APPENDIX F-G

Traffic Impact Analysis for the DesertXpress Project and Supplemental Traffic Impact Analysis for Victorville Station Site 3 (VV3)

FINAL REPORT

TRAFFIC IMPACT ANALYSIS

Prepared by

DMJM HARRIS | AECOM

February 2009

Table of Contents

Appendix

List of Figures

List of Tables

1.0 INTRODUCTION

This report analyzes the potential traffic impacts that could result from the proposal by DesertXpress Enterprises, LLC, to construct and operate a high-speed passenger railroad between Victorville, California, and Las Vegas, Nevada. DesertXpress would finance and own the system and be responsible for the project's development, construction, operation, and maintenance. Approvals by several federal agencies, including the Federal Railroad Administration (FRA), Bureau of Land Management (BLM), Surface Transportation Board (STB), and Federal Highway Administration (FHWA) would be necessary to implement the project, including the granting of permission to use of public lands and/or highway rights-of-way.

1.1 Project Description

1.1.1 Overview

The project would construct nearly 200 miles of new, high quality exclusive double track railroad with no at-grade crossings. The route would either be immediately alongside or in the median of Interstate 15 (I-15) and/or within existing railroad corridors/rights-of-way. There would be two passenger stations; one at each end of the line, in Victorville, California, and Las Vegas, Nevada.

DesertXpress would provide trains departing both ends of the line at least hourly and as frequently as every 20 minutes on Fridays and Sundays. DesertXpress would travel at speeds up to 150 mph. The 200-mile trip would take between 1 hour and 45 minutes and 2 hours, and would operate every day of the year. The trains would be based on high speed trains used in Europe and customized for the high desert. Each car would be self-propelled to provide the high power-to-weight ratio needed o negotiate the alignment's relatively steep grades.

ALIGNMENT ALTERNATIVES

From Victorville, a completely separate, dedicated two-track passenger railway would be constructed, largely following the north side or median of I-15, making maximum use of excess freeway right-of-way. At Mountain Pass, there are two alignment options. One option would divert south of the I-15 corridor and traverse at grade a three mile portion of the Mojave National Preserve. East of the Preserve near Primm, this option would rejoin the I-15 corridor, continuing northeasterly toward metropolitan Las Vegas. The second option would divert north of the I-15 corridor at Mountain Pass and pass through the Clark Range in two tunnels, 1,300 feet and 5,000 feet in length respectively, to rejoin the I-15 corridor near Primm. Near Sloan Road, one alignment option continues in the I-15 corridor to reach Las Vegas, while another option would diverge from the I-15 corridor and generally follow or be located within the existing Union Pacific Railroad (UPRR) right-of-way to reach Las Vegas.

EQUIPMENT ALTERNATIVES

Two technology alternatives are under consideration: a diesel-electric multiple unit train (DMU) and an electric multiple unit train (EMU). The two technology options would have similar right-of-way width requirements as well as the same construction footprint. However, the EMU option would also include overhead catenary wires and supports, three electrical substations, and approximately seventeen transformers, all of which would be located within the right-of-way and/or within construction easement areas.

STATION ALTERNATIVES

Two passenger stations would be constructed, one in Victorville located along the west side of I-15 near the Stoddard Wells Road interchanges, and the other in Las Vegas at one of four possible locations.

Two sites north of central Victorville are being considered for the Victorville station. Site 1 is located just north of the southern Stoddard Wells Road exit (Exit #154); Site 2 is located to the northwest of the northern Stoddard Wells Road exit (Exit #157). The two site options are located about 1.5 miles apart. The facilities directly associated with the either station site would occupy about 60 to 70 acres and would have a parking capacity for approximately 13,000 to 18,000 vehicles in self-parking lots, valet parking areas, and a proposed parking structure. The Victorville station would offer train ticketing, baggage handling, and hotel room check-in for Las Vegas resorts.

In Las Vegas, the terminal station would be designed to serve as a multi-modal facility with convenient access to rental cars, hotel shuttles, and taxis. The four options are being considered for the Las Vegas passenger station are:

- Southern Station, along Polaris Road, between West Russell Road and West Hacienda Drive, across I-15 from the Mandalay Bay Resort and Casino
- Central Station A, between West Flamingo Road and West Twain Avenue, adjacent to the Rio Suites Hotel property
- Central Station B, south of West Flamingo Road, in an area along the UPRR right of way that is currently occupied by industrial and light industrial uses
- Downtown Station, in the City of Las Vegas, along South Main Street between West Bonneville Avenue and Boulder Avenue

Note that the Southern Station option could not be utilized if the UPRR alignment option north of Sloan Road was selected.

1.1.2 Operations, Maintenance, and Storage Facility Alternatives

A 50-acre train maintenance and storage facility and operations center would be built in Victorville. The facility would include a train washing facility, repair shop, parts storage, trains storage tracks, operations control center, meeting rooms and administrative offices. OMSF site option 1 is located in the City of Victorville southwest of proposed Victorville station site 1. OMSF site option 2 is located north of Victorville station site option 2, west of I-15 and south of the Dale Evans Parkway interchange.

A light maintenance, storage, cleaning, and inspection facility would also be built near the northern terminus of the project. Three site options are under consideration for the Las Vegas area maintenance and storage facility:

- Sloan Road - located approximately 5 miles south of Sloan Road, on the east side of I-15, between the I-15 freeway and South Las Vegas Boulevard (Nevada State Route 604), near where Union Pacific Railroad (UPRR) crosses from east to west side of I-15.
- Wigwam Avenue – located west of the I-15 freeway about one half mile south of Blue Diamond Boulevard (Nevada State Route 160).
- Robindale Avenue – also located west of the I-15 freeway, about one half mile south of Blue Diamond Boulevard.

1.2 Relationship of Traffic Analysis Report to EIS

An EIS is being prepared by the FRA in cooperation with STB, BLM, FHWA, the California Department of Transportation (Caltrans) and the Nevada Department of Transportation (NDOT) to evaluate the impacts of the DesertXpress proposal. The FRA has authority to regulate the safety of railroads, under 49 U.S.C. 20101 et seq. The BLM has approval authority over the use of public lands under their control under 43 U.S.C. 1761, the Federal Land Policy and Management Act (FLPMA). The STB has jurisdiction, pursuant to 49 U.S.C. 10501(b), over the construction, acquisition, operation, and abandonment of rail lines, railroad rates and services, and rail carrier consolidations and mergers. The FHWA has jurisdiction over the use of and/or modification of Interstate highway right of way under 23 CFR 1.23. On June 25, 2007, the STB issued a declaratory order in finding that the proposed construction and operation of the interstate high-speed passenger rail system is not subject to state and local environmental review and land use and other permitting requirements because of the Federal preemption authority in 49 U.S.C. 10501(b).

