



I-15 Central Corridor

City of Las Vegas and Clark County, Nevada

Purpose and Need

June 2024

The I-15 Central Corridor project and this Purpose and Need statement are a product of previous studies, including most recently the Nevada Department of Transportation's (NDOT) I-15 Flamingo to Sahara Feasibility Study.¹ The Purpose and Need provides background information on the context of the study corridor and outlines the factors that contribute to the need for improvements and the resulting purpose for the project. It is a fundamental part of the National Environmental Policy Act (NEPA) process and provides the basis for identifying, evaluating, and screening alternatives.

PROJECT OVERVIEW

Interstate 15 (I-15) is the primary tourism and commerce corridor in southern Nevada and is essential to the regional economy. The I-15 Central Corridor evolved from the I-15 Flamingo to Sahara study to evaluate transportation deficiencies and potential improvements along this critical section of I-15 adjacent to the Resort Corridor (Las Vegas Strip), located in the City of Las Vegas and Clark County, Nevada.

As originally identified in the 2021 Flamingo to Sahara Feasibility Study, the I-15 Central Corridor NEPA study will further identify, develop, refine and analyze possible improvements to I-15 and the service interchanges and arterial roads within the 6.3-mile corridor between NDOT's Project NEON (Sahara Avenue/Oakey Boulevard) and the I-15 South Design-Build Project (I-15/Tropicana Avenue). This corridor includes the last section of I-15 to be upgraded adjacent to the Resort Corridor. The NEPA study also includes further consideration of a project proposed by the City of Las Vegas to extend Martin Luther King Boulevard (MLK) southerly along I-15 to Dean Martin Drive and a new I-15 high-occupancy

Regional I-15 Corridor Planning and Projects

The I-15 corridor in this region has been extensively studied and developed over the past 15 years. The following list includes key studies and projects affecting the I-15 Central Corridor:

- NDOT I-15 South Sloan Road to Tropicana EA – 2008
- NDOT Resort Corridor Study – 2009
- NDOT Project NEON EIS – 2010
- NDOT I-15 South Design Build – 2010
- NDOT Project NEON Design Build – 2018
- NDOT Southern Nevada HOV Plan & Addendum – 2018
- NDOT I-15 Tropicana EA – 2019
- City of Las Vegas MLK Extension Feasibility Study – 2021
- NDOT Flamingo to Sahara Feasibility Study - 2021
- NDOT I-15 Tropicana Design Build – 2023/25

¹ CA Group, I-15 Flamingo to Sahara Feasibility Study, July 2021.



vehicle (HOV) interchange at Meade Avenue, between Desert Inn Road and Sahara Avenue, as part of NDOT's ongoing development of a valley-wide managed lanes/HOV network.²

LOGICAL TERMINI AND INDEPENDENT UTILITY

As discussed above, the I-15 Central Corridor NEPA study will refine and analyze possible improvements to I-15 and the service interchanges and arterial roads within the 6.3-mile corridor between Oakey Boulevard and the I-15/I-215 system interchange. These endpoints (**Figure 1**) formed the logical termini of this study, allowing for the development of a project that could be constructed alone, served a meaningful purpose, and allowed environmental impacts to be studied on a sufficient scale. The proposed improvements included in the I-15 Central Corridor NEPA study include the City of Las Vegas' proposed southerly extension of Martin Luther King Boulevard as a "frontage road" (a continuous local road running parallel to I-15) from its present terminus at Oakey Boulevard to Dean Martin Drive at Twain Avenue.

The I-15 Central Corridor NEPA study expands the Flamingo to Sahara Feasibility Study concept of completing freeway and interchange improvements in the last section of I-15 to be upgraded between Project NEON and the I-15 South Project. It is now looking at a wider, longer transportation corridor that not only complements improvements already made north and south of this freeway segment but also includes completion of a parallel westside continuous frontage road. Thus, the I-15 Central Corridor improvements will close the remaining transportation link between Downtown and the Resort Corridor (Las Vegas Strip).

