



Southern Nevada Traffic Study

Appendix A. TRAFFIC FORECASTING METHODS AND ASSUMPTIONS

October 2018

Prepared for



Prepared by HDR



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1. DISTRIBUTION AND UPDATES

This *Traffic Forecasting Methodology* is to be used by HDR and the subconsultants to facilitate a common understanding of the requirements of this project and act as a communication tool and team resource specifically for this project.

The *Traffic Forecasting Methodology* will be updated and distributed as decisions are agreed upon, as new information is available, and as results are ready. Distribution of the *Traffic Forecasting Methodology* and the updated versions will be sent via email with ProjectWise links to all internal team members. This project is an “electronic only” filing system.

This *Traffic Forecasting Methodology* guide will be updated if/when the following changes occur:

- Additional data collection is deemed necessary and identified
- Model run scenarios are identified and inputs outlined
- Modifications to the overall methods framework are identified

All comments, corrections, and requests for revisions should be directed to Laycee Kolkman, HDR Project Manager at:

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Table 1. Project Management Plan Distribution and Updates

Distribution List	(Date)	What was revised?
Original—Team, DM, QRC (via email)	9/12/2016	N/A



2. INTRODUCTION

Project Background

There are three main freeways in the Las Vegas Valley: I-15, US 95 (US95/US-93/I-515), and I-215. Over the last decade, there have been major widening projects on US 95 from I-15 to the west; I-15 from the US 95/I-515 to the north; and on I-15 from Tropicana south to Blue Diamond. New interchanges have been constructed on I-15 at Silverado Ranch and at Cactus Avenue. Additionally, a new interchange is planned for I-15 at Starr Ave and construction of Project NEON recently began.

To evaluate and prepare for future capacity needs, the Southern Nevada Traffic Study will undertake a system wide evaluation of the existing and future freeway system in Clark County, with a focus on current and projected congestion and other operational deficiencies. The SNTS will develop alternatives to address the system-wide capacity and safety needs, and may employ a coordinated Planning and Environmental Linkage (PEL) approach to consider environmental, community, and economic impacts of the solution alternatives.

The intent of this project is to develop travel demand forecasts, perform meso- and microscopic simulation analyses of traffic operations, develop conceptual design of projects, and provide some of the initial documentation required to evaluate potential solutions under the PEL study. This will set the stage for project-level coordination and environmental analysis once funding becomes available for construction.

Project Goals and Objectives

The following are the project's goals and objectives:

- 1) Conduct region-wide traffic forecasting and traffic analyses, and evaluate alternatives and Benefit-Cost Analyses (BCA) of selected urban southern Nevada freeways in coordination with ongoing projects and studies.
- 2) Provide a model of the freeway network under NDOT's jurisdiction and determine the impacts of freeway projects among the various freeway corridors.
- 3) Evaluate the needs of the select portions of the region's freeway system and develop improvement strategies to meet the short- and long-term transportation needs; conduct BCA to prioritize mitigation measures maximizing benefits based on investments.
- 4) Identify and evaluate performance measures for congestion mitigation on the urban freeway system.
- 5) Assessment and prioritization of future projects based upon updated analyses; to be evaluated using the NDOT-approved BCA.
- 6) Prepare traffic data for future projects and NEPA studies.
- 7) Prepare traffic data for future support of Change in Control of Access Reports (CCAR).



3. PROJECT STUDY LIMITS

The study area includes the freeway corridors/segments in the Las Vegas Valley (the Valley) in Clark County, Nevada, identified in Figure 1. Macroscopic modeling with the RTC TransCAD model will be performed for the model's area within the Valley. The level of analysis, such as meso- or microscopic will vary depending on the corridor. Corridors with recent project development or lesser needs will receive a mesoscopic level of analysis utilizing the Aimsun traffic simulation software discussed in Section 3 for this report to document future congestion conditions.

Corridors with greater congestion needs or those slated for alternatives development as part of this project will receive a microscopic level of analysis utilizing the Aimsun traffic simulation software to document future congestion conditions and to identify and develop project alternatives.

In addition, the SNTS will evaluate a potential east side link for the Valley. The alignment for this east side link will be determined by the Steering Committee with respect to the north and south connection points. This link will be analyzed at the macroscopic level using only TransCAD to determine feasibility and will not be included in the meso- or microscopic analysis. The presence of this potential corridor in the future will be macro-modeled only to understand the potential effects on the metropolitan freeway system.

The SNTS corridors, tiered by mesoscopic and microscopic level of analysis and are listed below and shown on Figure 2 and Figure 3, respectively:

Mesoscopic Simulation Analysis

- 1) US 95 from CC 215 to I-15/I-515/US 95 System Interchange (Spaghetti Bowl)
- 2) CC 215 from US 95 to Russell Road
- 3) I-215 from I-15/I-215 System Interchange to Windmill Lane
- 4) I-15 from south of Spaghetti Bowl (I-15/I-515/US 95 System Interchange) to Russell Road

Microscopic Simulation Analysis and Alternative Development

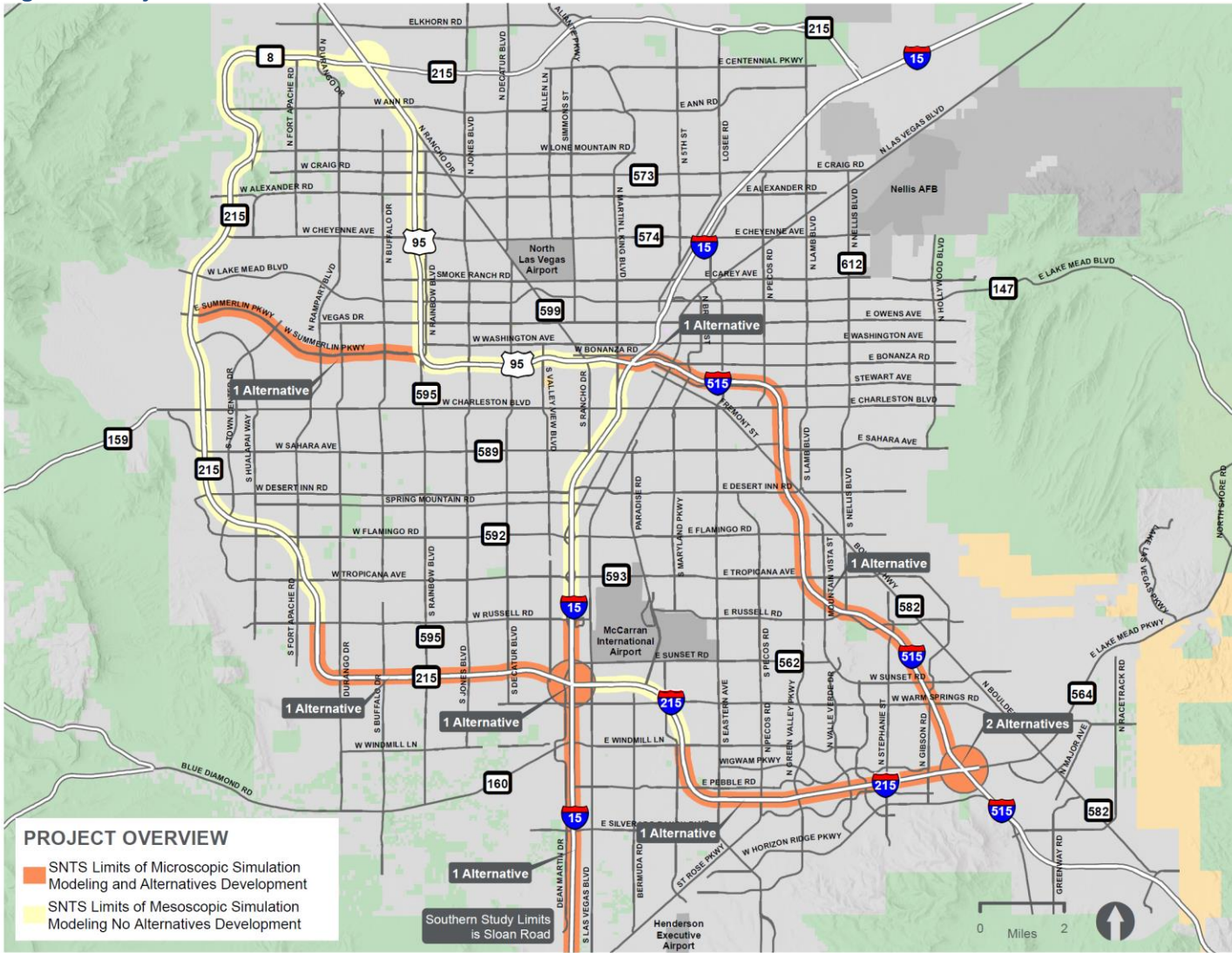
- 1) I-15 from Russell Road to Sloan Road
- 2) I-15/I-215 System Interchange
- 3) I-515 from Spaghetti Bowl (I-15/I-515/US 95 System Interchange) to Eastern Avenue
- 4) I-515 from Eastern Avenue to I-215/I-515 System Interchange
- 5) I-215/I-515 System Interchange
- 6) CC 215 from Russell Road to I-15/I-215 System Interchange
- 7) I-215 from Windmill Lane to the I-215/I-515 System Interchange
- 8) Summerlin Parkway from CC 215 to US 95



SOUTHERN NEVADA TRAFFIC STUDY

Traffic Forecasting Methods and Assumptions

Figure 1: Project Overview

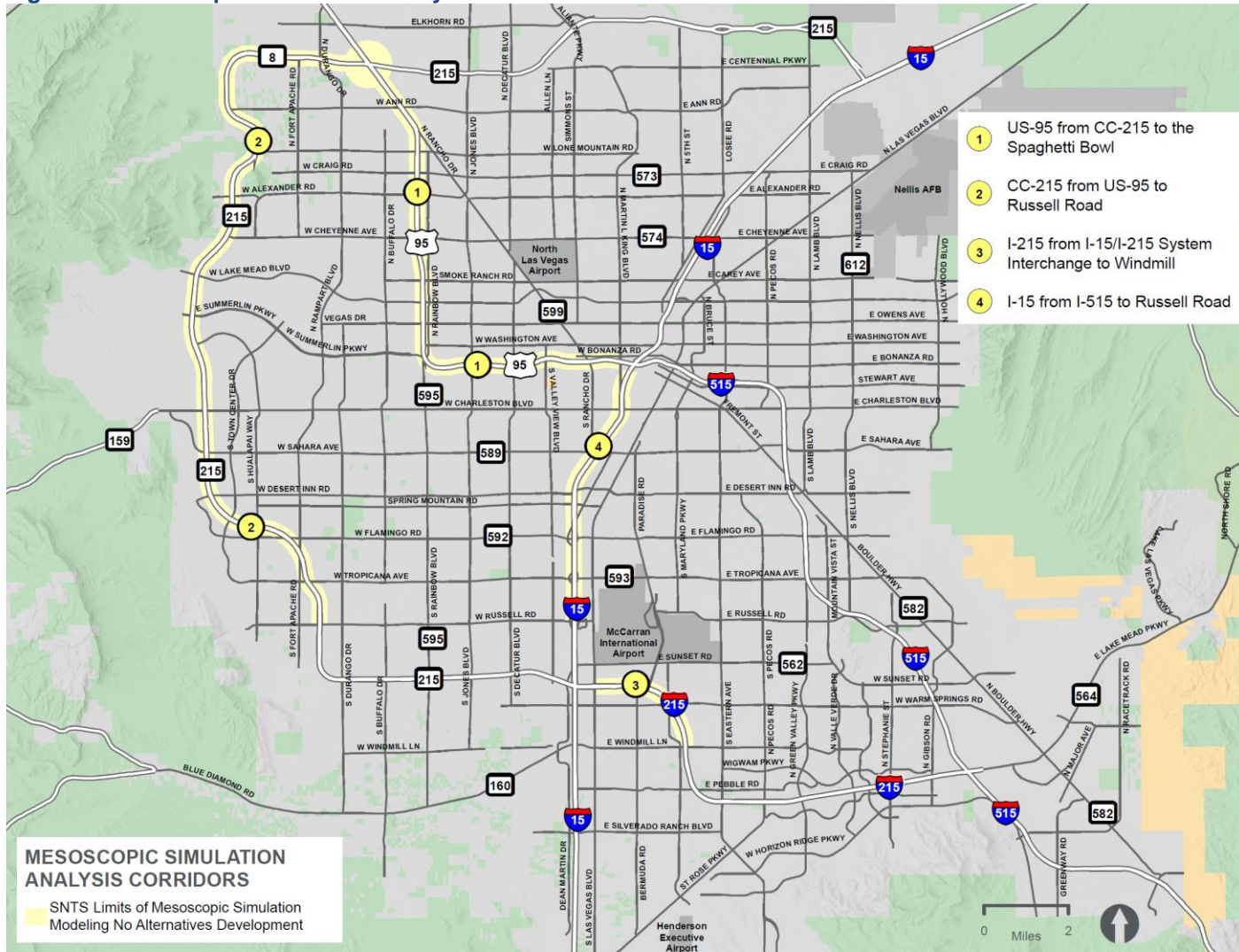




SOUTHERN NEVADA TRAFFIC STUDY

Traffic Forecasting Methods and Assumptions

Figure 2: Mesoscopic Simulation Analysis Corridors

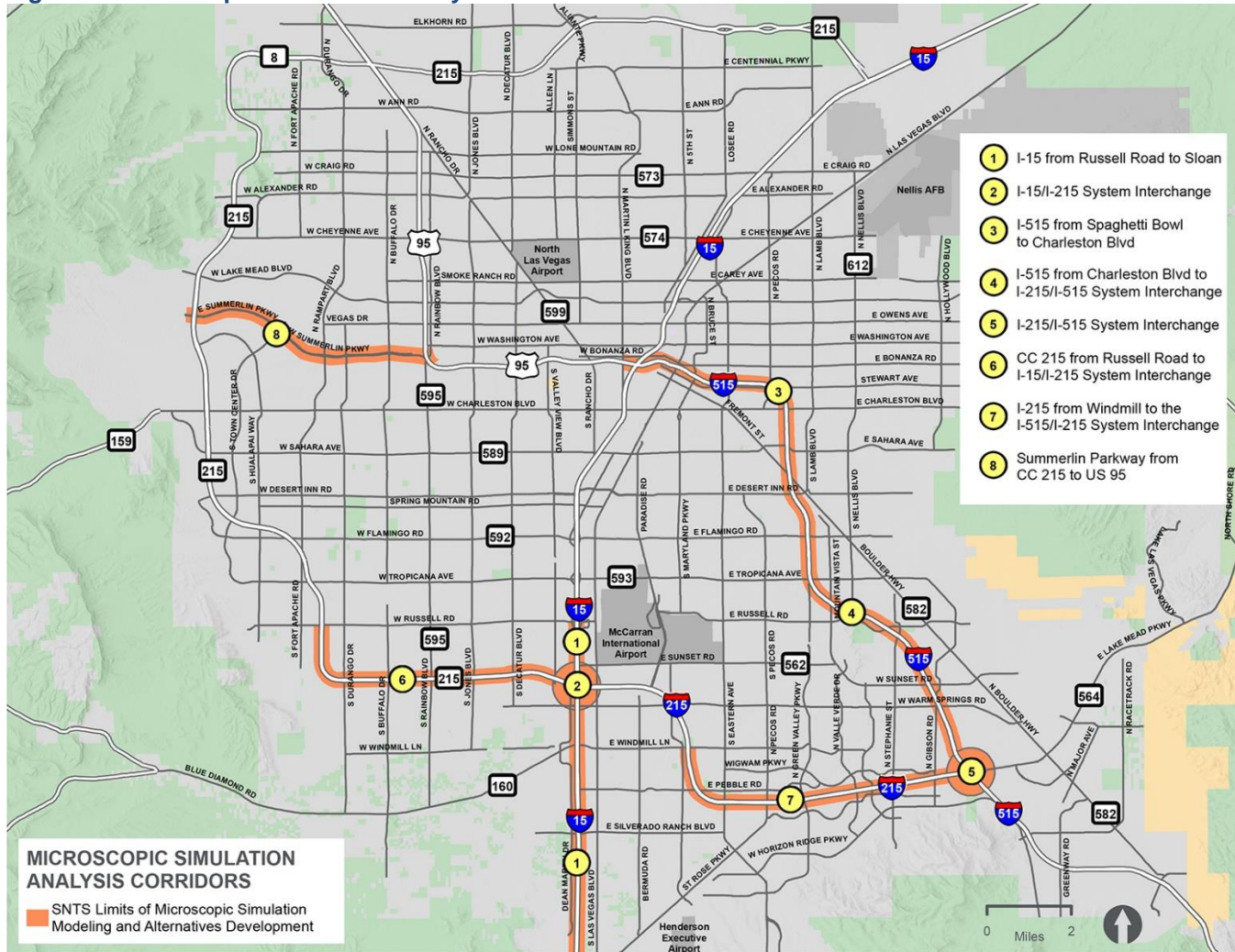




SOUTHERN NEVADA TRAFFIC STUDY

Traffic Forecasting Methods and Assumptions

Figure 3: Microscopic Simulation Analysis Corridors





4. TECHNICAL GUIDANCE AND ANALYSIS TOOLS

Traffic forecasts for SNTS will be developed using the Regional Transportation Commission (RTC) of Southern Nevada's updated regional travel demand forecasting macro-model. A travel demand model is a planning tool for assessing alternative improvements to a transportation system and provides various transportation system outputs including estimated traffic volumes along roadways. The RTC macro-model is a trip-based model run on the TransCAD platform, version 6.0 that follows the traditional four-step macro-model procedure of trip generation, trip distribution, mode choice, and route assignment.¹

In March 2017, the RTC adopted the 2040 RTP and released a new series of the regional model, referred to as RTC 2014 Model. The series includes the horizon years 2015, 2020, 2030, and 2040. The new RTC 2014 Model was used for the SNTS study.

The 2015 model roadway network was adjusted to year 2017 to match the existing year of the study and the count data. The 2040 model was reviewed and adjusted to develop 2040 Baseline, Build and Alternative roadway networks.

The software Aimsun will be used for final development of traffic volumes and detailed operations analysis. Aimsun is a traffic modeling software with the ability to perform macro-, meso-, and micro-model analysis and simulation. Once the macro modeling has been performed in TransCAD, model networks and origin-destination trip demand tables will be exported to Aimsun. Details regarding the microsimulation methodology and analysis in Aimsun can be found in the *SNTS Traffic Operations Methodology and Assumptions* memorandum.

The overall traffic analysis process, including macro-, meso-, and micro-modeling, benefit-cost analysis, alternatives development, and conceptual design, is summarized in the flow chart illustrated in Figure 4.

5. TRAVEL DEMAND MODEL REFINEMENT

A review of the RTC 2014 Model was completed with the goal of improving the forecast accuracy for the study freeway corridors. The reviews and adjustments focused on the roadway networks.

