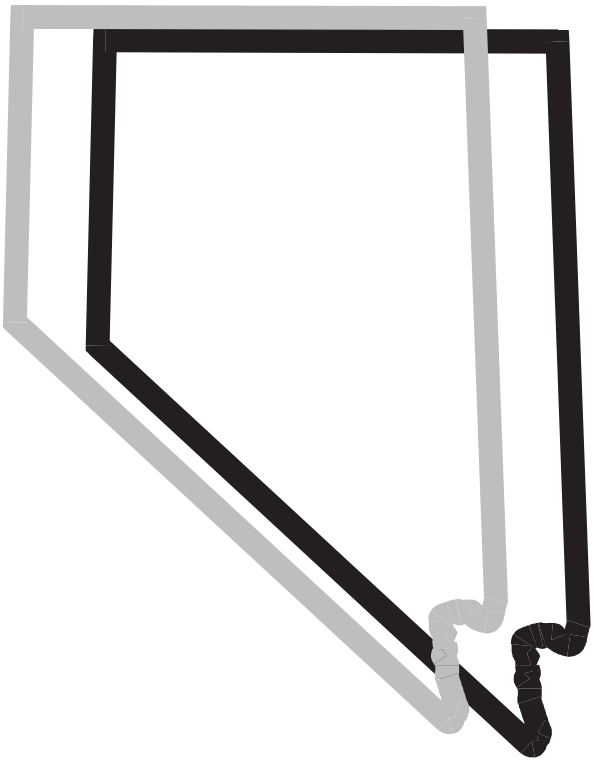
ENVIRONMENTAL ASSESSMENT

FHWA-NV-EA 07.02

EA: 73215

October 2008

Federal Highway Administration
and
Nevada Department of Transportation
in cooperation with the Bureau of Land Management



Interstate 15 South Corridor Improvement
Sloan Road to Tropicana Avenue
Clark County, Nevada

ENVIRONMENTAL ASSESSMENT

for

Interstate 15 South Corridor Improvement
Sloan Road to Tropicana Avenue

FHWA-NV-EA 07.02

NH-015-1(130)

EA: 73215

October 2008

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This Environmental Assessment has been prepared in accordance with the provisions and requirements of Chapter 1, Title 23, 23 CFR Part 771, relating to implementation of the National Environmental Policy Act of 1969. The Bureau of Land Management is a cooperating agency.

Abstract

The Nevada Department of Transportation (NDOT) and the Federal Highway Administration (FHWA), in cooperation with the Bureau of Land Management (BLM), have prepared this Environmental Assessment (EA), which examines the potential environmental impacts of the alternatives being considered for the proposed I-15 South Corridor Improvement Project located in Clark County, NV. The document describes why the project is being proposed, alternatives for the project (including the No Build

Alternative), the existing environment that could be affected by the project, the potential impacts from each of the alternatives, and the proposed mitigation measures.

NDOT, with FHWA, is proposing to improve 12 miles of the I-15 corridor from Sloan Road to Tropicana Avenue, including Las Vegas Boulevard South between Sloan Road and Sunset Road. Improvements proposed for I-15 consist of expanding the freeway to a ten-lane facility (five general purpose lanes in each direction) from Sloan Road to Blue Diamond Road, and a ten-lane facility (five general purpose lanes in each direction) with collector-distributor (C-D) lanes from Blue Diamond Road to Tropicana Avenue. The I-15 South corridor includes Las Vegas Boulevard South, which would be improved to a six-lane facility (three lanes in each direction) from Sloan Road to Sunset Road, and separated by an open median designated for future use by the Regional Transportation Commission of Southern Nevada's (RTC) Regional Fixed Guideway system. New service interchanges are proposed along I-15 at Bermuda Road, Starr Avenue, and Cactus Avenue; a reconstructed interchange at Sloan Road; a reconstructed overpass at Warm Springs Road;[1] and new overpasses at Pebble Road and Sunset Road. Improvements would be made to the Blue Diamond Road (SR 160) interchange and the I-15/I-215 Beltway system interchange. A park-and-ride lot is proposed in the southwest quadrant of Las Vegas Boulevard and St. Rose Parkway. Transportation System Management (TSM) measures, including dynamic message signs and ramp metering to improve traffic operations, would also be incorporated.

[1] Reconstruction of the Warm Springs Road overpass was previously studied and approved in the SR 160 EA and would be constructed as part of this project (FHWA and NDOT, 2004. *Environmental Assessment for SR 160 Widening & I-15 Interchange Improvements, I-15 to Rainbow Boulevard, Clark County, Nevada.* FHWA-NV-EA 04.03. April).

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ACRONYMS & ABBREVIATIONS

ADT	average daily traffic
APE	Area of Potential Effects
BLM	Bureau of Land Management
BMPs	Best Management Practices
CAAAs	1990 Clean Air Act Amendments
CCDAQEM	Clark County Department of Air Quality and Environmental Management
CCRFCD	Clark County Regional Flood Control District
C-D	collector-distributor
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
cfs	cubic feet per second
CO	carbon monoxide
dBA	A-weighted decibel
DOT	United States Department of Transportation
DPM	diesel particulate matter
EA	Environmental Assessment
EB	eastbound
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Freeway and Arterial System of Transportation
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FY	fiscal year
HA	Hydrographic Area
HAPs	hazardous air pollutants
HOV	high-occupancy vehicle
I-15	Interstate Highway 15
I-215	Interstate Highway 215
ITS	Intelligent Transportation System
L_{eq}	equivalent noise level
LOS	level of service
MFR	multi-family residential
mg	milligrams
mg/m^3	milligrams per cubic meter
$\mu g/m^3$	micrograms per cubic meter
MH	mobile home

MPO	Metropolitan Planning Organization
MSATs	mobile source air toxics
NAAQS	national ambient air quality standards
NAC	noise abatement criteria
NB	northbound
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NOI	Notice of Intent
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NOI	Notice of Intent
O_3	ozone
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
RMP	Las Vegas Resource Management Plan
ROW	right-of-way
RTC	Regional Transportation Commission of Southern Nevada
RTP	Regional Transportation Plan
RV	recreational vehicle
SB	southbound
SFR	single-family residential
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SNPLMA	Southern Nevada Public Lands Management Act
SNWA	Southern Nevada Water Authority
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TIP	Transportation Improvement Program
TSM	Transportation System Management
UPRR	Union Pacific Railroad
US 95	United States Highway 95
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WB	westbound

LIST OF MITIGATION MEASURES

The following list describes measures that will be implemented as part of the project to avoid, reduce, or otherwise mitigate environmental impacts associated with the project.

Mitigation measures and compliance with federal, state, and local laws and regulations with regards to noise, air quality, water quality, hazardous materials, and cultural resources will be specified in the contract documents.

The following list of mitigation measures and commitments are not subject to change or modification without prior written approval of the Federal Highway Administration (FHWA).

Responsible Party	EA Page No. Reference	Mitigation Category	Description
Contractor	49	Hazardous Waste and Materials	Prior to demolition, structures will be assessed for asbestos, and required abatement measures will be enforced.
Contractor and NDOT	50	Biological Resources	Cacti and yucca species that are present will be salvaged prior to construction activities. All terms and conditions of the BLM Programmatic Biological Opinion will be adhered to and would be specified in the Special Provisions for the project. As specified in the programmatic biological opinion, remuneration fees for the desert tortoise will be paid into the Desert Tortoise Public Lands Conservation Fund prior to surface-disturbing activities. Fees will be paid for both Section 7 and Section 10, due to the presence of both land ownerships in the project area. There are approximately 17.3 acres of BLM land (Section 7) that will be acquired for the project; however, only 15 acres would be considered new disturbance. The 15 acres will be charged at $753 per acre for a total of $11,295 paid to the fund. The $753 remuneration fee is indexed for inflation and is increased each year on March 1. If fees are paid after March 1, 2009, the new mitigation fee will apply to the number of acres that are disturbed. Section 10 funds are for state or private lands and are charged $550 per acre of disturbance. There are 43.7 acres that will be disturbed, and a total of $24,035 will be paid to the fund.

Responsible Party	EA Page No. Reference	Mitigation Category	Description
Contractor	51	Noxious Weeds	Earth-moving and hauling equipment will be washed at the contractor's storage facility prior to arriving onsite to prevent the introduction of noxious weed seeds. Disturbed areas will be landscaped and/or seeded with certified weed-free mixes. A noxious weed management plan will be specified in the Contract Special Provisions, prepared according to BLM's Las Vegas Field Office Noxious Weed Plan, and implemented to prevent noxious weeds from becoming established in the project area during and following construction. Elements of the plan will include surveying the project area to confirm absence of noxious weeds, verifying that vehicles and equipment are free of caked mud prior to being used at the construction site, eradication measures if noxious weeds do become established, and the use of approved BLM seed mixes.
NDOT Right-of-Way (ROW) Division	55	Social	The NDOT ROW Division, under the guidance of the Relocation Assistance and Real Property Acquisition Policy Act of 1970 (Uniform Act), will negotiate with the property owners directly impacted, ensuring that they receive fair market value for the acquired ROW and appropriate relocation assistance. Legally permitted property access will be perpetuated in the after condition. A detailed traffic plan will be created to maintain traffic circulation and access during construction. NDOT will coordinate with the existing businesses and residents about the construction schedule.
NDOT Design Division	56	Visual	Aesthetic treatments to soundwalls and structures within the project area will be in accordance with NDOT's Landscape and Aesthetics Master Plan and I-15 Corridor Plan. New freeway and street lighting will employ shields on luminaries to minimize light and glare impacts on adjacent residences.
Contractor	62	Air Quality	NDOT contract documents will specify that the contractor must implement a dust control program to minimize impacts. In addition, the contractor will comply with all federal, state, and local laws, including Clark County Department of Air Quality and Environmental Management (CCDAQEM) regulations governing air pollution control.

Responsible Party	EA Page No. Reference	Mitigation Category	Description
Contractor	77	Noise	Soundwalls will be constructed early in the project, as feasible, to mitigate construction noise (see Figures 10a through 10i). Soundwall height, length, and location will be determined during final design in coordination with NDOT Environmental Services Division. Contract documents will require the contractor to submit a noise control plan for review and approval by NDOT. The plan will specify how noise mitigation measures will be implemented during construction that occurs near residences. Contract specifications will address hours of operation and noise-level limits. Construction specifications will require performance of proper maintenance on construction equipment and that stationary equipment be placed as far from homes as feasible.
NDOT Design Division	79	Drainage/Flood Control	Floodplain impacts will be minimized by improving the offsite drainage system of the highway, by designing drainage systems in consultation with Clark County Regional Flood Control District (CCRFCD), and by incorporating designs that perpetuate existing flow patterns without increasing upstream water levels. Drainage and flood control systems will be designed in consultation with CCRFCD and in accordance with the CCRFCD Flood Control Master Plan for the Las Vegas Valley.
Contractor	83	Water Resources	If previously unidentified wells are encountered during project construction, the contractor is responsible for notifying the Nevada Department of Water Resources and for retaining a Nevada-licensed driller to properly abandon the well, if necessary.

Responsible Party	EA Page No. Reference	Mitigation Category	Description
NDOT Design Division and Contractor	83	Water Resources	In addition to securing a Section 404 Permit for the discharge of fill material into a Waters of the United States, Section 401 Water Quality Certification issued by NDEP, Bureau of Water Quality Planning, will also be required for water quality assurances. If construction equipment is required to enter any of the ephemeral stream channels, then a Temporary Working in Waterways Permit issued by NDEP, Bureau of Water Pollution Control, will be obtained by the contractor for water quality assurances as well. As part of the freeway design, erosion control measures will be incorporated for site stabilization. The contractor will obtain a construction stormwater permit issued by NDEP, Bureau of Water Pollution Control. To secure coverage under this permit, the contractor will file a Notice of Intent (NOI) and develop a Stormwater Pollution Prevention Plan (SWPPP) identifying sources of onsite stormwater discharge into adjacent surface waters and describing the implementation of best management practices (BMPs) to prevent or reduce to the maximum extent possible said discharges.

INTRODUCTION

This Environmental Assessment (EA) has been prepared to comply with the National Environmental Policy Act (NEPA) of 1969 and the environmental regulations and policies of the Federal Highway Administration (FHWA) as the lead federal agency. The Bureau of Land Management (BLM) is a cooperating agency on the EA to include their action related to the transfer of right-of-way (ROW) as outlined in the Memorandum of Understanding between FHWA, BLM, and the Nevada Department of Transportation (NDOT).

The EA evaluates the potential social, economic, and environmental impacts of the proposed action for decision makers, while providing an opportunity for local, state, or other agencies and the general public to provide input or comment through scoping, pubic information meetings, and a design/location hearing. The magnitude of impacts is evaluated based on the context and intensity of proposed improvements, as defined in the Council on Environmental Quality's (CEQ) regulations.

Interstate Highway 15 (I-15) has been designated as a Corridor of the Future by FHWA from San Diego, California, to Salt Lake City, Utah. The I-15 corridor through the states of California, Nevada, Arizona, and Utah is more than 840 miles long with approximately 240 miles crossing through urban areas. The overarching goal of the Corridor of the Future program is to provide a managed corridor for safe travel, sustained traffic flow, and reliable travel times. The proposed Corridor of the Future projects include capacity and operational improvements on the highway and rail portions of the corridor, including an Intelligent Transportation System (ITS) truck parking initiative, interchange reconstruction and modification, and road and bridge preservation.

The proposed improvements to the I-15 South corridor that are evaluated in this EA were initially identified in the 2001 *I-15 Corridor Operational Analysis, I-15 Sloan Road to I-215*[2]. The proposed improvements are also included in the 2006-2030 Regional Transportation Plan (RTP). The proposed project is the latest in a series of improvements within the I-15 corridor. Past improvements include a new interchange on I-15 at Silverado Ranch Boulevard and reconstructing the St. Rose Parkway and Blue Diamond Road interchanges with I-15.

1. PROPOSED ACTION

1.1 Description

NDOT, with FHWA, is proposing to improve 12 miles of the I-15 corridor from Sloan Road to Tropicana Avenue, including Las Vegas Boulevard South between Sloan Road and Sunset Road (see Figure 1). Potential improvements include adding lanes to I-15 and Las Vegas Boulevard South; new service interchanges at Bermuda Road, Starr Avenue, and Cactus Avenue; reconstructing the Sloan Road interchange; modifications to the I-15/Interstate Highway 215 (I-215) system interchange; collector-distributor (C-D) roads (separating traffic entering and exiting the freeway from the mainline); and park-and-ride facilities. I-15 is a six-lane freeway from Sloan Road to Tropicana Avenue. Las Vegas Boulevard South is a two-lane roadway from Silverado Ranch Boulevard to Sloan Road and varies from two lanes to three lanes in each direction north of Silverado Ranch Boulevard.

Improvements proposed for I-15 consist of expanding the freeway to a ten-lane facility (five general purpose lanes in each direction) from Sloan Road to Blue Diamond Road, and a ten-lane facility (five general purpose lanes in each direction) with C-D lanes from Blue Diamond Road to Tropicana Avenue. The I-15 South corridor includes Las Vegas Boulevard South, which would be improved to a six-lane facility (three lanes in each direction) from Sloan Road to Sunset Road, and separated by an open median designated for future use by the Regional Transportation Commission of Southern Nevada's (RTC) Regional Fixed Guideway system. New service interchanges are proposed along I-15 at Bermuda Road, Starr Avenue, and Cactus Avenue; a reconstructed interchange at Sloan Road; a reconstructed overpass at

[2] JE Sverdrup. 2001. *I-15 Corridor Operational Analysis, I-15 Sloan Road to I-215.*

Warm Springs Road;[3] and new overpasses at Pebble Road and Sunset Road. Improvements would be made to the Blue Diamond Road (SR 160) interchange and the I-15/I-215 Beltway system interchange. A park-and-ride lot is proposed in the southwest quadrant of Las Vegas Boulevard and St. Rose Parkway. Transportation System Management (TSM) measures, including dynamic message signs and ramp metering to improve traffic operations, would also be incorporated.

1.2 Purpose and Need

The purpose of the project is to alleviate existing and projected congestion, serve proposed growth in the corridor by improving local circulation and access, and accommodate regional and local transportation demand to ensure that I-15 operates as an efficient interstate transportation facility. Fourteen (14) new hotel/casino projects are proposed within the study corridor, along with new high-density residential/retail projects. These hotel/casino projects will generate new employment (more than 300,000 jobs) and traffic concentrated at or near the proposed interchanges (see Figure 2a). In 2005, the City of Henderson housed 246,000 residents, and the Enterprise Planning Area housed 84,000 residents for a total of 330,000 residents. By 2030, the City of Henderson is expected to house 507,000 residents, and the Enterprise Planning Area is expected to house 334,000 residents, for a total of 841,000 residents.[4] Based on these growth estimates, the populations in areas served by the I-15 South corridor are predicted to increase by more than 1.5 times the current level by 2030. This growth is expected to cause increased traffic congestion on the I-15 South facility (see Figure 2b).

The residents and businesses along the southern portion of the corridor have three access points to I-15 over a 6-mile stretch of the freeway; these are located at St. Rose Parkway, Silverado Ranch Boulevard, and Blue Diamond Road. The proposed new service interchanges would provide additional local access to the freeway, thereby reducing congestion at the overloaded interchanges, most notably at Blue Diamond Road. The proposed interchanges are included in the RTC 2006-2030 RTP[5] (see Figure 3).

At the southern end of the corridor, just south of Sloan Road, two-way average daily traffic (ADT) volumes on I-15 are forecast to rise from 42,000 vehicles in 2002/2003 to 158,000 by 2030. The projected increased traffic volumes include vehicles traveling to and from the proposed Southern Nevada Supplemental Airport (formerly the Ivanpah Valley International Airport), which is under separate environmental review by the Federal Aviation Administration (FAA) and BLM. The Southern Nevada Supplemental Airport is proposed to be located 20 miles south of Las Vegas between Jean and Primm. While the proposed airport would increase traffic volumes if approved, that traffic is not anticipated to contribute to peak-hour congestion in the I-15 South corridor. At the north end of the corridor, just north of Tropicana Avenue, ADT volumes are forecast to rise from 223,000 in 2002/2003 to 535,000 in 2030.[6]

Traffic operating conditions are described and compared using Level of Service (LOS) values. LOS values are designated from A to F, with LOS A representing the best operating conditions and LOS F representing the worst (see Figure 4).

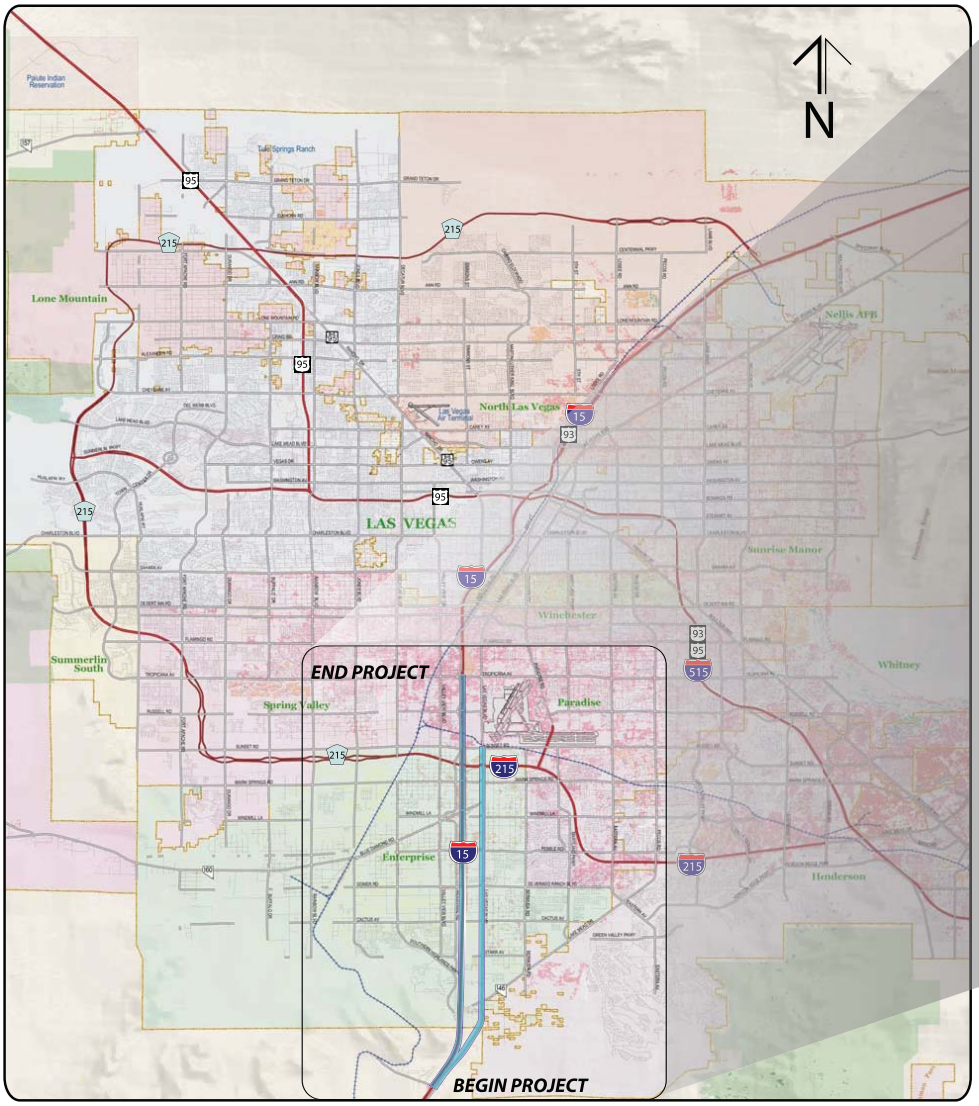
Table 1 shows peak-hour LOS for the I-15 mainline from Sloan Road to Tropicana Avenue. Depicted are the existing condition and the future No Build and Build Alternatives. The information in Table 1 indicates that future traffic conditions on the freeway will be worse if capacity and added access improvements are not made to I-15. During the AM peak period, the northbound (NB) direction of I-15, between I-215 and Tropicana Avenue, operates at a worse LOS than the southbound (SB) direction. The

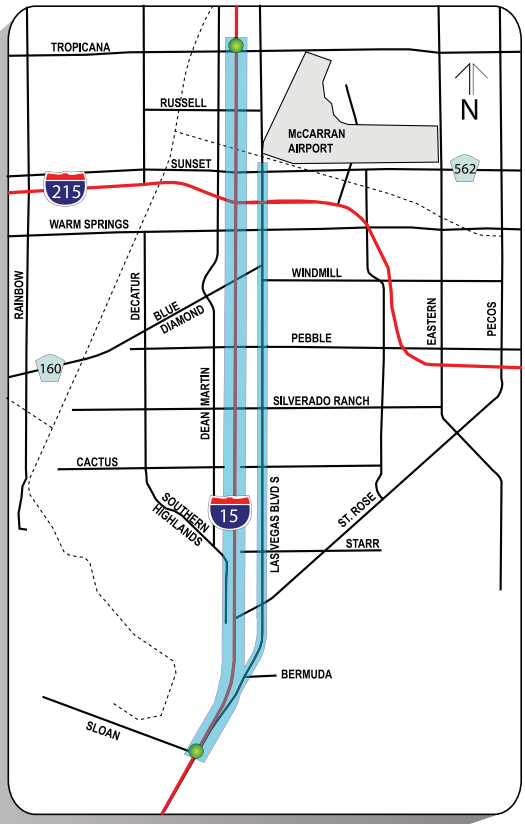
[3] Reconstruction of the Warm Springs Road overpass was previously studied and approved in the SR 160 EA and would be constructed as part of this project (FHWA and NDOT, 2004. *Environmental Assessment for SR 160 Widening & I-15 Interchange Improvements, I-15 to Rainbow Boulevard, Clark County, Nevada.* FHWA-NV-EA 04.03. April).

[4] Parsons. 2007. *I-15 South Traffic Report*. January.

[5] RTC. 2006. *Final Draft, Regional Transportation Plan,* FY 2006-2030.

[6] Parsons. 2007. *I-15 South Traffic Report*. January.





NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

PROJECT LOCATION
FIGURE 1

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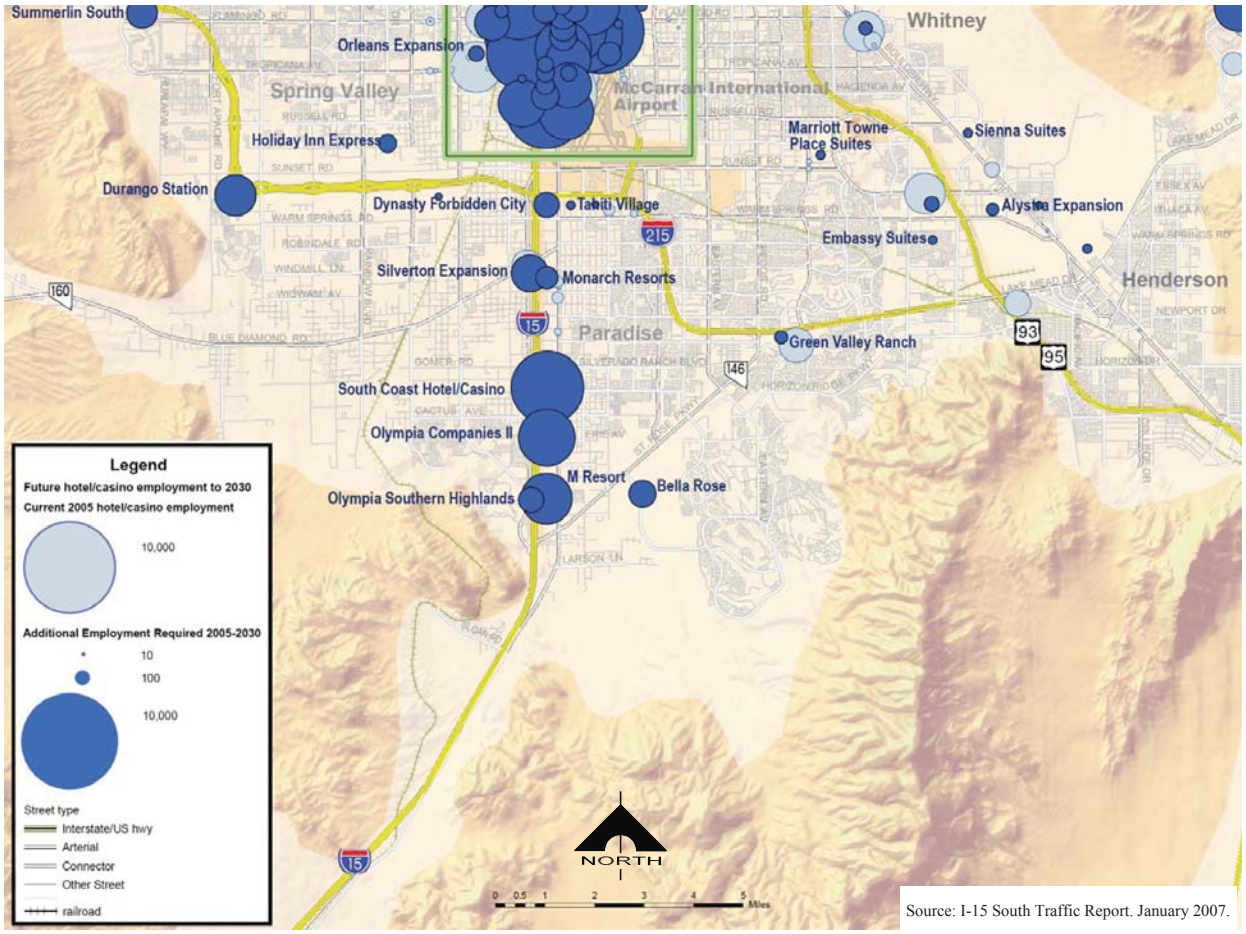

Source: I-15 South Traffic Report. January 2007.

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
CASINO/EMPLOYMENT GROWTH
FIGURE 2a

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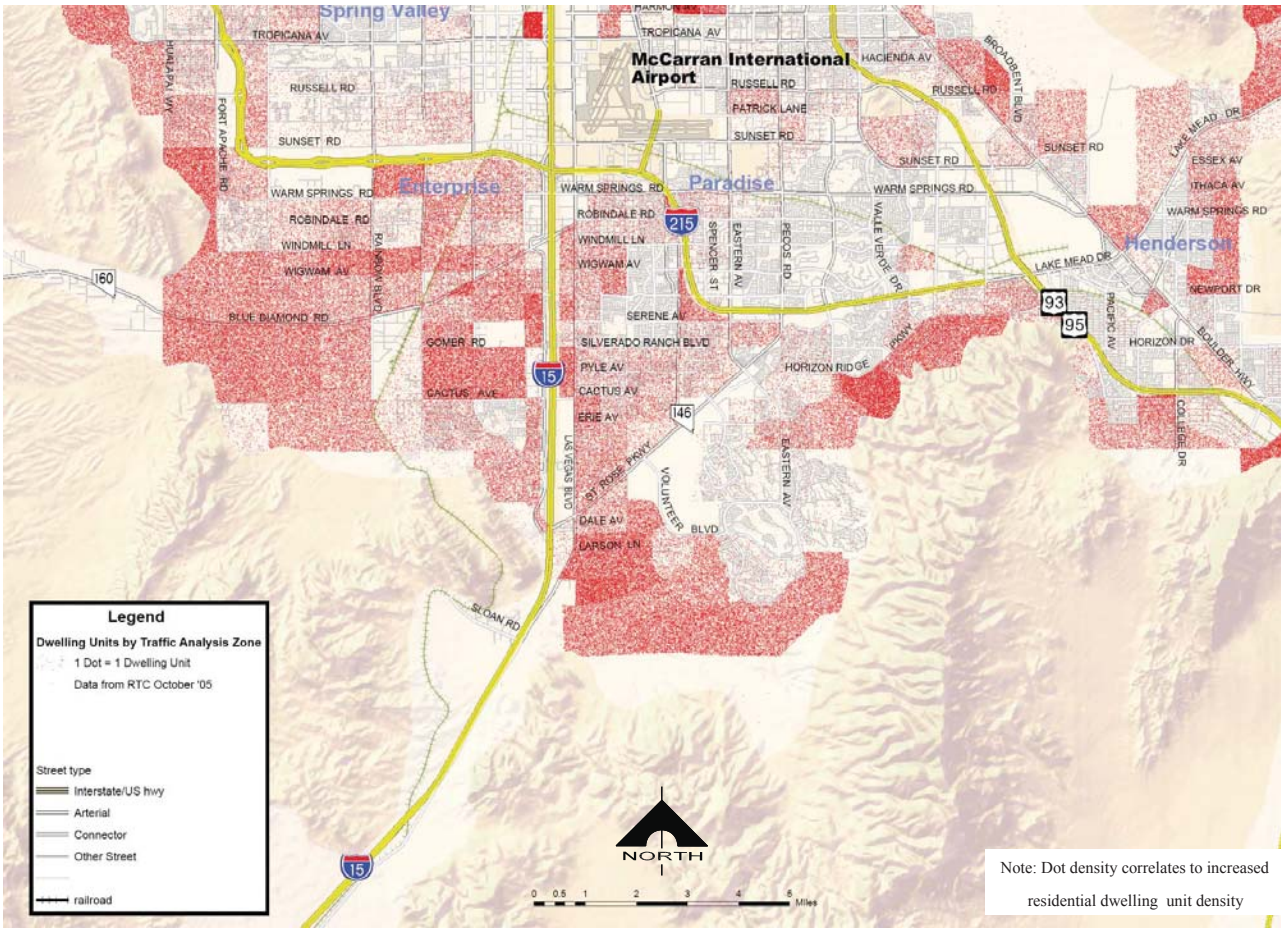

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
RESIDENTIAL GROWTH 2005 - 2030
FIGURE 2b

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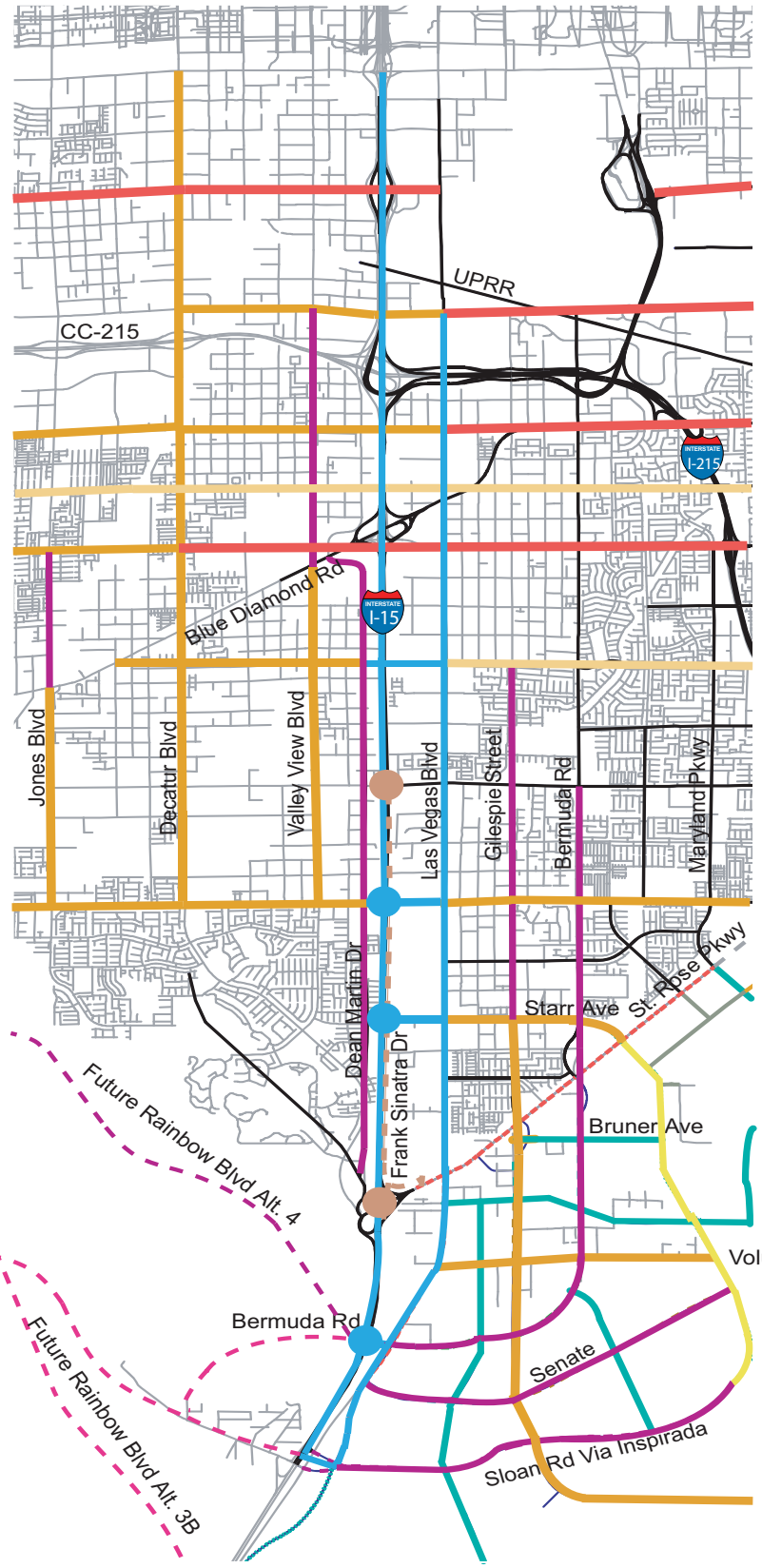

Source: *RTC 2006-2030 RTP and City of Henderson Master Street and Highways Plan*

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I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

PLANNED LOCAL STREET NETWORK

FIGURE 3

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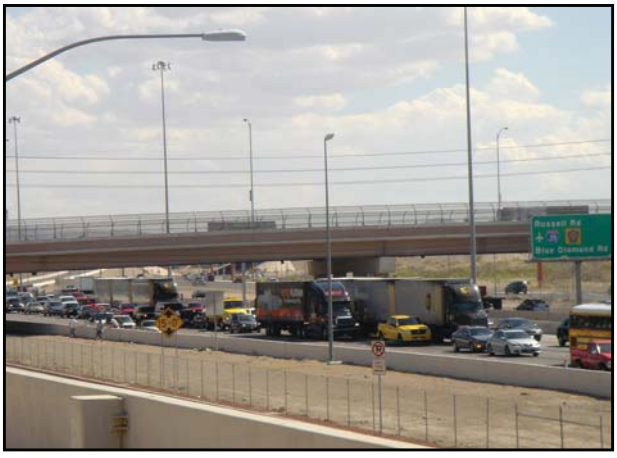
LOS A

LOS B

LOS C

LOS D

LOS E



LOS F

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

Levels of Service

FIGURE 4

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NB I-15 PM peak-period operation is worse than the AM peak period, even though the mainline volumes in the AM are higher.[7] This difference is attributed to higher volumes of traffic entering the freeway from the Russell Road and Tropicana Avenue NB on-ramps. Under the Build Alternative, two more lanes of vehicle traffic are continuing north of Tropicana Avenue. This additional traffic, coupled with the complex weaving and merging from the Tropicana Avenue NB on-ramps, results in LOS F north of the project limits. However, this would be resolved by a future project to add capacity on I-15 from Tropicana Avenue to Sahara Avenue (widen from 6 to 14 lanes), as identified in the 2006-2030 RTP.

Table 1
I-15 South Corridor Mainline Peak-Hour Traffic Operations Analysis

Freeway Segment	2005		2030 No Build Alternative		2030 Build Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
I-15 Northbound Mainline						
I-15 NB south end of the network to Sloan Road off-ramp	A	A	C	D	B	B
Sloan Road off-ramp to Sloan Road on-ramp	A	A	C	D	B	B
St. Rose Parkway off-ramp to St. Rose Parkway on-ramp	A	A	C	C	B	C
Blue Diamond Road off-ramp to Blue Diamond Road on-ramp	A	A	F	D	F	C
Blue Diamond Road on-ramp to I-215 off-ramp	A	A	F	D	D	C
I-215 WB on-ramp to Russell Road off-ramp	D	C	E	E	D	C
Russell Road on-ramp to Tropicana Avenue off-ramp	C	F	D	C	D	C
Tropicana Avenue on-ramp to Flamingo Road off-ramp	C	F	C	C	F	D
I-15 Southbound Mainline						
Flamingo Road on-ramp to Tropicana Avenue off-ramp	D	D	F	F	E	F
Tropicana Avenue on-ramp to Russell Road off-ramp	C	D	F	F	D	E
Russell Road on-ramp to I-215 off-ramp	C	C	F	F	C	D
I-215 WB on-ramp to I-215 EB on-ramp	A	B	C	C	C	E
I-215 EB on-ramp to Blue Diamond Road off-ramp	A	A	D	D	C	D
Blue Diamond Road off-ramp to Blue Diamond Road on-ramp	A	A	C	C	C	D
St. Rose Parkway off-ramp to St. Rose Parkway on-ramp	A	A	B	B	B	B
Sloan Road off-ramp to Sloan Road on-ramp	A	A	B	B	A	A
Sloan Road on-ramp to I-15 SB south end of the network	A	A	B	B	A	B

EB – Eastbound; WB – Westbound

The No Build Alternative would result in LOS F operation in the NB direction during the AM peak hour from south of Blue Diamond Road (see Table 1). Southbound, LOS F conditions would be prevalent from north of Tropicana Avenue to I-215 (AM and PM).

As shown in Table 1, In the SB direction, the proposed improvements would allow mainline traffic to operate at LOS D or better during the AM peak period. During the PM peak period, the NB freeway mainline sections would operate at LOS D or better. In the SB direction, which is the peak direction of afternoon travel, freeway mainline segments from the Flamingo Road on-ramp to the Russell Road off-ramp would operate at LOS E. This condition results from a series of conflicts that include high traffic demand on the mainline, on-/off-ramps, and weaving. Although the peak-hour speeds in this section of

[7] Ibid.

the freeway are expected to be as low as 35 miles per hour, traffic analysis shows that the mainline improvements would carry traffic at acceptable levels of service to the downstream segments.[8]

Table 2 compares 2030 peak-hour Build and No Build LOS for interchanges along the I-15 corridor from Sloan Road to Tropicana Avenue. The proposed interchanges south of Blue Diamond Road provide alternate access points between I-15 and the southern Las Vegas Valley, relieving congestion on the existing interchanges in this section of the corridor. As the southern Valley continues to develop, particularly with construction of the master-planned communities of Mountain's Edge and Inspirada, travel demand on I-15 South will increase and require more connectivity between I-15 and major arterials. According to Table 2, the addition of interchanges at Bermuda Road, Starr Avenue, Cactus Avenue, and the Pebble Road overpass would more evenly distribute traffic, resulting in higher LOS at the existing interchanges. The interchanges at Sloan Road, St. Rose Parkway, Silverado Ranch Boulevard, and Blue Diamond Road would not be able to meet the demand in the area or provide acceptable peak-hour LOS; they would operate at or over capacity.

Table 2
I-15 South Corridor Intersection Level of Service

Location	2030 No Build Alternative		2030 Build Alternative	
	AM Peak	PM Peak	AM Peak	PM Peak
Sloan Road and I-15	C	F	C	B
Sloan Road and Las Vegas Boulevard South	C	F	C	C
Bermuda Road and I-15	--	--	C	B
Bermuda Road and Las Vegas Boulevard South	--	--	C	C
St. Rose Parkway and I-15	C	E	C	C
St. Rose Parkway and Las Vegas Boulevard South	F	F	C	C
Starr Avenue and I-15	--	--	C	C
Starr Avenue and Las Vegas Boulevard South	--	--	C	C
Cactus Avenue and I-15	--	--	D	D
Cactus Avenue and Las Vegas Boulevard South	--	--	C	D
Silverado Ranch Boulevard and I-15	C	C	B	B
Silverado Ranch Boulevard and Las Vegas Boulevard South	D	E	D	E
Pebble Road and Dean Martin Drive	--	--	C	D
Pebble Road and Las Vegas Boulevard South	--	--	C	D
Blue Diamond Road and I-15	F	E	B	D
Blue Diamond Road and Las Vegas Boulevard South	F	F	D	F
Russell Road and I-15	D	F	D	D
Russell Road and Frank Sinatra Drive	C	E	C	C
Tropicana Avenue and I-15	D	F	D	E
Tropicana Avenue and Las Vegas Boulevard South	C	F	E	F

[8] Ibid.

While the Build Alternative proposes interchanges south of Blue Diamond Road, no new interchanges are proposed north of Blue Diamond Road. Providing the southern interchanges is possible because there are few access points south of Blue Diamond Road with several miles of spacing between them, whereas space constraints north of Blue Diamond Road vary between 1.5 miles and 1-mile between the existing interchanges. Improvements to the I-15 mainline, including C-D ramps that separate weaving traffic between interchanges from the mainline, and the inclusion of directional ramps are proposed to improve operations north of Blue Diamond Road. These interchanges would operate at an improved LOS, most noticeably in the PM peak hour, where Russell Road at I-15 and Frank Sinatra Drive would improve from failing LOS with the No Build condition to acceptable LOS with the Build Alternative; Tropicana Avenue would improve from a failing LOS to meeting the capacity needs of the interchange.

According to data provided by the NDOT Safety Division, during the 3-year period from October 1, 2000, to October 1, 2003, 1,030 crashes were reported along I-15 from Sloan Road to Tropicana Avenue. Rear-end collisions accounted for 506 (49 percent) of these crashes, and 159 (15 percent) were sideswipe collisions. Additionally, 210 (20 percent) of the crashes on I-15 were vehicles that ran off the roadway.

Along Las Vegas Boulevard South from Sloan Road to Sunset Road, 443 crashes occurred during this same time period. Rear-end collisions accounted for 225 (51 percent) of these crashes, and 79 (18 percent) were angle collisions. Sideswipe collisions accounted for 51 (12 percent) of the crashes along Las Vegas Boulevard South, and 37 (8 percent) were associated with left-turn movements.

Rear-end collisions and sideswipe collisions are associated with congested roadways where heavy merging and diverging movements occur. The proposed improvements to the I-15 corridor would reduce collisions by redistributing merging and diverging operations to new interchanges and reducing congestion at overloaded interchanges.

1.3 Alternatives

As part of the I-15 South Corridor Improvements project development process, the Technical Advisory Committee (TAC) developed and evaluated a range of potential alternatives. The TAC was comprised of representatives from NDOT, FHWA, BLM, RTC, Clark County Public Works, Clark County Department of Aviation, and City of Henderson. While some of the improvement concepts were eliminated entirely, several of the concepts considered were eliminated as "stand-alone" solutions for the I-15 South Corridor, but they are incorporated into the Build Alternative (TSM and Alternate Routes) or accommodated by the Build Alternative (Transit) as described in the following section. Potential project alternatives being considered include the No Action (No Build Alternative) and the Preferred (Build) Alternative, which would provide physical improvements. High-occupancy vehicle (HOV) lanes and transit were not studied as alternatives because they are being considered as part of a system-wide plan, as described in Section 2.9.3, Local Transportation Development Projects. The Build Alternative would not preclude implementation of HOV lanes[9] and would accommodate transit improvements within the project corridor.

1.3.1 Alternatives Considered but Eliminated

Freeway Improvement

The I-15 mainline freeway is three lanes in each direction from Sloan Road to Blue Diamond Road. There are no auxiliary lanes between the interchanges in this section. Auxiliary lanes facilitate movements of vehicles entering and exiting the freeway. The I-15 freeway is three lanes in each direction plus auxiliary lanes between Blue Diamond Road and I-215, and four lanes in each direction plus auxiliary lanes from I-215 to Tropicana Avenue. More vehicles enter the I-15 freeway at the interchanges from Blue Diamond Road to Tropicana Avenue compared to the interchanges south of Blue Diamond Road. Because of the higher traffic volumes entering the freeway north of Blue Diamond Road, different types of

[9] Parsons, 2007. *Southern Nevada High-Occupancy Vehicle Plan.*

improvements were considered from Sloan to Blue Diamond Road and from Blue Diamond Road to Tropicana Avenue. These alternatives are presented in separate sections below.

I-15 Alternatives – Sloan Road to Blue Diamond Road

Widening from Six to Eight Lanes. Widening I-15 from the existing six to eight lanes was considered but eliminated because it did not provide adequate capacity to meet the expected traffic demand. Projected traffic growth in the corridor would result in unacceptable operating conditions (LOS E to F) for I-15, even with the addition of auxiliary lanes between the interchanges, because there would not be sufficient through capacity to meet demand.

Collector-Distributor Roads. The *I-15 Corridor Operational Analysis, I-15 Sloan Road to I-215*[10] evaluated a widened I-15 with additional interchanges similar to the Build Alternative and a system of C-D roadways for this section of freeway. C-D roadways between the interchanges were not justified on this portion of I-15 because freeway and interchange operational needs were met with the proposed new interchanges and auxiliary lanes (the Build Alternative); therefore, the C-D alternative was eliminated because it had a higher cost and greater ROW impacts than the Build Alternative, and it did not provide additional operational benefits.

Frontage Roads. One-way frontage roads on each side of I-15, with access between the interchanges, were considered but eliminated because they would require additional roadways necessitating improvements to offsite drainage facilities, which would increase cost and require additional ROW. Frontage roads were eliminated because they did not increase capacity over the Build Alternative and were more costly.

Auxiliary Lanes. The need for auxiliary lanes between on- and off-ramps was analyzed for all of the freeway sections. Auxiliary lanes that were required to provide capacity to meet the projected demand were included in the Build Alternative. Auxiliary lanes were eliminated from further consideration in areas where they were not needed to accommodate traffic demand.

I-15 Alternatives – Blue Diamond Road to Tropicana Avenue

The section from Blue Diamond Road to Tropicana Avenue has high merging and weaving traffic volumes because four existing interchanges (i.e., Blue Diamond Road, Russell Road, Tropicana Avenue, and the system interchange with I-215) are located within a 5-mile stretch of I-15. Several alternatives were considered to address these conditions but were eliminated from further study for reasons described below.

Widen Freeway with No C-D Roads. A widened mainline freeway, up to six lanes in each direction with auxiliary lanes between interchanges, was analyzed and found to not provide adequate capacity, especially for the heavy weaving (merging/diverging) movements. The through volumes on I-15 could be accommodated, but the weaving movements between the interchanges could not be accommodated without C-D roads. This alternative was eliminated from further evaluation because it was not able to accommodate the expected traffic demand.

Collector-Distributor Roadways with Weaving on Collector-Distributors. C-D roadways that allowed weaving movements between interchanges to occur on the C-D roadway and not on the I-15 mainline were evaluated. C-D roadways of up to three lanes in one direction were studied, but the weaving volumes between the interchanges could not be accommodated, so this alternative was eliminated from further consideration.

[10] JE Sverdrup. 2001. *I-15 Corridor Operational Analysis, I-15 Sloan Road to I-215.*

Transportation System Management (TSM)

NDOT, FHWA, and RTC have developed a Southern Nevada ITS to be implemented by regional stakeholders. The result of this plan is the Freeway and Arterial System of Transportation (FAST) program, which implements and manages ramp meters, traffic cameras, and dynamic message signs. Due to the high traffic volumes in the I-15 corridor (535,000 ADT), existing congestion cannot be alleviated with ITS as a stand-alone alternative, which does not meet the purpose and need, but TSM/ITS components are included in the Build Alternative (e.g., ramp meters, traffic cameras, and dynamic message signs).

Interchange Locations

Pebble Road Interchange

A new I-15 interchange at Pebble Road was considered, but this alternative was eliminated because it did not meet the minimum requirements for spacing between interchanges on the Interstate System and the traffic demand could be met by adjacent interchanges.

