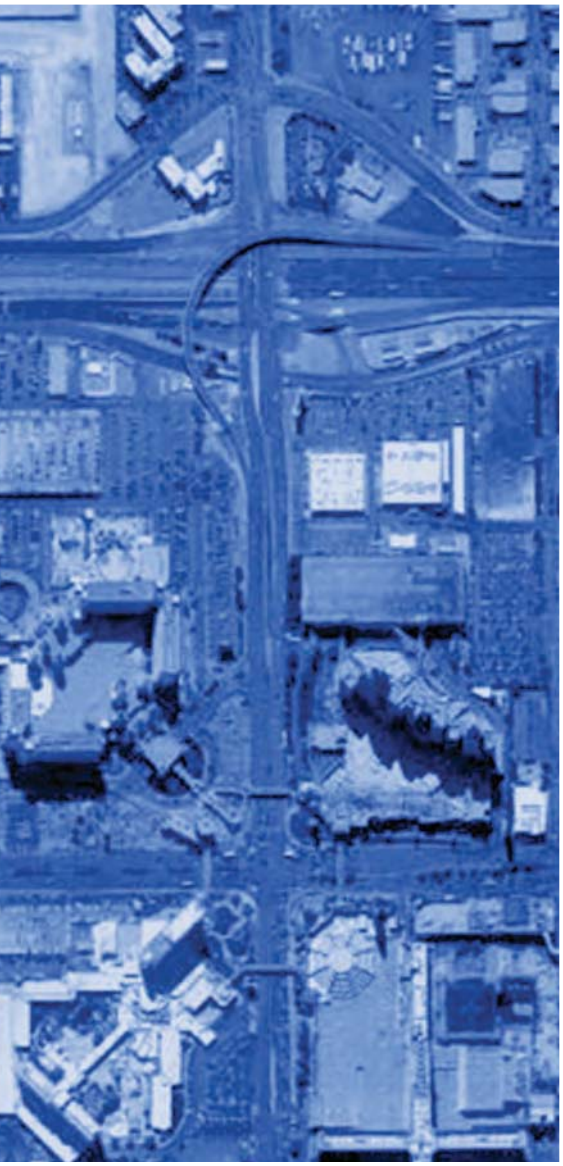
NEVADA DOT

I-15/Tropicana Feasibility Study

I-15/Tropicana Interchange Feasibility Study



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Final Report

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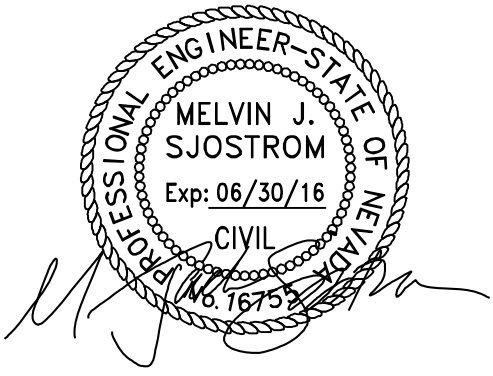

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Resort Corridor Stakeholders

Station Casinos

MGM Grand Properties

UNLV

McCarran Airport

Las Vegas Convention and Visitors Authority Tropicana

Casino

In-N-Out Burger

Golden Palm Hotel

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1.0 Introduction

In Nevada, I-15 is the single most important tourism and commerce corridor and the lifeblood for southern Nevada's economy. Its interchange with Tropicana Avenue is one of a few crucial points connecting I-15 motorists to the Las Vegas Strip, McCarran Airport, and UNLV. Projected increases in both passenger vehicles and commodity flows within the Las Vegas metropolitan area along I-15 and Tropicana Avenue will result in major traffic congestion. The existing Tropicana overpass bridge restricts widening of I-15 in the future. This study will assist the Nevada Department of Transportation (NDOT) and other stakeholders to identify and prioritize a range of cost-effective and workable transportation improvements needed to serve this growth and enable future improvements to I-15.

Throughout the study several technical memoranda, listed below, were developed to address specific elements of the study. These memoranda are summarized in this report and included in their entirety as appendices in a separate compact disc.

- I-15/Tropicana Interchange Feasibility Study CORSIM Modeling - Methodology Memorandum
- I-15/Tropicana Interchange Feasibility Study Traffic Forecasting Memorandum
- I-15/Tropicana Interchange Feasibility Study Initial Concepts Summary Memorandum
- I-15/Tropicana Interchange Feasibility Study Interim Concepts Memorandum
- I-15/Tropicana Interchange Feasibility Study Tropicana Exit Ramp Interim Signing Memorandum

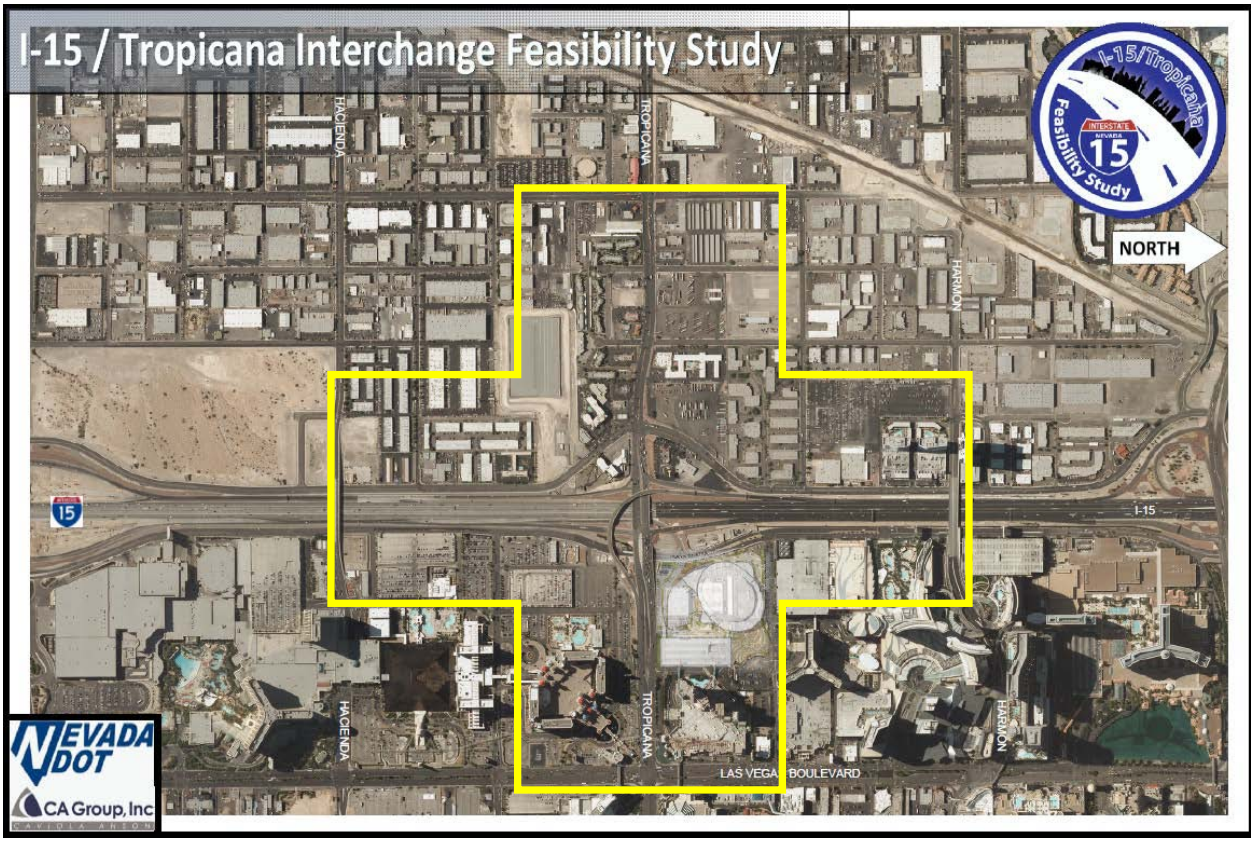
At specific decision stop points during the study process, meetings were held with NDOT and project stakeholders to review the results of the study process and provide concurrence or direction for the continuance of the study. The presentations from these meetings are documented in Appendices 6 and 7 of this Study.

- I-15/Tropicana Alternatives Screening Meeting
- I-15/Tropicana Alternatives Selection Meeting

1.1 Project Study Area

The study area includes I-15 from approximately Hacienda Avenue north to Harmon Avenue and on Tropicana Avenue between Valley View Boulevard and Las Vegas Boulevard (see Figure "Project Study Area").

Project Study Area



1.2 Purpose and Need

Congestion within the I-15 corridor creates delays for all users. In order to meet additional traffic demand, widening of I-15 will be needed from the recently completed I-15 South Design-Build project to the north. The existing Tropicana overpass bridge does not have sufficient width underneath to allow widening of I-15 in the northbound nor southbound directions. Traffic operations on Tropicana Avenue are currently impacted by congestion on Tropicana itself, as well as congestion on the I-15 on- and off-ramps.

As traffic demand increases, the congestion will only worsen, with significant delays expected to affect all road users.

The purpose of this study is to determine a range of improvements that could alleviate the congestion on both I-15 and in the vicinity of the interchange on Tropicana Avenue, and to recommend the most feasible solution.

1.3 Study Process

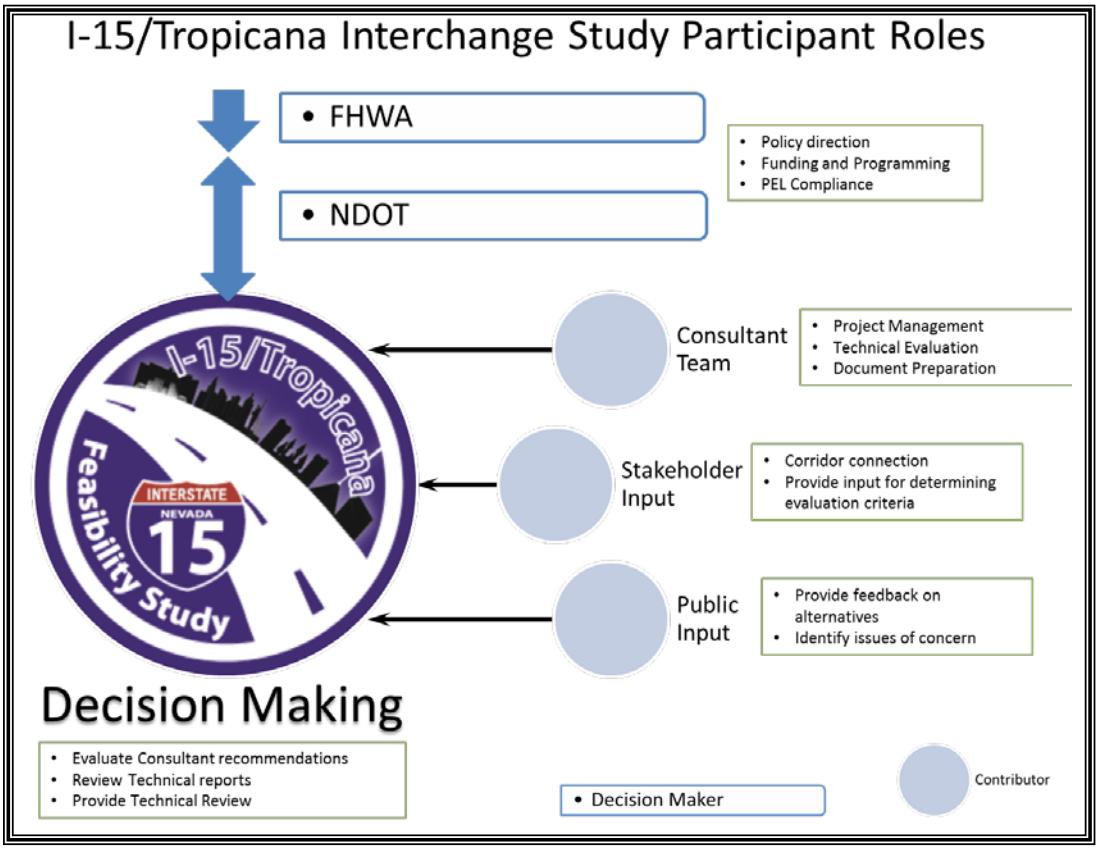
The process for this study utilized an approach whereby decision stop points established the basis for tasks leading to the next decision. Decision stop points were reached during development of the

screened concepts as well as during the screening process at presentations of potential concepts and screening results. At each stop point, the analysis results and recommendations for proceeding were presented to the project team. In addition to monthly project progress meetings, two specific concept meetings were held, one to present screening results and another to present alternatives for selection. Consensus of the results and direction forward was obtained.

1.3.1 Decision Framework

The roles and responsibilities of participants, including interest groups and public involvement, were defined shortly after project initiation and are illustrated in the Figure titled "The Role of Study Participants".

The Role of Study Participants



1.3.2 Alternatives Development Workshop/Charrette

An Alternatives Development Workshop was held to identify existing problems, develop decision making criteria, and identify potential alternative solutions related to the I-15/Tropicana interchange. Participants included the Consultant design team as well as Clark County, the Regional Transportation Commission, FAST, and NDOT members.

Alternatives Workshop Attendees

Chad Anson, CA Group	Fidel Calixto, CA Group
Jack Sjostrom, CA Group	Jim Caviola, CA Group
John Taylor, CH2M	Mike Cooper, CH2M
Cigdem Mulazimoglu, Jacobs	John Karachepone, Jacobs
Boniface Njoroge, NDOT	Chris Petersen, NDOT
Jeff Lerud, NDOT	Lynnette Russell, NDOT
Mike Bratzler, NDOT	Mike Mayberry, NDOT
Paul Judd, RTC of Southern Nevada	

The workshop was presented in three half-day "sessions".

Firstly, information was presented to the team, including the existing conditions in the vicinity of the I-15 and Tropicana interchange. A preliminary utility evaluation was presented, which has been further developed and is discussed in Section 2.3. Crash Data was provided and reviewed to determine critical locations that may need special attention. A review of the then on-going Southern Nevada HOV Study Update was provided by Jacobs, outlining the plan for the number of HOV lanes that would be required in the vicinity of the interchange. This also included other planned connectivity options that would impact the traffic volumes at the interchange ramps.

Project Stakeholders were listed and discussed. The initial listing of stakeholders included:

I-15/Tropicana Interchange stakeholders

Clark County	MGM Resorts International (MGM)
Federal Highway Administration (FHWA)	Nevada Department of Transportation (NDOT)
Golden Palm Casino	Regional Transportation Commission of Southern Nevada (RTC)
In-n-Out Burger	Station Casinos Inc.
Las Vegas Convention and Visitors Authority (LVCVA)	Tropicana Las Vegas
McCarran International Airport	University of Nevada Las Vegas (UNLV)

Participating stakeholders during the study process included Clark County, FHWA, NDOT, and the RTC.

A summary of the existing geometry and corridor constraints was presented. Critical points of constraint within the corridor were highlighted, defining the maximum possible width upstream and/or downstream for the improvements with respect to traffic. Locations, such as the UPRR spur bridge over I-15 and the UPRR bridge over Tropicana Avenue west of Valley View Boulevard, as well as the Las Vegas Boulevard intersection and Tropicana to the east, were identified.

The anticipated project schedule was discussed which included durations for this study, future environmental study and action, design, and construction periods.

Secondly, a pre-prepared range of alternative concepts was presented. These alternatives attempted to provide initial solutions to some of the critical project problems, as well as seeded the charrette participants' creativity in developing additional concepts for evaluation. The group debated on the merits of various alternatives, creating a list of possible concepts. These concepts are discussed further in Section 4.

Lastly, the charrette served as the basis for developing the project evaluation criteria and the ranking scale. It was agreed that at this level of detail - with the wide array of concepts that needed to be screened - the ranking would be on a "poor to best" scale, with 5 steps to establish some meaningful separation between concepts per evaluation criteria. Each of the participants provided important criteria, which were then reduced down via discussion to establish the final evaluation criteria that were used in the screening process.

The Workshop provided the basis for the initial concepts screening and kicked off the alternatives development process, followed by the screening process.

1.3.3 Screening Process

Before any concepts were developed, the evaluation criteria were developed to screen the ideas and concepts. Throughout the alternatives brainstorming process, the evaluation criteria were tested and adjusted as needed to ensure that the criteria would fairly and adequately screen the alternatives.

Evaluation Criteria

The evaluation criteria listed below served as a guide for judging each concept on its ability to meet the project needs. Evaluation criteria were graded on a 5 point scale, from Poor to Best. Additionally, each concept was grouped into one of three timeframes for implementation, Initial (I), Interim (N), and Ultimate (U).

- **NEPA Action**: refers to the anticipated NEPA action of the specific concept. NEPA action scales from Categorical Exclusion (Most Desirable) to Environmental Impact Statement (Least Desirable.)
- **Operations**: refers to the anticipated or modeled traffic operations of the specific concept (if applicable).
- **Safety**: refers to the ability for users of the system to reach their destination safely on any given trip.
- **Accessibility**: refers to the ability of the concept alternative to connect people to desired destinations through the study corridor.
- **Reliability**: refers to the ability of the concept to meet anticipated needs/demand and offers flexibility in adverse circumstances. This can be based on past experience, obvious characteristics, or accepted test results.
- **Implementability**: refers to estimated scale of improvements versus impact to surrounding or future infrastructure and the associated estimated costs. For initial screening, reality check type of analysis was used to assign a comparative score. For Alternative Selection, quality cost estimates that incorporate both direct (construction) and indirect (engineering) costs of a project, and available funding for the proposed improvements were used to determine implementability.

Objectives

There were multiple objectives in applying the Evaluation Criteria such as: to identify non-performing or unreasonable concepts; to identify possible concepts for further evaluation; to identify solutions to immediate needs; and to identify solutions to long-term needs.