² NDOT, Southern Nevada HOV Plan Addendum, October 2018.

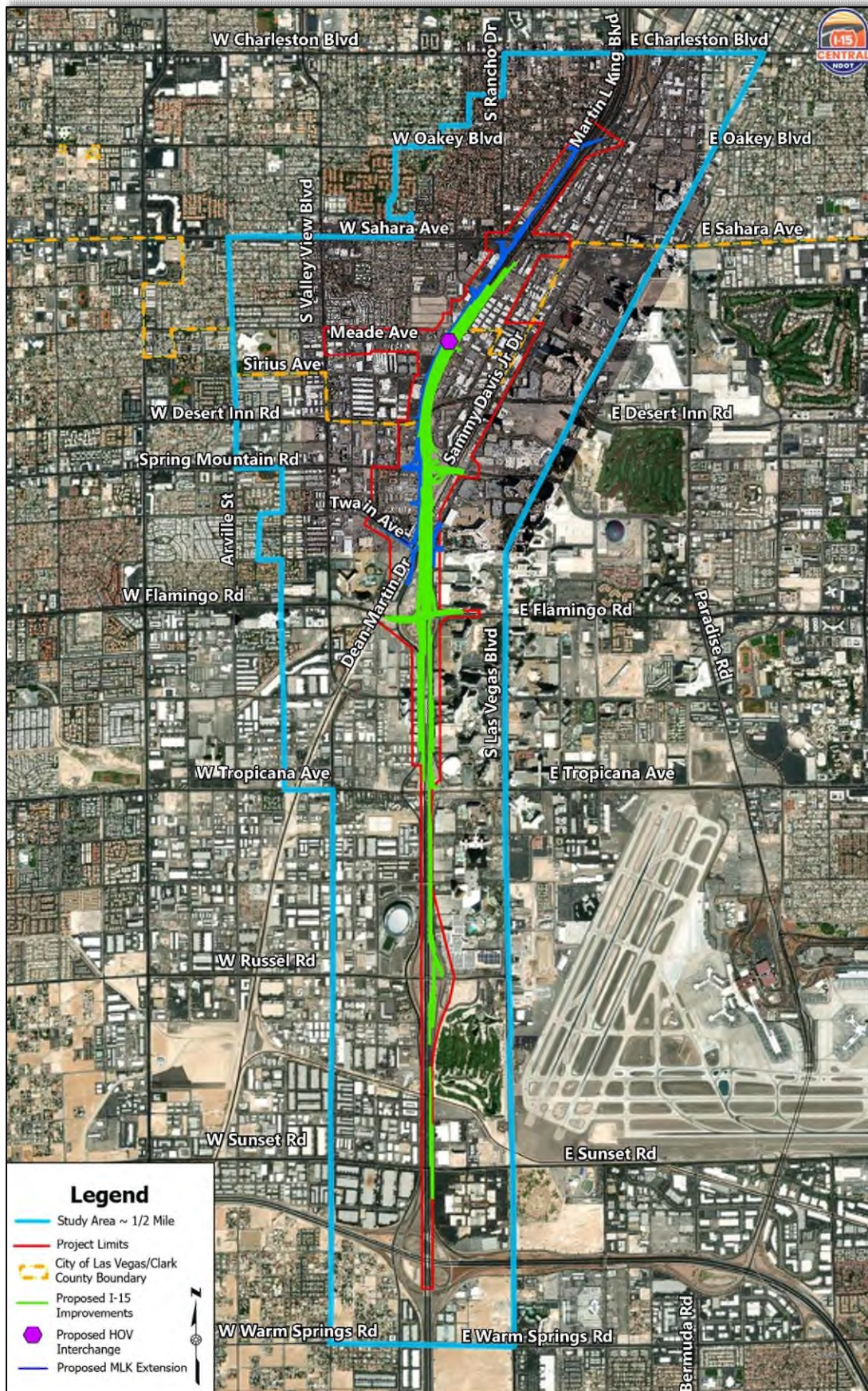


Figure 1. I-15 Central Corridor NEPA Study Area



The eastern and western study area along I-15 will vary as alternatives are further developed and refined. The NEPA study will cover sufficient area to assess impacts to transportation, the community, and the environment from improving I-15, extending MLK to Dean Martin Drive at Twain Avenue, constructing a new I-15/Meade Avenue HOV interchange connecting east of I-15 potentially to Highland Drive, and making related changes to other local streets in this corridor.