Socio-economic Forecasts

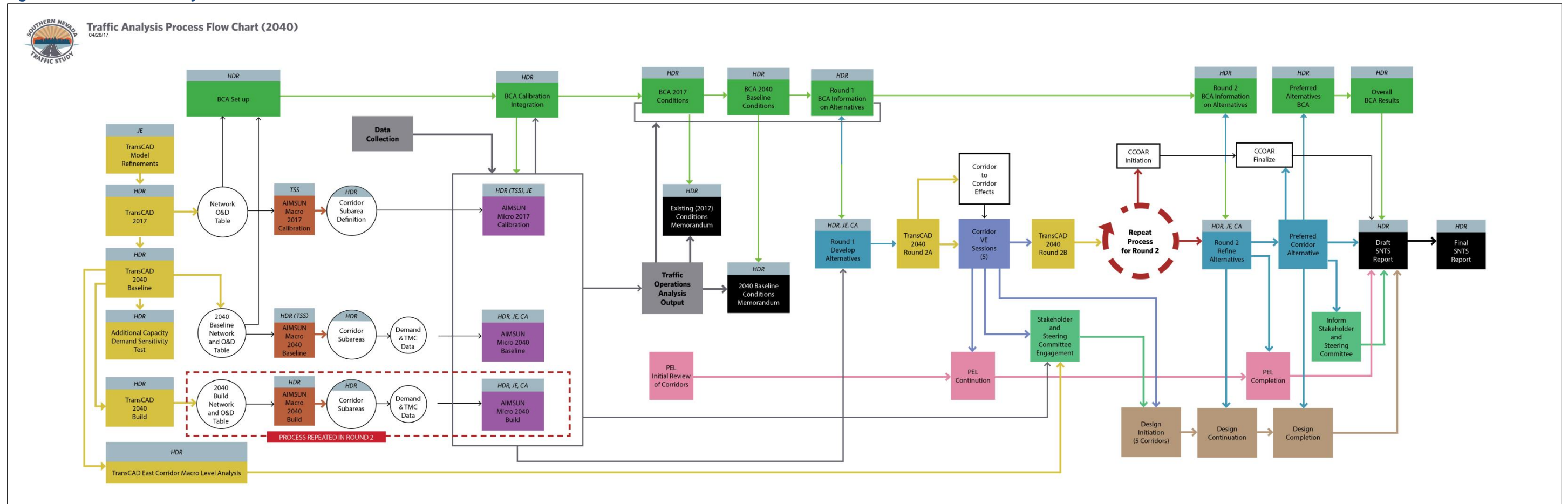
The 2040 RTP socio-economic land use assumptions of population and employment, as provided by the RTC in March 2017, are assumed without change for the study.

Travel Demand Model Transportation Network

The RTC 2014 Model roadway and transit network inputs were reviewed and adjustments made as necessary. All changes were thoroughly documented. No changes were deemed necessary to the transit system.

¹ For SNTS, the RTC macro-model was run on TransCAD, version 6.0, Build 9210

Figure 4. SNTS Traffic Analysis Process Flow Chart



NOTE: See revised flow chart in the Southern Nevada Traffic Study Final Report.



Model Refinements

The RTC 2014 Model for year 2015 was reviewed and an assessment conducted to determine how well the model represents year 2015 traffic on the interstate and freeway systems. A *SNTS Travel Demand Model Refinement Memorandum* was developed to describe the refinements to the model in detail. This memorandum is attached in Appendix A-1. The model performance evaluation was conducted using 2015 observed daily traffic counts across the freeway system provided by NDOT (TRINA). Daily traffic counts collected for the project in 2017 along the project corridors CC 215 and Summerlin Parkway were used to supplement the very limited TRINA data for these two corridors. Factors were applied, where appropriate, to convert traffic counts to year 2015 estimates and to account for seasonality. The review and assessment of the 2015 model identified some updates to improve the performance along the interstate and freeway systems.

Enhancing the model performance will be an iterative testing process that may include updating the 2015 roadway network. Modifications may include:

- Adjusting HOV link capacity and speeds
- Adjusting freeway and interstate mainline and ramp speeds

To ensure the network reflects ground conditions for the year 2015 and incorporates roadway improvements constructed by the end of the year, the number of the lanes on the interstate and freeway corridors, including the ramps, system-to-system ramps and cross street facilities will be verified and updated using aerial photography. Improvements to site-specific locations within the network will generally be limited to adjustments to laneage, facility type, or area type. A comprehensive list of adjustments to the 2015 roadway network will be included in Appendix A-2.

Results of adjustments to the 2015 model will be documented to illustrate improvements to the absolute differences between model volumes and 2015 traffic counts along freeways, system-to-system ramps, interchange ramps, and HOV facilities.

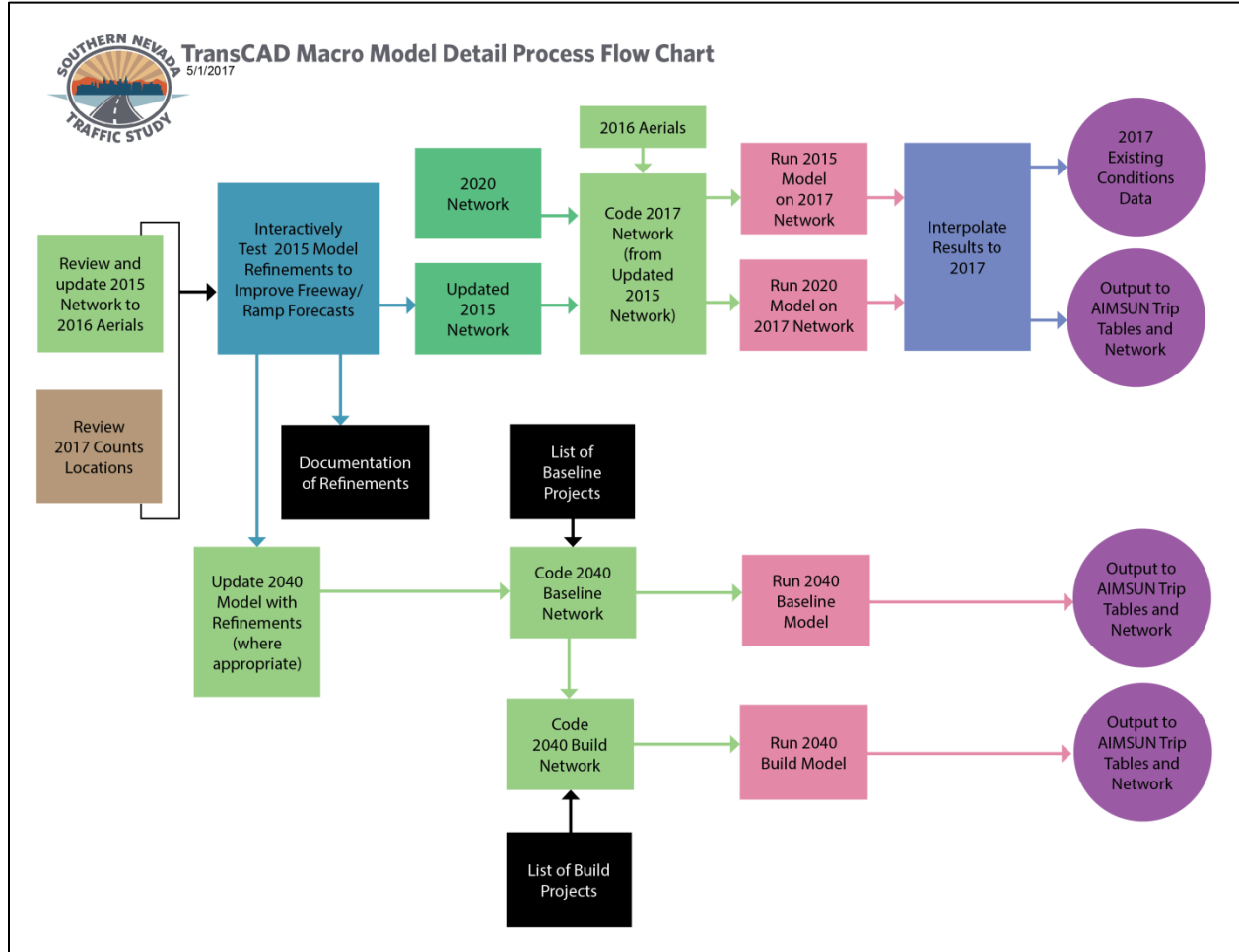
Where appropriate, adjustments made to the 2015 model will be carried forward to the 2040 model in order to ensure that the future year model operates under the same assumptions. A list of the adjustments to the 2040 model roadway network will be included in Appendix A-2 once completed.

6. MACRO-MODELING APPROACH

A detailed flow chart of the macro-modeling process is illustrated in Figure 5. The following steps summarize the SNTS macro-modeling approach:

- 1) Code the network in TransCAD, as appropriate for the scenario
- 2) Perform the TransCAD model run
- 3) Export Networks and Demand Tables for Aimsun

Figure 5. SNTS Macro Model Detail Process Flow Chart



7. MODELING SCENARIO DESCRIPTIONS

This section describes the anticipated scenarios of travel demand model runs as well as the assumptions of each model run. The nomenclature of the model scenarios is comprised of *base year network*, *baseline network*, the *build network*, and the *corridor alternatives*. Definitions of these scenarios are as follows:

- The **base year network** reflects existing conditions for the year 2017.
- The **2040 baseline network** includes projects that are either short term in the TIP/STIP or have funding and will be accelerated. Specifically, they are currently identified to be constructed before 2040.
- The **2040 build network** includes projects that are identified in the RTP but not in the STIP/TIP. These projects will be included in the SNTS study for analysis and will therefore have an impact on Benefit Cost Analysis.



- After the build projects have been incorporated into the analysis, additional or remaining traffic congestion (if any) on the freeway network will be identified. Then **2040 corridor alternatives** will be developed for congestion mitigation. Alternatives will be part of the SNTS project and may/may not be in the current STIP/TIP/RTP.

Note, inclusion in the Baseline Network does not infer project readiness. Projects excluded from the baseline are likely to be included in the build project network. The Baseline Network provides a comparison against the build and corridor alternatives Benefit-Cost Analysis.

Details on these scenarios are provided below.

Base Year Model

An existing year 2017 (base year) model run will be developed for comparison to real world conditions. This comparison highlights the expected variation associated with the model's representation of travel conditions along roadways in the region.

The RTC does not have a year 2017 travel demand model to use for direct comparison to existing conditions. Consequently, two model runs with 2015 and 2020 socioeconomic datasets, respectively, will be performed on the roadway network representing year 2017 conditions. The base year (2017) origin-destination tables will be interpolated from these two 2015 and 2020 travel demand model runs to form a 2017 origin and destination table. From this, a base year 2017 model run will produce 2017 traffic volumes.

The 2017 roadway network will be developed based on the SNTS 2015 roadway network, including revisions made to the network during the review and assessment of the original RTC 2015 regional travel demand model. Adjustments to the 2015 model to develop the 2017 roadway network will be included in Appendix A-2.

The steps for developing SNTS 2017 results are summarized below:

- 8) Update the 2015 roadway network to SNTS 2017 by including improvements, identified from aerials, to the freeway systems, ramps, and cross streets that occurred from 2015 to 2017.
- 9) Run the SNTS 2017 roadway network with 2015 and 2020 socioeconomic datasets.
- 10) Interpolate the 2017 trip tables from the two model runs.
- 11) Perform traffic assignment using 2017 roadway network and 2017 interpolated trip tables.

The 2017 network and trip tables will be exported from TransCAD for import into Aimsun.

2040 Baseline Model

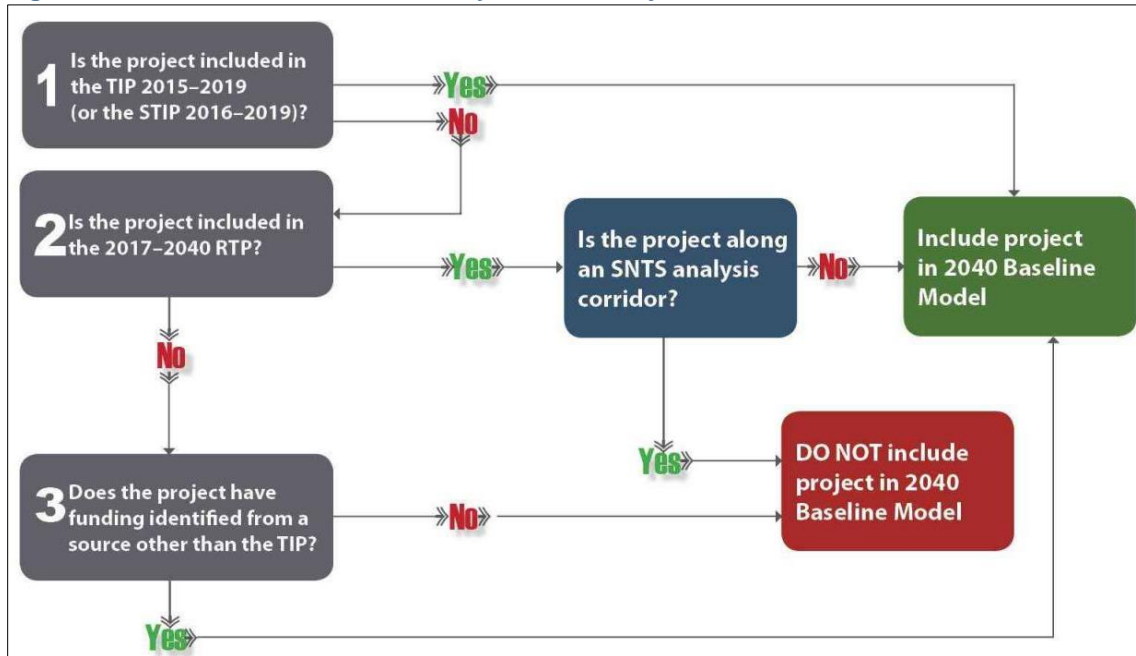
The SNTS 2040 Baseline Model will be developed based on the RTC's adopted 2040 RTP travel demand model. The SNTS 2040 Baseline model will be used to create a base set of results for comparison to 2040 "Build" model runs that will include various projects throughout the Las Vegas freeway system. Socioeconomic projections will remain the same for all future year models. The SNTS Steering Committee provided direction on Baseline project list. The SNTS 2040 Baseline Model roadway network



will be based on the RTC's adopted 2040 RTP roadway network, with the exception that select freeway projects on SNTS study corridors will be removed. This provides a clean slate in order to compare alternatives.

In order to provide consistency in determining the appropriate set of freeway-related projects for the Baseline model, a decision-making structure, as shown in Figure 6, will be applied:

Figure 6. SNTS 2040 Baseline Freeway-Related Projects



SNTS 2040 Baseline Model Project Criteria

1. Is the project included in the TIP (2015-2019) or in the Nevada STIP (2016-2019)?
 - a. If YES, include the project.
 - b. If NO, proceed to next question.
2. Is the project included in the RTP (2017-2040)?
 - a. If YES, is the project along a SNTS analysis corridor freeway?
 - i. If YES, do not include the project.
 - ii. If NO, is the project only planning, preliminary engineering, or ROW acquisition?
 1. If YES, do not include the project.
 2. If NO, include the project.
 - b. If NO, proceed to next question.



3. Does the project have funding identified from a source other than the TIP?
 - a. If YES, include the project.
 - b. If NO, do not include the project.

The project selection criteria outlined above serves as a guide for development of the SNTS 2040 Baseline Model roadway network. The SNTS Steering Committee reviewed the Baseline project list. The following summarizes the assumptions and model inputs:

SNTS 2040 Baseline Model Roadway Network (to be updated to 2040)

- Assumes the RTC's 2040 RTP model network
- Removed RTP projects along SNTS alternatives development corridors, including:
 - CC 215/Summerlin Parkway interchange: Upgrade to system-to-system interchange
 - Summerlin Parkway from CC 215 to US 95: Widen to 8 lanes
 - I-15 at I-215: System to system direct connector HOV ramps
 - I-15 from Sloan Road to Blue Diamond Road: Widen to 8 lanes (includes HOV)
 - I-515 from Charleston Boulevard to I-15/US 95 (Spaghetti Bowl): Widen to 10 lanes, including HOV lanes, and add new interchanges
 - I-215 from Eastern Avenue to Windmill Lane: Widen to 8 lanes
- Removed additional projects along SNTS alternatives development corridors, including:
 - I-15 at Harmon Ave HOV ramps
 - I-15 at Hacienda Ave HOV ramps
- Added TIP/RTP projects that were not included in the original RTCSNV 2040 roadway network:
 - I-15 from Blue Diamond Road to Tropicana Ave: Widen to 10 lanes (includes HOV)
 - I-15 North (Phase 3) from Speedway Boulevard to Apex Interchange: Widen to 6 lanes

The list of freeway-related projects to be included in the SNTS 2040 Baseline roadway network is shown in Table 2 and illustrated on Figure 7.

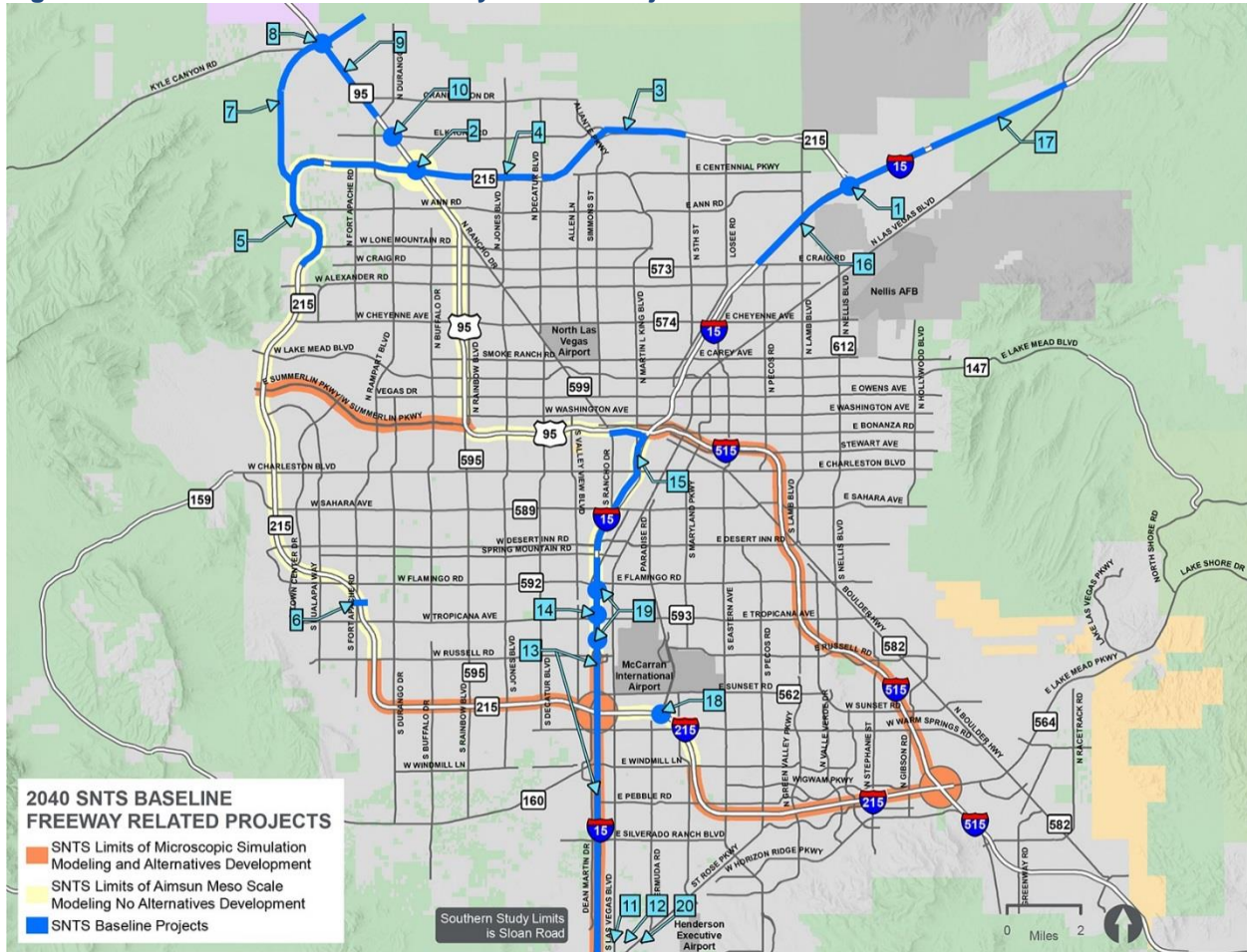


Table 2. SNTS 2040 Baseline Freeway-Related Projects

ID	Freeway	Description	Source
1	CC 215 N / I-15	I-15 / CC 215 System-to-System Interchange; 4th Leg of Interchange	TIP/RTP
2	CC 215 N / US 95	US 95 / CC 215 Interchange - Complete System-to-System Interchange & Local Improvements	TIP/RTP
3	CC 215 Northern	CC 215 Northern Beltway - Widen to 6 lanes from Decatur to 5th	TIP
4	CC 215 Northern	CC 215 Northern Beltway - Widen to 6 lanes, Hualapai to Decatur	Under constr.
5	CC 215 Western	CC 215 Western Beltway - Widen to 6 lanes from Craig to Hualapai	TIP
6	CC 215 Western	Peace Way bridge over CC 215	RTP
7	Sheep Mtn Pkwy	Sheep Mountain Pkwy - Construct 4 lane highway and interchanges	TIP/RTP
8	US 95	US 95/Kyle Canyon - Design/Construct New Interchange	TIP
9	US 95	US 95 North Pkg 2B - Durango to Kyle Canyon: Widen to 6 lanes, add auxiliary lanes, HOV drop ramps at Durango, new service interchange.	TIP
10	US 95	Elkhorn Rd HOV Connection - US 95 HOV ramp direct connects	RTP
11	I-15	I-15 at Sloan Road interchange	RTP
12	I-15	I-15 at Starr Ave interchange	RTP
13	I-15	I-15 Express Lanes - Conversion to HOV/GP Lanes	NA
14	I-15	Tropicana from Polaris to I-15: widening and grade-separation over Dean Martin	RTP
15	I-15 / US 95	Project Neon - I-15 and US 95	RTP
16	I-15	I-15 North Part 2 Pkgs - Widen to 6 lanes, Craig to Speedway	TIP
17	I-15	I-15 North Pkg 3 - Widen to 6 lanes, Speedway Boulevard to Apex	RTP
18	I-215	I-215 Southern Beltway at Airport Connector: Interchange Upgrade	Under Constr.
19	I-15	I-15 HOV: Harmon & Hacienda direct ramp connections	SN HOV Plan
20	Near I-15	Via Nobila from new I-15 interchange to Via Inspirada; Via Inspirada from I-15/Sloan to Via Inspirada/Bicentennial Pkwy	City of Henderson

Source: RTCSNV RTP 2017-2040 (Feb. 2017), RTCSNV TIP 2015-2019 (Dec. 2016), RTCSNV, NDOT.