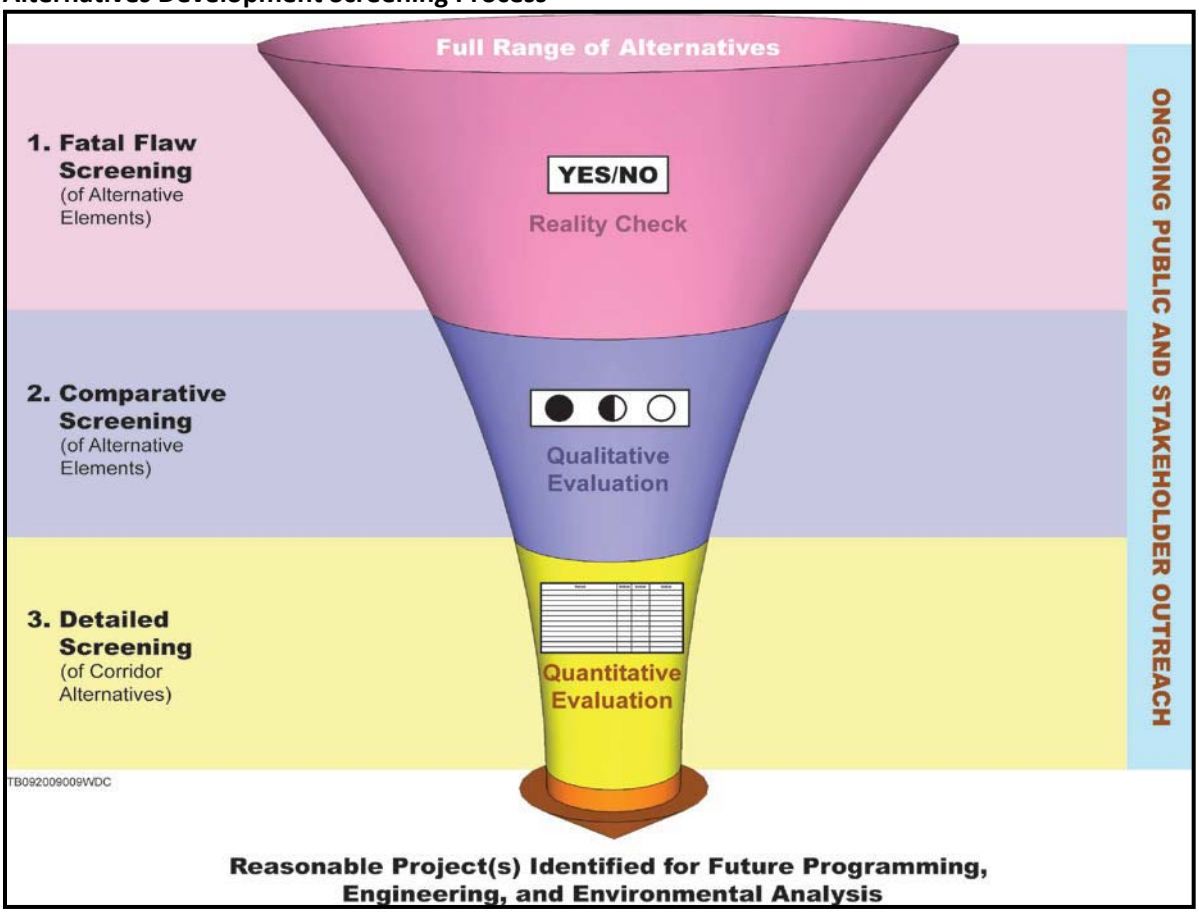
Constraints

This study considered the individual project's unique constraints. Overall, each alternative concept would need to address the project constraints and still succeed in meeting the evaluation criteria developed during the Alternatives Development Workshop.

1.3.4 Preliminary Alternatives

During the I-15 Tropicana Concepts Screening Meeting, a broad range of alternatives for addressing the problems within the corridor were developed, and the initial or fatal flaw screening conducted. Initial screening consisted of applying the evaluation criteria to each alternative and qualitatively assigning a weighted Performance Total to each alternative. The results were then reviewed and categorized.

Alternatives Development Screening Process



1.3.5 Evaluate Screened Alternatives

The screened alternatives were developed more fully during this step, including planning level engineering consisting of detailed geometric and traffic operations evaluations. Of the alternatives that cleared the initial screening process, progressively more complicated and costly alternatives were tagged for evaluation if simpler, lower cost alternatives could not meet the project needs. Preliminary

cost estimates were prepared using the NDOT Wizard estimating worksheet. The results of this evaluation were summarized in the *Alternatives Selection Meeting presentation* (Appendix 7).

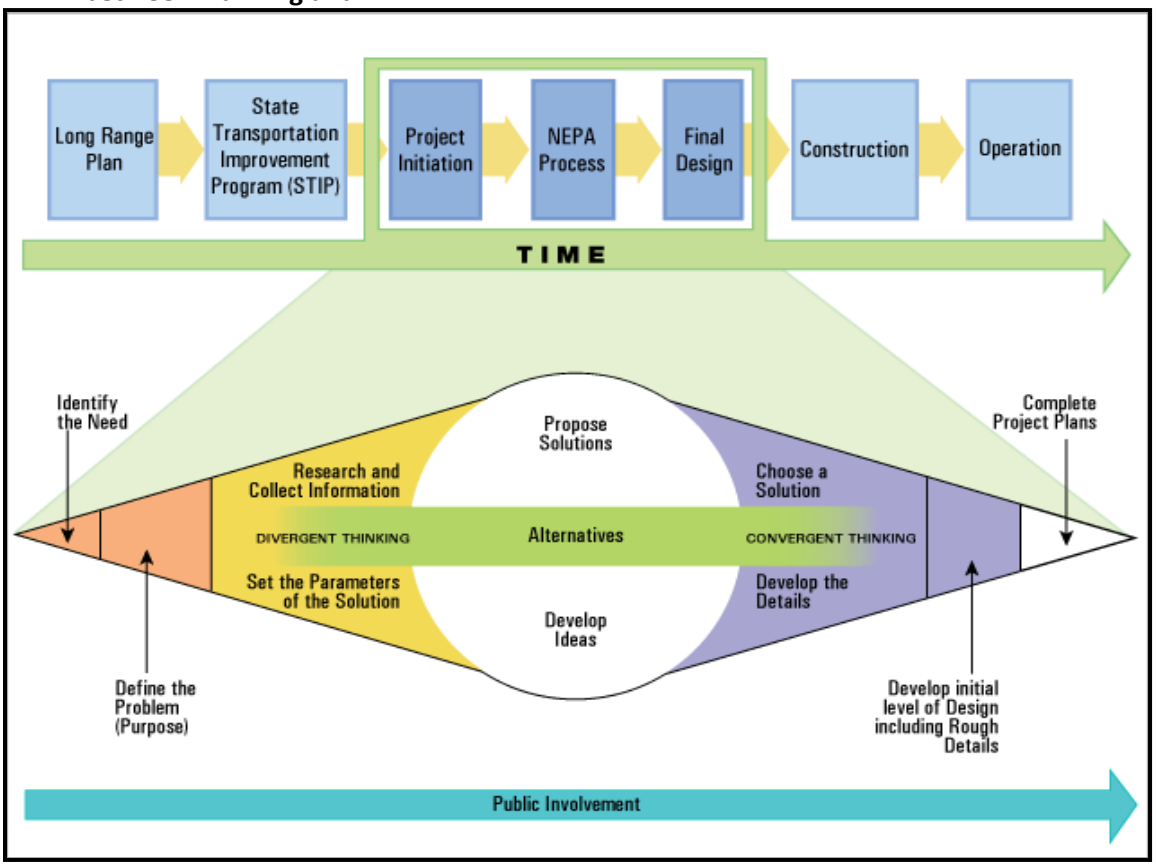
1.3.6 Determine Timing of Recommended Alternatives

The final study recommendations include alternatives that best solve the problems of the corridor and are consistent with the project goals. Some of the recommendations address immediate needs, as summarized in the Initial Concepts Memo, and therefore can be implemented in the short term. Some of the recommendations overlap the final ultimate geometric improvement recommendation. The completion of the recommended interchange alternative will address all of the project needs and will supersede the implementation of some short term recommendations.

1.4 Linking Planning and NEPA

The purpose, need, and project objectives were developed with stakeholder input and serve as a foundation for future action on the recommended alternatives. This is the initial step in linking Planning and National Environmental Policy Act (NEPA).The objective is that the planning process and the environmental assessment required during the project development by NEPA work in tandem, with the results of the transportation planning process feeding into the NEPA process. See below Figure "A Link between Planning and NEPA" showing the different steps involved in the planning process and how it is linked with NEPA.

A Link between Planning and NEPA



The following are some of the reasons for linking Planning and NEPA:

- Long-range planning develops the "purpose and need" and foundation for alternatives analysis. Both are required by NEPA.
- Process provides clarity for public input in framing purpose and need/criteria for local agencies, planning partners, and general public.
- Eliminates duplication of planning and NEPA processes by using environmental data acceptable in the NEPA process, documents decisions and processes, and engages agencies early.
- Develops a process for meeting SAFETEA-LU requirements for the planning process.
- Encourages environmental stewardship.
- Identifies fatal flaws early, improves project delivery, and improves transportation management's regional planning project-oriented process.

2.0 Existing Conditions

2.1 Demographic Conditions and Travel Demand

2.1.1 Demographics

Based on the forecasts by the RTCSNV's Regional Travel Demand model, Clark County population for year 2015 was estimated at approximately 2.2 million, 95 percent of whom reside within the Las Vegas valley.[1] The model estimated a total of 3,716 link miles of various classifications within Clark County serving approximately 5,788,760 weekday vehicle trips. The I-15/Tropicana Interchange is one of a few crucial points connecting I-15 motorists to the Las Vegas Strip, McCarran Airport, and UNLV among other land uses. Traffic operations on Tropicana Avenue are currently impacted by congestion on Tropicana itself, as well as congestion on the I-15 on- and off- ramps. With current facility capacity, increased demand exacerbates existing congestion. Feasible solutions are therefore necessary to alleviate the congestion on both I-15 and in the vicinity of the interchange on Tropicana.

Summary of Transportation & Land Use Documents

Relevant transportation documents were obtained from the following agencies:

- The Regional Transportation Commission of Southern Nevada
- Nevada Department of Transportation
- Clark County

Relevant land use documents were obtained from Clark County.

2.1.2 Travel Demand

Existing Traffic Volumes

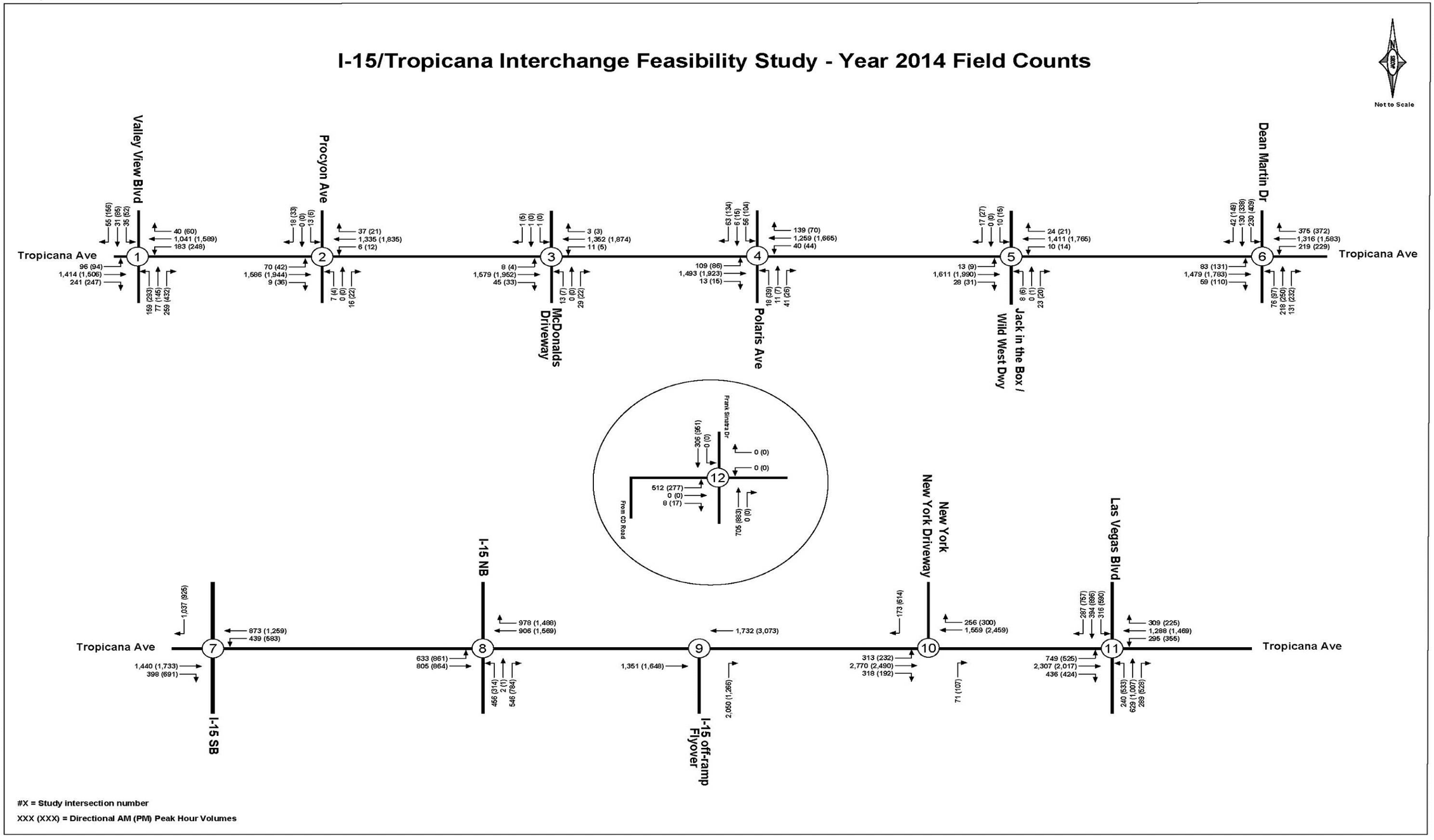
Available physical and operational data along the corridor was obtained from the following local and/or state agencies:

- NDOT
- Regional Transportation Commission of Southern Nevada
- Clark County

Existing volumes at various points along I-15 and the collector-distributor (CD) roads were obtained from NDOT traffic counting stations. Tropicana Avenue counts obtained during off-season periods were seasonally adjusted to obtain annual average daily traffic volumes (AADT) as described in the *Traffic Forecasting Memorandum* (Appendix 2). The volumes were adjusted to obtain peak-hour volumes that were used for operational analyses. Existing AADT at key locations in the corridor are shown in the following Figure "Existing Traffic Volumes". All traffic volumes used for analyses in the project are available in the *Interchange Concepts Traffic Report* (Appendix 8).

[1] RTCSNV, *Appendix 4 Travel Demand Model Methodology and Air Quality Conformity Analysis*, pgs. 8, 20, 29, 2014, http://www.rtcsnv.com/wp-content/uploads/2012/10/the-findings-of-the-air-quality-conformity-analysis-that-was-performed.pdf.

Existing Traffic Volumes - Local Roads



Existing Traffic Volumes – I-15 and Ramps

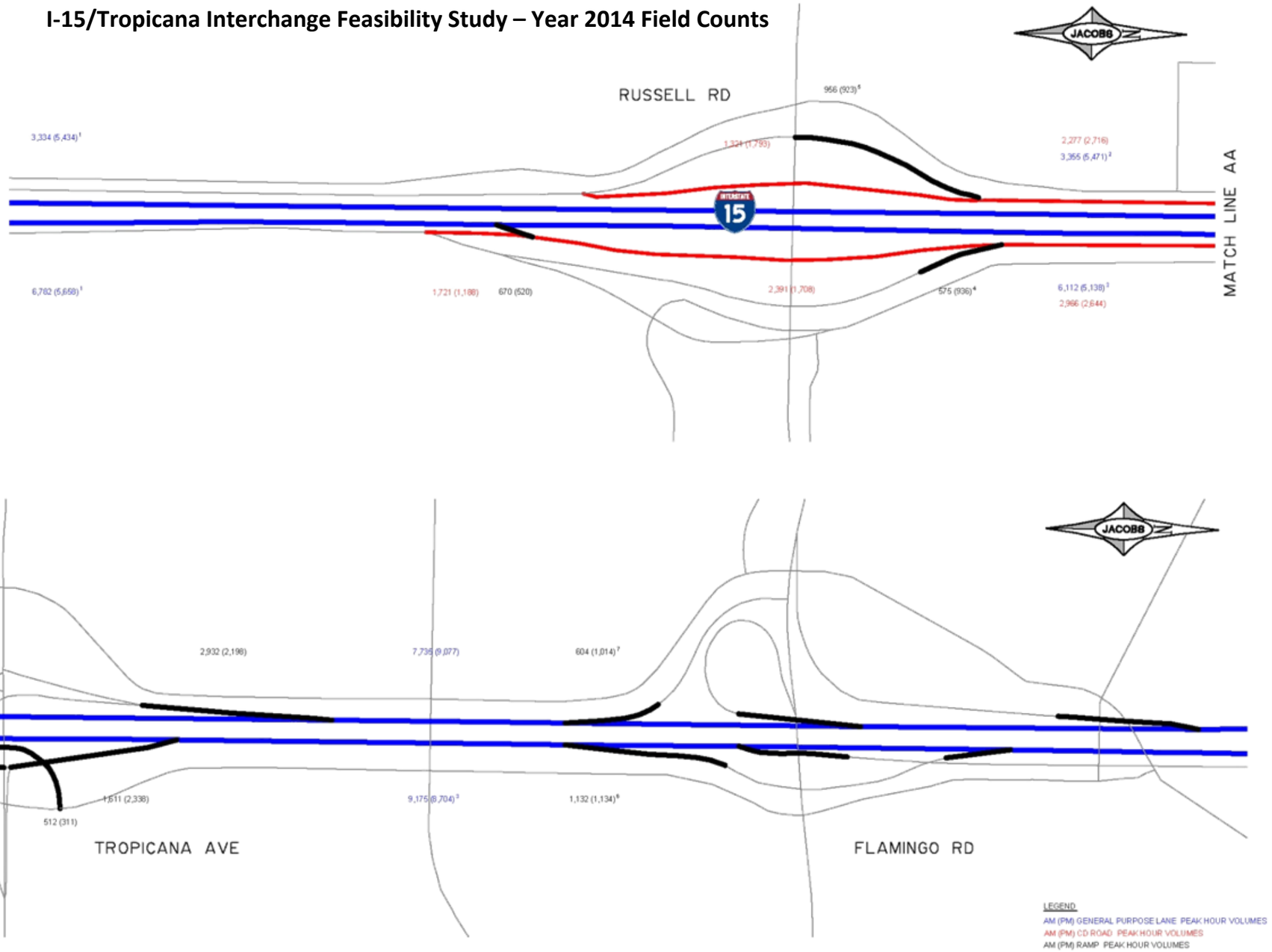
Notes:

Year 2014 AM (8:00 AM - 9:00 AM) and PM (04:00 PM - 05:00 PM) peak hour volumes from NDOT short-term count station reports are shown. The following table shows the NDOT count station ID and the date the count was measured.

NDOT count stations are unavailable on the CD roads. These volumes are calculated based on the volumes of the adjacent links.

Volumes for the I-15/Tropicana interchange's ramps are obtained from the field counts conducted on 06/24/2014.

Location	NDOT Count Station ID	NDOT Count Date
1	0031021	04/01/2014
2	0030052	04/01/2014
3	0030061	04/02/2014
4	0031018	04/01/2014
5	0031015	04/01/2014
6	0030062	04/02/2014
7	0030066	04/01/2014



2.2 Existing Roadway Conditions

The I-15/Tropicana Avenue interchange exists as a tight diamond interchange with a southbound to eastbound ramp flyover. The right-of-way limits at the interchange vary. The posted speed limits are 65 mph on I-15 and 45 mph on Tropicana. The functional classifications of the roadways within the study corridor are:

- Interstate Highway for I-15
- Principal Arterial for Tropicana Avenue

2.2.1 Freeway and Roadway Networks

I-15 Freeway is a ten-lane divided highway with two of those lanes (one in each direction) dedicated to HOV. The I-15 corridor also contains three-lane collector-distributor roads in each direction south of the Tropicana interchange. The lane widths are 12 feet and the shoulder widths vary from 1 foot to 10 feet within the study area. I-15 has interchanges at Russell and at Flamingo Roads, south and north of the study area respectively.

Through the study limits between Valley View and Las Vegas Boulevards, Tropicana Avenue is a six lane arterial with raised median and numerous dedicated right and left turn lanes. It has three through lanes in each direction from Valley View Blvd to the New York New York signalized driveway, and four through lanes east to Las Vegas Blvd. The signalized intersections are at Polaris Avenue, Dean Martin Drive, both I-15 ramp terminals, and at the New York New York Casino driveway. Lane widths are generally 12 feet. East of I-15, there are two access driveways; one on the north and one on the south. West of I-15, numerous access driveways exist on both sides.