Bermuda Road and Starr Avenue Interchanges

The regional roadway system was analyzed independently without the Bermuda Road and Starr Avenue interchanges. Without the Bermuda Road interchange, the adjacent interchanges (i.e., Sloan Road to the south and St. Rose Parkway to the north) would not be able to accommodate the projected traffic demand. Without the Starr Avenue interchange, the adjacent interchanges (i.e., St. Rose Parkway to the south and Cactus Avenue to the north) would not be able to accommodate the projected traffic demand. Since the system was not able to meet the demand without these interchanges, Bermuda Road and Starr Avenue interchanges are included in the Build Alternative.[11]

Alternate Routes

Improvements to other adjacent arterials were considered instead of improving I-15 and Las Vegas Boulevard. Clark County and the City of Henderson will continue to develop the local arterial street network in accordance with the 2006-2030 RTP and Master Plan of Streets and Highways.[12,13] As shown on Figure 3, development of the approved RTP includes many arterials. Traffic analysis indicates that freeway improvements are warranted with buildout of the local arterial street network. Because of the proximity and connectivity with I-15, improvements to Las Vegas Boulevard South from Sloan Road to Sunset Road are included as part of the Build Alternative.

Las Vegas Boulevard South

Las Vegas Boulevard South was analyzed as a four-lane arterial with dedicated bus lanes, as part of RTC's bus rapid transit system, but it did not meet the projected traffic demand.[14] Las Vegas Boulevard South was also evaluated as a typical six-lane arterial without dedicated bus lanes (mixed-flow bus service). Mixed-flow bus service was found to be inadequate in this long segment with shared lanes (mixed-flow traffic). This alternative was eliminated because Las Vegas Boulevard South has adequate ROW for a six-lane arterial with a wide median for future dedicated bus lanes south of Warm Springs Road. The Build Alternative includes an open median in Las Vegas Boulevard South designated for use as part of the RTC's Regional Fixed Guideway system.

North of Warm Springs Road, Las Vegas Boulevard South does not have adequate ROW for the full six-lane arterial with dedicated bus lanes. Widening and acquiring ROW for the six lanes plus dedicated bus

[11] Parsons. 2008. *I-15 South Change in Control of Access Report*. March.
[12] RTC. 2006. *Final Draft, Regional Transportation Plan,* FY 2006-2030.
[13] City of Henderson. 2007. *Master Streets and Highways Plan.* January
[14] Parsons. 2007. *I-15 South Traffic Report.* January.

lanes was not deemed cost effective, and future bus rapid transit service will run in shared lanes in this segment, as determined by RTC as part of their Regional Fixed Guideway system.

1.3.2 No Build Alternative

The No Build Alternative would maintain the I-15 project segment of three general purpose lanes in each direction between Sloan Road and Tropicana Avenue. Interchanges and overpasses at Sloan Road, St. Rose Parkway, Blue Diamond Road, Warm Springs Road, Las Vegas Beltway, Russell Road, and Tropicana Avenue would remain; new interchanges and overpasses would not be constructed. Las Vegas Boulevard South would remain as a two-lane roadway in each direction from Sloan Road to Silverado Ranch Boulevard, and it would vary from a two-lane to three-lane roadway in each direction from Silverado Ranch Boulevard to Sunset Road. The No Build Alternative would not preclude the installation of new noise attenuation structures (soundwalls) along the highway segment. Additionally, independent projects planned in the corridor would be constructed (i.e., Frank Sinatra Drive). Figures 5 and 6 display the No Build cross sections.

1.3.3 Build Alternative

The improvements proposed for I-15 consist of expanding the freeway to a ten-lane facility (five general purpose lanes in each direction) from Sloan Road to Blue Diamond Road, and a ten-lane facility (five general purpose lanes in each direction) with C-D lanes from Blue Diamond Road to Tropicana Avenue (see Figure 7). Las Vegas Boulevard South would be improved to a six-lane facility (three lanes in each direction) from Sloan Road to Sunset Road, and it would be separated by an open median designated for future use by RTC's Regional Fixed Guideway system (see Figure 8). New service interchanges are proposed along I-15 at, Bermuda Road, Starr Avenue, and Cactus Avenue; a reconstructed interchange at Sloan Road; a reconstructed overpass at Warm Springs Road; and new overpasses at Pebble Road and Sunset Road (see Figure 9). Improvements would be made to the Blue Diamond Road (SR-160) interchange and the I-15/I-215 Beltway system interchange. A park-and-ride lot is proposed in the southwest quadrant of Las Vegas Boulevard and St. Rose Parkway. TSM measures, including dynamic message signs and ramp metering to improve traffic operations, would also be incorporated. Figures 10a-10i display the general plan of the proposed improvements for the I-15 corridor.

I-15 Freeway

Between Sloan Road and Blue Diamond Road, the three-lane (in each direction) mainline freeway would be widened to provide five general purpose lanes in each direction plus auxiliary lanes from Sloan Road to Blue Diamond Road in the NB and SB directions (see Figures 10a through 10f). From Blue Diamond Road to Tropicana Avenue, I-15 would be widened to provide five general purpose lanes and two C-D ramp lanes in each direction, plus auxiliary lanes from Blue Diamond Road to Tropicana Avenue in the NB and SB directions (see Figures 10f through 10i). The existing Union Pacific Railroad (UPRR) crossing would be reconstructed within railroad ROW to accommodate the NB and SB C-D ramp lanes. A flyover ramp would be added to accommodate eastbound (EB) Blue Diamond Road traffic destined for NB I-15.

Las Vegas Boulevard South

The two-lane Las Vegas Boulevard South section between Sloan Road and Windmill Lane would be widened to three lanes in each direction separated by an open median. (see Figure 8). Between Windmill Lane and George Crockett Road, the SB and NB roadway would be widened to provide a three-lane roadway in each direction. Near I-215 and north to Sunset Road, Las Vegas Boulevard South would be widened on the outside to provide a third lane in each direction.

The Build Alternative would accommodate RTC's proposed Regional Fixed Guideway system. The system is being planned to utilize the open median in Las Vegas Boulevard South from St. Rose Parkway to Sunset Road. The 33-mile valley-wide system would link the cities of Henderson, Las Vegas, North

Las Vegas, and unincorporated Clark County with the Las Vegas Resort Corridor. (See Section 3.3 for discussion on RTC's ongoing involvement in planning the I-15 South corridor improvements through participation in the Technical Advisory Committee.)

Sloan Road Interchange

Prior to construction of the Sloan Road interchange, the City of Henderson would build a new arterial street – Via Inspirada Boulevard – east of I-15 with connections to Sloan Road and Las Vegas Boulevard South. Sloan Road and Via Inspirada Boulevard would be realigned and connected, crossing over I-15 250 to 300 feet north of the existing I-15/Sloan Road interchange (see Figure 10a). Las Vegas Boulevard South would be realigned to the east to provide room for the new interchange. Via Inspirada Boulevard would be grade separated over the realigned Las Vegas Boulevard South, and a two-way connecting ramp would be constructed to the east, linking Las Vegas Boulevard South and Via Inspirada Boulevard. The Sloan Road interchange is approximately 1-mile south of the Bermuda Road interchange.

Bermuda Road Interchange

Bermuda Road, east of the project limits, would be built by the City of Henderson to connect to Las Vegas Boulevard South. Under the I-15 South Build Alternative, Bermuda Road would be extended to the west and elevated to pass over I-15, with three lanes in each direction (see Figure 10b). To provide new freeway access, a new interchange would be constructed. The Las Vegas Boulevard South/Bermuda Road intersection and adjacent stretches of Las Vegas Boulevard South would be modified as needed. The Bermuda Road interchange would be located approximately 1-mile between the Sloan Road and St. Rose Parkway interchanges.

St. Rose Parkway Park-and-Ride Facility

A park-and-ride facility would be constructed as part of the Build Alternative within the existing ROW in the southwest quadrant of Las Vegas Boulevard South and St. Rose Parkway (see Figure 10c).

Starr Avenue and Cactus Avenue Interchanges

Starr Avenue and Cactus Avenue terminate at Las Vegas Boulevard South east of I-15 and Dean Martin Drive west of I-15. New interchanges would be constructed at each location. The arterial street improvements would be completed between Las Vegas Boulevard South and Dean Martin Drive with six-lane roadways (three lanes in each direction) on Starr Avenue and Cactus Avenue (see Figures 9 and 10d). The Starr Avenue interchange would be located approximately 1-mile between the St. Rose Parkway interchange to the south and the Cactus Avenue interchange to the north. The Cactus Avenue interchange would be located approximately 1-mile between the Starr Avenue interchange and the Silverado Ranch Boulevard interchange.

Overpasses

Pebble Road would be extended over I-15 and would be reconstructed with a six-lane arterial roadway (three lanes in each direction) without providing freeway access. East of I-15, one-lane one-way frontage roads would be provided along the through roadway to permit continued access to and from adjacent properties.

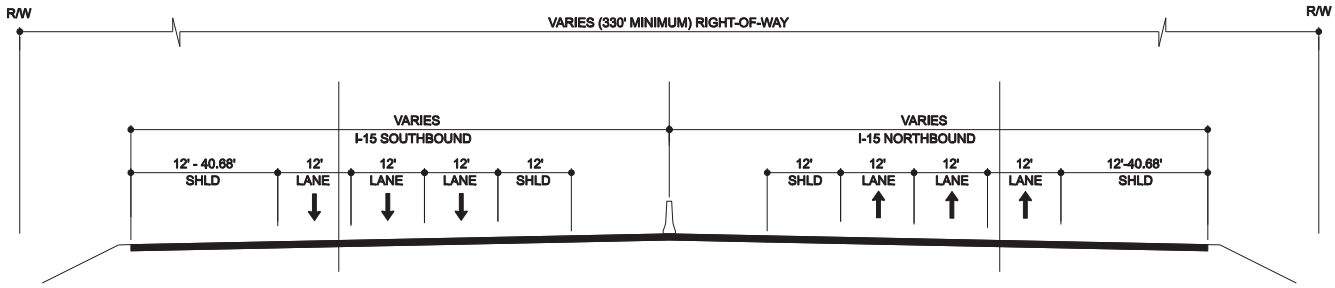
The existing two-lane overpass at Warm Springs Road would be reconstructed as a six-lane arterial roadway (three lanes in each direction) without providing freeway access. This overpass was previously cleared under the Environmental Assessment for SR 160 Widening and I-15 Interchange Improvements.[15]

[15] FHWA and NDOT, 2004. *Environmental Assessment for SR 160 Widening & I-15 Interchange Improvements, I-15 to Rainbow Boulevard, Clark County, Nevada*. FWHA-NV-EA 04.03. April.

Sunset Road would be extended over I-15 and would be constructed with a six-lane arterial roadway (three lanes in each direction) without providing freeway access from Las Vegas Boulevard South to Polaris Boulevard.

Project Phasing

It is anticipated that the project would be constructed in phases. NDOT is currently planning Phase 1 – Tropicana Avenue to Blue Diamond Road to be design-build construction, with an anticipated award date in spring 2009. Phase 1 elements are likely to include constructing the NB and SB C-D roads from Tropicana Avenue to Blue Diamond Road, the Sunset Road and Warm Springs Road overpasses, and reconstruction of the UPRR overcrossing. Phasing of the other project elements is unknown at this time; however, those elements would be constructed as outlined in the RTP.



AS CONSTRUCTED - SLOAN ROAD TO TROPICANA AVENUE

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

I-15 NO BUILD ALTERNATIVE CROSS SECTION

FIGURE 5

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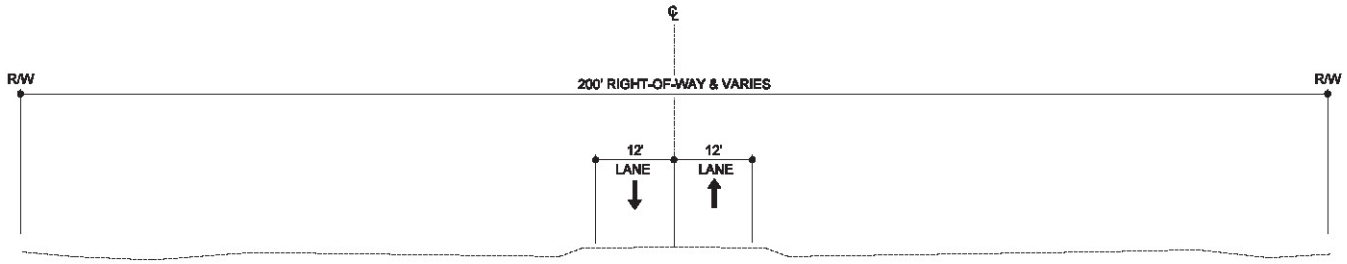
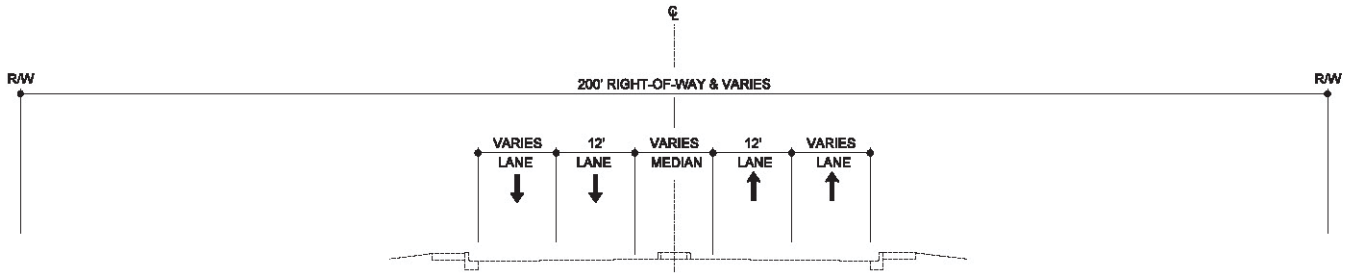
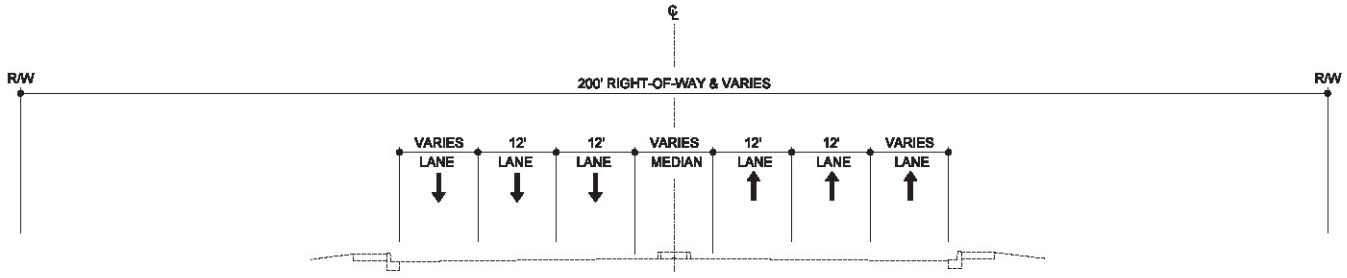


EXISTING SECTION SOUTH OF SLOAN ROAD TO SILVERADO RANCH BLVD



EXISTING SECTION - SILVERADO RANCH BLVD TO BLUE DIAMOND



EXISTING SECTION - BLUE DIAMOND TO SUNSET ROAD

EXISTING TYPICAL SECTIONS
LAS VEGAS BOULEVARD SOUTH

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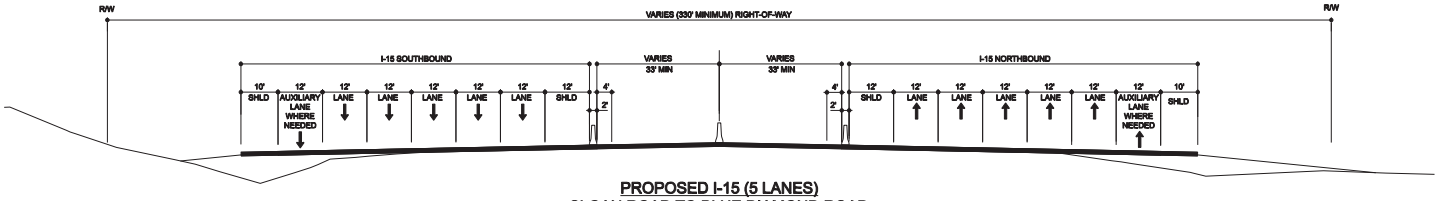
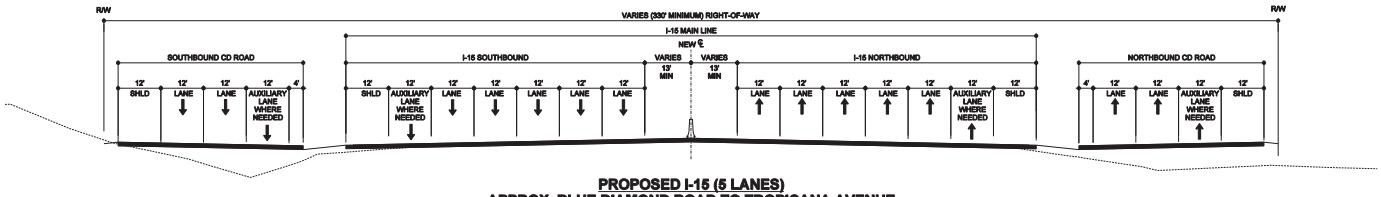


PROPOSED I-15 (5 LANES)
SLOAN ROAD TO BLUE DIAMOND ROAD



PROPOSED I-15 (5 LANES)
APPROX. BLUE DIAMOND ROAD TO TROPICANA AVENUE

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

I-15 BUILD ALTERNATIVE CROSS SECTIONS

FIGURE 7

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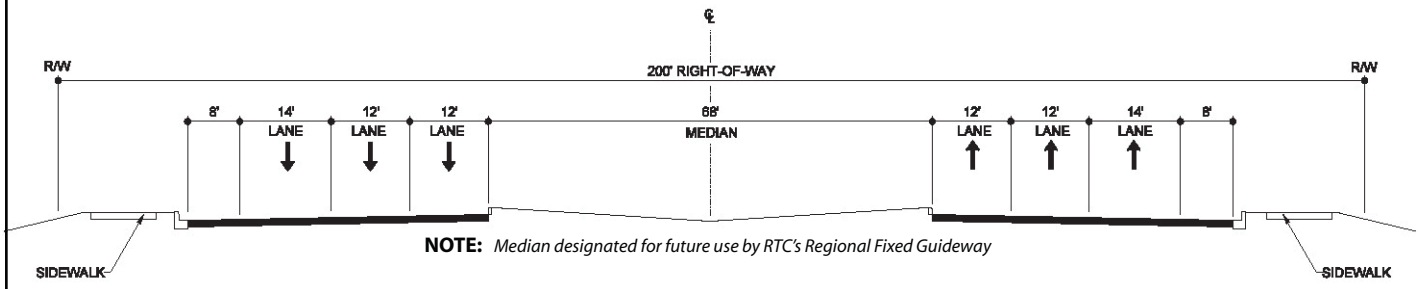
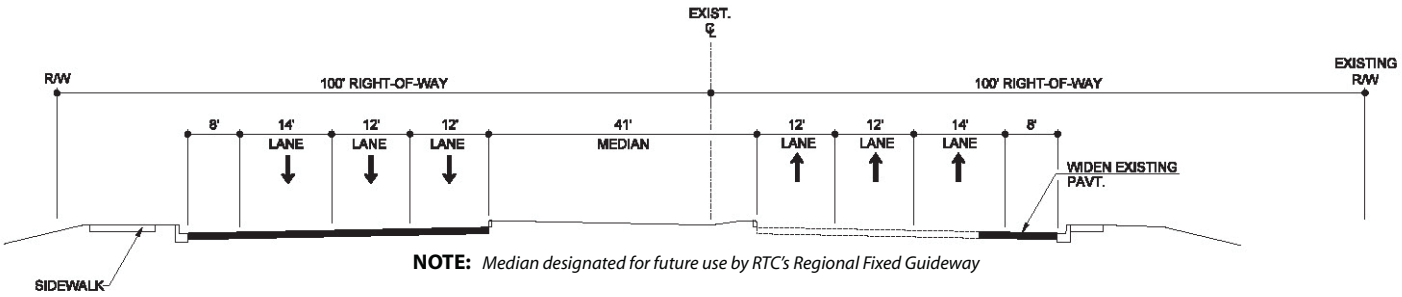


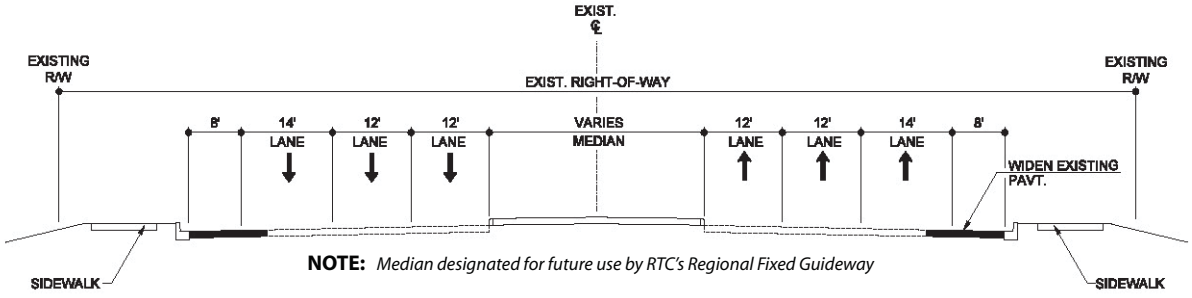
NOTE: *Median designated for future use by RTC's Regional Fixed Guideway*

PROPOSED LAS VEGAS BLVD SOUTH:
SLOAN ROAD TO WINDMILL LANE



NOTE: *Median designated for future use by RTC's Regional Fixed Guideway*

PROPOSED LAS VEGAS BLVD SOUTH:
WINDMILL LANE TO GEORGE CROCKETT ROAD



NOTE: *Median designated for future use by RTC's Regional Fixed Guideway*

PROPOSED LAS VEGAS BLVD SOUTH:
HIDDEN WELL ROAD TO SUNSET ROAD

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
LAS VEGAS BOULEVARD SOUTH
BUILD ALTERNATIVE CROSS SECTION
FIGURE 8

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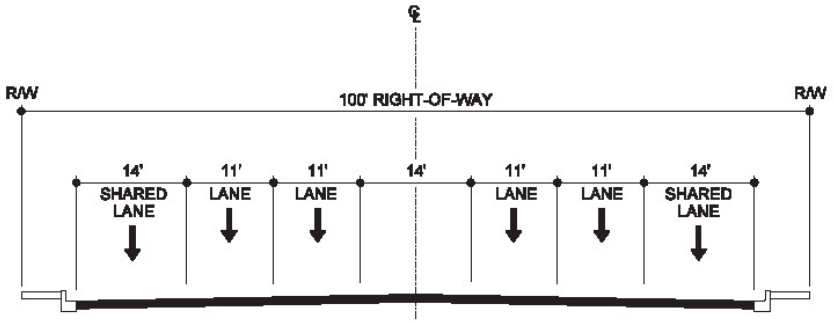
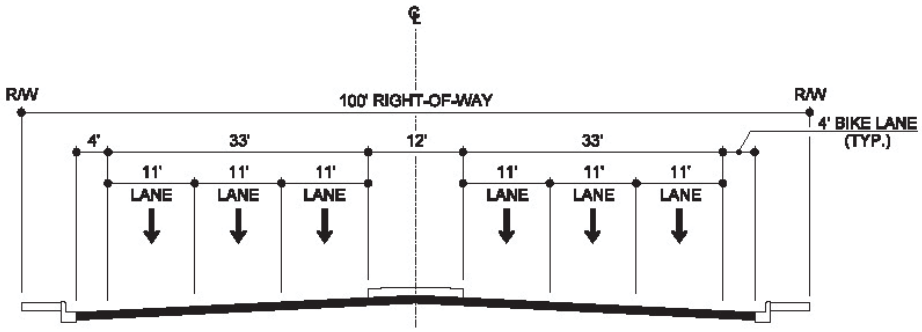