Figure 7. SNTS 2040 Baseline Freeway-Related Projects



2040 Build Model

The SNTS 2040 Build travel demand model will be developed using the 2040 Baseline as a starting point. The Build model will include identified improvements from the RTP along SNTS corridors that were not included in the Baseline model as well as select projects under current study along the rest of the freeway system. The SNTS Steering Committee provided direction and reviewed the Build project list. The list of freeway-related projects to be included in the SNTS 2040 Build roadway network is shown in Table 3 and illustrated on Figure 8.



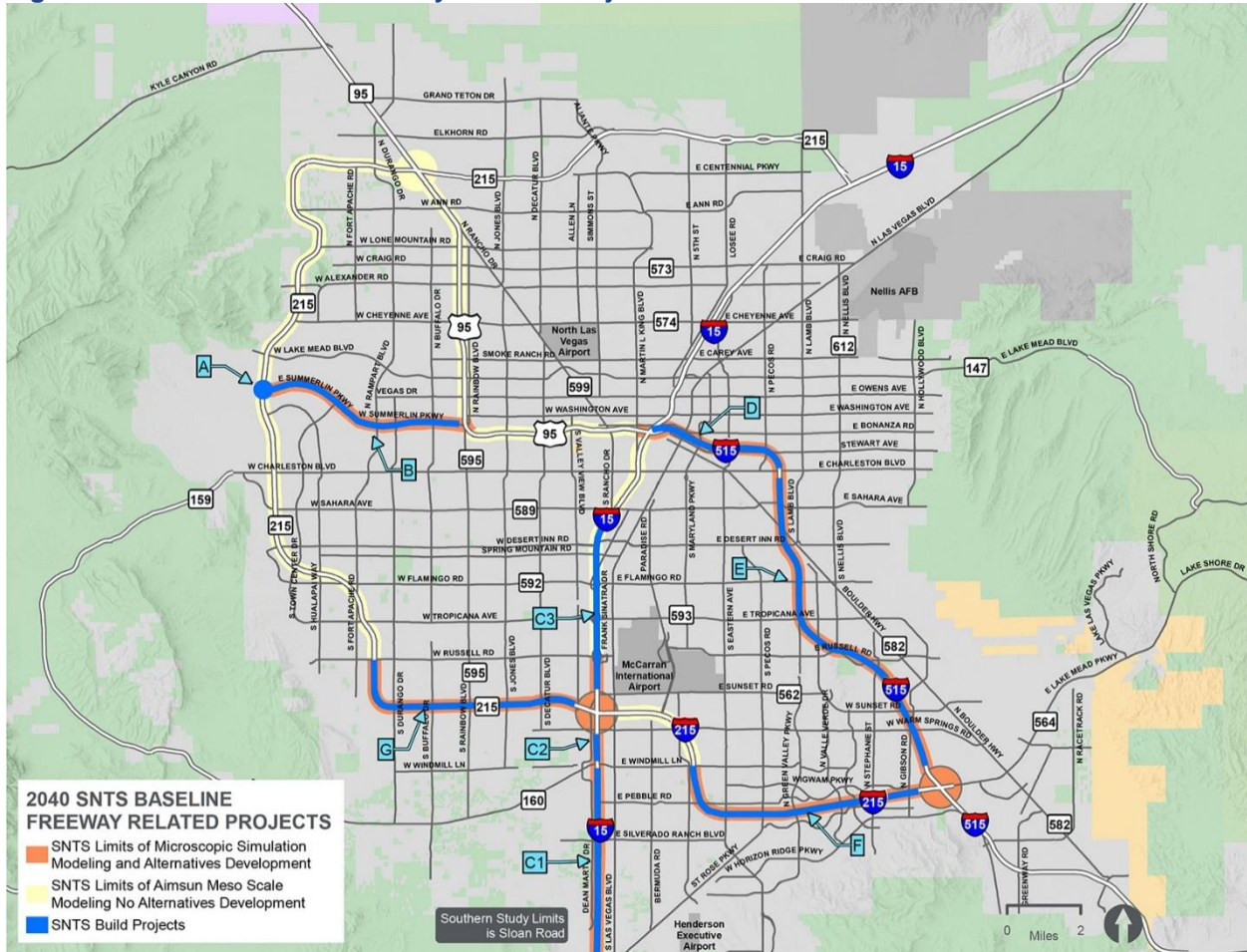
Table 3. SNTS 2040 Build Freeway-Related Projects

ID	Freeway	Description	Source
A	Summerlin Parkway / CC 215	CC 215 / Summerlin Parkway – Add SB to EB flyover	Project Team
B	Summerlin Parkway	Summerlin Parkway – Add 1 GP lane both directions (plus planned auxiliary lanes in select locations) from CC 215 to US 95	Project Team
C1	I-15	I-15 South – Add 1 GP lane both directions, Sloan to Blue Diamond	RTP
C2	I-15	I-15 South – Add 1 GP lane both directions, Blue Diamond to I-215	Project Team
C3	I-15	I-15 Central Core – Add 1 GP lane both directions (SB: Sahara to I-215 and NB: I-215 to north of Desert Inn)	Project Team
D	I-515	I-515 – Add 1 or 2 GP lanes, both directions (no additional lanes or CD roads), from Charleston Boulevard to MLK (west of I-15 interchange)	RTP
E	I-515	I-515 – Add 1GP lane both directions, Charleston Boulevard to I-215	Project Team
F	I-215	I-215 Southern Beltway – Add 1 GP lane in both directions, Windmill Lane to I-515 interchange	RTP/ Project Team
G	CC 215 South	CC 215 Southern Beltway – Add 1 GP lane in both directions, Russell to I-15/I-215 interchange	Project Team

Source: RTCSNV RTP 2017-2040 (Feb. 2017), NDOT



Figure 8. SNTS 2040 Build Freeway-Related Projects



Results from this model will be used to inform the alternatives development.

2040 Alternatives Models

The SNTS 2040 Build travel demand model will be used as a starting point for analysis of projects along the SNTS alternatives development corridors. These alternatives will be individually analyzed in Aimsun micro-simulation. The recommended set of alternatives will then be added to the TransCAD SNTS 2040 Build roadway network in order to develop new trip tables, to account for shifting of travel patterns due to the combined effect of the roadway improvements, and then individually analyzed in Aimsun again.

Eastern Bypass Macroscopic Model Run Sensitivity Test

Sensitivity model runs will be performed with TransCAD that include an eastern bypass in order to gauge its effect on I-515 and the rest of the southern Nevada freeway system. Since the alignment and termini



of the eastern bypass is unknown, two or three options will be run to establish a range of effect on the freeway system. Analysis will be summarized from the TransCAD macro-model.

Anticipated Sequence of Macro Modeling

- 1) Develop and Perform SNTS Base Year (2017) Model: The SNTS 2017 model network developed from the RTC 2015 model roadway network as a base and using 2015 and 2020 land use assumptions to develop 2017 trip tables and traffic volumes.
- 2) Develop and Perform SNTS Horizon Year (2040) Baseline Model: The SNTS 2040 Baseline model developed from the RTC 2040 model, reflecting the 2040 RTP. Includes a “Baseline” set of freeway projects generally from the TIP, Nevada STIP, and 2040 RTP. The Baseline model will be used to develop subsequent models and for results comparisons.
- 3) Develop and Perform SNTS Horizon Year (2040) Build Model: The SNTS 2040 Build model developed from the SNTS 2040 Baseline model. Includes a “Build” set of freeway projects generally from the 2040 RTP.
- 4) Provide Networks and Demand Tables to Aimsun: Export 2017 and 2040 roadway networks and trip tables to Aimsun.
- 5) Develop and Perform SNTS Horizon Year (2040) Alternatives Model: Develop Alternatives model in TransCAD from the SNTS 2040 Build model based on the Aimsun micro-simulation analysis. Perform model runs and export to Aimsun for micro-simulation.
- 6) Repeat Step 5 as Necessary: Develop and run new alternatives models in TransCAD and macro- and micro-simulation in Aimsun as alternatives refinements warrant.

8. TRAFFIC OPERATIONS

Details regarding the final traffic forecasting methodology and microsimulation methodology and analysis in Aimsun can be found in the *SNTS Traffic Operations Methodology and Assumptions* memorandum.



Appendix A-1. SNTS Travel Demand Model Refinement Memorandum



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1.0 INTRODUCTION

Project Description

There are three main freeways in the Las Vegas Valley: I-15, US-95 (US95/US-93/I-515), and I-215/CC-215. Over the last decade, there have been major widening projects on US-95 from the Spaghetti Bowl to the west; I-15 from the Spaghetti bowl to the north; and on I-15 from Tropicana south to Silverado Ranch Boulevard. In addition, there have been new interchanges constructed on I-15 at Silverado Ranch and at Cactus Avenue. A new interchange is being planned for I-15 at Starr Ave and Project NEON recently began.

To plan and prepare for future freeway capacity needs, the Southern Nevada Traffic Study (SNTS) will conduct a system wide evaluation of the freeway system with a focus on existing and potential future congestion and other operation deficiencies while employing Planning and Environmental Linkage (PEL) approach to take into account environmental, community, and economic factors. The study includes the development of travel demand forecasts, performing operational analyses and providing some of the initial documentation required to evaluate potential solutions under PEL. This will set the stage for project-level coordination and environmental analysis once funding becomes available for construction.

The first element of the study is to determine the current and future travel demand using the regional travel demand model (TDM). A regional TDM main objective is to capture the existing travel patterns in a region and use these patterns to forecast future traffic conditions based on future land use, demographic and economic growth. A TDM is validated to establish it has captured the existing travel pattern. Validation is the exercise of comparing model results to existing traffic counts by calculating the percent error between them. The percent error has established industry standard margins of error by facility type. For the entire system the margin of error should be less than $\pm 5\%$ while for freeway/interstate mainline it should be $\pm 7\%$ and for arterial should be between 10% and 15%. There is not set margin of error for system-to-system ramps and ramps but it is much higher, sometime between 20% and 30%. Generally, TDMs replicate traffic on freeway/interstate mainlines much better than they do for system-to-system ramps and ramps.

The Regional Transportation Commission of Southern Nevada (RTC SNV), which oversees the regional travel demand model for the Las Vegas metro area, is in the process of updating the regional model and the Regional Transportation Plan (RTP). To meet NDOT's schedule for the SNTS, it was established that the original 2013 RTC SNV travel demand model would serve as the base to develop a refined model to be used in this study.

Task Purpose

The objective of this task was to review and identify potential minor updates to the travel demand model to improve the performance along the interstate and freeway systems for the validation year 2013. The model performance evaluation of the original 2013 RTC SNV model and the revised 2013 model, which includes enhancements discussed in the following sections, was conducted using 2013 observed traffic counts provided by NDOT. The base year model refinements will be utilized in the development and assessment of alternative improvements to meet the current (year 2016) and projected (year 2040) travel demand in the Las Vegas Valley.

Study Area

Model refinements and adjustments were focused on the interstate and freeway corridors including mainline, HOV, system ramps and ramps in the Las Vegas Valley.

2.0 ORIGINAL 2013 RTCSNV MODEL

Prior to making any enhancements, an assessment was conducted to determine how well the original 2013 RTCSNV regional travel demand model represented the year 2013 traffic counts on the interstate and freeway systems.

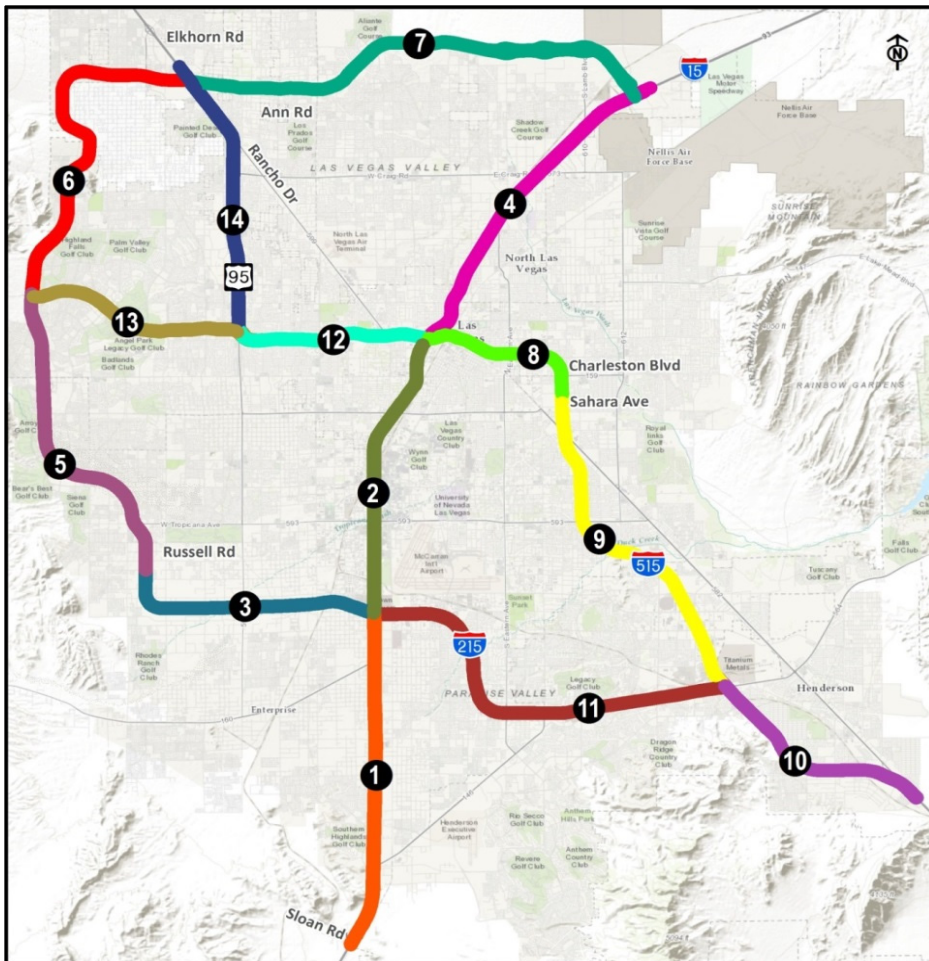
The RTCSNV travel demand model, reflective of the adopted 2013-2035 RTP, was obtained and utilized as the base for this task. The original 2013 model network includes approximately 153 miles of interstate and freeways consisting of I-15, US 95 (US 95/US 93/I 515), I-215, CC 215, and 10 miles of HOV lanes located on US 95 from Ann Rd to South Rancho Dr and Summerlin Pkwy from Buffalo Dr to US 95. Model results are reported as Annual Average Weekday Traffic (AAWDT). For analysis purposes, the interstate and freeway corridors in the model network were divided into 14 logical segments as shown in Figure 2.1. Traffic count data obtained from the NDOT Traffic Information Systems were adjusted to AAWDT using a weekday factor of 1.06736. Counts were incorporated into the RTCSNV model network based on station location and classified based on facility type.

Link Results (Model Volumes Vs Counts)

To ascertain the RTCSNV model performance, the original 2013 model volumes were compared to the 2013 AAWDT counts on the interstate and freeway system provided by NDOT. Appendix A displays the approximate location of the count stations, while Appendix B contains the detailed directional count data for each location.

Traffic counts provided by NDOT were two-way counts (directional counts were not available). If HOV was present, HOV traffic was aggregated with mainline. Table 2.1 summarizes the aggregated original 2013 model volumes and aggregated 2013 AAWDTs by segment and facility type for the mainline, mainline and HOV, and ramps. The comparison between the model volume and the AAWDT traffic counts was reported as the actual and percent difference between the corridor total model volumes and total counts by facility type and also as the cumulative absolute difference (actual difference between model volumes and traffic counts at each count location) for each corridor by facility type.

FIGURE 2.1: INTERSTATE/FREEWAY SEGMENTS





Following are some of the comparison findings.

- The percent difference between model volumes and 2013 AAWDT on segments along the three major freeway corridors vary in range ; I-15 from -1% to -9%, I-515 from 14% to -20%, and US 95 from 2% to -2%.
- Segments 2 and 11 each have percent differences less than 10% however the cumulative absolute difference between the model volumes and the 2013 AADWTs on the segments were greater than 450,000. This could suggest that the model is over or under estimating at most locations along the corridor by a wide margin.
- Limited counts are located along CC 215; two counts are located on the mainline of Segment 5 between Sahara Ave and Far Hills Ave and variation on the segment is -43%. Similarly, Segment 7 has two counts that are located at the on and off ramps with I-15 in north Las Vegas and variation of the segment is -71%.
- With the exception of Segment 5, mainline variance on interstates and freeways ranges from 16% to -30%. Segment 12 has only one mainline count located between MLK Blvd and I-15, the variance at this location is -30%.
- Overall, ramps and system to system ramps in the majority of the segments have higher percent differences than the mainline.