The Interchange consists of two-lane exit ramps in both the northbound and southbound I-15 directions and ramp meters on the entrance ramps. The southbound exit splits eastbound and westbound traffic, sending eastbound drivers on the flyover to merge with eastbound Tropicana Avenue traffic. The northbound exit also splits, sending Frank Sinatra Drive bound traffic under the Tropicana bridge. The southbound entrance ramp feeds traffic directly onto the southbound collector-distributor road, which enters I-15 approximately 2.5 miles south at the CC-215 and I-15 interchange. The northbound entrance ramp is a two-lane entrance onto I-15 that becomes an auxiliary lane to both Flamingo Road and Spring Mountain Road interchanges.

In addition to the northbound and southbound collector-distributor road system south of Tropicana Avenue, two Clark County arterials parallel the I-15 right-of-way. To the east, Frank Sinatra Drive is a four-lane roadway that has an access ramp from the northbound collector-distributor road just north of Tropicana. The ramp access passes under the Tropicana bridge between the northbound Tropicana exit ramp and northbound I-15. Frank Sinatra itself passes under the Tropicana bridge east of the northbound Tropicana exit ramp. To the west, Dean Martin Drive is a four-lane roadway that has an at grade intersection with Tropicana just west of the southbound I-15 exit ramp terminal intersection.

2.2.2 Traffic Operations

The majority of the signalized intersection along Tropicana Avenue operates at LOS D during the AM peak period and LOS C-D in the PM peak period. As expected while serving the highest turning movement volumes along the corridor, the Tropicana Avenue/Northbound on-ramp as well as Tropicana Avenue/Las Vegas Boulevard intersections have the lowest performance levels. The posted speed limit on Tropicana between Valley View Boulevard and Polaris Avenue is 45mph and 35mph east of Polaris.

The proposed MGM Arena and park development currently under construction is considered as part of existing conditions for analyses purposes. The traffic impact analysis performed for the Arena (scheduled to commence operations in year 2016) showed less than 300 vehicle trips generated during typical weekday conditions.[2] Weekend traffic was estimated at approximately 2,830 entering trips and 3,630 exiting trips. To offset traffic impacts anticipated with construction completion, recommendations included event traffic management plans and 52.7% contribution to possible future dual left-turn lanes at the Reno Avenue and Las Vegas Boulevard intersection.

Freeway Operations

HCS analysis based on Highway Capacity Manual (HCM) methodologies was performed for basic freeway, on-ramp, and weave segments. Analyses for existing freeway operations were conducted on the Northbound CD between the Russell Road on-ramp and the distributor-collector (DC), as well as between Hacienda Avenue on the south and Harmon Avenue on the north on I-15. The I-15 freeway was estimated to be serving between 14,500 and 134,000 AADT on the analysis segment. The Northbound CD road operates at LOS D with an on-ramp speed of 32mph and 29mph for AM and PM peaks, respectively, for existing conditions.

During the AM peak on the I-15 freeway, the average freeway speed for the study segment was 57mph with various segments operating at LOS C and D. In the PM peak, the average freeway speed is 45mph. The basic freeway segment south of the Tropicana Avenue on-ramp operates at the lowest LOS (F) with average speeds of 19mph during the PM peak. In the same period, the basic freeway segment south of the Northbound CD operates at the highest LOS B (within study limits) at an average speed of 65mph.

Street Network Operations

Operational analyses also based on HCM methodologies were performed using Synchro software on eight of the eleven intersections that were signalized on Tropicana Avenue. Three stop controlled intersections at Procyon Avenue, McDonald's, and Jack-in-the-box/ Wild Wild West driveways were not analyzed. The Tropicana Avenue/Northbound on-ramp intersection currently operates at LOS F with the highest intersection delay of 116 seconds per vehicle (LOS F) during the PM peak. The Tropicana Avenue/Las Vegas Boulevard intersection also has poor performance following with a LOS E and intersection delay of 68 sec/vehicle during the same period. The other six intersections operate at better LOS having intersection delays that vary between 15 sec/veh (LOS B) and 45 sec/veh (LOS D) during the PM peak.

During AM peak, the Tropicana Avenue/ Northbound on-ramp as well as Tropicana Avenue/Las Vegas Blvd intersections operate at LOS E with the highest AM peak intersection delays of 57 and 48sec/veh (LOS D), respectively. In comparison, intersections at Tropicana and Polaris Avenues, and New York New York driveway operate at better conditions, with the lowest intersection delays ranging between 5 sec/veh (LOS A) and 17 sec/veh (LOS B) for both AM and PM peaks. A more detailed discussion for freeway and street network operations is provided in *Interchange Concepts Traffic Report* (Appendix 8).

[2]Lochsa Engineering, *Traffic Impact Analysis for MGM Resorts International Arena & Park*, 2014.

Study Intersections

2.2.3 Transit System

Clark County Regional Transportation Commission operates multiple transit routes along I-15 and Tropicana Avenue. The RTC's Transit Guide and System Map, October 2014, shows Tropicana as Frequent Service Route 201, and is combined with the Westcliff Airport Express route that utilizes I-15.

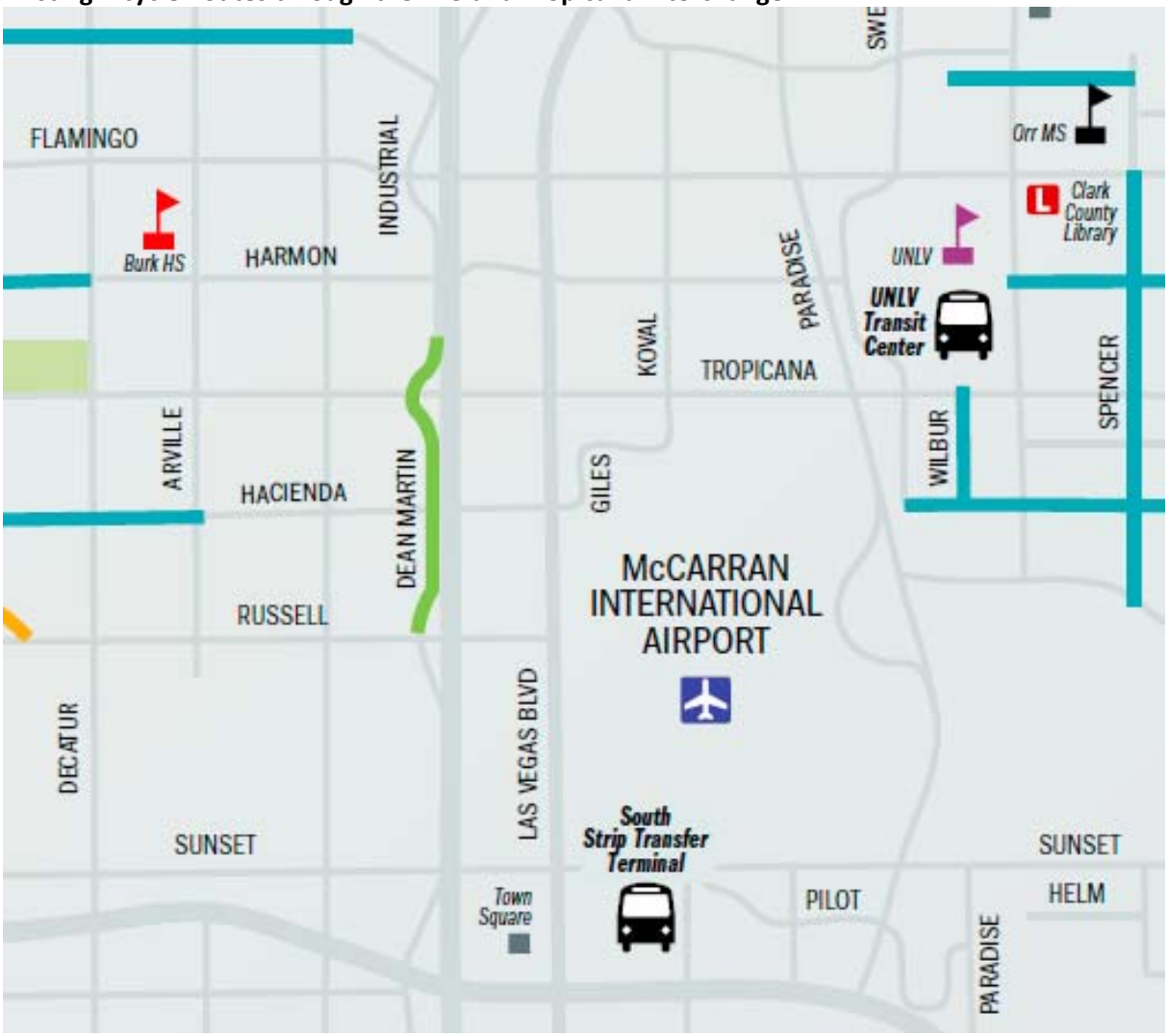
Existing Transit Routes through the I-15 and Tropicana interchange

2.2.4 Pedestrian and Bicycle Access

The Clark County Regional Transportation Commission's Bike Map only identifies one route in the project study area, along Dean Martin Drive. High vehicle volumes and limited roadway width make Tropicana Avenue undesirable as a travel route for cyclists, though they are not precluded. Cyclists have been observed utilizing sidewalks as well as the outside lane along Tropicana Avenue.

Pedestrians however, predominantly use Tropicana Avenue as a means of accessing multiple destinations. Five-foot sidewalks exist on both the north and south sides of Tropicana from Valley View Boulevard to Dean Martin Drive. At Dean Martin Drive, pedestrians are encouraged to use the south sidewalk where the north sidewalk stops. From Dean Martin Drive through the interchange ramp intersections, and over the Frank Sinatra Drive underpass, a sidewalk is available on the south side of Tropicana Avenue until the entrance of the southbound to eastbound flyover ramp. There are portions of existing sidewalk in this stretch along the north side of Tropicana on the bridge over I-15, and then again from Frank Sinatra Drive, ramping up to meet at Tropicana. However both are inaccessible without jaywalking. At the eastbound flyover ramp entrance, the sidewalk loops down under the flyover ramp and back up on the east side of the entrance. This maintains a continuous path along the south side of Tropicana. From there, the sidewalk continues to the pedestrian bridge crossing at Las Vegas Boulevard. There is no sidewalk on the northern side of this stretch.

Existing Bicycle Routes through the I-15 and Tropicana interchange



2.3 Existing Utilities

The study area contains an extensive amount of utility infrastructure both above and below ground, serving the surrounding community. This infrastructure consists of every type of utility conveyance found within the Las Vegas valley and serves commercial, residential, and government enterprises. It is comprised of both transportation facilities as well as distribution services.

2.3.1 Determination of existing utilities

To identify corridor utilities, possible sources were identified to obtain data. The standard suite of agency contacts was assembled, and, through on-line research, past projects and development improvements were identified as possible sources for as-built information. These historical documents were data mined for utility infrastructure improvements as well as for the existence of previously installed facilities.

As-built plans received through this effort were reviewed for accuracy (where applicable) and imported into the developing utility base map. Some of the data had to be converted to the common coordinate system so that it was vertically and horizontally positioned for use. In the case of the public agencies, the data received was depicted on a common map printed from their electronic system and was not from actual as-built drawings. These plans are the typical provided products issued by the agencies to developers or engineers upon request. As usual for these products, the agencies issue disclaimers directing customers to field verify these locations prior to any actual design or construction. They do not guarantee the location accuracy of these provided products.

2.3.2 Utility Matrix and Base Map

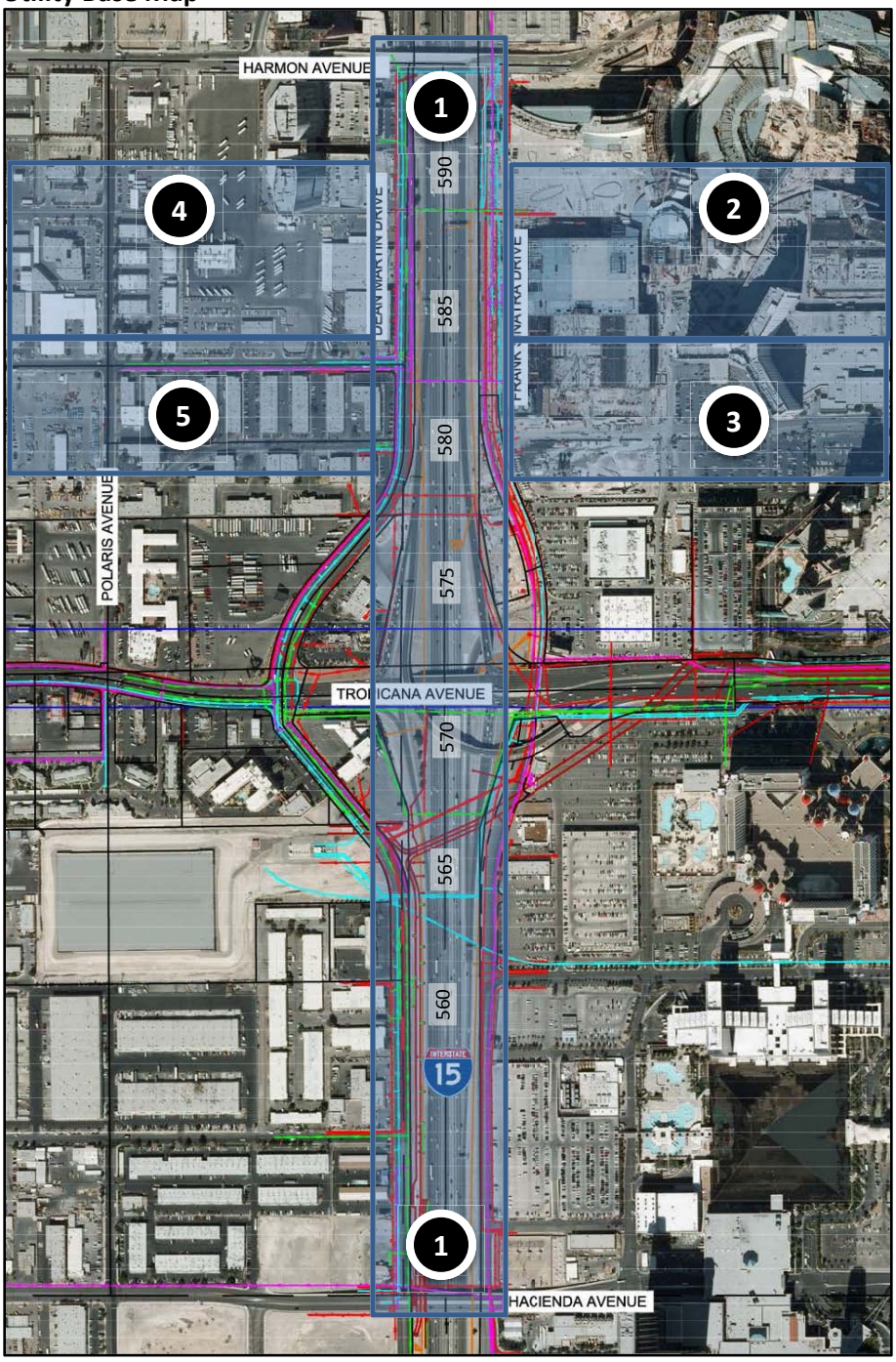
A utility matrix was created, along with a CAD base map drawing, to encompass the limits of the study area. Known utilities from past projects were incorporated where applicable. As mentioned previously, an attempt to identify all possible utility owners and facilities was undertaken and updated with each new piece of information. Upon receiving the last response to written requests, the final as-built and agency data were imported into the base map and coordinates corrected to match position.

Utility Matrix

	6" AND SMALLER GAS LINE	8" GAS LINE	10" GAS LINE	12" GAS LINE	16" GAS LINE	UNDERGROUND ELECTRICAL / TELEPHONE / FIBER OPTICES	OVERHEAD ELECTRICAL / TELEPHONE / FIBER OPTICES	24" AND SMALLER WATERLINE	30" TO 42" WATERLINE	60" TO 90" WATER LINE	21" AND SMALLER SEWER	24" TO 30" SEWER	36" OR LARGER SEWER	21" AND SMALLER STORM DRAIN	24" TO 30" STOREM DRAIN	36" OR LARGER STORM DRAIN	(4) 7'X8' STORM DRAIN	(2) 15'X4' STORM DRAIN	(3) 14"X23" HE RCP STORM DRAIN	RCB STORM DRAIN (SIZE VARIES)
DEAN MARTIN (NORTH OF TROPICANA)	●	●			●	●	●	●	●				●			●			●	
DEAN MARTIN (SOUTH OF TROPICANA)	●			●		●	●	●	●	●	●	●		●	●	●		●		●
FRANK SINATRA (NORTH OF TROPICANA)	●				●	●		●						●	●					
FRANK SINATRA (SOUTH OF TROPICANA)	●		●	●		●		●	●	●	●		●		●		●			
TROPICANA (EAST OF I-15)	●		●		●	●			●	●	●		●				●			●
TROPICANA (WEST OF I-15)	●				●	●	●	●			●	●	●			●				

The utility matrix and base map were completed with verifiable data. However, there is one utility line which could not be verified that the team was made aware of. During a similar effort on another project at the intersection of Las Vegas Boulevard and Tropicana Avenue, possible existence of a classified fiber optic line within the public right-of-way of Tropicana was discovered. Several attempts to locate and identify this line or its owner failed. Several agencies claimed to know of its existence but had no data to support that assertion. Contact was made with local Department of Defense officials at Nellis AFB but they denied knowledge of the line and could not direct us to any other agency or contact that could assist us. The exact location of the line has not been determined. However, it is generally understood to be in the west bound travel lanes of Tropicana. It is also likely that this line is co-located with the telephone lines in the westbound lanes but that location could not be verified. Upon unsuccessful attempts to find any substantiating data, it is recommended that any developer in the area be forewarned to perform significant sub surface utility exploration prior to completion of design to preclude damage to this facility.

Utility Base Map



NOTES:

Utilities shown are described in Section 2.3.3.

Utility locations shown are approximate only and will require field location when additional evaluations or final design are performed.

For discussion purposes, the utilities have been grouped into corridor sections.

Utility Sections:

1. I-15 Corridor
2. NE Quadrant
3. SE Quadrant
4. NW Quadrant
5. SE Quadrant

2.3.3 Utility Descriptions

The areas shown in the Utility Base Map for each of the five sections include the utilities that run along and across the right-of-way (ROW). A majority, if not all, of the utility lines mentioned and described within the vicinity of I-15/Tropicana interchange are likely to be impacted by the proposed improvements on I-15 NB, I-15 SB, the on-ramp and off-ramp near Tropicana Avenue, Frank Sinatra Drive, and Dean Martin Drive. It is imperative that any contractor working within the map area field verify the exact locations of these lines and take the appropriate action to prevent service disruption.

The utilities and the general direction of run per section are described as follows:

Utilities that cross the I-15 Freeway.