SLOAN ROAD
CACTUS AVENUE
PEBBLE ROAD



BERMUDA ROAD
STARR AVENUE

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
LOCAL STREETS
BUILD ALTERNATIVE CROSS SECTION
FIGURE 9

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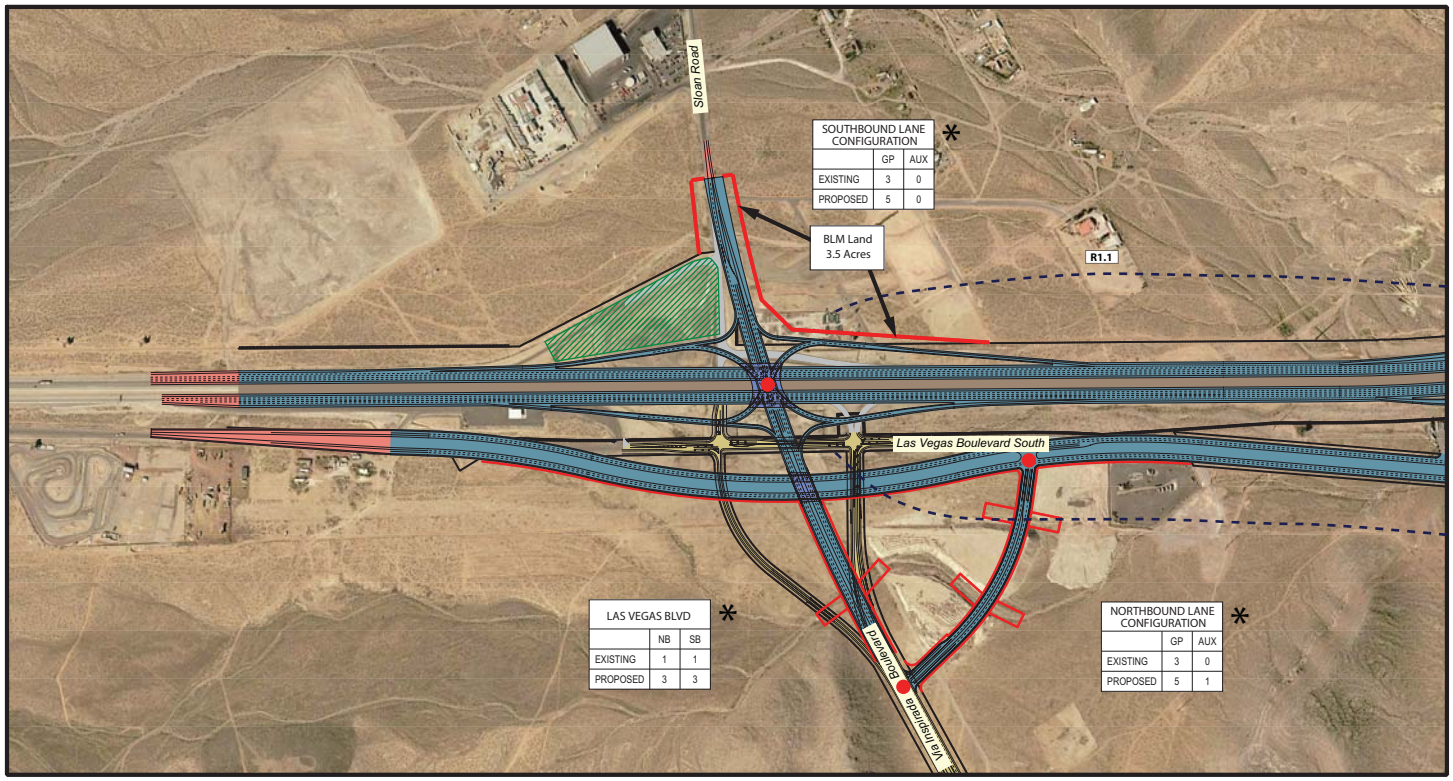

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10a

* Data as of 2008, March

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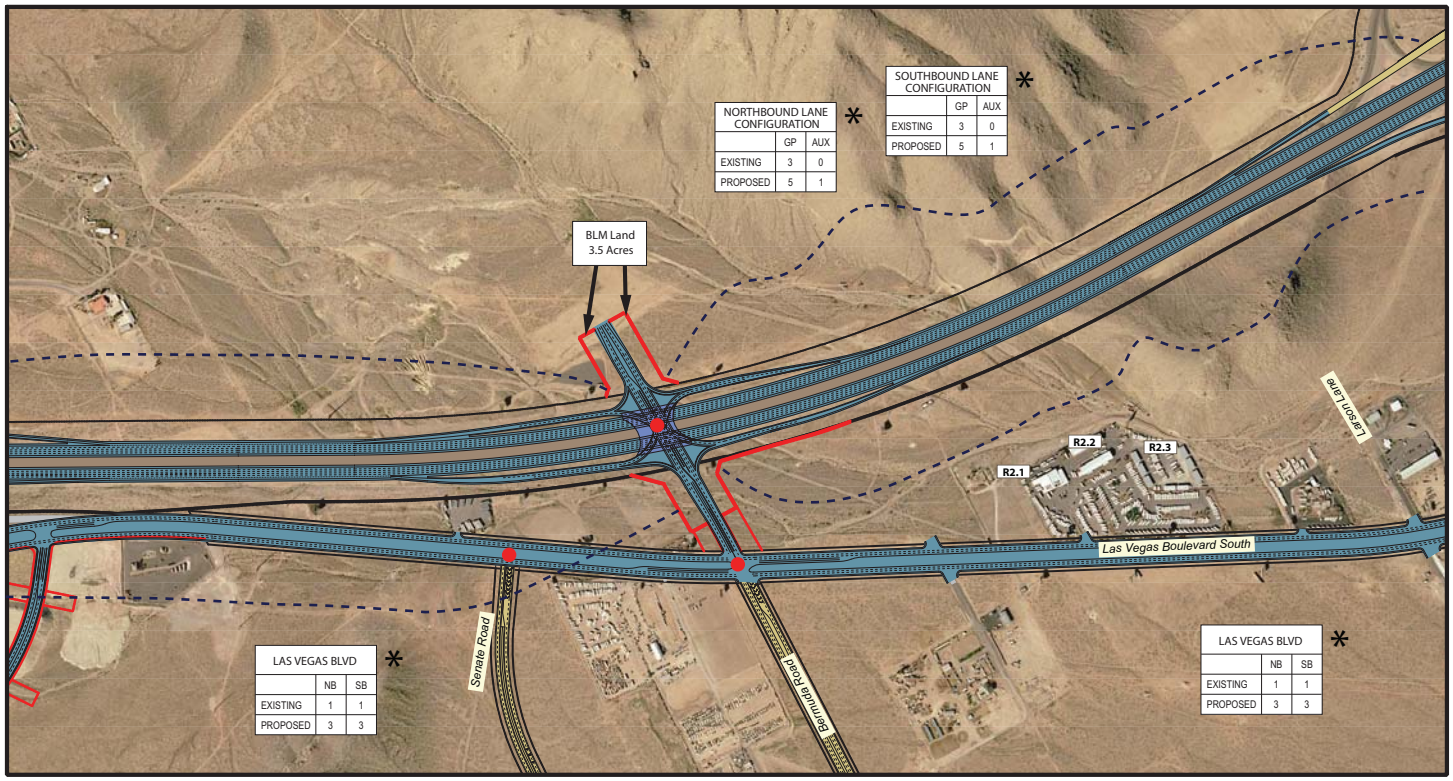

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10b

* Data as of 2008, March

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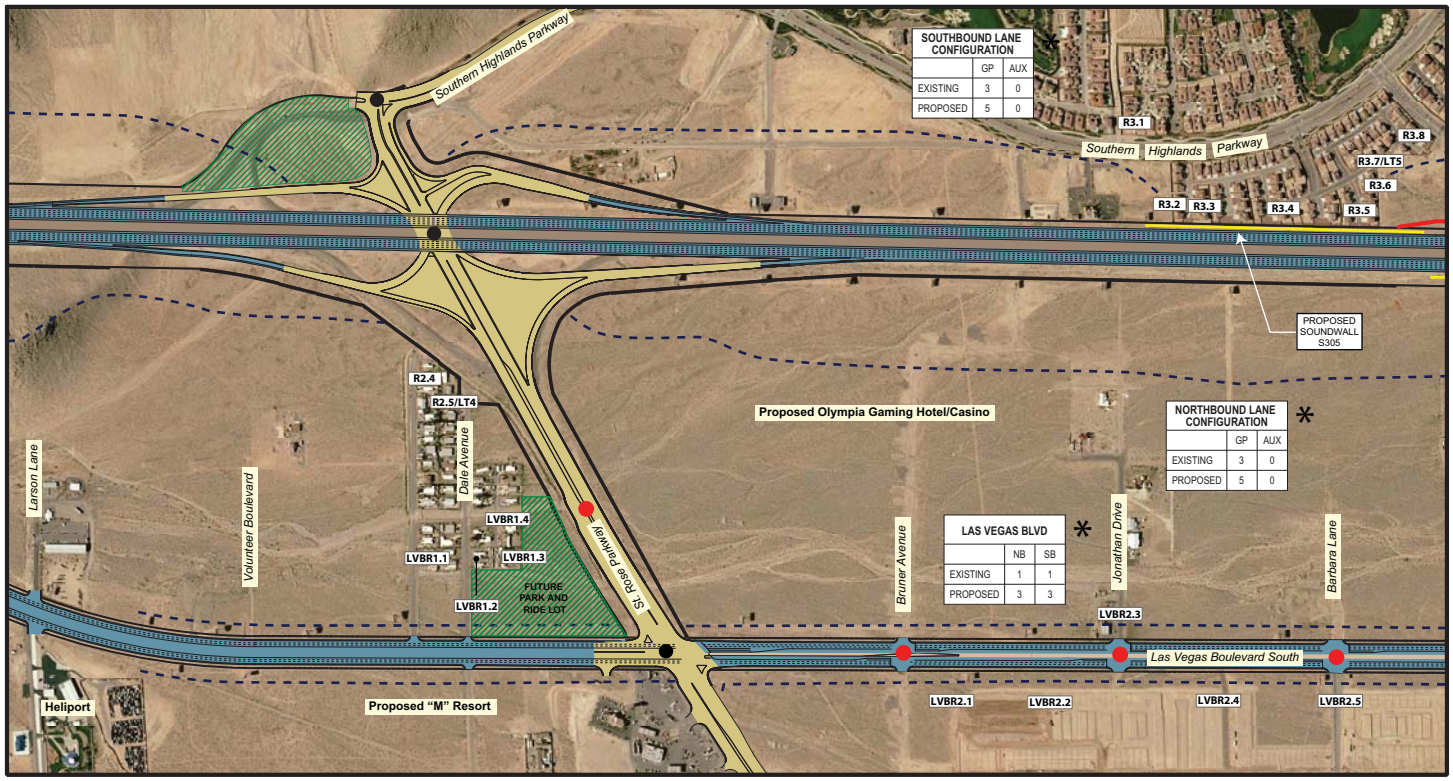

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
AREA OF POTENTIAL EFFECTS
FIGURE 10c

* Data as of 2008, March

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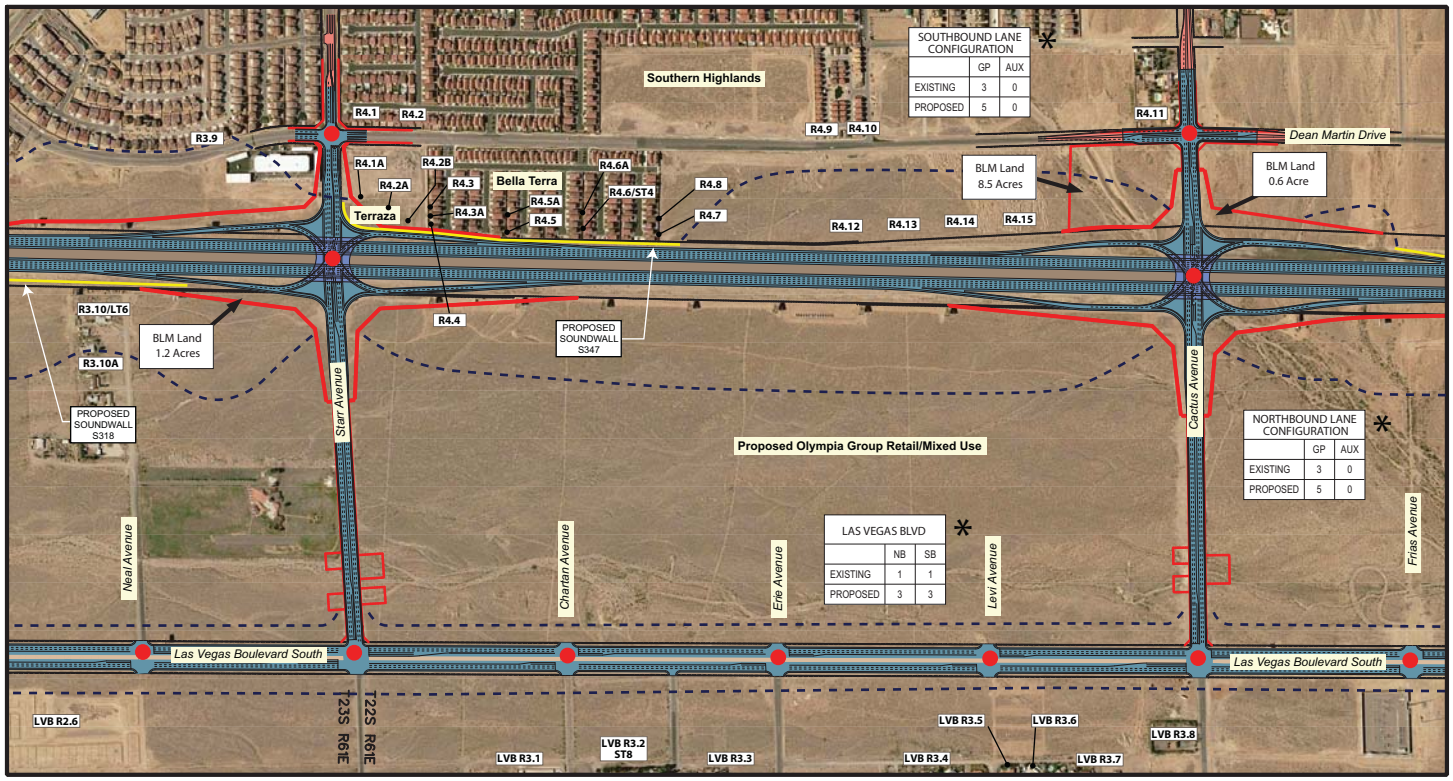

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

* Data as of 2008, March

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10d

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LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10e

* Data as of 2008, March

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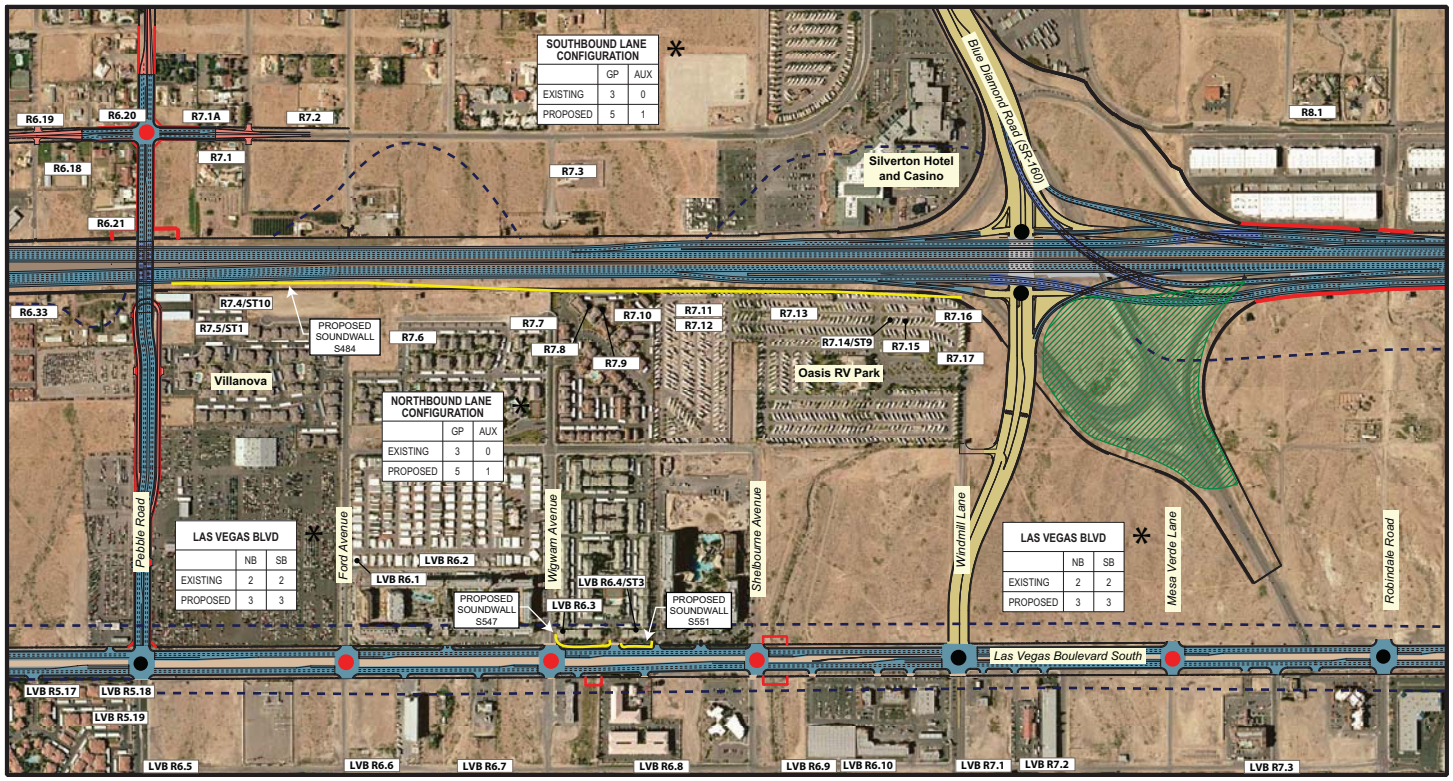

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10f

* Data as of 2008, March

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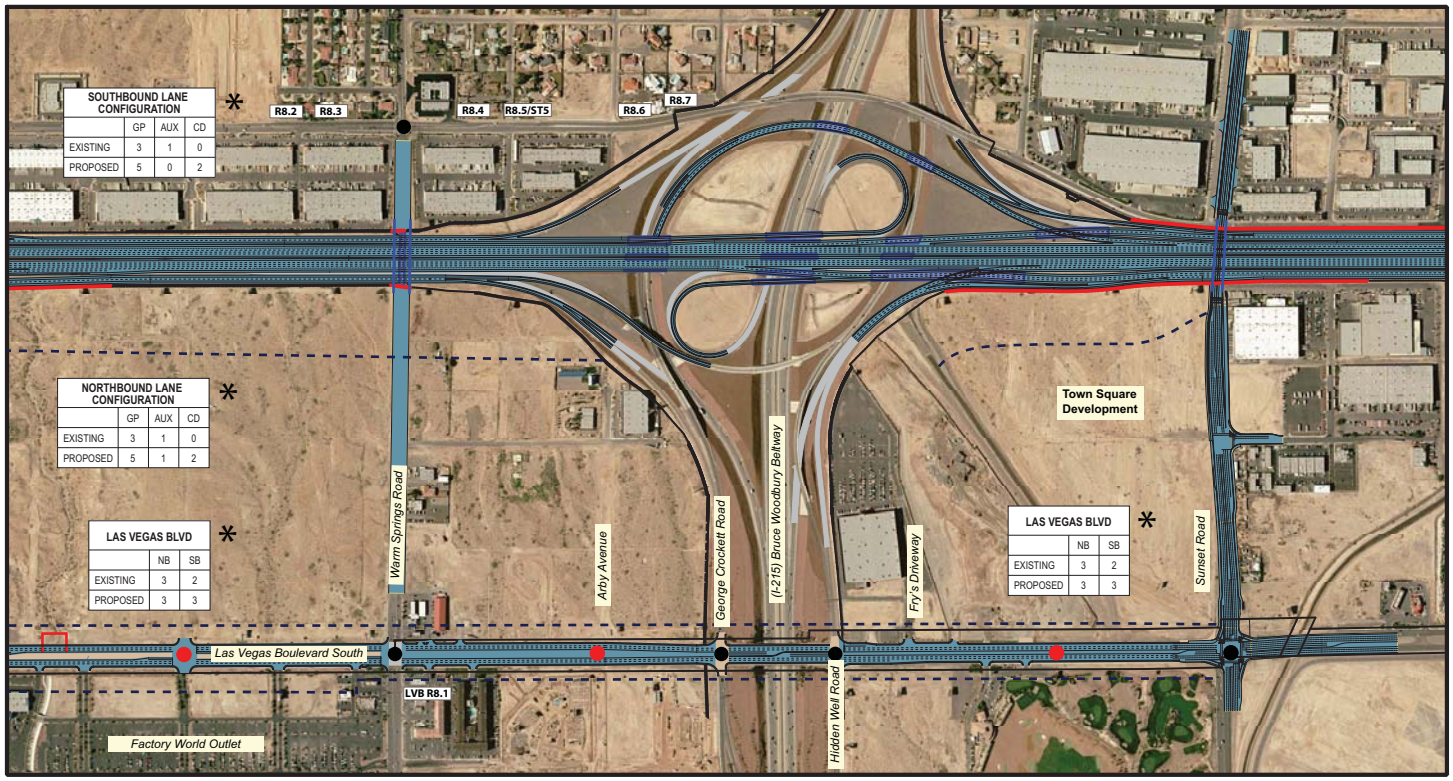

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
- ExistingTraffic Signal
- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10g

* Data as of 2008, March

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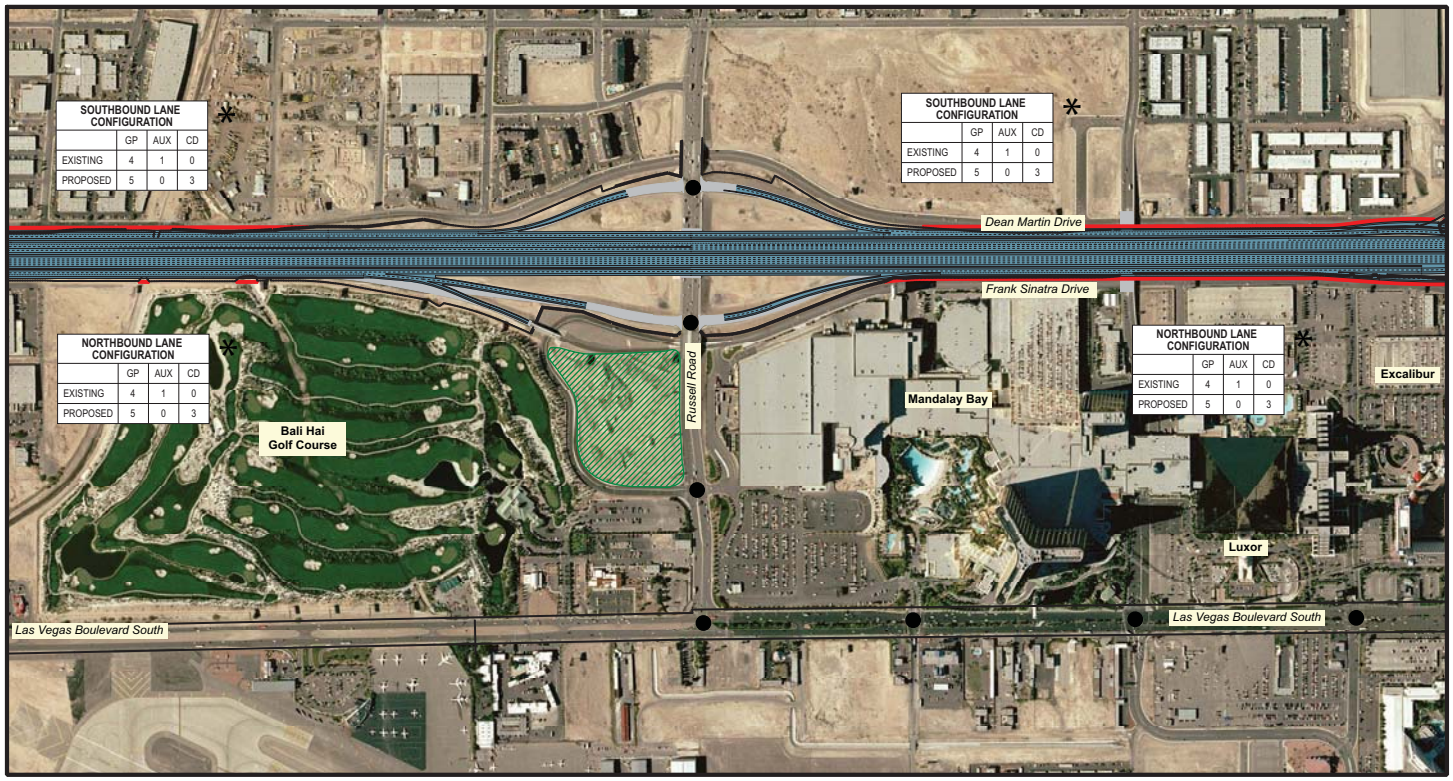

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
- R1.1 Noise Sensitive Receptor
- Proposed Sound Wall
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- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10h

