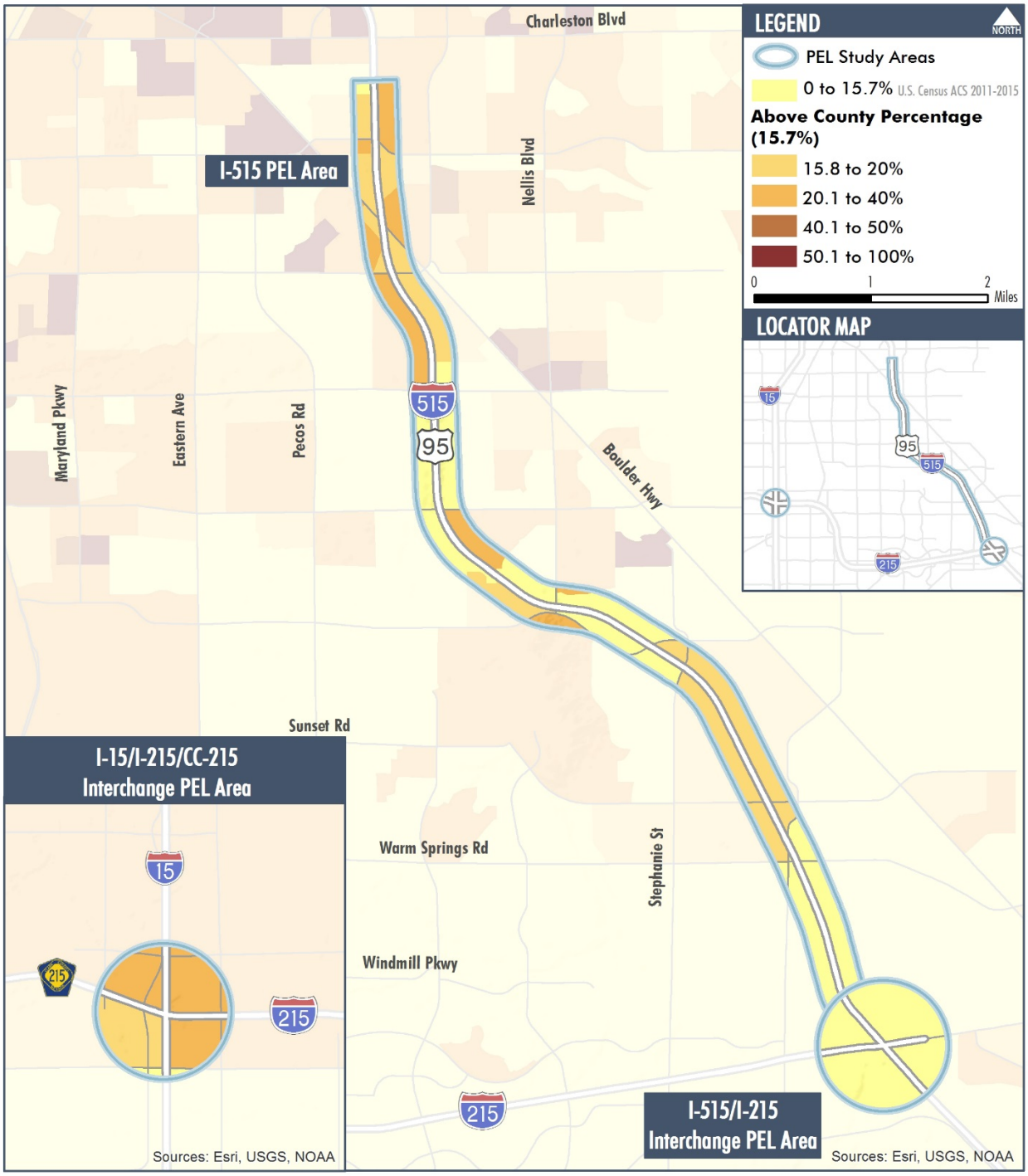
3.1.4 Hazardous Materials Sites

The locations of hazardous materials sites in the PEL Study Areas are summarized in Table 12 and shown on Figure 20.

Table 12: Hazardous Materials Sites in PEL Study Areas

I-515 Study Area	I-215/I-515 Interchange Study Area	I-15/I-215 Interchange Study Area
According to the U.S. Environmental Protection Agency (EPA), approximately 60 hazardous waste sites, one brownfield site, and one toxic release inventory site were identified in the Study Area. In addition, approximately 23 Nevada Department of Environmental Protection (NDEP) corrective actions and one active case were identified.	Approximately three hazardous waste sites and one toxic release inventory site are located in the Study Area. No brownfield site or NDEP active cases were identified. Two NDEP corrective actions occur within the Study Area. This area is near a former munitions plant site.	Approximately 10 hazardous waste sites and 7 NDEP corrective actions are located within the Study Area. No brownfield sites, toxic releases, or NDEP active cases occur.

Figure 17: Percent of Households Below Poverty Level in PEL Study Areas



Source: U.S. Census ACS 2011-2015

Figure 18: Percent of Minority Populations in PEL Study Areas

Source: U.S. Census ACS 2011-2015

Figure 19: Floodplains in PEL Study Areas

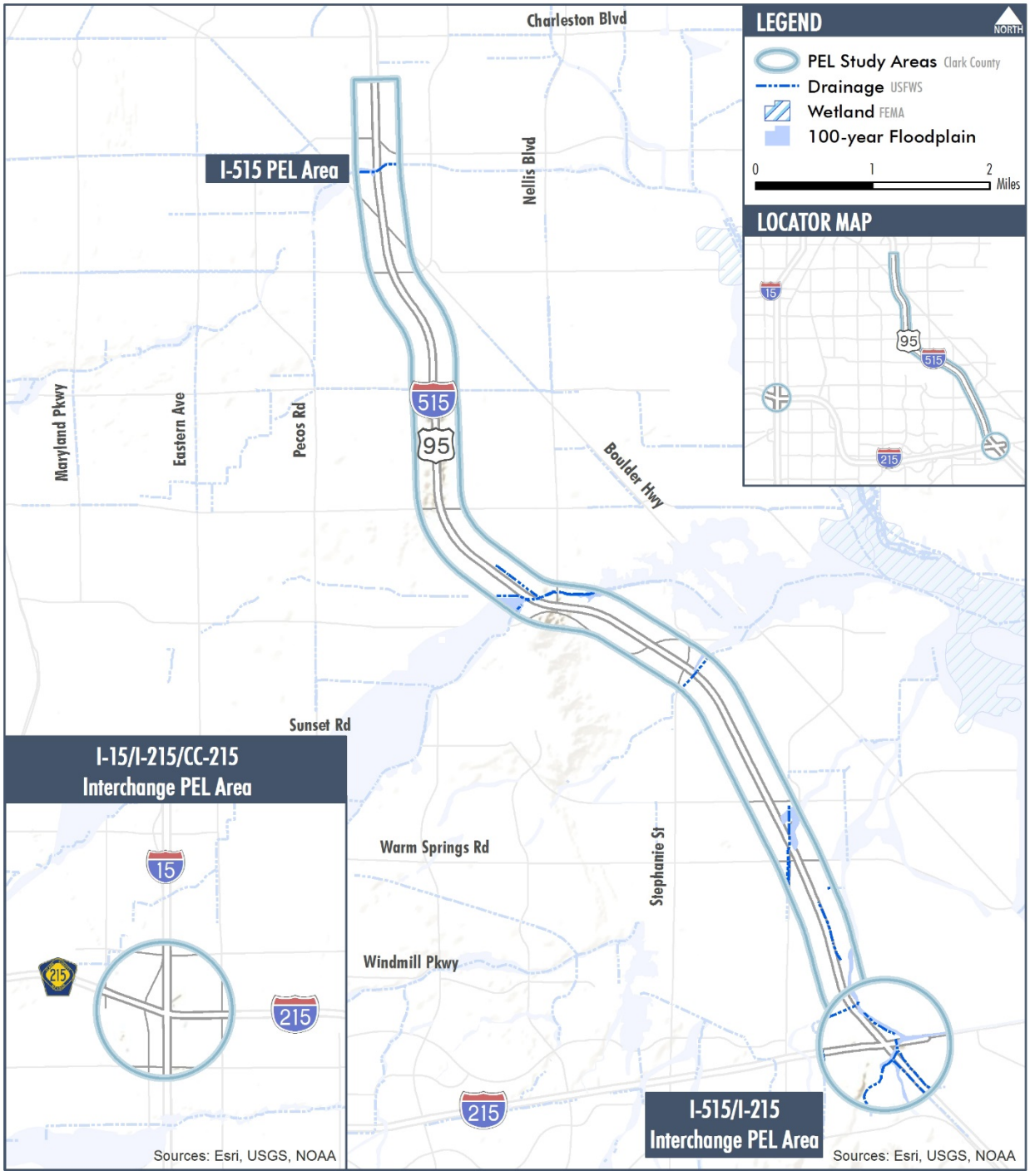
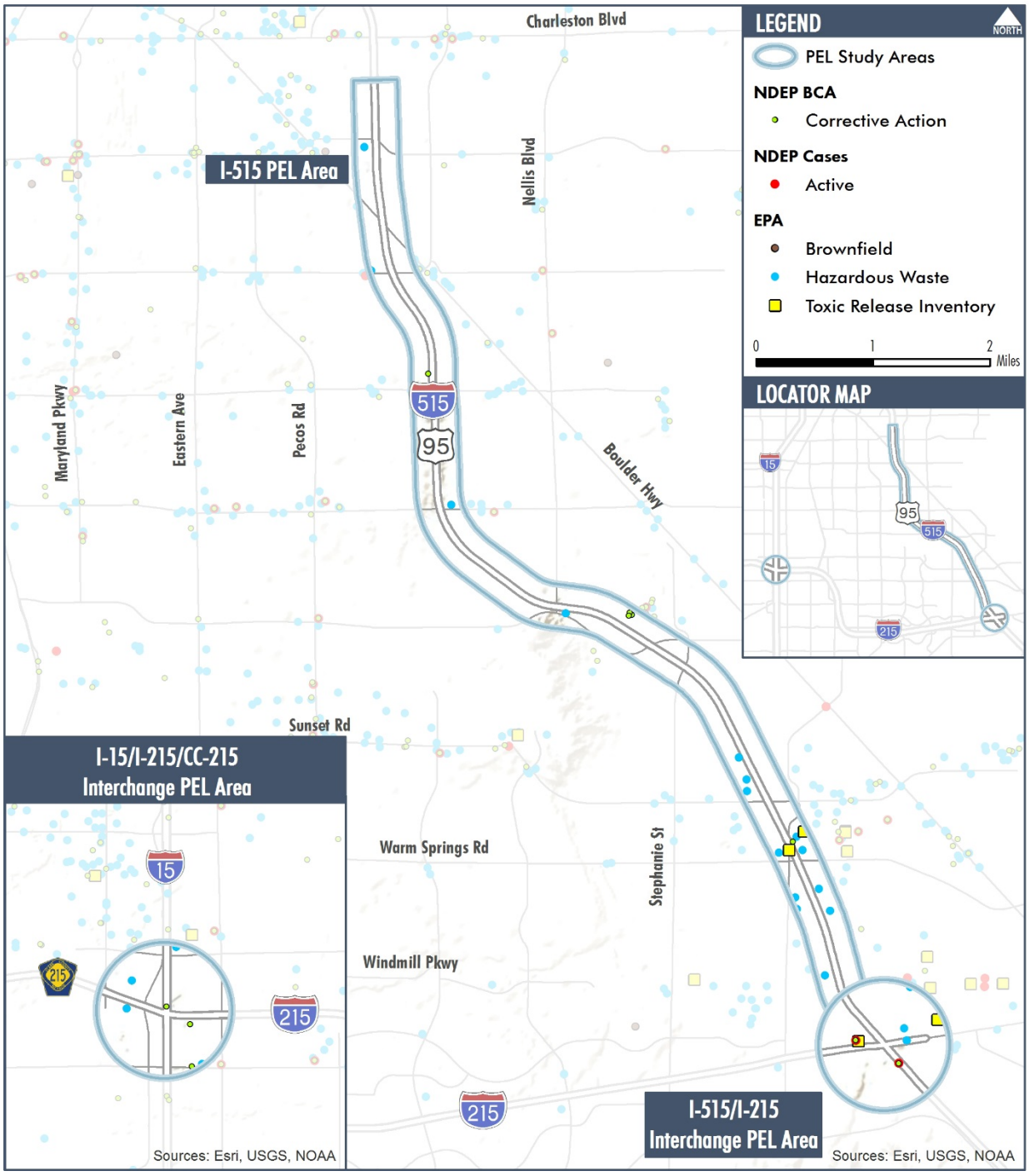


Figure 20: Hazardous Materials Sites in PEL Study Areas



3.1.5 Historic Resources

Historic properties are protected under Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) and other statutes, as well as Section 4(f) as amended and codified in the U.S. Department of Transportation (U.S. DOT) Act of 1966, 49 U.S. Code (USC) 303 (c). Section 106 of the NHPA requires federal agencies to take into account the effects that their undertakings have on historic properties, which are those properties that are included in, or eligible for, the National Register of Historic Places (NRHP). This review process ensures that federal agencies identify any potential conflicts between their undertakings and historic preservation, and resolve any conflicts in the public interest. Locations of historic resources in the PEL Study Areas are summarized in Table 13 and shown on Figure 21.

Table 13: Historic Resources in PEL Study Areas

I-515 Study Area	I-215/I-515 Interchange Study Area	I-15/I-215 Interchange Study Area
The northern portion of the Study Area traverses older parts of Las Vegas that contain several historic properties. At least two NRHP-eligible properties were identified near Freemont Street and within the study corridor. Several other potentially historic resources with no information available also occur north of Flamingo Road.	No historic resources sites were identified within the Study Area.	Several potentially historic properties are located within or adjacent to the Study Area. No information pertaining to these sites was available. Just north of the Study Area, two NRHP-listed historic sites were identified, including the Little Church of the West at Russell Road and the Welcome to Fabulous Las Vegas sign south of Russel Road.

3.1.6 Park, Recreation, and Trail Resources

The PEL Study Areas contain several park, recreation, and bicycle/pedestrian facilities. Section 4(f) of the U.S. DOT Act requires consideration of publicly-owned parks and recreation areas in transportation project development. Use of a Section 4(f) property cannot be approved unless the use is *de minimis* or there is no feasible and prudent alternative that completely avoids the property, and the project includes all possible planning to minimize harm to the property. School yards, if open to the public when school is not in session, could also be protected under Section 4(f). When a public school playground is open to the public and serves either organized or substantial walk-on recreational purposes that are determined to be significant, it will be subject to the requirements of Section 4(f).

Section 6(f) of the Land and Water Conservation Fund Act requires that the conversion of lands or facilities acquired or improved with Land and Water Conservation Act funds be coordinated with the Department of Interior. Such a conversion requires an involved process where land of comparable value must be provided to offset the conversion.

Park, recreation, and trail facilities in the PEL Study Areas are summarized in Table 14 and shown on Figure 22.

Table 14: Park, Recreation, and Trail Resources in PEL Study Areas

I-515 Study Area	I-215/I-515 Interchange Study Area	I-15/I-215 Interchange Study Area
Parks in the City of Henderson portion of the corridor include Russell Road Sports Complex, Stephanie Lynn Craig Park, and White School Park. In addition, Cowan Sunset Southeast High School is adjacent to the southwest side of I-515 north of Russell Road, with Thurman White Middle School and Jim Thorpe Elementary School located farther west. To the north of Henderson, adjacent parks include Grapevine Springs Park, and Whitney Park and recreation center. Schools within the Study Area include HA Harmon Elementary School, Francis H. Cortney Junior High School fields, Chaparral High School track and fields, CW Woodbury Middle School, George E. Harris Elementary School, and Walter V. Long Elementary School. Unpaved bike trails in the Study Area include Marks Trail north of Warm Springs Road within Henderson (City of Henderson 2018). County multi-use trails run along I-515 from Russell Road north to the end of the study corridor, and cross the corridor just north of Russell Road and south of Sahara Avenue. Connecting trails extend along I-515 from I-215 to the beginning of the multi-use trail, and cross the corridor adjacent to the canal located south of Russell Road (Clark County 2011).	Parks and trails in the Study Area are shown on the City of Henderson Park and Trail Map (http://www.cityofhenderson.com/docs/default-source/Parks-Recreation/bike_network_map.pdf?sfvrsn=4). The Acacia Park and Acacia Park Demonstration Gardens are located south of I-215 and west of I-515. According to the Nevada Division of State Parks, a portion of Acacia Park was developed with Land and Water Conservation Fund monies, and, therefore, would be subject to Section 6(f) protection.	No parks, trails or other recreational features are located within the Study Area. A privately-owned golf course is located just east of the Study Area. A paved bicycle trail is located south of I-215; Fiesta Trail is located east of I-515 and the 215 trail is located to the west of the Study Area.

Figure 21: Historic Resources in PEL Study Areas

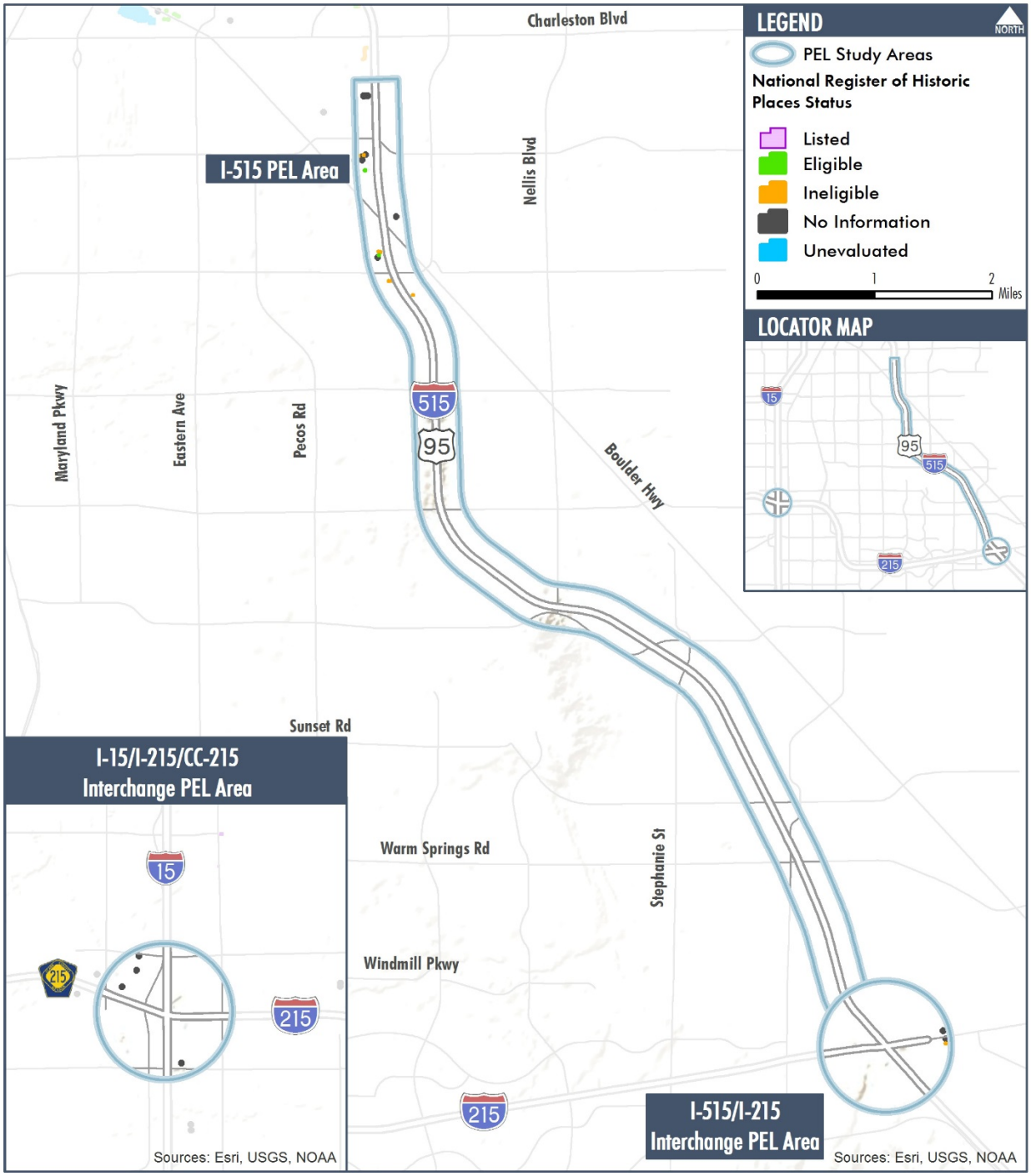
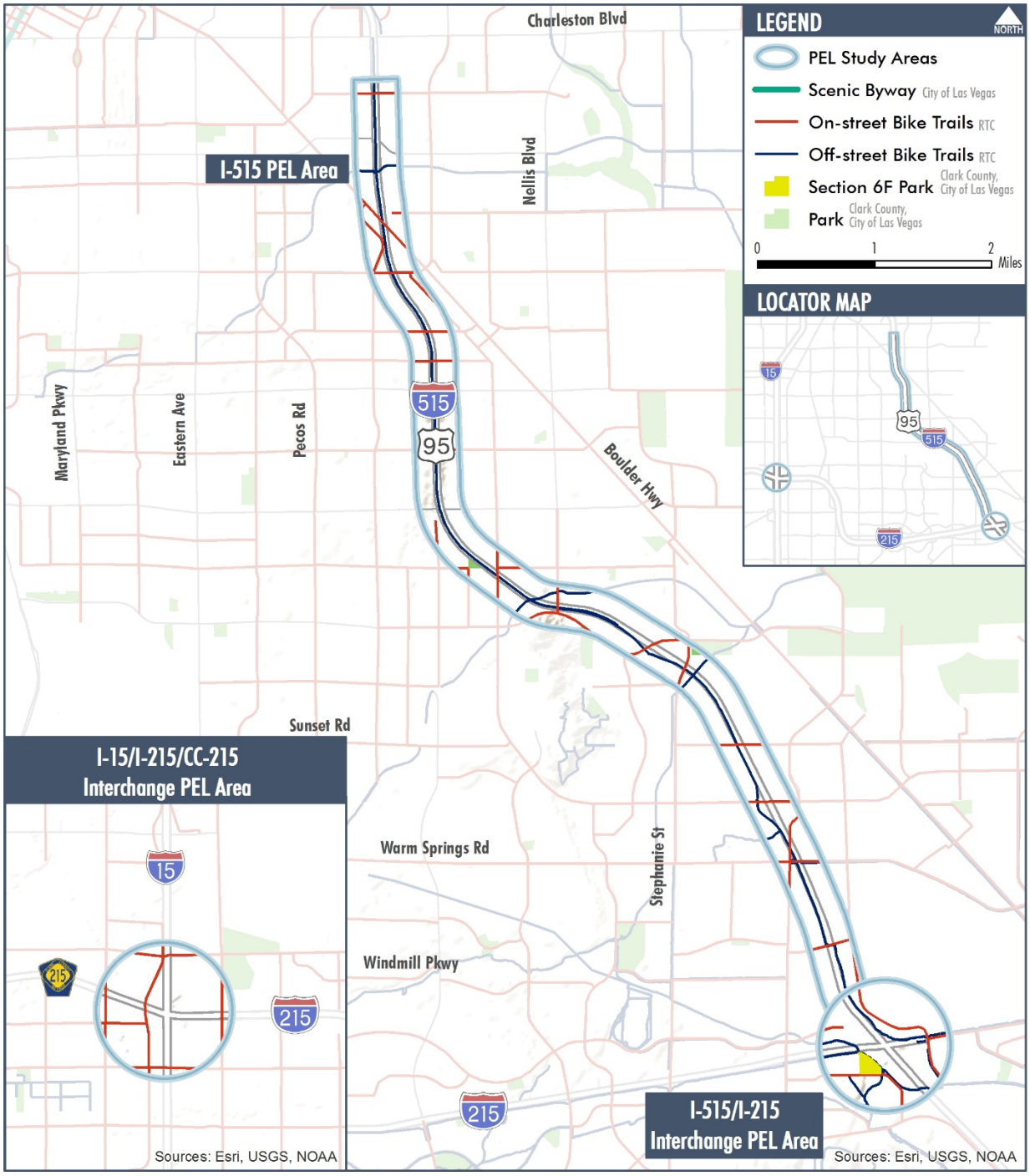