- In the vicinity of station 584.5, a 16" gas line runs in the east–west (E-W) direction across Dean Martin Drive, I-15 freeway, and Frank Sinatra Drive (North of Tropicana Avenue). West of Dean Martin and east of Frank Sinatra, the gas line splits into two. One line runs in the north–south (N-S) direction within the ROW of I-15 and the other line continues in the E-W direction away from I-15.
- Between stations 579 and 580 south of the 16 "gas line described above, an underground telephone line runs in the E-W direction across Dean Martin Drive, I-15, and Frank Sinatra Drive. To the east of I-15, it turns south and runs on the east side of the on-ramp from Tropicana Avenue to I-15 NB (within the ROW). To the west, it continues in the E-W direction away from the freeway.
- In the vicinity of station 579 an underground electricity line runs in the E-W direction across Dean Martin Drive, I-15, and Frank Sinatra Drive. To the east of the freeway, it terminates at a junction beyond the on-ramp. To the west of the freeway, it turns south to travel in the N-S direction along the ROW of the off-ramp from I-15 SB to Tropicana Avenue.
- In the vicinity of station 570, a 39" sewer line runs in the E-W direction across the Dean Martin Drive, I-15, and Frank Sinatra Drive. The sewer line runs within the ROW of Tropicana Avenue immediately to the south of the road. It continues to the east and west in the ROW of Tropicana beyond the interchange.
- In the vicinity of station 566, a second 39" sewer line runs in the E-W direction across Dean Martin Drive, I-15, and Frank Sinatra Drive. To the east of I-15, the 39" sewer line is reduced into an 18" sewer line which turns north and runs in the N-S direction until it approaches the south side of Tropicana Avenue. At Tropicana Avenue, it turns east and runs in the E-W direction within the ROW (together with the first 39" sewer line described above). To the west of I-15, this 39" sewer line turns north and runs in the N-S direction until it reaches Tropicana where it then turns west to run in the E-W direction within the Tropicana Avenue ROW (i.e. the two 39" sewer lines run alongside each other towards the west).
- In the vicinity of station 566, three underground electric lines run across I-15, Dean Martin, and Frank Sinatra Drives. These electric lines are very near to the second 39"sewer line described above. The general direction is NE-SW across I-15; beyond that, it continues in the NE-SW direction in the I-15 ROW.
- At station 565, one wide RCB storm drain runs across I-15 in the NE-SW direction. To the west of I-15, it splits into two with one running south in the N-S direction (within the I-15 ROW), and the other continuing across Dean Martin Drive in the E-W direction. To the east, it continues to run in the NE-SW direction, crosses Dean Martin Drive, and continues until Tropicana Avenue.
- Between stations 561 and 563, three water pipes (30", 60", and 90") cross I-15, Dean Martin, and Frank Sinatra Drives. To the west of I-15, they turn slightly in the NW-SE direction for about 250 feet before turning again in the E-W direction. To the east of I-15, the 30" and 60" lines turn north and run in the N-S direction within the ROW of I-15 NB until they reach Tropicana Avenue, where they turn east and run in the E-W direction within the ROW of Tropicana Avenue. The 90" line continues in the E-W direction to the east of Frank Sinatra.

Utilities in the NE Quadrant (North of Tropicana - East of I-15 Freeway).

- Four underground electric lines run in the N-S direction within the ROW of Frank Sinatra Drive. At the north end of Tropicana Avenue, one line turns east and continues within the ROW with the other three lines continuing in the south direction across Tropicana.
- Two underground telephone lines run N-S between Frank Sinatra Drive and I-15 NB on-ramp within the ROW. One line runs along Frank Sinatra Drive and the other runs along I-15 NB on-ramp from Tropicana Avenue. At Tropicana Avenue, both lines turn east and run in the E-W direction within the ROW.
- One ITS line, with several branch-offs, runs in the N-S direction between I-15 and Frank Sinatra Drive within the ROW. It continues in the south direction across Tropicana Avenue.
- One 16" gas line runs in the N-S direction within the ROW of Frank Sinatra Drive until Tropicana Avenue, where it turns east and runs E-W along the north side of Tropicana within the ROW. A 10" line branches off and runs south across Tropicana Avenue to continue in the N-S direction.

- One 24" water line runs in the N-S direction within the ROW of Frank Sinatra Drive. It crosses Tropicana Avenue and connects to a 30" pipe line south of Tropicana Avenue within the ROW of I-15 NB.
- One underground concrete duct (with several electric lines) originates from the intersection of Frank Sinatra Drive and Tropicana Avenue and runs east in the E-W direction within Tropicana Avenue ROW.

Utilities in the SE Quadrant (South of Tropicana - East of I-15 Freeway).

- Three underground electric lines with branch-offs run in the N-S direction. They are a continuation of the lines from the NE quadrant that cross Tropicana Avenue.
- Two sewer lines, 18" and 39", are shown to run E-W within the ROW of Tropicana Avenue About 250 feet from the center line of I-15, the 18" pipeline makes a south turn and runs in the N-S direction (within the ROW of 1-15) for about 400 feet before making a turn west to cross I-15 NB and SB as a 39" pipe.
- One 10" gas line, a branch-off from the 16" gas line described crossing I-15, crosses Tropicana Avenue and runs within the ROW of Frank Sinatra Drive in the N-S direction.
- Two water lines, 30" and 60", run in an E-W direction within the ROW of Tropicana Avenue. About 300 feet from the centerline of I-15, they turn south and run for about 800 feet in the N-S direction within the ROW of the I-15 NB off-ramp to Tropicana Avenue. They then turn west to continue in the E-W direction across I-15 freeway (see above).
- One 90" water line runs in the E-W direction to cross I-15. This line is to the south of the two water lines described above.
- One ITS line runs in the N-S direction within the ROW of I-15, from across Tropicana Avenue and continues south. This is a continuation of the ITS line from the NE quadrant above.
- One wide RCB storm drain runs in the NE-SW direction, starting from the east side of I-15 freeway. It continues in the same direction until it gets to Tropicana Avenue, where it turns east and continues in the E-W direction within the ROW of Tropicana Avenue until Las Vegas Boulevard.
- One 24" storm drain originates from the east side of I-15 NB and runs in the E-W direction across Frank Sinatra Drive and the I-15 NB off-ramp to connect to the storm drain in the third bullet above.

Utilities in the NW Quadrant (North of Tropicana - West of I-15 Freeway).

- One fiber optic line runs in the N-S direction within the ROW of Dean Martin Drive. It continues south across Tropicana Avenue in the same direction. In the vicinity of Station 586, there is a branch off that runs in the west direction away from Dean Martin.
- One ITS line, with branch-offs (located to the west of I-15), runs in the N-S direction within the ROW of Dean Martin Drive. It continues to run south and crosses Tropicana Avenue.
- One overhead electric line, with branch-offs, runs in the N-S direction within the ROW of Dean Martin Drive. At Tropicana Avenue, it turns and runs in the E-W direction for about 250 feet and turns south. It crosses Tropicana Avenue and continues to run in the N-S direction within the Dean Martin of ROW.
- One underground electric line (from across I-15) runs in the E-W direction for about 200 feet, turns south, and runs in the N-S direction within the ROW of Dean Martin Drive. At Tropicana Avenue, it turns west and continues in the E-W direction alongside the other utility lines within the Tropicana ROW.
- Two underground telephone lines run in the N-S direction within the ROW of Dean Martin Drive, one on the east and the other on the west of the roadway. At Tropicana Avenue, the line on the west turns west and continues in the E-W direction within the ROW. The line on the east continues across Tropicana Avenue and runs south within the Dean Martin ROW.
- One 4" gas line runs in the N-S direction within the ROW of Dean Martin Drive. In the vicinity of station 576, it becomes a 6" line and continues in the N-S direction. At Tropicana Avenue, it turns west and travels in the E-W direction within the ROW. At the turning point on Tropicana Avenue, a 4" line branches off and runs south across Tropicana to continue in the N-S direction within the Dean Martin ROW.

- In the vicinity of station 584.5 one 16" gas line runs in the E-W direction. This is a branch-off from the 16" gas line that crosses I-15.
- One 8" gas line runs in the N-S direction towards the north. This is a branch-off from the 16" gas line that crosses I-15.
- One 30" water line runs in the N-S direction within the ROW of Dean Martin Drive. To the south, it crosses Tropicana Avenue and continues into the SW quadrant. It has a 6" and a 10" branch-off that go west in the E-W direction.
- One 39" sewer line starts from the vicinity of station 577' and runs south in the N-S direction within the ROW of Dean Martin Drive to cross Tropicana Avenue and continues southward.

Utilities in the SW Quadrant (South of Tropicana Ave - West of I-15 Freeway).

- One 39" sewer line, with branch-offs, runs south from the NW quadrant across Tropicana Avenue and continues in the N-S direction within the ROW of Dean Martin Drive.
- Two 39" Sewer lines run in the E-W direction within the ROW of Tropicana Avenue. One turns south and runs in the N-S direction from station 570 to 566 where it turns east to cross I-15.
- One underground electric line runs in the N-S direction from Tropicana Avenue within the ROW of I-15. It starts from station 570 and joins another line at station 565.
- Three underground electric lines run from across I-15 in the E-W direction. They turn south near Dean Martin Drive and run in the N-S direction within the ROW.
- One overhead electric cable, with several branch-offs, runs in the N-S direction from Tropicana Avenue to the south within the ROW of Dean Martin Drive.
- One underground telephone line runs in the N-S direction from the NW quadrant across Tropicana within the ROW of Dean Martin Drive.
- One underground telephone line runs in the E-W direction from the west to meet Dean Martin Drive, and then turns south to run in the N-S direction within the Dean Martin ROW.
- Two major storm drains are in this quadrant (branch-offs from the RCB drain that runs across I-15). One drain turns south and runs in the N-S direction within the ROW of I-15; the other runs east across Dean Martin Drive in the E-W direction.
- Several smaller storm drains connect to the two major drains mentioned in the previous bullet.
- One 24" water line starts from the west, runs in the E-W direction until it meets Dean Martin, where it turns south to run in the N-S direction within the Dean Martin ROW.
- Two water lines, 8" and 30", continue from Tropicana Avenue and run in the N-S direction within the ROW of Dean Martin Drive. The 30" line is a continuation of a water line from the NW quadrant, and the 8" is a branch off of a 10" line that runs in the E-W direction within the Tropicana ROW.
- One 4" gas line continues from the NW quadrant across Tropicana Avenue and runs in the N-S direction within the ROW of Dean Martin Drive.
- One fiber optic line runs in the N-S direction within the ROW of Dean Martin Drive as a continuation of the line from the NW quadrant.

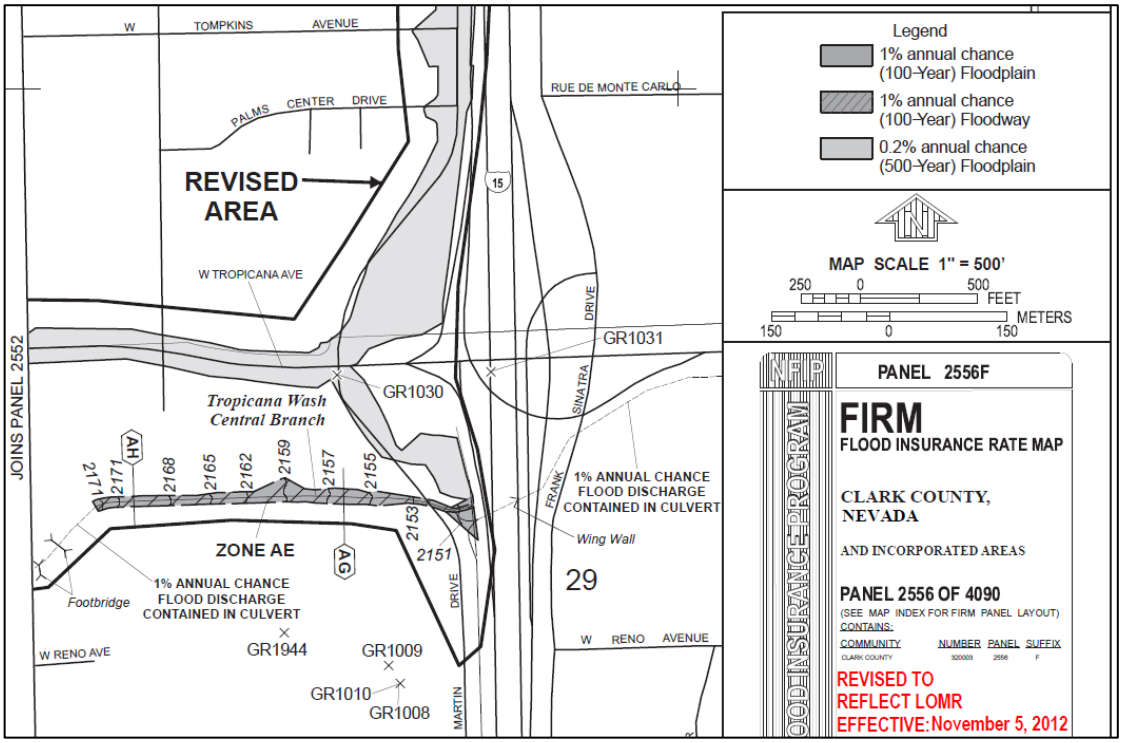
2.4 Existing Drainage Facilities

2.4.1 I-15 and Tropicana – Drainage Background

There are several existing drainage facilities within the vicinity of the I-15 and Tropicana interchange that will be affected by construction of improvements. Hydraulic and hydrologic analyses have been completed on previous projects for work related to I-15. These include the 2006 *I-15 Widening Project "Gap" Offsite Hydrologic Memorandum,* which modified the 2002 CCRFCD MPU HEC-1 model to develop interim offsite flows from CC-215 to Sahara Avenue. Several Clark County Regional Flood Control District (CCRFCD) Master Plan Update (MPU) facilities have been constructed upstream of the project since the 2006 HEC-1 model was developed. The CCRFCD has since released the 2008 Master Plan Update with revisions to hydrologic parameters in the MPU HEC-1 model and updated proposed facilities within the project tributary area in the 2013 Master Plan Update.

In November 2012, a Letter of Map Revision (LOMR) was approved for the recently completed Tropicana North Branch Detention Basin, Tropicana Central Branch, and Breakout Flow Area that updated the flood zone from a Zone A to a shaded Zone X along the west side of the project, from just south of the Flamingo Interchange to just south of the Tropicana Interchange, and along Tropicana Avenue. A FEMA Zone AE remains along the Tropicana Wash – North Branch, just south of Tropicana Avenue.

Revised FIRM Area



The *I-15 Express Lanes, I-215 to Sahara Avenue* project constructed a combination of riprap and concrete-lined trapezoidal channel along the west side of I-15, from just north of the Tropicana Interchange to approximately 850 feet north of the Harmon Bridge crossing. The channel ties into two 10'x6' reinforced concrete boxes just south of the Flamingo Interchange. The boxes continue north to the Flamingo Wash. The channel was designed to convey the 50-year peak flow with a series of flow splits diverted into the existing culverts underneath I-15 along the channel alignment. The channel design also matched the 100-year overtopping of I-15 that was identified in the 1996 *Overtopping Analysis of I-15, Between Tropicana Avenue and Flamingo Road*. The profile of the channel was

controlled by major Cox and LVVWD utility crossings, the Harmon Bridge pile cap, and the two 10'x6' reinforced concrete box inverts. Due to right-of-way constraints, the pile cap and pier columns of the Harmon Bridge and an I-15 overhead sign platform are in the middle of the channel and impact the conveyance of the channel.

The recently completed Tropicana North Branch Detention Basin has eliminated breakout flow from the Tropicana Wash – Central Branch to Tropicana Avenue. The existing flow along Tropicana Avenue is from adjacent sub-basins. There is an existing flow split at the intersection of Tropicana Avenue and Dean Martin Drive.

The current flyover from I-15 southbound to eastbound Tropicana Avenue drains into the existing Tropicana Wash channel that is located in the Excalibur Casino parking lot.

The Corps of Engineers facility at the southwest corner of the Tropicana interchange was recently modified by the I-15 South Design Build Project. This facility will need to be protected in place.

3.0 Future Conditions and Facilities

RTC traffic forecasts for the year 2035 were used to determine the projected freeway demand volumes. Geometric assumptions for 2035 include the construction of NDOT's Project NEON, as well as other projects by Clark County that are listed in the 2035 Regional Transportation Plan. The result is a conversion of I-15's existing two express lanes and three GP Lanes to one HOV lane plus 4 GP lanes, an addition of one lane in each direction from Dean Martin Drive to Decatur Boulevard, and the grade separation of Dean Martin Drive and Tropicana Avenue.

3.1 Demographic Forecasts

Horizon year 2035 population forecasts were estimated at 2.7 million from the RTCSNV's Regional Planning Model that is used to determine future travel demand and travel patterns[3]. For the same projected period, the model estimated 4,090 link miles, which is an 11% increase from the model base year 2013. Projected link miles of various classifications will serve approximately 7,438,000 average weekday vehicle trips, a 24% increase from 2015. The volume and traffic forecasts include projects scheduled in the Regional Transportation Plan, which are further discussed below.

3.2 2035 Regional Transportation Plan

The Regional Transportation Commission's Regional Transportation Plan lists three projects, through or adjacent to the project study area, that are scheduled within the 2035 timeframe.

Project 247 – Widening I-15 and replacing the Tropicana interchange bridge, of which this study's focus is a component. I-15 is already ten lanes wide, constructed as part of the I-15 South Design Build Project. The CD Roads in the vicinity of Tropicana Avenue are already striped as three lanes.

Project 4727 – Construct the fourth westbound lane from Decatur Boulevard to Polaris Avenue. While a portion of this proposed project is within the study limits, a majority of it is not.

Project 4248 – Widening Tropicana Avenue from Polaris Avenue to Dean Martin Drive to eight lanes with a grade separation over Dean Martin. This project and the result of its improvement are discussed below.

3.3 Traffic Volume Forecasts

The traffic forecasts were developed per the guidance provided in the NDOT's *Traffic Forecasting Guidelines*. Traffic forecasts for design year 2035 were developed for a No-Action Scenario and a Build Alternative Scenario. The year 2035 No-Action Alternative corresponds to the road network without the projects listed in the RTP within the study limits. The year 2035 Build Alternative corresponds to the road network with all projects listed in the RTP in place. Both No-Action and Build Alternatives include the proposed MGM Arena and Park development.

The horizon year 2035 traffic forecasts were developed per the approved *Methodology and Traffic Forecasting Memorandum* (Appendix 2). Growth rates were derived and applied as approved in the same Memorandum. After estimation of 2035 AADT, peak hour volumes were derived and turning movements for the study intersections obtained. Turning movements used to conduct analyses are also available in the *Interchange Concepts Traffic Report* (Appendix 8).

[3] RTCSNV, *Appendix 4 Travel Demand Model Methodology and Air Quality Conformity Analysis*.

3.4 Regional Road System Operations

Projected year (No-Build Alternative) analyses indicated poor freeway performance with average segment speeds of 29mph in both AM and PM peaks. As expected with increased projected volumes using existing capacity, freeway performance declined for all segments except the basic freeway segment north of the Flamingo off-ramp that maintained performance of LOS B. During the AM peak in year 2035, segments within study limits operated between LOS E and F; and at LOS D and F in the afternoon peak. The on-ramp segment on the northbound CD operated at LOS F in the projected year, compared to LOS D and C in the AM and PM peak, respectively, with existing conditions.