* Data as of 2008, March

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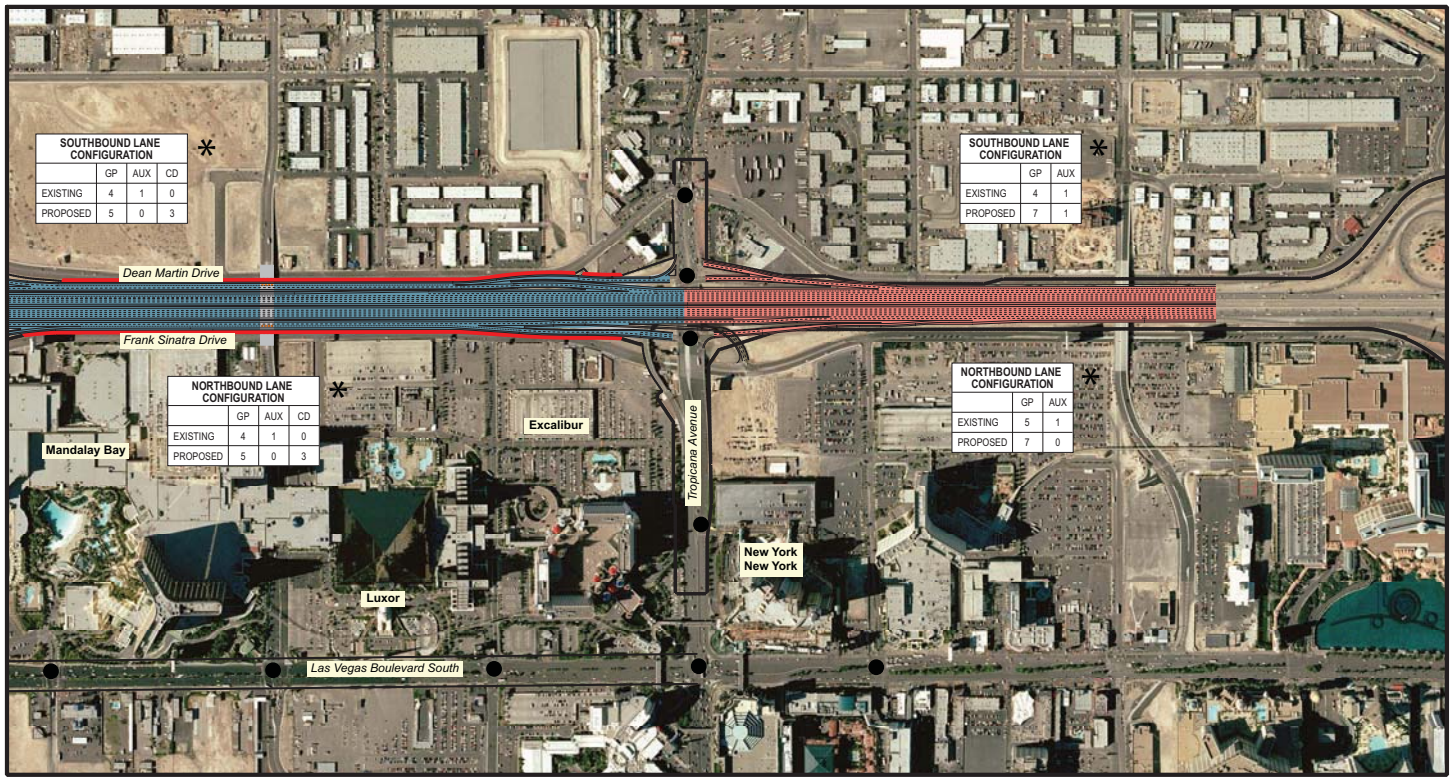

LEGEND

- Existing Right-of-Way
- Proposed Right-of-Way
- Construction Staging Area
- 66 dBA Noise Contour
- Pavement
- Transition to Existing
- Ongoing Projects by Others
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- Proposed Traffic Signal

0 300 600 900 1,200

SCALE: 1" = 600'

NORTH

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
BUILD ALTERNATIVE
FIGURE 10i

* Data as of 2008, March

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2. ENVIRONMENTAL IMPACTS AND MITIGATION

2.1 Areas of No Impact

Social and natural elements of the environment that have been evaluated that would not be adversely affected by the proposed project are summarized below:

- Cultural Resources – No archaeological resources were noted within the project's Area of Potential Effects (APE).[16,17] A total of 753 properties (including vacant parcels) are within the APE, 9 of which contained buildings, structures or objects that were documented because of their age. All 9 documented properties were found to be not eligible for the National Register of Historic Places. Three-hundred sixty-seven (367) properties containing buildings, structures or objects in the APE were not surveyed and remain unevaluated because they were not 40 years old. The State Historic Preservation Officer (SHPO) has concurred with a determination of "No Historic Properties Affected" (Appendix F). No Native American concerns were identified regarding the proposed project based on communication with the appropriate tribal representatives (Appendix F).

- Hazardous Waste/Materials – No known hazardous waste/materials sites exist within the project area.[18] Prior to demolition, structures would be assessed for asbestos, and required abatement measures would be enforced.

- Environmental Justice – Census data indicates that 84 percent of the population within the project area identifies as White/Caucasian.[19] The average income reported was $68,841, compared to the Clark County average of $44,616. Businesses that may be impacted by the proposed project are not minority owned or operated. Based on available demographic data, there are no environmental justice groups within the project area.

2.2 Biological Resources

2.2.1 Existing Conditions

Lands adjacent to the project corridor have been modified by urban development; consequently, native desert habitat has been eliminated throughout the area. Frontage roads, local roads, residential neighborhoods, and retail shopping centers abut the corridor along the 12-mile project area. Land between Las Vegas Boulevard South and Dean Martin Drive, and near the proposed Sloan Road and Bermuda Road interchanges where urban developments are not yet fully realized has been altered by paved roads leading to proposed residential tracts. Additional developments are expected within the adjacent areas.

Prior to conducting surveys, species lists were requested from Nevada Natural Heritage Program and the U.S. Fish and Wildlife Service. Both species lists identified the desert tortoise (*Gopherus agassizii*) as the only federally listed threatened species to exist throughout the project area (see Appendix B of the Biological Resources Report). There is no designated critical habitat for the desert tortoise within the project area.

The project area contains suitable habitat for desert tortoise near the Sloan Road and Cactus Avenue interchanges. One burrow was observed near the Sloan Road interchange. During surveys in July 2008, tortoise scat was observed in a reinforced concrete box culvert near the Sloan Road interchange. This may

[16] Pacific Legacy. 2006. *Cultural Resources Inventory – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue.* May.
[17] Parsons. 2007. *Historical Architecture Report – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue.* February.
[18] Parsons. 2005. *Hazardous Waste and Materials Site Assessment Technical Memorandum – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue.* November.
[19] US Census. 2000.

indicate that the tortoise has utilized the structure for movement between the east and west sides of the highway or simply an individual is using the culvert as temporary shelter.[20,21]

Surveys for native vegetation were conducted in 2006 and 2008. The surveys show native vegetation and sensitive plants present within the project limits, but the density of cacti and yucca throughout the project area is low.[22] During the surveys, no noxious weeds were observed onsite; however, the Sahara mustard is a noxious weed that is known to exist in the project area.

Because federal land would be transferred from BLM for the proposed project and BLM is a cooperating agency in the development of this environmental document, FHWA has requested that BLM be the lead agency for the Section 7 consultation requirements under the Endangered Species Act. BLM has agreed to take the lead in Section 7 consultation and allow the project to be covered under their existing programmatic biological opinion (1-5-96-F-23R.3). Correspondence between FHWA and BLM regarding lead agency designation for Section 7 consultation is provided in Appendix D.

2.2.2 Impacts

Proposed improvements on I-15 and Las Vegas Boulevard South would be carried out primarily within the existing ROW and within areas that have been disturbed by previous highway improvements. Areas of new ROW at the proposed interchanges are adjacent to the highway where biological resources have been disturbed and are limited due to urbanization. Due to the sparse distribution of plant species and the proximity to developed areas, impacts to biological resources, including special-status species and the desert tortoise, would be minimal.

Approximately 85 acres of land would be acquired for the proposed project. Of the 85 acres, 17.3 acres are BLM land and 67.7 acres are state or privately owned land. Of the 17.3 acres of BLM land, approximately 2.3 acres are disturbed and 15 acres would be new disturbance. Of the 67.7 acres of state or privately owned land, approximately 24 acres are disturbed and 43.7 acres would be new disturbance.

Natural resources in the immediate area would be directly affected by construction activities. The construction activities would clear undisturbed habitat for the desert tortoise and other resident species that have small home ranges.

Disturbance of native soils and vegetation allows opportunistic noxious weed species to invade the disturbed area. If these species are not controlled, they may out compete native species and prevent them from becoming re-established in the area of disturbance. The likelihood of a noxious weed invasion is dependent on many factors. For instance, if noxious weed species do not exist on the project site, then the probability of future establishments may be reduced. The proximity of the project area to an established seed source may dictate whether the site is likely to become infested.

2.2.3 Mitigation

All terms and conditions of the BLM Programmatic Biological Opinion would be adhered to and would be specified in the Special Provisions for the project. As specified in the programmatic biological opinion, remuneration fees for the desert tortoise would be paid into the Desert Tortoise Public Lands Conservation Fund prior to surface-disturbing activities. Fees would be paid for both Section 7 and Section 10, due to the presence of both land ownerships in the project area. There are approximately 17.3 acres of BLM land (Section 7) that would be acquired for the project; however, only 15 acres would be considered new disturbance. The 15 acres would be charged at $753 per acre for a total of $11,295 paid to the fund. The $753 remuneration fee is indexed for inflation and is increased each year on March 1. If

[20] Parsons. 2006. *Biological Resources Report – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue.* May

[21] Parsons. 2008. *Biological Resources Report Technical Memorandum Update – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue.* June.

[22] Ibid.

fees are paid after March 1, 2009, the new mitigation fee would apply to the number of acres that are disturbed. Section 10 funds are for state or private lands and are charged $550 per acre of disturbance. There are 43.7 acres that would be disturbed, and a total of $24,035 would be paid to the fund.

In compliance with Executive Order 13112 regarding noxious weeds, earth-moving and hauling equipment would be washed at the contractor's storage facility prior to arriving onsite to prevent the introduction of noxious weed seeds. Disturbed areas would be landscaped and/or seeded with certified weed-free mixes.

A noxious weed management plan would be specified in the Contract Special Provisions, prepared in accordance with BLM's Las Vegas Field Office Noxious Weed Plan, and implemented to prevent noxious weeds from becoming established in the project area during and following construction. Elements of the plan would include surveying the project area to confirm absence of noxious weeds, verifying that vehicles and equipment are free of caked mud prior to being used at the construction site, eradication measures if noxious weeds do become established, and the use of approved BLM seed mixes.

Cacti and yucca species that are present would be salvaged prior to construction activities.

2.3 Social Considerations

2.3.1 Conformance with Applicable Land Use Plan

The proposed action is in conformance with BLM's Las Vegas Resource Management Plan (RMP), which was approved October 5, 1998. The plan has been reviewed, and it has been determined that the proposed action conforms with land use decision RW-1, which states "Meet public demand and reduce impacts to sensitive resources by providing an orderly system for transportation, including legal access to private inholdings, communications, flood control, major utility transmission lines, and related facilities."

2.3.2 Relationship to Statutes

The proposed action does not conflict with any known local or state law, ordinance, planning, or zoning, and it is consistent with Title V of the Federal Land Policy & Management Act of October 21, 1976 (United States Code [U.S.C.] 1701 *et seq*), and the Act of Congress of August 27, 1958 (23 U.S.C. Section 317 and/or 107).

2.3.3 Existing Conditions

Population

Most of the project area is within the Enterprise Township of Clark County, with the northern portions located within the Winchester/Paradise Township.[23] The U.S. Census 2000 reports the population within the Enterprise Township is 14,676, while the Nevada 2005 Population Estimates[24] indicate the population increased to 96,404 in 2005. The residential areas are a mix of low-, medium-, and high-density single-family homes. Several master-planned communities are located west of I-15. Mixed-use and high-density multi-family development is concentrated east of I-15 along Las Vegas Boulevard South (see Figure 11, Land Use).

Land Use

The Enterprise Land Use Plan includes open space; rural neighborhood preservation; single- and multi-family residential; commercial, industrial, and business uses; and public facilities. Sixty-three (63) percent of Enterprise Township is allocated to residential and rural preservation.

[23] Clark County. 2005. *Winchester/Paradise Land Use Plan.* August.
[24] Clark County. 2005. *Comprehensive Plan.* May.

A "Gateway District" has been established along I-15 and Las Vegas Boulevard South from I-215 to St. Rose Parkway that is planned for higher density uses.[25] High-rise condominium developments and other high-density residential areas are in the planning stages or under construction. More than 5,000 multi-family residential units are part of this residential development. Single-family residential areas are also found along Las Vegas Boulevard South and I-15.

2.3.4 Impacts

The project corridor is an existing transportation facility and would have minimal direct impacts to land use or zoning within the corridor. Construction of the proposed project would result in some alteration of existing land use, with vacant, undeveloped land and residential areas converted to transportation uses.

Construction of the proposed project would result in the acquisition of 85 acres of land. Of the 85 acres, approximately 3.5 acres would be transferred from BLM for the Sloan Road interchange, 8 acres would be transferred for the Bermuda Road interchange, and 8 acres would be transferred for the Cactus Avenue interchange. Table 3 identifies the acreages of land that would be acquired as part of the proposed project and the number of residential and business relocations.

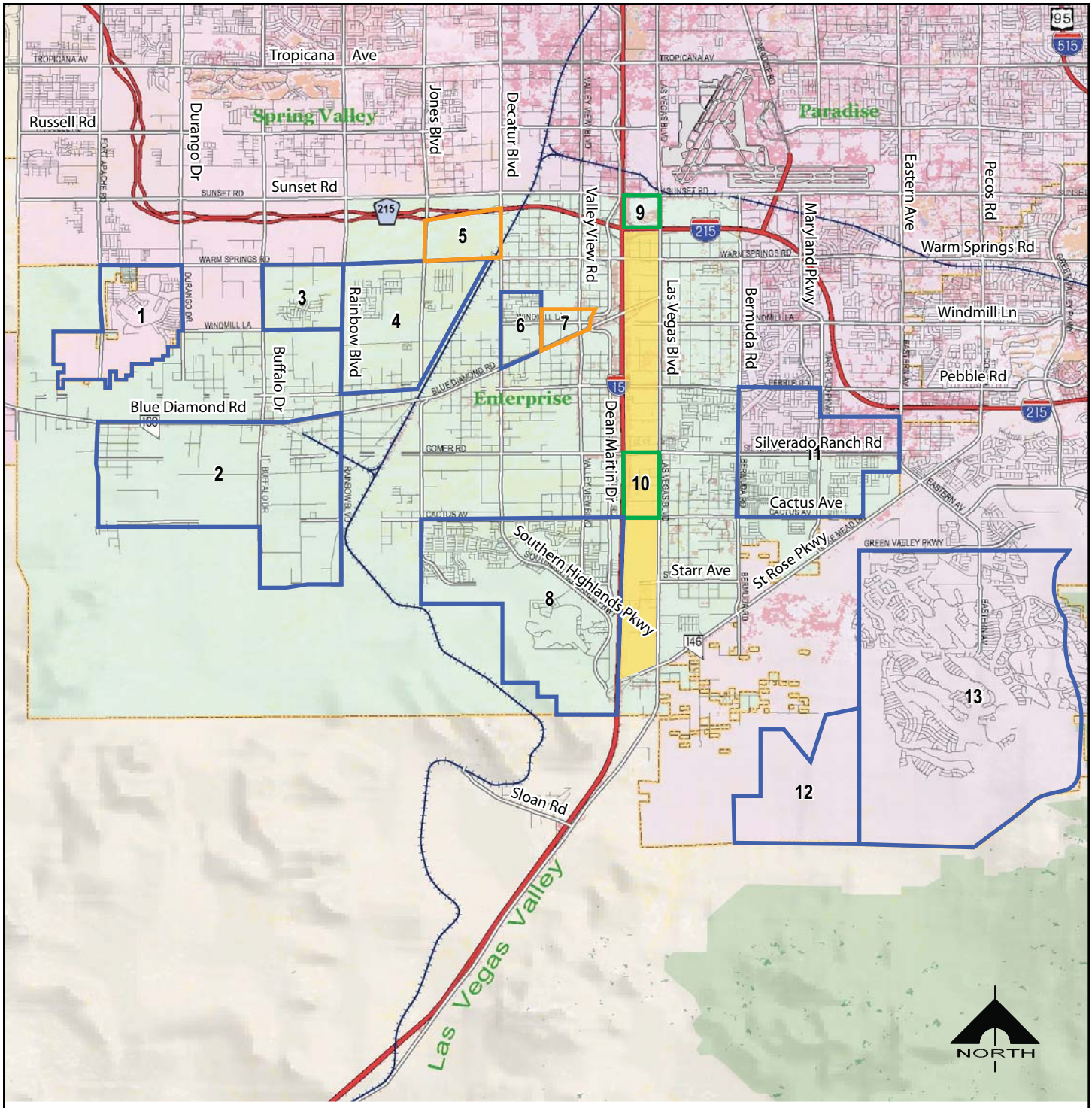
Table 3
Relocations and Areas of New Right-of-Way

Location of New Right-of-Way	Acres	Relocations
Sloan Road Interchange	25	1 business (Pottery World)
Bermuda Road Interchange	8	None
Starr Avenue Interchange	16	33 single-family residences
Cactus Avenue Interchange	14	None
Pebble Road Overpass	4	2 single-family residences 8 multi-family residences 1 business (PRE Storage)
Southeast of Blue Diamond Road Interchange	4	20 parking spaces (1 multi-family complex)
Northeast of Blue Diamond Road Interchange	7	None
Northeast of I-215 Interchange	7	Parking (unknown number under construction)

Development in the project area is managed through various land use and transportation plans, and it would occur whether or not the proposed I-15 improvements are built. Construction of the proposed project is not anticipated to result in additional unplanned development. The zoning restrictions that are part of Clark County's Comprehensive Plan and City of Henderson's Comprehensive Plan minimize the potential impacts of these planned developments.

Clark County's Comprehensive Plan (2005) and the City of Henderson's Comprehensive Plan (2006) each include standards for development within their respective jurisdictions. Zoning is the major implementation tool of each plan. The various zoning districts regulate the type of land use. It is anticipated that the residential and commercial development planned within the project area would have the greatest effect on land use. These developments would result in the conversion of previously undeveloped land to more intensive land uses. These projects are consistent with the desired future development of the area relative to housing density, intensity of commercial development, and development of the local transportation network, as described in the planning documents.

[25] Clark County. 2004. *Enterprise Land Use Plan.* December.



LEGEND

- MIXED USE
- MASTER PLAN
- BUSINESS PARK
- GATEWAY DISTRICT

1 RHODES RANCH MASTER PLAN
2 MOUNTAIN'S EDGE MASTER PLAN
3 NV TRAILS MASTER PLAN
4 CORONADO RANCH MASTER PLAN
5 BELTWAY BUSINESS PARK
6 BLUE DIAMOND RANCHES MASTER PLAN
7 BLUE DIAMOND CROSSINGS BUSINESS PARK
8 SOUTHERN HIGHLANDS MASTER PLAN
9 TOWN SQUARE - MIXED USE
10 SOUTH POINT - CASINO AND MIXED USE
11 SILVERADO RANCH MASTER PLAN
12 INSPIRADA MASTER PLAN
13 ANTHEM MASTER PLAN

NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT

LAND USE

FIGURE 11

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Effectiveness of growth management is dependent upon adherence by the local entities to the land use, zoning, and development ordinances. Overall, the proposed project is consistent with the long-range transportation and development plans envisioned for the southern area of the Las Vegas Valley.

Relocation Impacts

Construction of the proposed Sloan Road interchange would result in the partial acquisition of the property located in the northwest quadrant of the interchange. The Pottery World business location would be impacted by construction of the proposed interchange; however, it appears that the business could be reconfigured to land remaining within the same parcel (see Figure 10a). There are no permanent structures at this site because of the nature of the business. At Starr Avenue, construction of the proposed interchange would result in the relocation of 4 single-family homes within the Bella Terra subdivision in the northwest quadrant of the interchange. Twenty-nine (29) single-family residences in the Terraza subdivision would also require relocation for construction of the proposed interchange (see Figure 10d). The proposed Pebble Road overpass would result in the relocation of approximately 2 single-family homes west of I-15 and 8 multi-family units in the Villanova apartment complex located east of I-15. Relocation of the 43 residences would have a minimal impact on the overall community of Southern Highlands which has more than 6,700 residences. The Pebble Road overpass would also result in the acquisition of the PRE Storage facility, which contains 28 spaces for large recreational vehicles (RVs) or boats (see Figure 10f). Improvements near the Blue Diamond Road interchange would result in a partial acquisition from the Amalfi apartment complex. Fifteen (15) garage spaces located immediately adjacent to I-15 and 5 covered parking spaces would be acquired (see Figure 10f). On the northeast quadrant of the I-215 interchange, construction of the ramps would require a partial acquisition of the Town Square development. According to recent site plans for the development, only parking spaces would be impacted (see Figure 10g).

2.3.5 Mitigation

The NDOT ROW Division, under guidance of the Relocation Assistance and Real Property Acquisition Policy Act of 1970 (Uniform Act), would negotiate with the property owners directly impacted, ensuring that they receive fair market value for the acquired ROW and appropriate relocation assistance. Legally permitted property access would be perpetuated in the after condition.

A detailed traffic plan would be created to maintain traffic circulation and access during construction. NDOT would coordinate with the existing businesses and residents about the construction schedule. (See also Section 2.6.3 – *Construction* for noise mitigation measures in residential areas.)

The proposed project is not expected to result in substantial long-term adverse social or economic impacts, due to the availability of comparable housing in the vicinity, and because it is consistent with current land use plans and policies.

2.4 Visual Resources

2.4.1 Existing Conditions

The project area is generally characterized by visual elements associated with commercial, residential, and transportation development, as well as undeveloped, native desert parcels. Major visual landmarks are the Spring Mountains and Mt. Charleston to the west of the corridor and the Las Vegas Strip to the north. I-15 corridor development limits views from the transportation corridor to foreground and middle-ground viewsheds. Adjacent properties only have views of their immediate surroundings and the mountains to the west. The views vary throughout the corridor from residential and commercial development to major transportation features (e.g., walls, structures, and signage) associated with I-15 and other surface transportation facilities. In the southern limits of the corridor, the background views consist of mountains with alluvial fans extending from the mountain base to form the valley floor, with a slight undulating terrain over several dry washes.

Viewers are categorized in two classes – viewers from the road and viewers of the road. Views from the highway consist of numerous billboards and overhead traffic signage within foreground views. Commercial structures, such as office buildings and various retail establishments, and residential areas east and west of the highway dominate middle-ground views. Manmade structures rise vertically and horizontally with diverse colors and shades. A concrete median divides the NB and SB lanes for most of the project area; the median widens in the far southern portion of the project area. Mountains and the Las Vegas Strip create background views.

Viewers traveling on I-15 are characterized as interstate truckers, tourists and commuters, with peak travel times occurring during morning and evening commutes and weekends; however, the number of viewers remains relatively high throughout the daytime hours. Viewer sensitivity would be characterized as low due to the high rate of speed and primarily peripheral views along the corridor.

The viewer population with views of the road and from bridge overpasses is characterized as residential and commercial viewers traveling to and from retail establishments and/or work places and their homes. In areas where soundwalls are proposed to be installed, residential views of the highway would be shielded. Viewer sensitivity for viewers of the road would be characterized as low.

The BLM uses a Visual Resources Management (VRM) system to identify and manage scenic values on public lands. The VRM system classifies visual resources on BLM lands in one of four categories: Class I, II, III, or IV—with Class I having the highest visual sensitivity and Class IV being the least sensitive. The proposed project is located along the existing I-15 corridor and is within both Class III and Class IV VRM areas. The management objective for VRM Class III areas is to partially retain the existing character of the landscape. For Class III areas, a moderate level of change is acceptable. The management objective for VRM Class IV areas is to provide for management activities that require major modification of the existing character of the landscape. For Class IV areas, a high level of change is acceptable.

2.4.2 Impacts

The proposed additional lanes on I-15 and Las Vegas Boulevard South would minimally alter the near and middle horizon viewshed from properties along the project corridor. The change in views would result from having a larger transportation facility (i.e., more lanes) located closer to existing and planned development. The proposed interchanges at Sloan Road, Bermuda Road, Starr Avenue, and Cactus Avenue and the overpasses at Pebble Road, Warm Springs Road, and Sunset Road would be approximately 25 to 35 feet above the existing I-15 lanes. Construction of these new interchanges would be visually consistent with existing overpasses within the project corridor; however, some existing views from residential areas along the freeway would be blocked by the new overpasses, soundwalls, and retaining walls.

High mast lighting would be installed along I-15 as part of the Build Alternative. Lights would be spaced approximately 330 to 400 feet apart and would be approximately 100 feet above the roadway surface. The distance from the nearest residential areas to the new high mast lights would be approximately 230 feet. Along Las Vegas Boulevard South and local cross streets, lighting would be placed on the outside of the roadway. Typical streetlight spacing would be 150 to 250 feet, and the lights would be 35 to 55 feet above the roadway surface. Installation of high mast and street lighting would not adversely affect adjacent residences because of the use of shielding technology for new high mast lighting.

The proposed project is consistent with the VRM management objectives given the ongoing development in this transportation corridor.

2.4.3 Mitigation

Aesthetic treatments to soundwalls and structures within the project area would be in accordance with NDOT's Landscape and Aesthetics Master Plan and I-15 Corridor Plan. New freeway and street lighting would employ shields and luminaries to minimize light and glare impacts on adjacent residences.

2.4.3 Mitigation

Aesthetic treatments to soundwalls and structures within the project area would be in accordance with NDOT's Landscape and Aesthetics Master Plan and I-15 Corridor Plan. New freeway and street lighting would employ shields and luminaries to minimize light and glare impacts on adjacent residences.