WHY IS THE PROJECT NEEDED?

Congestion within the I-15 Central Corridor results in delay and increased crash rates for all users. Additional traffic demand generated by the capacity improvements to the north (Project NEON) and south (I-15 South Design-Build) exacerbates existing pinch points between Tropicana Avenue and Sahara Avenue. The regional and interstate traffic demand through the study corridor is compounded by local traffic that relies on the interstate for short trips as the north-south, east-west access roadway. These factors drive the purpose for the project, which is to reduce travel delay, improve safety, and enhance local and regional connections.

The following are the key factors demonstrating the need for improvements in the study area.

1. Travel Delay

The I-15 Central Corridor NEPA study will analyze existing traffic conditions in 2023 and future conditions in 2050, and that data will be used to update this congestion analysis when it is available. The NEPA study is looking at traffic operations at the network³ and freeway segment levels, as well as analyzing the performance of the freeway interchanges and arterial connections in the corridor.

Congestion

Network-Wide: At the network level the 2017 PM (evening) peak period (3:30 PM to 6:30 PM) was congested with 2,294 vehicles unable to pass through the study segment (having to take other routes) and approximately 6 minutes of average network delay. The increase in delay was attributed to heavy congestion on northbound I-15 from Tropicana Avenue to Sahara Avenue.⁴

Morning and evening peak network delay values are summarized in **Table 1 and Table 2**.⁵ During the AM peak period, vehicles within the network had 143 seconds (approximately 2.4 minutes) of delay. In 2040, network vehicles were predicted to experience 176 seconds or nearly 3 minutes of delay. Without improvements, morning peak network delay would increase by 23 percent from 2017 to 2040.

During the evening peak, vehicles within the network experienced 373 seconds (approximately 6.3 minutes) of delay. In 2040, network vehicles were predicted to experience 323 seconds (approximately 5.4 minutes) of delay. Without improvements, the average evening peak network

³ The limits of the local street and freeway system analyzed in the project's traffic forecasting model.

⁴ CA Group, I-15 Flamingo to Sahara Feasibility Study, July 2021, pg. 7.

⁵ Parametrix, I-15 Flamingo to Sahara Feasibility Study Purpose and Need, August 2020, pg. 9.



delay is expected to decrease by 15 percent from 2017 to 2040, likely due to limited capacity and congestion restricting vehicle access.⁶

Table 1: AM Peak Network Delay

AM Peak Network Existing Conditions	2017	2040 (No Build)	% Change
Network Vehicles	107,590	141,907	32%
Total Network Delay (Hours)	4,273	6,946	63%
Average Network Delay (Seconds / Vehicle)	143	176	23%

Table 2: PM Peak Network Delay

PM Peak Network Existing Conditions	2017	2040 (No Build)	% Change
Network Vehicles	126,359	172,367	36%
Total Network Delay (Hours)	13,312	15,449	16%
Average Network Delay (Seconds / Vehicle)	379	323	-15%

Northbound I-15: At the freeway segment level, traffic density⁷ and speed were used to compare operations within the Aimsun Next model. It was found that due to heavy traffic exiting at Sahara Avenue, as well as the I-15/US 95 spaghetti bowl, northbound I-15 during the PM peak period operated at densities greater than 35 vehicles per mile per lane (veh/mile/lane) and speeds less than 50 mph in various segments; during the AM peak period, the segment from the Spring Mountain Road westbound on-ramp to the Sahara Avenue off-ramp experienced congestion with higher densities and lower speeds than under free-flow conditions.⁸