This Traffic Analysis Report has been prepared by DMJM Harris for DesertXpress Enterprises. The research and analysis for preparing this report was conducted in coordination with the FRA's EIS consultant, CirclePoint. This report will be provided to CirclePoint for their use in preparing the transportation section of the EIS, as well as other sections.

1.3 Overview of Traffic Analysis Methodology

This report quantifies the potential impact of the DesertXpress project in terms of vehicular traffic on surrounding roadway facilities. The project represents the introduction of a new mode of travel in the Southern California to Las Vegas corridor. As such, the project will have the effect of shifting travelers from one mode to another. The size of these shifts have been forecast in a rail ridership report prepared for DesertXpress Enterprises and peer-reviewed by a firm hired by the FRA's EIS consultant. (see below). The first step of the rail ridership study was to forecast the annual number of trips by each existing mode between Southern California and Las Vegas through 2035. Existing modes included air, auto, and bus. The ridership study then applied rail diversion factors to each mode to develop rail ridership. These rail ridership forecasts are the basis for the traffic analysis. Note that the rail ridership study only included trips that originate in Southern California.

The traffic analysis focused on three separate areas which were selected based on likely changes in traffic patterns. One focus area is the I-15 freeway mainline, which will experience a reduction in traffic due to introduction of DesertXpress. Trips that were formerly made by auto will be diverted to the train, thereby reducing the number of vehicles on I-15 between Victorville and Las Vegas.

South of Victorville, the rail project will have a negligible effect on mainline freeway traffic volumes. Since I-15 is essentially the only route to Las Vegas, all auto and bus trips must pass through Victorville. Rail trips that otherwise would have been made by the auto and bus modes will use I-15 to reach Victorville from Southern California. *These trips would be on I-15 south of Victorville whether or not the rail project is built.* With the rail project, these trips will leave the freeway at Victorville and switch to the rail mode. Trips diverted from the air mode to the rail mode most likely will access the Victorville station via the auto mode. The diverted air trips are not currently using I-15 south of Victorville. Instead, persons making a trip to Las Vegas by air travel to the most convenient airport. To use the rail mode, these travelers will now use I-15 south of Victorville to reach the rail station. However, the ridership study indicates that only 11% of the forecast rail trips would be diverted from the air mode. Applying this factor to the 2013 forecast rail ridership and converting from person-trips to vehicle trips, this works out to only 63 additional vehicles in the peak hour, peak direction on the segment of I-15 south of Victorville. This is less than 1% of the existing southbound PM peak hourly volume of 6490 vehicles in this section.

The other two focus areas are near the proposed station sites in Victorville and Las Vegas, respectively, and specifically the local roadway intersections. In these areas, the stations will act to concentrate trips that would otherwise remain on the freeway (in Victorville) or be dispersed on the local road network (Las Vegas). For the station areas, the DesertXpress project will increase the number of vehicles on the local roadways.

Two horizon years were selected for the traffic analysis: 2013 and 2030. DesertXpress is expected to begin operating in 2013. The out-year of 2030 was selected because it is about 20 years after the start of construction, and because it was the farthest year in the future for which regional travel forecasts were available for the metropolitan Las Vegas area. In the Victorville area, intersections were also analyzed for existing conditions. This was done due to uncertainty regarding the completion date of the South Stoddard Wells Road interchange relative to the opening date of the DesertXpress rail project.

The traffic analysis uses outputs from regional travel models as the baseline “without-project” traffic volumes. With-project traffic volumes were calculated by either subtracting (for the I-15 mainline) or adding (for the station areas) project-related vehicle trips to the baseline traffic volumes. For the I-15 mainline, baseline future volumes were obtained from the respective regional travel models in each state, as reviewed and agreed upon by the two state DOTs. In Victorville, baseline future traffic volumes were obtained from the Victor Valley travel demand model recently prepared for the City of Victorville. This model was based on the SCAG 2004 RTP model. Note that the Victorville model produces 2035 forecasts, which were factored back by DMJM Harris to be compatible with the 2030 horizon year. In the Las Vegas area, future baseline volumes were obtained from the RTC travel demand model. The RTC model included future roadway improvement projects as identified in their Regional Transportation Plan 2009 – 2030.

2.0 TRANSPORTATION SETTING

Today, over one-third of the 38 million annual Las Vegas visitors come from Southern California. The transportation system serving these trips consists of:

- The freeway network of Southern California, feeding auto trips to I-15 at Victorville.
- Interstate 15, the only direct roadway available, is only two lanes in each direction for most of its length, and has not been modified since it was constructed about 50 years ago.
- Airlines and airports such as LAX, Burbank, Ontario, and John Wayne with flights to McCarran.
- Buses that use the freeway network.

Most travelers drive, leaving their point of origin and traveling by the most convenient route to Victorville. Though they used many different routes to reach Victorville, at the point where they cross the Mojave River, all of them are on I-15, where they will stay until they reach the I-215 beltway in Las Vegas. At this point, they will begin to exit the freeway and make their way to the final destination at a resort or hotel.

According to the project's ridership study (see below), the projected travel demand from Southern California to Las Vegas in the year 2012 will be 18.2 million trips. The study found that DesertXpress would potentially capture over 20 percent of the total trips between southern California and Las Vegas in the first full start up year. Most of these trips would be diverted from private automobiles that would otherwise use I-15 between Victorville and Las Vegas.

In the future, Interstate 15 will remain in its existing configuration for most the distance between Victorville and Las Vegas, except for capacity improvements in the urban areas. Caltrans is planning the following improvements to the I-15 freeway that would add capacity[1]:

- Widen bridge over Mojave River in Victorville; reconstruct D Street, E Street, and South Stoddard Wells Road interchanges.
- Widen approximately 1 mile of freeway to 6 lanes and reconstruct an interchange in Barstow.
- Add several truck lanes in sections with steep grades.