TABLE 2.1: ORIGINAL 2013 RTCSNV MODEL RESULTS BY SEGMENT

Segment	Aggregate Model Volume	Aggregate Year 2013 AADWT	Aggregate Difference	Aggregate %Difference	Cumulative Absolute Difference
1) I-15: Sloan Rd to I-215/CC 215	535,667	589,183	-53,516	-9%	142,685
Interstate Mainline	353,796	393,854	-40,058	-10%	64,421
Ramp	157,307	176,863	-19,556	-11%	72,166
System to System Ramp	24,564	18,466	6,098	33%	6,098
2) I-15: I-215/CC 215 to I-515/US 95	2,331,557	2,409,673	-78,116	-3%	456,109
Interstate Mainline	1,837,896	1,865,746	-27,850	-1%	237,667
Ramp	435,341	443,061	-7,720	-2%	175,896
System to System Ramp	58,320	100,866	-42,546	-42%	42,546
3) I-215/CC 215: I-15 to Russell Rd	263,408	270,789	-7,381	-3%	54,476
Interstate Mainline	178,581	175,048	3,533	2%	3,533
Ramp	63,078	43,975	19,103	43%	20,926
System to System Ramp	21,749	51,766	-30,017	-58%	30,017
4) I-15: I-515/US 95 to CC 215	791,929	802,547	-10,618	-1%	193,910
Interstate Mainline	596,158	595,052	1,106	0%	84,617
Ramp	194,017	186,789	7,228	4%	90,342
System to System Ramp	1,755	20,706	-18,951	-92%	18,951
5) CC 215: Russell Rd to Summerlin Pkwy	95,021	167,256	-72,235	-43%	72,235
Freeway Mainline	95,021	167,256	-72,235	-43%	72,235
6) CC 215: Summerlin Pkwy to US 95					
No Counts Available					
7) CC 215: US 95 to I-15	1,395	4,803	-3,408	-71%	3,408
System to System Ramp	1,395	4,803	-3,408	-71%	3,408
8) I-515: I-15 to Sahara Ave	724,021	904,268	-180,247	-20%	191,556
Interstate Mainline	604,418	679,910	-75,492	-11%	75,492
Ramp	104,681	182,731	-78,050	-43%	89,359
System to System Ramp	14,922	41,627	-26,705	-64%	26,705
9) I-515: Sahara Ave to I-215	1,126,149	1,127,131	-982	0%	230,627
Interstate Mainline	875,686	841,078	34,608	4%	94,520

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Segment	Aggregate Model Volume	Aggregate Year 2013 AADWT	Aggregate Difference	Aggregate %Difference	Cumulative Absolute Difference
Ramp	228,880	232,151	-3,271	-1%	103,788
System to System Ramp	21,583	53,902	-32,319	-60%	32,319
10) I-515: I-215 to Wagon Wheel Dr	420,667	368,289	52,378	14%	72,693
Interstate Mainline	302,190	260,434	41,756	16%	41,756
Ramp	71,379	77,435	-6,056	-8%	14,259
System to System Ramp	47,098	30,420	16,678	55%	16,678
11) I-215: I-515 to I-15	2,393,230	2,228,120	165,110	7%	610,102
Interstate Mainline	1,803,443	1,665,084	138,359	8%	383,273
Ramp	502,384	461,317	41,067	9%	188,919
System to System Ramp	87,404	101,719	-14,315	-14%	37,909
12) US 95: I-15 to Summerlin Pkwy	1,366,139	1,390,764	-24,625	-2%	332,342
Freeway Mainline	162,731	232,684	-69,953	-30%	69,953
Freeway Mainline and HOV	972,818	875,232	97,586	11%	107,167
Ramp	163,520	208,666	-45,146	-22%	132,113
System to System Ramp	67,070	74,182	-7,112	-10%	23,108
13) Summerlin Pkwy: US 95 to CC 215	420,099	418,728	1,371	0%	117,150
Freeway Mainline	259,748	282,852	-23,104	-8%	80,025
Freeway Mainline and HOV	132,200	101,400	30,800	30%	30,800
Ramp	931	2,989	-2,058	-69%	2,058
System to System Ramp	27,220	31,487	-4,267	-14%	4,267
14) US 95: Summerlin Pkwy to CC 215	933,875	913,448	20,427	2%	186,026
Freeway Mainline	86,764	90,192	-3,428	-4%	3,428
Freeway Mainline and HOV	613,531	555,030	58,501	11%	66,774
Ramp	218,235	257,019	-38,784	-15%	111,686
System to System Ramp	15,345	11,207	4,138	37%	4,138
Grand Total	11,403,159	11,594,999	-191,840	-2%	2,663,320

Note: The cumulative absolute difference is determined by calculating model vs traffic count difference for each link, then summing the differences.

Table 2.2 summarizes the aggregated original 2013 RTCSNV model volume and aggregated 2013 AAWDT by facility type for all count locations.

- With the exception of freeway mainlines, major roadway facilities such as the interstate systems in the study area have a difference of the less than 12%.
- The percent variation of the freeway mainline is roughly -22% which is caused by three segments (5, 12 and 13) having several locations where the difference between model volumes and traffic count is high. In addition, Segment 5 has only two counts while Segment 12 has one count on the mainline. The limited number of available counts for the corridors does not provide a good picture of how the model is performing along these two corridors.
- Percent difference for system to system ramps is roughly -28% while ramps have a difference of -6% but have an absolute difference of roughly 1M vehicles.
- The percent difference between the aggregated model volume and the aggregated 2013 AAWDT traffic counts for the RTC model is -2% (-191,840) however the absolute difference is approximately 2.66M.



TABLE 2.2: ORIGINAL 2013 RTCSNV MODEL RESULTS BY FACILITY TYPE

	Aggregate Model Volume	Aggregate Year 2013 AADWT	Aggregate Difference	Aggregate %Difference	Cumulative Absolute Difference
Interstate Mainline	6,552,168	6,476,206	75,962	1%	985,280
Freeway Mainline	604,264	772,984	-168,720	-22%	225,641
Freeway Mainline and HOV	1,718,548	1,531,662	186,886	12%	204,741
Ramp	2,139,754	2,272,996	-133,242	-6%	1,001,512
System to System Ramp	388,425	541,151	-152,726	-28%	246,145
Grand Total	11,403,159	11,594,999	-191,840	-2%	2,663,320

Summary of Findings of the Original 2013 RTCSNV Model Performance

Listed below are some key findings and observations of the 2013 RTCSNV travel demand model performance.

- The cumulative absolute difference of the original 2013 model volumes and 2013 AADWTs highlights the wide variation between the model volumes and traffic counts on facilities as well as segments.
- The number of count stations located on a segment may contribute to a higher variation between model volumes and count data as depicted on the Segment 5 and 7.
- Percent difference on interstate mainlines and ramps is less than $\pm 6\%$ from the ground counts, however the cumulative absolute difference on these facilities is in the range of 2M.
- Conversely, freeway mainlines and system-to-system ramps each have an absolute difference that is less than 250,000 vehicles but have a higher percent difference -22% and -28%, respectively.

3.0 MODEL REFINEMENT STRATEGIES

Enhancing model performance on interstates, freeways, and ramps was an iterative process that included updating the original 2013 RTCSNV network and incorporating improvements from previous studies such as the Southern Nevada HOV Plan Update. Modifications included reducing HOV ingress/egress link capacity from 2,000 to 1,500 vehicles per hour per lane (vphpl), increasing speed on HOV links to equal freeway speeds, and adjustments of time-of-day distribution.

To ensure the network reflected ground conditions for the year 2013 and incorporated roadway improvements constructed by the end of the year, the number of lanes on the interstate and freeway corridors including the ramps, system-to-system ramps and cross street facilities were verified and updated using March 2014 aerials.

Facility speeds reflective of area type for freeway mainlines and system-to-system ramps were reviewed and adjusted based on their functionality and the iterative model run results of the previous network modifications. The changes were applied to system-to-system ramps at I-15/US 95/I 515 traffic interchange (the spaghetti bowl); I-515 and I-215 traffic interchange; and I-15 and I-215 traffic interchange as well as the ramps at I-215 and Airport Connector.

Count station locations along the interstate, freeway, and ramps including system-to-system ramps were reviewed and adjusted based on station location description and NDOT 2015 Annual Traffic Report for Clark County.

4.0 ORIGINAL 2013 RTCSNV MODEL WITH REFINEMENTS

The revised 2013 RTCSNV network consists of the cumulative changes described in the previous section. All network modifications are documented in Appendix A. This network is identified from this point forward as the SNTS



network. Model results are reported as 2013 AAWDT and reflective of the SNTS network and the 2013 socioeconomic data from the RTCSNV model. This model is referred to as the SNTS model.

Link Comparison (Model Volumes Vs Counts)

Network modifications were incorporated to reduce the difference between the model volumes and the 2013 AAWDTs and thus improve model performance and decrease the overall cumulative absolute difference on the facilities. Table 4.1 presents the SNTS model resulting aggregated traffic volumes and aggregated year 2013 AAWDTs comparison by segment and facility type for the mainline, mainline and HOV, and ramps. Following are some of the comparison findings.

- Majority of the segment variance on the three major facilities are within the range of $\pm 15\%$; I-15 ranges from 4% to -8%, I-515 ranges from 15% to -14%, and US 95 ranges from 1% to -5%.
- While the percent difference on Segments 2 and 11 are less than 10%, the cumulative absolute difference on the segments are on the high side with 367,626 and 603,328 vehicles respectively.
- Segments 5 and 7 have only two count stations each which contributes to the higher percentage difference between the SNTS model volumes and the 2013 AAWDTs. In addition, there is only one count located on the freeway mainline of Segment 12 between MLK Blvd and the I-15 and US 95/I-515 traffic interchange.
- Excluding Segments 5 and 12, the percent difference on the interstate/freeway mainline ranges between -6% and 17%.
- In general, ramps and system to system ramps have a higher percent difference and higher absolute difference than the interstate/freeways mainlines.

TABLE 4.1: SNTS MODEL RESULTS BY SEGMENT

Segment	Aggregate Model Volume	Aggregate Year 2013 AADWT	Aggregate Difference	Aggregate %Difference	Cumulative Absolute Difference
1) I-15: Sloan Rd to I-215/CC 215	542,324	589,183	-46,859	-8%	113,984
Interstate Mainline	376,444	393,854	-17,410	-4%	41,979
Ramp	143,872	176,863	-32,991	-19%	68,464
System to System Ramp	22,008	18,466	3,542	19%	3,542
2) I-15: I-215/CC 215 to I-515/US 95	2,516,534	2,409,669	106,865	4%	367,626
Interstate Mainline	1,962,450	1,865,742	96,708	5%	182,210
Ramp	457,256	443,061	14,195	3%	172,240
System to System Ramp	96,829	100,866	-4,037	-4%	13,176
3) I-215/CC 215: I-15 to Russell Rd	276,234	270,789	5,445	2%	60,552
Interstate Mainline	186,486	175,048	11,438	7%	11,438
Ramp	64,210	43,975	20,235	46%	22,887
System to System Ramp	25,538	51,766	-26,228	-51%	26,228
4) I-15: I-515/US 95 to CC 215	797,661	802,547	-4,886	-1%	186,303
Interstate Mainline	590,193	595,052	-4,859	-1%	74,089
Ramp	203,600	186,789	16,811	9%	95,377
System to System Ramp	3,868	20,706	-16,838	-81%	16,838
5) CC 215: Russell Rd to Summerlin Pkwy	107,655	167,256	-59,601	-36%	59,601
Freeway Mainline	107,655	167,256	-59,601	-36%	59,601
6) CC 215: Summerlin Pkwy to US 95					
No Counts Available					
7) CC 215: US 95 to I-15	1,356	4,803	-3,447	-72%	3,447

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Segment	Aggregate Model Volume	Aggregate Year 2013 AADWT	Aggregate Difference	Aggregate %Difference	Cumulative Absolute Difference
System to System Ramp	1,356	4,803	-3,447	-72%	3,447
8) I-515: I-15 to Sahara Ave	777,633	904,268	-126,635	-14%	145,014
Interstate Mainline	646,128	679,910	-33,782	-5%	43,539
Ramp	108,088	182,731	-74,643	-41%	83,265
System to System Ramp	23,417	41,627	-18,210	-44%	18,210
9) I-515: Sahara Ave to I-215	1,156,647	1,127,131	29,516	3%	223,211
Interstate Mainline	896,516	841,078	55,438	7%	92,884
Ramp	233,817	232,151	1,666	1%	102,740
System to System Ramp	26,314	53,902	-27,588	-51%	27,588
10) I-515: I-215 to Wagon Wheel Dr	424,416	368,289	56,127	15%	74,167
Interstate Mainline	305,665	260,434	45,231	17%	45,231
Ramp	72,202	77,435	-5,233	-7%	12,807
System to System Ramp	46,549	30,420	16,129	53%	16,129
11) I-215: I-515 to I-15	2,381,834	2,228,120	153,714	7%	603,328
Interstate Mainline	1,793,603	1,665,084	128,519	8%	367,687
Ramp	501,744	461,317	40,427	9%	198,646
System to System Ramp	86,487	101,719	-15,232	-15%	36,996
12) US 95: I-15 to Summerlin Pkwy	1,325,557	1,390,764	-65,207	-5%	283,531
Freeway Mainline	168,040	232,684	-64,644	-28%	64,644
Freeway Mainline and HOV	931,148	875,232	55,916	6%	62,226
Ramp	158,145	208,666	-50,521	-24%	129,784
System to System Ramp	68,225	74,182	-5,957	-8%	26,877
13) Summerlin Pkwy: US 95 to CC 215	410,323	418,728	-8,405	-2%	85,680
Freeway Mainline	280,968	282,852	-1,884	-1%	78,965
Freeway Mainline and HOV	101,498	101,400	98	0%	98
Ramp	1,252	2,989	-1,737	-58%	1,737
System to System Ramp	26,606	31,487	-4,881	-16%	4,881
14) US 95: Summerlin Pkwy to CC 215	923,896	913,448	10,448	1%	179,747
Freeway Mainline	85,126	90,192	-5,066	-6%	5,066
Freeway Mainline and HOV	604,661	555,030	49,631	9%	59,663
Ramp	218,391	257,019	-38,628	-15%	110,506
System to System Ramp	15,718	11,207	4,511	40%	4,511
Grand Total	11,642,070	11,594,999	47,075	0%	2,386,193

Note: The cumulative absolute difference is determined by calculating model vs traffic count difference for each link, then summing the differences

Table 4.2 summarizes the aggregated SNTS model volume and aggregated 2013 AAWDT by facility type for all count locations.

- Similar to the original 2013 RTCNV model, major roadway facilities such as the interstate system have variance less than $\pm 15\%$ with the exception of Freeway mainlines which has a percent difference of -17%.
- The percent difference between the aggregated SNTS model volumes and aggregated 2013 AAWDT is roughly $\pm 5\%$ for Interstate mainlines and Ramps while the absolute differences are roughly 859,000 and 998,000, respectively.
- Traffic circulation improved along several system-to-system ramps reducing the percent difference between the SNTS model volumes and the 2013 AAWDTs as well as the absolute difference.



- The percent difference between the aggregated SNTS model volumes and the aggregated 2013 AAWDT traffic counts is 0% (47,075) and the absolute difference is roughly 2.38M.

TABLE 4.2: SNTS MODEL RESULTS BY FACILITY TYPE

	Aggregate Model Volume	Aggregate Year 2013 AADWT	Aggregate Difference	Aggregate %Difference	Cumulative Absolute Difference
Interstate Mainline	6,757,484	6,476,202	281,282	4%	859,055
Freeway Mainline	641,788	772,984	-131,196	-17%	208,276
Freeway Mainline and HOV	1,637,306	1,531,662	105,644	7%	121,987
Ramp	2,162,577	2,272,996	-110,419	-5%	998,451
System to System Ramp	442,914	541,151	-98,237	-18%	198,423
Grand Total	11,642,070	11,594,999	47,071	0%	2,386,193

Summary of findings of the SNTS Model Performance

Listed below are some key findings and observations of SNTS travel demand model performance.

- Traffic flow and circulation improved; while the margin of difference was reduced on several segments, the absolute difference was improved for more than half of the segments.
- Modifications incorporated into the network provided a slight improvement to segments with limited count locations (5 and 7) as well as on Segment 12 primarily on the freeway mainline.
- Percent difference and absolute difference for ramps and system-to-system ramps improved.

Comparison of Models Results Summary

Table 4.3 displays the change in difference, percent difference and absolute difference between the original 2013 RTCSNV model and the SNTS model results. Following are some of the major findings.

- The revised network modifications improved the overall percent difference of the aggregated model volumes and aggregated year 2013 AADWTs by roughly 2% and reduced the absolute difference by 277,127 vehicles.
- Interstate mainlines decreased by -3% but the absolute difference was reduced by 126,225 vehicles.
- System-to-system ramps improved by 10% while the absolute difference was reduced by 47,722 vehicles.
- Freeway Mainline and HOV improved by 5% and the absolute difference was reduced by 82,754 vehicles.
- Ramps improved by 1% while the absolute difference was reduced by 3,061 vehicles.

TABLE 4.3: 2013 RTCSNV BASE MODEL AND SNTS MODEL COMPARISON RESULTS

Facility Type	Change in Difference	Change in %Difference	Change in Absolute Difference
Interstate Mainline	-205,320	-3%	126,225
Freeway Mainline	37,524	5%	17,365
Freeway Mainline and HOV	81,242	5%	82,754
Ramp	22,823	1%	3,061
System to System Ramp	54,489	10%	47,722
Grand Total	144,769	2%	277,127



5.0 RECOMMENDED MODEL REFINEMENTS

The following list contains some of the model refinements implemented in the original 2013 RTCSNV regional model to enhance traffic flow performance on the interstate and freeway facilities in the Las Vegas Valley. A detailed list of all modifications is found in Appendix C.

- Lane changes on selected interstates, freeways, ramps and cross streets.
- Incorporated Express lanes on I-15 from I-215 to Silverado Ranch Blvd (1-lane in each direction) and from Desert Inn Rd to I-215 (2-lanes in each direction).
- Included southbound US 95 on ramp at Durango Dr southbound.
- Reconfigured southbound US 95 off ramp at Rancho Drive south of Ann Rd.
- Revised area type and functional classification of several links including ramps and system to system ramps at Spaghetti Bowl (I-515 and I-215 System Traffic Interchange), I-15 and I-215 System Traffic Interchange, and I-215 and Airport Connector.
- The final year 2013 SNTS network also includes improvements from the HOV Plan Update:
 - Reduce HOV Link Capacity from 1950 volume per hour per lane (vphpl) to 1500 vphpl
 - Reduce HOV Ingress/Egress Capacity from 2000 vphpl to 1500 vphpl
 - HOV link speed equal to the freeway speed