2.5 Air Quality

In accordance with the federal Clean Air Act, the United States Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, as listed in Table 4. The Clark County Department of Air Quality and Environmental Management (CCDAQEM) is the regulatory and enforcement agency in Clark County, Nevada. In addition, all construction projects equal to or larger than 0.25 acre require a dust control permit obtained through the CCDAQEM.

Table 4
National Ambient Air Quality Standards

Pollutant	Averaging Period	Primary Standards	Secondary Standards
Particulate Matter (PM_{10})	24 hour	150 $\mu g/m^3$	150 $\mu g/m^3$
Carbon Monoxide (CO)	8 hour	9.0 ppm (10 mg/m^3)	--
	1 hour	35 ppm (40 mg/m^3)	--
Ozone (O_3)	8 hour	0.08 ppm	0.08 ppm

[1] The federal air quality standard for $PM_{2.5}$ was adopted in 1997. Presently, no methodologies for determining impacts relating to $PM_{2.5}$ have been developed or adopted by federal, state, or regional agencies. Additionally, no strategies or mitigation programs for $PM_{2.5}$ have been developed or adopted by federal, state, or regional agencies.

mg/m^3: milligrams per cubic meter
$\mu g/m^3$: micrograms per cubic meter
ppm: parts per million

Source: EPA, 2006. http://www.epa.gov/air/criteria.html.

2.5.1 Existing Conditions

The proposed project is located entirely within Hydrographic Area (HA) 212, which encompasses the Las Vegas Valley nonattainment area. The entire state of Nevada is in attainment/unclassifiable status for $PM_{2.5}$ (particulate matter with an aerodynamic diameter less than 2.5 micrometers). Within Clark County, the cities of Las Vegas, North Las Vegas, and Henderson are collectively designated as nonattainment for carbon monoxide (CO) and PM_{10} (particulate matter with an aerodynamic diameter less than 10 micrometers) by EPA.[27] EPA has also designated Clark County as an 8-hour ozone (O_3) nonattainment area. Ozone is considered an area-wide pollutant that is assessed in systems-level planning as part of the development of state implementation plans. In addition, ozone is evaluated as a regional pollutant, using emissions inventories for its precursors, nitrogen oxide (NOX) and volatile organic compounds (VOCs), as part of the conformity process by the RTC. Therefore, ozone is not a concern as a hot-spot, project-level air pollutant.

[27] Parsons. 2007. *Air Quality Assessment Technical Report – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue.* May.

Project Conformity

The current transportation plan is the Fiscal Year (FY) 2006-2030 RTP, and the transportation improvement program is the FY 2006-2008 Transportation Improvement Program (TIP). The TIP and RTP were adopted by RTC on July 13, 2006. The United States Department of Transportation (DOT) approved the Air Quality Conformity Finding in the RTP in December 2006.

The proposed project elements are included in RTC's RTP 2006-2030 and the Clark County TIP which has been approved by FHWA; therefore, pursuant to 40 *Code of Federal Regulations* (CFR) 93, this project conforms to the State Implementation Plan (SIP). The project would not violate the NAAQS for the build scenario.

2.5.2 Impacts

A CO micro-scale analysis was performed at five interchange locations using the CAL3QHC air quality dispersion model to calculate CO concentrations for the No Build Alternative and the Build Alternative. In accordance with EPA's *Guideline for Modeling Carbon Monoxide from Roadway Intersections*, the three intersections with the highest traffic volumes and the three intersections with the worst LOS under the Build Alternative were modeled. Since four of the six intersections are the intersections with the highest traffic volumes and the worst LOS, this reduced the number of intersections to be analyzed to three; however, to model areas with sensitive receptors along the entire project corridor, five intersections were analyzed. As shown in Table 5, the federal 1- and 8-hour standards of 35 parts per million (ppm) and 9 ppm would not be exceeded at any location.

Table 5
Year 2030 CO Concentrations

Intersection	Concentrations 10 Feet from Intersection			
	1-Hour Concentration (ppm)		8-Hour Concentration (ppm)	
	No Build	Build	No Build	Build
Las Vegas Boulevard South and Tropicana Avenue	9.3	9.6	5.4	5.6
Dean Martin Drive and Tropicana Avenue	8.4	9.2	5.7	5.3
Las Vegas Boulevard South and Blue Diamond Road	9.2	9.7	5.3	5.6
Dean Martin Drive and Blue Diamond Road	9.8	9.5	5.7	5.5
Las Vegas Boulevard South and Hidden Well Road	8.4	9.2	5.7	5.3
NAAQS	35		9	

Note: CO concentrations include 1-hour and 8-hour concentrations of 5.5 and 2.7 ppm based on 3-year average monitoring data at Las Vegas Boulevard South monitoring station.

Sources of PM_{10} during operation of the proposed project include vehicle exhaust and re-entrained road dust. Typically, PM_{10} emissions from vehicle exhaust are highest when vehicles are idling. The Build Alternative would increase capacity along I-15, which would reduce vehicle idling time, thereby reducing emissions of PM_{10}. The proposed project is included in the RTP; thus, it is included in Clark County's air quality modeling efforts for the region, as provided in the CCDAQEM PM_{10} Plan.

Given that I-15 is not sanded or salted during the year, the roadway would have very low surface silt loading. In addition, NDOT complies with Clark County's enforceable PM_{10} SIP requirements to control emissions from paved roads, which include frequent sweeping of all freeways in Clark County using PM_{10}-compliant equipment and stabilization of soil and road shoulders and medians.

These measures would reduce the PM_{10} increment associated with operation of the proposed project; therefore, NDOT qualitatively concludes that there would be no PM_{10} hot spot violations resulting from operation of the new freeway lanes and ramps.

Construction

Periodic and localized increases in CO and PM_{10} levels would occur during construction due to traffic congestion and equipment operations; however, such increases would be temporary and short term.

2.5.3 Mobile Source Air Toxics

Introduction

The I-15 South Corridor Improvement Project is designed to mitigate expected future traffic demand in the southern Las Vegas Valley. The future traffic demand will be fueled by planned residential and commercial development along the corridor[28] and by regionwide population growth. Improvements to I-15 would include the addition of general purpose and auxiliary lanes from Sloan Road in the south to Tropicana Avenue in the north (see Figure 1). The project would also include construction of new interchanges and widening of South Las Vegas Boulevard.

The 1990 Clean Air Act Amendments (CAAAs) identified 188 hazardous air pollutants (HAPs). Of the identified HAPs, EPA identified a group of 21 mobile source air toxics (MSATs). The MSATs are considered by EPA to have the potential to cause serious health and environmental impacts, and they are emitted from a variety of sources, including highway vehicles (i.e., cars, trucks, buses) and non-road sources such as aircraft, marine vessels, locomotives, and construction equipment.

In February 2006, FHWA released Interim Guidance to its state division offices on when and how MSAT emissions should be addressed in environmental documents for federally funded highway projects.[29]

Traffic volume forecasts, which were modeled using the most recent population growth and land-use assumptions for the Las Vegas Valley,[30] indicate that the 2030 ADT along most segments of the I-15 South corridor will exceed 200,000 vehicles per day, with a high of 546,000 vehicles per day adjacent to the Las Vegas Strip.

The FHWA Interim Guidance set forth a tiered approach for evaluating potential impacts of MSAT emissions for transportation projects. Because there are capacity improvements planned for the project corridor, and because the 2030 ADT will exceed 150,000 vehicles per day, FHWA recommends that MSAT emissions be quantitatively assessed as part of the NEPA process; therefore, in accordance with the FHWA Interim Guidance, NDOT performed a quantitative analysis of MSAT emissions for the I-15 South Corridor Improvement Project.

MSAT Analysis Methodology

Air toxics analysis is an ongoing area of research by EPA and FHWA, and they are developing strategies and procedures for modeling ambient concentrations of MSATs at the project level.[31] Acceptable methods to predict the ambient concentrations of MSATs for specific transportation projects or near specific roadside locations are not currently available. Acceptable methods to predict how MSATs disperse are also currently unavailable. The current modeling tools were developed and validated for predicting episodic concentrations of CO and compliance with the NAAQS. In addition, project-specific MSAT background concentrations do not exist.

[28] Parsons. 2007. *I-15 South Traffic Report.* January.
[29] FHWA. 2006. *Interim Guidance on Air Toxic Analysis in NEPA Documents.*
[30] Parsons. 2007. *I-15 South Traffic Report.* January.
[31] FHWA. 2006. *Interim Guidance on Air Toxic Analysis in NEPA Documents.*

These shortcomings prevent predicting meaningful exposure patterns to assess potential health risk. Deriving useful conclusions regarding project-specific health effects are hindered by current techniques in exposure assessment and risk analysis. Considering the need of using unsupported assumptions in exposure patterns, uncertainties associated with estimating MSAT toxicity, and lacking methods to predict concentrations and dispersion, the calculated health effects between alternatives is likely to be smaller than the uncertainties involved.

It is possible to evaluate MSAT emission trends over time for larger projects and whether differences in MSAT emission levels occur over time between the No Build and Build Alternatives.

EPA has established eight priority MSATs, which are defined as those most likely to present the highest risks to human health. The priority MSATs include the following volatile organic compounds (VOCs): benzene, formaldehyde, acetaldehyde, acrolein, 1,3 butadiene, naphthalene, and polycyclic organic matter (POM). Diesel particulate matter (DPM), the eighth priority MSAT, is a fine aerosol composed of solid and liquid particles.

A. Nature of Emissions Analysis

Claggett and Miller[32] formulated a methodology for use by state DOTs and Metropolitan Planning Organizations (MPOs) to evaluate the relative MSAT emissions for transportation project alternatives.

To conduct an emissions analysis, one calculates emission factors for each of the various pollutants, grams (or milligrams [mg])/vehicle miles traveled (VMT), which are then multiplied by the daily VMT for each affected roadway link or segment. This calculation gives the daily mass emission rate (in grams or mg) for each of the pollutants, which are then summed to get the total daily MSAT emissions for that link or segment.

EPA's MOBILE6.2 Emission Factor Model has functionality to calculate emission factors for the eight priority MSATs, and its use is recommended by FHWA for doing quantitative MSAT assessments. Emission factors for most MSATs vary as a function of speed, vehicle mix, fuel composition (i.e., aromatic and sulfur content), and diurnal fluctuations in temperature.

Input parameters specific to Clark County were used to run MOBILE6.2. For the I-15 South corridor improvements, and other planned projects in Las Vegas, NDOT consulted modeling experts from CCDAQEM for their guidance as to what local inputs should be used in MOBILE6.2.[33,34]

The emissions analysis for this project includes those freeway (including ramps) and arterial segments slated for improvement as part of the I-15 South Corridor Improvement Project, plus other segments within and beyond the project corridor that are not slated for improvement. Road segments beyond the project corridor are included because MOBILE6.2 is a regional-scale model.

NDOT utilized a comprehensive, detailed traffic demand analysis for the I-15 South Corridor Improvement Project to calculate MOBILE6.2 emission factors.[35] Pertinent local transportation network attributes were also used.[36] Detailed traffic demand forecast information correlated to the specific elements of the I-15 South Corridor Improvement Project is not available outside the improvement corridor, and current traffic count information was used to fill in the gaps,[37] therefore,

[32] Claggett, M. and T.L. Miller. 2005. *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives.* www.fhwa.gov/environment/airtoxic/.
[33] CCDAQEM. 2005. *Carbon Monoxide State Implementation Plan Revision: Las Vegas Valley Nonattainment Area, Clark County, Nevada, Appendix A – Technical Support Document.*
[34] CCDAQEM. 2006. Personal communication with Mr. Zheng Li, CCDAQEM Planning.
[35] Parsons. 2007. *I-15 South Traffic Report.* January.
[36] RTC. 2006. *Final Draft, Regional Transportation Plan,* FY 2006-2030.
[37] NDOT. 2005. *2005 Annual Traffic Report.*

the affected network for this project encompasses the project corridor itself, plus a 0.5-mile buffer on each side.

Project-Level MSAT Analysis Burden

This section discusses the results of the MSAT burden analysis for those facilities affected by the proposed I-15 South Corridor Improvement Project. The "emissions burden" is defined as the total mass emissions of an air contaminant, or group of air contaminants, for a specified period of time. In this case, the pollutants of interest are the priority MSATs emitted by the assemblage of motor vehicles that will be using the transportation facilities in question.

MSAT impacts from the proposed project are assessed by comparing the emission rates for the no build and build conditions for various horizon years. NDOT followed the methodology of Claggett and Miller[38] to do the burden analysis.

A. Freeway Mainline MSAT Emissions

Charts showing the relative daily MSAT emissions for the no build and build scenarios are presented in Figures 12 and 13. The years covered are 2003, 2020 (estimated completion), and 2030 (design year).

Emissions of MSATs are quite variable along individual segments of I-15 (see Figures 12 and 13). Segmental MSAT emissions are controlled by congested speeds and VMT, both of which can vary considerably. Most segments exhibit a decrease of total MSATs from 2003 to 2030 for the build condition (i.e., 17 to 64 percent decreases).

For both 2020 and 2030, differences between no build and build emissions along each segment are insignificant (less than 1 pound). However, for the 2030 design year, 10 out of 13 freeway mainline segments showed either no change or decreases in build emissions relative to the no build condition.

Relative to the 2003 base year, Segments 1 through 7 and 12 through 13 show a decrease in MSAT emissions for the design year build alternative, while Segments 8, 10, and 11 show no change in emission levels. Segment 9 exhibited an increase, with both the no build and build design year emissions increasing by similar proportions.

For the collection of I-15 mainline segments, total MSAT emissions decrease by 32 percent for the build condition relative to the 2003 base year (see Figure 14), and MSAT emissions show an overall decrease from 2003 to 2030 for both the no build and build scenarios.

B. MSAT Emissions for Arterials

NDOT also evaluated total MSAT emissions for major arterials both within and outside the project corridor. Figure 15 shows the total MSAT emissions for Las Vegas Boulevard and the collection of crossing arterials. MSAT emissions decrease by 83 percent for the build condition, with build emissions significantly less than no build emissions for the 2020 and 2030 analysis years. Capacity improvements slated for Las Vegas Boulevard contribute significantly to these corridor-scale MSAT reductions.

Discussion and Conclusions

MSAT emission trends for the I-15 South Corridor Improvement Project show that total emissions are projected to decrease over time for both the no build and build scenarios. Total MSATs decrease by 32 percent from 2003 to 2030 along the freeway mainline, and by 83 percent for crossing arterials, including Las Vegas Boulevard. Differences between no build and build emissions are insignificant for the 2020 and 2030 analysis years. Comparisons of MSAT emissions between roadway segments exhibit a high degree of variability, but MSATs generally decrease for those segments with the highest ADT and VMT.

[38] Claggett, M. and T.L. Miller. 2005. *A Methodology for Evaluating Mobile Source Air Toxic Emissions among Transportation Project Alternatives.* www.fhwa.gov/environment/airtoxic/.

Segments 7, 9, and 10 show greater increases in traffic demand than other segments for the design year. Corridor-wide, there is only a 2 percent difference in overall traffic demand between the no build and build alternatives. Segments 9 and 10 are those that have sensitive receptors (i.e., residential development) within 600 feet of the mainline. Differences between the build and no build emissions are less than one pound per day for these segments in the design year and despite the increases in traffic demand, these differences are insignificant. Local municipalities could also maintain a separation between sensitive receptors and the ROW by controlling planning, zoning, and type of development along the mainline and throughout the corridor.

The I-15 South Corridor Improvement Project would relieve traffic congestion along the I-15 corridor, which would lower emissions of MSATs and other air pollutants. Since the ambient concentrations of MSATs, or any air contaminant, are related to their mass emission rates, these results suggest that the ambient concentrations of MSATs attributable to operation of the freeway would be lower in the future.

Total MSAT emissions from motor vehicles operating on I-15 are very low. To put this in perspective, the 2001 average daily emissions of VOCs from gasoline service stations in Clark County are approximately 5.6 tons per day,[39] which is expected to be higher in 2003 and subsequent years. By contrast, combined emissions for MSATs for the freeway mainline and arterials are only 0.10 ton per day (200 pounds). Given that most MSATs are VOCs, this example shows that MSAT emissions from vehicles operating on I-15 are negligible when compared to nonvehicle sources.

Major mitigating factors for reducing future MSAT emissions is implementation of EPA's diesel emission control and fuel sulfur standards. Additional MSAT reductions on a regional scale will come from restrictions on the aromatic content of gasoline, plus reductions in exhaust and evaporative emissions from gasoline-powered passenger vehicles. These federal standards will provide tangible air quality benefits for the Las Vegas Valley.

Furthermore, NDOT has provided funding to the Clark County School District to retrofit a portion of their diesel bus fleet with emissions-reduction technology. NDOT is also implementing a comprehensive idling reduction outreach program in Clark County during 2007. These NDOT initiatives will achieve additional MSAT reductions, particularly for DPM, throughout the Las Vegas urbanized area.

For the United States as a whole, MSATs will be reduced by 68 percent between 2000 and 2020 (see Figure 16). These projected reductions are a result of newly enacted control programs for MSATs that include more stringent heavy-duty diesel engine emission standards and on-highway diesel fuel sulfur requirements.[40] These reductions in MSATs will be realized despite the nationwide 64 percent growth in VMT. Moreover, there will be additional reductions in MSATs, particularly for benzene, resulting from EPA-mandated restrictions in the aromatic content of gasoline and from standards for portable fuel containers.[41]

2.5.4 Mitigation

NDOT contract documents would specify that the contractor must implement a dust control program to minimize impacts. In addition, the contractor must comply with all federal, state, and local laws, including CCDAQEM regulations governing air pollution control. These regulations require that the contractor use acceptable methods to prevent fugitive dust emissions. All dust control permit conditions and stipulations must be in compliance for the duration of the project. With implementation of an effective dust control program, the increase in PM_{10} levels would not create adverse effects.

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[39] EPA. 2001. *National Emissions Inventory (NEI): 2001 VOC Data for Clark County, Nevada.*

[40] Claggett, M. and T.L. Miller. 2005. *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives.* www.fhwa.gov/environment/airtoxic/.

[41] EPA. 2007 *Control of Hazardous Air Pollutants from Mobile Sources: Final Rule to Reduce Mobile Source Air Toxics.* EOA420-F-07-017. February.

Figure 12
Total Mobile Source Air Toxics (MSATs)
I-15 Mainline Segments 1 to 6

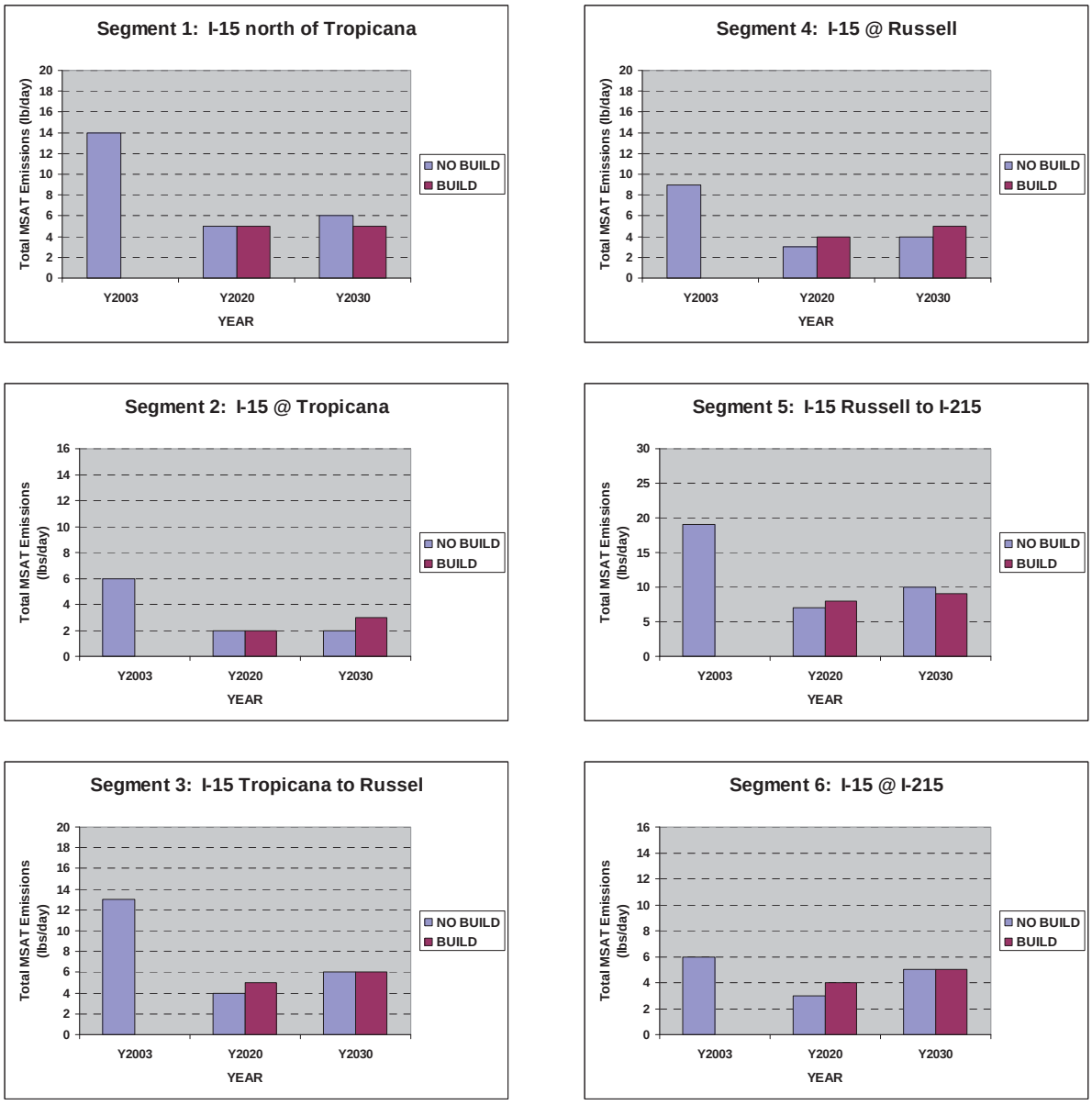

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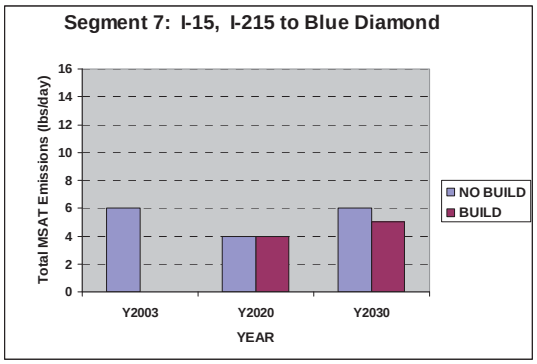
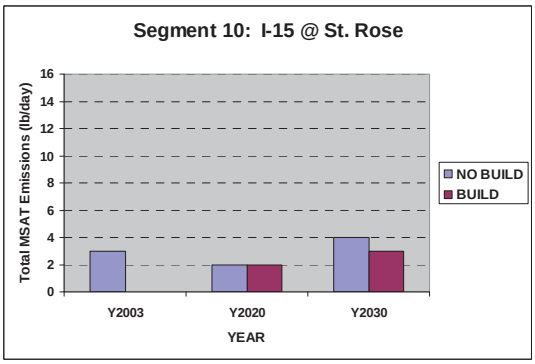
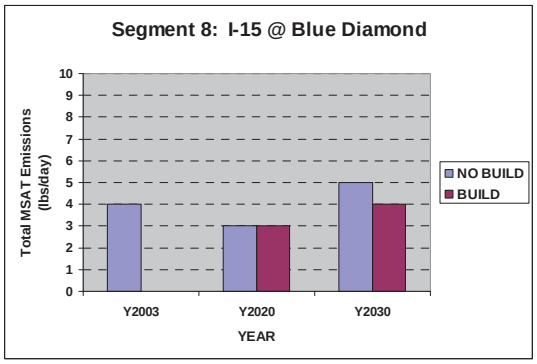
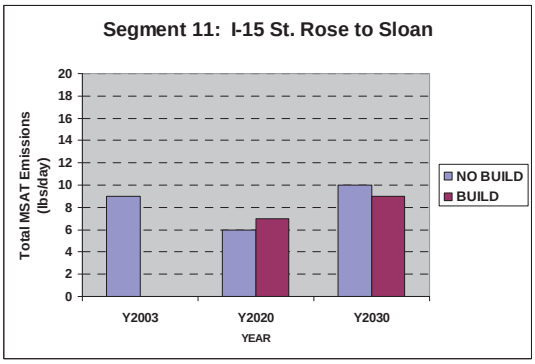
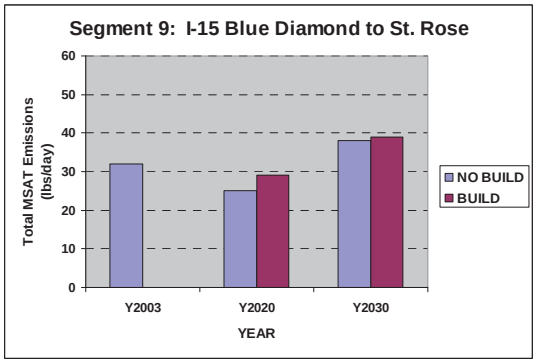
Figure 13
Total Mobile Source Air Toxics (MSATs)
I-15 Mainline Segments 7 to 13