Figure 22: Park, Recreation, and Trail Resources in PEL Study Areas



4.0 Alternatives Identification and Evaluation

4.1 Alternatives Process

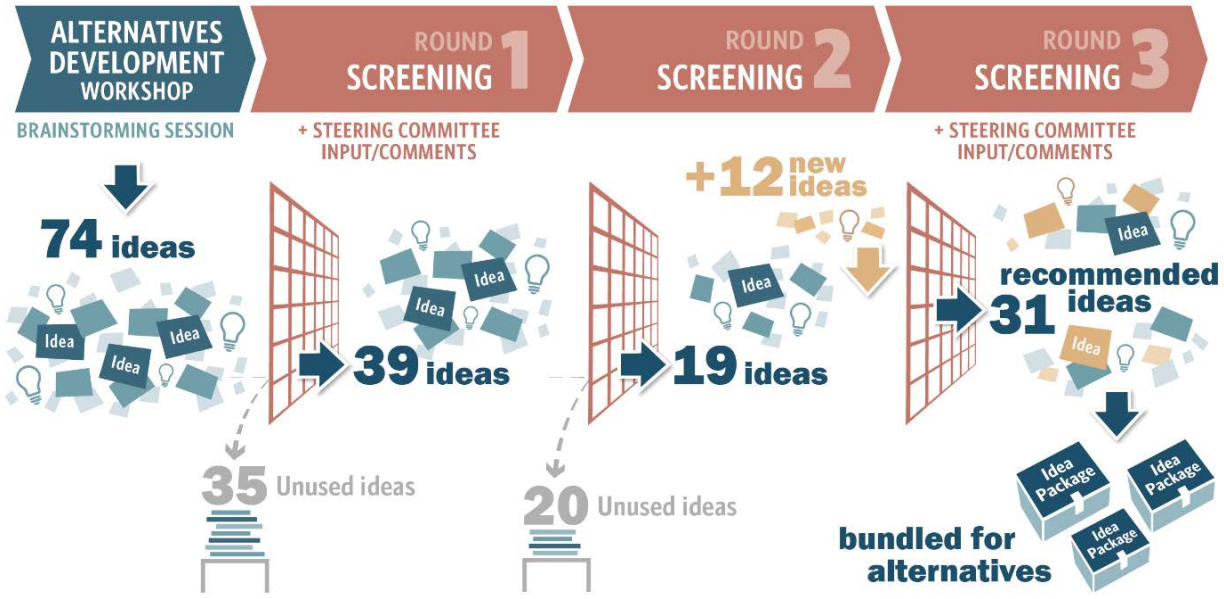
Alternatives were developed and evaluated for the PEL Study Areas using a three-step process. Each step or stage successively involved further detail and refinement. After analyzing traffic congestion and safety conditions specific to each PEL Study Area, as discussed in Chapter 2.0, the Study team held a brainstorming workshop to identify reasonable alternatives or ideas to address those issues. This resulted in a range of improvements based on conventional as well as innovative design approaches.

Alternatives included corridor-wide ideas, such as providing additional capacity by adding lanes, and improvements at specific locations. The results of the traffic analysis presented in Chapter 2.0 clearly showed that each of the PEL Study Areas will exceed capacity by 2040. Under the 2040 Baseline network condition, the extent of the congestion was so extreme that more localized improvements would not measurably provide the needed congestion relief (see Figure 12 and Figure 13 for examples). Because of the need for additional capacity along the entire SNTS network, the Study team began the alternatives design process by adding one lane in each direction to the traffic model for all of the SNTS corridors. This allowed the traffic model to attract so-called latent traffic that was not using the interstate because of its congested condition. This “Build” scenario allowed the traffic model to better show future traffic movements and specific problem locations. In turn, this allowed designers to develop ideas beyond capacity improvements that would mitigate congestion. These other ideas formed the basis for the alternatives analysis conducted under this PEL Study. Despite this alternatives analysis building on the Build scenario, the improvements identified do not necessarily depend or rely on an additional GP lane (see Section 6.3 for more information).

Therefore, the range of alternatives for the PEL Study Areas encompassed one additional GP lane in each direction, interstate auxiliary lanes, interchange reconfigurations, new interchange ramps, and concepts such as eliminating left turns at ramp terminals and providing opportunities for U-turns. Also, Transportation Systems Management (TSM) approaches, including ramp metering, were considered. The Study team determined that the additional GP lane could be used as an HOV or express lane in the future, but it was modeled as a GP lane.

Sections 4.3 through 4.5 summarize the three steps, or rounds, of alternatives evaluation undertaken for this PEL Study. For each round, the Study team applied evaluation criteria, considered analysis results, and applied professional judgement in rating alternatives. Draft results were presented to the Steering Committee at several workshops held during this Study and ratings were adjusted based on technical input from committee members. Ideas that were rated well were advanced to the next round; the remaining ideas were discarded. Figure 2 illustrates the alternatives development and screening process.

Figure 23: Alternatives Development and Screening Process



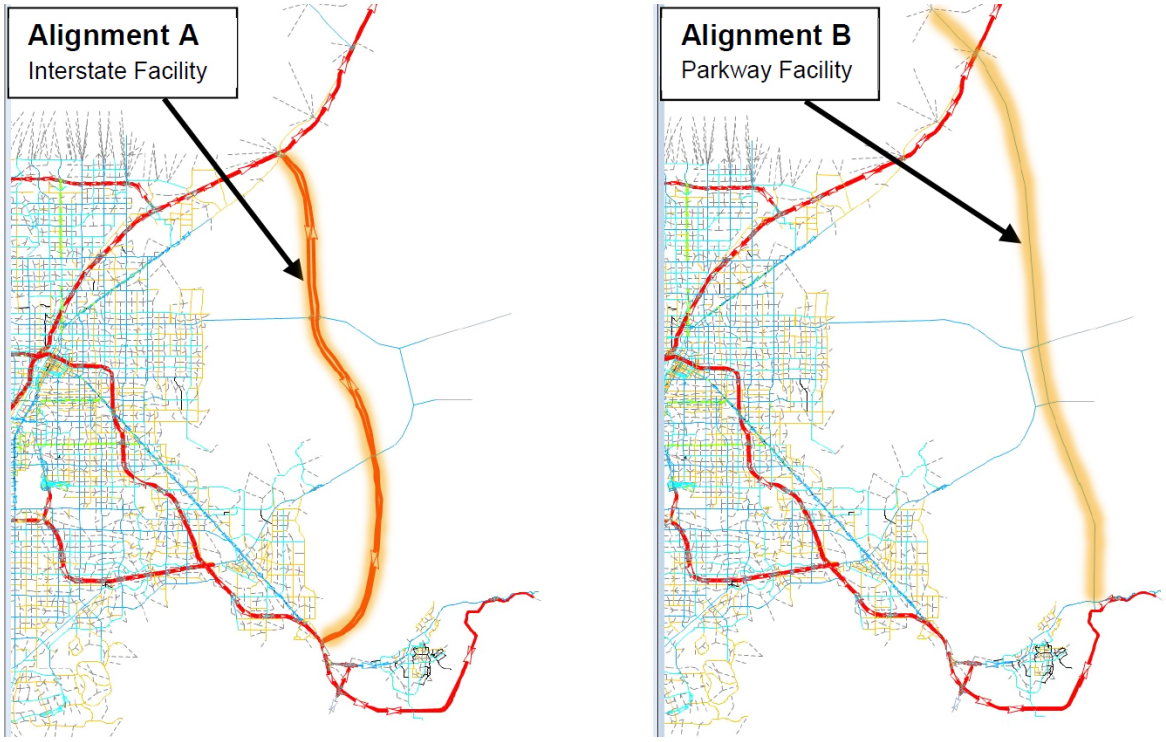
4.2 Eastern Bypass Traffic Forecasting

As part of the SNTS, an analysis was performed to estimate daily traffic volumes along a proposed eastern bypass that would connect I-15 to the northeast and I-515 or US 93 to the southeast of the Las Vegas metropolitan area. The analysis provided an estimated range of projected daily traffic volumes for years 2017 and 2040. This provided a sensitivity analysis to show how much traffic an eastern bypass might attract.

Two potential alignments for the bypass were evaluated (see Figure 3). Alignment A was assumed to be a freeway along the western-most alignment. Alignment B would consist of a parkway along the eastern-most alignment. Both scenarios assumed a four-lane facility with two lanes in the north and southbound directions.

Under the Alignment A scenario, the effect on I-15 and I-515 would generally be a decrease in vehicles per day of less than 4 percent, compared to 2040 Baseline conditions. Only I-15 between CC 215 to the north and the eastern bypass connection would experience a growth in traffic (about 5 percent). Under the Alignment B scenario, I-15 and I-515 would experience decreases in daily traffic of no more than 3 percent.

Figure 24: Eastern Bypass Alternatives



The analysis confirmed that:

- A future eastern bypass would have considerable capacity to accommodate more traffic.
- A future eastern bypass would not result in sizeable congestion relief in the PEL Study Areas and, therefore, not affect the Purpose and Need.

Refer to Appendix N of the SNTS report for the complete eastern bypass analysis.

4.3 Round 1 Evaluation

The Round 1 evaluation was based on the five criteria listed below:

- **Mainline Operations**: An assessment of traffic operations and safety on the freeway. Operational considerations included level of service relative to the 20-year (2040) traffic projections, as well as geometric considerations, such as design speed, sight distance, and lane and shoulder widths.
- **Local Operations**: An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations included level of service relative to the 20-year (2040) traffic projections, as well as geometric considerations, such as design speed, sight distance, lane and shoulder widths, and bicycle and pedestrian operations.
- **Maintainability**: An assessment of the long-term maintainability of the transportation facility(ies). Maintenance considerations included the overall durability, longevity, and

maintainability of pavement, structures, and systems; ease of maintenance; and accessibility and safety considerations for maintenance personnel.

- **Construction Impacts**: An assessment of the temporary impacts to the public during construction. Considerations related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust, and construction traffic; and environmental impacts.
- **Environmental Impacts**: An assessment of the long-term impacts to select environmental resources. Resources considered included traffic noise, air quality, floodplains, parks and recreation, biological resources, historic resources, and socioeconomic impacts (Environmental Justice, businesses, residents).

Each idea was assigned a rating for each of the above criteria. Using these ratings, a team of subject matter experts determined the overall rating of the idea (zero through three). Ideas that scored either 0 or 1 were eliminated from further study. Figure 25 shows an example for an I-515 alternative and how it was evaluated during the Round 1 screening process.

Figure 25: Example of Round 1 Evaluation

Round 1 Screening

#	Description	Advantages	Disadvantages
1	I-515 - Add auxiliary lanes between Tropicana and Russell	• Improves Operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 8,000ft weaving movement • Potential noise impacts • Potential EJ impacts

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◉	◉	◉

Rating	Justification/Comments/Disposition:
3	Moved to further evaluation and modeling.

Key

3 = Moved to Further Evaluation and Modeling 2 = Design Consideration, may be combined with other ideas, but was not moved forward as a standalone idea for further evaluation 1 = Major Value Degradation 0 = Fatal Flaw (unacceptable impact or doesn't meet the project purpose and need)	● = More Desirable ○ = Average ◉ = Less Desirable

4.3.1 I-515 Corridor Round 1 Evaluation

As mentioned previously, one additional GP lane was modeled in both directions and is referred to as the Build condition. The limits of the GP lane generally extend from Boulder Highway through the I-215 interchange to Horizon Drive. As shown on Figure 28 later in this chapter, this provided considerable congestion relief, lowering the average travel delay from 51 seconds under 2040 Baseline conditions to 17 seconds. Based on a review of its ability to address the Purpose and Need and associated evaluation criteria, this Build condition was carried forward.

Despite reducing congestion considerably, the Build condition modeling revealed other congestion issues along the I-515 corridor. During the morning peak period, the southbound

direction on I-515 experiences gridlock caused by the weave movement between Flamingo Road and Tropicana Avenue. The queues or back-ups due to this congestion extend beyond the limits of Boulder Highway, which likely affect the interchanges and arterials farther north. Also, moderate congestion occurs in the southbound direction between Sunset Road and Auto Show Drive. I-515 in the northbound direction experiences slight to no congestion in the morning.

During the evening peak period, I-515 experiences heavy congestion in the southbound direction between Sunset Road and Auto Show Drive. This is likely caused by the consecutive merging and diverging ramps in this area. The northbound direction experiences slight to moderate congestion north of Auto Show Drive caused by the combination of heavy consecutive merging and the short weaving distance onto the I-515 mainline.

To address these issues, additional Round 1 alternatives for the I-515 area included adding auxiliary lanes in each direction and ramp metering. Auxiliary lanes are lanes other than through or travel lanes that are used to separate entering, exiting, or turning traffic from through traffic. Ramp metering refers to facilitating traffic flow on freeways by regulating the amount of traffic entering the freeway through the use of control devices (typically signals) on entrance ramps.

Appendix A contains the results of the evaluation. The auxiliary lane alternatives were advanced to Round 2 as standalone alternatives. While ramp metering scored favorably, the Study team determined that this alternative could be implemented anytime by NDOT and Clark County to ease congestion. In concluding that future evaluation was not necessary, the rating for the ramp metering alternative was lowered to 2 (Design Consideration) and it was confirmed that ramp metering would not be precluded as part of the 10 percent design plans developed as part of the SNTS.

4.3.2 I-15/CC 215/I-215 System Interchange Round 1 Evaluation

The Study team added a GP lane on I-15 to the network in both directions for the Build condition model. The addition of the GP lane resolves most of the severe capacity issues in the evening peak period along I-15. As shown on Figure 29 later in this chapter, the average delay in 2040 under the Build condition decreases to 10 seconds compared to 25 seconds under Baseline conditions. However, the westbound I-215 ramp would continue to experience severe congestion in the morning peak period from I-15 northbound. This is caused by the apparent upstream congestion that forms before the interchange on I-215 eastbound. This congestion acts as a meter, which does not allow the full traffic demand to access the system interchange. Considerable congestion occurs as far back as Russell Road heading eastbound toward the interchange.

Round 1 alternatives for the I-15/I-215 Interchange area included various interchange ramp improvements, a ramp to Decatur Avenue, and an HOV flyover. The results of the evaluation are shown in Appendix A. The additional lane and ramp improvement alternatives were advanced to Round 2 as standalone alternatives. The ramp to Decatur Avenue was retained as

a design consideration, while the HOV ramp alternative will be considered as part of a long-term HOV study.

4.3.3 I-215/I-515 System Interchange Round 1 Evaluation

Adding a GP lane on I-515 in both directions would address most capacity issues at this interchange. As shown on Figure 30 later in this chapter, the average delay in 2040 under the Build condition decreases to 12 seconds compared to 51 seconds under Baseline conditions. The overall network performed significantly better under the Build condition than under Baseline conditions during the morning peak period. However, additional alternatives were developed to address remaining congestion issues.

Round 1 alternatives for the I-215/I-515 Interchange area included an alternative to remove the local traffic from the through interstate traffic. A different interchange configuration also was considered. All alternatives rated well and were advanced to Round 2.

4.4 Round 2 Evaluation

Round 2 screening focused on differentiating alternatives based on their ability to meet the Purpose and Need and therefore focused on two criteria—mainline and local operations. Round 2 screening was conducted by performing microsimulation traffic modeling[5] for each of the individual improvements. The modeling provided a detailed assessment of the effectiveness of each idea for improving traffic congestion. During this phase, iterative traffic modeling was conducted that involved testing improvements, refining them based on results, then retesting. This approach helped coalesce the ideas into sets, or a package of ideas, for each corridor. The packages were assembled largely based on alternatives that complement each other. This process also generated new ideas to include in some of the packages. As in Round 1, ideas were added to the model individually, and results at a network level were reviewed in comparison to Baseline conditions. Also, using traffic modeling outputs, crash modification factors (CMF)[6] were developed where possible. A CMF is a measure of the safety effectiveness of a particular treatment or design element (FHWA n.d.). These factors were considered in the ratings. Each alternative was assigned a numerical score between 1 to 10. Figure 26 shows an example of the Round 2 scoring.

In general, alternatives found to not be effective at reducing corridor congestion at a network level were discarded. Those that produced the highest overall positive benefits were advanced to Round 3.

[5] A category of computerized analytical tools that perform highly detailed analysis of activities such as highway traffic flowing through an intersection.

Figure 26: Example of Round 2 Evaluation

Round 2 Screening

#	Description	Advantages	Disadvantages
1	I-515 - Add auxiliary lanes between Tropicana and Russell	▪ Improves Operations ▪ No new ROW anticipated ▪ Improved air quality from reduced congestion	▪ Creates an 8,000ft weaving movement ▪ Potential noise impacts ▪ Potential EJ impacts
Mainline Operations 10	Local Operations 5	Safety: Adding an auxiliary lane may reduce crashes by 21% (CMF ID 7440).	
Rating 3	Justification/Comments/Disposition: Idea used in Corridor Alternative 1 and Corridor Alternative 2.		

	Description	Rank	
Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.		10—Operations are significantly improved 5—No change to operations 1—Operations are significantly impacted
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.		10—Operations are significantly improved 5—No change to operations 1—Operations are significantly impacted

4.4.1 I-515 Corridor Round 2 Evaluation

In addition to the Round 1 alternatives discussed above, two additional I-515 alternatives were added in Round 2 in response to additional congestion issues identified in the detailed traffic modeling process. The additional alternatives included adding auxiliary lanes between Auto Show Road and Russell Road, plus ramp improvements at Auto Show Road, Flamingo Road, and Tropicana Avenue.

Appendix A provides the evaluation results. All alternatives were advanced to Round 3 either as standalone alternatives or as concepts to be considered with other alternatives. Standalone alternatives included:

- Add auxiliary lanes between Tropicana Avenue and Russell Road
- Add auxiliary lanes between Auto Show Road and Russell Road plus two-lane Auto Show northbound on-ramp
- Join Flamingo Road southbound on ramps plus braid with Tropicana Avenue dual off ramp

4.4.2 I-15/CC 215/I-215 System Interchange Round 2 Evaluation

Round 2 alternatives for the I-15/CC 215/I-215 Interchange area were unchanged from Round 1. All alternatives rated well and were advanced to Round 3.

4.4.3 I-215/I-515 System Interchange Round 2 Evaluation

In addition to the Round 1 alternatives discussed above, two additional I-215/I-515 alternatives were added in Round 2. The I-215/I-515 Free Flow alternative combines ramp improvements and ramp "braiding," which generally involves adding an additional lane to most of the direct connect ramps and modifying the location for on and off ramp merge/diverge areas to eliminate weaving.

The full interchange reconfiguration alternative was eliminated from consideration. All other alternatives evaluated well and were advanced to Round 3 either as standalone alternatives or as design considerations to be combined with other alternatives.

4.5 Round 3 Evaluation

The Round 3 screening was conducted by subjecting the packages of ideas to refined review and assessment based on more detailed design. The screening considered the following three criteria:

- An assessment of the long-term maintainability of the transportation facility.
- A review of construction impacts based on developing conceptual layouts at the 10 percent level of design; and
- Review of environmental resources using GIS mapping.

Although not considered in the ratings, crash modification factors were developed for specific improvement types and considered. Each package or alternative was assigned a numerical score between 1 and 10. Figure 27 shows an example of the Round 3 scoring.

Figure 27: Example of Round 3 Evaluation

Round 3 Screening

#	Description	Advantages	Disadvantages
1	I-515 - Add auxiliary lanes between Tropicana and Russell	• Improves Operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 8,000ft weaving movement • Potential noise impacts • Potential EJ impacts

Maintainability 5 Construction Impacts 6 Environmental Impacts 5

	Description		Rank
Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.		10—Maintainability is significantly reduced 5—No change in maintainability 1- Maintainability is significantly increased
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.		10—No impacts 5—Minimal impacts 1—Significant impacts
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.		10—No/minor impacts 5—Moderate impacts 1—Potentially high impacts

4.5.1 I-515 Corridor Round 3 Evaluation

In addition to the additional GP lane, two alternatives were advanced from Round 2 based on the criteria and ratings listed above. These included:

- Auxiliary lanes in select locations
- Ramp braiding in specific locations

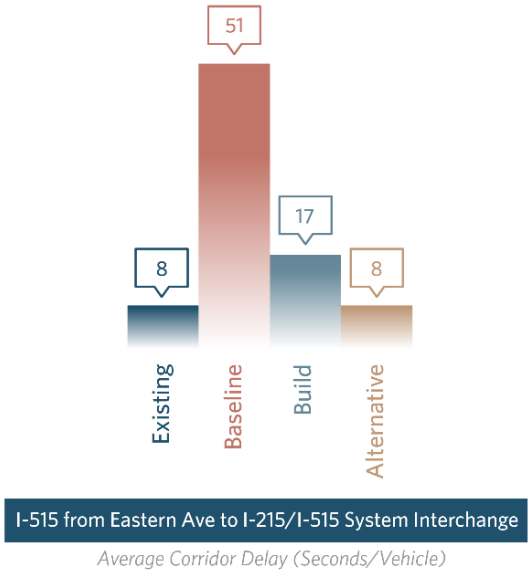
Each alternative scored well and, therefore, were packaged into an alternative and modeled collectively. The traffic modeling showed notable congestion relief when combined with the Build condition. Specific observations included:

- Severe congestion between Flamingo Road and Tropicana Avenue (southbound) was reduced to minor congestion.
- Northbound I-515 experiences little to no congestion during both the morning and evening peak periods.