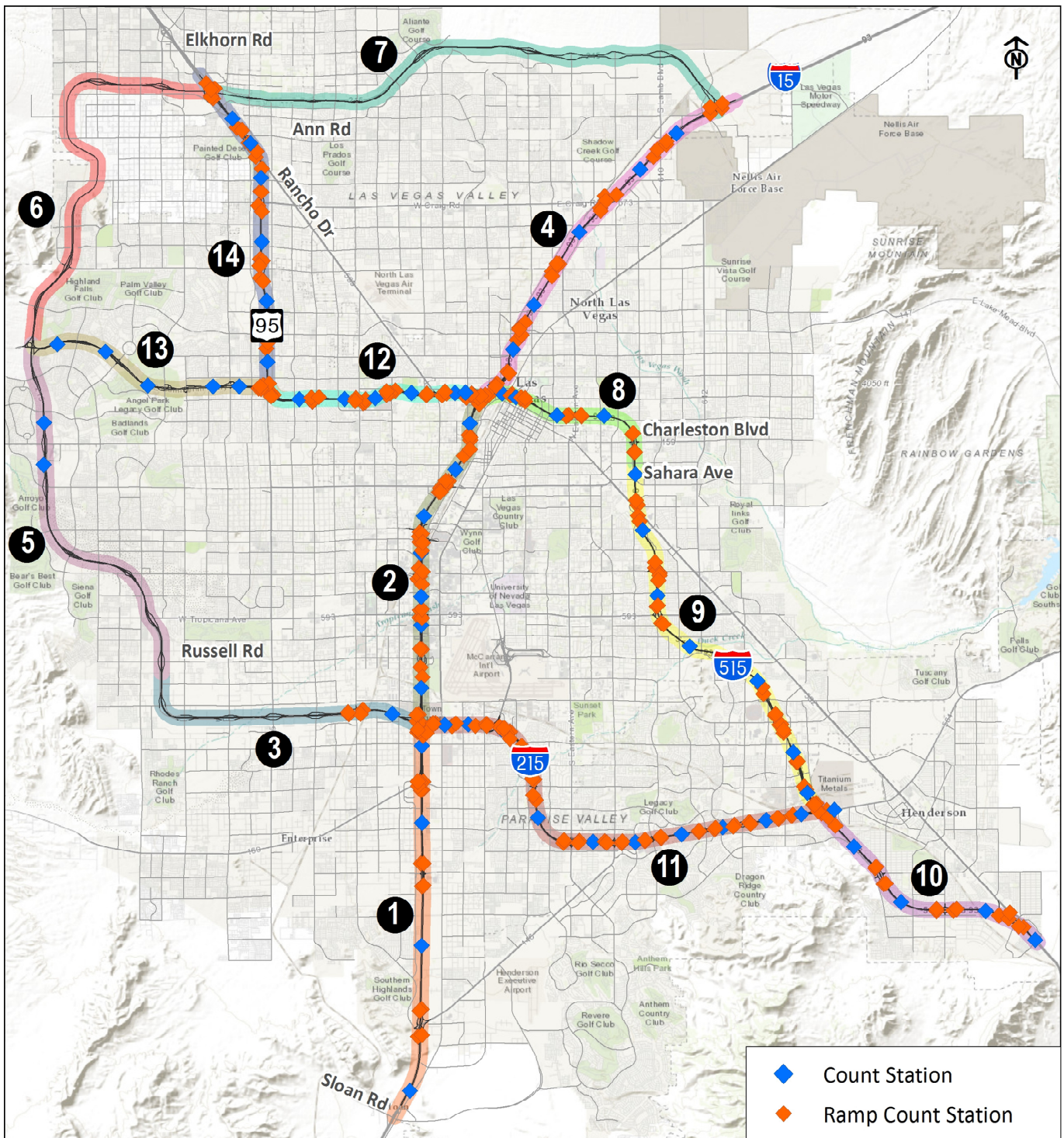
APPENDIX A

2013 COUNT STATIONS GENERAL LOCATION MAP

SNTS Travel Demand Model Refinement Memorandum



2013 COUNT STATION GENERAL LOCATION MAP





APPENDIX B

2013 COUNT DATA



APPENDIX C

2013 NETWORK CODING CHANGES – DETAILED LIST

Onroad	Beginning	Ending	Condition in the Model	Proposed Changes
I-15 NB/SB mainline	California/Nevada Border	I-15 NB On Ramp/SB Off Ramp at Primm Blvd	3 lanes in each direction	2 lanes in each direction
I-15 NB Off Ramp at St. Rose Pkwy	I-15 NB mainline	St. Rose Pkwy	2 lanes	1 lane
St. Rose Pkwy	Southern Highlands Pkwy	East of I-15 NB Off/On Ramps	8 lanes	5 lanes
I-15 NB Off Ramp at Silverado Ranch Blvd	I-15 NB mainline	Silverado Ranch Blvd	2 lanes	1 lane
Silverado Ranch Blvd	Dean Martin Dr	East of I-15 NB On/Off Ramps	6 lanes	5 lanes
I-15/I-215 NB Ramp	North of Blue Diamond Rd	I-15 NB Slip Ramp	2 lanes	3 lanes
I-215 EB Off Ramp at I-15	I-215 EB Off Ramp/Las Vegas Blvd Ramp	I-15 SB CD Road	2 lanes	1 lane
I-15 SB Off Ramp at I-215	South of I-15 SB mainline	I-15 SB CD Off Ramp/I-215 EB	3 lanes	2 lanes
I-15 SB CD Off Ramp at I-215	I-15 SB CD Off Ramp/I-215 WB	I-15 SB Off Ramp/I-215 EB	2 lanes	1 lane
I-15 SB CD Road	I-215 WB Off Ramp/I-15 SB CD	I-215 EB Off Ramp/I-15 SB	2 lanes	1 lane
I-15 NB/SB Express Lanes with Egress/Ingress	I-15 NB On Ramp/SB Off Ramp at Silverado Ranch Blvd	South of Sunset Rd	Does not Exist	Express lanes - coded as Interstate and 1-lane in each direction Egress/Ingress - coded as System to System ramps and 1 lane in each direction, locations were based on aerial review
I-15 NB/SB Express Lanes with Egress/Ingress	South of Sunset Rd	North of Desert Inn Rd	Does not Exist	Express lanes - coded as Interstate and 2-lane in each direction Egress/Ingress - coded as System to System ramps, 2 lanes in each direction for links north of Desert Inn Rd and 1 lane in each direction for all other links. Locations were based on aerial review
I-15 NB/SB mainline	I-15 NB CD On Ramp/I-15 SB CD Off Ramp at I-215	I-15 NB On Ramp/SB Off Ramp at Tropicana Ave	4/5 lanes in each direction	3 lanes in each direction
I-15 NB mainline	I-15 NB On Ramp at Tropicana Ave	I-15 NB Off Ramp at Flamingo Rd	5.5 lanes	4.5 lanes
I-15 SB mainline	I-15 SB Off Ramp at Tropicana Ave	I-15 SB On Ramp at Flamingo Rd	5.5 lanes	3 lanes
I-15 NB/SB mainline	I-15 NB Off Ramp/SB On Ramp at Flamingo Rd	I-15 NB On Ramp/SB Off Ramp at Flamingo Rd	5/5.5 lanes in each direction	3 lanes in each direction
I-15 NB/SB mainline	I-15 NB On Ramp/SB Off Ramp at Flamingo Rd	I-15 NB Off Ramp at Spring Mountain Rd EB/ I-15 SB On Ramp at Spring Mountain Rd	5.5 lanes in each direction	4 lanes in each direction
I-15 SB mainline	South of Desert Inn Rd	I-15 SB On Ramp at Spring Mountain Rd	5 lanes	3 lanes
I-15 NB CD Off Ramp/SB CD On Ramp at Russell Rd	I-15 NB/SB CD Road	Russell Rd	1 lane in each direction	2 lanes in each direction
I-15 SB CD Road	I-15 SB CD On Ramp at Tropicana Ave	Mandalay Bay Rd/Hacienda Ave	2 lanes	1 lane
I-15 SB CD On Ramp at Tropicana Ave	Tropicana Ave	I-15 SB CD Road	1 lane	2 lanes
Flamingo Rd	West of I-15 SB Off/On Ramps	East of I-15 NB On/Off Ramps	7 lanes	6 lanes
I-15 NB On Ramp at Flamingo Rd	North of Flamingo Rd	I-15 NB mainline	1 lane	2 lanes
I-15 SB Off Ramp at Spring Mountain Rd	I-15 SB mainline	I-15 SB Off Ramp to Spring Mountain Rd WB/EB	1 lane	2 lanes
I-15 NB Off Ramp at Sahara Ave	I-15 NB mainline	Sahara Ave	1 lane	2 lanes
I-15 SB On Ramp at Sahara Ave	Rancho Dr	I-15 SB mainline	1 lane	2 lanes
Sahara Ave	Rancho Dr	East of I-15 NB Off/On Ramps	7 lanes	6 lanes
I-15 NB On Ramp at Sahara Ave	Sahara Ave	I-15 NB mainline	3 lanes	1 lane
I-15 NB mainline	I-15 NB On Ramp at Sahara Ave	I-15 NB Off Ramp at Grand Central	4/5.5 lanes	4.5 lanes
I-15 NB On Ramp at Grand Central Pkwy	Grand Central Pkwy	I-15 NB mainline	2 lanes	1 lane
I-15 NB mainline	I-15 NB On Ramp at Grand Central Pkwy	I-15 NB Off Ramp at US 95 WB/MLK	4 lanes	5 lanes
I-15 NB mainline	I-15 NB Off Ramp at US-95 WB/MLK	I-15 NB Off Ramp at I-515 EB	3 lanes	4 lanes
I-15 NB Off Ramp at I-515 EB	I-15 NB mainline	I-515 EB mainline	1 lane	2 lanes
I-15 SB mainline	I-15 SB On Ramp at I-515/US 95 WB	I-15 SB On Ramp at I-515/US 95 EB	3/3.5 lanes	4 lanes
D St	Washington Ave	I-15 NB Off Ramp at D St SB	2 lanes	4 lanes
I-15 NB mainline	I-15 NB On Ramp at I-515/US-95 WB	I-15 NB On Ramp at Washington	3.5 lanes	5 lanes
I-15 NB On Ramp/SB Off Ramp at Washington Ave	Washington Ave	I-15 NB/SB mainline	2 lanes	1 lane
I-15 NB On Ramp at Lake Mead Blvd	Lake Mead Blvd North	I-15 NB mainline	2 lanes	1 lane
I-15 NB On Ramp at Cheyenne Ave	Cheyenne Ave	I-15 mainline	2 lanes	1 lane
I-15 NB mainline	I-15 NB On Ramp at Cheyenne Ave	South of I-15 NB Off Ramp at Craig Rd	3.5 lanes	4 lanes
I-15 SB mainline	I-15 SB On Ramp at Craig Rd	I-15 SB Off Ramp at Cheyenne Ave	3.5 lanes	4 lanes
I-15 SB mainline	I-15 SB On Ramp at Craig Rd WB	I-15 SB Off Ramp at Craig EB	2 lanes	3 lanes
I-15 NB Off Ramp at Craig Rd	I-15 NB mainline	Craig Rd	1 lane	2 lanes
I-15 NB Off Ramp/SB On Ramp at Lamb Blvd	Lamb Blvd	I-15 NB/SB mainline	2 lanes in each direction	1 lane in direction
Lamb Blvd	I-15 SB Off/On Ramps	South of I-15 NB Off/On Ramps	4 lanes	6 lanes
I-15 NB On Ramp/SB Off Ramp at Lamb Blvd	Lamb Blvd	I-15 NB/SB mainline	2 lanes in each direction	1 lane in direction
I-515 SB Off Ramp at Horizon Dr	I-515 SB mainline	Horizon Dr	2 lanes	1 lane
I-515 NB On Ramp at Lake Mead Pkwy WB/I-215 WB	North of Lake Mead Pkwy	I-515 NB mainline	2 lanes	1 lane
Flamingo Rd	I-515 SB On Ramp at Flamingo Rd WB	I-515 NB Off Ramp at Flamingo Rd EB	6 lanes	5 lanes
I-515 SB Off Ramp at Boulder Hwy	I-515 SB mainline	Boulder Hwy	1 lane	2 lanes
US 95 EB mainline	East of US 95 EB On Ramp at Decatur Blvd	West of US 95 EB Off Ramp at Valley View Blvd	4.5 lanes	4 lanes

Onroad	Beginning	Ending	Condition in the Model	Proposed Changes
US 95 EB Off Ramp at Jones Blvd	US 95 EB mainline	Jones Blvd	2 lanes	1 lane
US 95 NB Off Ramp at Rainbow Blvd	US 95 NB mainline	Rainbow Blvd/Lake Mead Blvd WB	2 lanes	1 lane
US 95 NB On Ramp at Cheyenne Ave EB	Cheyenne Ave	US 95 NB mainline	1 lane	Remove
US 95 NB mainline	US 95 NB On Ramp at Cheyenne Ave	US 95 NB Off Ramp at Craig Rd	3.5 lanes	4.5 lanes
US 95 NB mainline	US 95 NB On Ramp at Rancho Dr	US 95 NB On Ramp at Ann Rd	2 lanes	3 lanes
US 95 SB Off ramp at Rancho/ SB On Ramp at Ann Rd	US 95 SB mainline/ SB On Ramp at Ann Rd	US 95 SB Off Ramp at Rancho Dr	Does not Exist	1 lane
US 95 SB mainline	US 95 SB On Ramp at Centennial Center Blvd	US 95 SB On Ramp at Ann Rd	2 lanes	3 lanes
US 95 SB mainline	US 95 SB Off Ramp at Durango Dr	South of Elkhorn Rd	2 lanes	3 lanes
US 95 SB On Ramp at Durango Dr NB	Durango Dr NB	US 95 SB mainline	2 lanes	1 lane
US 95 SB On ramp at Durango Dr SB	Durango Dr SB	US 95 SB mainline	Does not Exist	1 lane
Summerlin Pkwy WB Off Ramp at Durango Dr	Summerlin Pkwy WB mainline	Durango Dr	1 lane	2 lanes
Summerlin Pkwy WB Off Ramp/EB On Ramp Ramp at Anasazi Dr	Summerlin Pkwy WB/EB mainline	Anasazi Dr	2 lanes in each direction	1 lane in each direction
Summerlin Pkwy WB On Ramp/EB Off Ramp Ramp at Anasazi Dr	Anasazi Dr	Summerlin Pkwy WB/EB mainline	2 lanes in each direction	1 lane in each direction
I-215 WB Off Ramp at Gibson Rd	I-215 WB mainline	Gibson Rd	1 lane	2 lanes
I-215 EB Off Ramp at Gibson Rd	I-215 EB mainline	Gibson Rd	1 lane	2 lanes
Stephanie St	I-215 WB On/Off ramps	I-215 EB On/Off ramps	4 lanes	5 lanes
I-215 EB Off Ramp at Eastern Ave	I-215 EB mainline	Eastern Ave	2 lanes	1 lane
I-215 EB Off Ramp at Windmill Ln	I-215 EB mainline	Windmill Ln	1 lane	2 lanes
I-215 EB Off Ramp at Warm Springs Rd	I-215 EB mainline	Warm Springs Rd	1 lane	2 lanes
I-215 WB On Ramp at I-15	I-15 NB Off Ramp/I-15 SB CD Off Ramp	I-215 WB mainline	1 lane	2 lanes
CC 215 WB On Ramp at Decatur Blvd	Decatur Blvd	Rafael Rivera Way	1 lane	3 lanes
CC 215 WB Off Ramp/EB On ramp at Jones Blvd	CC 215 WB/EB mainline	Rafael Rivera Way/Roy Horn Way	2 lanes in each direction	1 lane in each direction
CC 215 WB On Ramp/EB Off Ramp at Jones Blvd	Rafael Rivera Way/Roy Horn Way	CC 215 WB/EB mainline	2 lanes in each direction	1 lane in each direction
CC 215 EB On Ramp at Rainbow Blvd	Ron Horn Way	CC 215 EB mainline	2 lanes	1 lane
CC 215 WB On Ramp/EB Off Ramp at Rainbow Blvd	Rafael Rivera Way/Roy Horn Way	CC 215 WB/EB mainline	2 lanes in each direction	1 lane in each direction
CC 215 WB Off Ramp/EB On Ramp at Buffalo Dr	CC 215 WB/EB mainline	Rafael Rivera Way/Roy Horn Way	2 lanes in each direction	1 lane in each direction
Buffalo Dr	Sunset Rd	Badura Ave	2 lanes	4/5 lanes
CC 215 WB On Ramp/EB Off Ramp at Buffalo Dr	Rafael Rivera Way/Roy Horn Way	CC 215 WB/EB mainline	2 lanes in each direction	1 lane in each direction
CC 215 EB On Ramp at Durango Dr	Ron Horn Way	CC 215 EB mainline	2 lanes	1 lane
Durango Dr	CC 215 WB Off/On Ramps	South of CC 215 EB Off/On Ramp	6 lanes	5 lanes
Sunset Rd	Quarterhorse Ln	CC 215 EB On/Off Ramps	2 lanes	5 lanes
CC 215 SB Off Ramp/NB On Ramp at Sunset Rd	CC 215 SB/NB mainline	Jerry Tarkanian Way/Brent Thurman Way	2 lanes in each direction	1 lane in each direction
Jerry Tarkanian Way	Patrick Ln	CC 215 SB Off Ramp at Sunset Rd	1 lane	2 lanes
CC 215 SB On Ramp/NB Off Ramp at Russell Rd	Jerry Tarkanian Way/Brent Thurman Way	CC 215 SB/NB mainline	2 lanes in each direction	1 lane in each direction
Russell Rd	CC 215 NB Off/On Ramps	West of Bonita Vista St	6 lanes	4 lanes
Russell Rd	East of Fort Apache Rd	CC 215 SB Off/On Ramps	2 lanes	4 lanes
CC 215 SB Off Ramp/NB On Ramp at Russell Rd	CC 215 SB/NB mainline	Jerry Tarkanian Way/Brent Thurman Way	2 lanes in each direction	1 lane in each direction
CC 215 SB On Ramp/NB Off Ramp at Tropicana Ave	Jerry Tarkanian Way/Brent Thurman Way	CC 215 SB/NB mainline	2 lanes in each direction	1 lane in each direction
Tropicana Ave	Fort Apache Rd	CC 215 NB Off/On Ramps	5 lanes	6 lanes
CC 215 NB On Ramp at Tropicana Ave	Tropicana Ave	CC 215 NB mainline	2 lanes	1 lane
Flamingo Rd	West of CC 215 SB Off/On Ramps	East of CC 215 NB Off/On Ramps	6 lanes	5 lanes
CC 215 SB On Ramp/NB Off Ramp at Charleston Blvd	Charleston Blvd	Hughes Park Dr WB/EB	1 lane in each direction	2 lanes in each direction
CC 215 SB Off Ramp at Charleston Blvd	CC 215 SB mainline	Charleston Blvd	1 lane	2 lanes
CC 215 SB On Ramp/NB Off Ramp at Far Hills Ave	Far Hills Ave	CC 215 SB/NB mainline	2 lanes in each direction	1 lane in each direction
CC 215 NB On Ramp at Far Hills Ave	Far Hills Ave	CC 215 NB Off Ramp at Summerlin Pkwy	2 lanes	1 lane
CC 215 NB Off Ramp at Summerlin Pkwy	CC 215 NB mainline	CC 215 NB On Ramp at Far Hills Ave	1 lane	2 lanes
CC 215 SB On Ramp at Summerlin Pkwy	Summerlin Pkwy Off Ramp WB/EB	CC 215 SB mainline	1 lane	2 lanes
CC 215 SB Off Ramp at Summerlin Pkwy	CC 215 SB mainline	Summerlin Pkwy WB/EB mainline	1 lane	2 lanes
CC 215 NB Off Ramp at Lake Mead Blvd	CC 215 NB mainline	Lake Mead Blvd	1 lane	2 lanes
CC 215 SB Off Ramp at Lake Mead Blvd	CC 215 SB mainline	Lake Mead Blvd	1 lane	2 lanes
Cliff Shadows Pkwy/Cheyenne Ave	East of Novat St	East of CC 215 NB Off/On ramps	2/4 lanes	5/6 lanes
Hualapai Way	Deer Springs Way	Centennial Pkwy	2 lanes	4 lanes
CC 215 WB/EB mainline	West of Tenaya Way	CC 215 WB Off Ramp/EB On Ramp at Decatur Blvd	3 lanes in each direction	2 lanes in each direction
CC 215 WB/EB mainline	North of Aviary Way	CC 215 WB Off Ramp/EB On Ramp at Aliante Pkwy	3 lanes in each direction	2 lanes in each direction
CC 215 WB On Ramp/EB Off Ramp at 5th Street	CC 215 WB/EB mainline	5th Street	2 lanes in each direction	1 lane in each direction
5th Street	CC 215 WB Off/On Ramps	Dorrell Ln	2 lanes	4/5 lanes
CC 215 WB Off Ramp/EB On Ramp at 5th Street	5th Street	CC 215 WB/EB mainline	2 lanes in each direction	1 lane in each direction

Onroad	Beginning	Ending	Condition in the Model	Proposed Changes
Losee Rd	CC 215 WB Off/On Ramps	South of CC 215 EB Off/On Ramps	2 lanes	4 lanes
Pecos Rd	CC 215 WB Off/On Ramps	South of CC 215 EB Off/On Ramps	2 lanes	4 lanes
Lamb Blvd	CC 215 WB Off/On Ramps	South of CC 215 EB Off/On Ramps	8 lanes	4 lanes
CC 215 SB Off Ramp at I-15 NB	CC 215 SB Off Ramp at I-15 SB	CC 215 NB On Ramp at I-15 NB	2 lanes	1 lane
CC 215 SB/NB mainline	CC 215 SB Off Ramp/NB On Ramp at I-15	I-15 NB Off/On Ramps	4 lanes	2 lanes
US 95 HOV Egress/Ingress	Ann Rd	East of Valley View	2 lanes in each direction	0.75 lanes in each direction
I-215 EB Off Ramp at I-15 NB CD	I-215 EB mainline	I-15 NB CD Road	Urban	Suburban
I-15 SB CD Off Ramp at I-215/I-215 On Ramp at I-15	I-15 SB CD Road	I-215 WB mainline	Urban	Suburban
I-15 SB Off Ramp at I-515 EB	South of Bonanza Rd	I-15 NB Off Ramp at I-515 EB	CBD	Urban
I-515 EB Off Ramp at I-15 SB	I-515 WB mainline	I-15 SB mainline	CBD	Urban
I-515 WB Off Ramp at I-515 NB	I-515 WB mainline	North of Bonanza Rd	CBD	Urban
US 95 WB mainline	East of I-15 SB Off Ramp at US 95 WB	West of MLK Blvd	CBD	Urban
US 95 EB mainline	West of MLK Blvd	US 95 EB Off Ramp at I-15 SB	CBD	Urban
Summerlin Pkwy EB Off Ramp at Rainbow Blvd	Summerlin Pkwy EB mainline	Rainbow Blvd	Urban	Suburban
CC 215 SB/NB mainline	CC 215 SB Off Ramp/NB On Ramp at Summerlin Pkwy	CC 215 SB Off Ramp/NB On Ramp at Tropicana Ave	Urban in each direction	Suburban in each direction
I-215 EB Off Ramp at Airport Connector	I-215 EB mainline	I-215 WB Off Ramp at Airport Connector	Freeway	Ramp
I-215 EB Off Ramp at I-15 NB CD	South of I-215 EB mainline	I-15 NB CD Road	Ramp	System to System Ramp
I-15 SB Off Ramp at I-515 EB	I-15 SB mainline	I-15 NB Off Ramp at I-515 EB	System to System Ramp	Interstate
I-515 EB Off Ramp at I-15 SB	I-515 WB mainline	I-15 SB mainline	System to System Ramp	Interstate
I-515 WB Off Ramp at I-515 NB	I-515 WB mainline	I-15 NB mainline	System to System Ramp	Interstate
I-515 SB Off Ramp at I-215 WB	I-515 SB mainline	I-215 WB mainline	System to System Ramp	Interstate
I-215 EB Off Ramp at I-515 NB	I-215 EB mainline	I-515 NB mainline	System to System Ramp	Interstate
I-15 NB Off Ramp at I-515 EB	I-15 NB mainline	I-515 EB mainline	CBD	Urban