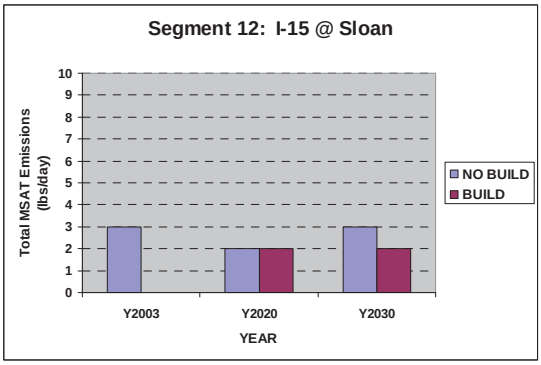












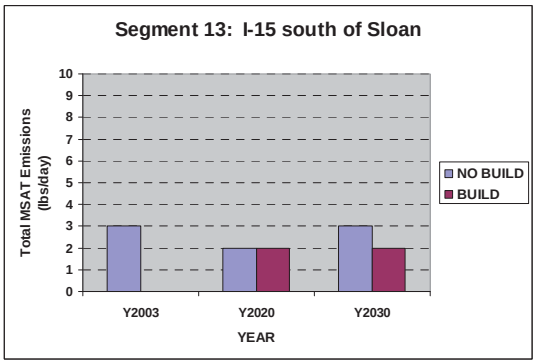


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Figure 14

I-15 South Corridor - All Freeway Mainline Segments
Mobile Source Air Toxics (MSATs)

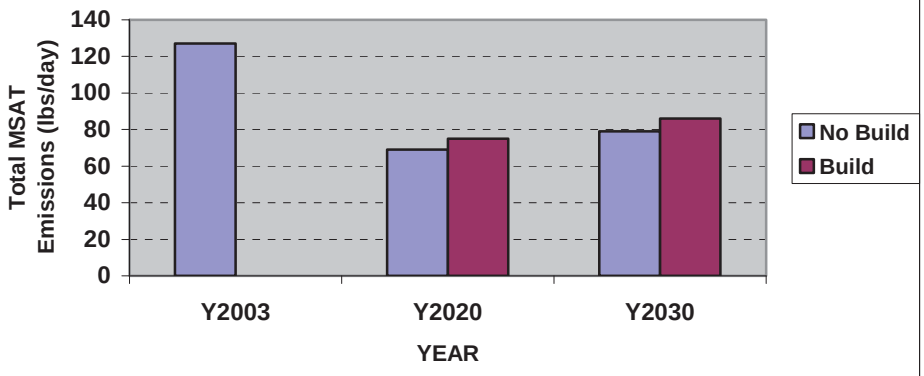


Figure 15

I-15 South Project - Arterials in Affected Network
Mobile Source Air Toxics (MSATs)

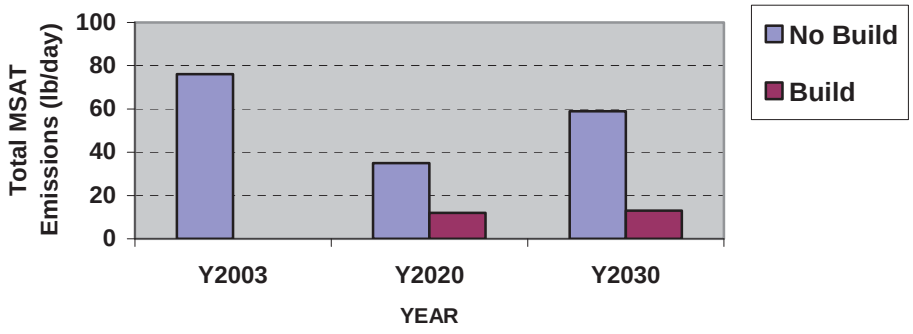
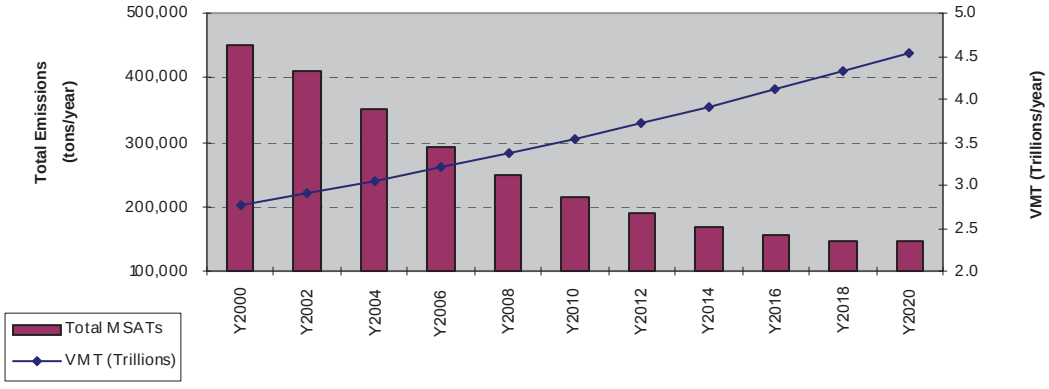


Figure 16

U.S. Annual Vehicle Miles Traveled (VMT) vs.
Mobile Source Air Toxics Emissions, 2000-2020
Source: Federal Highway Administration



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2.6 Noise

A noise study was prepared for the proposed project in accordance with *FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772, 2001) and *NDOT Traffic and Construction Noise Abatement Policy* (2003). Table 6 shows the FHWA noise abatement criteria (NAC). Table 7 shows the corresponding common indoor and outdoor activity sounds.

Table 6
Noise Abatement Criteria

Activity Category	Noise Abatement Criteria (L_{eq}, dBA)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B, above.
D	---	Undeveloped lands.
E	52 (Interior)	Residences, motels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: 23 CFR Part 772, 2005.

2.6.1 Existing Conditions

Noise-sensitive land uses, called sensitive receptors, in the proposed project area consist of existing and permitted single-family residences and multi-family housing developments that fall into Category B of the NAC. Noise was monitored and modeled at various locations along the I-15 South corridor. Table 8 identifies the noise measurement locations and their respective measured noise levels. Short-term (20-minute) noise measurements were conducted at 10 residential locations that are representative sites for the sensitive receptors within the project corridor. Long-term (21- to 43-hour) measurements were also conducted at 6 receptors.

TABLE 7
TYPICAL SOUNDS AND THEIR CORRESPONDING NOISE LEVELS

OUTDOOR NOISE LEVELS	NOISE LEVEL DECIBELS	INDOOR NOISE LEVELS
JET FLYOVER @ 1000 ft (304.80m) 	110	ROCK BAND 
GAS LAWN MOWER @ 3ft (.91m) 	100	INSIDE SUBWAY TRAIN (NEW YORK CITY) 
DIESEL TRUCK @ 50ft (15.24m) 	90	FOOD BLENDER @ 3 ft (.91m) 
NOISY URBAN DAYTIME 	80	GARBAGE DISPOSAL @ 3 ft (.91m) 
GAS LAWN MOWER @100ft (30.48m) 	70	SHOUTING @ 3 ft (.91m) 
FHWA NOISE IMPACT CRITERIA	**66**	*NDOT TRAFFIC NOISE POLICY (2/14/03)*
HEAVY TRAFFIC @ 300ft (91.44m) 	60	NORMAL SPEECH @ 3 ft (.91m) 
QUIET URBAN DAYTIME 	50	LARGE BUSINESS OFFICE 
QUIET URBAN NIGHTTIME 		DISHWASHER IN THE NEXT ROOM 
QUIET SUBURBAN NIGHTTIME 	40	LARGE CONFERENCE ROOM (BACKGROUND) 
QUIET RURAL NIGHTTIME 	30	LIBRARY 
RUSTLING LEAVES 	20	BEDROOM AT NIGHT 
MOSQUITO @ 3 ft (.91M) 	10	CONCERT HALL (BACKGROUND) 
THRESHOLD OF HEARING	0	BROADCAST / RECORDING STUDIO (BACKGROUND) 
		THRESHOLD OF HEARING

Table 8
Noise Measurements

Site Number	Address	Noise Levels, dBA Leq
ST1	2815 Villanova Court, Building 35, Unit 1015	63.0[1]
ST2[2]	8080 Giles Street	64.0[1]
ST3[2]	8445 Las Vegas Boulevard South, Building 24, Unit 1002/1003	70.0[1]
ST4	Scalise Court cul-de-sac	60.0 / 61.0[1]
ST5	7181 Dean Martin Drive	75.0[1]
ST6	9604 Gary Avenue	68.0[1]
ST7	2850 Silverado Ranch Boulevard	66.0[1]
ST8[2]	52 Saddle Avenue	57.0[1]
ST9	2711 W. Windmill Lane	68.0[1]
ST10	2815 Villanova Court	64.0[1]
LT1[2]	9000 Las Vegas Boulevard South, Building 38, Unit 1035	66.3
LT2[2]	13 Bellcrest Court	64.9
LT3	6055 Pyle Avenue	60.8
LT4	1197 Dale Avenue	61.5
LT5	3239 Rapale Lane	54.3
LT6	1671 W. Neal	60.7

[1] Noise levels adjusted to reflect peak traffic noise hours.
[2] Measurement sites along Las Vegas Boulevard South.
dBA – A-weighted decibel
L_{eq} – equivalent sound level

Source: Parsons, 2006. Noise Study and Barrier Analysis Report – I-15 South Corridor Improvement Project – Sloan Road to Tropicana Avenue. May.

2.6.2 Impacts

A traffic noise analysis was completed to identify impacts and evaluate mitigation measures. A traffic noise impact occurs when predicted traffic noise levels "approach or exceed" the NAC or when the predicted noise levels "substantially exceed" the existing noise levels (23 CFR 722.5, g). NDOT defines "approach" as 1 A-weighted decibel (dBA) less than the FHWA impact criteria listed in Table 6 and "substantially greater" as a predicted noise increase equal to or greater than 15 dBA. Table 9 summarizes the results of the modeling. Figures 10a through 10i show the location of the noise receivers and monitoring locations listed in Table 9.

Table 9
Predicted Noise Levels and Soundwall Recommendations

Receiver Number	Land Use	Existing Noise Levels, dBA, $L_{eq}(h)$	Predicted Noise Levels, dBA, $L_{eq}(h)$	Mitigated Noise Levels, dBA, $L_{eq}(h)$	Wall Type/ Location/Number or Reason Wall Not Recommended	Wall Dimensions[1]	
						Height (feet)	Length (feet)
Las Vegas Boulevard							
LVB R1.1	SFR	51	55		No impact		
LVB R1.2	SFR	53	57		No impact		
LVB R1.3	SFR	53	57		No impact		
LVB R1.4	SFR	50	53		No impact		
LVB R2.1	SFR	55	59		No impact		
LVB R2.2	SFR	56	60		No impact		
LVB R2.3	SFR	59	63		No impact		
LVB R2.4	SFR	58	62		No impact		
LVB R2.5	SFR	57	60		No impact		
LVB R2.6	SFR	56	60		No impact		
LVB R3.1	SFR	46	50		No impact		
LVB R3.2	SFR	57	54		No impact		
LVB R3.3	SFR	47	51		No impact		
LVB R3.4	SFR	46	50		No impact		
LVB R3.5	SFR	47	51		No impact		
LVB R3.6	SFR	47	51		No impact		
LVB R3.7	SFR	50	55		No impact		
LVB R3.8	SFR	56	63		No impact		
LVB R4.1	SFR	54	57		No impact		
LVB R4.2	SFR	55	58		No impact		
LVB R4.3	SFR	55	59		No impact		
LVB R5.1	MFR	68	72	63	New/Property Line/S567[2]	8	392
LVB R5.2	MFR	67	71	60	New/Property Line/S571[2]	10	299
LVB R5.3	SFR	47	51		No impact		
LVB R5.4	SFR	46	49		No impact		
LVB R5.5	SFR	50	53		No impact		
LVB R5.6	SFR	51	55		No impact		
LVB R5.7	HOT	65	63		No impact		
LVB R5.8	MFR	67	65		No impact		
LVB R5.9	SFR	66	65		No impact		

[1]For the range of soundwall heights that were modeled, see the *Noise Study and Barrier Analysis Report* (Parsons, May 2006).
[2]When not an NDOT facility, listed soundwalls are only for illustration. NDOT does not propose to construct these soundwalls.

HOT – Hotel
MFR – Multi-family residential
SFR – Single-family residential

Table 9
Predicted Noise Levels and Soundwall Recommendations

Receiver Number	Land Use	Existing Noise Levels, dBA, $L_{eq}(h)$	Predicted Noise Levels, dBA, $L_{eq}(h)$	Mitigated Noise Levels, dBA, $L_{eq}(h)$	Wall Type/ Location/Number or Reason Wall Not Recommended	Wall Dimensions[1]	
						Height (feet)	Length (feet)
LVB R5.10	SFR	61	64		No impact		
LVB R5.11	SFR	65	68	63	New/Property Line/S576[2]	12 10	267 319
LVB R5.12	SFR	64	67	60			
LVB R5.13	SFR	63	67	61			
LVB R5.14	MFR	62	66	58 or 59	New/Right-of-Way/ S586[2]	10 14	613 360
LVB R5.15	MFR	63	66	58 or 59			
LVB R5.16	MFR	66	64		No impact		
LVB R5.17	MFR	65	63		No impact		
LVB R5.18	MFR	68	67		Soundwall not feasible[3]		
LVB R5.19	MFR	60	61		No impact		
LVB R6.1	SFR	52	53		No impact		
LVB R6.2	SFR	43	43		No impact		
LVB R6.3	MFR	70	70	60	New/Property Line/S547[2]	10	423
LVB R6.4	MFR	70	70	60	New/Property Line/S551[2]	10	294
LVB R6.5	SFR	54	59		No impact		
LVB R6.6	SFR	53	53		No impact		
LVB R6.7	SFR	52	53		No impact		
LVB R6.8	SFR	51	51		No impact		
LVB R6.9	SFR	50	50		No impact		
LVB R6.10	SFR	46	46		No impact		
LVB R7.1	SFR	64	55		No impact		
LVB R7.2	SFR	51	51		No impact		
LVB R7.3	SFR	53	53		No impact		
LVB R8.1	HOT	61	61		No impact		
I-15							
R1.1	SFR	57	65		No impact		
R2.1	MH	53	63		No impact		
R2.2	MH	53	63		No impact		
R2.3	MH	51	60		No impact		
R2.4	SFR	63	56		No impact		

[1]For the range of soundwall heights that were modeled, see the *Noise Study and Barrier Analysis Report* (Parsons, May 2006).

[2]When not an NDOT facility, listed soundwalls are only for illustration. NDOT does not propose to construct these soundwalls.

[3]Not feasible means a minimum 5-dBA noise reduction cannot be achieved with a practical height soundwall, determined to be a soundwall higher than 22 feet.

HOT – Hotel
MFR – Multi-family residential
MH – Mobile home
SFR – Single-family residential

Table 9
Predicted Noise Levels and Soundwall Recommendations

Receiver Number	Land Use	Existing Noise Levels, dBA, $L_{eq}(h)$	Predicted Noise Levels, dBA, $L_{eq}(h)$	Mitigated Noise Levels, dBA, $L_{eq}(h)$	Wall Type/ Location/Number or Reason Wall Not Recommended	Wall Dimensions[1]	
						Height (feet)	Length (feet)
R2.5	SFR	62	55		No impact		
R3.1	SFR	54	60		No impact		
R3.2	SFR	64	71	64	New/Shoulder/S305	18 14	1,400 633
R3.3	SFR	64	72	66			
R3.4	SFR	64	73	66			
R3.5	SFR	63	71	63			
R3.6	SFR	64	72	65			
R3.7	SFR	54	61				
R3.8	SFR	59	65				
R3.9	SFR	56	63		No impact		
R3.10	SFR	61	72		Not cost effective		
R3.10A	SFR	61	71		Not cost effective		
R4.1	SFR	55	60		No impact		
R4.1A	SFR	67	62	60	New/Shoulder/S347	12 16 20 18 16	246 139 358 422 3,144
R4.2	SFR	54	59				
R4.2A	SFR	68	65	61			
R4.2B	SFR	68	66	61			
R4.3	SFR	61	68	60			
R4.3A	SFR	62	70	62			
R4.4	SFR	61	71	63			
R4.5	SFR	63	72	66			
R4.5A	SFR	63	72	65			
R4.6	SFR	61	69	60			
R4.6A	SFR	63	71	65			
R4.7	SFR	62	70	61			
R4.8	SFR	62	69	62			
R4.9	SFR	52	59	55			
R4.10	SFR	52	59	55			
R4.11	SFR	55	60	60			
R4.12	SFR	68	71	65			
R4.13	SFR	71	73	66			
R4.14	SFR	70	73	66			
R4.15	SFR	66	69	63			
R5.1	SFR	65	73		Not cost effective		
R5.2	SFR	57	66		Not cost effective		
R5.3	SFR	61	69		Not cost effective		
R5.4	SFR	58	67		Not cost effective		

[1]For the range of soundwall heights that were modeled, see the *Noise Study and Barrier Analysis Report* (Parsons, May 2006).
SFR – Single-family residential

Table 9
Predicted Noise Levels and Soundwall Recommendations

Receiver Number	Land Use	Existing Noise Levels, dBA, $L_{eq}(h)$	Predicted Noise Levels, dBA, $L_{eq}(h)$	Mitigated Noise Levels, dBA, $L_{eq}(h)$	Wall Type/ Location/Number or Reason Wall Not Recommended	Wall Dimensions[1]	
						Height (feet)	Length (feet)
R5.5	SFR	61	69		Not cost effective		
R5.6	SFR	58	66		Not cost effective		
R5.7	SFR	65	73		Not cost effective		
R5.8	SFR	58	66		Not cost effective		
R5.9	SFR	61	68		Not cost effective		
R5.10	SFR	51	59		No impact		
R5.11	SFR	51	59		No impact		
R5.12	SFR	58	66		No impact – structure demolished		
R5.13	SFR	58	66		Not cost effective		
R6.1	SFR	70	62		No impact – structure demolished		
R6.2	SFR	68	64		No impact – structure demolished		
R6.3	SFR	67	65		No impact – structure demolished		
R6.4	SFR	54	60		No impact		
R6.5	SFR	70	70		No impact – structure demolished		
R6.6	SFR	67	71		No impact – structure demolished		
R6.7	SFR	67	72		Not cost effective		
R6.8	SFR	68	73		Not cost effective		
R6.9	SFR	55	60		No impact		
R6.10	SFR	55	60		No impact		
R6.11	SFR	64	69		Not cost effective		
R6.12	SFR	64	69		Not cost effective		
R6.13	SFR	59	64		No impact		
R6.14	SFR	61	69		Not cost effective		
R6.15	SFR	59	64		No impact		
R6.16	SFR	58	63		No impact		
R6.17	SFR	58	65		Not cost effective		
R6.18	SFR	59	66		Not cost effective		
R6.19	SFR	58	62		No impact		
R6.20	SFR	55	59		No impact		
R6.21	SFR	67	78		Not cost effective		
R6.22	MFR	66	61		No impact		
R6.23	MFR	65	64		No impact		
R6.24	SFR	62	65		No impact		

[1]For the range of soundwall heights that were modeled, see the *Noise Study and Barrier Analysis Report* (Parsons, May 2006).
MFR – Multi-family residential
SFR – Single-family residential

Table 9
Predicted Noise Levels and Soundwall Recommendations

Receiver Number	Land Use	Existing Noise Levels, dBA, $L_{eq}(h)$	Predicted Noise Levels, dBA, $L_{eq}(h)$	Mitigated Noise Levels, dBA, $L_{eq}(h)$	Wall Type/ Location/Number or Reason Wall Not Recommended	Wall Dimensions[1]	
						Height (feet)	Length (feet)
R6.25	SFR	62	66	59	New/Shoulder/S280	18 16 14 12 14	1382 200 200 600 498
R6.26	SFR	62	67	62			
R6.27	SFR	62	67	60			
R6.28	MFR	65	70	65			
R6.29	MFR	66	71	64			
R6.30	MFR	66	69	63			
R6.31	MFR	68	66	61			
R6.32	MFR	60	65		No impact		
R6.33	MFR	61	65		No impact		
R7.1	SFR	63	69		Not cost effective		
R7.1A	SFR	55	60		No impact		
R7.2	SFR	54	58		No impact		
R7.3	SFR	65	70		Not cost effective		
R7.4A	MFR	64	69	64	New/Shoulder/S484	12 10 12	2,653 700 400
R7.4	MFR	64	69	63			
R7.5	MFR	63	69	64			
R7.6	MFR	62	70	63			
R7.7	MFR	62	70	64			
R7.8	MFR	66	72	66			
R7.9	MFR	70	75	66			
R7.10	MFR	66	73	66			
R7.11	MH	66	71	65			
R7.12	MH	68	73	65			
R7.13	MH	69	65		New/Shoulder/S484[3]	10 8	322 878
R7.14	MH	68	61				
R7.15	MH	63	58				
R7.16	MH	59	58				
R7.17	MH	60	59				
R8.1	SFR	50	52		No impact		
R8.2	SFR	50	53		No impact		
R8.3	SFR	50	53		No impact		
R8.4	SFR	52	55		No impact		
R8.5	SFR	75	60		No impact		
R8.6	SFR	61	63		No impact		
R8.7	SFR	61	64		No impact		

[1]For the range of soundwall heights that were modeled, see the *Noise Study and Barrier Analysis Report* (Parsons, May 2006).

[2]Not feasible means a minimum 5-dBA noise reduction cannot be achieved with a practical height soundwall, determined to be a soundwall higher than 22 feet.

[3]Soundwall not required for noise abatement but replaces existing wall that would be removed by the project.

MFR – Multi-family residential
MH – Mobile home
SFR – Single-family residential

Construction

Noise during construction would be intermittent and intensity would vary. The degree of construction noise impacts would vary for different areas of the project and depending on the construction activities.

2.6.3 Mitigation

Noise abatement measures were evaluated by modeling a soundwall shielding the sensitive receivers. Soundwalls were determined to be the most reasonable and feasible mitigation option to reduce the long-term traffic noise impacts. Soundwalls would be constructed early in the project, as feasible, to mitigate construction noise.

For a barrier to be considered effective, it must be physically "feasible" and economically "reasonable." A barrier is considered "feasible" when it provides a minimum 5-dBA reduction for the first row of residents. In agreement with NDOT Environmental Services, $15,000 per resident was used to reflect the increase in construction costs as a guideline for determining if a barrier is considered economically "reasonable" and uses the Nevada demographics average of 2.6 residents per dwelling. The estimated cost of soundwalls was based on the current Clark County unit cost for a standard soundwall of $24 per square foot. The following summarizes the soundwalls that would provide adequate mitigation but are not cost effective, and therefore, are not recommended.

- Receivers 3.10 and 3.10A (Soundwall S318) – A soundwall along the NB I-15 ROW line would benefit 2 single-family residential units and would be 18 feet high. The cost effectiveness allowance for this soundwall is $78,000, and the estimated cost is $597,924.

- Receivers 5.1 through 5.9 (Soundwall S411) – A soundwall along the SB I-15 shoulder would benefit 8 single-family residential units and would range in height from 16 feet to 20 feet. The cost effectiveness allowance for this soundwall is $312,000, and the estimated cost is $1,232,092.

- Receiver 5.13 (Soundwall S414) – A soundwall along the NB I-15 shoulder would benefit 1 single-family residential unit and would range in height from 14 feet to 16 feet. The cost effectiveness allowance for this soundwall is $39,000, and the estimated cost is $870,400.

- Receivers 6.7, 6.8, 6.11, 6.12, 6.14, 6.17, 6.18, and 6.21 (Soundwall S285) – A soundwall along the SB I-15 ROW line would benefit 8 single-family residential units and would be 16 feet high. The cost effectiveness allowance for this soundwall is $312,000, and the estimated cost is $2,418,624.

- Receiver 7.1 (Soundwall S313) – A soundwall along the SB I-15 ROW would benefit 1 single-family residential unit and would be 16 feet high. The cost effectiveness allowance for this soundwall is $39,000, and the estimated cost is $399,840.

- Receiver 7.3 (Soundwall S337) – A soundwall along the SB I-15 ROW would benefit 1 single-family residential unit and would be 16 feet high. The cost effective allowance for this soundwall is $39,000, and the estimated cost is $651,712.

The recommended soundwalls are designed to reduce traffic noise levels by a minimum of 5 dBA, intercept the line-of-sight to truck exhaust stacks, and achieve an abatement level of 66 dBA. For the range of soundwall heights that were modeled, see the *Noise Study and Barrier Analysis Report* (Parsons, May 2006). See Figure 10a through 10i for locations of the recommended soundwalls. The following summarizes the recommended soundwalls as identified in Table 9. Soundwall height, length, and location would be determined during final design in coordination with NDOT Environmental Services Division.