NDOT is planning the following improvements to I-15[2]:

- "NEON" project in the City of Las Vegas, includes reconstruction of Charleston interchange, local access improvements, and a HOV direct connector from US 95 to I-15.
- "I-15 South" project from Sloan Road to Tropicana Avenue, includes new interchanges at Bermuda Road, Starr Ave. and Cactus Road, plus reconstruction of Sloan Road interchange.

[1] Email communication from Caltrans District 8, February, 28, 2008

[2] NDOT Quarterly Report for Major Projects, March 31, 2008

In addition, NDOT has a planning study underway of potential upgrades to I-15 and parallel roadways between I-215 and US 95, called the Urban Resort Corridor Study.

Clark County is considering a new airport in the Ivanpah Valley to supplement McCarran airport. Though planning has not advanced far enough to provide specifics, the new airport project has triggered consideration of adding roadway capacity in the I-15 corridor, either through freeway widening and/or construction of a new arterial roadway.

In the Victorville area, planning is underway for the High Desert Corridor (HDC) roadway project. This facility would intersect with I-15 between the Stoddard Wells Road interchanges at a freeway-to-freeway interchange. This section of the HDC is part of a longer facility envisioned to run from I-5 near Lancaster and Palmdale to east of Victorville. The section between I-15 and US 395 would be one of the earlier phases constructed.

Also near Victorville, the city is preparing a specific plan for the North Mojave area, which stretches along I-15 from the Mojave River to the north of the Dale Evans Parkway interchange. The specific plan area overlaps the alternative DesertXpress station and operations facility sites. As will be discussed in the following sections, the preliminary specific plan land use concepts have been included in the Victor Valley area travel demand model, and the future no-project traffic volumes used in the present analysis include a substantial level of development in this area. However, planning work is not complete on the plan, and the roadway system to support the specific plan development has not been fully defined. As a result, the assumed roadway geometry should be considered as preliminary.

3.0 BASELINE TRAFFIC FORECASTS

In order to determine the project impact (to be discussed in subsequent sections) in the two horizon years, future background traffic volumes needed to be obtained. Project volumes are then added to these future volumes before comparison of level of service can be made between the 'with' and 'without' project scenarios. The comparison results would be the project impact.

3.1 I-15 Mainline

Traffic volumes on I-15 in 2030 were obtained from the area wide model of San Bernardino Association of Governments (SANBAG) and Regional Transportation Commission of Southern Nevada (RTC) for the sections in California and Nevada respectively. These volumes had been reviewed by Caltrans and NDOT. These numbers were then used to interpolate for traffic volume in 2013 based on existing traffic counts. Existing counts for the California section of I-15 were published 2006 peak hour volumes by Caltrans; RTC provided 2005 volumes for the Nevada section. Tables 3-1 and 3-2 show the forecast volumes on I-15.

Table 3-1
Future Forecast of California Section of I-15

Section	2006				2013				2030			
	AM		PM		AM		PM		AM		PM	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
No. Jct. Stoddard Wells to Jct. I-40	3,335	2,795	2,250	4,560	3,756	3,147	2,533	5,134	4,777	4,003	3,221	6,529
Jct. I-40 to Nevada State Line	2,465	2,065	1,659	3,361	2,842	2,382	1,915	3,881	3,760	3,150	2,537	5,143

Table 3-2
Future Forecast of Nevada Section of I-15

Section	2005				2013				2030			
	AM		PM		AM		PM		AM		PM	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
Primm to Sloan	2,945	2,945	3,776	3,776	4,674	5,111	6,366	5,834	8,348	9,713	11,870	10,206
Sloan to I-215	3,772	2,824	3,786	4,662	7,520	6,904	7,285	9,242	15,483	15,573	14,720	18,974

3.2 Victorville Area

City of Victorville provided the 2035 3-hour peak volumes for local intersections around the proposed station locations. Growth factors for 2013 and 2030 were derived through straight line interpolation from the calibration year of 2005 and applied to existing turning movement counts collected for this project in 2006. These volumes were then adjusted to balance the 'in' and 'out' numbers. A peak hour factor of 0.28 was used whenever necessary according to the San Bernardino County CMP Guidelines 2005. A total of 13 intersections were analyzed for the two proposed station location alternatives.

3.3 Las Vegas Area

Future 2030 average daily traffic volumes (ADT) of local intersection volumes around the proposed station locations in Las Vegas were provided by RTC. Straight line interpolation was used to obtain the 2013 growth factors. Turning movement counts at intersections under Clark County jurisdiction were collected for this project in 2008 while the City of Las Vegas provided turn volumes for intersections under its jurisdiction. There were four alternatives for the proposed station location, giving a total of 48 intersections being analyzed.

4.0 PROJECT TRAFFIC FORECASTS

4.1 Ridership Studies

Ridership projections for the project were developed through a comprehensive travel demand modeling process commissioned by DesertXpress Enterprises. This forecast was prepared by URS and independently peer-reviewed by Stear Davies and Gleave (SDG). The URS study incorporated a comprehensive travel demand model that divided the Southern California area into zones (by postal zip codes), computed travel times and costs from those zones for the automobile and air travel modes, and then compared those modes to the time and cost of DesertXpress. The study also utilized an internet-based stated preference survey of selected Southern California residents (carried out in July 2005) to estimate how many existing auto and air trips to Las Vegas could potentially be diverted to DesertXpress.

Subsequently, the FRA's EIS consultants hired Cambridge Systematics (CSI) to independently review the URS study and SDG peer review. The Cambridge Systematics study examined and evaluated the methodologies employed in the URS ridership study and confirmed that the URS work was done in a professional manner using widely accepted travel forecasting tools. CSI noted that numerous factors could alter the findings of the URS ridership study in both positive and negative directions. Following consideration of all of these factors and their relative potential to alter the findings, CSI concluded that the ridership forecast numbers prepared by URS should be adjusted downwards by a factor of about 10 percent overall for use in the EIS. CSI prepared a reduced forecast which is being used for all of the EIS studies that require a travel forecast, including noise, air quality, energy, and traffic. The CSI./URS report was also the source for average auto occupancy.