Intersection analyses using year 2035 turning volumes (No-Build Alternative) revealed worse conditions for intersections whose performance levels were objectionable in existing conditions. Tropicana Avenue and Las Vegas Boulevard operated at LOS F with intersection delays of 136 and 187 sec/veh for AM and PM peak periods, respectively. Similarly, the Valley View Boulevard intersection operated at LOS F in the horizon year, having intersections delays of 93 and 157 sec/veh during the AM and PM peak, respectively. Performance at intersections that had better LOS in existing conditions slightly declined in the horizon year. Operations at Polaris Avenue and New York New York driveway intersections ranged between LOS A and C. The I-15 Northbound ramp intersection operated at LOS D and F for AM and PM peaks, respectively. The I-15 Southbound ramp and Dean Martin Drive intersections on Tropicana Avenue operated at LOS E and F for AM and PM peaks, respectively. A more detailed output for horizon year system operation analyses is available in the *Interchange Concepts Traffic Report* (Appendix 8).

Facility performance in the horizon year confirms the need for increased capacity proposed in the RTP. Analyses of proposed alternatives discussed henceforth were conducted using Build Alternative traffic forecasts. Full evaluation of a No-Build scenario should be performed and checked against the NEPA preferred alternative during future NEPA study.

4.0 Alternative Development and Evaluation

Throughout the alternatives screening and evaluation process, many alternatives were considered for inclusion. From the initial Alternatives Development Workshop to the final Alternatives Selection Meeting, new alternatives were considered and screened for applicability to address the project needs.

4.1 Summary of Alternatives Considered and Rejected

Over 50 concepts identified during the Alternatives Development Workshop were carried forward as potential concept projects. All of these concepts were included in the initial concept list.

A presentation of the initial concepts that were reviewed and evaluated was made to NDOT and the project team in January of 2015. NDOT and FHWA attendees approved of the concept rankings and alternatives to carry forward to further design consideration.

The following tables provide a record of the initial concepts that were considered, along with their ranking in each of the evaluation criteria, and their ranking measures information. Concepts are numbered sequentially and have been grouped into tables of their respective locations -- I-15 NB improvements, I-15 SB improvements, Tropicana Interchange Improvements, and Tropicana Corridor Improvements.

The Timeframe column in the following tables represents the expected construction time relative to the design charrette, with N representing “near-term” or “initial”, “I” representing “Interim”, or within the next three to five years, and “U” representing “Ultimate”, or the final interchange improvements. The Overall Performance Average is the simple average of all of the evaluation criteria scores. The Performance total is the sum of all of the individual concept’s evaluation criteria ranking totals.

I-15 NB Improvement Concepts

I-15 / Tropicana Interchange Study Alternatives Analysis

Alternatives Evaluation Matrix

4 = Best
3 = Better
2 = Good
1 = Neutral
0 = Poor

Item #	I-15 / Tropicana Interchange: I-15 NB Improvement Alternatives	Timeframe	NEPA Action	Operations	Safety	Accessibility	Reliability	Implementability	Overall Performance Average	Performance Total	
			Screening Measures						Ranking Measures		
1	Stripe CD Road to 3 Lanes. Bring either the EB or WB 215 ramp on as a third lane by absorbing the shoulders. The intent is to increase the capacity of the CD Road and enhance lane splits for I15, Frank Sinatra (1&2), Tropicana and Russell.	N	3 4	2 3	1 2	2 3	1 2	3 4	**3.00**	**18**	
2	Russell/I15 Ramp Braiding. Braid the EB215-I15 Entrance and Russell Entrance with the Tropicana Exit at the Russell Interchange. The intent is to enhance the safety and operations of these Ramp movements by eliminating the weaving movements by grade separating them.	I	3 4	3 4	3 4	3 4	3 4	2 3	**3.83**	**23**	
3	CD2. Move the WB 215 Tropicana Access to the CD Road and Exit Tropicana/Frank Sinatra 2 on the right between the Frank Sinatra 1 and Russell Exits. The intent is to eliminate the Russell and Tropicana/Frank Sinatra 2 weaving in order to improve the CD I15 entrance movement safety and operations.	I	3 4	1 2	1 2	1 2	1 2	2 3	**2.50**	**15**	
4	Flamingo Ramp Braiding. Grade Separate the Tropicana Entrance and the Flamingo Exit ramps near Tropicana. The intent is to eliminate these weaving movements to improve safety and operations as well as improve access to Flamingo.	U	3 4	2 3	3 4	2 3	2 3	1 2	**3.17**	**19**	
5	Eliminate Frank Sinatra Access Near Tropicana. Consolidate Frank Sinatra Access to the Frank Sinatra 1 Exit. The intent is to provide additional capacity to Tropicana.	U	3 4	3 4	2 3	# 0	0 1	3 4	**2.67**	**16**	
6	Move Frank Sinatra Access Near Tropicana. Move the Frank Sinatra 2 Exit terminal intersection south of Tropicana. The intent is to simplify the Tropicana interchange geometry and minimize structures and costs as well as improve capacity for the new Stadium intersection.	U	3 4	0 1	0 1	0 1	0 1	3 4	**2.00**	**12**	
7	Create a Two Lane Entrance for the CD Road. Expand the CD Road Entrance from one Lane to two. The intent is to improve the capacity and operations of the entrance.	U	3 4	3 4	1 2	2 3	2 3	0 1	**2.83**	**17**	

I-15 SB Improvement Concepts

I-15 / Tropicana Interchange Study Alternatives Analysis

Alternatives Evaluation Matrix

4 = Best
3 = Better
2 = Good
1 = Neutral
0 = Poor

Item #	I-15 / Tropicana Interchange: I-15 SB Improvement Alternatives		Timeframe	NEPA Action	Operations	Safety	Accessibility	Reliability	Implementability	Overall Performance Average	Performance Total	
			Screening Measures							Ranking Measures		
8	Stripe CD Road to 3 Lanes. Bring the Tropicana and Russell ramps on as a third lane by absorbing the shoulders. The intent is to increase the capacity of the CD Road and enhance lane splits for I-15, 215, and Russell.	I	3 4	2 3	1 2	2 3	1 2	3 4	**3.00**	**18**	
9	Create a Choice Lane at the I-15/215 Split and provide Two lanes for the WB 215 split. South of the UPRR bridge, stripe the CD road to 3 lanes by absorbing the shoulder, create a choice lane at the 215/15 split and add a second lane at the 215 ramps, provide two lanes for WB 215 at the 215 split that merge to one prior to the NB15-WB 215 ramp merge. The intent is to increase improve the operations and lane balance of the I-15/215 ramps off of the CD road.	I	3 4	3 4	2 3	2 3	2 3	3 4	**3.50**	**21**	
10	"CD" the Russell and Tropicana Ramps and Exit 215 WB closer to Russell. Make the current CD exit for Russell Road only and add a second exit closer to Russell Road to the CD Road for WB 215. The intent is to reduce volumes on the CD road between Tropicana and Russell to improve weaving operations in that reach to improve operations and safety.	N	3 4	2 3	1 2	2 3	2 3	3 4	**3.17**	**19**	
11	Move the Russell Ramps to between I-15 and the CD Road. Reconstruct the Russell Ramps to lie between I-15 and the CD Road, which may or may not include moving the CD road. The intent is to minimize weaving for the Russell movements to improve operations and safety.	N	3 4	2 3	1 2	1 2	1 2	1 2	**2.50**	**15**	
12	Start the CD South of the Flamingo B Ramp (extend the CD north). Widen I-15 for one Auxiliary lane to the CD Road. The intent is to improve lane balance, capacity, and operations for the high volume movement of the CD Road.	U	3 4	1 2	1 2	0 1	0 1	1 2	**2.00**	**12**	
13	Flamingo Ramp Braiding. Grade separate the Tropicana Exit and the Flamingo Entrance ramps. The intent is to eliminate these weaving movements to improve safety and operations.	U	3 4	3 4	3 4	0 1	0 1	0 1	**2.50**	**15**	
14	CD Road Ramp Braiding. Grade Separate the CD Road exit and the Tropicana entrance. The intent is to improve operations on the CD road by relieving it of Tropicana traffic.	U	3 4	2 3	2 3	2 3	2 3	0 1	**2.83**	**17**	

Tropicana Interchange Improvement Concepts

I-15 / Tropicana Interchange Study Alternatives Analysis

Alternatives Evaluation Matrix

4 = Best
3 = Better
2 = Good
1 = Neutral
0 = Poor

Item #	I-15 / Tropicana Interchange: Tropicana Interchange Improvement Alternatives	Timeframe	NEPA Action	Operations	Safety	Accessibility	Reliability	Implementability	Overall Performance Average	Performance Total	
			Screening Measures						Ranking Measures		
15	Move the Signal Pole out of the sidewalk. Move the SE Quadrant signal pole for the NB exit terminal intersection out of the sidewalk path. The intent is to improve access for pedestrians.	I	3 4	1 2	1 2	3 4	3 4	2 3	**3.17**	**19**	
16	Add a Lane at the NB Exit Terminal so there are Two lefts and Two Rights. Widen the NB Exit north of the flyover for an extra lane so that the intersection provides dual lefts and dual rights. The intent is to improve the capacity of the intersection.	I	3 4	1 2	1 2	1 2	1 2	1 2	**2.33**	**14**	
17	Signalize the Flyover. Place a signal near the touchdown point of the flyover. The intent is to improve safety by eliminating weaving with the free flow flyover traffic.	I	3 4	1 2	1 2	0 1	0 1	2 3	**2.17**	**13**	
18	Stripe the SB Exit WB movement to 3 lanes. Provide a third right turn lane in the available paved area at the SB Exit terminal intersection. The intent is to improve the capacity of the intersection.	I	3 4	1 2	0 1	1 2	1 2	3 4	**2.50**	**15**	
19	SPDI. Construct a Single Point type interchange at Tropicana. The intent is to manage high EB demand by the use of this interchange type and eliminate the need for the flyover. This concept assumes the Dean Martin grade separation is constructed concurrently.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
20	DDI. Construct a Diverging Diamond type Interchange at Tropicana. The intent is to manage high EB demand by the use of this interchange type and eliminate the need for the flyover.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
21	TDI. Expand the existing Tight Diamond type Interchange at Tropicana. The intent is to manage high EB demand by adding through and turn lanes in every direction to eliminate the need for the flyover.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
22	DCMI. Construct a Diverging Diamond type Interchange with Grade Separated through movements at Tropicana. The intent is to maximize the operations of a Diverging Diamond concept.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
23	Grade Separate One Direction of Tropicana (DCMI). Same as DCMI except there is no vertical or horizontal braiding of the through movements. The intent is to improve the through operations of the DCMI.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
24	CFI. Continuous flow intersection/interchange. Intent is to modify the entire interchange to a pair of coordinated two-phase signals.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
25	Split Diamond with Russell Road. Combine entering and exiting traffic for both interchanges with a connecting road between them. The intent is to eliminate weaving between Tropicana and Russell.	U	3 4	2 3	2 3	# 0	0 1	1 2	**2.17**	**13**	

26	Freeway Threads with Offset Single Point Interchange. Provide two lane exits to Russell and Tropicana, and Provide left side freeway ramps as an add lane with the use of an Offset Single Point type interchange. The intent is to eliminate Freeway weaving and optimize interchange access.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
27	Flip I-15 and Tropicana Levels/SPI under. Construct the Freeway on level 2 and Tropicana on level 1 and utilize a Single Point Diamond type interchange. The intent is to minimize structures cost and maximize access.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
28	Provide a SE Quad B Loop Exit. Construct a second SB I-15 to EB Tropicana ramp in the SW quadrant of the interchange. The intent is to maximize the operations of the intersection.	U	3 4	1 2	2 3	2 3	2 3	0 1	**2.67**	**16**	
29	Keep/Recreate SB-EB Flyover (all interchange types) (SB-EB Flyover). Provide a SB-EB Flyover ramp for the Tropicana interchange. The intent is to improve capacity and operations of the intersection.	U	3 4	3 4	0 1	0 1	2 3	0 1	**2.33**	**14**	
30	SB-EB Flyover Alt 1. Consider alternate landing locations for the ramp at the median. The intent is to minimize weaving and improve access.	U	3 4	3 4	0 1	0 1	2 3	0 1	**2.33**	**14**	
31	SB-EB Flyover Alt 2. Consider a divided ramp that would land at both the median and the right side of WB Tropicana. The intent is to minimize weaving and improve access.	U	3 4	3 4	1 2	0 1	0 1	# 0	**2.00**	**12**	
32	Provide both SB-EB and NB-WB Flyovers (all interchange types). Construct flyover ramps for left turns for both the NB and SB exit ramps. The intent is to maximize the operations and capacity of the intersections.	U	3 4	3 4	1 2	0 1	0 1	# 0	**2.00**	**12**	
33	Eliminate the Flyover (all interchange types). Remove the Flyover and replace it with a better operating second level interchange. The intent is to provide equal or better interchange operations and eliminate the weaving operations and access limitations created by the flyover.	U	3 4	0 1	0 1	2 3	1 2	3 4	**2.50**	**15**	
34	Grade Separate Tropicana Movements through the interchange (all interchange types). Place Tropicana Through movements on the third level through the interchange. The intent is to maximize the operations and capacity of the intersections.	U	3 4	2 3	2 3	# 0	2 3	0 1	**2.33**	**14**	
35	Modify the Frank Sinatra access to be free flow. Grade separate the NB access over the SB Frank Sinatra lanes. The intent is to optimize access to Frank Sinatra.	U	1 2	2 3	2 3	2 3	2 3	# 0	**2.33**	**14**	
36	At grade ramp intersections with Dean M and Frank Sinatra and ramps enter and exit from Frank and Dean Martin (Frank and Deans). Change the profile of Frank Sinatra to be at grade with Tropicana and have the Freeway ramps originate and terminate off of Dean Martin and Frank Sinatra. The intent is to relieve the Tropicana corridor by having the Resort Corridor employee commuters directly access the Frontage Road.	U	0 1	1 2	0 1	3 4	0 1	0 1	**1.67**	**10**	
37	Frank and Deans Alt 1. Same as Frank and Deans but perpetuating the ramps to Tropicana. The intent is to maximize the distribution of traffic to minimize point congestion.	U	0 1	0 1	0 1	3 4	0 1	0 1	**1.50**	**9**	
38	Frank and Deans Alt 2. Same as Frank and Deans but consolidate the ramp terminal intersections to the NE and SW quadrants of the interchange.	U	0 1	1 2	0 1	3 4	0 1	0 1	**1.67**	**10**	
39	Frank and Deans Alt 3. Create a one way couplet using Frank Sinatra and Dean Martin including at least one additional cross freeway connection between them. The intent is to create free flow access to the frontage roads.	U	0 1	0 1	0 1	0 1	0 1	0 1	**1.00**	**6**	
40	Provide a SB Dean Martin Slip. Construct a slip ramp off of the SB Exit to Dean Martin Drive similar to the Frank Sinatra slip off of the NB Exit. The intent is to distribute traffic.	U	1 2	0 1	0 1	2 3	0 1	1 2	**1.67**	**10**	
41	Exit the CD Road Before Tropicana. Exit the CD road north of Tropicana so that the SB Entrance enters the CD Road on the left hand side. The intent is to minimize weaving and improve operations and safety.	U	2 3	2 3	1 2	2 3	1 2	0 1	**2.33**	**14**	

Tropicana Corridor Improvement Concepts

I-15 / Tropicana Interchange Study Alternatives Analysis

Alternatives Evaluation Matrix

4 = Best
3 = Better
2 = Good
1 = Neutral
0 = Poor

Item #	I-15 / Tropicana Interchange: Tropicana Corridor Improvement Alternatives	Timeframe	NEPA Action	Operations	Safety	Accessibility	Reliability	Implementability	Overall Performance Average	Performance Total	
			Screening Measures						Ranking Measures		
42	Eliminate the Bi-Directional Lefts with a median. Implement “worm islands” to channelize lefts between signals. The intent is to minimize accidents.	N	3 4	1 2	2 3	0 1	1 2	2 3	**2.50**	**15**	
43	Add a Right Turn Lane WB at Dean Martin. Widen the WB Tropicana lanes between the SB Terminal intersection and Dean Martin Drive to provide a right turn lane to NB Dean Martin. The intent is to improve the capacity and operations of the intersection.	N	3 4	1 2	1 2	1 2	1 2	3 4	**2.67**	**16**	
44	Strengthen Intersections from Valley View to I-15. Provide additional Right, Left and Through lanes at all legs of the Valley View, Procyon, Polaris, and Dean Martin intersections. The intent is to improve the operations and capacity of the Tropicana corridor.	I	2 3	2 3	1 2	1 2	2 3	1 2	**2.50**	**15**	
45	Roundabout at Tropicana/Dean Martin. Construct a roundabout type intersection for Dean Martin and Tropicana. The intent is to improve safety and operations of the intersection without the use of a grade separation.	I	2 3	1 2	2 3	1 2	1 2	1 2	**2.33**	**14**	
46	Create a Separate Multi Use path. Construct a multi-use path separate and distinct from the interchange. The intent is to improve interchange operations and improve access and safety for bikes and peds.	U	3 4	2 3	2 3	2 3	2 3	1 2	**3.00**	**18**	
47	Arterial Interchange Dean Martin/Tropicana (Dean at the Tropicana). Grade separate Dean Martin and Tropicana and provide ramp connections between them. The intent is to retain the existing access and improve operations for Dean Martin and Tropicana.	U	1 2	2 3	2 3	0 1	1 2	0 1	**2.00**	**12**	
48	Dean at the Tropicana Alt 1. LBG’s concept to place Dean Martin Under Tropicana at Existing Intersection. The intent is to improve operations of Dean Martin and Tropicana.	U	2 3	2 3	2 3	0 1	2 3	0 1	**2.33**	**14**	
49	Dean at the Tropicana Alt 2. LBG’s concept to place Dean Martin Over Tropicana at Existing Intersection. The intent is to improve operations of Dean Martin and Tropicana.	U	2 3	2 3	2 3	0 1	2 3	0 1	**2.33**	**14**	
50	Dean at the Tropicana Alt 3. Construct a Dean Martin Grade Separation on an alignment parallel with I-15, “Loops” back to Trop. The intent is to restore the existing access and improve operations for Dean Martin and Tropicana.	U	1 2	2 3	2 3	2 3	2 3	0 1	**2.50**	**15**	
51	Combine Excalibur/NYNY Intersections. Create a full intersection at the Excalibur and NYNY intersections – this must be combined with removing the flyover concept – This could be left in only both directions. The intent is to improve access and reduce some left turning volumes at Las Vegas Blvd.	U	3 4	0 1	0 1	2 3	0 1	2 3	**2.17**	**13**	
52	Widen Tropicana from Decatur to I-15. Construct four through lanes on Tropicana from Decatur to I-15 as in Clark County’s long range plan. The intent is to improve capacity and operations on Tropicana.	U	1 2	2 3	2 3	2 3	2 3	0 1	**2.50**	**15**	

4.1.1 Pre-Screening of Alternatives

Concepts with Performance Totals higher than 14, or that subjectively required further evaluation, were carried forward to the next step for more detailed analysis. The remaining concepts were documented and archived in a pre-screened alternatives summary. This summary is provided in the Appendix 6.

Separation of Initial, Interim, and Ultimate Concepts

It became evident that a number of the concepts that passed the initial screening process were either in conflict with other proposed concept improvements, or better served the public by being implemented sooner than the anticipated project construction timeline. The concepts were then separated into groups that became:

4.1.2 "Initial concepts"

Those concepts that could be implemented within a short time frame and would have immediate benefit to road users and/or pedestrians. An Initial Concepts Memorandum was prepared that discussed all initial concepts, and provided recommendations for these concepts (Appendix 3). NDOT is currently determining which action to take based on those recommendations.