- Southbound I-515 in the evening peak period only experiences slight congestion between Boulder Highway and Flamingo Road and between Russell Road and Galleria Drive.

Figure 28 shows reductions in average travel delay for this alternative package relative to Existing, Baseline, and Build conditions. Also, based on the Crash Modification Factor calculations (see Section 4.4), the Preferred Alternative is predicted to result in a net decrease of 75 crashes per year through 2040.

Figure 28: Average Travel Delay Reductions for I-515 Alternative Package



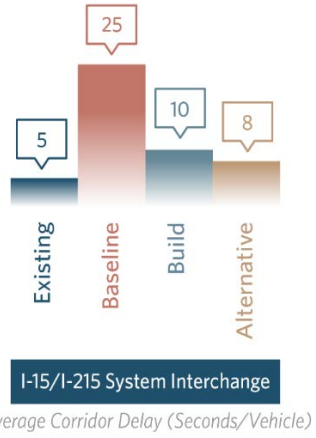
4.5.2 I-15/CC 215/I-215 System Interchange Round 3 Evaluation

Alternatives evaluated in Round 3 included:

- Widen CC 215 eastbound to I-15 northbound ramp from one to two lanes
- Widen the I-15 northbound/Las Vegas Blvd. to CC 215 westbound ramp from one to two lanes

These alternatives scored well and, therefore, were packaged into an alternative and modeled collectively. Figure 29 shows reductions in average travel delay all scenarios. When analyzing the interchange for safety, the number of crashed is expected to decrease by 34 crashes per year in 2040 relative to Baseline conditions.

Figure 29: Average Travel Delay Reductions for I-15/CC 215/I-215 Alternative Package



4.5.3 I-215/I-515 System Interchange Round 3 Evaluation

Alternatives that advanced from Round 2 were combined into two alternative packages based on their compatibility and how they complemented each other.

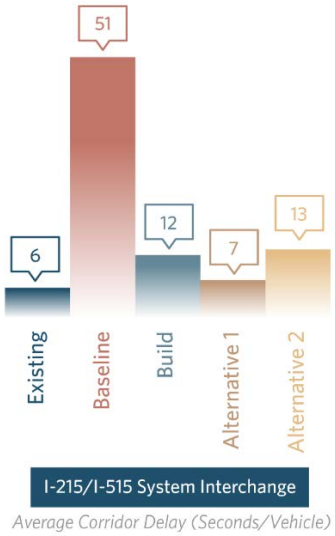
- Alternative 1
  - Ramp braiding
  - Additional lanes on select ramps
- Alternative 2
  - Modified rotary
  - Separation of local and freeway movements

Figure 30 shows how these alternative packages compared to the Baseline and Build conditions. As noted above, the Build condition greatly improves congestion issues over the Baseline, while both alternative packages would provide greater congestion relief.

The southbound congestion slowly builds from the beginning of the evening peak period at the system interchange and increases from moderate to severe by the end of the evening peak period. Congestion at the interchange can be directly linked to the weaving maneuvers of the ramps that service the interchanges at I-515 and Auto Show Drive and at I-215 and Gibson Road.

Although not part of the rating criteria, safety benefits were evaluated, and differ between the alternative packages. While Alternative 1 would result in three fewer crashes per year up to 2040 compared to the Build condition, Alternative 2 would result in 44 fewer crashes in that timeframe.

Figure 30: Average Travel Delay Reductions for I-215/I-515 Alternative Packages



4.6 Preferred Alternatives

The outcome of Round 3 was the identification of Preferred Alternative packages for I-515 and the I-15/CC 215/I-215 system interchange. Two alternative packages were identified for the I-215/I-515 system interchange. Figure 4 through Figure 7 show these packages. As noted on the figures, the proposed alternatives feature varied combinations of the following types of improvements:

- Braided ramps are grade-separated ramps that preclude traffic merging conflicts.
- Ramp augmentations include lane widening, dual and/or extended turn lanes, and other improvements.
- Direct connect ramps are dedicated ramps for HOV lanes connecting HOV lanes through a system interchange.
- Collector distributor roads are extra lanes between the freeway mainline and the arterial system.
- Auxiliary lanes provide an extra lane between interchanges to improve traffic operations.

Chapter 6.0 discusses how these alternative packages could be implemented in the future.

Figure 31: I-515 Corridor Preferred Alternative

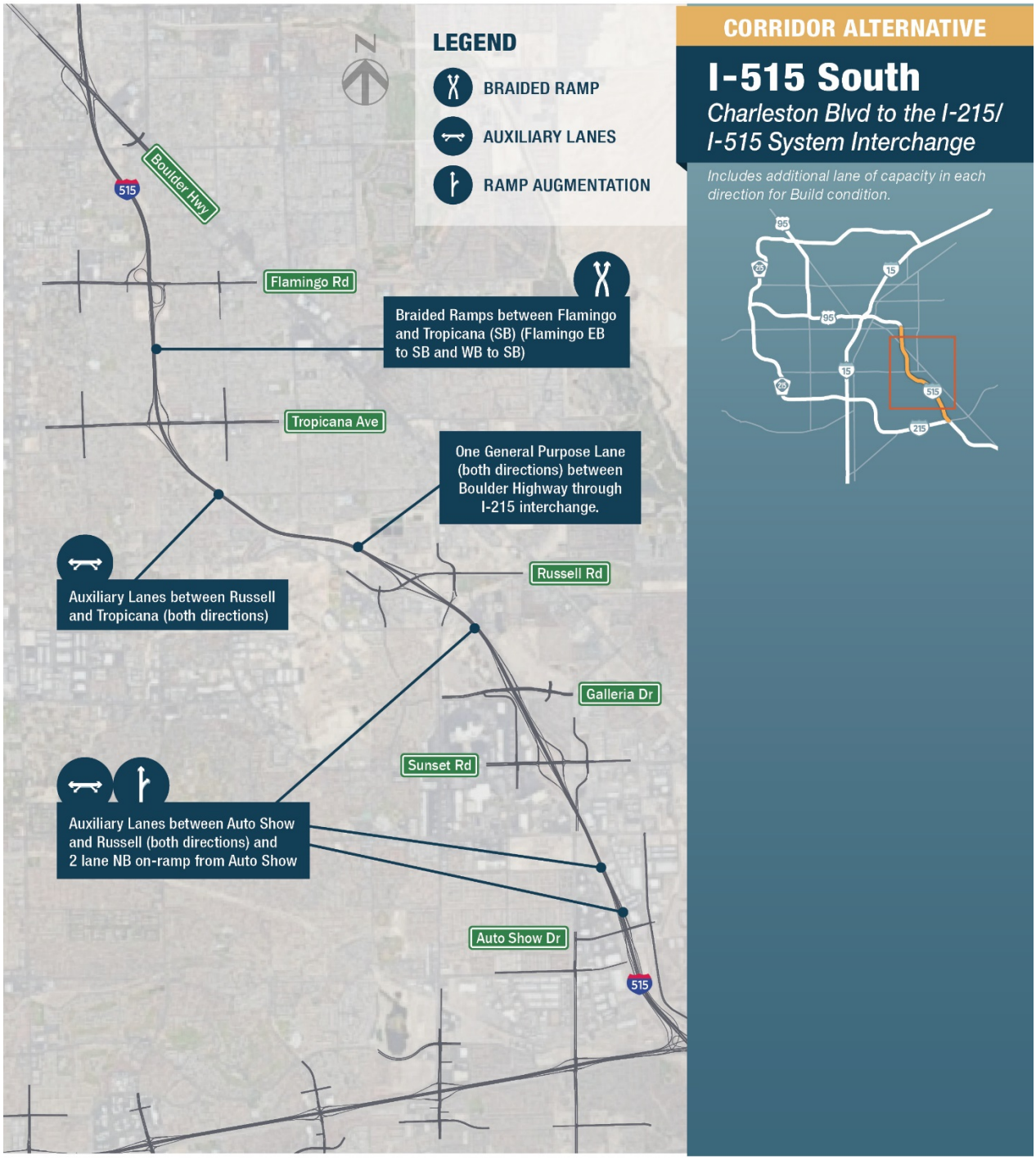


Figure 32: I-15/CC 215/I-215 System Interchange Preferred Alternative

Figure 33: I-215/I-515 System Interchange Alternative 1

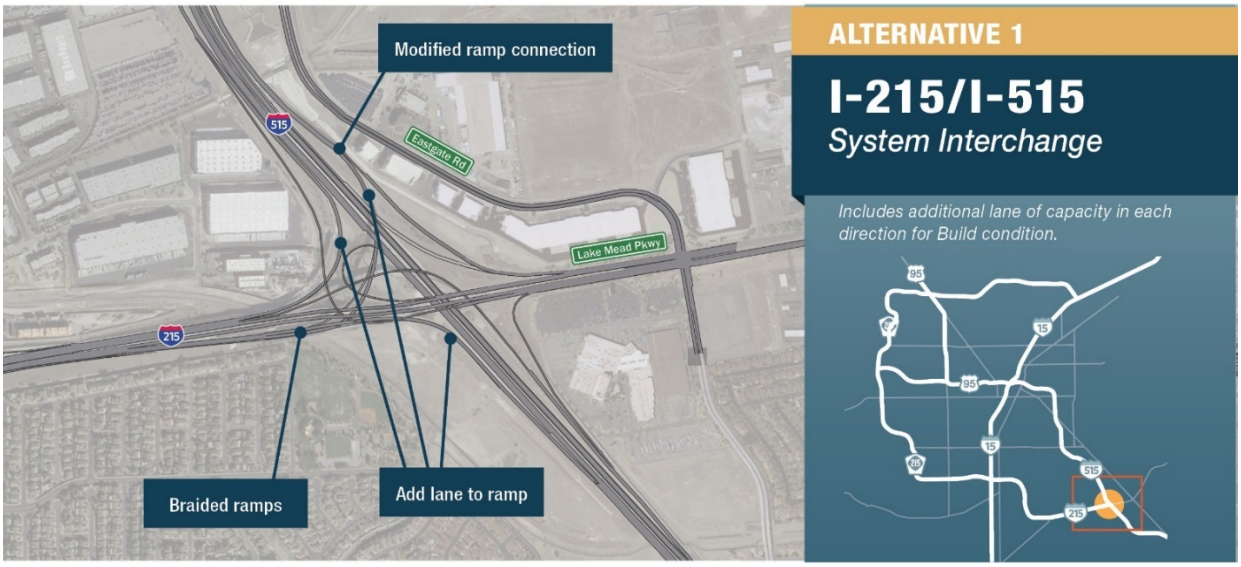
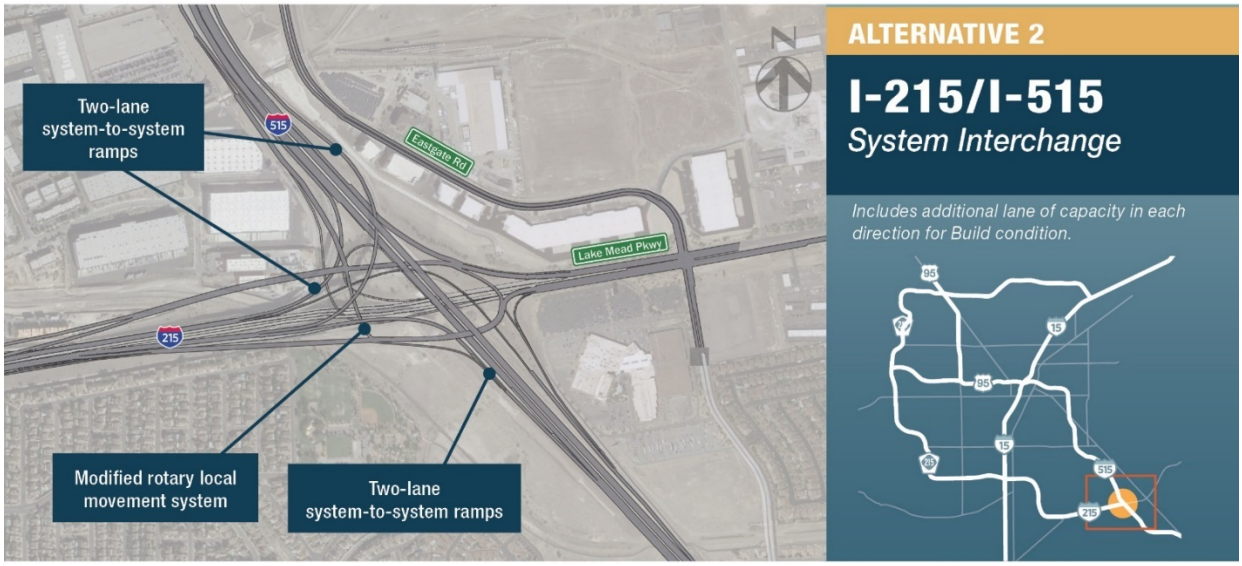


Figure 34: I-215/I-515 System Interchange Alternative 2



5.0 Agency Coordination and Public Involvement

The Study team conducted agency and public outreach for this PEL Study in conjunction with the overall SNTS to obtain input on issues and needs within the Study Area. This input was used to refine the Study's Purpose and Need and was considered during the alternatives development, evaluation, and screening process (see Chapter 4.0). This section summarizes agency coordination and public involvement activities.

5.1 Agency Coordination

5.1.1 Agency Scoping

On June 21, 2018, NDOT sent letters to representatives of local, state, and federal agencies and stakeholders listed below to inform them of the Study and request their scoping comments regarding any issues or concerns that they felt should be considered in the Study.

- Bureau of Reclamation
- Colorado River Commission
- Eleventh Coast Guard District
- Federal Aviation Administration (FAA)
- National Park Service (NPS)
- Natural Resources Conservation Service (NRCS)
- Nevada Chapter Associated General Contractors (AGC)
- Nevada Department of Wildlife (East)
- Nevada Division of Water Resources
- Nevada Environmental Coalition Inc.

- Nevada Natural Heritage Program
- Nevada Preservation Foundation
- Preservation Association of Clark County
- Sierra Club
- Southern Nevada Water Authority
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Department of the Interior – Pacific Southwest Region (U.S. DOI)
- U.S. Environmental Protection Agency (U.S. EPA)
- U.S. Fish and Wildlife Service (USFWS)
- U.S. Forest Service (USFS)
- U.S. Geological Survey Water Resources Division (USGS)
- U.S. Geological Survey Western Ecological Research Center

The U.S. EPA and FAA provided scoping comments, which are summarized below:

- U.S. EPA:
  - Provided recommendations for the interagency review process for resource and regulatory agencies.
  - Recommended that the Study clearly identify which elements of the traffic study will be used to inform future decision making and what analyses will be deferred until the NEPA stage.
  - Asked that logical termini and independent utility, as well as the scope of future NEPA analyses be identified early in the planning process.
  - Provided recommendations for the alternatives development and evaluation process to include developing a full range of alternatives for corridor improvement concepts, considering alternatives that maximize use of existing facilities (e.g., high-occupancy toll lanes and improved transit), quantifying potential environmental impacts of each alternative to the extent possible, and providing a clear discussion of reasons that alternatives were eliminated.
  - Recommended that the Study consider and describe impacts to air quality; Environmental Justice populations; water bodies, wetlands, and water quality; cumulative impacts; and growth.
- FAA:
  - Thanked NDOT for the opportunity to review and comment on this Study; voiced no concerns or issues.

Scoping letters and responses are provided in Appendix C of this PEL Study.

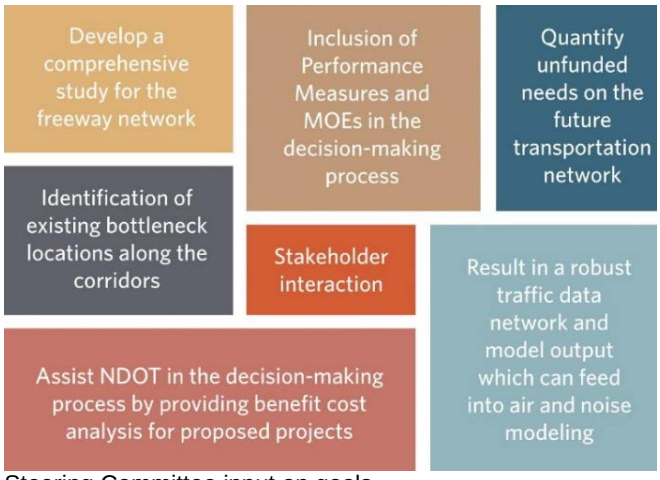
5.1.2 Steering Committee

A Steering Committee was formed to provide guidance and oversight throughout the course of the study. The Steering Committee was made up of representatives of FHWA, RTCSNV, Clark County, and municipalities within the Study area. Steering Committee members are listed below:

- Federal Highway Administration
- Regional Transportation Commission of Southern Nevada
- Clark County
- City of Henderson
- City of Las Vegas
- City of North Las Vegas

The Steering Committee met seven times, typically in half-day workshops, to review the study progress and to provide valuable feedback on issues, goals, and projects to be considered. Committee input on Study goals are shown at right:

Steering Committee materials are provided in Appendix K of the *Southern Nevada Traffic Study* report.



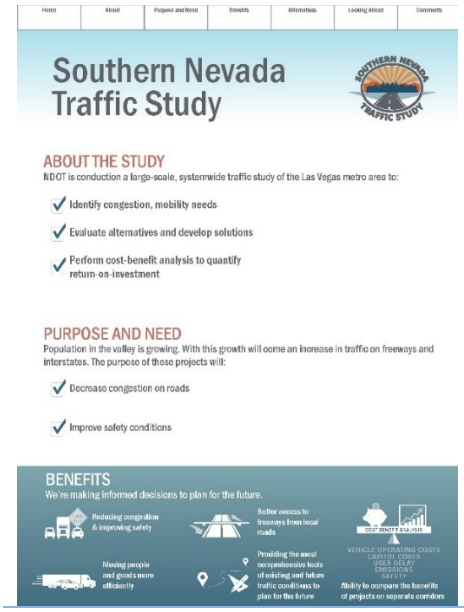
Steering Committee input on goals

5.2 Public Involvement

This section summarizes public outreach activities that were conducted under the overall SNTS and this PEL Study. Public outreach materials are provided in Appendix D of this PEL Study.

5.2.1 Website

Because the SNTS and PEL Study are of regional importance, a Study website was established (www.ndotsnts.com) that could be accessed by anyone in the Study Area at any time. The website was publicized through links on the NDOT website, in newspaper ads for the I 515 Restripe Slip Ramp at SR 564 and CC 215 project, and on the presentation and handout materials provided at the information booth discussed below. The website provided information about the study, PEL process, PEL alternatives, and provided members of the public the opportunity to share comments about the Study. No public comments were received through the project website.



Study website

5.2.2 Public Meeting Information Booth

An information booth for this PEL Study was staffed in conjunction with a public meeting held on August 22, 2018 for the I 515 Restripe Slip Ramp at SR 564 and CC 215 project. This public meeting was selected because it was held in Henderson, which is in proximity to the PEL Study Areas, and was anticipated to attract many residents and businesses who were concerned about access changes. The team provided attendees with information about the Study, the Purpose and Need, and the PEL Study Area alternatives. The NDOT Project Manager discussed the Study with about a dozen members of the public, providing information about the PEL process and how it will feed into future NEPA studies. However, no public comments were received. This meeting was advertised in the Las Vegas Review-Journal.


Study information booth at an August 22, 2018 public meeting

6.0 Next Steps and Implementation

Because NDOT adopted a PEL approach for the I-515, I-215/I-515 system interchange, and the I-15/CC 215/I-215 system interchange areas, environmental analyses were conducted at a planning level in this Study based on existing mapping and data resources. Future NEPA studies will involve more detailed analyses for environmental resources that could be impacted by the projects. This chapter highlights future resource analyses expected for the alternatives packages outlined in Section 4.6 and discusses future NEPA classes of (described below) action for those alternatives.

As NDOT identifies projects to advance to development, it will work with FHWA to outline environmental clearance requirements under NEPA.

6.1.1 Future Resources Analysis

Land Use

The alternative packages are focused on improving congestion and safety, generally within the existing NDOT right-of-way. Therefore, changes in land use are not expected. However, future NEPA processes should continue to coordinate with city, county, and RTCSNV planners to identify plans, planned projects, and any future land use changes. This information will help ensure consistency with local land use and transportation decision-making.

Right-of-Way/Relocations

Future NEPA studies should identify existing right-of-way and future right-of-way needs through more detailed design and property mapping. Where projects require additional right-of-way, designers should work to avoid and minimize effects to private landowners as much as possible. Any residential and/or business relocations resulting from implementation of federal aid projects require compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as well as NDOT's *Right-of-Way Manual* (NDOT 2016).

Biological Resources

Because of the highly disturbed nature of the PEL Study Areas, impacts to federal- or state-protected species are not expected. However, future studies should verify that no effects would occur, and evaluate effects to migratory birds under the Migratory Bird Treaty Act, which may include migratory birds nesting under bridge structures. Some undeveloped land is located west of the I-15/I-215 PEL Area that could potentially support Mojave desert tortoise. If staging locations are considered in that area, it should be investigated for Mojave desert tortoise. Wildlife and vegetation impacts are expected to be minimal.

Environmental Justice

Each alternative package must be assessed to determine if it will result in disproportionate effects to low-income or minority populations. If such impacts are expected, the analysis should assess whether the impacts are disproportionately high and adverse, as defined by FHWA guidance (FHWA 2015) (https://www.environment.fhwa.dot.gov/projdev/guidance_ej_nepa.asp). For any adverse effects, NDOT should evaluate measures to avoid and minimize impacts to disadvantaged communities. If impacts cannot be avoided, NDOT should work with the affected community to develop mitigation measures to offset the impacts. This will require outreach to these communities to determine their needs and concerns.

Floodplains

Several FEMA-regulated 100-year floodplains are located in the PEL Study Areas (see Figure 19 in Chapter 3.0). As project designs are refined, hydrologic and hydraulic analyses should be conducted to confirm compliance with the City of Las Vegas and NDOT drainage criteria. Consistency with these requirements should be coordinated with NDOT, the City of Las Vegas,

and FEMA. Additionally, the number and type of permits should be identified, including National Pollution Discharge Elimination System permits.