Appendix A-2. SNTS Roadway Network Adjustments

Source of Record	Corridor ID	Onroad	Beginning	Ending	Condition in the New RTC 2015 Model	Proposed	Changes to the New RTC 2015 Model?	Notes 2015 Model	2017 model proposed	2017 Updated?	2017 Note	2040 Model Condition	2040 model proposed	2040 Updated
HDR	1	St Rose at I-15	SB ramps	NB to EB off-ramp	4 lanes in each direction	2 WB/3 EB lanes	Yes					4 lanes each direction	2 WB/3 EB lanes	Yes
HDR	1	St Rose at I-15	NB to EB off-ramp	WB to NB on-ramp	4 lanes in each direction	2 WB/4 EB lanes	Yes					4 lanes each direction	2 WB/4 EB lanes	Yes
HDR	1	I-15 NB off ramp at St. Rose			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	1	I-15 NB off ramp at Silverado Ranch			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	1	Silverado Ranch WB at I-15	Dean Martin	1 link E of NB ramps	3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	1	I-15 Express Lanes	Silverado Ranch IC	N of Desert Inn	0 lanes	1/2 lanes in each direction	Yes	Added express lanes, 1 or 2 lanes. Removed lanes from GP links.				N/A	N/A	No
HDR	1	I-15 Exp Lane ramps. SB = S of Tropicana NB = S of Russell			0 lanes	1 lane in each direction	Yes	Added express lane ramps				N/A	N/A	No
HDR	1	I-15 SB mainline	I-215 interchange	Blue Diamond off ramp	3.5 lanes	3.5 lanes	No	Copied from old spreadsheet. No change needed.				3.5 lanes	3.5 lanes	No
HDR	1	I-15 SB mainline	C/D SB on ramp	Blue Diamond on ramp	3.5 lanes	4 lanes	Yes					3.5 lanes	4 lanes	Yes
HDR	1	I-15 SB mainline	Blue Diamond on ramp	1 link N of Silverado Ranch off ramp	3.5 lanes	4 lanes	Yes					4 lanes	4 lanes	No
HDR	1	I-15 NB mainline	Silverado Ranch on ramp	1 link N of Silverado Ranch on ramp	4.5 lanes	3.5 lanes	Yes					3.5 lanes	3.5 lanes	No
HDR	1	I-15 NB mainline	1 link N of Silverado Ranch on ramp	Blue Diamond off ramp	4.5 lanes	3.5 lanes	Yes					3.5 lanes	3.5 lanes	No
HDR	1	I-15 NB mainline	Blue Diamond off ramp	Blue Diamond on ramp	4 lanes	3 lanes	Yes					3 lanes	3 lanes	No
HDR	1	I-15 NB mainline	Blue Diamond EB flyover on ramp	C/D road on ramp	5 lanes	4 lanes	Yes					4 lanes	4 lanes	No
HDR	1	I-15 NB mainline	C/D road on ramp N of Blue Diamond	C/D road off ramp under I-215	5.5 lanes	4.5 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	1	I-15 NB C/D road	1 link N of Blue Diamond	S of C/D road on ramp	2 lanes	3 lanes	Yes					3 lanes	3 lanes	No
HDR	1	I-15 SB on ramp at Blue Diamond			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	1	Blue Diamond at I-15	SB ramps	1 link W of SB ramps	3 lanes in each direction	4 lanes in each direction	Yes					3 lanes in each direction	4 lanes in each direction	Yes
HDR	1	I-215 WB to I-15 SB			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	1	I-15 HOV Ingress/Egress north of Sloan										2-lane ramps from I-15 to HOV	Direct connects as in 2015	Yes
HDR	1	Via Inspirada	I-15/Sloan IC	Via Inspirada/Exec Airport Dr	NA	NA	NA		NA	NA	NA	NA	2 / 2 lane minor arterials	Yes
HDR	1	Via Nobila	I-15	Via Inspirada/Exec Airport Dr	NA	NA	NA		NA	NA	NA	NA	2 / 2 lane minor arterials	Yes
HDR	1	Via Nobila / I-15 Interchange										NA	1 lane ramps	Yes
Jacobs	1	I-15 NB Express Lane Egress/Ingress	North of Silverado Ranch Blvd	North of Silverado Ranch Blvd	Does not exist	Coded as System to System Ramp (FT = 82), 1-lane in each direction	Yes		Coded as System to System Ramp (FT = 82), 1-lane in each direction	Yes	Confirmed that express lane markings are dashed north of Silverado (dashed for approx. 1/2 mile)			Yes
Jacobs	1	I-15 NB/SB mainline	I-15 NB On Ramp/SB Off Ramp at Cactus Ave	I-15 NB Off Ramp/SB On Ramp at Silverado Ranch Blvd	3-lanes in each direction Auxiliary lanes does not exist	3.5-lanes in each direction Coded auxiliary lanes (AuxLn = 1)	Yes		3.5-lanes in each direction Coded auxiliary lanes (AuxLn = 1)	Yes	Change made.			No
Jacobs	1	I-15 SB mainline	North of I-15 SB Off Ramp at Silverado Ranch Blvd	North of Pebble Rd	4-lanes	3.5-lanes	Yes		3.5-lanes	Yes	Change made.			No
Jacobs	1	I-15 SB mainline	North of Pebble Rd	South of I-15 SB On Ramp at Blue Diamond Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
HDR	2	I-15 NB HOV Direct Connect Ramp from CC-215 EB	CC215 EB Off Ramp to I-15 SB	CC215 WB HOV Ramp to I-15 HOV NB	NA	NA	NA	NA	NA	NA	NA	NA	Add HOV direct connect	Yes
HDR	2	I-15 SB HOV Direct Connect Ramp to CC215 WB	I-15 SB HOV Direct Ramp to I-215 EB	CC215 WB HOV Ramp to I-15 HOV NB	NA	NA	NA	NA	NA	NA	NA	NA	Add HOV direct connect	Yes
HDR	2	I-15 NB mainline	I-15 NB CD road off ramp	I-215 WB on ramp	4 lanes	3 lanes	Yes					4 lanes	3 lanes	Yes
HDR	2	I-15 Express	I-215 IC	N of Spring Mountain WB on ramp	1 lanes	2 lanes in each direction	Yes					1 lane	1 lane	No

Source of Record	Corridor ID	Onroad	Beginning	Ending	Condition in the New RTC 2015 Model	Proposed	Changes to the New RTC 2015 Model?	Notes 2015 Model	2017 model proposed	2017 Updated?	2017 Note	2040 Model Condition	2040 model proposed	2040 Updated
HDR	2	I-15 NB mainline	I-215 WB on ramp	C/D road off ramp S of Russell	5.5 lanes	3.5 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	2	I-15 NB off ramp to C/D road S of Russell	I-15 NB	C/D road	2 lanes	1 lane	Yes					1 lane	1 lane	No
HDR	2	I-15 NB off ramp immediately S of Russell			1 lane	2 lanes	Yes					2 lanes	2 lanes	No
HDR	2	I-15 NB mainline	C/D road off ramp S of Russell	Tropicana NB on ramp	5 lanes	3 lanes	Yes					4 lanes	4 lanes	No
HDR	2	I-15 NB C/D road	1 link N of Russell	S of Russell on ramp	2 lanes	3 lanes	Yes					3 lanes	3 lanes	No
HDR	2	I-15 NB on ramp from Russell			2 lanes	1 lane	Yes					1 lane	1 lane	No
HDR	2	I-15 NB mainline	Tropicana NB on ramp	Flamingo off ramp	6 lanes	4.5 lanes	Yes					5.5 lanes	5.5 lanes	No
HDR	2	I-15 NB mainline	Flamingo off ramp	Spring Mountain off ramp	5.5 lanes	3.5 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	2	I-15 NB mainline	Spring Mountain off ramp	Flamingo on ramp	5 lanes	3 lanes	Yes					4 lanes	4 lanes	No
HDR	2	I-15 NB on ramp from Flamingo			1/2 lanes	2 lanes	Yes					2 lanes	2 lanes	No
HDR	2	I-15 NB mainline	N of Flamingo on ramp	Spring Mountain EB loop on ramp	5 lanes	4/3 lanes	Yes					4 / 4 lanes	5 / 5 lanes	Yes
HDR	2	I-15 SB off ramp at Spring Mountain			1 lane	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	2	I-15 SB off ramp at WB Spring Mountain										3 lanes	1 lane	Yes
HDR	2	I-15 NB on ramp at Spring Mountain										2 lanes	2 / 1 lane	Yes
HDR	2	I-15 NB mainline	Spring Mountain EB loop on ramp	end of express lanes	6 lanes	4 lanes	Yes					4 lanes	5 / 4 lanes	Yes
HDR	2	I-15 NB HOV	S of Spring Mtn	N of Desert Inn								2 lanes	1 / 2 lanes	Yes
HDR	2	I-15 NB HOV Ramp	N of Spring Mtn	S of Desert Inn								NA	1 lane	Yes
HDR	2	I-15 NB on ramp at Sahara			3 lanes	1 lane	Yes					NA	NA	NA
HDR	2	I-15 NB mainline	1 link S of Charleston EB off ramp	Charleston EB off ramp	4 lanes	4.5 lanes	Yes							No
HDR	2	I-15 NB mainline	Charleston EB off ramp	Charleston WB loop off ramp	4 lanes	4.5 lanes	Yes							No
HDR	2	I-15 NB on ramp at Grand Central/Charleston			2 lanes	1 lane	Yes							No
HDR	2	I-15 NB mainline	1 link S of US 95 off ramp	US 95 off ramp	4 lanes	4.5 lanes	Yes							No
HDR	2	I-15 NB & SB HOV connectors at Desert Inn			N/A	2/2 lanes	Yes					NA	NA	No
HDR	2	I-15 SB mainline	I-515 NB on ramp	US 95 EB/MLK on ramp	3/3.5 lanes	4 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	2	I-15 SB mainline	US 95 EB/MLK on ramp	Sahara off ramp	4 lanes	4.5 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	2	I-15 SB mainline	MLK on ramp	Sahara off ramp	4 lanes	4.5 lanes	Yes					4.5 lanes	5.5 lanes	Yes
HDR	2	I-15 SB HOV On-ramp at Alta	S of Spaghetti Bowl	Just S of Alta Overpass								2 lanes	1 lane	Yes
HDR	2	I-15 SB C/D road	1 link S of Alta overpass	Diverge								2.5 lanes	2 lanes	Yes
HDR	2	MLK SB ramp to I-15 SB C/D road	1 link S of MLK	CD Road (north of Charleston)								2 lanes	2 / 1 lanes	Yes
HDR	2	I-15 SB on ramp at Charleston	1 link N of I-15	I-15 SB								2 lanes	2 / 1 lanes	Yes
HDR	2	I-15 SB mainline	N of Sahara overpass	S of Sahara overpass								4.5 lanes	5 lanes	Yes
HDR	2	I-15 SB off ramp to CD/Sahara	I-15 SB	CD Road								2 lanes	2 / 1 lanes	Yes
HDR	2	I-15 SB off ramp to EB Sahara	I-15 SB off diverge	1 link south								2 lanes	1 lanes	Yes
HDR	2	Sahara at I-15	Rancho	Highland	3/4 lanes in each direction	3 lanes in each direction	Yes					3/4 lanes in each direction	3 lanes in each direction	Yes
HDR	2	EB Sahara east of I-15	Highland	SB I-15 off-ramp								4 lanes	3 lanes	Yes
HDR	2	Sahara east of I-15	SB I-15 off-ramp	Las Vegas Blvd								4 WB / 3 EB	3 WB / 4 EB	Yes
HDR	2	I-15 SB on ramp from Sahara	1 link N or I-15	I-15 SB								2 lanes	1 lane	Yes
HDR	2	I-15 SB mainline	1 link S of Sahara on ramp	2 links to south								5 lanes	4.5 lanes	Yes
HDR	2	I-15 SB HOV	N of Desert Inn	S of Spring Mtn								2 lanes	2 / 1 lane	Yes
HDR	2	I-15 SB HOV Direct Exit	S of Desert Inn	N of Spring Mtn								NA	1 lane	Yes
HDR	2	I-15 SB mainline	beginning of express lane	Spring Mountain on ramp	5 lanes	3 lanes	Yes					4 lanes	4 lanes	No
HDR	2	I-15 SB mainline	Spring Mounain on ramp	Flamingo EB loop off ramp	5.5 lanes	4 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	2	I-15 SB mainline	Flamingo EB loop off ramp	Flamingo on ramp	5 lanes	3 lanes	Yes					4 lanes	4 lanes	No
HDR	2	Flamingo EB at I-15	2 links W of SB on ramp	1 link E of NB on ramp	4 lanes	3 lanes	Yes					4 lanes	3 lanes	Yes
HDR	2	Flamingo SB on & NB off ramps										2 lanes	1 lanes	Yes
HDR	2	I-15 SB mainline	Flamingo on ramp	Tropicana off ramp	5.5 lanes	3.5 lanes	Yes					4.5 lanes	4.5 lanes	No
HDR	2	I-15 SB mainline	Tropicana off ramp	C/D road slip ramp at Hacienda overpass	5 lanes	3/3.5 lanes	Yes					4 / 4.5 lanes	4 / 4.5 lanes	No

Source of Record	Corridor ID	Onroad	Beginning	Ending	Condition in the New RTC 2015 Model	Proposed	Changes to the New RTC 2015 Model?	Notes 2015 Model	2017 model proposed	2017 Updated?	2017 Note	2040 Model Condition	2040 model proposed	2040 Updated
HDR	2	I-15 SB on ramp to C/D road from Tropicana			1/2 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	2	I-15 SB C/D road	slip ramp S of Tropicana off ramp to CD road S of Tropicana	1 link N	2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	2	I-15 SB mainline		I-215 EB off ramp	5 lanes	3 lanes	Yes					4 / 4.5 lanes	4 / 4.5 lanes	No
HDR	2	I-15 SB on ramp from Russell			3 lanes	1 lane	Yes					3 lanes	1 lane	Yes
HDR	2	I-15 SB CD road from EB US 95 and MLK on-ramp										FT=53	FT=80	Yes
HDR	2	I-15 SB on-ramp from MLK at Spaghetti Bowl										1 lane	1 / 2 lanes	Yes
Jacobs	2	I-15 SB mainline	I-15 SB CD Off Ramp/I-15 SB	Sunset Rd	4-lanes	3-lanes	Yes		3-lanes	Yes	Change made.			No
Jacobs	2	I-15 SB mainline	Sunset Rd	South of Ponderosa Way	3-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	4.5 lanes	Yes
Jacobs	2	I-15 SB mainline	I-15 SB Off Ramp at Hacienda Ave/Mandalay Bay Rd	North of Reno Ave	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	4.5 lanes	Yes
Jacobs	2	I-15 SB mainline	North of Reno Ave	South of Tropicana Ave	3-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	4.5 lanes	Yes
Jacobs	2	I-15 NB mainline	I-15 NB On Ramp at Tropicana Ave	I-15 NB Off Ramp at Flamingo Rd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	5 lanes	5.5 lanes	Yes
Jacobs	2	I-15 SB mainline	I-15 SB Off Ramp at EB Flamingo Rd	I-15 SB Off Ramp at WB Flamingo Rd	4-lanes	3.5-lanes	Yes		3.5-lanes	Yes	Change made.	4.5 lanes	4 lanes	Yes
Jacobs	2	I-15 SB mainline	I-15 SB Off Ramp at WB Flamingo Rd	I-15 SB On Ramp at Spring Mountain Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.	4.5 lanes	4.5 lanes	No
Jacobs	2	I-15 NB mainline	North of I-15 NB On Ramp at Spring Mountain Rd	I-15 NB Off Ramp at Sahara Ave	6-lanes Auxiliary lane does not exist	5.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		5.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	5 / 5.5 lanes	5 / 5.5 lanes	No
Jacobs	2	I-15 SB mainline	I-15 SB Off Ramp at Sahara Ave	I-15 SB On Ramp at Martin L. King Blvd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.		4 lanes	Yes
Jacobs	2	I-15 NB mainline	I-15 NB Off Ramp at Charleston Blvd	I-15 NB Off Ramp at Grand Central Pkwy	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.		4 lanes	No
Jacobs	2	I-15 SB mainline	I-15 SB Off Ramp at Martin L. King Blvd	US 95 EB Off Ramp/I-15 SB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4.5 lanes	4.5 / 4 lanes	Yes
Jacobs	2	I-15 SB mainline	US 95 EB Off Ramp/I-15 SB	South of I-515 WB Off Ramp/I-15 SB	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.	4.5 lanes	4.5 lanes	No
Jacobs	2	I-15 NB mainline	I-15 NB On Ramp at Grand Central Pkwy	I-15 NB Off Ramp/US 95 WB	4.5-lanes Existing auxiliary lane	5-lanes Removed Auxiliary lane, does not exist	Yes		5-lanes Removed Auxiliary lane, does not exist	Yes	Change made.	4 lanes	5 lanes	No
Jacobs	2	I-15 NB mainline	I-15 NB Off Ramp/US 95 WB	I-15 NB Off Ramp/I-515 EB	4-lanes Auxiliary lane does not exist	3-lanes Coded auxiliary lane (AuxLn = 2)	Yes		3-lanes Coded auxiliary lane (AuxLn = 2)	Yes	Change made.	5 lanes	5 lanes	No
HDR	3	CC 215 EB mainline	I-15 SB off ramp	I-15 NB loop ramp	3 lanes	3.5 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	3	CC 215 mainline	Decatur E side ramps	I-15 W side ramps	3 lanes in each direction	3.5 lanes in each direction	Yes					3 lanes	3.5 lanes	Yes
HDR	3	Decatur NB at CC 215	CC 215 NB ramps	Sunset	2 lanes	3 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	3	CC 215 SB off ramp at Decatur	Roy Horn Way	Decatur	1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	3	CC 215 NB off ramp to Decatur SB			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	3	CC 215 NB on ramp from Decatur			1 lane	3 lanes	Yes					1 lane	3 lanes	Yes
HDR	3	CC 215 mainline	Jones ramps	Decatur ramps	3 lanes in each direction	3.5 lanes in each direction	Yes					3 lanes	3.5 lanes	Yes
HDR	3	CC 215 SB on ramp at Jones			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB off ramp at Jones			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 NB off ramp at Jones			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 NB on ramp at Jones			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB on ramp at Rainbow			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB off ramp at Rainbow			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 NB on ramp at Rainbow			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB on ramp at Buffalo			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB off ramp at Buffalo			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 NB off ramp at Buffalo			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 NB on ramp at Buffalo			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB mainline	Durango Dr E side ramps	Buffalo W side ramps	3 lanes	3.5 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	3	Durango Dr NB at CC 215	CC 215 SB ramps	CC 215 NB ramps	3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	3	CC 215 SB on ramp at Durango Dr			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	Sunset Rd at CC 215	CC 215 SB ramps	Quarter Horse Ln	1 lane in each direction	2 WB/3 EB lanes	Yes					1 lane in each direction	2 WB/3 EB lanes	Yes
HDR	3	CC 215 SB off ramp at Sunset			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 NB on ramp at Sunset			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	3	CC 215 SB frontage road (Jerry Tarkanian)	Patrick Lane	Sunset off ramp	1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	3	I-15 CD ramps to CC 215 WB			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes

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Jacobs	3	CC 215 EB mainline	CC 215 EB Off Ramp/I-15 NB CD Road	CC 215 EB Off Ramp/I-15 SB CD Road	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	3	CC 215 EB mainline	CC 215 EB Off Ramp/I-15 SB CD Road	CC 215 EB On Ramp at Decatur Blvd	3.5-lanes	4-lanes	Yes		4-lanes	Yes	Change made.			Yes
Jacobs	3	CC 215 WB mainline	I-15 SB CD Road Off Ramp/CC 215 WB	East of Hinson St	3.5-lanes	4-lanes	Yes		4-lanes	Yes	Change made.			Yes
Jacobs	3	CC 215 WB mainline	East of Hinson St	CC 215 WB Off Ramp at Decatur Blvd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Split link. Change made.			Yes
Jacobs	3	CC 215 WB/EB mainline	CC 215 WB On Ramp/EB Off Ramp at Decatur Blvd	CC 215 EB On Ramp/WB Off Ramp at Jones Blvd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	3	CC 215 EB mainline	CC 215 EB Off Ramp at Buffalo Dr	CC 215 EB On Ramp at Durango Dr	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
HDR	4	I-15 NB mainline	1 link N of Lamb on ramp	New CC-215 off ramp								2 lanes	3 lanes	Yes
HDR	4	I-15 ramps at Lamb			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	Lamb Blvd at I-15	I-15 SB ramps	Lone Mountain	2 lanes in each direction	3 lanes in each direction	Yes					2 lanes in each direction	3 lanes in each direction	Yes
HDR	4	I-15 NB off ramp at Craig			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	4	I-15 NB off ramp at Craig (EB/WB)			1/2 lanes	2/3 lanes	Yes					1/2 lanes	2/3 lanes	Yes
HDR	4	I-15 NB on ramp from Craig EB			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	4	I-15 mainline	Speedway S side ramps	Apex S side ramps								2 lanes in each direction	3 lanes in each direction	Yes
HDR	4	I-15 SB mainline	Craig N side ramps	Craig S side ramps	2 lanes	2/3 lanes	Yes					3/3 lanes	3/3 lanes	Yes
HDR	4	I-15 NB on ramp at Cheyenne			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	I-15 NB off ramp to EB Cheyenne			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	I-15 SB loop on ramp at Lake Mead			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	I-15 NB on ramp at Lake Mead			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	I-15 SB mainline	Lake Mead WB loop on ramp	1 link S of Lake Mead EB on ramp	4 lanes	5 lanes	Yes					4 lanes	5 lanes	Yes
HDR	4	I-15 SB off ramp to Washington			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	I-15 NB on ramp at Washington			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	4	I-15 NB on ramp from US 95 EB / MLK										1 lane	2 lanes	Yes
HDR	4	I-15 mainline	Cheyenne N side ramps	Craig S side ramps	3.5 lanes in each direction	4 lanes in each direction	Yes					3.5 lanes in each direction	4 lanes in each direction	Yes
HDR	4	I-15 SB mainline	Link N of Spaghetti Bowl	Link S of Spaghetti Bowl								3 lanes	3.5 lanes in each direction	Yes
HDR	4	I-15 NB mainline	Link under I-515 in Spaghetti Bowl									3 lanes	3.5 lanes in each direction	Yes
Jacobs	4	I-15 SB mainline	South of the Cartier Ave	I-15 SB On Ramp at Cheyenne Ave	4.5-lanes Existing auxiliary lane	5-lanes Removed Auxiliary lane, does not exist	Yes		5-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	4	I-15 NB mainline	I-15 NB On Ramp at Lake Mead Pkwy	South of the Cartier Ave	4.5-lanes Existing auxiliary lane	5-lanes Removed Auxiliary lane, does not exist	Yes		5-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	4	I-15 SB mainline	I-15 SB Off Ramp at Cheyenne Ave	I-15 SB On Ramp at Craig Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	4	I-15 NB mainline	I-15 NB On Ramp at Cheyenne Ave	North of Gowan Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	4	I-15 NB mainline	North of Gowan Rd	I-15 NB Off Ramp at Craig Rd	4-lanes	3.5-lanes	Yes		3.5-lanes	Yes	Change made.			Yes
HDR	5	CC 215 SB on ramp at Russell			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 SB off ramp at Russell			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 NB off ramp at Russell			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 NB on ramp at Russell			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	Russell Rd WB at CC 215	CC 215 SB ramps	1 link E of NB ramps	3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	5	Tropicana WB at CC 215	CC 215 NB ramps	Fort Apache	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	5	CC 215 NB on ramp at Tropicana			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 NB off ramp at Tropicana			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 SB on ramp at Tropicana			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 SB	Flamingo SB on ramp	N of Tropicana off ramp	3 lanes	3.5 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	5	Flamingo WB at CC 215	E of CC 215 interchange	W of CC 215 interchange	3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	5	CC 215 SB off ramp at Charleston			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	5	CC 215 NB off ramp at Charleston			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	5	CC 215 SB on ramp at Charleston			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	5	CC 215 NB off ramp to Far Hills			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	CC 215 ramps at Far Hills (all 4 right turns)			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	5	Summerlin Pkwy WB to CC 215 SB loop ramp			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes

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HDR	5	CC 215 SB mainline	Summerlin Pkwy WB loop on ramp	Far Hills off ramp	4 lanes	4.5 lanes	Yes					4 lanes	4.5 lanes	Yes
Jacobs	5	CC 215 SB mainline	North of CC 215 SB Off Ramp at Tropicana Ave	CC 215 SB On Ramp at Flamingo Rd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	5	CC 215 SB mainline	North of Alta Dr	CC 215 SB On Ramp at Far Hills Ave	3.5 lanes Existing auxiliary lane	4-lanes Removed auxiliary lane, does not exist	Yes		4-lanes Removed auxiliary lane, does not exist	Yes	Split link. Change made.			Yes
Jacobs	5	CC 215 SB mainline	CC 215 SB Off Ramp at Far Hills Ave	Summerlin Pkwy WB Off Ramp/CC 215 SB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	5	CC 215	Summerlin Pkwy	Far Hills Ave	Two links have 55 mph posted speed	65 mph posted speed	Yes		65 mph posted speed	Yes	Change made.			Yes
HDR	6	CC 215 SB off ramp to Summerlin Pkwy EB			1 lane	2 lanes	Yes					0 lanes	2 lanes	Yes
HDR	6	CC 215 SB off ramp to Summerlin Pkwy EB			1 lane	2 lanes	Yes					1 lane	2 lane	Yes
HDR	6	CC 215 SB off ramp to Summerlin Pkwy EB	CC-215 SB	Summerlin EB on ramp from CC215 NB								1 lane	0 lane	Yes
HDR	6	CC 215 SB off ramp at Lake Mead			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	6	Cheyenne Ave at CC 215	CC 215 SB ramps	Hualapai Way	2 lanes in each direction	3 lanes in each direction	Yes					2 lanes in each direction	3 lanes in each direction	Yes
HDR	6	Hualapai Way at CC 215	Deer Springs Way	Centennial Pkwy	3/3 lanes, 1/1 lane in each direction	2 lanes in each direction	Yes					3/3 lanes, 1/1 lane in each direction	2 lanes in each direction	Yes
HDR	6	Deer Springs Way	Hualapai Way	Egan Crest Drive	1 lane in each direction	0 lanes in each direction	Yes					1 lane	1 lane	No
Jacobs	6	CC 215 SB mainline	South of Gilmore Ave	CC 215 SB Off Ramp at Cheyenne Ave	3-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Split link. Change made.			Yes
HDR	7	CC 215 mainline	2 links E of US 95	1 link W of Tenaya Way	3 lanes in each direction	2 lanes in each direction	Yes					3 lanes in each direction	3 lanes in each direction	No
HDR	7	CC 215 mainline	US 95 / CC 215 IC	5th IC								2 lanes in each direction	3 lanes in each direction	Yes
HDR	7	Decatur at CC 215	WB ramps	1 link S of WB ramps	FT=53 (minor arterial)	FT=43 (major arterial)	Yes					FT=43 (major arterial)	FT=43 (major arterial)	No
HDR	7	Revere at CC 215	Southern ramps	Northern ramps								NA	3 / 3 lanes	Yes
HDR	7	Revere at CC 215	New IC - All Ramps									NA	WB off 2 lanes. All others 1 / 2.	Yes
HDR	7	CC 215 ramps at 5th St			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	7	5th St at CC 215	WB ramps		3 lanes in each direction	0 lanes	Yes	Disconnected 5th Street north of IC for both 2015 and 2017 networks.				3 lanes in each direction	3 lanes in each direction	No
HDR	7	Losee St at CC 215	WB ramps		3 lanes in each direction	0 lanes	Yes	Disconnected Losee Street north of IC for both 2015 and 2017 networks.				3 lanes in each direction	3 lanes in each direction	No
HDR	7	5th St at CC 215	CC 215 WB	Dorrell Ln	1 lane in each direction	3 SB lanes/2 NB lanes	Yes					3 lanes in each direction	3 lanes in each direction	No
HDR	7	Losee at CC 215	CC 215 WB	1 link S of CC 215 EB	3 lanes in each direction	2 lanes in each direction	Yes					3 lanes in each direction	3 lanes in each direction	No
HDR	7	Pecos at CC 215	CC 215 WB	1 link S of CC 215 EB	1 lane in each direction	2 lanes in each direction	Yes					3 lanes in each direction	3 lanes in each direction	No
HDR	7	Lamb Blvd at CC 215	CC 215 WB	1 link S of CC 215 EB	4 lanes in each direction	2 lanes in each direction	Yes					2 lanes in each direction	2 lanes in each direction	No
HDR	7	CC 215 EB to I-15 NB			2 lanes	1 lane	Yes					2 lanes	2 lanes	No
HDR	7	I-15 NB to CC 215 WB			2 lanes	1 lane	Yes					2 lanes	2 lanes	No
Jacobs	7	CC 215 EB mainline	East of Tenaya Way	West of CC 215 EB Off Ramp at Jones Blvd	2-lanes Auxiliary lane does not exist	2.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		2.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	7	CC 215 WB mainline	East of Rainbow Blvd	CC 215 WB On Ramp at Jones Blvd	2.5-lanes Existing auxiliary lane	2-lanes Removed Auxiliary lane, does not exist	Yes		2-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
HDR	8	I-15 NB off ramp to I-515 EB			1 lane	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	8	I-515 EB mainline	I-15 on ramps	Casino off ramp	3 lanes	3.5 lanes	Yes					3 / 2 lanes	3.5 lanes	Yes
HDR	8	I-515 NB mainline	Casino on ramp	I-15 SB off ramp	3 lanes	3.5 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	8	I-515 SB off ramp at Casino			1 lane	2 lanes	Yes					2 lanes	2 lanes	Yes

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HDR	8	I-515 SB mainline	2 links S of Charleston on ramp	1 link S	3 lanes	4 lanes	Yes					4 lanes	4 lanes	No
HDR	8	I-515 NB mainline	2 links S or Charleston off ramp (begin HOV)	1 link S or Charleston off ramp								3 lanes	3.5 lanes	Yes
HDR	8	MLK to I-515 EB on ramp										NA	1 lane	Yes
Jacobs	8	I-515 SB mainline	Sahara Ave	I-515 SB On Ramp at Charleston Blvd	3.5-lanes Existing auxiliary lane	4-lanes Removed Auxiliary lane, does not exist	Yes		4-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	8	I-515 NB mainline	West of Pecos Rd	West of Mojave Rd	3.5-lanes Existing auxiliary lane	3-lanes Removed Auxiliary lane, does not exist	Yes		3-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			No
Jacobs	8	I-515 SB mainline	I-515 SB On Ramp at Eastern Ave	East of Mojave Rd	3.5-lanes Existing auxiliary lane	3-lanes Removed Auxiliary lane, does not exist	Yes		3-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			No
Jacobs	8	I-515 NB mainline	I-515 NB On Ramp at Casino Center Blvd	I-515 WB Off Ramp/I-15 SB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			No
Jacobs	8	I-515 SB mainline	I-15 NB Off Ramp/I-515 EB	I-515 SB Off Ramp at Casino Center Blvd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			No
HDR	8	I-515 NB mainline	1 links S or Charleston off ramp (begin HOV)	Charleston off ramp								4 lanes	3.5 lanes	Yes
HDR	8	I-515 NB mainline	Charleston off ramp	Mojave overpass (3 links east of Eastern)								4 / 4.5 lanes	3 lanes	Yes
HDR	8	I-515 NB mainline	Mojave overpass (3 links east of Eastern)	Eastern off ramp								4.5 lanes	3.5 lanes	Yes
HDR	8	I-515 NB mainline	Eastern off ramp	Eastern on ramp								4 lanes	3 lanes	Yes
HDR	8	I-515 NB mainline	Eastern on ramp	Las Vegas off ramp								4.5 lanes	4 lanes	Yes
HDR	8	I-515 NB mainline	Las Vegas off ramp	1 link W of LV off ramp								4 lanes	3 lanes	Yes
HDR	8	I-515 NB mainline	1 link W of Main overpass (2015 model on ramp from LV)	3 link2 W of Main overpass (2015 model on ramp from LV)								3 lanes	3.5 lanes	Yes
HDR	8	I-515 SB mainline	1 link E of EB US95 to NB I-15 off ramp	2 links E of MLK to I-515 on ramp								3 lanes	2 lanes	Yes
HDR	8	I-515 SB mainline	2 links E of MLK to I-515 on ramp	1 link W of Main overpass								3 / 2 lanes	3.5 lanes	Yes
HDR	8	I-515 SB mainline	1 link W of Main overpass	Las Vegas on ramp								2 lanes	3 lanes	Yes
HDR	8	I-515 SB mainline	Las Vegas on ramp	Eastern off ramp								2 lanes	4 lanes	Yes
HDR	8	I-515 SB mainline	Eastern off ramp	Charleston on ramp								2 / 5 / 5.5 / 5 / 4 lanes	3 lanes	Yes
HDR	8	I-515 / Pecos / Stewart Interchange and Frontage Roads										Frontage Roads and Ramps	Removed	Yes
HDR	8	I-515 / Eastern Interchange										2 lanes, RT link 35898, 35905 to frontage	1 lane, deleted 35898, 35905 reconnected	Yes
HDR	8	I-515 EB Frontage Rd	Spaghetti Bowl	Eastern / Stewart IC								Frontage road	Removed	Yes
HDR	8	I-515 WB Frontage Rd	Eastern / Stewart IC	Spaghetti Bowl								Frontage road	Removed	Yes
HDR	8	I-515 / Casino / 4th St Interchange										Frontage road / improved ramps	Removed frontage, ramps back to existing	Yes
HDR	9	I-515 SB off ramp at Boulder Hwy			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	9	I-515 SB mainline	Boulder Hwy SB on ramp	1 link S of Boulder Hwy on ramp	3 lanes	3.5 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	9	Flamingo EB at I-515	I-515 SB on ramp	I-515 NB off ramp	3 lanes	2 lanes	Yes					3 lanes	3 lanes	No
HDR	9	I-515 SB mainline	Flamingo WB loop on ramp	Flamingo EB on ramp	3.5 lanes	3 lanes	Yes					3.5 lanes	3 lanes	Yes
HDR	9	I-515 SB off at Tropicana			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	9	I-515 SB on ramp at Sunset			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes

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HDR	9	I-515 NB off ramp at Sunset			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	9	I-515 SB mainline	Auto Show Dr off ramp	Lake Mead off ramp	3 lanes	4 lanes	Yes			3.5 lanes		3 lanes	3.5 lanes	Yes
HDR	9	I-515 SB mainline	Auto Show Dr on ramp	1 link S of I-215 EB on ramp	3 lanes	4 lanes	Yes					3 lanes	4 lanes	Yes
HDR	9	I-515 NB mainline	Lake Mead WB on ramp	Auto Show Dr off ramp	3 lanes	3.5 lanes	Yes					3 lanes	3.5 lanes	Yes
HDR	9	I-515 SB off ramp to Lake Mead Pkwy EB			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	9	I-515 NB on ramp from Lake Mead Pkwy			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
Jacobs	9	I-515 NB mainline	I-215 WB Off Ramp/I-515 NB	I-515 NB Off Ramp at Auto Show Dr	3.5-lanes	4-lanes	Yes		4-lanes	Yes	Change made.			Yes
Jacobs	9	I-515 SB mainline	I-515 SB Off Ramp at Auto Show Dr	I-515 SB Off Ramp/I-215 EB	4-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	9	I-515 NB/SB mainline	I-515 NB On Ramp/SB Off Ramp at Galleria Dr	I-515 NB Off Ramp/SB On Ramp at Russell Rd	3-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	9	I-515 NB mainline	I-515 NB On Ramp at Tropicana Ave	I-515 NB Off Ramp at Flamingo Rd	3-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	9	I-515 SB mainline	I-515 SB On Ramp at EB Flamingo Rd	I-515 SB On Ramp at WB Flamingo Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	9	I-515 SB mainline	North of Emerson Ave	North of Desert Inn Rd	3.5-lanes Existing auxiliary lane	4-lanes Removed auxiliary lane, does not exist	Yes		4-lanes Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	9	I-515 SB mainline	North of Desert Inn Rd	I-515 SB On Ramp at Boulder Hwy	3.5-lanes	4-lanes	Yes		4-lanes	Yes	Change made.			Yes
Jacobs	9	I-515 NB mainline	I-515 NB On Ramp at Boulder Hwy	Sahara Ave	3.5-lanes Existing auxiliary lane	4-lanes Removed Auxiliary lane, does not exist	Yes		4-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
HDR	10	I-515 NB off ramp to I-215			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	10	I-215 EB off ramp to SB I-515			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	10	I-515 on ramps at Horizon (right turns only)			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	10	I-515 mainline	Wagon Wheel interchange	1 or 2 links NW	2 lanes in each direction	3 lanes in each direction	Yes					2 lanes in each direction	3 lanes in each direction	Yes
HDR	10	I-515 NB mainline	3 links N of US 95	1 link N	FT=42 (major arterial)	FT=13 (freeway)	Yes					N/A	N/A	No
Jacobs	10	I-515 SB mainline	I-515 SB On Ramp at College Dr	I-515 SB Off Ramp at Wagon Wheel Dr	3-lanes Auxiliary lane does not exist	2.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		2.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	10	I-515 NB mainline	North of Rocky Rd	I-515 NB Off Ramp/I-215 EB	3-lanes Auxiliary lane does not exist	3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		3.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
HDR	11	I-215 EB off ramp to I-515			2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	11	I-215 EB mainline	I-515 SB on ramp	I-515 NB on ramp	2 lanes	4 lanes	Yes					2 lanes	4 lanes	Yes
HDR	11	I-215 EB mainline (Lake Mead Pkwy)	I-515 NB on ramp	Eastgate	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	11	I-215 WB mainline (Lake Mead Pkwy)	Eastgate	I-515 NB on ramp	2 lanes	2.5 lanes	Yes					2 lanes	2.5 lanes	Yes
HDR	11	I-215 EB off ramp at Gibson			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	11	I-215 WB off ramp at Gibson			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	11	Gibson Rd at I-215	Las Palmas Entrada	I-215 EB ramps	2 lanes in each direction	2 SB lanes/3 NB lanes	Yes					3 lanes in each direction	3 lanes in each direction	No
HDR	11	Stephanie SB at I-215	NB ramps	SB ramps	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	11	I-215 WB mainline	St Rose on ramp	Eastern off ramp	3.5 lanes	3 lanes	Yes					3.5 lanes	3 lanes	Yes
HDR	11	I-215 EB off ramp to Eastern			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	11	I-215 EB off ramp to Windmill			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	11	I-215 mainline	Windmill N ramps	Eastern S ramps								4 lanes	3 lanes	Yes
HDR	11	I-215/Windmill SPUI - left turn lanes			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	11	I-215 EB mainline	Warm Springs on ramp	Windmill off ramp	4.5 lanes	5 lanes	Yes					4.5 lanes	5 lanes	Yes
HDR	11	I-215 EB off ramp to Warm Springs			1 lane	2 lanes	Yes					2 lanes	2 lanes	No
HDR	11	I-215 WB mainline	Warm Springs on ramp	Airport Connector off ramp	4 lanes	4.5 lanes	Yes					4 lanes	4.5 lanes	Yes
HDR	11	I-215 EB mainline	Airport Connector on ramp	Warm Springs off ramp	4 lanes	4.5 lanes	Yes					4 lanes	4 lanes	No
HDR	11	Airport Connector SB ramp to Hidden Well			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	11	I-215 WB mainline	Airport Connector on ramp	Las Vegas Blvd off ramp	4.5 lanes	5 lanes	Yes					4.5 lanes	5 lanes	Yes
HDR	11	I-215 EB mainline	I-15 on ramps	Las Vegas Blvd on ramp	4.5 lanes	5 lanes	Yes					4.5 lanes	5 lanes	Yes
HDR	11	I-215 WB mainline	I-15 NB off ramp	I-15 SB loop off ramp	3 lanes	4 lanes	Yes					3 lanes	4 lanes	Yes