NDOT identified an additional initial concept during the study process that was added to the scope of the study but not taken through the concept evaluation process – the evaluation of the existing Tropicana exit ramp signing. A Tropicana Exit Ramp Interim Signing memorandum was prepared to address concerns that the current Tropicana exit ramp signing doesn't provide drivers with adequate lane use information at the ramp gore. It was recommended to implement one of two concepts as soon as possible to address the issue. The full details are presented in the Memo.

4.1.3 "Interim concepts"

Those concepts that could be implemented within the near future, either as their own stand-alone project, or as part of another project. These concepts may or may not be in conflict with the ultimate alternative, but their implementation would provide benefit to road users and/or pedestrians in the interim until the final project alternative can be constructed. Three interim projects were identified. Two address the northbound collector distributor entrance to I-15; while the third addresses issues with the southbound collector distributor at the I-15 and CC-215/I-215 interchange.

The first northbound collector distributor entrance option considers the conversion of the existing lane widths to 11-feet and reduction of the shoulders on both the left and the right. The CD road would enter I-15 as an additional lane, and just fit through the opening under the existing Tropicana overpass structure. It would then continue north as an auxiliary lane to Spring Mountain Road. A minor reconfiguration/restriping of the lanes between Tropicana Avenue and Flamingo Road would be required to accommodate the additional lane on I-15.

The second northbound collector distributor entrance option considers reducing the number of I-15 mainline lanes prior to the entrance of the CD and carrying the CD north in the position of the existing outside lane. This option requires minor restriping on I-15 south of and through the northbound CD entrance to I-15.

The goal of these two options is to allow the CD road entrance to I-15 to have its own lane that extends all the way to the Spring Mountain exit.

The southbound collector distributor choice lane concept develops the southbound I-15 to CC-215/I-215 split from its exiting single lane ramp exit into a true directional fork, with one lane each for westbound CC-215 and eastbound I-215 and two lanes for southbound I-15. Today, the single lane ramp exit from the CD road for the CC-215/I-215 creates a bottleneck that causes backups and significant delays to travelers on the southbound CD.

These potential projects are presented in additional detail in the Interim Concepts Report. The Interim Concepts Memo (Appendix 4) was prepared that discussed all interim concepts and provided recommendations for these comments. NDOT is currently determining which action to take based on these recommendations.

4.1.4 "Ultimate Concepts"

Once the initial and interim concepts were separated from consideration, ultimate concepts for the interchange improvement were considered and categorized. More geometrically advanced alternatives, such as three level concepts and structurally complicated concepts, were put on hold during the initial alternative evaluation.

Two-Level Interchanges

Two-level interchange concepts (I-15 below and Tropicana above with all ramps meeting at-grade with Tropicana) would pose the most economical solution(s). The concepts consisted of:

- Tight Diamond Interchange
- Single Point Urban Interchange
- Diverging Diamond Interchange

Multiple lane configurations were evaluated in an attempt to observe adequate levels of service and traffic impacts. SYNCHRO was used as a comparative measure to determine the possible performance of each option and compare the different alternatives. CORSIM was also used to verify the performance of a two-level interchange, see Section 4.3 below. Additional discussion on the performance of the two level interchange alternatives is provided in the Study Traffic Report. Ultimately, it was determined that a two-level interchange would not meet the demand of all movements at acceptable levels of service. Owing to this, three-level interchanges were considered.

Three-Level Interchanges

The three-level concepts developed for consideration consist of many complicated and/or unconventional interchange types. Prior to evaluating any of them, a look at the existing configuration was performed, and it provided a solution to the traffic operations issues of the two-level interchange types. The team evaluated the following interchange types, assuming that the existing southbound to eastbound flyover would be either maintained or reconstructed as necessary to support the volumes:

- Tight Diamond Interchange: The tight diamond interchange with flyover provides similar operation to today's interchange, which operates at a reasonable LOS. The improvements mostly fit within existing right-of-way.
- Single Point Urban Interchange: With the absence of the left turns in the southbound ramp direction, considering a SPUI with a southbound to eastbound flyover at this interchange doesn't justify the additional costs of the complicated bridge structure. It also introduces challenging geometry where the flyover and right turn ramp radii conflict, eliminating the SPUI from consideration.
- Diverging Diamond Interchange: Diverging diamond interchanges require adequate queueing distances between crossover intersections that can support the volumes. With the acceptable

performance of the tight diamond interchange, further evaluation of the diverging diamond interchange type was abandoned as it would require additional right of way and would potentially impact existing businesses. The diverging diamond interchange geometry that fit within a similar footprint as that of the tight diamond interchange does not support the traffic demand volumes with an acceptable LOS.

4.2 Improvements to Local Roads

Dean Martin Drive

During the concept evaluation, it was found that the proximity of the Dean Martin Drive intersection to the west interchange ramp terminal intersection created delay through the interchange. This triggered the consideration of multiple Dean Martin realignment concepts, acknowledging even the pre-screened alternatives. Since the RTC had planned to grade separate Dean Martin from Tropicana by 2035, the team evaluated options for incorporating the future improvement, either partially or completely. Dean Martin concepts that required little to no right-of-way were considered first and implemented into the project alternative(s).

When considering the two-level interchange, Dean Martin most sensibly rests west of the ramp terminal locations, eliminating ramp bridges. In combination with a flyover, Dean Martin rests easterly, alongside southbound I-15, passing under Tropicana using the same bridge structure as I-15. This requires coordination with the flyover geometry as well as bridges for both ramps to cross over Dean Martin.

Las Vegas Boulevard

The traffic operations of the Tropicana Avenue and Las Vegas Boulevard intersection were also evaluated. Multiple revisions to lane assignments for the eastbound traffic from the interchange were reviewed in CORSIM, including their impacts to the intersection's other directions of traffic.

Improvements to I-15

As part of the evaluation of the overall operations performance of the interchange, the functionality of I-15 and adjacent ramps was considered within the vicinity of the interchange.

A few concepts emerged as potential alternatives for addressing existing weaving issues on the northbound collector distributor at the Tropicana ramp and I-15 northbound split. The simplest concept provides a two-lane entrance ramp from the northbound collector distributor to I-15, splitting from the Tropicana Avenue and Frank Sinatra Drive ramp as a fork. The first lane would be extended as an auxiliary lane to the Spring Mountain northbound exit ramp. The second lane would drop into the first lane prior to the Tropicana northbound entrance ramp gore.

4.3 Study Recommended Alternative

Once the tight diamond interchange with flyover configuration was determined to be the most effective in meeting demand, a "base configuration" was created for CORSIM modeling. As a result, the following configurations were laid out and tested geometrically and with CORSIM. A two-level alternative was also tested to validate the initial Synchro model results with CORSIM. Plan view exhibits of these alternatives are located in Appendix 9A.

Alternative 1 (Exhibit Base configuration A-1) - Tight Diamond Interchange (TDI) with flyover, four EB thru lanes on Tropicana Avenue with one left lane drop at Las Vegas Boulevard and 2-lane entrance from the flyover to Tropicana

This configuration consists of a tight diamond interchange at Tropicana Avenue and a flyover from southbound I-15 to eastbound Tropicana with minimal right-of-way impact. There will be no right-of-way acquisition west of the interchange. East of the interchange, the right-of-way impact is due to Dean Martin Drive realignment and the flyover. The southbound I-15 exit ramp at Tropicana will include three right turn lanes only. There will be four eastbound thru lanes on Tropicana with one left most eastbound lane trapped left at Las Vegas Blvd and a two-lane entrance from the flyover to Tropicana. There will be one lane exit from northbound I-15 to Frank Sinatra Drive.

Alternative 2 (Exhibit Base configuration A-2) - Tight Diamond Interchange (TDI) with flyover, four EB thru lanes on Tropicana with one left lane drop at Las Vegas Blvd and two flyover lanes merging into one prior to Tropicana

This configuration consists of a tight diamond interchange at Tropicana and a flyover from southbound I-15 to eastbound Tropicana with minimal right-of-way impact. There will be no right-of-way acquisition west of the interchange. East of the interchange, the right-of-way impact is due to Dean Martin realignment and the flyover. There will be four eastbound thru lanes on Tropicana with one left lane drop at Las Vegas Blvd and two lanes from the flyover merging into one lane prior to entering Tropicana. The southbound I-15 exit ramp at Tropicana will include three right turn lanes only. There will be one lane exit from northbound I-15 to Frank Sinatra Drive.

Alternative 3 (Exhibit Base configuration B) - Tight Diamond Interchange (TDI) with flyover and three EB thru lanes on Tropicana

This configuration consists of a tight diamond interchange at Tropicana and a flyover from southbound I-15 to eastbound Tropicana with minimal right-of-way impact. There will be no right-of-way acquisition west of the interchange. East of the interchange, the right-of-way impact is due to Dean Martin realignment and the flyover. There will be three eastbound thru lanes on Tropicana and two lanes from the flyover. The southbound I-15 exit ramp at Tropicana will include three right turn lanes only. There will be one lane exit from northbound I-15 to Frank Sinatra Drive.

Alternative 4 (Exhibit flyover configuration with left turns) – Hybrid option - Tight Diamond Interchange (TDI) with flyover and left turns from southbound I-15 exit to eastbound Tropicana

This configuration consists of a tight diamond interchange at Tropicana and a flyover from southbound I-15 to eastbound Tropicana. The southbound I-15 exit ramp at Tropicana will include three right turn lanes and two additional left turn lanes at Tropicana. There will be no right-of-way acquisition west of the interchange. East of the interchange, the right-of-way impact is due to Dean Martin shift west. There will be four eastbound thru lanes on Tropicana with one left most eastbound lane trapped left at Las Vegas Boulevard and a two-lane entrance from the flyover to Tropicana. There will be one lane exit from northbound I-15 to Frank Sinatra Drive.

Alternative 5 (Exhibit No flyover configuration) - Tight Diamond Interchange (TDI) without flyover

Because of the inherent cost savings, one more alternative was reviewed with CORSIM, a two-level tight diamond interchange without flyover. This configuration consists of a tight diamond interchange at Tropicana including a two-lane exit from northbound I-15 to Frank Sinatra Drive. There will be right-of-way impacts east and west of the interchange due to Dean Martin Drive realignment and the additional exit lane at Frank Sinatra. There will be four eastbound through

lanes on Tropicana expanding to five, east of the interchange to match the existing with added right turn lane at Las Vegas Boulevard. The southbound I-15 exit ramp at Tropicana will include three right turn lanes only.

Of these, **Alternative 1 is recommended** to take forward to the NEPA process and final design.

The final geometric layout of the recommended TDI interchange includes enhanced exit ramps from I-15, providing dual-lane exits for both the north and southbound directions. The northbound exit ramp forks to Frank Sinatra as a single lane exit towards the Frank Sinatra ramp terminal intersection adjacent to the Las Vegas Arena access driveway. The northbound exit ramp then widens to provide triple left turns to westbound Tropicana and triple right turns to eastbound Tropicana. The northbound entrance ramp consists of dual right turns from westbound Tropicana and triple left turns from eastbound Tropicana. These combine into three ramp lanes to a proposed ramp meter stop bar. From there, the lanes merge into one and onto I-15.

Southbound, two lanes exit I-15, widening to three prior to the southbound exit ramp fork. Eastbound traffic will travel in the left and center lane to the flyover structure, which operates as a free-flow ramp onto eastbound Tropicana east of the interchange bridge and ramps, similar to today. Westbound exiting traffic will proceed to the Tropicana ramp terminal interchange, where triple right turn lanes are available to feed Tropicana Avenue. The southbound entrance ramp consists of dual right turns from eastbound Tropicana and triple left turns from westbound Tropicana, combining into three lanes to the ramp meter which is located prior to the SB CD road merge.

On I-15, space has been accommodated under the proposed bridge structure to support two HOV lanes and four GP lanes in each direction. Additional room is available northbound for two auxiliary lanes from the CD road, and the Frank Sinatra Drive ramp lane is accommodated as well. Dean Martin Drive passes under Tropicana as well, adjacent to the southbound I-15 lanes, in its own span.

Along Tropicana, sidewalks are provided on both sides of the road for the limits of the improvements. From Polaris to Dean Martin, Tropicana is proposed to have raised median separation of the east and westbound traffic. The westbound roadway is widened to accommodate a dedicated right turn to northbound Polaris, accommodating future development. Dean Martin's through movements are grade separated, with right-in, right-out access to both the north and south of Tropicana at the existing Dean Martin intersection location. From Dean Martin through the interchange, the roadway width supports four through lanes in each direction, raised median separation, and triple left turns for the interchange ramps. A ten-foot sidewalk is provided along the north side of Tropicana for enhanced pedestrian access and safety. East of the interchange, Tropicana consists of varying width raised median, allowing for dual left turns into the New York New York parking garage. The I-15 southbound to eastbound ramp enters eastbound Tropicana on the right, adding two lanes to the roadway. From there, the eastbound left-most lane becomes a trap lane to northbound Las Vegas Boulevard, resulting in Tropicana consisting of four westbound lanes, a narrow raised median, two east to northbound left turns, four eastbound through lanes, and one southbound right turn trap lane. At Las Vegas Boulevard, all improvements match back to the existing lane configuration.

Dean Martin is improved as a grade separation of the through movements of Dean Martin and Tropicana. This is accomplished via braiding the Tropicana southbound entrance and exit ramps with an alignment shift of Dean Martin. It passes under both ramps and Tropicana while still maintaining access to Tropicana via two new intersections, north and south of Tropicana. It consists of two lanes in each direction, as well as a wide median supporting left turn pockets and the bridge piers at the interchange ramps. The Recommended Alternative exhibit provides a general depiction of the recommended alternative. Detailed plan sheets are provided in Appendix 9B.

Recommended Alternative

Structural review and recommendations

A Bridge Type, Size and Location Investigation Memo was prepared based upon the recommended alternative's geometry. Bridge types for the various grade separations (shown above in a light gray shade) were reviewed and selected for preliminary analysis. Structural Design Criteria were established, along with individual bridge cost estimates. All information pertaining to the structural type selection is provided in Appendix 9B, in the "I-15 Trop IC Study - Bridge TSL Memo". Steel beam superstructures are recommended for constructing both bridges crossing I-15, while cast-in-place post-tensioned concrete box superstructures are recommended for the remaining bridges. Final retaining wall locations were not determined as part of this study, and will need to be evaluated further during the NEPA process development. The Type Selection memo serves as a guide for future evaluation of project costs and bridge types preferred by NDOT.

4.4 Potential Right of Way Impacts

The above recommended improvements impact several adjacent properties outside of the existing NDOT I-15 and Clark County Tropicana right of way. Final impacts of the project have not been determined, however, potential impacts are identified generally as follows.

West of the Interchange, the widening of Tropicana Avenue may impact adjacent properties to both the north and south, requiring minor widening of the existing curb and gutter to allow the lane transitions. These properties include Assessor Parcel Numbers (APN) 162-20-403-001, 162-20-403-006, 162-29-101-008, 162-29-101-016, 162-29-101-009, 162-29-101-010 and 162-29-101-011. The north Dean Martin intersection and southbound I-15 exit ramp geometry will impact the In-N-Out Burger property (APN No. 162-20-404-001) in the northwest quadrant of the Interchange. Similarly, the south Dean Martin intersection and the southbound I-15 entrance ramp geometry will impact the Golden Palm hotel property (APN No. 162-29-101-019) as well as the Flood Channel parcel (APN No. 162-29-196-002) in the southwest quadrant. To the east, the south to east bound flyover ramp realignment impacts the existing private parcel on APN 162-29-510-001. Heading further east, minor widening of Tropicana based on the above geometric recommendations may impact the north and south frontages along Tropicana (APN Nos. 162-20-810-003, 162-20-801-009, and 162-29-510-006) amounting to minor widenings of the existing curb and gutter location.

The overall project geometry will be further developed and finalized at a later date as part of the FHWA NEPA process for the project. Design refinements should be evaluated to minimize the impact to all potentially impacted properties.

4.5 Proposed Freeway Improvements

Connecting the interchange alternative to the entering and exiting traffic on I-15 should not impact I-15 operations beyond what would be expected if no improvements were constructed. Without reconfiguring significant portions of I-15 outside of the study area, modifying the existing northbound collector distributor ramp entrance in the following configurations was evaluated:

- Modify NB CD Ramp to be a two-lane entrance, consisting of a 12-foot auxiliary lane to Spring Mountain Road and one GP lane added to I-15.
- Modify NB CD Ramp to be a two-lane entrance, consisting of two 12-foot auxiliary lanes, one to Spring Mountain and one to Flamingo Road.
- Modify NB CD Ramp to have a two-lane entrance, with two 12-foot lanes, dropping the outside lane prior to the Tropicana entrance ramp and continuing the inside lane as an auxiliary lane to Spring Mountain.
- Modify the NB CD Ramp to have a two-lane entrance, using 11-foot lanes for the above options.

The alternative described in the third bullet above is recommended for construction by this project. Further evaluation of I-15 is needed in order to determine the impacts of I-15 on those interchanges north of Tropicana Avenue.

4.6 I-15 and Tropicana – Project Drainage Design Elements

After a review of the project area and previous drainage studies and improvement projects, several elements related to the hydrologic and hydraulic design were identified for the project to evaluate and assess the proposed roadway improvement alternatives.

4.6.1 Offsite Hydrology

The HEC-1 models from the 2006 *I-15 Widening Project "Gap" Offsite Hydrologic Memorandum* will need to be updated to develop offsite design HEC-1 models for the project. Changes will need to be incorporated into the models from the 2008 MPU model to include existing conditions and ultimate conditions. The existing conditions model will need to be updated with the MPU facilities that are shown in the 2013 MPU as having been constructed since the 2008 MPU and those that are currently under construction, as shown on the CCRFCD website, within the project watershed.

4.6.2 I-15/Dean Martin Drive Drainage Facilities

The existing conveyance facilities along the west side of I-15 need to be hydraulically analyzed to determine existing conditions, including flow depth, flow regime, and velocities. The impacts of the proposed roadway improvements need to be modelled on the existing drainage facilities and either reroute, reshape, and/or resize the conveyance facilities to address the impacts of the proposed improvements at the Tropicana Interchange and the I-15 widening. Existing conditions should be met or improved for the backwater along Dean Martin Drive that is caused by the existing dual 10'x6' reinforced concrete boxes.

4.6.3 FEMA Flood Zone Analysis

The widening of I-15 and other project improvements will need to be analyzed to show that the flood zone changes along Tropicana Avenue and I-15 in the LOMR, dated November 5, 2012, are not adversely affected.

4.6.4 Tropicana Avenue Onsite Analysis

The flow split at Tropicana Avenue and Dean Martin Drive will need to be reassessed with the updated hydrologic information and proposed project improvements. The flow split reassessment will need to show that drainage patterns are either maintained or improved, and if not, an evaluation of the need of improved or additional storm drain systems with the project improvements will be required. An analysis of the existing and ultimate flows along Tropicana Avenue will need to ensure dry lane and spread criteria is met. The improvements and design will need to show that the impact(s) to the Corps of Engineers facility at the southwest corner of Tropicana/I-15 interchange are minimized.

4.6.5 I-15 and Tropicana Interchange Onsite Analysis

Onsite drainage analysis of the Tropicana Interchange and I-15 improvements will need to be coordinated with the bridge designer and roadway designer to minimize design exceptions due to shoulder spread and inlets within the bridge structures.

4.7 Recommended Alternative Renderings

The following renderings provide three views of the recommended alternative improvements. These renderings were prepared for use in the public information meeting exhibits as discussed in Section 7.