Hazardous Materials

Hazardous materials sites have been identified in all three PEL Study Areas, as shown on Figure 20 in Chapter 3.0, Future projects should consider the locations of recognized environmental conditions relative to future improvements to determine the need for future hazardous materials analysis. This effort should start with updated database searches, followed by an Initial Site Assessment or, if greater potential exists for contamination, a Phase I Environmental Site Assessment (ESA). Results of these assessments will determine the need for sampling and testing as part of a larger Phase II ESA. The need for future study and/or remediation efforts will be determined based on the results.

Historic Resources

Figure 21 (in Chapter 3.0) shows historic resources identified in the PEL Study Areas. Properties currently considered as “Unevaluated” or “No Information” require additional analysis to determine their eligibility for listing on the NRHP. Further, a comprehensive review will be required to identify whether other historic properties may exist that were not identified as part of previous studies, or whether the eligibility status of previously surveyed properties may have changed over time. Consultation with the State Historic Preservation Officer (SHPO) should occur for concurrence with NRHP eligibility determinations for those properties. During the NEPA process, a determination of no effect, no adverse effect, or adverse effect should be made for properties that have been determined to be eligible for the NRHP, followed by consultation with the SHPO and other parties consulting in the NRHP Section 106 process to identify any necessary mitigation for adversely affected properties.

Parks and Recreation, Community Facilities, Bicycle/Pedestrian Facilities

Plans for future community, park, and bicycle and pedestrian facilities should be reviewed for updated information. This includes the plans to continue improving the bicycle and pedestrian networks underneath and around the I-515, I-215/I-515, and I-15/CC 215/I-215 PEL areas. Improvements to interstate ramps and ancillary facilities that connect to the interstates should seek to improve bicycle and pedestrian connections affected by the projects.

Air Quality

The PEL Study Areas are located within portions of Clark County Hydrographic Area 212, which is designated as a non-attainment area for carbon monoxide (CO) and particulate matter less than 10 microns (PM_{10}). PM_{10} is more commonly known as dust. A larger area, comprising about 60 percent of Clark County, is in non-attainment for ozone. The PEL Study Areas are in attainment for all other criteria pollutants.

Because all alternative packages would reduce congestion, each should improve overall air quality. However, future NEPA studies should include air quality analyses to evaluate

compliance and conformity with the federal Clean Air Act and Amendments of 1990, Nevada State implementation plans, and applicable state and local regulations. The project assessment should consist of an analysis of traffic data, emissions calculations, evaluation of potential project air quality impacts, and preparation of technical reports. Depending on the project, coordination with agencies such as the EPA and Nevada Department of Environmental Protection Bureau of Air Quality may be required.

Projects will likely require quantitative (hot spot) CO analysis using the EPA's approved CAL3QHC model for assessing potential CO impacts. These hot-spot analyses would be conducted at the intersections or interchanges within the PEL Study Areas with the worst traffic operations. EPA's most current and approved MOtor Vehicle Emission Simulator Model (MOVES) should be used to estimate CO emission factors.

Either a quantitative or qualitative analysis of Mobile Source Air Toxics (MSATs) would be required using FHWA's current guidance on assessing MSATs. The type of analysis will depend on whether the project meets the criteria requiring a quantitative analysis. Additionally, temporary construction impacts on local air quality should be assessed qualitatively.

Traffic Noise

Future studies will need to identify noise-sensitive resources for potential traffic noise analysis. FHWA regulation 23 Code of Federal Regulations (CFR) 772 requires investigation of traffic noise impacts in areas adjacent to federally-aided highways for proposed construction of a highway on a new location, or the reconstruction of an existing highway to either significantly change the horizontal or vertical alignment, or increase the number of through-traffic lanes. If NDOT identifies traffic noise impacts, the agency should consider and incorporate all feasible and reasonable traffic noise abatement into project design. The most common form of noise abatement for highway projects is noise barriers. The greatest potential for noise impacts and barriers would be along I-515 due to the additional GP and auxiliary lanes.

Visual Conditions

Future NEPA processes should evaluate the need to conduct a visual impact assessment in accordance with FHWA's *Guidelines for the Visual Impact Assessment of Highway Projects* (FHWA 2015). An example of a visual impact that might require assessment would be moving a frontage road or noise barriers closer to an EJ neighborhood.

The need for and nature of these assessments will vary depending on the packages or projects advanced. The assessment could include a description of the existing visual quality, important visual resource issues, viewer characteristics, and the visual environment. Based on these elements, key observation points should be determined that represent important views. If necessary, photo simulations may be developed to assist in determining impacts to visual quality and identifying appropriate mitigation measures.

Wetlands/Waters of the U.S.

Based on the existing mapping, no wetlands appear to be located within the PEL Study Areas although drainages are shown that may be jurisdictional waters of the U.S. During the NEPA process, NDOT will conduct field investigations to confirm the presence of waters of the U.S., including wetlands. If needed, NDOT will work with the US. Army Corps of Engineers to determine whether wetlands fall under Clean Water Act jurisdiction. As project design progress, any impacts to wetlands and waters will need to be avoided and minimized as practicable.

6.2 NEPA Classes of Action

FHWA regulations (23 CFR 771.115) define three classes of actions that prescribe the level of documentation required in a NEPA process:

- **Class I (environmental impact statement [EIS])**. Actions that significantly affect the environment require an EIS; for example, building a new controlled access freeway or a highway project with four or more lanes at a new location.
- **Class II (categorical exclusion [CE])**. Actions that do not individually or cumulatively have a significant environmental effect are excluded from the requirement to prepare an environmental assessment (EA) (defined below) or EIS. A specific list of CEs normally not requiring NEPA documentation for FHWA actions is described in 23 CFR 771.117(c) or, when appropriately documented, additional projects may also qualify as CEs under 23 CFR 771.117(d).
- **Class III (environmental assessment)**. Actions in which the significance of the environmental impact is not clearly established. All actions that are not Class I or II are Class III. All Class III actions require preparation of an EA to determine the appropriate environmental document required.

In implementing projects or packages from this PEL Study, NDOT will consult with FHWA on appropriate classes of action, and FHWA will make final determinations.

6.3 Independent Utility and Logical Termini

Before advancing a Preferred Alternative project or package through the stages of planning, environmental assessment, design, and construction, NDOT must demonstrate that each improvement project has independent utility and logical termini. The purpose of determining independent utility is to confirm that each improvement project is able to operate independent of other projects. To have independent utility, the improvement project cannot depend on any other projects – it must be able to be completed and function properly without other improvements. If an improvement project has independent utility, that singular project can be considered by itself in a CE, EA, or EIS.

> If an improvement project has independent utility (can operate acceptably without depending on other projects), it can be considered by itself in a CE, EA, or EIS.

The term “logical termini” is related to independent utility and is defined as the rational end points for a transportation improvement (the project limits) and the rational end points for assessing environmental impacts. NDOT must demonstrate to FHWA that an improvement project has logical termini, and FHWA makes the final determination. Refer to this link for more info: https://www.environment.fhwa.dot.gov/legislation/nepa/guidance_project_termini.aspx.

The improvements that comprise the Preferred Alternative packages were modeled or based on the additional GP lane. However, although the Study team did not assess independent utility at this PEL stage, most or all of these improvements would individually provide congestion and safety benefits.

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Appendix A
Alternatives Evaluation

Appendix A: Alternatives Evaluation

Table of Contents

Page No.

I-515 from Eastern Ave to the US 95/I-515 System Interchange • Round 1

IDEAS

1. Add auxiliary lanes between Tropicana and Russell
2. Add auxiliary lanes between Lake Mead to Horizon
16. Ramp Metering

ROUND 1 CRITERIA

Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.
Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.

Round 1 Screening

#	Description	Advantages	Disadvantages
1	I-515 - Add auxiliary lanes between Tropicana and Russell	• Improves Operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 8,000ft weaving movement • Potential noise impacts • Potential EJ impacts

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◎	◎	◎

Rating 3

Justification/Comments/Disposition:
Moved to further evaluation and modeling.

I-515 from Eastern Ave to US 95/I-515 System Interchange • Round 1 *Continued*

Round 1 Screening

#	Description	Advantages	Disadvantages
2	I-515 - Add auxiliary lanes between Lake Mead to Horizon	• Improves operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 6,000ft weaving movement

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◉	◉	●

Rating 3

Justification/Comments/Disposition:
Moved to further evaluation and modeling.

Round 1 Screening

#	Description	Advantages	Disadvantages
16	Ramp Metering	• No notable environmental concerns	• Can cause queuing that may affect interchange

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◉	○	●

Rating 2

Justification/Comments/Disposition:
Idea was rated 3 but adjusted to 2 after further study. This was determined to be a design consideration that may warrant additional analysis in a future study or may be combined with other ideas.

I-515 from Eastern Ave to the US 95/I-515 System Interchange • Round 2

IDEAS

1. Add auxiliary lanes between Tropicana and Russell
2. Add auxiliary lanes between Lake Mead to Horizon
16. Ramp Metering
22. Add auxiliary lanes between Auto Show and Russell plus 2 lane Auto Show NB on-ramp
23. Join Flamingo SB on-ramps plus braid with Tropicana dual off-ramp

Ideas Screened Out During: **Round 1**	N/A
Ideas Added	22, 23

ROUND 2 CRITERIA

Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.	**10**. Operations Considerably Improved **5**. No Change to Operations **1**. Operations Considerably Impacted
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.	**10**. Operations Considerably Improved **5**. No Change to Operations **1**. Operations Considerably Impacted

Round 2 Screening

#	Description	Advantages	Disadvantages
1	I-515 - Add auxiliary lanes between Tropicana and Russell	• Improves Operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 8,000ft weaving movement • Potential noise impacts • Potential EJ impacts

Mainline Operations: 10 Local Operations: 5

Safety: Adding an auxiliary lane may reduce crashes by 21% (CMF ID 7440).

Rating 3

Justification/Comments/Disposition:
Idea used in Corridor Alternative 1 and Corridor Alternative 2.

I-515 from Eastern Ave to US 95/I-515 System Interchange • Round 2 *Continued*

Round 2 Screening

#	Description	Advantages	Disadvantages
2	I-515 - Add auxiliary lanes between Lake Mead to Horizon	• Improves operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 6,000ft weaving movement

Mainline Operations: N/A Local Operations: N/A

Rating 2

Justification/Comments/Disposition:
This Idea is already a part of the assumed 2040 Build network ; the auxiliary lane was replaced with the GP lane concept.

Round 2 Screening

#	Description	Advantages	Disadvantages
16	I-515 - Add auxiliary lanes between Lake Mead to Horizon	• No notable environmental concerns	• Negative local system impacts • Maintenance of system

Mainline Operations: N/A Local Operations: N/A

Rating 2

Justification/Comments/Disposition:
Design consideration for future projects. Not considered as part of SNTS B/C analysis.

Round 2 Screening

#	Description	Advantages	Disadvantages
22	Add auxiliary lanes between Auto Show and Russell plus 2 lane Auto Show NB on-ramp	• Removal of bottle neck along I-515 • Minimal addition of pavement and striping • Improved flow on congested movements	• Without 2 lane on-ramps, traffic would back into Auto Show • Ramp closures • Potential EJ impacts • Potential drainage feature impacts • Potential noise impacts

Mainline Operations: 10 Local Operations: 5

Rating 3

Justification/Comments/Disposition:
Idea used in Corridor Alternative 1 and Corridor Alternative 2.

Round 2 Screening

#	Description	Advantages	Disadvantages
23	Join Flamingo SB on-ramps plus braid with Tropicana dual off-ramp	• Removal of bottle neck along southbound I-515 • Separation of conflicting movements	• Without removal of weave, traffic could backup to Boulder and Flamingo • Cost of new bridge and wall maintenance • Ramp closures • If ROW is required, potential impacts to EJ and off-street bike trail along I-515

Mainline Operations 10 Local Operations 8

Rating 3

Justification/Comments/Disposition:
Idea used in Corridor Alternative 1 and Corridor Alternative 2.

I-515 from Eastern Ave to the US 95/I-515 System Interchange • Round 3

IDEAS

1. Add auxiliary lanes between Tropicana and Russell
22. Add auxiliary lanes between Auto Show and Russell plus 2 lane Auto Show NB on-ramp
23. Join Flamingo SB on-ramps plus braid with Tropicana dual off-ramp

Ideas Screened Out During: **Round 2** 2, 16

ROUND 3 CRITERIA

Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.	**10**. Maintainability Considerably Reduced **5**. No Change in Maintainability **1**. Maintainability Considerably Increased
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.	**10**. No Impacts **5**. Minimal Impacts **1**. Considerable Impacts
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.	**10**. No/minor Impacts **5**. Minimal Impacts **1**. Potentially High Impacts

Round 3 Screening

#	Description	Advantages	Disadvantages
1	I-515 - Add auxiliary lanes between Tropicana and Russell	• Improves Operations • No new ROW anticipated • Improved air quality from reduced congestion	• Creates an 8,000ft weaving movement • Potential noise impacts • Potential EJ impacts

Maintainability 5 Construction Impacts 6 Environmental Impacts 5

✓ **Preferred Alternative**

Round 3 Screening

#	Description	Advantages	Disadvantages
22	Add auxilary lanes between Auto Show and Russell plus 2 lane Auto Show NB on-ramp	• Removal of bottle neck along I-515 • Minimal addition of pavement and striping	• Without 2 lane on-ramps, traffic would back into Auto Show • Ramp closures

Maintainability 4 Construction Impacts 4 Environmental Impacts 4

✓ **Preferred Alternative**

I-515 from Eastern Ave to US 95/I-515 System Interchange • Round 3 *Continued*

Round 3 Screening

#	Description	Advantages	Disadvantages
23	Join Flamingo SB on-ramps plus braid with Tropicana dual off-ramp	• Removal of bottle neck along southbound I-515	• Without removal of weave, traffic could backup to Boulder and Flamingo • Cost of new bridge and wall maintenance • Ramp closures
	Maintainability 3 Construction Impacts 3 Environmental Impacts 4		

✓ **Preferred Alternative**

I-215/I-515 System Interchange • Round 1

IDEAS (Note: alternatives evaluated below are based on, or in addition to, one GP lane in each direction)

15. I-515/I-215 System Interchange – Remove the local movements (blue lines) from the freeway movements
21. I-215/I-515 Modified Dogbone

EVALUATION OF IDEAS

Taking into consideration the constraints and controlling decisions, the team discussed each idea and documented the advantages and disadvantages for that location. Each idea was then carefully evaluated with the assembled team of subject matter experts reaching consensus on the overall rating of the idea (zero through three).

The rating values are shown below:

3	**Moved to Further Evaluation and Modeling**	Advanced as Recommendation
2	**Design Consideration**	Maybe Combined with Other Ideas
1	**Major Value Degradation**	Dropped from Future Consideration
0	**Fatal Flaw** (unacceptable impact or doesn't meet the project purpose and need)	Dropped from Future Consideration

- ● More Desirable
- ○ Average
- ◉ Less Desirable

ROUND 1 CRITERIA

Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.
Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.

I-215/I-515 System Interchange • Round 1 *Continued*

Round 1 Screening

#	Description	Advantages	Disadvantages
15	I-515/I-215 System Interchange – Remove the local movements (blue lines) from the freeway movements	• Separates local from freeway movement within the system interchange	• ROW impacts • May have some other impacts • Visual impacts • Potential impacts to off-street bike trail

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	●	◎	◎	◎

Rating 3

Justification/Comments/Disposition:
Moved to further evaluation and modeling.

Round 1 Screening

#	Description	Advantages	Disadvantages
21	I-215/I-515 Modified Dogbone	• Separates local from freeway movement within the system interchange • Utilizes existing structures • Limits sideswipe and head on conflict points	• ROW impacts • May have some other impacts • Potential floodplain impacts • Visual impacts • Additional infrastructure to maintain • Driver expectation

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◎	◎	◎

Rating 3

Justification/Comments/Disposition:
Moved to further evaluation and modeling.

I-215/I-515 System Interchange • Round 2

IDEAS

15. I-515/I-215 System Interchange – Remove the local movements (blue lines) from the freeway movements
21. I-215/I-515 Modified Dogbone
88. I-212/I-215 Free Flow (Cadillac Version)
95. I-215/I-515 Modified Rotary

Ideas Screened Out During: **Round 1**	N/A
Ideas Added	88, 95

ROUND 2 CRITERIA

Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.	 **10**. Operations Considerably Improved **5**. No Change to Operations **1**. Operations Considerably Impacted
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.	 **10**. Operations Considerably Improved **5**. No Change to Operations **1**. Operations Considerably Impacted

Round 2 Screening

#	Description	Advantages	Disadvantages
15	I-515/I-215 System Interchange – Remove the local movements (blue lines) from the freeway movements	• Separates local from freeway movement within the system interchange	• ROW impacts • May have some other impacts • Visual impacts • Potential impacts to off-street bike trail
Mainline Operations 3	Local Operations 3		
Rating 2	**Justification/Comments/Disposition:** Idea #15 is a design consideration that was implemented as a part of Idea #21 and added Idea #95.		

I-215/I-515 System Interchange • Round 2 *Continued*

Round 2 Screening

#	Description	Advantages	Disadvantages
21	I-215/I-515 Modified Dogbone	• Separates local from freeway movement within the system interchange • Utilizes existing structures	• ROW impacts • May have some other impacts • Potential drainage impacts • Visual impacts • Additional infrastructure to maintain • Driver expectation

Mainline Operations: 1 Local Operations: 1 Safety: No relevant information found to determine safety benefits for this alternative. Further detailed investigation is required to estimate potential outcome.

Rating 1

Justification/Comments/Disposition:
The heavy I-215 eastbound through traffic to Lake Mead did not allow for ramps/side streets to yield into the dogbone. The congestion formed by this alternative impacted Lake Mead as well as both I-215 and I-515 corridors.

Round 2 Screening

#	Description	Advantages	Disadvantages
88	I-215/I-515 Free Flow: 2 lane system ramps, braided I-215 eastbound to I-515 southbound & I-215 eastbound to I-515 northbound	• Improves SB to WB, EB to NB, and EB to SB to two lanes each • Minimal improvements that maintain connectivity	• ROW impacts • Additional infrastructure to maintain

Mainline Operations: 3 Local Operations: 3

Rating 3

Justification/Comments/Disposition:
Analyzed as a part of Corridor Alternative 1.

Round 2 Screening

#	Description	Advantages	Disadvantages
95	I-215/I-515 Modified Rotary: Remove the local movements from the freeway movements into a signalize rotary configuration	• Improves SB to WB and EB to NB ramps to two lanes each • Separates local movements from freeway, improves access	• Local operation at Lake Mead and Eastgate • Driver expectation • Signing

Mainline Operations: 3 Local Operations: 3

Rating 3

Justification/Comments/Disposition:
Analyzed as a part of Corridor Alternative 2.

I-215/I-515 System Interchange • Round 3

IDEAS

88. I-212/I-215 Free Flow (Cadillac Version)
95. I-215/I-515 Modified Rotary

Ideas Screened Out During: **Round 2** 15, 21

ROUND 3 CRITERIA

Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.	**10**. Maintainability Considerably Reduced **5**. No Change in Maintainability **1**. Maintainability Considerably Increased
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.	**10**. No Impacts **5**. Minimal Impacts **1**. Considerable Impacts
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.	**10**. No/minor Impacts **5**. Minimal Impacts **1**. Potentially High Impacts

Round 3 Screening

#	Description	Advantages	Disadvantages
88	I-215/I-515 Free Flow: 2 lane system ramps, braided I-215 eastbound to I-515 southbound & I-215 eastbound to I-515 northbound	• Improves SB to WB, EB to NB, and EB to SB to two lanes each • Minimal improvements that maintain connectivity	• ROW impacts • Additional infrastructure to maintain
Maintainability 3	Construction Impacts 1	Environmental Impacts 5	

✓ **Preferred Alternative**

Round 3 Screening

#	Description	Advantages	Disadvantages
95	I-215/I-515 Modified Rotary: Remove the local movements from the freeway movements into a signalize rotary configuration	• Improves SB to WB and EB to NB ramps to two lanes each	• Local operation at Lake Mead and Eastgate • Driver expectation • Signing • ROW impacts
Maintainability 3	Construction Impacts 1	Environmental Impacts 6	

✓ **Preferred Alternative**

I-15/I-215 System Interchange • Round 1

IDEAS (Note: alternatives evaluated below are based on, or in addition to, one GP lane in each direction)

1. Construct the CC-215/I-15 HOV flyovers (CC-215 EB to I-15 NB and I-15 SB to CC-215 WB)
2. Widen the CC-215 EB to I-15 NB ramp from one to two lanes
3. Widen the I-15 NB/Las Vegas Boulevard to CC-215 WB ramp from one to two lanes
4. Early exit to Decatur from I-215 prior to the System Interchange

ROUND 1 CRITERIA

Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.
Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.

Round 1 Screening

#	Description	Advantages	Disadvantages
1	Construct the HOV direct connects East/North and West/North	• Delays the need for improvements on the I-15 CD roads and some ramps at the I-15/I-215/CC-215 interchange • Recommended for implementation in the Southern Nevada HOV Plan Update	• Potential ROW impacts • Not necessarily the "best" option geometrically without reconfiguring the entire I-15/I-215 interchange

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	●	◉	◉	○

Rating 2

Justification/Comments/Disposition:
Suggest changing the rating from 3 to 2 because this idea is part of the proposed Long-Term HOV System (from the Southern Nevada HOV Plan Update) and will be implemented. Therefore, no further investigation is required.

Round 1 Screening

#	Description	Advantages	Disadvantages
2	Widen the CC-215 EB to I-15 NB ramp from one to two lanes	• Adds capacity to the existing ramp and reduces congestion • No notable environmental concerns	• Slow speed dual lane exit may increase crashes • Low speed ramps have reduced capacity compared to high speed ramps

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◉	◉	●

Rating 3

Justification/Comments/Disposition:
Moved to further evaluation and modeling.

Round 1 Screening

#	Description	Advantages	Disadvantages
3	Widen the I-15 NB/Las Vegas Boulevard merge to CC-215 WB ramp from one to two lanes	• Adds capacity to the ramp and reduces congestion • No notable environmental concerns	• May not be effective if this idea is implemented without any improvements to CC-215 WB • Potential ROW impacts

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	●	◉	◉	●

Rating 3

Justification/Comments/Disposition:
Moved to further evaluation and modeling.
Needs to be coordinated with CC-215 geometry (to be implemented together with the CC-215 WB Decatur off-ramp braid).

Round 1 Screening

#	Description	Advantages	Disadvantages
4	Early exit to Decatur from I-215 prior to the System Interchange	• Reduce weave between I-15 ramps and Decatur	• Exit signing may conflict with system interchange signs

Mainline Operations	Local Operations	Maintainability	Construction Impacts	Environmental Impacts
●	○	◉	◉	◉

Rating 2

Justification/Comments/Disposition:
Design Consideration.