4.2 Rail Operating Plan

The preliminary operations plan used for the traffic analysis assumes that trains would operate between approximately 6 a.m. to 10 p.m., 365 days per year. There would be ten cars per train. Passenger capacities for DMU trains would be 478 passengers. EMU trains, which have slightly longer and wider cars, would have a capacity of 675 passengers.

Depending upon the direction of travel and the specific alignment and station locations, one-way travel times are in the range of 100 minutes for the EMU technology option to 116 minutes for the DMU technology option. DMU average speeds would be approximately 100 mph while EMU average speeds would be approximately 112 mph, enabling a shorter travel time for the EMU technology option (98 minutes for the EMU; 109 minutes for the DMU). Trains would depart from both ends of the line at 20 minute headways during peak hours and once per hour during off-peak periods.

Rail passengers would have the option of using a full-service valet parking and baggage service, where they would be greeted at the Victorville station as if they were arriving at their hotel in Las Vegas. Staff in Victorville would park their car, check them into their hotel and forward their bags to their room. On arriving in Las Vegas, these passengers would take a hotel shuttle to their resort, where they would find their bags in their room.

4.3 Rail Ridership Forecasts

The URS and CSI rail ridership forecasts assumed that DesertXpress would begin operation in 2012. Since these forecasts were prepared, it has become apparent that 2013 would be a more likely opening date. Part of the URS forecast methodology assumed that there would be a "ramp-up" period for rail ridership covering the first two years of operation. This was implemented by discounting the total rail market to 60% in the first year and 80% in the second year of operation. As shown in Table 4-1, Wilbur Smith Associates, as part of their review of the rail operation plan for the EIS consultant, adjusted the CSI forecasts to a 2013 opening date. This table also shows the annual rail round trips that were used in the traffic analysis.

Table 4-1
Rail Ridership Ramp-Up Adjustments Annual Round Trips

Year	DMU			EMU		
	Total Rail Market	Ramp Share	Adjusted Rail Ridership	Total Rail Market	Ramp Share	Adjusted Rail Ridership
2012	3,245,797	0%	0	4,120,508	0%	0
2013	3,375,629	60%	2,025,377	4,285,329	60%	2,571,197
2014	3,510,654	80%	2,808,523	4,456,742	80%	3,565,394
2015	3,651,080	100%	3,651,080	4,635,012	100%	4,635,012
2016	3,797,123	100%	3,797,123	4,820,413	100%	4,820,413
2030	5,426,147	100%	5,426,147	6,888,443	100%	6,888,443

Source: WSA

4.4 Mainline Traffic Reduction

As discussed earlier, the proposed DesertXpress rail service is aimed to reduce traffic between southern California and Las Vegas. As such, it is envisaged that traffic along I-15 between the proposed Victorville station and Las Vegas would decrease when the service begins in 2013.

Two train types were considered for this project, each with a different capacity. As a result, the potential traffic reduction on I-15 would vary. Table 4-2 shows the expected volume reduction for the peak direction during peak hour. Following assumptions were made in arriving at the mainline traffic reduction.

<u>Project Assumptions</u>: Average daily trips were calculated from annual trips by dividing by 365.

Using data from the URS report, DH calculated the number of rail trips diverted from the auto, air and bus modes.

Table 4-2
Expected Number of Vehicle Reduction on I-15

Alternative	Year	Average Annual Daily Rail One-way Trips	Daily Trips Diverted From Auto	Daily Trips Diverted From Bus	Daily Diverted Auto Volume	Daily Diverted Bus Volume	Total Daily Diverted Volume	Total Volume Reduction in Peak Hour of Peak Direction
DEMU	2013	11,098	9,988	1,110	4,060	18	4,097	410
DEMU	2030	29,732	26,759	2,973	10,878	50	10,977	1,098
EMU	2013	14,089	12,680	1,409	5,154	23	5,201	520
EMU	2030	37,745	33,970	3,774	13,809	63	13,935	1,393

Trips diverted from the auto and bus modes to rail will reduce traffic on the section of I-15 between Victorville and Las Vegas.

Rail trips diverted from auto were converted to vehicle trips using an average vehicle occupancy rate of 2.46 persons per vehicle.

Rail trips diverted from bus were converted to vehicle trips using an average vehicle occupancy rate of 60 persons per bus.

Peak hour diverted vehicle volumes were derived from average daily diverted vehicle volumes by applying the highway peak hour factor of 10%.

It is assumed that 90% of the reduced trips would be auto trips and 10% would be bus trips. The occupancy for one car is 2.46 passengers and that for bus is 60 passengers. The peak hour volume in the peak direction is assumed to be 10% of the daily trips.

4.5 Station Mode Share and Trip Generation

The expected number of passengers using the project's stations will arrive or leave the station via 5 modes. Tables 4-3 and 4-4 present the mode share for Victorville and Las Vegas Station respectively, together with the assumed occupancy.

Table 4-3
Mode Share at Victorville Station

Mode	Occupancy (passenger/car)	Spilt %	PCE[1]
Self Drive	2.4	75%	
Kiss & Ride	1	5%	
Charter Bus	10	4%	1.5
Shuttle Bus	3	11%	
Taxi	1	5%	
Total		100%	

[1]Passenger Car Equivalent

Table 4-4
Mode Share at Las Vegas Station

Mode	Occupancy (passenger/car)	Spilt %	PCE
Rental/Car	1.5	21%	
Kiss & Ride	1	7%	
Charter Bus	15	5%	1.5
Shuttle Bus	2	35%	
Taxi	1	32%	
Total		100%	

The number of trips generated at the proposed stations depends on the type of train system selected for operation. EMU has a higher capacity of 675 passengers at full load whereas the capacity of DMU is 478. The train station would operate in the off-peak mode for both directions (outbound/inbound) on Monday to Thursday and on Saturday. For the Victorville Station, it would operate at peak mode during Friday for the outbound direction and the inbound direction would operate in off-peak mode. On Sunday, it would operate in peak mode for the inbound direction and off-peak mode for outbound. The Las Vegas Station on the other hand, would operate at peak mode for its inbound direction on Friday and off-peak mode for outbound. The outbound direction on Sunday would be peak and the inbound direction would operate at off-peak.