Interchange Rendering Looking North

Interchange Rendering Looking East

Interchange Rendering Looking South

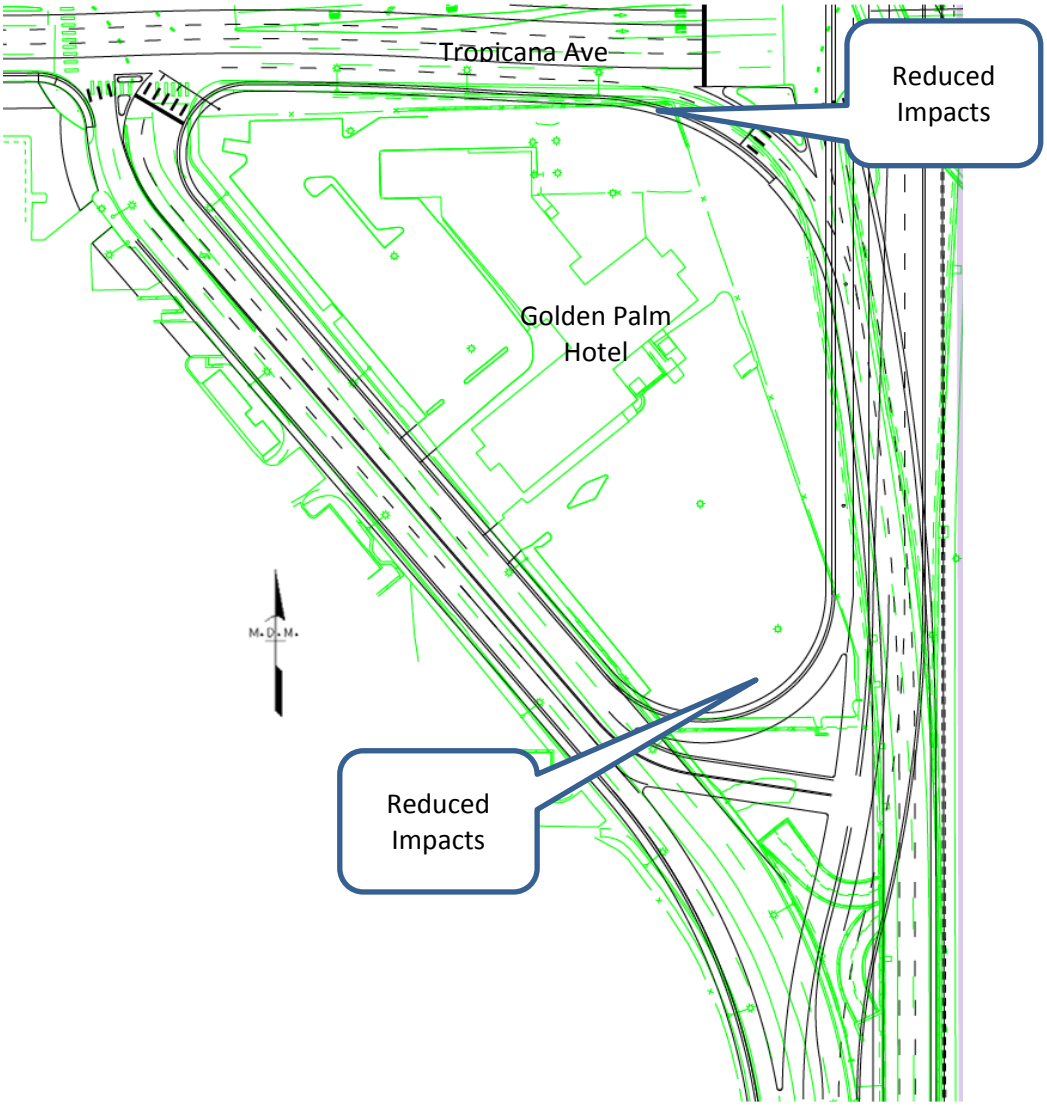
4.8 Additional alternatives to be considered

Throughout the development of the study alternatives, ongoing stakeholder coordination has resulted in evaluation of refinements and/or revisions of portions of the recommended alternative. These refinements are considered as potential concepts to be carried forward in the NEPA process in developing the preferred alternative.

4.8.1 Southwest Quadrant and coordination

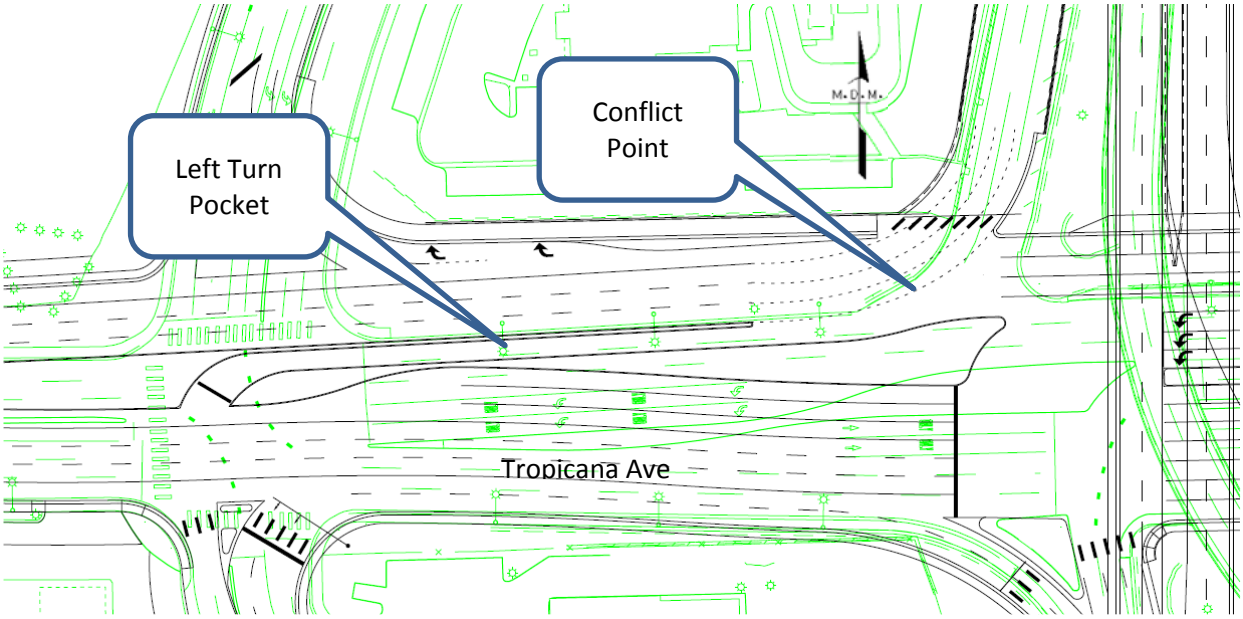
Possible refinements to further consider in the NEPA process include alternate geometrics in the vicinity of the Golden Palm Hotel. The recommended option requires a portion of the existing Golden Palm property in order to accommodate the proposed roadway improvements. As part of the stakeholder coordination, a configuration was developed that could potentially reduce the impacts to the property, while still maintaining the proposed traffic patterns. The following figure depicts the geometry that was developed in order to determine a minimal impact footprint. When compared to the recommended alternative (see Appendix 9B), it would require an additional bridge structure and revision of the southbound entrance ramp. Further evaluation of this or other configurations should be considered during the NEPA process in coordination with the property owner. This graphic is included in Appendix 9C.

Golden Palm Alternate Ramp Geometry



The proprietors of the Golden Palm Hotel, Chevron, and Hampton Inn Tropicana also requested that the existing left turn from eastbound Tropicana Avenue to southbound Dean Martin be maintained in the future alternative. The recommended configuration removes that movement, supplying it as a right-turn loop using the proposed Dean Martin alignment revision instead. The geometry would provide approximately 300 feet of storage; however the execution may lead to undesirable effects related to traffic. Due to the close proximity to the I-15 southbound on/off ramps intersection, instances of blockage at Dean Martin by eastbound through traffic intersection are expected. The Traffic Report addresses this configuration, and also notes that the overall interchange performance is further degraded with the left turn lane when compared to the recommended alternative (see Appendix 9B). The traffic model also does not consider possible confusion for the drivers making the right turn from I-15 northbound to westbound Tropicana, and they may become inadvertently trapped in the left turn lane pocket. Additional congestion could result at the interchange should traffic queues build past the turn pocket end into the through lanes. This graphic is included in Appendix 9C.

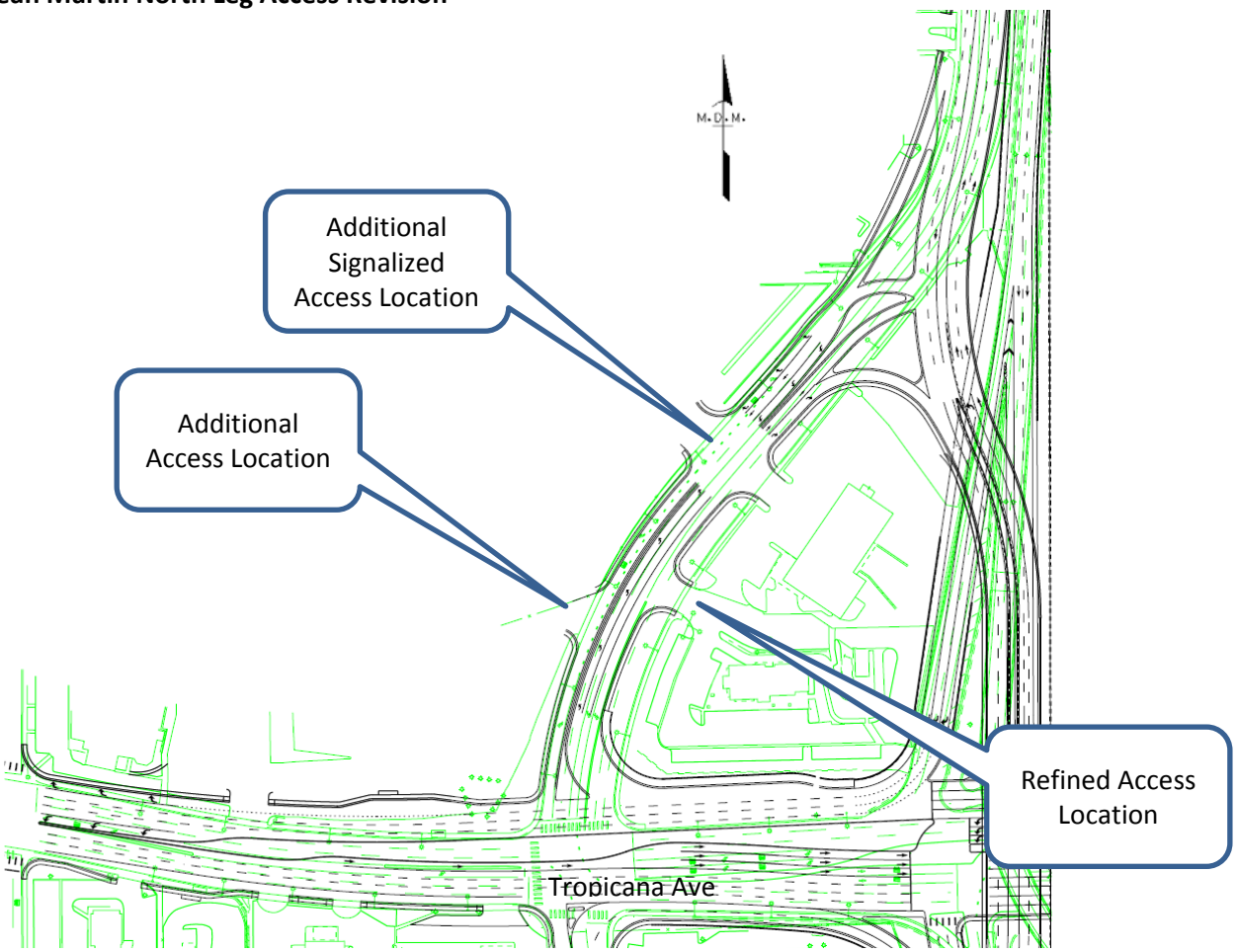
Westbound Left Turn Pocket Alternate



4.8.2. Northwest Quadrant Coordination

Refinements to access along the proposed Dean Martin leg were requested by all owners adjacent to the improvements. In-N-Out Burger requested a second access point north of the recommended alternative's access location. The Wild Wild West Casino requested that existing access points be maintained. Station Casinos provided a proprietary map of future plans for the site, and requested that additional access be provided to accommodate their potential improvements. Based on the interaction, a concept was developed to address all parties' concerns. The refined geometric layout changes the access locations and provides access for today's traffic requests and future traffic possibilities as illustrated in the following figure. This graphic is included in Appendix 9C.

Dean Martin North Leg Access Revision

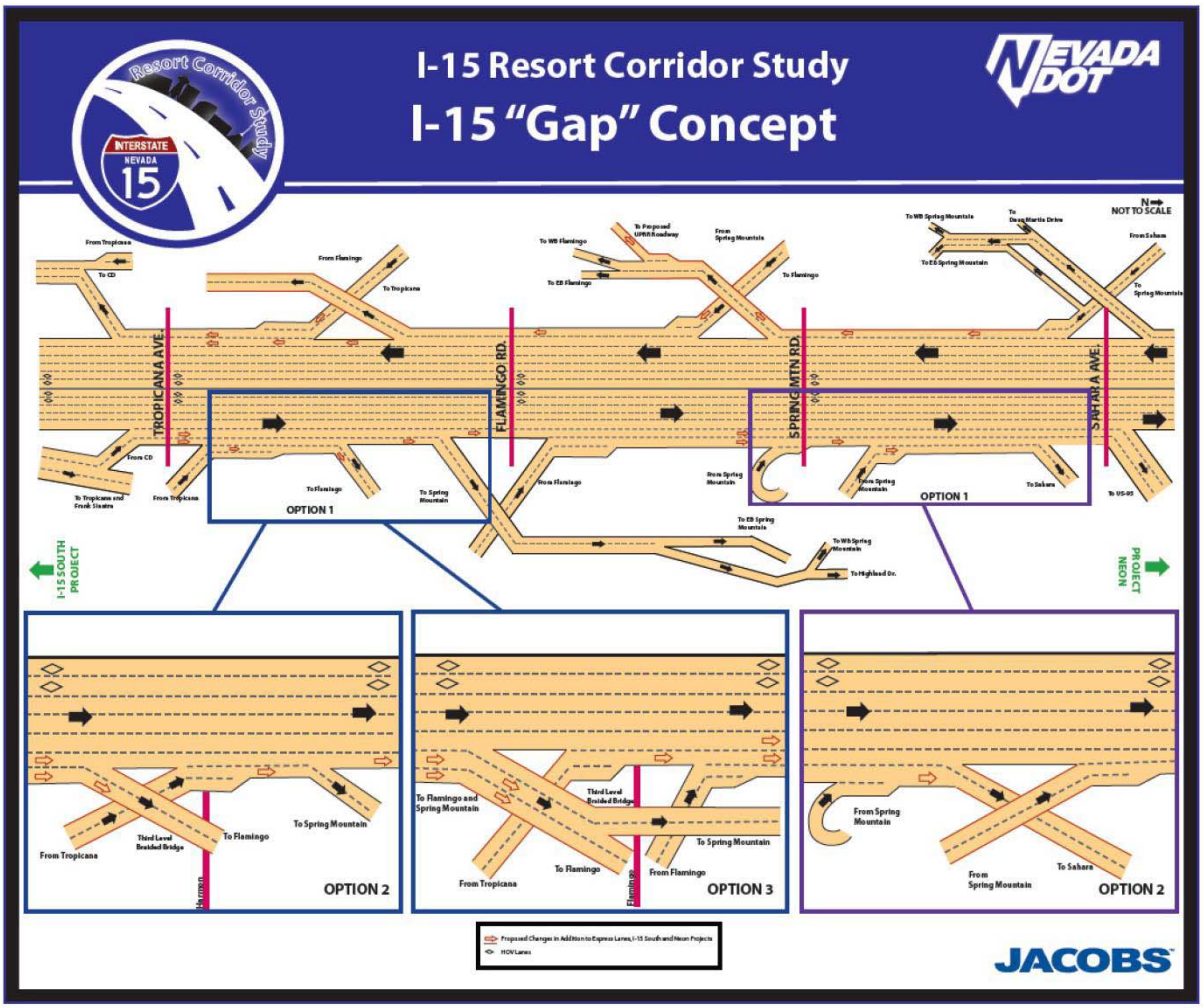


Further evaluation of these intersections and access locations should be performed as the project transitions into the NEPA phase. Stakeholder interaction already conducted should be leveraged and built upon to expedite that process. A stakeholder summary is provided in Section 7.0.

4.9 Future I-15 Widening

Consideration for the future widening of I-15 is addressed by the recommended alternative in accordance with the plan outlined in the I-15 Resort Corridor Study. [4]

I-15 Resort Corridor Study



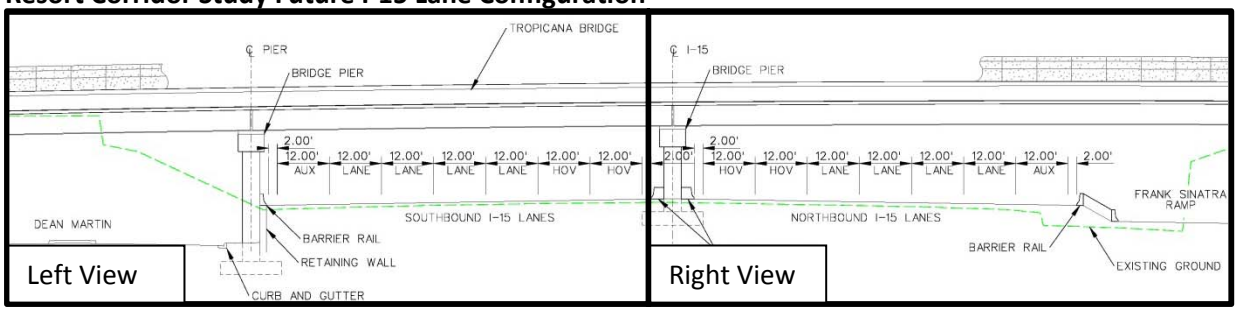
The "Gap" project consists of multiple options that have yet to be fully evaluated, and extend beyond the limits and scope of this study. The I-15 and Tropicana Interchange layout has considered the multiple options and provides room beneath the proposed Tropicana overpass for the lane and ramp configuration shown above.

Braided ramp configurations are being evaluated under a separate traffic study and recommendations for such improvements will be considered by NDOT for inclusion in the continuing phases of the project development and NEPA.

The future I-15 lane configuration is depicted in the next two figures, assuming reduced shoulder design exceptions at point obstructions where the bridge columns will be constructed.