I-15/I-215 System Interchange • Round 2

IDEAS

2. Widen the CC-215 EB to I-15 NB ramp from one to two lanes
3. Widen the I-15 NB/Las Vegas Boulevard to CC-215 WB ramp from one to two lanes
45. Widen the CC-215 EB to I-15 NB ramp from one to two lanes and Widen the I-15 NB/Las Vegas Boulevard to CC-215 WB ramp from one to two lanes (including braiding of the CC-215 WB Decatur Boulevard off-ramp and the I-15 on-ramp to CC-215 WB)

Ideas Screened Out During: **Round 1**	1, 4
Ideas Added	45

ROUND 2 CRITERIA

Mainline Operations	An assessment of traffic operations and safety on the freeway. Operational considerations include level of service relative to the 20-year traffic projections, as well as geometric considerations such as design speed, sight distance, and lane and shoulder widths.	**10**. Operations Considerably Improved **5**. No Change to Operations **1**. Operations Considerably Impacted
Local Operations	An assessment of traffic operations and safety on the local roadway infrastructure. Operational considerations include level of service relative to the 20-year traffic projections; geometric considerations such as design speed, sight distance, lane and shoulder widths; bicycle and pedestrian operations.	**10**. Operations Considerably Improved **5**. No Change to Operations **1**. Operations Considerably Impacted

Round 2 Screening

#	Description	Advantages	Disadvantages
2	Widen the CC-215 EB to I-15 NB ramp from one to two lanes	• Adds capacity to the existing ramp and reduces congestion • No notable environmental concerns	• Slow speed dual lane exit may increase crashes • Low speed ramps have reduced capacity compared to high speed ramps

Mainline Operations 6 Local Operations 6 Safety: If a two-lane off ramp is used instead of a one-lane off ramp, there can be a 29% decrease in crashes (CMF ID 3040).

Rating 3 **Justification/Comments/Disposition:**
Moved to further evaluation and modeling.

Round 2 Screening

#	Description	Advantages	Disadvantages
3	Widen the I-15 NB/Las Vegas Boulevard merge to CC-215 WB ramp from one to two lanes	• Adds capacity to the ramp and reduces congestion • No notable environmental concerns	• May not be effective if this idea is implemented without any improvements to CC-215 WB • Potential ROW impacts

Mainline Operations 9 Local Operations 8 Safety: Substantial improvements on the boulevard will improve safety and mobility.

Rating 3 **Justification/Comments/Disposition:**
Moved to further evaluation and modeling. Needs to be coordinated with CC-215 geometry (to be implemented together with the CC-215 WB Decatur off-ramp braid).

I-15/I-215 System Interchange • Round 2 *Continued*

Round 2 Screening

#	Description	Advantages	Disadvantages
45	Widen the CC-215 EB to I-15 NB ramp from one to two lanes and Widen the I-15 NB/Las Vegas Boulevard to CC-215 WB ramp from one to two lanes (including braiding of the CC-215 WB Decatur Boulevard off-ramp and the I-15 on-ramp to CC-215 WB)	• Eliminates weave of critical movements • Increases roadway capacity	• Potential EJ impacts • Potential desert tortoise impacts (at Decatur) • Potential ROW impacts
Mainline Operations 9	Local Operations 8		
Rating 3	**Justification/Comments/Disposition:** See Ideas #2 and #3.		

I-15/I-215 System Interchange • Round 3

IDEAS

2. Widen the CC-215 EB to I-15 NB ramp from one to two lanes
3. Widen the I-15 NB/Las Vegas Boulevard to CC-215 WB ramp from one to two lanes

Ideas Screened Out During: **Round 2** 45

ROUND 3 CRITERIA

Maintainability	An assessment of the long-term maintainability of the transportation facility(s). Maintenance considerations include the overall durability, longevity and maintainability of pavements, structures and systems; ease of maintenance; accessibility and safety considerations for maintenance personnel.	**10**. Maintainability Considerably Reduced **5**. No Change in Maintainability **1**. Maintainability Considerably Increased
Construction Impacts	An assessment of the temporary impacts to the public during construction related to traffic disruptions, detours and delays; impacts to businesses and residents relative to access, visual, noise, vibration, dust and construction traffic; environmental impacts.	**10**. No Impacts **5**. Minimal Impacts **1**. Considerable Impacts
Environmental Impacts	An assessment of the permanent impacts to the environment including ecological (i.e., flora, fauna, air quality, water quality, visual, noise); socioeconomic impacts (i.e., environmental justice, business, residents); impacts to cultural, recreational and historic resources.	**10**. No/minor Impacts **5**. Minimal Impacts **1**. Potentially High Impacts

Round 3 Screening

#	Description	Advantages	Disadvantages
2	Widen the CC-215 EB to I-15 NB ramp from one to two lanes	• Adds capacity to the existing ramp and reduces congestion • No notable environmental concerns	• Slow speed dual lane exit may increase crashes without proper design • Low speed ramps have reduced capacity compared to high speed ramps
Maintainability 4	Construction Impacts 4	Environmental Impacts 10	

✓ **Preferred Alternative**

Round 3 Screening

#	Description	Advantages	Disadvantages
3	Widen the I-15 NB/Las Vegas Boulevard merge to CC-215 WB ramp from one to two lanes	• Adds capacity to the ramp and reduces congestion • No notable environmental concerns	• May not be effective if this idea is implemented without any improvements to CC-215 WB • Potential ROW impacts
Maintainability 4	Construction Impacts 3	Environmental Impacts 10	

✓ **Preferred Alternative**

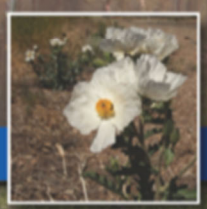
Appendix B
NDOT Planning and Environmental Linkages Questionnaire and Checklist

Planning and Environmental Linkages

Questionnaire and Checklist

NEVADA DOT

Completed for the
Southern Nevada Traffic Study
Planning and Environmental
Linkages (PEL) Study
November 2018



November 2012

PREPARED BY HDR

Planning and Environmental Linkages Questionnaire and Checklist

The Nevada Department of Transportation (NDOT) seeks to employ unified and dedicated efforts to deliver transportation solutions that improve the quality of life for those in Nevada. Improvements to the transportation system are typically accomplished through projects. Federal and State transportation improvement funds and NDOT's construction program and projects are scheduled and delivered through the Statewide Transportation Improvement Program (STIP). For 40 years, Congress directed this sequencing of funding flow, triggered by metropolitan and statewide transportation planning processes that serve as the basis for project decisions and incorporate an emphasis on public involvement, environmental considerations, and other factors.

The National Environmental Policy Act of 1969 (NEPA) established a national environmental policy intentionally focused on federal activities and the desire for a sustainable environment balanced with other, essential, present and future needs of generations of Americans. NEPA mandated that federal agencies consider the potential environmental consequences of their proposed actions, document the analysis, and make this information available to the public for comment prior to implementation. These requirements form the basic framework for federal decision making and the NEPA process. NEPA applies only where there is a federal action. For the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), implementation of NEPA is based on the Council on Environmental Quality (CEQ) regulations set down in 40 Code of Federal Regulations [C.F.R.] §§ 1500–08 and 23 C.F.R. § 771.

1978 CEQ regulations call for an integration of "the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts" (40 C.F.R.§ 1501.2). Despite this statutory and regulatory emphasis on the early integration of transportation planning with NEPA, these two activities have, in practice, been carried out in a separate and sequential manner. Environmental analyses prepared to support the project development/NEPA process are typically disconnected from the analyses used to develop long-range transportation plans, statewide and metropolitan Transportation Improvement Programs, and planning-level corridor/subarea/feasibility studies. When transportation planning and NEPA processes are not well coordinated, duplication of work and delays in implementing transportation improvements frequently occur.

New legislation has been adopted known as Moving America forward in the 21st Century (MAP-21). MAP-21 replaces Transportation Efficiency Act for the 21st Century (TEA-21 and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA_LU). While MAP-21 has numerous changes related to transportation the portion related to Planning and Environmental Linkages was relatively unchanged.

The federal government is currently updating reference documents to provide proper reference to MAP-21. As this process is completed this document will be updated to correctly reference regulations establishing the Map-21 guidelines.

This questionnaire and checklist is designed to assist in linking planning with potential environmental concerns and should be viewed as a tool, not a mandatory exercise when reviewing potential transportation projects. As noted in 23 CFR Appendix A to Part 450.

> "The Transportation Efficiency Act for the 21st Century (TEA-21) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) specifically exempted transportation plans and programs from the NEPA process as part of, or concurrently with, a transportation planning study does not subject transportation plans and programs to NEPA. Implementation of this Appendix by States, MPOs and public transportation operators is voluntary."
>
> 23 CFR APPENDIX A to PART 450

Please reference 23 CFR Appendix A to Part 450 for more information regarding how the PEL process is designed to assist in the planning of transportation projects. Federal Legislation enacted in 2012 and known as MAP-21[1] includes several provisions to link transportation planning and NEPA processes. However, guidance on this legislation is still being developed. SAFETEA-LU[1], which was enacted in 2005 and precedes MAP-21 which established the guidelines to better integrate transportation planning and NEPA. Regulations (23 CFR § 450) implementing this legislation included requirements as well as nonbinding guidance to enhance the process. Sections 1310 and 1311 of MAP-21 (Sections 6001 and 6002 of SAFETEA-LU~~),~~ among other requirements, define criteria that a federal agency must consider in deciding whether to adopt planning-level analyses or decisions in the NEPA process:

- involvement of interested state, local, tribal, and federal agencies
- public review
- reasonable opportunity to comment during a statewide or metropolitan transportation planning process and development of a corridor or subarea planning study
- documentation of relevant decisions in a form that is identifiable and available for review during the NEPA scoping process and that can be appended to or referenced in the NEPA document
- review by FHWA and FTA, as appropriate

FHWA's *SAFETEA-LU Environmental Review Process: Final Guidance* (2006) provides a framework for carrying out existing requirements under NEPA and other laws. Among other items, it requires the development of a coordination plan as part of the environmental impact statement process. Such plans add review and comment points to the traditional NEPA steps:

- public and agency involvement when developing the project's purpose and need
- public and agency involvement when developing the project's alternatives
- collaboration with participating agencies (no public involvement required) in determining the appropriate impact assessment methodologies to be used and the level of detail required for the analysis of alternatives

A requirement to consider mitigation activities in long-range plans and a requirement to consult with resource and land management agencies and related plans, maps, or inventories during the development of long-range transportation plans provide an opportunity for early identification of environmental and design considerations that could cause project costs to rise and jeopardize schedules. This initiative is referred to as planning and environmental linkages (PEL). The goal of PEL is to create a decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays, from the visioning and planning stages all the way through project development to project implementation. At the time of preparation of this document, final guidance under MAP-21 was not yet available. Once more guidance becomes available this document will be updated.

NDOT developed the attached *Project Development and Scoping Guidelines – Linking Planning and NEPA: Project-Level Scoping* in 2009 to address challenges in the STIP process that can delay the delivery of its projects. Unrealistic expectations for projects, unrecognized schedule risks, and unrealistic cost estimates characterize such challenges and, when combined, can threaten delivery of the STIP, result in schedule delays, cost escalation, and even project cancellation. The integrity of the STIP is enhanced through advancing the project scoping process by placing an early focus on developing realistic project definitions, schedules and costs.

The PEL process seeks to develop subarea and corridor studies that have been scoped to more directly inform the NEPA process for those projects that ultimately become part of the STIP. Effective, conceptual-level transportation planning studies that follow the PEL process provide opportunities both to identify important issues of concern early and to build agency, stakeholder, and public understanding of the project. Such early, integrated planning is not driven solely by regulatory requirements and the quest for more efficient and effective processes, although those are desirable results. Transportation and environmental professionals—as well as those in metropolitan planning organizations, state and federal resource agencies, and nongovernmental organizations—are finding that early collaboration helps achieve broader transportation and environmental stewardship goals through better decisions regarding programs, planning, and projects.

This document has been developed by NDOT to provide guidance, particularly to transportation planners and NEPA specialists, regarding how to most effectively link the transportation planning and NEPA processes. By considering the questions and issues raised in this questionnaire, transportation planners will become more aware of potential gaps in their subarea or corridor studies, better understand the needs of future users of the studies, and be reminded of the benefits of wider and/or deeper collaboration with agencies, the public, and other stakeholders. NEPA specialists who fill out the checklist will assume a new role in the transportation planning process: becoming advocates for early awareness of environmental issues before the NEPA process begins.

The following PEL questionnaire and checklist are intended to be used as tools to guide proper documentation and selection of information gathered during the planning process that can later be made available for input, review, and possible incorporation by reference during the NEPA project development process.

This questionnaire and checklist will be used to effectively influence the scope, content, and process employed for NDOT transportation planning studies that focus on specific transportation corridors or on transportation network subareas (versus statewide transportation studies). Completion of this questionnaire and checklist will support the PEL process and serve dual objectives:[1]

- provide guidance to transportation planners on the level of detail needed to ensure that information collected and decisions made during the transportation planning study can be used during the NEPA process for a proposed transportation project
- provide the future NEPA study team with documentation on the outcomes of the transportation planning process, including the history of decisions made and the level of detailed analysis undertaken

[1] Objectives are based on the Federal Highway Administration's online document: *Case Studies: Colorado: Colorado Department of Transportation: Tools and Techniques to Implement PEL*, <www.environment.fhwa.dot.gov/integ/case_colorado2.asp> (accessed October 24, 2011).

Major issues to consider when conducting a transportation planning study that links to the future NEPA process include:[2]

- identifying the appropriate level of environmental analysis for the study
- identifying the appropriate level of agency, stakeholder, and public involvement
- defining unique study concurrence points for seeking agreement from relevant resource agencies, stakeholders, and members of the public
- developing a process to ensure that the study will be recognized as valid within the NEPA process
- identifying when to involve resource agencies in the study, and to what extent they influence decision making
- identifying how to persuade U.S. Department of Transportation reviewers to accept the use of these studies in the NEPA process

These issues should be considered throughout the transportation planning study process. Users of this *NDOT Planning and Environmental Linkages Questionnaire and Checklist* should review the entire document at the beginning of the study to familiarize themselves with whatever local and general issues may be operative. The questionnaire is provided in two parts: one to be completed by transportation planners at the beginning of the study and one to be completed at the end. The checklist (Part 3) should be used by NEPA specialists throughout the study and should be finalized at the end of the study.

Upon completion of the transportation planning study, this document should be included as an appendix to the study's final report to document how the study meets the requirements of 23 C.F.R. § 450.212 or § 450.318 (Subpart B: Statewide Transportation Planning and Programming or Subpart C: Metropolitan Transportation Planning and Programming, respectively).

The flowchart on the following page outlines the major inputs, decision points, and outcomes that occur during implementation of a transportation planning study using the PEL process.

[2] Further guidance is available in the Federal Highway Administration's *Guidance on Using Corridor and Subarea Planning to Inform NEPA*, dated April 5, 2011, available online at <www.environment.fhwa.dot.gov/integ/corridor_nepa_guidance.pdf>.

	Transportation Planners	Both	NEPA Specialists
PEL Launch	Review Part 1 and Part 2 of questionnaire Complete Part 1 of questionnaire	Become familiar with local and general issues Modify study scope to include or deepen analysis of specific resources or environmental issues	Review checklist Advocate inclusion of resources and issues Seek resource agency assistance in changing study scope
Analysis and Comment	Define, clarify, analyze,and screen modes,corridors, and alternatives (including no-action alternative) Involve relevant stakeholders, agencies, and public in comments and reviews to ensure later acceptability and defensibility in NEPA	Become familiar with local and general issues Modify study scope to include or deepen analysis of specific resources or environmental issues	Continue to advocate addressing collection and analysis of data pertinent to effective application in NEPA process
PEL Completion	Complete Part 2 of questionnaire	Include questionnaire and checklist in appendix to study Document relevant findings for use in later NEPA documents	Complete checklist (Part 3)

Beginning of NEPA Process

NEPA specialists review completed PEL questionnaire and checklist and confirm that study recommendations and analyses can support the anticipated NEPA process(es) and document type(s), including, if applicable, incorporation into the content of a Notice of Intent

Questionnaire for Transportation Planners – Part 1

This part of the questionnaire should be completed by transportation planners at the beginning of the transportation planning study. Please note that planners should also review Part 2 of the questionnaire to understand what additional issues will need to be considered and documented as the study progresses.

Project identification
What is the name of the study? What cities and counties does it cover? What major streets or highways are covered? For corridor studies, what are the intended termini?
Southern Nevada Traffic Study Planning and Environmental Linkages (PEL) Study, City of Las Vegas and City of Henderson, Clark County, Nevada. The study covers three PEL areas: the I-515 corridor from Charleston Boulevard to I-215, the I-215/I-515 system interchange, and the I-15/CC 215/I-215 system interchange.
Who is the study sponsor?
NDOT
Briefly describe the study and its purpose.
NDOT commissioned the Southern Nevada Traffic Study (SNTS) to conduct a system-wide traffic analysis of freeways in the cities of Las Vegas, Henderson, and North Las Vegas. As part of the SNTS, NDOT initiated the Southern Nevada Traffic Study PEL Study to assess existing and future traffic congestion, identify safety problems in the three PEL Study Areas, and identify and prioritize future improvement projects to address these issues. A PEL approach was used to provide efficiency for future projects when they move into the NEPA phase.
Who are the primary study team members (include name, title, organization name, and contact information)?
The study team members included the Federal Highway Administration (FHWA); Nevada Department of Transportation (NDOT); and the consultant team of HDR, Inc., Jacobs Engineering Group, and CA Group.
Does the team include advisory groups such as a technical advisory committee, steering committee, or other? If so, include roster(s) as attachment(s).
A Steering Committee was formed to review the study progress and to provide valuable feedback on issues, goals, and projects to be considered. Committee members included study team members and representatives from the Regional Transportation Commission of Southern Nevada (RTCSNV), City of Las Vegas, City of Henderson, City of North Las Vegas, and Clark County. The Committee met seven times (typically half-day workshops) during the course of the study. See attached Steering Committee member contact list.
Have previous transportation planning studies been conducted for this region? If so, provide a brief chronology, including the years the studies were completed. Provide contact names and locations of the studies and study websites.
2040 Regional Transportation Plan (RTP), 2017, RTCSNV I-515 and Charleston Boulevard Interchange Alternatives Feasibility Study, 2015, City of Las Vegas Southern Nevada HOV Plan, 2007 (Rev 2015), NDOT Vision 2045 Downtown Las Vegas Master Plan, 2016, City of Las Vegas Southern Nevada Strong Regional Plan, 2015, RTCSNV Southern Nevada Regional Goods Movement Master Plan, 2015, RTCSNV Corridor Concept Report I-11 and Intermountain West Corridor Study, 2014, NDOT and ADOT I-515 Preliminary Draft Environmental Impact Statement, 2009, NDOT I-15 Resort Corridor Study, 2009, NDOT I-15 Tropicana Interchange Feasibility Study, 2015, NDOT I-15 Corridor System Master Plan, 2017, NDOT Section 1.4 of the Southern Nevada Traffic Study PEL Study provides a summary of previous and current transportation plans and studies
What current or near-future planning (or other) studies in the vicinity are underway or will be undertaken? What is the relationship of this study to those studies? Provide contact names and locations of the studies and study websites.
See response above. A number of projects listed in the STIP and RTP are ongoing, such as Project NEON, I-515 Alternatives Development Study, I-515/Charleston Boulevard Interchange, and auxiliary lane improvements. Refer to Section 1.4 of this study for further details. Current planning studies that may have an indirect impact influencing travel modes choice and travel patterns across the region include On Board – Your Future Transit Plan and the SNS Livable Centers Study – Pilot (ongoing; http://onboardsnv.com).

Study objectives

What are your desired outcomes for this study? (Check all that apply.)

- ☒ Stakeholder identification
- ☒ Stakeholder roles/responsibilities definition
- ☒ Travel study area definition
- ☒ Performance measures development
- ☒ Development of purpose and need goals and other objectives
- ☒ Alternative evaluation and screening
- ☐ Alternative travel modes definition
- ☒ Operationally independent segments
- ☒ Scheduling of infrastructure improvements over short-, mid-, and long-range time frames
- ☒ Environmental impacts
- ☐ Mitigation identification
- ☐ Don't know
- ☐ Other _____

Have system improvements and additions that address your transportation need been identified in a fiscally constrained statewide or regional long-range transportation plan?

NDOT's Statewide Transportation Improvement Program and RTCSNV's 2040 Regional Transportation Plan include system improvement recommendations within the PEL Study Areas. These improvements are included in the Baseline or No-Action traffic model (see Section 2.1.1 of this study for details). Because the Baseline condition would not meet the project Purpose and Need, build alternatives were developed and evaluated as part of this study to supplement the fiscally-constrained, planned improvements.

Will a purpose and need statement[3] be prepared as part of this effort? If so, what steps will need to be taken during the NEPA process to make this a project-level purpose and need statement?

Yes, a purpose and need statement was prepared. The Purpose of the Southern Nevada Traffic Study PEL Study is to address existing and future traffic congestion issues in the PEL areas, while improving safety conditions. Refer to Chapter 2 of this report for details. NDOT will continue to refine this statement for specific projects as they are addressed for further development and delivery, but the overarching needs should apply.

Establishment of organizational relationships

Is a partnering agreement in place? If so, who are signatories (for example, affected agencies, stakeholders, organizations)? Attach the partnering agreement(s).

No formal partnering agreement is in place.

What are the key coordination points in the decision-making process?

- ☐ Project Development Checklist for funding request
- ☒ Initial NDOT risk assessment
- ☒ Initial Project Development Committee review
- ☐ Project Scoping Report
- ☒ Project inclusion in TIP/STIP

Planning assumptions and analytical methods

Is the time horizon of the study sufficiently long to consider long-term (20 years or more from completion of the study) effects of potential scenarios?

The study used a 2040 assessment year, in line with RTCSNV's 2040 travel demand model. This allowed for the consideration and assessment of long-term potential scenarios.

What method and what planning year will be used for forecasting traffic volumes (for example, traffic modeling or growth projections)? What are the sources of data being used? Has USDOT validated their use? Are the models and their output conducive for use with NEPA-related noise and air quality modeling?