Southbound I-15: The majority of the southbound segments operated at a density less than 35 veh/mi/lane with speeds ranging from 55 to 60 mph. The segment between the Flamingo Road on-ramp and the Tropicana Avenue off-ramp operated at a density higher than 35 veh/mile/lane, potentially attributable to the higher volumes entering and exiting from Flamingo Road and Tropicana Avenue resulting in weaving between these ramps. During the AM peak period, almost all the segments operated at a density less than 35 veh/mile/lane and speeds greater than 50 mph.⁹

⁶ This modeled future average decrease in delay in the PM peak can be explained using the hourglass example. The sand in the top chamber is the total number of vehicles. After a certain period of time, while most of the sand has passed to the bottom chamber, there is still some sand in the top. If the size of the opening between the two chambers (which equates to the I-15 study segment) was larger, more sand would pass through. Traffic works the same way.

⁷ Density = number of vehicles per mile, per lane.

⁸ CA Group, I-15 Flamingo to Sahara Feasibility Study, July 2021, pg. 8.

⁹ Ibid., pg. 9.



Roadway and Operational Deficiencies

Northbound I-15

Northbound (NB) I-15 experiences congestion, primarily due to high peak period traffic volumes, weaving movements, and HOV egress between interchanges from north of Tropicana Avenue to Sahara Avenue. Specifically, interchange cross weaving, where both entrance ramps from Tropicana Avenue also serve as the Flamingo Road (1,600 feet) and Spring Mountain Road (3,000 feet) exit ramps, causes slowing between the interchanges. Also, the NB I-15 exit ramp to Sahara Avenue from the HOV lane exit, combined with the Spring Mountain Road entrance ramp and auxiliary lane requires HOVs accessing Sahara Avenue to navigate four lanes of general-purpose traffic in less than 4,000 feet, an insufficient distance for this maneuver.

At the southern end of the study limit, the I-15 NB collector-distributor (CD) road¹⁰ segment between the I-215 westbound (WB) on-ramp and Russell Road off-ramp is congested in the AM (morning) peak period (6:30 AM to 9:30 AM), with high vehicle density and low operating speeds. This is because the NB CD road between I-215 and Tropicana Avenue conveys both the WB I-215 to NB I-15 traffic as well as the eastbound (EB) and WB Russell Road to NB I-15 traffic. This traffic enters I-15 just south of Tropicana Avenue resulting in a high volume of vehicles entering the freeway at a single location (**Figure 2**). The entering traffic conflicts with NB I-15 traffic transitioning to use the I-15 Flamingo Road and Spring Mountain Road exit ramps. These factors also contribute to significant recurring NB congestion on I-15 and the CD road.