When both directions are operating as off-peak mode (Monday – Thursday and Saturday), it is assumed that the headway for each train would be 60 minutes, at full loading capacity. On days when one direction is operating at peak mode, the off-peak direction train would operate at 20-minute headway at only 69% capacity. The peak direction train would also operate at 20-minute headway but at 100% capacity. Table 4-5 and 4-6 show the number of peak hour trips (in terms of cars) generated at each station for each technology alternative.

Table 4-5
Peak Hour Trips Generated for Victorville Station

EMU				DMU			
	Trips In	Trips Out	Total Trips		Trips In	Trips Out	Total Trips
Mon-Thurs, Sat (arrive/depart)	342	342	685	Mon-Thurs, Sat (arrive/depart)	243	243	486
Friday (peak=depart, off-peak= arrive)	993	739	1732	Friday (peak=depart, off-peak= arrive)	704	524	1227
Sunday (peak=arrive, off-peak=depart)	739	993	1732	Sunday (peak=arrive, off-peak=depart)	524	704	1227

Table 4-6
Peak Hour Trips Generated for Las Vegas Station

EMU				DMU			
	Trips In	Trips Out	Total Trips		Trips In	Trips Out	Total Trips
Off Peak (arrive/depart)	528	528	1056	Off Peak (arrive/depart)	374	374	749
Friday (peak=arrive, off-peak=depart)	1136	1537	2673	Friday (peak=arrive, off-peak=depart)	803	1089	1892
Sunday (peak=depart, off-peak=arrive)	1537	1136	2673	Sunday (peak=depart, off-peak=arrive)	1089	803	1892

Station employees are included in the trip generation numbers, as are vehicles serving the station for deliveries, maintenance, etc. Note that some access modes such as kiss and ride generate both an in and out trip, while other modes such as self park generate only an inbound or outbound trip. This accounts for the relatively higher trip figures for the Las Vegas Station when compared to the Victorville Station.

4.6 Operation and Maintenance Service Facilities

Alternative locations have been proposed for the O & M facilities in Victorville and Las Vegas. Figures 4-1 and 4-2 show the proposed location options. A third alternative location in Las Vegas, near Sloan Road is not shown on the map.

Employees at these facilities would be divided into three shifts. Only the day and night shift employees would commute during the peak hour of the adjacent street. The day shift would work 7:00 am to 3:30 pm and the night shift starts at 11:00 pm and works to 7:30 am. It is assumed that 15% of the day shift would arrive after 7:00 am, constituting inbound trips. All the night shift employees would leave during the AM peak, making up the outbound station trips. No O & M generated trips would be added to the PM peak commute. Assuming each employee drives alone, Tables 4-7, 4-8 and 4-9 shows the number of trips generated at both facilities in 2013 and 2030. In 2030, the DMU fleet would be larger than the EMU fleet, leading to higher trip volumes for the DMU alternative.

Table 4-7
O & M Trip Generation in 2013

	Inbound Trips		Outbound Trips		
Station Location	Employees (Day Shift)	Trips @ 15%	Employees (Night Shift)	Trips @ 100%	Total
Victorville	60	9	40	40	49
Las Vegas	11	2	22	22	24

DMJM HARRIS | AECOM

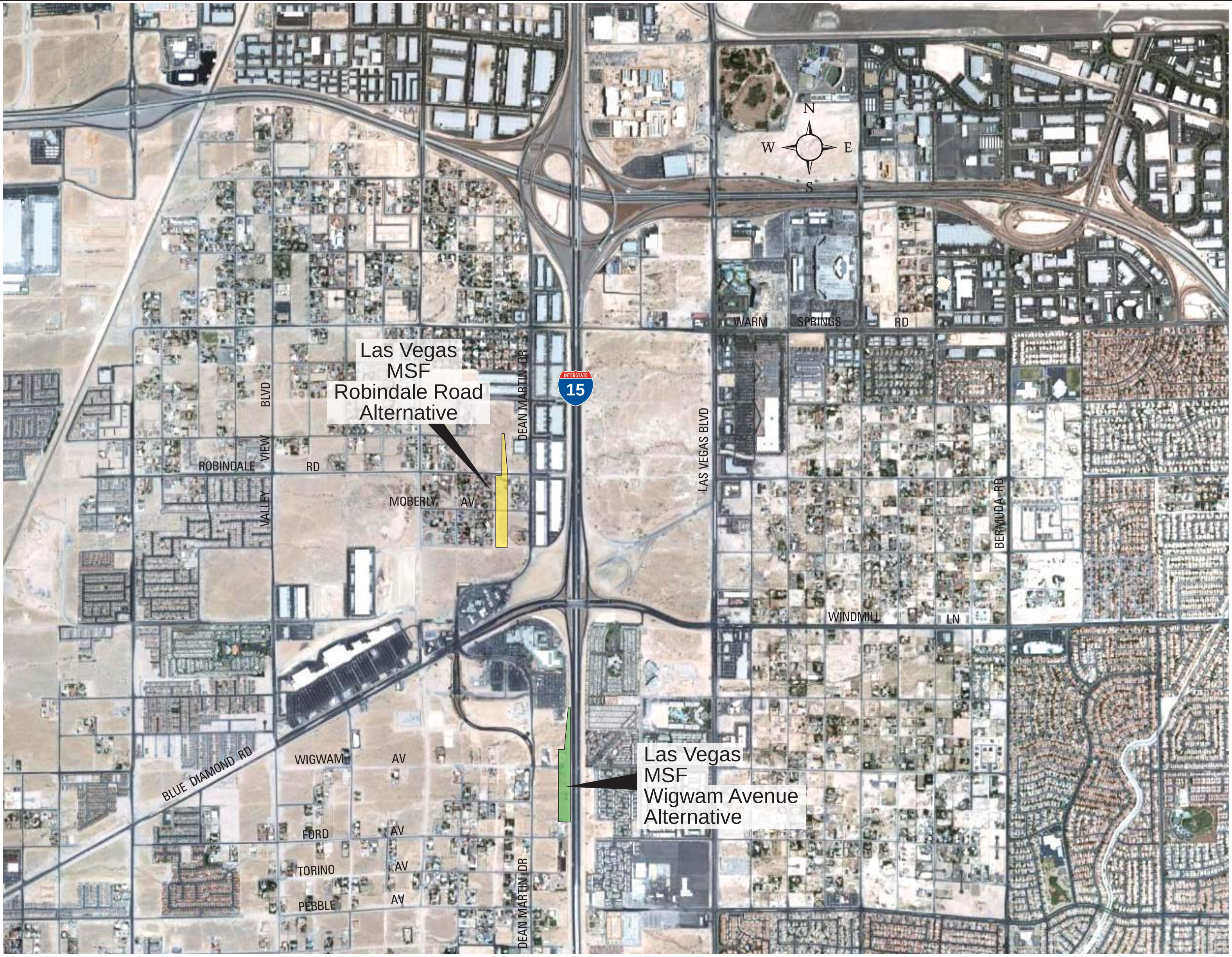
Maintenance facilities Victorville.ai

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 4-1

PROPOSED MAINTENANCE FACILITY AT VICTORVILLE
(2 Alternatives)