As discussed above, traffic has been forecasted to 2040 and is based on model runs from RTCSNV's 2040 travel demand model, which has been approved by FHWA for future use. A baseline network (incorporating committed projects while excluding any proposed upgrades as part of the Southern Nevada Traffic Study PEL Study) was developed and included projects in the Las Vegas Valley that are either short term in the TIP/STIP or have funding and would be accelerated, and those that would be constructed before 2035. FHWA has accepted this methodology on other similar studies. For future NEPA studies, traffic forecasts should be revisited prior to NEPA-level analyses. More detailed traffic data likely would be required for traffic noise and air quality modeling, if required.

[3] For an explanation of purpose and need in environmental documents, please see the Federal Highway Administration's (FHWA's) "NEPA and Transportation Decisionmaking: The Importance of Purpose and Need in Environmental Documents," <Purpose and Need>. This website provides links to five additional resources and guidance from FHWA that should be helpful in understanding the relationship between goals and objectives in transportation planning studies and purpose and need statements of NEPA documents.

Will the study use FHWA's Guide on the Consistent Application of Traffic Analysis Tools and Methods[4]*? If not, why not? How will traffic volumes from the travel demand model be incorporated, if necessary, into finer-scale applications such as a corridor study?*
The study analysis tools are consistent with FHWA's Guide. The traffic forecasts used in the analysis were developed using the regional travel demand model. These forecasts were then used in finer scale tools such as AIMSUN (microscopic and mesoscopic simulation) and Synchro (signal optimization).
Do the travel demand models base their projections on differentiations between vehicles?
As mentioned in Section 2.1.1 of the Southern Nevada Traffic Study PEL Study, the model differentiates between cars and trucks, but does not distinguish buses from cars.
Data, information, and tools
Is there a centralized database or website that all State resource agencies may use to share resource data during the study?
A centralized database was not set up for this study to share data between resource agencies. Because the study area is located in a highly urbanized area, natural resources are limited. A study website was established. Information was shared between Study team members via a ProjectWise site, but this was not accessible to other agencies.

[4] FHWA November 2011 publication: <Traffic Analysis Tools and Methods>

Questionnaire for Transportation Planners – Part 2

This part of the questionnaire should be completed by transportation planners at the end of the transportation planning study. This completed document should become an appendix to the study's final report to document how the study meets the requirements of 23 Code of Federal Regulations § 450.212 or § 450.318.

Purpose and need for this study
How did the study process define and clarify corridor-level or subarea-level goals (if applicable) that influenced modal infrastructure improvements and/or the range of reasonable alternatives?
After analyzing traffic congestion and safety conditions, the Study team developed a Purpose and Need statement (see study purpose above). The Purpose and Need, combined with other study goals (e.g. minimize construction and environmental impacts) were used to develop evaluation criteria. The Study team held a brainstorming workshop to identify reasonable alternatives or ideas to address those issues. This resulted in a range of improvements based on conventional as well as innovative design approaches.
What were the key steps and coordination points in the decision-making process? Who were the decision-makers and who else participated in those key steps?
Key steps include project scoping, Purpose and Need development, and alternatives development and evaluation. NDOT worked closely with the project stakeholders and Steering Committee, discussed above, on each decision point. Also, public and agency input was solicited. The Study team conducted agency and public outreach to obtain input on issues and needs within the Study Area. This input was used to refine the Study's Purpose and Need and was considered during the alternatives development, evaluation, and screening process.
How should this study information be presented in future NEPA document(s), if applicable? Are relevant findings documented in a format and at a level of detail that will facilitate reference to and/or inclusion in subsequent NEPA document(s)?[5]
Future NEPA document(s) should present Study information and key decisions as planning products of the Southern Nevada Traffic Study PEL Study. The Purpose and Need for the Southern Nevada Traffic Study PEL Study, and supporting information on congestion and safety issues, were documented in a way that will facilitate their future inclusion in subsequent NEPA studies. As mentioned above, this information should be updated and tailored, as needed, for specific project areas. Environmental mapping can be used as a basis for more detailed analysis during NEPA (see Section 6.1.1 of the PEL report for details)
Were the study's findings and recommendations documented in such a way as to facilitate an FHWA or Federal Transit Administration decision regarding acceptability for application in the NEPA process? Does the study have logical points where decisions were made and where concurrence from resource or regulatory agencies, stakeholders, and the public was sought? If so, provide a list of those points.
The Study followed a process involving logical milestones, and input from stakeholders was sought during the process. Milestones included scoping, Purpose and Need development, development of the range of reasonable alternatives, and alternatives evaluation. Input was solicited from resource or regulatory agencies, stakeholders, and the public as discussed above. The study's findings and recommendations are documented in such a way as to facilitate FHWA decision making regarding use of the planning products in the NEPA process.

Establishment of organizational relationships – tribes and agencies[6]			
Tribe or agency	**Date(s) contacted**	**Describe level of participation**	**Describe the agency's primary concerns and the steps needed to coordinate with the agency during NEPA scoping.**[7]
Tribal			
n/a	n/a	n/a	No tribal governments were contacted for this study. During initiation of NEPA, NDOT will consult with tribes for any projects where tribes may have an interest.

[5] For an explanation of the types of documents needed under the NEPA process and the nature of the content of those documents, please see "NEPA Documentation: Improving the Quality of Environmental Documents,"<Documentation>.

[6] Users may add rows to this table to accommodate additional tribes and agencies. Unused rows may be deleted.

[7] If the transportation planning study final report does not adequately document interactions (for example, meeting notes, resolutions, letters) with the relevant agencies, append such information to the end of this questionnaire and checklist.

Establishment of organizational relationships – tribes and agencies[6]			
Tribe or agency	**Date(s) contacted**	**Describe level of participation**	**Describe the agency's primary concerns and the steps needed to coordinate with the agency during NEPA scoping.[7]**
Federal			
Bureau of Indian Affairs	n/a	n/a	The BIA was not contacted for this study. During initiation of NEPA, NDOT will consult with the BIA for any projects where tribes may have an interest.
Bureau of Land Management	n/a	n/a	The BLM was not contacted for this study. During initiation of NEPA, NDOT will consult with the BLM for any projects where the agency may have an interest.
Bureau of Reclamation	June 21, 2018	Scoping	No response received
Federal Highway Administration	Various throughout Study	Steering Committee member	Active throughout Study process, attended meetings, and provided input.
National Park Service	June 21, 2018	Scoping	No response received
U.S. Army Corps of Engineers Sacramento, CA	June 21, 2018	Scoping	No response received
U.S. Army Corps of Engineers, St. George, UT	June 21, 2018	Scoping	No response received
U.S. Forest Service	June 21, 2018	Scoping	No response received
U.S. Department of Agriculture Forest Service Region 4	June 21, 2018	Scoping	No response received
U.S. Forest Service Spring Mountain NRA	June 21, 2018	Scoping	No response received
U.S. Environmental Protection Agency Region 9	June 21, 2018	Scoping	Recommended that NDOT establish an interagency process to share information and results with all resource and regulatory agencies that may have a future permitting, approval, or review role for resulting projects. Recommended that the study examine a full range of alternatives that consider potential air quality impacts, health and sensitive receptors, environmental justice, impacts to water and wetlands resources, growth related impacts, and cumulative impacts.
U.S. Fish and Wildlife Service, Las Vegas, NV	June 21, 2018	Scoping	No response received
U.S. Department of Agriculture Natural Resources Conservation Service, Las Vegas, NV	June 21, 2018	Scoping	No response received
U.S. Department of The Interior Pacific Southwest Region	June 21, 2018	Scoping	No response received
U.S. Department of The Interior Fish and Wildlife Service Region 1, Portland, OR	June 21, 2018	Scoping	No response received
U.S. Geological Survey Water Resources Division	June 21, 2018	Scoping	No response received
U.S. Department of Housing and Urban Development, Las Vegas, NV	June 21, 2018	Scoping	No response received

Establishment of organizational relationships – tribes and agencies[6]			
Tribe or agency	**Date(s) contacted**	**Describe level of participation**	**Describe the agency's primary concerns and the steps needed to coordinate with the agency during NEPA scoping.[7]**
Federal Aviation Administration, San Francisco Airports District Office-Western Pacific Region	June 21, 2018	Scoping	Response received; no concerns were identified.
Federal Aviation Administration, Western-Pacific Region, Office of Airports, Phoenix Airports District Office	June 21, 2018	Scoping	No response received
Eleventh Coast Guard District	June 21, 2018	Scoping	No response received
State			
Natural Heritage Program, Carson City, NV	June 21, 2018	Scoping	No response received
Nevada Division of Environmental Protection	n/a	n/a	n/a
Nevada Department of Public Safety	n/a	n/a	n/a. During initiation of future projects that have notable safety considerations, NDOT will coordinate with the Nevada Highway Patrol.
Nevada Department of Wildlife (East)	June 21, 2018	Scoping	No response received
Nevada Division of State Lands	n/a	n/a	n/a
Colorado River Commission	June 21, 2018	Scoping	No response received
Nevada Division of Water Resources	June 21, 2018	Scoping	No response received
County			
Clark County	Various throughout Study	Steering Committee member	Active throughout process, attended meetings, and provided input. See Section 5.1.2 of this study.
Local			
City of Las Vegas	Various throughout Study	Steering Committee member	Active throughout process, attended meetings, and provided input. See Section 5.1.2 of this study.
City of Henderson	Various throughout Study	Steering Committee member	Active throughout process, attended meetings, and provided input. See Section 5.1.2 of this study.
City of North Las Vegas	Various throughout Study	Steering Committee member	Active throughout process, attended meetings, and provided input. See Section 5.1.2 of this study.
Transportation agencies			
RTC of Southern Nevada	Various throughout Study	Steering Committee member	Active throughout process, attended meetings, and provided input. See Section 5.1.2 of this study.

n/a – not applicable.

Establishment of organizational relationships – stakeholders and members of the public[8]			
Public and stakeholders	**Date(s) contacted**	**Describe level of participation**	**Describe the primary concerns expressed by members of the public and stakeholders.**
Public			
Members of the public	August 22, 2018	Attended public meeting	A Southern Nevada Traffic Study PEL Study information booth was staffed in conjunction with an August 22, 2018 public meeting held for the I-515 Restripe Slip Ramp at SR 564 and CC 215 project. This public meeting was selected because it was held in Henderson, which is in proximity to the three PEL Study Areas. Booth staffers were available to answer questions and provided meeting attendees with information about the study, the Purpose and Need, and the PEL area alternatives. While comment forms were provided at the meeting, no public comments were received. During future NEPA stages, NDOT will conduct public outreach depending on considerations such as NEPA class-of-action, nature of the project, and level of public interest.
Members of the public	Throughout Study	Project website	Because the Southern Nevada Traffic Study PEL Study is of regional importance, a study website was established (www.ndotsnts.com) that could be accessed by anyone in the Study Area at any time. The website was publicized through links on the NDOT website, in newspaper ads for the restriping project, and on materials provided at the information booth held at the above public meeting. The website provided information about the study, PEL process, PEL alternatives, and provided the opportunity for the public to provide comments about the Study. No comments were received through the website. During future NEPA stages, NDOT will conduct public outreach depending on considerations such as NEPA class-of-action, nature of the project and level of public interest.
Stakeholders			
Other (for example, Audubon Society, Center for Biological Diversity, citizens groups, homeowners associations, Sierra Club, private mining or energy interests, railroad companies)	See below	See below	See below
Sierra Club	June 21, 2018	Scoping	No response received
Nevada Chapter AGC	June 21, 2018	Scoping	No response received
Nevada Environmental Coalition Inc.	June 21, 2018	Scoping	No response received
Southern Nevada Water Authority	June 21, 2018	Scoping	No response received
USGS Western Ecological Research Center	June 21, 2018	Scoping	No response received
Nevada Preservation Foundation	June 21, 2018	Scoping	No response received
Preservation Association of Clark County	June 21, 2018	Scoping	No response received

[8] Users may add rows to this table to accommodate additional stakeholders.

Planning assumptions and analytical methods
Did the study provide regional development and growth assumptions and analyses? If so, what were the sources of the demographic and employment trends and forecasts?
The study used the Southern Nevada RTCSNV's adopted regional travel demand model for traffic forecasting and, therefore, used the model's underlying demographic and employment trends, development assumptions, and growth assumptions.
What were the future-year policy and/or data assumptions used in the transportation planning process related to land use, economic development, transportation costs, and network expansion?
Yes, RTCSNV's model considers all of these variables in developing its network assignments. Transportation costs are considered in the fiscally constrained analysis of the Regional Transportation Plan. Benefit/cost analyses were conducted as part of the alternatives evaluation to compare various project and user costs to benefits (see Chapter 7 of the *Southern Nevada Traffic Study* report).
Were the planning assumptions and the corridor vision/purpose and need statement consistent with each other and with the long-range transportation plan? Are the assumptions still valid?
Yes. As mentioned above, the Study's planning assumptions were based on the RTCSNV travel demand model. The Purpose and Need is consistent with goals found in the RTCSNV's current and draft Regional Transportation Plans.
Data, information, and tools
Are the relevant data used in the study available in a compatible format that is readily usable? Are they available through a centralized web portal?
Yes. Data are available in the appendices to the *Southern Nevada Traffic Study* report, of which this PEL Study is a part. Electronic data can also be made available upon request.
Are the completeness and quality of the data consistent with the quality (not scale or detail) of inputs needed for a NEPA project-level analysis[9]?
Yes. The quality of the data is such that it can serve as a basis for project-level analysis. During future stages of project development, model data and input may need to be updated to develop project-specific traffic projections. Environmental data will be collected on a project basis.
Are the data used in the study regularly updated and augmented? If regularly updated, provide schedule and accessibility information.
Yes, data used in the RTCSNV travel demand model is regularly updated consistent per federal transportation planning requirements. NDOT traffic count data is updated yearly. The travel demand model is updated every four years.
Have the environmental data been mapped at scales that facilitate comparison of effects across different resources and at sufficient resolution to guide initial NEPA issue definition? If not, what data collection and/or manipulation would likely be needed for application to the NEPA scoping process?
Yes. See Chapter 3.0 of the Southern Nevada Traffic Study PEL Study for details. The data collection was conducted at an appropriate scale for future NEPA scoping processes. The need for data updates will depend on the length of time between completion of the Southern Nevada Traffic Study PEL Study and initiation of future NEPA studies.

[9] For an explanation of the types of information needed to evaluate impacts in environmental documents, please see FHWA's "NEPA and Transportation Decisionmaking: Impacts,"<Analysis of Impacts>. This website provides links to six additional resources and guidance that should be helpful in understanding the types of impacts that need to be assessed, their context, and their intensity.

Examine the Checklist for NEPA specialist, at the back of this document, for more detail about potential impacts that could be mapped. Below is an abbreviated list of resources that could occur in the study area and may be knowable at this time and at the study's various analytical scales:

Resource or issue	Is the resource or issue present in the area?	Would any future transportation policies or projects involve the issue? Would there be impacts on the resource?
Sensitive biological resources	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable
Wildlife corridors	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable
Wetland areas	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable
Riparian areas	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable
100-year floodplain	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Prime or unique farmland or farmland of statewide or local importance	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable
Visual resources	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Designated scenic road/byway	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable
Archaeological resources	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable
Historical resources	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable

Resource or issue	Is the resource or issue present in the area?	Would any future transportation policies or projects involve the issue? Would there be impacts on the resource?
Section 4(f)[10] wildlife and/or waterfowl refuge, historic site, recreational site, park	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable
Section 6(f)[11] resource	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable
Existing development	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Planned development	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable
Title VI/ Environmental justice populations[12]	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Utilities	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Hazardous materials	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Sensitive noise receivers[13]	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable
Air quality	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable
Other (list) NOA/E (Naturally Occurring Asbestos/Erionite)	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable

[10] Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S. Code § 303, as amended); see <Section 4(f)>.

[11] Section 6(f) of the Land and Water Conservation Fund Act

[12] refers to Title VI of the 1964 Civil Rights Act and 1994 Executive Order 12898 on environmental justice

[13] under FHWA's Noise Abatement Criterion B: picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals

Did the study incorporate models of, for example, species/habitat locations (predictive range maps), future land use, population dynamics, stormwater runoff, or travel demand? What models were used? Did the study adequately document what models were used, who was responsible for their use, and how they were used (with respect to, for example, calibration, replicability, contingencies, and exogenous factors)?
Travel demand models were used. See above.
In scoping, conducting, and documenting the planning study, participants have come across documents and leads from agency staff and other sources that NEPA specialists may be able to use in conducting their studies. List any applicable memoranda of understanding, cost-share arrangements, programmatic agreements, or technical studies that are underway but whose findings are not yet published, etc.
Refer to Section 1.2 of the Southern Nevada Traffic Study PEL Study for recent and ongoing studies.
Development of alternatives
Were resource agencies, stakeholders, and members of the public engaged in the process of identifying, evaluating, and screening out modes, corridors, a range of alternatives,[14] or a preferred alternative (if one was identified—the latter two refer to corridor plans)? If so, how? Did these groups review the recommendation of a preferred mode(s), corridor(s), range of alternatives (including the no-build alternative), or an alternative? Were the participation and inputs of these groups at a level acceptable for use in purpose and need statements or alternatives development sections in NEPA documents? If not, why not?
Agencies, stakeholders, and the public were engaged during the SNTS and the Southern Nevada Traffic Study PEL Study. Information on the Purpose and Need, range of alternatives, improvement concepts, and existing conditions were presented and input solicited through the project website (www.ndotsnts.com). This information also was presented at a Study information booth staffed in conjunction with an August 22, 2018 public meeting held for the I-515 Restripe Slip Ramp at SR 564 and CC 215 project. A Steering Committee was formed to review the study progress and to provide valuable feedback on issues, goals, and projects to be considered. Committee members included study team members (FHWA, NDOT, and consultant team [HDR, Jacobs, CA Group]), and representatives from the RTCSNV, City of Las Vegas, City of Henderson, City of North Las Vegas, and Clark County. The Committee met seven times (typically half-day workshops) during the course of the study. Intent to Study letters were sent to resource agencies. Further resource agency and public outreach might be needed depending on the project advanced, NEPA class of action, duration between PEL and NEPA, etc.
Describe the process of outreach to resource agencies, the public, and other stakeholders. Describe the documentation of this process and of the responses to their comments. Is this documentation adequate in breadth and detail for use in NEPA documents?
Outreach efforts included letters of intent/agency scoping, and a Southern Nevada Traffic Study PEL Study information booth staffed in conjunction with an August 22, 2018 public meeting held for the I-515 Restripe Slip Ramp at SR 564 and CC 215 project. Project information and the public meeting were announced through the project website and a notice placed in the Las Vegas Review-Journal. Documentation: Refer to Chapter 3.0 of the *Southern Nevada Traffic Study* report and Chapter 5.0 of the Southern Nevada Traffic Study PEL Study. The need for future outreach should be assessed at the NEPA stage.
If the study was a corridor study, describe the range of alternatives or modes of transportation (if any) considered, screening process, and screening criteria. Include what types of alternatives were considered (including the no-build alternative) and how the screening criteria were selected. Was a preferred alternative selected as best addressing the identified transportation issue? Are alternatives' locations and design features specified?
The alternatives development and evaluation process was developed in coordination with the Steering Committee early in the study process. The range of alternatives for the PEL Study Areas encompassed the Baseline scenario, one additional general purpose (GP) lane in each direction, interstate auxiliary lanes, interchange reconfigurations, new interchange ramps, and concepts such as eliminating left turns at ramp terminals and providing opportunities for U-turns. Also, Transportation Systems Management approaches, including ramp metering, were considered. The Study team determined that the additional GP lane could be used as an HOV or express lane in the future, but it was modelled as a GP lane. Travel Demand Management or transit alternatives were not considered reasonable to meet the Purpose and Need. Refer to Chapter 4.0 of the Southern Nevada Traffic Study PEL Study for the range of alternatives and screening process. Preferred Alternative packages were identified for I-515 and the I-15/CC 215/I-215 system interchange. Two alternative packages were identified for the I-215/I-515 system interchange. Alternative concepts were grouped into projects and projects are identified for further advancement.

[14] For an explanation of the development of alternatives in environmental documents, please see FHWA's "NEPA and Transportation Decisionmaking: Development and Evaluation of Alternatives,"<Alternatives>.

Also regarding whether the study was a corridor study, for alternatives that were screened out, summarize the reasons for their rejection.

☒ Are defensible, credible rationale articulated for their being screened out?

☒ Did the study team take into account legal standards[15] needed in the NEPA process for such decisions?

☒ Did the study team have adequate information for screening out the alternatives?

What issues, if any, remain unresolved with the public, stakeholders, and/or resource agencies?

Prioritization, assembly, and timing of projects for implementation remain to be coordinated with local stakeholders. Projects advanced to the NEPA stage will require additional analysis for resources, including Section 106 consultation, Section 4(f) evaluation, air quality, and traffic noise. Coordination with appropriate agencies will be needed. Refer to Chapter 6.0 of the Southern Nevada Traffic Study PEL Study.

Identification of potential environmental mitigation activities

Could the transportation planning process be integrated with other planning activities, such as land use or resource management plans? If so, could this integrated planning effort be used to develop a more strategic approach to environmental mitigation measures?

Yes, the analysis and results from this planning process could help inform other planning activities, such as RTCSNV's RTP and Southern Nevada Strong. Because recommended alternatives in this PEL would have limited environmental impacts, specific mitigation measures were not identified at this stage.

With respect to potential environmental mitigation opportunities at the PEL level, who should NDOT consult with among federal, State, and local agencies and tribes and how formally and frequently should such consultation be undertaken?

Alternatives resulting from this study are not expected to result in considerable impacts requiring mitigation, with the possible exception of effects to Environmental Justice (EJ) communities, traffic noise impacts, and/or effects to cultural resources. Depending on the project, NDOT could consider engaging: 1) local agencies and communities regarding EJ and/or traffic noise impacts and mitigation; 2) EPA regarding comments received on this study; and 3) the Nevada State Historic Preservation Officer regarding historic effects from projects resulting from the Southern Nevada Traffic Study PEL Study, and comprehensive ways to mitigate these impacts. This could include interested parties such as the City of Las Vegas Historic Preservation Officer, the Nevada Preservation Foundation, and the Preservation Association of Clark County.

Formally joining PEL with the NEPA process

Lead federal agencies proposing a project that will undergo the NEPA process will want to most effectively leverage the transportation planning study's efforts and results. How could a Notice of Intent (for an environmental impact statement[16]) refer to the study's findings with respect to preliminary purpose and need and/or the range of alternatives to be studied?

A future Notice of Intent could reference this PEL Report and decisions made with regard to Purpose and Need, range of reasonable alternatives, and alternatives screening.

Could a Notice of Intent in the NEPA process clearly state that the lead federal agency or agencies will use analyses from prior, specific planning studies that are referenced in the transportation planning study final report? Does the report provide the name and source of the planning studies and explain where the studies are publicly available? If not, how could such relevant information come to the NEPA specialists' attention and be made available to them in a timely way?