Southbound I-15

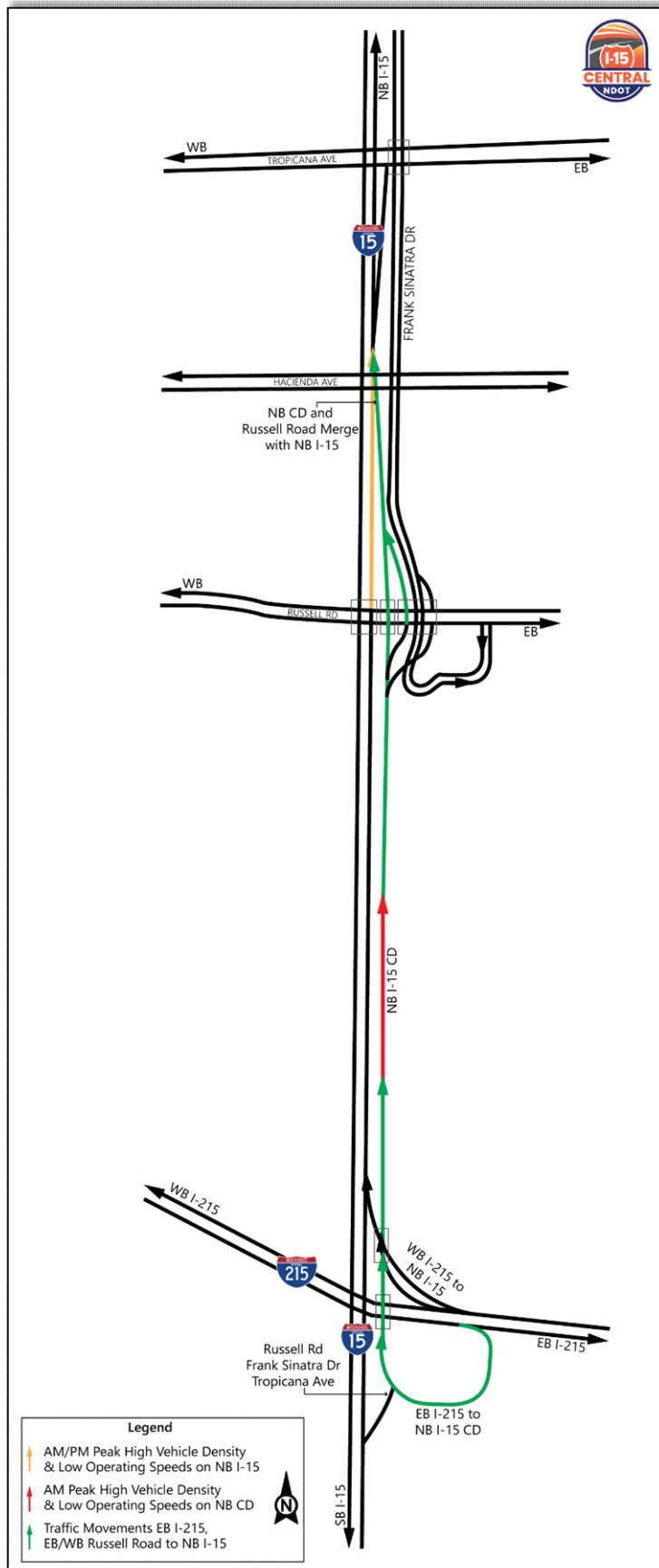
Southbound (SB) I-15 similarly experiences congestion from high peak period traffic volumes, and specifically traffic exiting to Flamingo Road. The Flamingo Road exit ramp consists of a low speed loop ramp and this ramp often backs up onto SB I-15. With the opening of Project NEON, traffic travels southbound at a higher flow rate, which exacerbates the problems with the SB exit ramp at Flamingo Road.

There are also weaving conflicts between the Flamingo Road and Tropicana Avenue ramps. All SB traffic experiences delays caused by vehicles entering from Flamingo Road and conflicting with traffic exiting at both Tropicana Avenue and the SB CD road just south of Tropicana. This weaving delay is magnified by the SB CD road exit providing the only I-15 access to Russell Road and Clark County 215 (CC-215). The SB CD road exits from I-15 in two lanes, which concentrates WB traffic exiting in the right-most lanes from as far north as Flamingo Road.

¹⁰ Collector-distributor roads are separated lanes paralleling I-15 that circulate traffic between I-15 and local interchanges.



Figure 2. Northbound I-15 CD Road Traffic Movements





2. Traffic Safety

For NDOT’s 2021 Feasibility Study, crash data in the study corridor from a 6-year period (2013 to 2018) was analyzed to inventory the crash rate and type of crashes occurring, allowing an understanding of what conditions could be contributing to safety concerns. Between 2013 and 2018, a total of 2,121 crashes occurred, including 691 injuries and 6 fatalities (see Figure 3)¹¹.

Of these, over half were rear ends and between 15 and 25 percent sideswipes, indicative of congestion and weaving, respectively. Rear-end crashes were higher in the northern segment, between Spring Mountain Road and Sahara Avenue, while the segment between Flamingo and Spring Mountain Road experienced a more even distribution of rear-ends and side-swipes.