DMJM HARRIS | AECOM



Las Vegas Maintenance Sites rev1.ai

DESERT XPRESS LAS VEGAS

Figure 4-2

PROPOSED MAINTENANCE FACILITY AT LAS VEGAS (2 Alternatives)

Table 4-8
O & M Trip Generation in 2030 for EMU

Station Location	Inbound Trips		Outbound Trips		Total
	Employees (Day Shift)	Trips @ 15%	Employees (Night Shift)	Trips @ 100%	
Victorville	79	12	53	53	64
Las Vegas	14	2	29	29	31

Table 4-9
O & M Trip Generation in 2030 for DMU

Station Location	Inbound Trips		Outbound Trips		Total
	Employees (Day Shift)	Trips @ 15%	Employees (Night Shift)	Trips @ 100%	
Victorville	109	16	72	72	89
Las Vegas	20	3	40	40	43

The number of trips generated by the proposed O&M facilities in 2013 would be less than 50 trips. Based on the San Bernardino County CMP and Caltrans guidelines, intersection analysis would not be necessary at the Victorville Station. Since the station location at Victorville Station would be served primarily by I-15, with less than 100 trips in 2030, intersection analysis on I-15 ramps would not be necessary as well. The proposed locations in Las Vegas are away from the high traffic area and the amount of trips generated is also less than 50 peak hour trips for both the horizon years. While RTC does not have guidelines on the minimum number of trips required for analysis, based on the California agencies' criteria, detailed evaluation of the local intersections would not be necessary as well.

5.0 I-15 MAINLINE AND RAMP ANALYSIS

5.1 Roadway Network

Regional Access. Currently I-15 is the only significant surface transportation route between Victorville and Las Vegas. The general number of traffic lanes on I-15 is described below:

- Victorville to Barstow - 3 lanes each way with a 4th southbound truck lane between Barstow and the summit,
- Barstow to I-40 - 3 lanes each way plus some auxiliary lanes,
- I-40 to Baker - 2 lanes each way,
- Baker to State Line - 2 lanes each way with a truck lane approaching Halloran Summit (~17 miles north of Baker) and at Mountain Pass (~15 miles south of the State Line),
- State Line to I-215 - 3 southbound lanes and 2 northbound lanes, with an additional northbound lane currently being constructed,
- I-215 to Flamingo Road in Las Vegas - 3 lanes each way plus auxiliary lanes, and
- North of Flamingo Road in Las Vegas - 4 lanes each way.

5.2 Freeway Section and Ramp Junction Analysis Methodology

The operating conditions for the freeway mainline were evaluated using the *Highway Capacity Manual (HCM)* methodology. For freeway mainlines, this methodology determines LOS based on the density of the freeway section, which is the number of vehicles within a given section of roadway for a period of time (presented in passenger cars per mile per lane, or pc/mi/ln).[3] Density values of LOS A through E assume stable non-breakdown operations, while LOS F signifies that a breakdown condition exists or is expected to occur. For the freeway-ramp junctions, the level of service is based on the amount of vehicles in the area of the freeway directly downstream of the analysis ramp, combining the mainline volume with the ramp volume. Density values of LOS A through E assume stable non-breakdown operations, while LOS F signifies that a breakdown condition exists or is expected to occur. In California and Nevada LOS E and F are considered unacceptable service conditions. Table 5-1 presents the definitions LOS threshold values for freeway sections and the ramp junctions.

[3] Density is not computed when free-flow speed is less than 55 mph. Under LOS F conditions, free-flow speed drops to below 55 mph.

Table 5-1
Freeway Mainline and Ramp Junction Level of Service Thresholds

Level of Service	**Freeway Density Range (pc/mi/ln)**	**Ramp (Merge and Diverge area) Density Range (pc/mi/ln)**
A	0 to 11	≤ 10
B	> 11 to 18	> 10 to 20
C	> 18 to 26	> 20 to 28
D	> 26 to 35	> 28 to 35
E	> 35 to 45	> 35
F	> 50	Demand exceeds capacity

SOURCE: *Highway Capacity Manual*, Transportation Research Board, 2000.

5.3 Existing Freeway Section Analysis

Interstate 15 (I-15) mainline conditions were evaluated for the following sections for weekday AM and PM peak hours:

1. North Stoddard Wells to Junction I-40 (California)
2. Junction I-40 to Nevada State Line (California)
3. Primm to Sloan (Nevada)
4. Sloan to I-215 (Nevada)

These sections are also indicated on Figure 5-1.

For the mainline analysis sections in California, volumes for existing (year 2007) conditions were obtained by interpolating between year 2006 and year 2030 volumes provided by the San Bernardino Association of Government's (SANBAG) travel demand model. Similarly for the mainline analysis sections in Nevada, volumes for existing (year 2007) conditions were obtained by interpolating between year 2005 and year 2030 volumes provided by Regional Transportation Commission (RTC) travel demand model. The mainline section AM and PM peak hour volumes are presented on Figure 5-2.

The following assumptions were made for the mainline HCM analysis (Table 5-2).

Table 5-2
HCM Analysis Assumptions – Existing Conditions

Description	**California**	**Nevada**
Peak Hour Factor	0.90	0.90
Terrain	Level	Level
Trucks and Buses (%)	20	10
Driver population adjustment	1.0	1.0
Measured Free Flow Speed	70.0	70.0
Number of Lanes		
North Stoddard Wells to Junction I-40 (NB, SB)	3 NB, 3 SB	
Junction I-40 to Nevada State line (NB, SB)	2 NB, 2 SB	
Primm to Sloan (NB, SB)		3 NB, 3 SB
Sloan to I-215 (NB, SB)		3 NB, 3 SB

SOURCE: DMJM Harris, 2008.