Yes, please see response above.

List how the study's proposed transportation system would support adopted land use plans and growth objectives.

The proposed alternatives are focused on improving congestion and safety, mostly within existing right-of-way. Therefore, changes in land use are not expected. Transportation improvements from the Southern Nevada Traffic Study PEL Study generally would support adopted land use plans and objectives for orderly growth.

What modifications are needed in the goals and objectives as defined in the transportation study process to increase their efficient and timely application in the NEPA process?

Some modifications to the goals and objectives specific to project locations might be appropriate.

[15] 23 Code of Federal Regulations (CFR) § 771.123(c), 23 CFR § 771.111(d), 40 CFR § 1502.14(a), 40 CFR § 1502.14(b) and (d), 23 CFR § 771.125(a)(1); see FHWA Technical Advisory T 6640.8A, October 30, 1987, <FHWA Technical Advisory T 6640.8A>.

[16] While Notices of Intent are required by some federal agencies for environmental assessments, they are optional for FHWA. Please see "3.3.2 Using the Notice of Intent to Link Planning and NEPA," in *Guidance on Using Corridor and Subarea Planning to Inform NEPA* (Federal Highway Administration, April 5, 2011), <Notice of Intent>.

Jurisdictional delineations of waters of the United States frequently change. Housing and commercial developments can alter landscapes dramatically and can be constructed quickly. Noise and air quality regulations can change relatively rapidly. Resource agencies frequently alter habitat delineations to protect sensitive species. Will the study data's currency, relevance, and quality still be acceptable to agencies, stakeholders, and members of the public for use in the NEPA process? If not, what will be done to rectify this problem? Who will be responsible for any needed updating?

Considering the developed nature of the three PEL Study Areas, most resources are not expected to greatly change in coming years. However, for historic resources, private owners can modify (or even destroy) NRHP-eligible resources, or over time additional properties can achieve sufficient age to be evaluated for NRHP eligibility. Chapter 6.0 of the Southern Nevada Traffic Study PEL Study outlines resource data collected and updates and analyses needed for future NEPA studies. This involves the following resources: land use, parks/rec, community facilities, bike/ped facilities, right-of-way/relocations, EJ, air quality, traffic noise, cultural resources/Section 106, hazardous materials, visual conditions, floodplains, wetlands/Waters of the U.S., and biological resources.

Other issues

Are there any other issues a future NEPA study team should be aware of (mark all that apply)? In the space below the check boxes, explain the nature and location of any issue(s) checked.

- ☒ Public and/or stakeholders have expressed specific concerns
- ☒ Utility problems
- ☒ Access or right-of-way issues
- ☒ Encroachments into right-of-way
- ☒ Need to engage—and be perceived as engaging—specific landowners, citizens, citizen groups, or other stakeholders
- ☒ Contact information for stakeholders
- ☒ Special or unique resources in the area
- ☒ Federal regulations that are undergoing initial promulgation or revision
- ☐ Other _____

Stakeholders and the public did not express specific concerns regarding the Preferred Alternatives. It is recommended that future NEPA practitioners continue and build upon public and agency outreach conducted for the Southern Nevada Traffic Study PEL Study, including members of the Steering Committee established for this Study (see attached contact list). Project alternatives have the potential to impact utilities, existing access, or right-of-way, based on preliminary design conducted under future NEPA studies. As noted in Chapter 3.0 of the Southern Nevada Traffic Study PEL Study, undeveloped land west of the I-15/I-215 Interchange Study Area could potentially support the Mojave desert tortoise, which is listed as a threatened species. If staging locations are considered in that area, it should be investigated for Mojave desert tortoise. Hazardous materials issues near the I-215/I-515 interchange should be thoroughly investigated.

Concurrence

By signature, we concur that the transportation planning document meets or exceeds the following criteria in terms of acceptability for application in NEPA projects:

- ☐ Public involvement (outreach and level of participation)
- ☐ Stakeholder involvement (outreach and level of participation)
- ☐ Resource agencies' involvement and participation
- ☐ Documentation of the above efforts
- ☒ Applicability of the general findings and conclusions for use, by reference, in NEPA documents

Approved by: Sondra Rosenberg Date: 12/17/2018

Sondra Rosenberg, PTP
Assistant Director, Planning
Nevada Department of Transportation

Approved by: Steve Cooke Date: 12/18/2018

Steve M. Cooke, PE
Environmental Services Division Chief
Nevada Department of Transportation

Approved by: Enos Han Date: 12/18/2018

Enos Han
Planning Manager
Federal Highway Administration-Nevada Division

Approved by: Abdelmoez Abdalla Date: 12/18/2018

Abdelmoez Abdalla, PhD
Environmental Program Manager
Federal Highway Administration-Nevada Division

Checklist for NEPA Specialists – Part 3

By completing this checklist, NEPA specialists will be able to systematically evaluate the transportation planning study with regard to environmental resources and issues. It provides a framework for future NEPA studies by identifying those resources and issues that have already been evaluated, and those that have not. The role of NEPA specialists during the study's various stages is laid out in the flowchart on page 4. This role includes timely advocacy for resources and issues that will later be integral to NEPA processes.

Checklist for NEPA specialists

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural environment				
Sensitive biological resources	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	Yes ☒ No ☐ Unknown ☐ Not applicable	Yes ☐ No ☐ Unknown ☒ Not applicable	Because the PEL Study Areas are developed and disturbed, impacts to federally- or state-protected species are not expected. However, undeveloped land west of the I-15/I-215 Interchange Study Area could potentially support the Mojave desert tortoise, which is listed as a threatened species. If staging locations are considered in that area, it should be evaluated for presence of Mojave desert tortoise. Further, future studies should verify that no effects would occur to other sensitive biological resources, and evaluate effects to migratory birds under the Migratory Bird Treaty Act, which may include migratory birds nesting under bridge structures. Wildlife and vegetation impacts would be minimal. Any adverse effects are expected to be mitigated through seasonal restrictions or other measures.
Wildlife corridors	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	
Invasive species	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Potential for spread of invasive weeds during construction.
Wetland areas	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Based on existing mapping, no wetlands appear to be located immediately adjacent to or within the three PEL Study Areas. However, during the NEPA process, NDOT will review any undisturbed areas to confirm that no impacts to resources protected by Section 404 of the Clean Water Act would occur.
Riparian areas	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	

Checklist for NEPA specialists

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
100-year floodplain	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Floodplains are present in three locations in the I-515 PEL Area and the I-515/I-215 Interchange PEL Area. As project designs are refined, hydraulic analyses will be conducted to confirm compliance with local floodway plans and floodplain management programs. Consistency with these requirements should be coordinated with local floodplain managers and the Federal Emergency Management Agency. The number and type of permits should be identified, including NPDES permits.
Clean Water Act Sections 404/401 waters of the United States	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	GIS mapping from Clark County shows drainages in the PEL Study Areas that may be jurisdictional waters of the U.S.
Prime or unique farmland	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	
Farmland of statewide or local importance	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	
Sole-source aquifers	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	.
Wild and scenic rivers	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	
Visual resources	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	Future NEPA processes should evaluate the need to conduct a visual impact assessment. Impacts typically can be mitigated through visual screening, addition of aesthetic elements, or other means.
Designated scenic road/byway	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	
Cultural resources				
Archaeological resources	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Most eligible sites can be mitigated through data recovery.

Checklist for NEPA specialists

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Historical resources	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Consultation with the SHPO should occur for concurrence with NRHP eligibility determinations for historic properties. A determination of no effect, no adverse effect, or adverse effect should be identified during the NEPA process, followed by consultation with the SHPO and other parties consulting in the NRHP Section 106 process to identify any necessary mitigation for these properties. Adverse effects typically can be mitigated through visual screening, noise barriers for audible effects, aesthetic elements, archival documentation, or other means.
Section 4(f) and Section 6(f) resources				
Section 4(f) wildlife and/or waterfowl refuge	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	
Section 4(f) historic site	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	See Historical Resources, above.
Section 4(f) recreational site	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Based on current information, it appears uses of Section 4(f) recreational properties could be mitigated through noise barriers, on-site enhancements, or other means.
Section 4(f) park	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	See Section 4(f) recreational site, above.
Section 6(f) resource	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☒ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ☒ Not applicable	A recreation resource protected under Section 6(f) is located in the southwest quadrant of the I-515/I-215 Interchange PEL Study Area. Impacts to the resource from the Preferred Alternative packages warranting a conversion are not anticipated.
Human environment				
Existing development	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	Future NEPA processes should include coordination with city, county, and RTCSNV planners regarding effects to existing land uses. This information will help ensure consistency with local land use and transportation decision-making.
Planned development	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	Future NEPA processes should include coordination with city, county, and RTCSNV planners to identify plans, planned projects, and any future land use changes. This information will help ensure consistency with local land use and transportation decision-making.

Checklist for NEPA specialists

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Displacements	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Any relocations for residences and businesses for federal aid projects would require compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as well as NDOT 2016 Right of Way Manual.
Access restriction	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Temporary restrictions expected during construction.
Neighborhood continuity	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	Any impacts to continuity would mostly be indirect and mitigable.
Community cohesion	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	See above.
Title VI/Environmental justice populations	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	Each project must be assessed to determine if it will result in disproportionate effects to low-income or minority populations. If such impacts are expected, the analysis should assess whether they are high and adverse. For any adverse effects, NDOT should evaluate measures to avoid and minimize impacts to disadvantaged communities. If impacts cannot be avoided, NDOT should work with the affected community to develop mitigation measures to offset the impacts. This will require outreach to these communities to determine their needs and concerns.
Physical environment				
Utilities	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Utility coordination will be required.
Hazardous materials	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Future projects should consider the locations of Recognized Environmental Conditions (RECs) relative to future improvements to determine the need for future hazardous materials analysis. This effort should start with updated database searches, followed by an Initial Site Assessment or, if greater potential exists for contamination, a Phase I Environmental Site Assessment (ESA). Results of these assessments will determine the need for sampling and testing as part of a larger Phase II ESA. The need for future study and/or remediation efforts will be determined based on results.

Checklist for NEPA specialists

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Sensitive noise receivers	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	Future studies will need to identify noise-sensitive resources for potential noise analysis. FHWA regulation 23 CFR 772 requires investigation of traffic noise impacts in areas adjacent to federally-aided highways for proposed construction of a highway on a new location, or the reconstruction of an existing highway to either significantly change the horizontal or vertical alignment or increase the number of through-traffic lanes. If NDOT identifies noise impacts, the agency should consider and incorporate all feasible and reasonable noise abatement into project design.
Air quality	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☒ Yes ☐ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	The project assessments will consist of an analysis of traffic data, emissions calculations, evaluation of potential project air quality impacts, and preparation of technical reports. Depending on the project, coordination with agencies such as the Environmental Protection Agency (EPA) and Nevada Department of Environmental Protection Bureau of Air Quality may be required. The projects generally are expected to improve air quality.
Other (list) NOA/E	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☐ Yes ☐ No ☒ Unknown ☐ Not applicable	☒ Yes ☐ No Unknown ☐ Not applicable	

Identification of potential environmental mitigation activities
Off-site and compensatory mitigation areas are often creatively negotiated to advance multiagency objectives or multiple objectives within one agency. Who determined what specific geographic areas or types of areas were appropriate for environmental mitigation activities? How were these determinations made?
n/a
To address potential impacts on the human environment, what mitigation measures or activities were considered and how were they developed and documented?
Mitigation measures considered include impact avoidance and minimization and discussion of potential noise barriers.

Prepared by: DocuSigned by: 5A3BCD652D2D472... Date: 12/18/2018

Steering Committee Member Contact List

Steering Committee Members	Email Addresses
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Yates, Michael	myates@dot.state.nv.us

Appendix C
Agency Scoping

STATE OF NEVADA

DEPARTMENT OF TRANSPORTATION

1263 S. Stewart Street

Carson City, Nevada 89712

Brian Sandoval
Governor

Rudy Malfabon, P.E.
Director

June 21, 2018

US Department of Agriculture
Natural Resources Conservation Service
7080 LA Cienega Street
Las Vegas, NV 89119

Subject: Southern Nevada Traffic Study
Request for Scoping Comments

Dear: US Department of Agriculture

The Nevada Department of Transportation (NDOT) is preparing the Southern Nevada Traffic Study (SNTS) to evaluate options to improve the Las Vegas valley freeway system. The purpose of this letter is to inform you of the study and solicit your input regarding any issues or concerns that you feel should be considered in the study.

As the Las Vegas area has grown over the last several decades, traffic congestion on the freeway system has worsened, and development is projected to continue to grow. Recent infrastructure investments are under construction, including NDOT's Project Neon, which would increase capacity at a major system interchange. However, many of the Las Vegas Valley freeway system roadways remain congested. This study was prompted by the need to identify concepts to improve traffic congestion and safety in the freeway system, while considering impacts to area communities and environmental resources.

The following freeways and corridors are being evaluated: CC 215, I-15, I-215, I-515 and Summerlin Parkway (see attached Study Area map). The SNTS traffic study is conducting different levels of traffic modeling, which will be used to develop improvement concepts for several of the corridors. Those concepts will be evaluated based on how they address the project needs, congestion relief and safety as well as their relative impacts, feasibility and constructability. Based on the results of the alternatives evaluation, recommended concept improvements will be identified for certain corridors, interchanges, and segments. The traffic study will summarize the findings and recommendations for the Southern Nevada freeway system.

A Planning and Environmental Linkages (PEL) approach, focused on certain corridors (see Study Area map) is being used for the traffic study. This approach is intended to shorten the time required to take projects from planning to implementation. Decisions made as part of the study could be carried forward into more detailed National Environmental Policy Act (NEPA) studies. Because of the likelihood of funding availability, the PEL process will focus on the I-215/I-515 system interchange, the I-15/I-215 system interchange, and the I-515 corridor from Charleston Boulevard to the I-215/I-515 System Interchange. Information developed as part of the PEL, including the results of the concept evaluations, may be used in future NEPA studies and project development for these three areas.

Please submit your written comments or questions to the address below, or emailed to:

Jeff Lerud, P.E., CPM
Senior Project Manager
Nevada Department of Transportation
123 E. Washington Avenue
Las Vegas, NV 89101
jlerud@dot.nv.gov

Thank you for your cooperation and assistance.

Sincerely,

Rudy Malfabon, P.E.
Director

cc: Jeff Lerud, P.E., NDOT Project Manager
Steve Cooke, P.E. NDOT Environmental Services Director
Laycee Kolkman, P.E., HDR
Jim O. Clarke, AICP, Jacobs Engineering

Enclosure: Study Area Map

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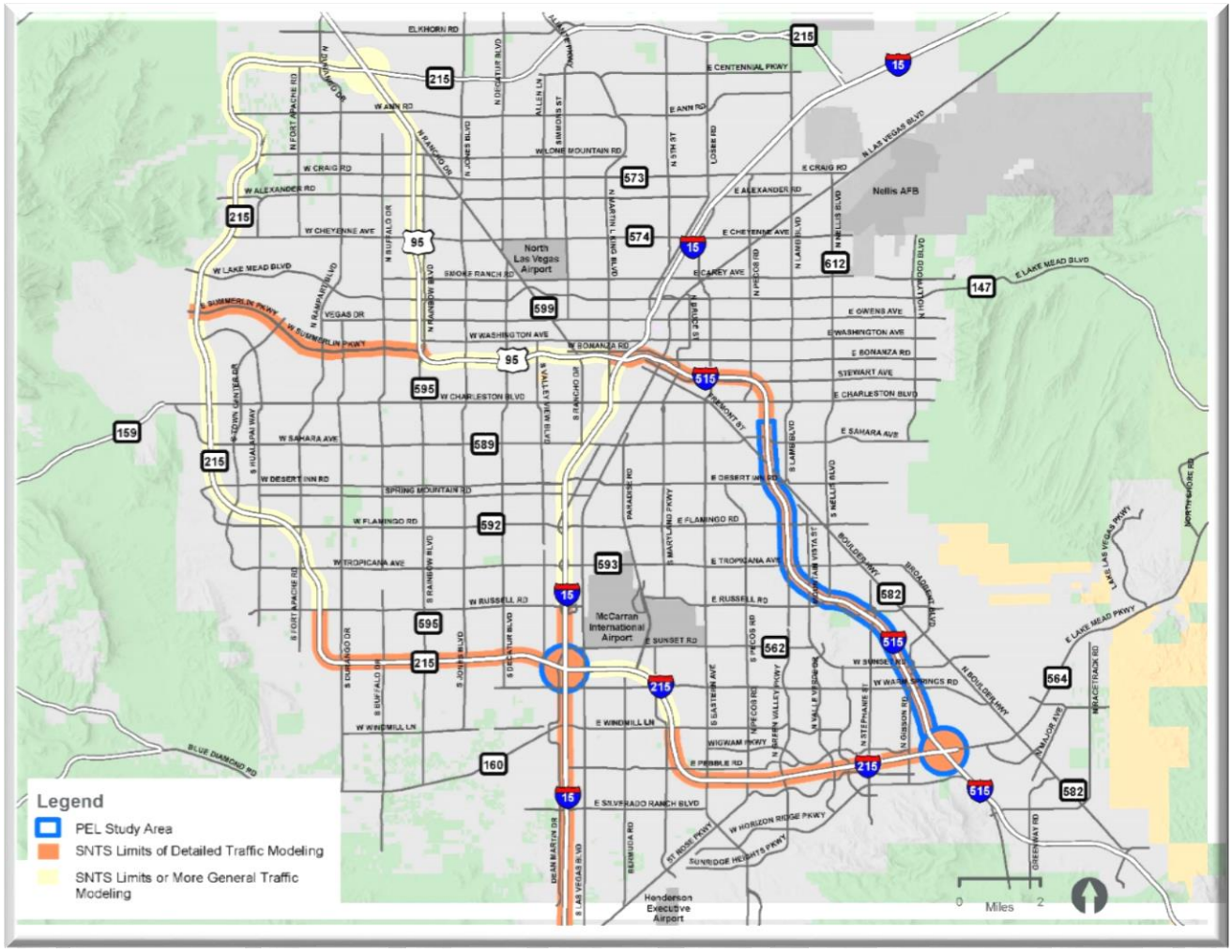
Study Area Map



Name	Title	Agency	Address 1	City/State/Zip
US Department of Agriculture	Natural Resources Conservation Service		7080 LA Cienega Street	Las Vegas, NV 89119
US Department Of The Interior	Regional Environmental Officer	Pacific Southwest Region	1111 Jackson St Ste 735	Oakland CA, 94607-4807
US Department of Agriculture	Regional Forester	Forest Service Region 4	324 25th Street	Ogden, UT 84401
US Department of The Interior	Regional Director Region 1	Fish And Wildlife Service	911 Ne 11th Avenue	Portland, OR 97232-4181
	United States Forest Service		1200 Franklin Way	Sparks, NV 89431
Carolyn Mulvihill	US Environmental Protection Agency Region 9		75 Hawthorne St Ced-2	San Francisco, CA 94105-3901
US Geological Survey	Water Resources Division		2730 N Deer Run Road	Carson City, NV 89701
National Park Service			1111 Jackson St Ste 700	Oakland, CA 94607-4807
US Forest Service	Spring Mountain NRA		4701 N Torrey Pines Dr	Las Vegas, NV 89130-2301
US Fish and Wildlife Service			4701 N Torrey Pines	Las Vegas, NV 89130
US Army Corps Of Engineers	Section Chief		1325 J Street Room 1513	Sacramento, CA 95814
Regulatory Project Manager	US Army Corps Of Engineers		321 North Mall Drive Suite L-101	St George, UT 84790-7314
D Bradford Hardenbrook	Regional Supervisory Biologist - Habitat	Nevada Department Of Wildlife (East)	4747 Vegas Drive	Las Vegas, Nevada 89108
Colorado River Commission			555 E. Washington Ave Suite 3100	Las Vegas, NV 89101-1065
James D Morefield	Natural Heritage Program	Dept Of Conservation & Nat Resources	901 S Stewart St Ste 5002	Carson City, NV 89701-5245
Sierra Club			2330 Paseo Del Prado C-109	Las Vegas, NV 89102
Craig Madole	Assistant Executive Director	Nevada Chapter AGC	5400 Mill Street	Reno, NV 89502
Robert W Hall	Nevada Environmental Coalition Inc		10720 Button Willow Dr	Las Vegas, NV 89134
John Entsminger	General Manager	Southern Nevada Water Authority	P.O. Box 99956	Las Vegas, NV 89193-9956
David H. Sulouff	Chief Bridge Section	Eleventh Coast Guard District	50-2 Coast Guard Island	Alameda, CA 94501
Dept of Housing And Urban Development			302 East Carson Street, 4th Floor	Las Vegas, NV 89101-5911
Bureau Of Reclamation			P.O Box 61470	Boulder City, NV 89006-1470
State Nfip Coordinator	Nevada Division Of Water Resources		901 S Stewart St Ste 2002	Carson City, NV 89701-5250
USGS Western Ecological Research Center	Las Vegas Field Station		160 N Stephanie	Henderson, NV 89074
Dr. Heidi Swank	Executive Director	Nevada Preservation Foundation	620 S. 11th St., Suite 110	Las Vegas, NV 89101
		Preservation Association of Clark County	PO Box 36365	Las Vegas, NV 89101
Michael N. Williams, A.A.E.	Federal Aviation Administration	Western-Pacific Region, Office of Airports, Phoenix Airports District Office	3800 N. Central Avenue, Suite 1025, 10th Floor	Phoenix, AZ 85012

U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of Airports
Phoenix Airports District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

July 3, 2018

Mr. Jeff Lerud, P.E. CPM
Senior Project Manager
Nevada Department of Transportation
123 E Washington Avenue
Las Vegas, NV 89101

Southern Nevada Traffic Study – Request for Scoping Comments

Dear Mr. Lerud:

This office is in receipt of the June 21, 2018 correspondence from Mr. Rudy Malfabon on the above noted subject. Please note, that since May of 2014, public use airports is the State of Nevada are assigned to the Phoenix Airports District Office. We ask that you please update your contact information as necessary.

We appreciate the opportunity to review and comment on this study. Should you have any questions, please contact Mr. Jared Raymond, Community Planner at 602-792-1072 or via email to jared.raymond@faa.gov. Documents sent via mail/deliver can be sent to the address shown above.