- Soundwall S305 – This soundwall on the shoulder of I-15 would benefit 14 single-family residential units and would range in height from 14 feet to 18 feet (see Figure 10c).

- Soundwall S347 – This soundwall along the Starr Avenue SB off-ramp would benefit 50 single-family residential units and would range in height from 12 feet to 20 feet (see Figure 10d).

- Soundwall S280 – This soundwall along the NB I-15 shoulder would benefit 39 single- and multi-family residential units and would range in height from 12 feet to 18 feet (see Figure 10e)

- Soundwall S484 – This soundwall along the NB I-15 shoulder would benefit 80 single- and multi-family residential units and would range in height from 10 feet to 12 feet. In addition, receivers represented by R7.13 through R7.17 would not be impacted, but the soundwall is proposed to be extended in this area to replace the existing property wall (see Figure 10f).

When soundwalls are not for an NDOT facility, they are described for illustrative purposes only. NDOT does not propose to construct the following soundwalls.

- Soundwalls S567 and S571 – These soundwalls are at the property line along SB Las Vegas Boulevard South and are separated to allow access into the apartment complex. These soundwalls would benefit 12 multi-family residential units and would be 8 feet and 10 feet high, respectively (see Figure 10e).

- Soundwall S 576 – This soundwall at the property line along NB Las Vegas Boulevard South would replace the existing private property wall with a higher wall adjacent to the roadway. The soundwall would benefit 13 single-family residential units and would range in height from 10 feet to 12 feet (see Figure 10e).

- Soundwall S586 – This soundwall along the ROW line along NB Las Vegas Boulevard would benefit 23 multi-family residential units and range in height from 10 feet to 14 feet (see Figure 10e).

- Soundwalls S547 and S551 – These soundwalls at the property line along SB Las Vegas Boulevard South are separated to allow access into the apartment complex. These soundwalls would benefit 10 multi-family residential units and would be 10 feet high (see Figure 10f).

Construction

Mitigation measures for construction noise would be addressed in the contract documents, which would require the contractor to submit a noise control plan for review and approval by NDOT. The plan would specify how noise mitigation measures would be implemented during construction that occurs near residences. Contract specifications would address hours of operation and noise-level limits. Construction specifications would require performance of proper maintenance on construction equipment and that stationary equipment be placed as far away from homes as feasible.

2.7 Floodplain and Hydrologic Assessment[41]

2.7.1 Existing Conditions

The Clark County Regional Flood Control District (CCRFCD) has developed a drainage master plan that includes a series of storm drainage systems west of I-15. The agency has constructed several storm drainage systems, including channels, box culverts, storm drains, and retention basins, that are designed to hold and control the flow of surface waters, thus reducing the potential for flooding.

The watersheds in the area are Tropicana Wash, Blue Diamond Wash, and Duck Creek Wash. Offsite runoff flows easterly toward I-15 along the entire length of the project area.

[41] VTN. 2006. *Conceptual Offsite Hydrology and Conceptual Drainage Design Report.* June.

Runoff crosses I-15 and Las Vegas Boulevard through a series of cross-culverts, entering pipelines and box culverts that convey flows to the east (see Figure 17). Federal Emergency Management Administration (FEMA) mapping indicates that several areas are designated as Zone A (i.e., within a 100-year floodplain). These include areas around Tropicana Avenue (near the northerly limit) and Cactus Avenue (near the southerly limit), which are designated as Zone A because of the ponding of offsite flows against the I-15 roadway embankment. In addition, Zone A delineations follow natural washes (i.e., crossing both the I-15 and Las Vegas Boulevard alignments) where planned flood control facilities have not been completed.

Four regulatory floodways where development and/or improvement must not raise the base flood elevations by more than 1-foot occur in the project area at Blue Diamond Wash (between Windmill Lane and Shelbourne), Duck Creek/Blue Diamond Wash (between Windmill Lane and Wigwam), Duck Creek Wash – Tributary 4 (between LeBaron and Pyle), and Duck Creek Wash – Main Branch (between LeBaron and Cactus Avenue).

2.7.2 Impacts

Overall Flow Increases: Construction of additional lanes on I-15, widening Las Vegas Boulevard, and interchange construction/modification would not increase peak runoff to adjacent and downstream properties. A small increase in runoff may occur because of the additional paving and the resulting increase in impermeable area along the corridor. Given the large basin areas tributary to the drainage crossings and the large time-to-peak differences between onsite and offsite drainage areas, this increase in runoff would not affect peak offsite runoff.

I-15: Overtopping of the I-15 roadway occurs during high-intensity rainfall events near Cactus Avenue, Pyle Avenue, and Blue Diamond Road. Proposed interchange ramps at Cactus Avenue, along with overpass approaches at Cactus Avenue and Pebble Road, would impact the existing northerly conveyance of these overtopping flows.

Las Vegas Boulevard Widening: South of Sunset Road, the Las Vegas Boulevard South widening would overlay some minor offsite washes paralleling the roadway.

2.7.3 Mitigation

I-15: New offsite conveyance systems would be required in these locations to keep ponding limits from exceeding those under existing conditions under the Build Alternative. The I-15/Cactus Avenue interchange (centered on Duck Creek Wash) would require offsite drainage improvements. The CCRFCD Master Plan shows that approximately 2,900 cubic feet per second (cfs) (100-year storm flow) are directed to this location. To perpetuate drainage patterns, a portion of this flow (1,600 cfs) would be directed north, along the west edge of I-15 (crossing the Cactus Avenue roadway embankment). The remaining flow would be directed across I-15 back to Duck Creek Wash. Grading would be required east of I-15 to maintain drainage patterns and return flows to their natural water courses without adversely impacting upstream watercourse hydraulics.

Las Vegas Boulevard Widening: To accommodate anticipated development, these flows would be conveyed along realigned ditches or via storm drain systems below the roadway prism to the largest extent possible.

Floodplain impacts would be minimized by improving the offsite drainage system of the highway, by designing drainage systems in consultation with CCRFCD, and by incorporating designs that perpetuate existing flow patterns without increasing upstream water levels.

Drainage and flood control systems would be designed in consultation with CCRFCD and in accordance with the CCRFCD Flood Control Master Plan for the Las Vegas Valley.

2.8 Water Resources

2.8.1 Existing Conditions

Surface Water: The project area is located within the sub-watersheds for the Tropicana, Blue Diamond, and Duck Creek Washes within the Las Vegas Wash Watershed (Hydrologic Unit Code 15010015). The sub-watersheds are characterized by steep mountain washes in the upper reaches (west of I-15), discharging to broad alluvial valleys (east of I-15) in a general southwest to northeast direction.

Perennial waterways are not present within the project limits; however, several potential jurisdictional ephemeral drainages, which convey water only during storm events, cross I-15 and Las Vegas Boulevard South within the project limits and potentially discharge into the Las Vegas Wash. Many of the culverts perpetuate urban stormwater runoff with flows dissipating across downstream landscapes. The overall lack of annual streamflow is evidenced by the establishment of mature, upland vegetation within many of the stream channels.

The historical flow paths of the ephemeral drainages have been altered by urbanization and regional flood control projects. Wetlands or other special aquatic sites are not present within the project limits. Aquatic life is not supported within any of the impacted waterways.

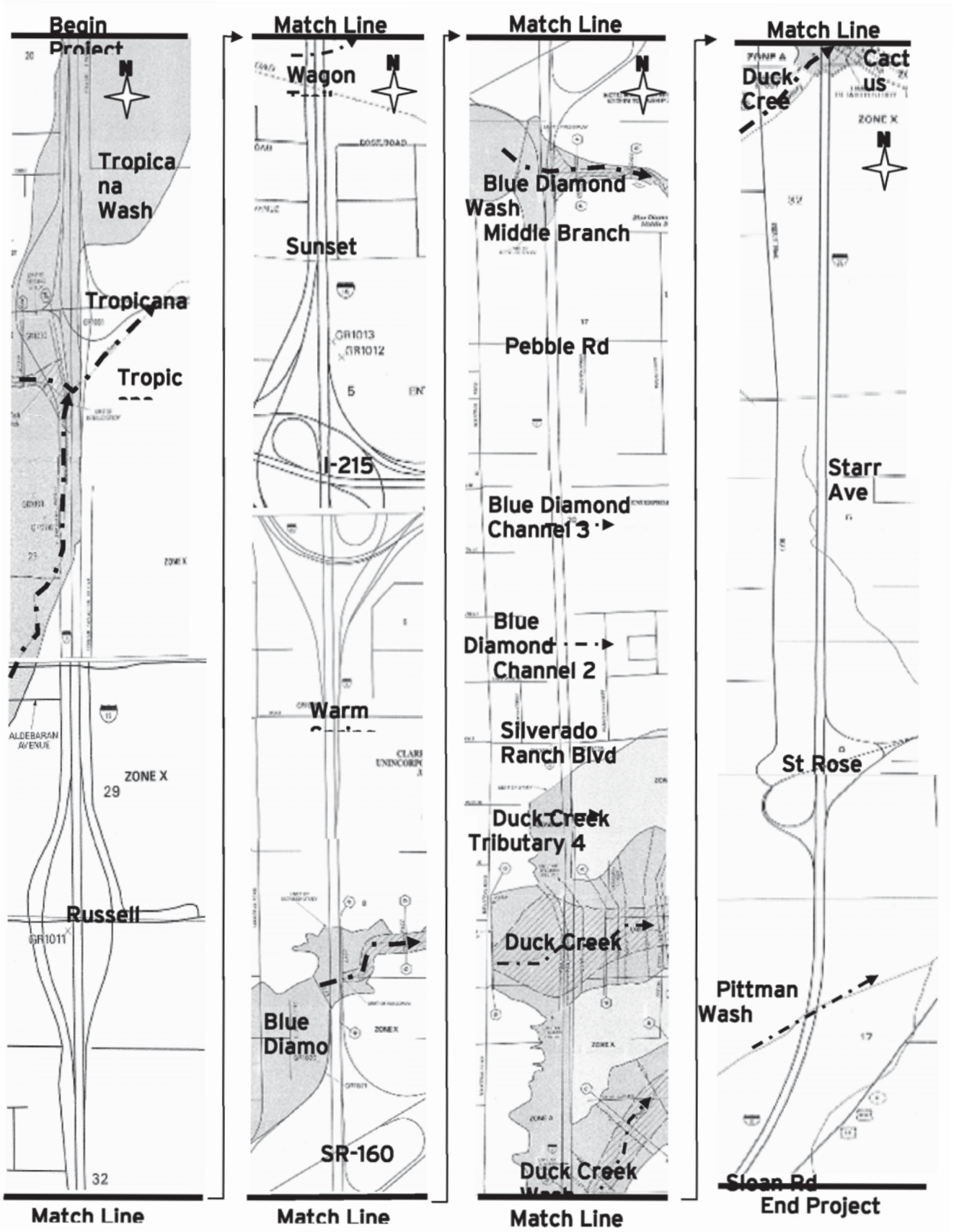
Groundwater: Static water levels obtained from the Nevada Division of Water Resources indicate initial groundwater depths in the project vicinity of 85 to 100 feet below the ground surface. The groundwater regime is identified as the "Principal Aquifer," which is used for a portion of the drinking water supply in the Las Vegas area. The surficial soils vary throughout the project area, but they are dominated by fine sandy loams in hydrologic soil group D with more gravelly loams in the streambed areas, which are characterized as hydrologic soil group A. The Type D soils, which dominate the area, exhibit low infiltration rates.

Water Quality: Due to the ephemeral nature of the drainages within the project limits, precipitation events more than likely result in pulses (load and/or concentration) of sediment, in addition to typical urban highway pollutant constituents (e.g., heavy metals, hydrocarbons, pesticides, debris) conveyed downstream. The final discharge point of the larger ephemeral drainages is the Las Vegas Wash, which is located 12 miles northeast of the project area. The Las Vegas Wash is currently listed on Nevada's 303(d) Impaired Waters list. Total maximum daily loads for total ammonia and total phosphorus are established for each reach of the Las Vegas Wash between Telephone Line Road and Lake Mead with iron and total dissolved solids listed as pollutants of concern. The Nevada Division of Environmental Protection (NDEP), who retains statutory authority for water quality, does not classify specific water quality standards for ephemeral washes due to streamflow conveyance times of one day or less in direct response to precipitation events.

2.8.2 Impacts

Surface Water: Several drainage structures (e.g., culverts and reinforced concrete boxes) would be extended as part of the I-15 widening. The extension of these drainage structures would result in a discharge of fill material within 0.24-acre of ephemeral stream channel. A jurisdictional determination would be required to determine if the ephemeral drainages fall under the jurisdiction of the United States Army Corps of Engineers (USACE). If any drainage is deemed a jurisdictional Waters of the United States, impacts would qualify for the Section 404 Nationwide Permit issued by USACE. The extension of the drainage structures would not alter flow capacity.

During precipitation events, it is expected that a lag time would occur for peak runoff between offsite flows and runoff associated with I-15. The increase in impervious surface, in conjunction with the peak runoff lag time, should result in only minor increases in peak flows downstream of the project area; therefore, impacts at the watershed level should be low.



NEVADA DOT

I-15 SOUTH CORRIDOR IMPROVEMENTS
ENVIRONMENTAL ASSESSMENT
FEMA Map with Streams Along Project Alignment
FIGURE 17

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Groundwater: Excavation for the proposed project would not exceed 2 to 3 feet, with the exception that spot excavations of 25 to 30 feet may be required for the installation of drainage facilities, structural foundations, and signs. Due to limited excavation depths, impacts to groundwater are not expected. The potential impact to groundwater is minimal due to the low infiltration rates of area soils, coupled with the large depth to groundwater in the project area.

Water Quality: Nonstabilized fill material and the inadvertent discharge of equipment fluids could enter the ephemeral drainage channels during construction. The increases in stormwater flows resulting from the increased impervious surface area could lead to increases in highway pollutant loading into the ephemeral drainages during the precipitation events (e.g., sediment, nutrients, heavy metals). Several regional flood control structures are present downstream of the project limits to capture stream flow conveyed within the larger ephemeral drainages, allowing for sediment deposition and nutrient attenuation prior to discharge into Las Vegas Wash.

2.8.3 Mitigation

Surface Water

Surface Water: Because the increase of impervious surface in the area would be minimal, mitigation measures for flow reduction are unnecessary. If any of the ephemeral drainages potentially impacted by the proposed project are determined to be jurisdictional waters of the U.S., the project would comply with all of the conditions and stipulations stated in the Section 404 Nationwide Permit.

Groundwater: No impacts to groundwater are expected; therefore, mitigation measures would not be necessary. If previously unidentified wells are encountered during project construction, the contractor is responsible for notifying the Nevada Department of Water Resources and for retaining a Nevada-licensed driller to properly abandon the well, if necessary.

Water Quality: In addition to securing a Section 404 Permit for the discharge of fill material into a Waters of the United States, Section 401 Water Quality Certification issued by NDEP, Bureau of Water Quality Planning, would also be required for water quality assurances. If construction equipment is required to enter any of the ephemeral stream channels, then a Temporary Working in Waterways Permit issued by NDEP, Bureau of Water Pollution Control, would be obtained by the contractor for water quality assurances as well.

As part of the freeway design, erosion control measures would be incorporated for site stabilization. The contractor would obtain a construction stormwater permit issued by NDEP, Bureau of Water Pollution Control. To secure coverage under this permit, the contractor would file a Notice of Intent (NOI) and develop a Stormwater Pollution Prevention Plan (SWPPP) identifying sources of onsite stormwater discharge into adjacent surface waters and describing the implementation of best management practices (BMPs) to prevent or reduce to the maximum extent possible said discharges.

2.9 Cumulative Impact Analysis

2.9.1 Introduction

Purpose and Regulatory Basis

This proposed project is in response to the growth planned in the southern Las Vegas Valley, which will require I-15 to be a major transportation corridor to serve a predicted increase in average annual daily traffic as planned developments build out to capacity in the next 20 years.

NEPA requires that the potential direct, indirect, and cumulative impacts of a federal-funded or approved project be identified and evaluated. Within the context of NEPA, indirect effects are defined by the CEQ

as impacts that are "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR 1508.8). Cumulative impacts are defined as "the impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonable foreseeable future actions…" (40 CFR 1508.7). Logically, if a given project does not *directly* or *indirectly* impact a particular environmental resource, that project would not contribute to a *cumulative* impact on the resource.

FHWA and CEQ Guidance

This analysis is conducted in accordance with FHWA and CEQ regulations and guidance documents, including the January 1997 CEQ handbook entitled *Considering Cumulative Effects under the National Environmental Policy Act* (1997) and the April 1992 FHWA position paper entitled *Secondary and Cumulative Impact Assessment in the Highway Project Development Process*.

Methodology

Cumulative impacts associated with the proposed project are limited to unincorporated areas of Clark County and the City of Henderson. The 2030 design year was used as a future projection, consistent with the 2030 RTP, as described in Section 1, with a past time limit of 1990. Although growth in Clark County has been substantial in every decade since 1940, 1990 benchmarks the beginning of unprecedented population and job growth in the region, with the population increasing from 764,464 in 1990 to 1,752,240 in 2005.[44]

2.9.2 Overview of Past and Present Conditions

Land Use

The Las Vegas Valley environment has been impacted by a variety of development activities, including construction of highways, secondary roads, residential, and commercial development. The extent of past development activities has resulted in the loss of natural resources and an increase in urbanization. Residential and commercial development within the I-15 corridor has been ongoing since the late 1970s, with the rate of development increasing since that time.

Under the Southern Nevada Public Lands Management Act (SNPLMA), BLM has the authority to dispose of lands within Clark County that are under their jurisdiction. As such, beginning in the 1990s, land has been sold and became available for development. The Southern Highlands master-planned community, which is located in the southern portion of the corridor west of I-15, is a major development that resulted from the sale of land. See Figure 10 for the location of master-planned communities within the project study area.

Local Transportation Development Projects

Over the past 5 years, NDOT and Clark County have made improvements to the I-15 South corridor. Both the St. Rose Parkway and Blue Diamond Road interchanges with I-15 are under construction to improve the operational characteristics of each interchange in response to the rapid growth within the Las Vegas Valley. Construction began on the Silverado Ranch Boulevard interchange with I-15 in summer 2006 and will be completed in fall 2007. NDOT is also making improvements to NB I-15 from Primm, at the Nevada-California border, to Sloan Road.

NDOT, Clark County, and the City of Henderson have made improvements to several arterial streets within the I-15 South corridor, including St. Rose Parkway, Silverado Ranch Boulevard, and Blue Diamond Road. In the northern portion of the project area, Clark County constructed Frank Sinatra Drive, which serves as an alternative travel route to the Resort Corridor, in the early 2000s.

[44] Clark County. 2005. *Comprehensive Plan* May.

Clark County Public Works completed construction on the initial facilities of the Bruce Woodbury Beltway, which forms a C-shaped loop around most of the Las Vegas Valley, in 2003. Within the I-15 corridor, construction of the ultimate facility was completed in 2000.

2.9.3 Other Reasonably Foreseeable Future Actions

Land Development

Due to the availability of land and the high in-migration rate that is creating demand for housing, businesses, and public services, developments are being planned and approved that will convert undeveloped land to residential, commercial, recreational, and urban open-space uses.

BLM recently sold approximately 2,300 acres, which were nominated by the City of Henderson as part of the Inspirada master-planned community. Growth in these outlying communities will increase demand on the I-15 South corridor.

Hotel, casino, and retail developments are in the planning phases along Las Vegas Boulevard South. These developments include the proposed M Resort in the southeast quadrant of Las Vegas Boulevard South and St. Rose Parkway, the Southern Highlands Resort and Casino in the northwest quadrant of Las Vegas Boulevard South and St. Rose Parkway, and a mixed-use retail development in the southwest quadrant of Las Vegas Boulevard South and Cactus Avenue.

Local Transportation Development Projects

Improvements to I-15 from Tropicana Avenue to Spring Mountain Road began in summer 2006. These improvements will add additional capacity to the freeway without major reconstruction. Additionally, the I-15 Express Lanes project will reconfigure the width of I-15 to include two express lanes in the median area in addition to the three and four through lanes in each direction from just north of I-215 to south of Sahara Avenue. Clark County and the City of Henderson will continue to improve local streets in accordance with their Master Plan of Streets and Highways. Clark County is proposing to extend Frank Sinatra Drive from St. Rose Parkway to Silverado Ranch Boulevard, adjacent to the I-15 ROW, as development occurs. A direct connection is planned between the I-15 NB off-ramp and Frank Sinatra Drive at St. Rose Parkway in the future.

NDOT has prepared a valleywide HOV system plan. This plan will result in additional HOV facilities throughout the I-15 corridor that would complement the HOV lanes recently constructed along United States Highway 95 (US 95) north of the I-15/US 95 interchange. The HOV plan identifies two HOV lanes in each direction from the I-15/US 95 interchange south to the I-15/I-215 interchange, and one HOV lane in each direction from the I-15/I-215 interchange south to the I-15/Sloan Road interchange. The Build Alternative would not preclude implementation of the HOV plan.[44]

RTC is proposing a 33-mile Regional Fixed Guideway system that would link the cities of Henderson, Las Vegas, North Las Vegas, and unincorporated Clark County with the Las Vegas Resort Corridor. One of the corridors under study is Las Vegas Boulevard South from Sloan to downtown Las Vegas. Additionally, RTC anticipates express bus routes to utilize HOV lanes after the HOV system has been developed throughout the corridor.

FAA is in the process of preparing an Environmental Impact Statement (EIS) to evaluate the proposed Southern Nevada Supplemental Airport. The airport is anticipated to be located 20 miles south of Las Vegas between Jean and Primm on 6,500 acres of land that was recently acquired from BLM. The Southern Nevada Supplemental Airport project could include dedicated lanes in the median of I-15 for direct access to the airport.

[44] Parsons. 2007. *I-15 South Traffic Re-evaluation of Design Modifications to Implement the Southern Nevada HOV Plan.* May.

The Federal Railroad Administration is analyzing a potential high-speed magnetic levitation train system linking Las Vegas to southern California along 270 miles of the I-15 corridor. The project is in the early phases of preparing a programmatic EIS. The Desert Xpress, which is a privately funded passenger railroad, is proposing to provide passenger rail service from Victorville, California, to Las Vegas utilizing I-15 ROW.

2.9.4 Analysis of Potential Cumulative Impacts

Based on the analysis of potential direct and indirect impacts that may result from the proposed I-15 South Corridor Improvement Project (Section 1.3) the Build Alternative is not anticipated to pose any cumulative impacts to the following resources:

- Cultural Resources
- Hazardous Waste/Materials
- Environmental Justice
- Air Quality
- Noise
- Floodplains

The proposed I-15 South Corridor Improvement Project may contribute to cumulative impacts to the following resources:

- Biological Resources
- Water Quality

As described in Section 2.9.2, the extent of past development activities has resulted in the loss of natural resources and an increase in urbanization. Residential and commercial development within the I-15 corridor has been ongoing since the 1970s, with the rate of development increasing since that time. Relative to the development that is ongoing and planned within the project area and in adjacent Clark County planning areas, the incremental cumulative impact of the proposed project on biological resources (tortoise habitat) is negligible. Mitigation measures identified in the Programmatic Biological Opinion between U.S. Fish and Wildlife Service and BLM and as part of the Clark County Desert Conservation Program and Multiple Species Habitat Conservation Plan address the valley-wide habitat impacts to the desert tortoise.

3. AGENCY COORDINATION AND PUBLIC INVOLVEMENT

3.1 Intent-to-Study Letter

An Intent-to-Study letter and list of agencies and individuals it was sent to can be found in Appendix A. This correspondence notified the recipients of NDOT's intention to study the proposed project, invited comments, and advised interested parties of the scheduled Public Information Meeting. Responses were received from various government agencies and members of the general public. Copies of comments are in Appendix B, followed by responses.

3.2 Information Meeting

An Information Meeting was held on May 5, 2005, from 4:00 p.m. to 7:00 p.m. at the Enterprise Library, 25 E. Shelbourne Avenue, Las Vegas, Nevada. Representatives from FHWA and NDOT and the consultant team explained the proposed project and were available to receive comments and answer questions. A court reporter was present to transcribe comments from attendees who preferred to make a verbal statement, which became part of the administrative record. Thirty-three (33) people attended the meeting, and four people provided statements to the court reporter.

Written and verbal comments and responses are presented in Appendix B.

3.3 Technical Advisory Committee

As part of the project development process, a TAC was formed. The TAC was comprised of representatives from NDOT, FHWA, BLM, RTC, Clark County Public Works, Clark County Department of Aviation, and City of Henderson. The TAC met monthly from February 2005 through November 2006 to develop and evaluate alternatives, and serve as technical advisors to the project team.

3.4 BLM Coordination

BLM was invited to participate in the project development process as a Cooperating Agency via letter dated March 9, 2005, and accepted Cooperating Agency status via letter dated January 31, 2006. A coordination meeting was held on June 21, 2006. NDOT and FHWA briefed BLM staff on the project description and status. BLM was an active participant in the project TAC throughout the project development process.

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