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HDR	11	I-15 SB/CC 215 EB off ramp to Las Vegas Blvd			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
Jacobs	11	I-215 WB mainline	Eastgate Rd/Fiesta Henderson Blvd	I-215 WB Off Ramp/I-515 NB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	11	I-215 WB mainline	I-215 WB Off Ramp/I-515 NB	I-215 WB Off Ramp/I-515 SB	Auxiliary lane does not exist	2.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes		2.5-lanes Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	11	I-215 EB mainline	I-215 EB Off Ramp/I-515 SB	I-215 EB On Ramp at Gibson Rd	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	11	I-215 WB mainline	I-515 WB On Ramp at Pecos Rd	I-515 WB Off Ramp at Eastern Ave	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	11	I-215 EB mainline	I-215 EB Off Ramp at Windmill Ln	North of Robindale Rd	5-lanes	4.5-lanes	Yes		4.5-lanes	Yes	Link split. Change made.			Yes
Jacobs	11	I-215 EB mainline	North of Robindale Rd	I-215 EB On Ramp at Warm Springs Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	11	I-215 WB mainline	I-215 WB On Ramp at EB Warm Springs Rd	I-215 WB Off Ramp/Airport Connector NB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	11	I-215 EB mainline	I-215 EB Off Ramp at Warm Springs Rd	Airport Connector SB Off Ramp/I-215 EB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			No
Jacobs	11	I-215 WB mainline	Airport Connector SB Off Ramp/I-215 WB	I-215 WB Off Ramp at Las Vegas Blvd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	11	I-215 WB mainline	I-215 WB Off Ramp at Las Vegas Blvd	East of Las Vegas Blvd	4.5-lanes Existing auxiliary lane	5-lanes Removed auxiliary lane, does not exist	Yes		5-lanes Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	11	I-215 EB mainline	I-215 EB Off Ramp/Airport Connector NB	I-215 EB On Ramp at Las Vegas Blvd	4.5-lanes Existing auxiliary lane	5-lanes Removed Auxiliary lane, does not exist	Yes		5-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	11	I-215 EB mainline	I-215 EB On Ramp at Las Vegas Blvd	I-15 SB Off Ramp/I-215 EB	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
HDR	12	US 95 WB HOV begin link	West of Rancho overpass	1 link east of Rancho on ramp								1 way HOV	2-way ramp	Yes
HDR	12	US 95 EB HOV end link	East of Rancho overpass	1 link west of Rancho on ramp								Btwn Valley View & Rancho	East of Rancho overpass	Yes
HDR	12	US 95 HOV Access (EB & WB)	Rancho interchange	Valley View interchange								NA	1 / 1 lanes	Yes
HDR	12	US 95 SB (EB) mainline	I-15 NB off ramp	1 link to E	2 lanes	3 lanes	Yes					3 lanes	3 lanes	No
HDR	12	US 95 NB (WB) ramp between MLK and Rancho Dr	End of MLK on ramp	Beginning of Rancho Dr off ramp	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	12	US 95 SB (EB) on ramp at Rancho Dr			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	12	US 95 SB (EB) CD road (off-ramp to MLK)										2 lanes	2.5 lanes	Yes
HDR	12	US 95 SB (EB) off-ramp to MLK										1 lane	1 / 2 / 2	Yes
HDR	12	US 95 NB (WB) off ramp at Rancho Dr			2 lanes	1 lane	Yes					3 lanes	1 lane	Yes
HDR	12	US 95 NB (WB) on ramp at Rancho Dr			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	12	US 95 SB (EB) off ramp at Rancho Dr			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	12	US 95 SB (EB) off ramp at Rancho Dr			2 lanes	1 lane	Yes					3 lanes	2 lanes	Yes
HDR	12	Rancho Dr SB (south interchange)	N of US 95 interchange	S of US 95 interchange	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	12	US 95 NB (WB) mainline	beginning of HOV lane	Rancho on ramp	5.5 lanes	5 lanes	Yes					5.5 lanes	5 lanes	Yes
HDR	12	US 95 NB (WB) mainline	Rancho on ramp	Valley View off ramp								6 lanes	5.5 lanes	Yes
HDR	12	US 95 SB (EB) mainline	I-15 SB / MLK off ramp	1 link east								3 lanes	2 lanes	Yes
HDR	12	US 95 SB (EB) mainline	Rancho off ramp	I-15 SB / MLK off ramp								5.5 lanes	4.5 lanes	Yes
HDR	12	US 95 SB (EB) mainline	OLD end of HOV lane (1 link west of Rancho off)	Rancho off ramp	5.5 lanes	6.5 lanes	Yes					5.5 lanes	5.5 lanes	No
HDR	12	US 95 SB (EB) mainline	Jones overpass	Jones on ramp	4.5 lanes	4 lanes	Yes					4.5 lanes	4 lanes	Yes
HDR	12	US 95 SB (EB) off ramp to Jones			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	12	US 95 NB (WB) mainline	Summerlin Pkwy off ramp	Rainbow Blvd off ramp	4.5 lanes	3.5 lanes	Yes					4.5 lanes	3.5 lanes	Yes
HDR	12	US 95 & Summerlin Pkwy interchange ramps			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	12	US 95 & Summerlin Pkwy interchange ramps			3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes

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Jacobs	12	US 95 WB mainline	Ramsey St	US 95 WB On Ramp at Rancho Blvd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	12	US 95 WB mainline	US 95 WB On Ramp at Rancho Blvd	US 95 WB Off Ramp at Valley View Blvd	5.5-lanes Existing auxiliary lane	6-lanes Removed Auxiliary lane, does not exist	Yes		6-lanes Removed Auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	12	US 95 EB mainline	US 95 EB On Ramp at Jones Blvd	Jones Blvd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
HDR	13	Summerlin Pkwy EB mainline	W end	CC 215 NB ramps	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	13	Summerlin Pkwy WB at CC 215	CC 215 NB ramps	CC 215 SB loop on ramp	2 lanes	3 lanes	Yes					2 lanes	3 lanes	Yes
HDR	13	Summerlin Pkwy WB mainline	Anasazi on ramp	CC 215 SB loop on ramp	2 lanes	3 lanes	Yes					4 lanes	3 lanes	Yes
HDR	13	Summerlin Pkwy EB mainline	CC-215 NB on ramp	Durango on ramp								4 lanes	2 lanes	Yes
HDR	13	Summerlin Pkwy EB mainline	Buffalo Dr off ramp	Buffalo Dr on ramp								4 lanes	2 lanes	Yes
HDR	13	Summerlin Pkwy EB mainline	Buffalo Dr on ramp	Rainbow off ramp	2 lanes	2.5 lanes	Yes					4 lanes	2.5 lanes	Yes
HDR	13	Summerlin Pkwy EB mainline	Rainbow off ramp	US 95	2 lanes	2.5 lanes	Yes					2 lanes	2.5 lanes	Yes
HDR	13	Summerlin Pkwy WB mainline	Buffalo Dr off ramp	end of HOV lane								4 lanes	2 lanes	Yes
HDR	13	Summerlin Pkwy WB mainline	end of HOT lane	Buffalo Dr NB loop on ramp	2 lanes	3 lanes	Yes					4 lanes	3 lanes	Yes
HDR	13	Summerlin Pkwy WB on ramp from Buffalo NB - Turn Prohib	Buffalo NB	Summerlin WB on ramp from SB Buffalo								No Trun Prohib	Added Turn Prohib	Yes
HDR	13	Summerlin Pkwy EB mainline	Durango Dr on ramp	Buffalo Dr off ramp	2 lanes	2.5 lanes	Yes					4 lanes	2.5 lanes	Yes
HDR	13	Summerlin Pkwy WB off ramp to Durango			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	13	Town Center	Summerlin Pkwy WB ramps	2 links N	2/3, 3/2 lanes	3 lanes in each direction	Yes					2/3, 3/2 lanes	3 lanes in each direction	Yes
HDR	13	Summerlin ramps at Anasazi			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
Jacobs	13	Summerlin Pkwy WB mainline	US 95 SB Off Ramp/Summerlin Pkwy WB	Summerlin Pkwy WB Off Ramp at Buffalo Dr	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	2.5 lanes	Yes
Jacobs	13	Summerlin Pkwy EB mainline	Summerlin Pkwy EB Off Ramp/US 95 NB	Summerlin Pkwy EB On Ramp at Buffalo Dr	Auxiliary lane does not exist 3-lanes	Coded auxiliary lane (AuxLn = 1) 2.5-lanes	Yes		Coded auxiliary lane (AuxLn = 1) 2.5-lanes	Yes	Change made.	4 lanes	2.5 lanes	Yes
Jacobs	13	Summerlin Pkwy WB mainline	Summerlin Pkwy WB On Ramp at NB Buffalo Dr	Summerlin Pkwy WB On Ramp at SB Buffalo Dr	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	2.5 lanes	Yes
Jacobs	13	Summerlin Pkwy WB mainline	Summerlin Pkwy WB On Ramp at SB Buffalo Dr	Summerlin Pkwy WB Off Ramp at Durango Dr	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	2.5 lanes	Yes
Jacobs	13	Summerlin Pkwy EB mainline	Summerlin Pkwy EB Off Ramp at Buffalo Dr	Summerlin Pkwy EB On Ramp at Durango Dr	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	4 lanes	2.5 lanes	No
Jacobs	13	Summerlin Pkwy EB/WB mainline	US 95	CC 215	Several links have 55 mph posted speeds	65 mph posted speed	Yes		65 mph posted speed	Yes	Change made.			Yes
HDR	14	Summerlin Pkwy EB mainline	W end	CC 215 NB ramps	2 lanes	3 lanes	Yes					4 lanes	2 lanes	Yes
HDR	14	US 95 NB to Buffalo/CC 215 WB ramp			1 lane	2 lanes	Yes		1 lane	Yes	Construction narrowed to 1 lane	1 lane	2 lanes	Yes
HDR	14	US 95 NB to CC 215 EB			1 lane	0 lanes	Yes	Disconnected ramp and will need to be reconnected for 2017 network.	1 lane	Yes		1 lane	1 lane	No
HDR	14	US 95 NB mainline	Summerlin Pkwy on ramp	Rainbow Blvd on ramp	3.5 lanes	4 lanes	Yes					3.5 lanes	4 lanes	Yes
HDR	14	US 95 NB mainline	Rainbow Blvd on ramp	Lake Mead WB loop off ramp	3.5 lanes	4.5 lanes	Yes					3.5 lanes	4.5 lanes	Yes
HDR	14	US 95 NB mainline	Lake Mead WB loop off ramp	Lake Mead on ramp	3 lanes	4 lanes	Yes					3 lanes	4 lanes	Yes
HDR	14	US 95 NB mainline	Lake Mead on ramp	Cheyenne off ramp	3.5 lanes	4.5 lanes	Yes					3.5 lanes	4.5 lanes	Yes
HDR	14	US 95 NB mainline	Cheyenne off ramp	Cheyenne on ramp	3 lanes	4 lanes	Yes					3 lanes	4 lanes	Yes
HDR	14	US 95 NB mainline	Cheyenne on ramp	Craig off ramp	3.5 lanes	4.5 lanes	Yes					3.5 lanes	4.5 lanes	Yes
HDR	14	US 95 NB mainline	Craig off ramp	Craig on ramp	3 lanes	4 lanes	Yes					3 lanes	4 lanes	Yes
HDR	14	US 95 NB mainline	Craig on ramp	1 link S of Rancho off ramp	3.5 lanes	4.5 lanes	Yes					3.5 lanes	4.5 lanes	Yes
HDR	14	US 95 NB mainline	1 link S of Rancho off ramp	Rancho off ramp	3.5 lanes	5.5 lanes	Yes		4.5 lanes plus 1 HOV lane	Yes		3.5 lanes	4.5 lanes	Yes

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HDR	14	US 95 NB HOV			0	2 lanes	Yes	Deleted HOV to north of El Rancho off ramp	Code back in HOV to north	Yes		1 lane	1 lane	No
HDR	14	US 95 NB mainline	Rancho off ramp	Ann Rd off ramp	3.5 lanes	4.5 lanes	Yes					3.5 lanes	4.5 lanes	Yes
HDR	14	US 95 NB mainline	Ann Rd off ramp	Ann Rd on ramp	3 lanes	4 lanes	Yes		4 lanes	Yes	ID 25861 increased 3 to 4 lanes	3 lanes	4 lanes	Yes
HDR	14	US 95 SB mainline	Start HOV lane	Ann Rd on ramp	3.5 lanes	3 lanes	Yes		Check lanes	Yes	3 lanes	3.5 lanes	3 lanes	Yes
HDR	14	US 95 NB off ramp at Craig Rd			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	14	US 95 SB off ramp at Craig Rd			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	14	Craig Rd WB at US 95	SB ramp intersection	1 link W	3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	14	Craig Rd EB at US 95	NB ramp intersection	1 link E	3 lanes	2 lanes	Yes					3 lanes	2 lanes	Yes
HDR	14	US 95 SB off ramp at Cheyenne			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	14	US 95 NB off ramp at Cheyenne			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	14	US 95 SB mainline	Cheyenne WB loop on ramp	Cheyenne EB on ramp	3.5 lanes	3 lanes	Yes					3.5 lanes	3 lanes	Yes
HDR	14	US 95 SB off ramp at Lake Mead			1 lane	2 lanes	Yes					1 lane	2 lanes	Yes
HDR	14	US 95 NB loop off ramp at Lake Mead WB			2 lanes	1 lane	Yes					2 lanes	1 lane	Yes
HDR	14	US 95 SB mainline	Lake Mead WB loop on ramp	Lake Mead EB on ramp	3.5 lanes	3 lanes	Yes					3.5 lanes	3 lanes	Yes
HDR	14	US 95 NB mainline	1 link S of Rancho on ramp	Rancho on ramp	4 lanes	3 lanes	Yes		4 lanes plus 1 HOV lane	Yes		4 lanes	4 lanes	No
HDR	14	US 95 NB mainline	Rancho on ramp	Ann Rd on ramp	4 lanes	3 lanes	Yes		4 lanes plus 1 HOV lane	Yes		4 lanes	4 lanes	No
HDR	14	US 95 NB mainline	Ann Rd on ramp	CC 215 off ramp	2 lanes	2.5 lanes	Yes		4 lanes plus 1 HOV lane	Yes		3.5/3 lanes	4 lanes	Yes
HDR	14	US 95 SB mainline	Centennial Center Blvd on ramp	CC 215 on ramp	2 lanes	3 lanes	Yes					3 lanes	3 lanes	No
HDR	14	US 95 SB mainline	CC 215 on ramp	Ann Rd off ramp	2 lanes	3.5 lanes	Yes					3.5/3 lanes	3.5/3 lanes	No
HDR	14	US 95 SB mainline	Ann Rd off ramp	HOV beginning	2/3.5 lanes	3 lanes	Yes							
HDR	14	Moccasin Road US 95 overpass			2 lanes in each direction	0 lanes	Yes	Removed from 2015 model.						
HDR	14	US 95 SB on ramp at Durango Dr			2 lanes	1 lane	Yes							
HDR	14	US 95 mainline	Durango Drive	CC 215	2 lanes in each direction	2 lanes in each direction	No		Check laneage for 2017 (should be 3.5 in each direction)	Yes	3.5 lanes			
HDR	14	US 95 mainline HOV lanes	S of Durango	S of Ann Road	0 lanes	0 lanes	No	Not in the 2015 model.	Add HOV lanes in 2017	Yes				
HDR	14	US 95 mainline	between CC 215 ramps		2 lanes in each direction	2 lanes in each direction	No	2 lanes due to construction	Update lanes	Yes	3 Lanes			
HDR	14	Rancho Dr NB to Ann Rd off ramp			2 lanes	1 lane	Yes							
HDR	14	US 95 NB (WB) mainline	Rainbow off ramp	Summerlin Pkwy EB on ramp	4 lanes	3 lanes	Yes							
HDR	14	US 95 NB (WB) mainline	Durango off ramp	Durango overpass			No	2015 only 2 lanes due to construction	3 lanes	Yes	Added 1 lane			
HDR	14	US 95 NB (WB) to Sky Canyon Park off ramp			1 lane	1 lane	No	2015 only 1 lane due to construction	2 lanes	Yes	Added 1 lane			
HDR	14	US 95 SB (EB) to Sky Canyon Park off ramp			2 lanes	2 lanes	No	Should have been 1 lane.	1 lane	Yes	Should have been 1 lane in 2015.			
HDR	14	US 95 SB (EB) mainline	Durango off ramp	WB Durango loop on ramp	2 lanes	2 lanes	No	2015 only 2 lanes due to construction	3 lanes	Yes	Added 1 lane			
HDR	14	US 95 SB (EB) mainline	WB Durango loop on ramp	EB Durango on ramp	2 lanes	2 lanes	No	2015 only 2 lanes due to construction	3.5 lanes	Yes	Added 1.5 lanes	4 lanes	3.5 lanes	Yes
HDR	14	US 95 HOV Ingress/Egress south of Durango										2-lane ramps from US 95 to HOV	Direct connections as in 2015	Yes
HDR	14	US 95 / Sheep Mtn Interchange	Shp Mtn NB off ramp	US 95 NB								Ramp Not Connected	Ramp Connected	Yes
Jacobs	14	US 95 HOV Egress/Ingress	Ann Rd	Rancho Dr	2-lanes in each direction	1-lane in each direction	Yes		1-lane in each direction	Yes	North of Ann Rd is not in the 2015 model. Extended these changes to links north of Ann Rd for 2017			Yes
Jacobs	14	US 95 SB mainline	US 95 SB On Ramp at WB Lake Mead Blvd	US 95 SB On Ramp at EB Lake Mead Blvd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes

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Jacobs	14	US 95 SB mainline	US 95 SB On Ramp at WB Cheyenne Blvd	US 95 SB On Ramp at EB Cheyenne Blvd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	14	US 95 SB mainline	South of Ann Rd	US 95 SB On Ramp at Ann Rd	Existing auxiliary lane	Removed auxiliary lane, does not exist	Yes		Removed auxiliary lane, does not exist	Yes	Change made.			Yes
Jacobs	14	US 95 NB mainline	US 95 NB On Ramp at Ann Rd	US 95 NB Off Ramp at Centennial Pkwy/CC 215	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.			Yes
Jacobs	14	US 95 SB mainline	US 95 SB Off Ramp at Ann Rd	CC 215 EB Off Ramp/US 95 SB	Auxiliary lane does not exist	Coded auxiliary lane (AuxLn = 1)	Yes		Coded auxiliary lane (AuxLn = 1)	Yes	Change made.	3.5 lanes	3.5 lanes	No
Jacobs	14	US 95 SB mainline	CC 215 EB Off Ramp/US 95 SB	US 95 SB On Ramp at Centennial Center Blvd	2-lanes	3-lanes	No		3-lanes	No	Already 3 lanes in model.	3 lanes	3 / 3.5 lanes	Yes