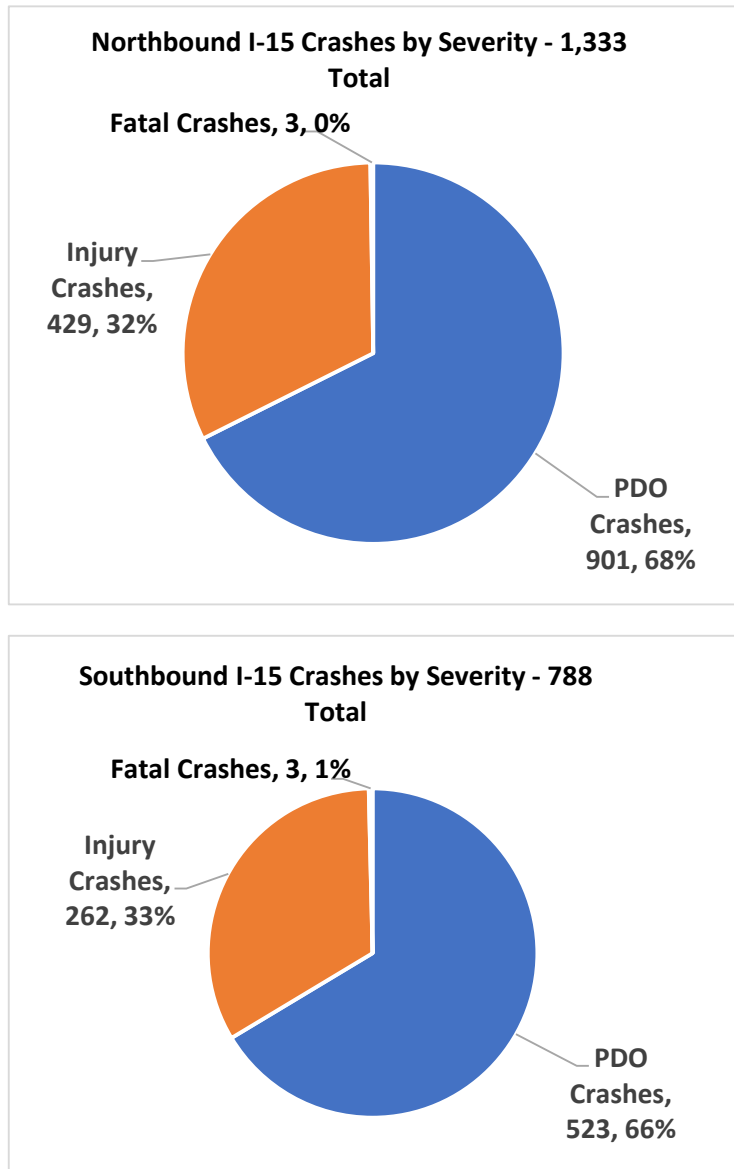


Figure 3. I-15 Crash History – 2013 to 2018

¹¹ PDO: Property Damage Only.

Over the Feasibility Study’s 6-year analysis period, I-15 had a major increase in crashes in the NB direction, with some reduction in the SB direction after the completion of Project NEON first phase improvements directly north of this segment of freeway. Crash “hot spots” were prevalent at all the interchanges in the corridor, but the areas of greatest crash frequencies were along I-15 NB, between Desert Inn Road and Sahara Avenue. The highest SB frequencies were between Spring Mountain Road and Flamingo Road. **Figure 4** illustrates these areas.



Figure 4. Crash Analysis Hot Spots
(Source: Parametrix, 2020)

NDOT measures roadway safety by the frequency and severity of vehicular crashes and pedestrian injuries/fatalities. The I-15 Central Corridor NEPA study is analyzing the most recent NDOT historical crash data for the last 5 years (2018 through 2022) in the study corridor. This



most recent period will reflect normal traffic conditions, unaffected by previous Project NEON construction immediately north of the study corridor. The crash rates for each of the project's roadways is being compared to the NDOT 2019 Functional Classification Crash Rates (statewide) for the same roadway classification.