DMJM HARRIS | AECOM

I-15 Mainline Analysis Secs.ai

DESERT XPRESS

Figure 5-1

I-15 MAINLINE ANALYSIS SECTIONS

DESERT XPRESS

Figure 5-2

I-15 MAINLINE EXISTING VOLUMES

AM (PM) Peak Hour

Based on the assumptions listed in Table 5-2 and existing peak hour volumes shown on Figure 5-2, level of service analysis was performed on the freeway mainline sections. Table 5-3 presents the results of the analysis.

Table 5-3
Freeway Mainline Level of Service - Existing Conditions

No.	Section	Peak Hour	NB		SB	
			LOS	Density	LOS	Density
1	North Stoddard Wells to Junction I-40	AM	C	19.8	B	16.6
		PM	B	13.3	D	28.4
2	Junction I-40 to Nevada State line	AM	C	22.1	C	18.4
		PM	B	14.8	D	33.5
3	Primm to Sloan	AM	C	18.8	C	19.4
		PM	C	25.1	C	24.2
4	Sloan to I-215	AM	D	27.1	C	21.4
		PM	D	26.8	**E**	**38.7**

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln

As indicated in Table 5-3, all the freeway sections operate at acceptable conditions in the AM and PM peak hours except Section 4 from Sloan to I-215 that operates at LOS E in the southbound direction during the PM peak hour.

The unacceptable condition indicates that the travel speeds along the freeway section are low, with delays to traffic and breakdown in flow.

5.4 Existing Ramp Junction Analysis

In accordance with Chapter 6 of this report, the ramp junction analysis is performed for the PM peak hour only as done for the intersection analysis. Ramp junctions were evaluated at both of the proposed station locations in Victorville. The following ramp-junctions were evaluated for the PM peak hour conditions. Ramp junctions 1 through 4 indicate merge and diverge areas at the station location alternative 1 and ramp junctions 5 through 8 are near the station location alternative 2.

1. I-15 NB Off-ramp to Stoddard Wells (Diverge analysis)
2. I-15 SB Off-ramp to Stoddard Wells (Diverge analysis)
3. I-15 NB On-ramp from Stoddard Wells (Merge analysis)
4. I-15 SB On-ramp from Stoddard Wells (Merge analysis)
5. I-15 NB Off-ramp to North Stoddard Wells (Diverge analysis)
6. I-15 SB Off-ramp to North Stoddard Wells (Diverge analysis)
7. I-15 NB On-ramp from North Stoddard Wells (Merge analysis)
8. I-15 SB On-ramp from North Stoddard Wells (Merge analysis)

For the above ramp junctions, volumes for existing (year 2007) conditions were obtained by interpolating between year 2006 and year 2035 volumes provided by the San Bernardino Association of Government's (SANBAG) travel demand model. The existing ramp junction volumes are presented in the Appendix. Table 5-4 presents the results of the ramp junction analysis. HCS calculation sheets are provided in the Appendix.

Table 5-4
Ramp Junction Level of Service – Existing Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	B	18.4
2	I-15 SB Off-ramp to Stoddard Wells	D	28.2
3	I-15 NB On-ramp from Stoddard Wells	B	18.5
4	I-15 SB On-ramp from Stoddard Wells	D	31.0
5	I-15 NB Off-ramp to North Stoddard Wells	B	17.5
6	I-15 SB Off-ramp to North Stoddard Wells	C	27.9
7	I-15 NB On-ramp from North Stoddard Wells	B	17.5
8	I-15 SB On-ramp from North Stoddard Wells	D	29.7

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 5-4, all the ramp junctions would operate at acceptable conditions.

5.5 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project on the freeway mainline. The impacts were assessed for the following scenarios:

- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project Conditions

5.6 2013 Opening Year Conditions

5.6.1 Freeway Analysis

1. 2013 Baseline Conditions

For the mainline analysis sections in California, volumes for opening (year 2013) conditions were obtained by interpolating between year 2006 and year 2030 volumes provided by the San Bernardino Association of Government's (SANBAG) travel demand model. Similarly for the mainline analysis sections in Nevada, volumes for opening (year 2013) conditions were obtained by interpolating between year 2005 and year 2030 volumes provided by Regional Transportation Commission (RTC) travel demand model. I-15 mainline volumes for analysis sections are presented in the Appendix.

Table 5-5 presents the results of 2013 Baseline conditions for the freeway mainline.

Table 5-5
Freeway Mainline Level of Service – 2013 Baseline Conditions

No.	Section	Peak Hour	NB		SB	
			LOS	Density	LOS	Density
1	North Stoddard Wells to Junction I-40	AM	C	21.9	C	18.3
		PM	B	14.7	D	33.3
2	Junction I-40 to Nevada State line	AM	C	25.4	C	20.8
		PM	B	16.7	**E**	**43.6**
3	Primm to Sloan	AM	D	26.9	D	30.5
		PM	**F**	**>45.0**	**E**	**39.1**
4	Sloan to I-215	AM	**F**	**>45.0**	**F**	**>45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**

Notes: SOURCE: DMJM Harris, 2008.
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln
Bold indicates unacceptable conditions

As indicated in Table 5-5, the following freeway sections would operate at unacceptable conditions:

<u>AM Peak Hour</u>:

- #4. Sloan to I-215 in the northbound and southbound directions (LOS F)

<u>PM Peak Hour</u>:

- #2. Junction I-40 to Nevada State Line in southbound direction (LOS E)
- #3. Primm to Sloan in the northbound and southbound directions (LOS F and E respectively)
- #4. Sloan to I-215 in the northbound and southbound directions (LOS F)

The unacceptable conditions indicate that the travel speeds along the freeway are low, with delays to traffic and breakdown in flow.

2. 2013 Baseline plus DMU Alternative Conditions

Based on the mainline traffic reduction for the DMU alternative presented in Section 4.2, the project trips associated with the alternative were reduced from the 2013 Baseline volumes to generate 2013 Baseline plus DMU alternative volumes, presented in Figure 5-3.