Sincerely,

MICHAEL N WILLIAMS Digitally signed by MICHAEL N WILLIAMS
Date: 2018.07.03 09:51:14 -07'00'

Mike N. Williams, A.A.E.
Manager

CC Jared Raymond, Community Planner, FAA
Rudy Malfabon, NDOT
Steve Cooke, NDOT
Laycee Kolkman, HDR
Jim O. Clarke, Jacobs Engineering

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 19, 2018

Jeff Lerud, P.E., CPM
Senior Project Manager
Nevada Department of Transportation
123 E. Washington Avenue
Las Vegas, NV 89101

Subject: Planning and Environmental Linkages Scoping Comments for the Southern Nevada Traffic Study, Clark County, Nevada

Dear Mr. Lerud:

The U.S. Environmental Protection Agency (EPA) has reviewed the Nevada Department of Transportation (NDOT)'s June 21, 2018 letter, requesting input regarding any issues or concerns that we feel should be considered as part of the Southern Nevada Traffic Study.

The letter states that a Planning and Environmental Linkages (PEL) approach, focused on certain corridors, is being used for the traffic study. Since materials developed during PEL approaches are meant to be used to inform future decision-making and be incorporated/referenced in future National Environmental Policy Act (NEPA) documents, EPA recommends that NDOT establish an interagency process, with well-established milestones, to share information and results from early analyses with all resource and regulatory agencies that may have a future permitting, approval, or review role for resulting projects. It would also be helpful to clearly identify which elements of the current traffic study are intended to be used to inform future decision-making and what analyses will be deferred until potential project-level NEPA analyses are initiated. If the geographic limits (logical termini and independent utility), as well as the scope/level of analysis of any future NEPA analyses are known, we encourage NDOT to identify these decisions early in the planning process. Information provided on the Federal Highway Administration (FHWA) website (https://www.environment.fhwa.dot.gov/env_initiatives/PEL.aspx) may be helpful.

By establishing a robust interagency review process, it is more likely that early review and feedback from regulatory agencies can be incorporated into products that will ultimately be used in the environmental review process. Our attached comments provide recommendations for the types of information that would be useful to include in the study. EPA appreciates the opportunity to provide input. If you have any questions, please feel free to contact me at (415) 947-3554 or mulvihill.carolyn@epa.gov.

Sincerely,

Carolyn Mulvihill
Environmental Review Section

Enclosures: EPA's Detailed Comments

cc: Abdelmoez Abdalla, Federal Highway Administration

EPA PLANNING AND ENVIRONMENTAL LINKAGES SCOPING COMMENTS FOR THE SOUTHERN NEVADA TRAFFIC STUDY, CLARK COUNTY, NEVADA, JULY 19, 2018

Range of Alternatives

EPA recommends that the study examine a full range of alternatives in developing the improvement concepts for the corridors being evaluated. A robust range of alternatives will include options for avoiding significant environmental impacts.

Recommendations:

- Consider alternatives that maximize the use of existing facilities, including features such as congestion pricing, high occupancy toll lanes, and improved transit services.
- Quantify the potential environmental impacts of each alternative to the greatest extent possible (e.g. acres of wetlands impacted; change in water quality).
- Provide a clear discussion of the reasons for the elimination of alternatives that are not identified for future detailed evaluation.

Air Quality and Health Effects

EPA recommends that the study consider the potential air quality impacts of the improvement concepts, resulting from both potential construction activities and operation. Clark County is a federally designated maintenance area for particulate matter smaller than 10 microns (PM_{10}), carbon monoxide (CO), and the 1997 ozone standard. It is a nonattainment area for the 2015 ozone standard (effective August 3, 2018). Because of the area's status, it is important to reduce emissions of CO and particulate matter from any potential projects to the maximum extent.

Given the highly developed nature of the project area and the existence of both residential and commercial property adjacent to the study corridors, it is likely that there are sensitive receptors close enough to the roadways to experience mobile source air toxics (MSAT) impacts. Many studies have measured elevated concentrations of pollutants emitted directly by motor vehicles near large roadways. These elevated concentrations generally occur within approximately 200 meters of the road, although the distance may vary depending on traffic and environmental conditions.

Recommendations:

- Consider ambient air conditions (baseline or existing conditions), National Ambient Air Quality Standards (NAAQS), and criteria pollutant maintenance and nonattainment areas.
- Consider potential impacts (including cumulative and indirect impacts) from the construction and operation of the improvement concepts. Consider monitoring data, any potential exceedances of NAAQS, and estimates of all criteria pollutant emissions.
- Discuss potential air quality impacts in the context of conformity requirements and associated state implementation plans.
- The project study corridors may be considered "projects of air quality concern" for purposes of project-level air quality conformity. A project is considered a project of air quality concern (POAQC) if it is in a nonattainment area and meets certain additional criteria, including increased volume of truck traffic. Please contact EPA regarding consultation on this determination as additional project-level analyses would be required if the project is determined to be a POAQC.
- Identify sensitive receptors in the project area, such as children, elderly, schools, and hospitals. Describe measures that could mitigate emissions to prevent degradation of air quality and reduce health impacts, in particular those considered for sensitive receptors.

- Consider potential MSAT emissions resulting from the improvement concepts to determine potential exposure for identified sensitive receptors.

EPA recommends that the study consider the potential direct, indirect, and cumulative impacts of the project on the health of sensitive receptors, including children. Executive Order 13045 on Children's Health and Safety directs each Federal agency, to the extent permitted by law, to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and to ensure that its policies, programs, activities, and standards address these risks. Analysis and disclosure of these potential effects is necessary because some physiological and behavioral traits of children render them more susceptible and vulnerable than adults to environmental health and safety risks. The Centers for Disease Control and Prevention and others have concluded that near-roadway traffic emissions may trigger and exacerbate asthma symptoms, as well as contribute to the development of asthma in children. As such, proposals to construct additional lanes of traffic in an area with a large population of sensitive receptors should analyze, disclose, and mitigate impacts.

Recommendations:

- Consider the potential direct, indirect, and cumulative impacts on health of sensitive receptors, including children, from the improvement concepts. Please consider the following for this discussion:
    - Potential respiratory impacts, including asthma, from construction activities and increased traffic flow;
    - Potential noise impacts to health and learning, especially near schools, homes, childcare and health centers.
    - Sensitive receptors should include public schools, private schools, charter schools, preschools, community centers, and childcare centers.

Environmental Justice

Executive Order 12898 addresses environmental justice in minority and low-income populations, and the Council on Environmental Quality (CEQ) has developed guidance concerning how to address environmental justice in the environmental review process[1]. *Promising Practices for Environmental Justice Methodologies in NEPA Reviews*[2] (March 2016) may also serve as a useful resource for planning-level environmental justice analyses. This document is a compilation of methodologies from current agency practices identified by the NEPA Committee of the Federal Interagency Working Group on Environmental Justice. The document focuses on the interface of environmental justice considerations through NEPA processes and provides recommendations on applying environmental justice methodologies that have been established in federal NEPA practice.

Recommendations:

- Consider *Promising Practices for EJ Methodologies in NEPA Reviews* when developing the environmental justice analysis for the study.
- Consider impacts on low-income and minority populations from the improvement concepts. Include a description of the area of potential impact considered and provide the source of demographic information.
- Define potential environmental justice concerns, including any environmental justice issues raised during outreach and community engagement. Discuss any key issues where environmental

[1] http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf
[2] https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf

justice is potentially a concern, such as relocation, air quality, noise, vibration, access to property, pedestrian safety, etc.

- Consider whether potential projects could result in disproportionate and adverse impacts on minority or low-income populations.
- Identify mitigation that could be implemented if disproportionately high and adverse impacts on minority or low-income populations are likely to result from the improvement concepts.

Water and Wetlands Resources

The study should consider potential impacts to water bodies, wetlands, and water quality. Potential impacts may be direct, from construction and use of facilities, or indirect and cumulative. The assessment of impacts to waters and water quality should be of an appropriate scope and detail to identify sensitive areas or aquatic systems with functions highly susceptible to change. Describe how, at a planning level, projects could be designed to avoid impacts to naturally functioning aquatic systems and use green infrastructure to reduce negative impacts from stormwater runoff.

Recommendations:

- Include a classification of waters and the geographic extent of waters and any adjacent riparian areas in the project area.
- Characterize the functional condition of waters and any adjacent riparian areas.
- Describe the extent and nature of stream channel alteration, riverine corridor continuity, and buffered tributaries.
- Identify all protected resources with special designations and all special aquatic sites[3] and waters within state, local, and federal protected lands. Additional steps should be taken to avoid and minimize impacts to these areas.
- Include wildlife species that could reasonably be expected to use waters or associated riparian habitat and sensitive plant taxa that are associated with waters or associated riparian habitat.
- Characterize the hydrologic linkage to any impaired water bodies and identify any Clean Water Act 303(d) listed impaired water bodies that exist in the project area.
- Address potential direct and indirect, or secondary, impacts and identify how the following impacts could be minimized or avoided through use of low impact development and green infrastructure:
    - changes in hydrology and sediment transport capacity;
    - increases in impervious surfaces and the corresponding increases in the volume and velocity of polluted stormwater;
    - decreases in water quality from the impairment of floodplain and ecosystem functions including water filtration, groundwater recharge, and flood attenuation;
    - disruption of hydrological and ecological connectivity; and
    - decreases in biodiversity and ecosystem stability.

On-site Avoidance and Minimization Strategies

In developing improvement concepts, consider integrating on-site strategies to avoid or minimize impacts to waters. Typically, transportation projects can accomplish this by: (1) using spanned crossings, arch crossings, or oversized buried box culverts over drainages to encourage continuity of sediment transport and hydrological processes, and wildlife passage; (2) moving alignments to avoid impacts to wetlands and waterways; and (3) establishing and maintaining adequate buffers away from aquatic resources.

[3] Special aquatic sites are defined at 40 CFR 230.40 – 230.45 and include wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes.

Impacts to Clean Water Act Section 404 Waters

In describing existing conditions in the study area, include identification and quantification of jurisdictional waters of the United States (waters of the U.S.), if any, within the study area, including an overview of their condition and current threats to their ecological health. Discharges of dredged or fill material into waters of the U.S. require authorization by the U.S. Army Corps of Engineers under Clean Water Act (CWA) Section 404. The Federal Guidelines at 40 CFR Part 230 promulgated under CWA Section 404 (b)(1) provide substantive environmental criteria that must be met to permit discharges into waters of the United States. These criteria require a permitted discharge to: (1) be the least environmentally damaging practicable alternative (LEDPA); (2) avoid causing or contributing to a violation of a state water quality standard; (3) avoid jeopardizing a federally listed species or adversely modifying designated critical habitat for a federally listed species; (4) avoid causing or contributing to significant degradation of the waters of the United States; and require (5) mitigation for unavoidable impacts to waters.

Cumulative Impacts

Cumulative impacts are defined in CEQ's NEPA regulations as the impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such actions (40 CFR 1508.7). These actions include both transportation and non-transportation activities, such as large-scale developments and approved urban planning projects that are reasonably foreseeable and are identified within city and county planning documents. EPA encourages NDOT to consider these types of projects, identified within and around the project corridor, when preparing a cumulative impacts analysis.

Recommendations:

- Consider cumulative impacts of the improvement concepts, including a complete list of reasonably foreseeable actions, including non-transportation projects.
- Identify landscape-level impacts to all sensitive resources on a regional scale and identify landscape-level opportunities to avoid and minimize impacts, including working with other entities.

Growth-Related Impacts

Improvement concepts developed as a part of the study have the potential to result in indirect impacts due to improved access that may induce growth on surrounding lands. The May 2006 *Guidance for Preparers of Growth-related, Indirect Impact Analyses*[4] (Guidance) developed jointly by the California Department of Transportation, FHWA, and EPA, provides an approach to developing a growth-related impact analysis. The Guidance is relevant to highway projects outside of California.

***Recommendations*:**

- Identify if improvement concepts could affect the location and/or timing of planned growth in the area. Identify the potential resources that may be affected by the increased "zone of influence" associated with interchanges and impacts on resources outside of the right-of-way.
- Identify the types of resources that are likely to occur in geographic areas that may be affected by growth.
- Include a discussion of mitigation strategies to reduce impacts if adverse impacts cannot be avoided or minimized.

[4] http://www.dot.ca.gov/ser/Growth-related_IndirectImpactAnalysis/gri_guidance.htm

Appendix D
Public Involvement

Engagement

Public engagement was critical throughout the course of the study to engage the community and to integrate stakeholder and agency input into the study recommendations. In addition to the agency outreach that took place as part of the Steering Committee meetings, several monthly update meetings were held to provide additional coordination with the local agencies. Public involvement for the SNTS included the following efforts:

PUBLIC MEETING BOOTH

SNTS staffed an information booth in conjunction with a public meeting held for the I-515 Restripe Slip Ramp at SR 564 and CC 215 project held on August 22, 2018. This public meeting was selected because it is located in Henderson, close to the PEL corridor areas, and was anticipated to attract many residents and businesses who were concerned about changing access. The team provided open house attendees with information about the study, the Purpose and Need and the PEL area alternatives. The NDOT Project Manager was present to answer questions about the study, informing them specifically of the PEL process and how it would help inform the NEPA process. While comment forms were provided, SNTS did not receive any public comments at the meeting.

Materials provided to meeting attendees included:

- Informational Board
- Flyer
- Comment Forms

WEBSITE

Because the study is of regional importance, SNTS created a study website that could be accessed by anyone in the study area at any time. The website was publicized through links on the NDOT website, in newspaper ads for the restriping project and on the informational board and handouts at the Open House. The website contained further information about the study, the PEL process, PEL alternatives and provided an opportunity for public comments. No comments were received through the website. The website (ndotsnts.com) was designed for ease of use and readability, with graphics, icons, and maps to enhance the information.

Southern Nevada Traffic Study

ABOUT THE STUDY

The Southern Nevada Traffic Study (SNTS) is a large-scale, systemwide traffic study of the Las Vegas area conducted by NDOT designed to:

- ✓ Identify congestion, mobility needs
- ✓ Evaluate alternatives and develop solutions
- ✓ Perform benefit-cost analysis to quantify return-on-investment

PLANNING & ENVIRONMENTAL LINKAGES

For several of the areas being studied, NDOT is taking a Planning and Environmental Linkages (PEL) approach to bring efficiency to future projects.

The PEL process identifies and considers environmental constraints early in the planning process. It also involves soliciting feedback from public and agency stakeholders. Decisions that are made during the PEL process could be used during subsequent National Environmental Policy Act (NEPA) studies.

PURPOSE AND NEED

Population in the valley is growing. With this growth will come an increase in traffic on freeways and interstates. The purpose of these projects is to:

- ✓ Decrease congestion on roads
- ✓ Address safety

COMMENT

We are seeking your feedback on the study *Purpose and Need* and the proposed *PEL Corridor Alternatives*. Please be specific and provide a location. All comments will be public record and will be included in the final study report.

TO MAKE A COMMENT, PLEASE GO TO: NDOTSNTS.COM

BENEFITS

We're making informed decisions to plan for the future.

Reducing congestion & addressing safety

Moving people and goods more efficiently

Improving access to freeways from local roads

Providing traffic condition tools to plan for the future

Ability to compare the benefits of projects on separate corridors

PEL CORRIDOR AND SYSTEM INTERCHANGES

The PEL study is part of a larger traffic study which includes these three areas:

- I-515 from Charleston Boulevard to I-215
- I-215/I-515 system interchange
- I-15/CC-215/I-215 system interchange

LOOKING AHEAD

Existing Traffic Operational Analysis	Conceptual Design: Future Year Traffic Operational Analysis	Conceptual Design: Benefit-Cost Analysis	Final Report
WINTER 2018	SPRING 2018	SUMMER 2018	FALL 2018

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COMMENT

We are seeking your feedback on the *Purpose and Need* and the proposed *PEL Corridor Alternatives* (see back). Please be specific and provide a location. All comments will be public record and included in the final study report.

TO MAKE A COMMENT, PLEASE GO TO: NDOTSNTS.COM

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CAPITAL COSTS
USER DELAYS
EMISSIONS
SAFETY
VEHICLE OPERATING COSTS

Ability to compare the benefits of projects on separate corridors

LOOKING AHEAD

Existing traffic operational analysis	Conceptual Design: Future year traffic operational analysis	Conceptual Design: Benefit-Cost Analysis	Final Report
WINTER 2018	SPRING 2018	SUMMER 2018	FALL 2018

Contact
Jeff Lerud, NDOT Project Manager
Phone: 702-671-8865
Email: jlerud@dot.nv.gov

SOUTHERN NEVADA TRAFFIC STUDY

PEL Corridor Alternatives

Study Area

PEL Area

For several of the areas being studied, NDOT is taking a Planning and Environmental Linkage (PEL) approach to bring efficiency to future projects.

The PEL process identifies and considers environmental constraints early in the planning process. It also involves soliciting feedback from public and agency stakeholders. Decisions that are made during the PEL process are useful during subsequent National Environmental Policy Act (NEPA) studies.

I-515 ALTERNATIVES
UNDER CONSIDERATION

- ☑ +1 HOV/GP lane
- ☑ Auxiliary lanes in select locations
- ☑ Braided ramps in select locations

I-15/I-215/CC-215 ALTERNATIVES
UNDER CONSIDERATION

- ☑ 2 lane system ramps in select locations
- ☑ Braided ramps in select locations

I-515/I-215 ALTERNATIVES
UNDER CONSIDERATION

- ☑ 2 lane system ramps
- ☑ Braided ramps
- ☑ Collector distributor road system
- ☑ Modified interchange design

NEVADA DOT SAFE AND CONNECTED

Contact
Jeff Lerud, NDOT Project Manager
Phone: 702-671-8865
Email: jlerud@dot.nv.gov

RTC · The City of Henderson · City of Las Vegas Nevada · Clark County Nevada · City of North Las Vegas

Public Information Meeting

Nevada Department of Transportation

TRANSPORTATION NOTICE: INTERSTATE 515/215 RE-STRIPING PROJECT IN HENDERSON, NV

DATE: Wednesday, August 22, 2018

TIME: 4:00-7:00 p.m. (Presentation 5:30 p.m.)

LOCATION: Henderson Convention Center
200 South Water Street, Henderson, NV, 89009

CONTACT: Jesse Smithson, P.E., NDOT Roadway Design,
1263 South Stewart Street, Carson City, NV 89712.
Email: jsmithson@dot.nv.gov

PURPOSE OF MEETING: The Nevada Department of Transportation (NDOT), will soon re-stripe the I-515 / I-215 interchange. This meeting is to inform the travelling public about project details including how ramp access will be adjusted at the I-515 Auto Show Drive Interchange and the I-215 Gibson Road Interchange and the I-515 / I-215 Interchange.

PROJECT BENEFITS: The goal is to improve safety and mobility for southbound I-515 and westbound I-215 as well as the ramp connecting the two freeways. Southbound I-515 to westbound I-215 ramp has experienced significant congestion. The result has impacted the public's travelling times and has increased the potential for safety concerns. Two merging/ weaving areas have also been identified that are contributing to the increased congestion and the increased risk of the traveling public. The first area is on I-515 south, just before the I-215 on-ramp; and the second area is between where the I-215 west ramp merges onto I-215, and the Gibson Road off-ramp. While efforts are being made to establish a larger scale project for the I-515 / I-215 Interchange, this project was identified to address the more immediate congestion and safety concerns.

WHERE YOU COME IN: Please attend at your convenience any time during the meeting hours of 4 to 7 p.m. Project representatives will be on hand to discuss and answer your questions. There will be a brief project presentation at 5:30 p.m., followed by a short question and answer period from the audience. Before and after the presentation, the meeting will be conducted as an open-house format to provide an opportunity to view displays and individually discuss the project with representatives. At the meeting, your comments may be submitted for public record in writing or verbally to a court reporter, who will be available throughout the meeting. In addition to any comments received at the meeting, written or email comments will be accepted through Friday, September 7, 2018. Please email your comments to: jsmithson@dot.nv.gov with a reference to this project in the subject line. You may also mail your comments using the contact information below.

If you cannot attend in person, please join us via Facebook Live at 5:30 p.m. on August 22 to watch the presentation and submit your comments or ask questions. Facebook.com/NevadaDOT/

SPECIAL ACCOMMODATION REQUESTS: Reasonable efforts will be made to assist and accommodate persons with disabilities desiring to attend the meeting. Requests for auxiliary aids or services to assist individuals with disabilities or limited English proficiency should be made with as much advanced notice as possible to NDOT public hearings officer, Julie Maxey, at 775-888-7171 or email at jmaxey@dot.nv.gov

ADDITIONAL INFORMATION: Southern Nevada Traffic Study staff will be available to provide additional information on this traffic study and how your input is needed. Please contact Jeff Lerud, (702) 671-8865, or email, jlerud@dot.nv.gov.

NevadaDot.com

Nevada DOT Safe and Connected

zero Fatalities Drive Safe Nevada

Southern Nevada Traffic Study

COMMENT FORM

Tell us your thoughts about the project, *Purpose and Need*, or proposed *PEL Corridor Alternatives*. All comments will be recorded and considered in the traffic study. Responses to comments will be posted at the end of the comment period (Sept. 21).

Name: _____ Phone: _____

Address: _____ Email: _____

Comment: _____

_____

_____

_____

_____

_____

_____

_____

_____

Southern Nevada Traffic Study

ABOUT THE STUDY

NDOT is conduction a large-scale, systemwide traffic study of the Las Vegas metro area to:

- ☑ Identify congestion, mobility needs
- ☑ Evaluate alternatives and develop solutions
- ☑ Perform cost-benefit analysis to quantify return-on-investment

PURPOSE AND NEED

Population in the valley is growing. With this growth will come an increase in traffic on freeways and interstates. The purpose of these projects will:

- ☑ Decrease congestion on roads
- ☑ Improve safety conditions

BENEFITS

We're making informed decisions to plan for the future.

Reducing congestion & improving safety

Better access to freeways from local roads

VEHICLE OPERATING COSTS
CAPITOL COSTS
USER DELAY
EMISSIONS
SAFETY

Moving people and goods more

Providing the most comprehensive tools of existing and future

PEL CORRIDOR ALTERNATIVES

Planning and Environmental Linkages (PEL) is a study process used to identify transportation issues in a specific corridor. This process includes public input and can help determine a range of alternatives.

- I-515 ALTERNATIVES
- I-15/I-215/CC-215 ALTERNATIVES
- I-515/I-215 ALTERNATIVES

(Reserved for pop-up information on each alternative to show map, brainstorm, and benefits)

LOOKING AHEAD

Existing traffic operational analysis	Alternative Design: Future year traffic operational analysis	Alternative Design: Cost-benefit Analysis	Final Report
WINTER 2018	SPRING 2018	SUMMER 2018	FALL 2018

COMMENTS

We are looking for your feedback on the study Purpose and Need and the proposed alternatives in the PEL corridor. Please be specific and provide a location. All comments will be public record and will be included in the final study report.

FIRST NAME:

LAST NAME:

ADDRESS (optional):

EMAIL (optional):

COMMENT:

Submit