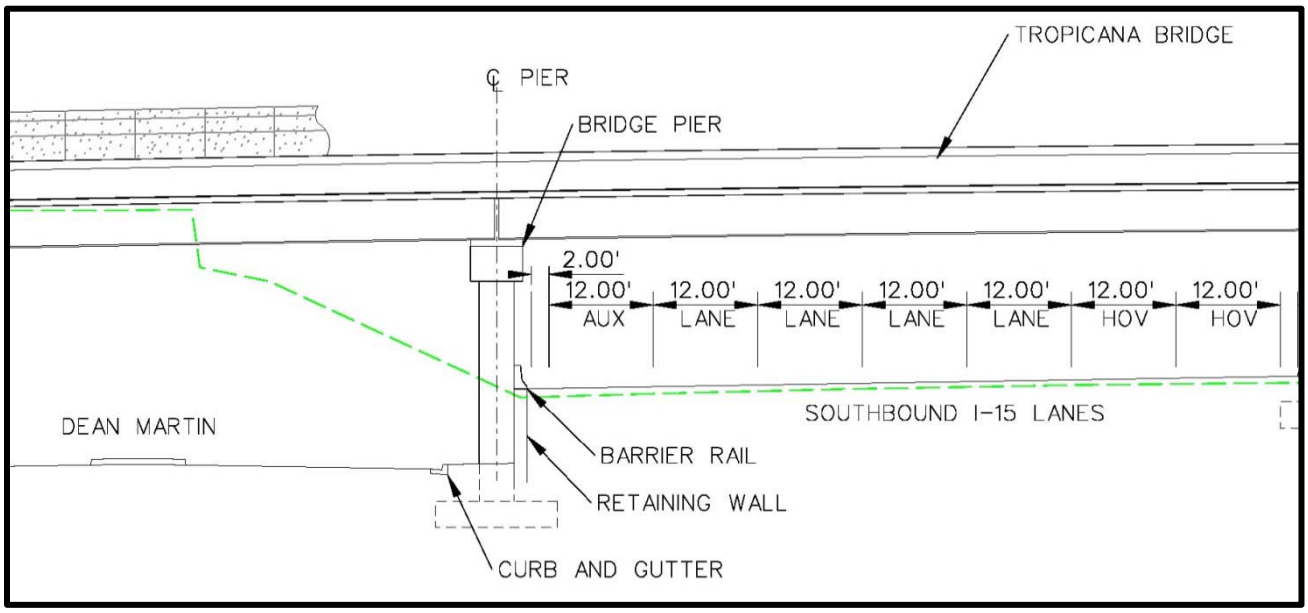
[4] Jacobs. *I-15 Resort Corridor* Study, 2009. (ftp://ftp.nevadadot.com/ProjectMgmt/I15%20Resort%20Corridor%20Study/Final%20Report%20Dec%202009/Final_I-15RCSFinalReport_120109.pdf)

Resort Corridor Study Future I-15 Lane Configuration

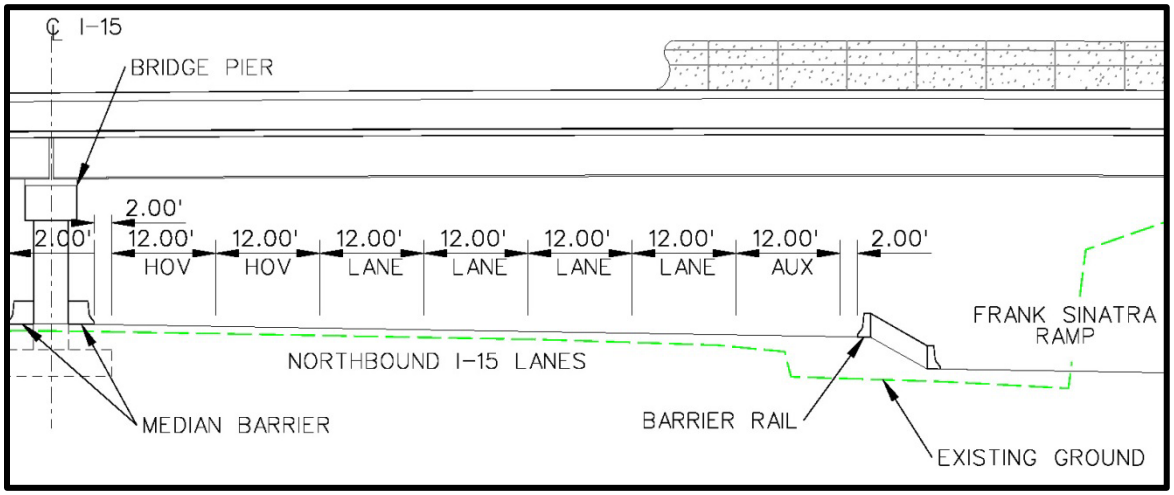


Looking Northbound on I-15, the future lanes are configured as shown above. The left view is the Southbound Lanes, while the Right view is the Northbound Lanes. The two views are expanded below for clarity.

Left View



Right View



5.0 Costs and Benefits of Study Recommended Alternative

The preparation of reliable and realistic preliminary project cost estimates is critical to a successful Project Planning/Scope Development process. For the alternative concepts evaluated, a cost estimate was prepared using NDOT's estimating tool called "Project Estimation Wizard", or just "Wizard". The preparation of cost estimates at this early project development phase allows NDOT a better chance of meeting their mission statement goals. Wizard takes information from the major project components to estimate project costs, using the cost average for each major item (such as the cost per length of typical roadway section or the cost per square foot of a bridge type). This information allows estimators to develop conceptual costs with common base pricing and assumptions for consistency and improved accuracy. Another key feature of Wizard, which is beneficial when estimating construction year needs, is the inflation of the anticipated costs by adjusting the year of expenditure. Wizard generates the costs in present day dollars and adds inflation by adjusting the escalation year within the estimate. The unit cost data is fed by cost worksheets that contain estimated quantities for common NDOT typical sections and/or construction items. The unit costs are based on the District selected in the Estimate Preparation Assistance. Cost estimates include common elements, such as Roadway, Bridges, Walls, Interchanges, Intersection signals, Additional Items, Demolition, Standard Percentage Adders, and Contingency. The summary is helpful as a check to see where the majority of the project costs are being generated and if there is a much larger number where it was not anticipated. Some experience with the tool is necessary to obtain reasonable results, and a consistent approach to item quantification and entry is critical when preparing comparative estimates.

5.1 Cost Estimates

The following alternatives were evaluated with Wizard to establish a rough order of magnitude of the possible project costs. More detailed analysis of the recommended alternative will be performed during the NEPA process and final design.

Initial and Interim Concepts

Concepts 2, 3, 8, 9, 15, 16, 18, 43 and 44, as shown in the previous Alternatives Evaluation Matrix, were evaluated with Wizard to determine the approximate costs of the improvements for their respective designs. This would provide NDOT with an idea of how much funding would need to be secured should any of the projects be carried forward to final design and construction. The Wizard spreadsheets and supporting materials for these estimates are provided in Appendix 10 on the Compact Disc.

Ultimate Concepts

Cost estimates were prepared for the 3-level concepts once it was determined that a 2-level interchange would not meet the needed traffic operations performance levels. Initial Wizard estimates were prepared for the 3-level DDI and TDI, as well as an estimate for widening Tropicana from Valley View to the I-15 interchange. These estimates were used to guide the development of the final recommended option and to give an idea of the magnitude of costs for each of the different interchange types.

A final cost estimate was prepared for the recommended TDI alternative. This estimate takes a more detailed look at all of the necessary improvements, right of way, and represents the costs expected to construct the improvements shown in Appendix 9B for the final interchange. The total anticipated costs of the recommended alternative for the interchange are approximately $188,000,000.00.

5.2 Benefits Estimate

Cost benefit analysis was performed for the three-level TDI interchange as shown in the Cost Benefit Table below. Travel time savings were estimated for the horizon year 2035 when the interchange is

expected to be fully functional. The costs were estimated FY 2020 when construction of recommended alternative is scheduled to begin. Construction of the recommended interchange is slated earlier to allow for driver familiarity and maturation resulting in reasonable comparison of benefits versus costs in the horizon year.

Cost Benefit Table

2035 BUILD 3-Level TDI				
	Tropicana Ave & SB Ramps		Tropicana Ave & NB Ramps	
	AM Peak Hour	PM Peak Hour Volume	AM Peak Hour	PM Peak Hour
No Build Volumes	6900	7980	7230	8210
Build Volumes	7040	8160	7350	8410
2035 NO-BUILD Intersection Delay	76.3	98.5	38.5	80.1
2035 BUILD 3-Level TDI Intersection Delay	38.8	44.3	21.6	28.3
Note: Synchro Results, Delay =sec/veh				
Benefits Summary				
Total Hours of Savings	140.7	353.8	66.4	349.7
Total Dollar Savings for 20 years @ $19.9/hr	$20,444,170	$51,394,347	$9,651,981	$50,798,256
Overall Study Corridor Savings for 20 years	$228,586,421			
Cost of Construction	$191,490,000			
Benefit-Cost ratio	1.19			

The TDI intersection delays were much lower compared to the No-Build analysis FY2035. Total hours saving in fiscal terms along the study corridor associated with the interchange resulted in a Benefit/Cost ratio of 1.2. Based only on the travel delay alleviated, the project cost is justified. Additional benefits were not analyzed within the timeframe allowed by the study; however, it is expected that additional benefits associated with pedestrian access and safety, Crash Reduction Factors for Dean Martin Drive, and other miscellaneous benefits, would further solidify the applicability of this project as a benefit to users of the interchange, its surrounding stakeholders, and NDOT.

6.0 Implementation

Given the variety of concepts that were identified and the number of those that could become viable project alternatives or individual projects, it is important to understand the timeframe in which those projects are necessary and how they interact. Driver and/or pedestrian safety related projects or projects that would provide an immediate benefit to road users with little need for funding planning should be considered for immediate action. Similarly, long-term planned improvements must follow required Federal and State processes, and their timelines should match a realistic progression of those processes.

6.1 Early Action Plan – Initial Project Concepts

This study identified potential improvements that could be constructed in the next six months to a year or slated for further study in order to provide immediate relief to differing constraints and issues within the study area. Projects requiring further study were identified as outside of the scope of this study. These are presented in detail in the Initial Concepts Report (Appendix 3).

These projects can be constructed with maintenance or included as components of other projects utilizing maintenance or excess project funds as they are available.

6.2 Proposed Interim Projects

Similar to the identification of immediate actions, near-term actions requiring additional approvals and design work or study were evaluated in the interim concepts report. The memo identified two potential concepts that could provide relief for the Northbound CD entrance to I-15, and it also included a carry-over from the initial concepts memo recommendations, the southbound collector distributor choice lane concept.

6.3 Proposed Ultimate Interchange

The recommended alternative is not a programmed project in the Nevada Transportation Improvement Program, nor is it currently a project identified in the Regional Transportation Commissions Regional Transportation Plan. NDOT has identified this interchange as a critical point to improving the operations of I-15 in the future and its current geometry is not compatible with previous and on-going studies. NDOT is planning to program funding for the construction of this project based on the findings of this study, and its implementation will be based upon secured and available funds, NEPA process timeframes, and final design requirements.

6.4 Funding Plan

The replacement of the existing Tropicana Interchange is identified as Project 247, "I-15 South Phase 2B", in the RTP of RTCSNV as a complete scope of work. The final scope of work will be identified during the NEPA process which is expected to begin in the second quarter of 2016. NEPA will be amended into the current TIP/STIP as the Department plans to obligate federal funds for the NEPA process. Once a final/revised scope of work is identified through the NEPA process, an amendment to the RTP will be necessary for inclusion into the long range plans for the RTCSNV and NDOT.

7.0 Public Involvement

Public involvement provides various stakeholders an opportunity to collaborate and influence decisions that affect their lives. I-15 is a crucial corridor for tourism and commerce as well as connecting local motorists to the Las Vegas Strip, McCarran Airport, and UNLV along Tropicana Avenue. Recognizing the need to incorporate stakeholder views, interests, and needs, NDOT has sought continuous and active stakeholder participation whose operations rely on the study corridor limits. Only through active stakeholder involvement, would the results of the study effectively address existing and projected needs and concerns in the study area. This process enables agencies to make better informed decisions and build mutual understanding and trust with the public that they serve. Public input has been sought as early as the "Preliminary Project Development and Planning" phase of the project (Appendix 14). Open, timely, and relevant public participation with adequate stakeholder representation brings value to the overall transportation planning process.

7.1 Steering Committee

The steering committee was comprised of management and staff from both public and private agencies. The committee held a Planning and Environmental Linkages meeting on June2, 2015 at 11am. A summary of the meeting is provided in section 7.2 with further details provided in Appendix 11.

7.2 Stakeholder Presentations

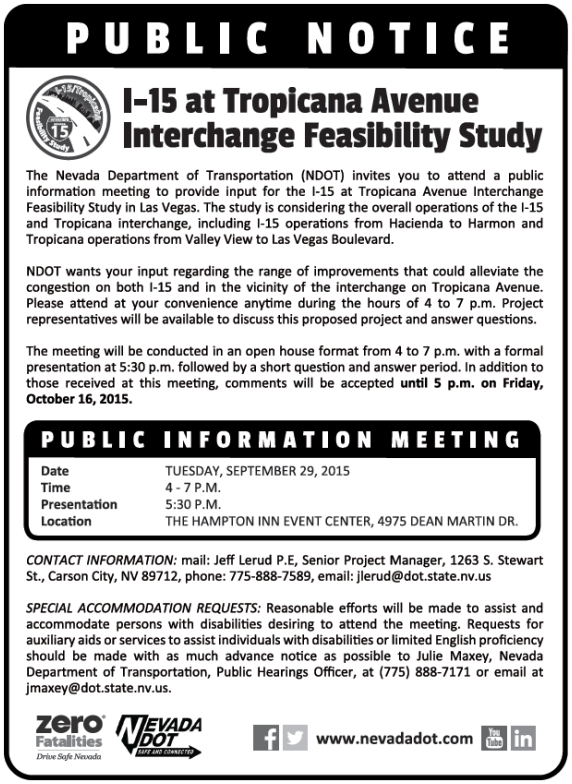
During the steering committee meeting, CA Group reviewed RTP scheduled projects for the period 2013-2035. In addition, initial and expanded scopes of study were set, including operational and geographical study limits. A roadway network for the horizon year to be used for traffic operational analyses was determined based on the RTC model forecasts and Clark County RTP. Operational and safety improvements of current alternatives that might be cleared using NEPA Class 2 or 3 documents were

presented. FHWA recommended continuous stakeholder involvement effort in the planning phase for easier incorporation into the subsequent NEPA action. Further details are provided in Appendix 11.

7.3 Press Releases

Public notices were issued on September 16th, 28th and 29th, 2015 in the Las Vegas Review Journal, and on September 24th in the El Tiempo, on behalf of NDOT. The meeting was conducted in an open house format on Tuesday, September 29, 2015. Appendix 13 contains copies of the public meeting advertisement notices and press releases. Appendix 14 contains the Public Meeting Handout materials.

Public Notice



PUBLIC NOTICE

I-15 at Tropicana Avenue Interchange Feasibility Study

The Nevada Department of Transportation (NDOT) invites you to attend a public information meeting to provide input for the I-15 at Tropicana Avenue Interchange Feasibility Study in Las Vegas. The study is considering the overall operations of the I-15 and Tropicana interchange, including I-15 operations from Hacienda to Harmon and Tropicana operations from Valley View to Las Vegas Boulevard.

NDOT wants your input regarding the range of improvements that could alleviate the congestion on both I-15 and in the vicinity of the interchange on Tropicana Avenue. Please attend at your convenience anytime during the hours of 4 to 7 p.m. Project representatives will be available to discuss this proposed project and answer questions.

The meeting will be conducted in an open house format from 4 to 7 p.m. with a formal presentation at 5:30 p.m. followed by a short question and answer period. In addition to those received at this meeting, comments will be accepted **until 5 p.m. on Friday, October 16, 2015.**

PUBLIC INFORMATION MEETING

Date	TUESDAY, SEPTEMBER 29, 2015
Time	4 - 7 P.M.
Presentation	5:30 P.M.
Location	THE HAMPTON INN EVENT CENTER, 4975 DEAN MARTIN DR.

CONTACT INFORMATION: mail: Jeff Lerud P.E, Senior Project Manager, 1263 S. Stewart St., Carson City, NV 89712, phone: 775-888-7589, email: jlerud@dot.state.nv.us

SPECIAL ACCOMMODATION REQUESTS: Reasonable efforts will be made to assist and accommodate persons with disabilities desiring to attend the meeting. Requests for auxiliary aids or services to assist individuals with disabilities or limited English proficiency should be made with as much advance notice as possible to Julie Maxey, Nevada Department of Transportation, Public Hearings Officer, at (775) 888-7171 or email at jmaxey@dot.state.nv.us.

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7.4 Public Meeting

The Feasibility Study Public Meeting took place on September 29th from 4:00 to 7:00pm, with a formal presentation at 5:30pm at the Hampton Inn Event Center on 4975 Dean Martin Drive. NDOT invited the public's input on the proposed range of improvements that could alleviate congestion on I-15 and the vicinity of the interchange on Tropicana Avenue. During the public meeting, the objective of the feasibility study – to reduce travel time by improving I-15 and Tropicana operations while enhancing intersection and interchange ramp performance – was presented. Conceptual solutions to meet project goals were highlighted. NDOT's Project Manager, Jeff Lerud, presented the study history, alternatives screening and selection process, and current recommendations. Afterward there was a question and answer session where the public was provided with the opportunity to state their questions and comments. All comments were recorded by a court reporter. Project representatives were available to answer questions. From public and stakeholder interaction, comments to the potential improvements will be carried through to the next phase of project development. The final formal presentation slides, meeting exhibit boards, photographs taken at the meeting, a full attendance roster, and copies of received comment forms are provided in Appendix 15.

Public Meeting

7.5 Coordination with Other Studies

The team reviewed previous studies and projects conducted along the study corridor. Some of the studies/projects' recommendations currently make up part of the existing geometry along the study corridor, such as widening of I-15 along various sections.[5,6] Coordination with these studies provided background for some of the proposed project concepts. For example, proposed improvements of interchanges on I-215, Tropicana, and Flamingo, as well as the Dean Martin underpass at Tropicana carried over from NDOT's I-15 Resort Corridor Study for consideration in this study. [7] Along Tropicana Avenue, street width increase/lanes and intersection improvements were proposed along current study limits between Valley View Boulevard and Las Vegas Boulevard[8]. A slip ramp from I-15 to Dean Martin Drive at Flamingo Road was also proposed. Review of the proposed MGM Arena and park development Traffic Analysis study indicated minimal traffic impact on typical weekday conditions.[9] During events, the Arena was expected to generate approximately 2,820 and 3,630, entering and exiting trips, respectively.

8.0 Planning and Environmental Linkages

This study was conducted following FHWA's Planning and Environmental Linkage program guidelines. See Appendix 17 for the completed PEL Questionnaire and Checklist pertaining to this project.

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

[6] FHWA NDOT and BLM. *Interstate 15 South Corridor Improvement Sloan Road to Tropicana Avenue Clark County, Nevada, Environmental Assessment*, FHWA-NV-EA 07.02, EA: 73215, 2008. (https://www.nevadadot.com/uploadedFiles/NDOT/About_NDOT/NDOT_Divisions/Engineering/Environmental_Services/NEPA_EA_07_02_I15South.pdf)

[7] Jacobs. *I-15 Resort Corridor* Study, 2009. (ftp://ftp.nevadadot.com/ProjectMgmt/I15%20Resort%20Corridor%20Study/Final%20Report%20Dec%202009/Final_I-15RCSFinalReport_120109.pdf)

[8] Louis Berger Group. *Tropicana Avenue Corridor Study*, 2008. (http://www.rtcsnv.com/mpo/plansstudies/Docs/Tropicana%20Corridor%20Study%20Final%2003-08_small.pdf)

[9] Lochsa, *TIA*, *MGM-Arena* 2014.