3. Local and Regional Access and Connectivity

This project connects to the center of the Resort Corridor, which contains Nevada's highest levels of economic activity, employment and tourism. Many employees commuting to jobs located in the center core from residences to the north and northwest are compelled to utilize I-15 for short segments of their journey due to limited alternative roadway connectivity across I-15 and the Union Pacific Railroad (UPRR).

Local trips that cross I-15, or progress from point to point within the corridor, rely heavily on the interstate as the north-south, east-west access roadway. Local roadway connectivity through the I-15 Central Corridor, as it pertains to single continuous routes, is limited and could be improved greatly in order to provide attractive and functional alternative routing to today's required use of I-15. MLK was upgraded by Project NEON for improved north-south operations near I-15 but its termination at Oakey Boulevard limits arterial connectivity between Downtown Las Vegas and the Resort Corridor. The lack of arterial frontage road connectivity also hampers major I-15 incident management along the west side of the interstate.

Local Roadway Access and Connectivity

This paucity of arterial connectivity and the conflict between local and freeway trips led the City of Las Vegas to undertake a study of MLK in 2020 to identify improvements needed to extend and connect it with Dean Martin Drive near Twain Avenue. The MLK Extension concept design study included arterial improvements that have not yet been included in the Regional Transportation Plan (RTP). The MLK Extension will be evaluated in the I-15 Central Corridor NEPA document. A major north-south Union Pacific Railroad (UPRR) route runs adjacent to and across this portion of the I-15 corridor and presents major challenges to the viability of any potential improvements to safely improve local access and connectivity.

The Regional Transportation Commission of Southern Nevada (RTC) also recommended a project in the I-15 Central Corridor, as part of the 2016 Transportation Investment Business Plan (TIBP). It would extend Meade Avenue through an intersection with the proposed MLK Boulevard extension. Meade Avenue would then pass underneath the interstate and the UPRR to connect with Genting Blvd. This extension could directly link to I-15 via direct access HOV drop ramps (see following HOV Connections). It would also serve as an alternative for commuters for access to and from the Resort Corridor.

HOV Connections

Traffic operational improvement projects, including restriping of I-15 and creating new freeway access points for HOVs to implement NDOT's Southern Nevada HOV Plan and Addendum (2015 and 2018), have attempted to adjust lane use to better distribute (and reduce) congestion areas. The HOV Plan identified the need for direct HOV freeway access in the corridor, which is lacking



in the vicinity of the I-15/Sahara Avenue interchange. This will reduce the problem of congestion at and between the Flamingo Road and Sahara Avenue interchanges due to HOV weaving and improve arterial connectivity in the corridor.

As noted in the NDOT HOV Plan Addendum, direct-access drop lanes improve traffic flow and safety by allowing vehicles in HOV lanes to access the ramps without weaving across general-purpose lanes for access to/from already congested system interchanges. Additionally, HOV direct-access drop ramps linking freeway HOV lanes and arterial roads provide time savings and local roadway connectivity. NDOT's 2018 HOV Plan Addendum compared potential HOV drop ramps in the vicinity of Sahara Avenue, specifically at Meade Avenue and Desert Inn Road, and recommended drop ramps at Meade Avenue (to/from the north and/or to/from the south) based on the analysis and outreach to stakeholders. The study concluded Desert Inn Road was "highly undesirable" due to a forecasted significant increase in local traffic volumes.

WHAT IS THE PURPOSE OF THE PROJECT?

The purpose of the project is to provide a freeway facility that complements improvements already made north and south of this segment of freeway creating a seamless freeway driving experience resulting in:

- Reduced travel delay
- Increased safety
- Improved access throughout I-15 Central Corridor

The purpose and need for this project will continue to be refined based on ongoing public, stakeholder, and agency comments. As discussed in the introduction, this statement of project Purpose and Need has been developed to guide the future identification of viable alternatives for the I-15 Central Corridor and frame the measures by which alternatives will be evaluated.