For analysis purposes, existing mainline geometry was assumed for year 2013. Based on the assumptions presented in Table 5-2 and mainline volumes presented in Figure 5-3, HCS analysis has been performed. Table 5-6 presents the results of 2013 Baseline plus DMU alternative conditions for the freeway mainline sections.

Table 5-6
Freeway Mainline Level of Service – 2013 Baseline plus DMU Conditions

No.	Section	Peak Hour	2013 Baseline Conditions				2013 Baseline plus DMU Conditions			
			NB		SB		NB		SB	
			LOS	Density	LOS	Density	LOS	Density	LOS	Density
1	North Stoddard Wells to Junction I-40	AM	C	21.9	C	18.3	C	19.5	B	15.9
		PM	B	14.7	D	33.3	B	12.4	D	29.1
2	Junction I-40 to Nevada State line	AM	C	25.4	C	20.8	C	21.3	B	17.2
		PM	B	16.7	**E**	**43.6**	B	13.1	D	34.1
3	Primm to Sloan	AM	D	26.9	D	30.5	C	24.0	D	27.1
		PM	**F**	**>45.0**	**E**	**39.1**	**E**	**41.0**	D	33.7
4	Sloan to I-215	AM	**F**	**>45.0**	**F**	**>45.0**	**F**	**> 45.0**	**F**	**> 45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**	**F**	**> 45.0**	**F**	**> 45.0**

Note:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln
Bold indicates unacceptable conditions

SOURCE: DMJM Harris, 2008.

Comparing the HCS analysis results from 2013 Baseline conditions to 2013 Baseline plus DMU conditions, it can be seen from Table 5-6 the following freeway section operating conditions improve from unacceptable to acceptable conditions with the reduction in volume with the DMU project alternative:

<u>PM Peak Hour</u>:

- #2. Section from Junction I-40 to Nevada State Line improves from LOS E to LOS D in the southbound direction.
- #3. Section from Primm to Sloan improves from LOS E to LOS D in the southbound direction.

DMJM HARRIS | AECOM

DESERT XPRESS

Figure 5-3

I-15 MAINLINE 2013 PLUS DMU ALTERNATIVE VOLUMES

AM (PM) Peak Hour

However, the following sections continue to operate at unacceptable level of service under 2013 Baseline plus DMU conditions:

AM Peak Hour:

- #4. Sloan to I-215 in the northbound and southbound directions (LOS F)

PM Peak Hour:

- #3. Primm to Sloan in the northbound direction (LOS F to LOS E)
- #4. Sloan to I-215 in the northbound and southbound directions (LOS F)

3. 2013 Baseline plus EMU Alternative Conditions

Based on the mainline traffic reduction for the EMU alternative presented in Section 4.2, the project trips associated with the alternative were reduced from the 2013 Baseline volumes to generate 2013 Baseline plus EMU alternative volumes, presented in Figure 5-4.

For analysis purposes, existing mainline geometry was assumed for year 2013. Based on the assumptions presented in Table 5-2 and mainline volumes presented in Figure 5-4, HCS analysis has been performed. Table 5-7 presents the results of 2013 Baseline plus the EMU alternative conditions for the freeway mainline sections.

Table 5-7
Freeway Mainline Level of Service – 2013 Baseline plus EMU Conditions

No.	Section	Peak Hour	2013 Baseline Conditions				2013 Baseline plus EMU Conditions			
			NB		SB		NB		SB	
			LOS	Density	LOS	Density	LOS	Density	LOS	Density
1	North Stoddard Wells to Junction I-40	AM	C	21.9	C	18.3	C	18.8	B	15.3
		PM	B	14.7	D	33.3	B	11.7	D	28.1
2	Junction I-40 to Nevada State line	AM	C	25.4	C	20.8	C	20.3	B	16.3
		PM	B	16.7	**E**	**43.6**	B	12.2	D	32.2
3	Primm to Sloan	AM	D	26.9	D	30.5	C	23.3	D	26.2
		PM	**F**	**>45.0**	**E**	**39.1**	**E**	**39.3**	D	32.6
4	Sloan to I-215	AM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln
Bold indicates unacceptable conditions

SOURCE: DMJM Harris, 2008.

DMJM HARRIS | AECOM

DESERT XPRESS

Figure 5-4

I-15 MAINLINE 2013 PLUS EMU ALTERNATIVE VOLUMES

AM (PM) Peak Hour

Comparing the HCS analysis results from 2013 Baseline conditions to 2013 Baseline plus EMU conditions, it can be seen from Table 5-7 the following freeway section operating conditions improve from unacceptable to acceptable conditions with the reduction in volume with the EMU project alternative:

PM Peak Hour:

- #2. Section from Junction I-40 to Nevada State Line improves from LOS E to LOS D in the southbound direction.
- #3. Section from Primm to Sloan improves from LOS E to LOS D in the southbound direction.

However, the following sections continue to operate at unacceptable level of service under 2013 Baseline plus EMU conditions:

AM Peak Hour:

- #4. Sloan to I-215 in the northbound and southbound directions (LOS F)

PM Peak Hour:

- #3. Primm to Sloan in the northbound direction (LOS F to LOS E)
- #4. Sloan to I-215 in the northbound and southbound directions (LOS F)

5.6.2 Ramp Junction Analysis

1. 2013 Baseline Conditions

The future year 2013 baseline volumes were obtained by interpolating between the existing year and future year 2035 travel demand volumes. The 2013 baseline condition volumes are presented in the Appendix. For analysis purposes, existing geometry was assumed for the future year 2013 conditions. Table 5-8 presents the results of the ramp junction analysis for 2013 baseline conditions. HCS calculation sheets are provided in the Appendix.

Table 5-8
Ramp Junction Level of Service – 2013 Baseline Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	F	41.5
2	I-15 SB Off-ramp to Stoddard Wells	F	47.5
3	I-15 NB On-ramp from Stoddard Wells	F	48.3
4	I-15 SB On-ramp from Stoddard Wells	F	69.7
5	I-15 NB Off-ramp to North Stoddard Wells	F	38.8
6	I-15 SB Off-ramp to North Stoddard Wells	F	47.0
7	I-15 NB On-ramp from North Stoddard Wells	F	44.1

Location		LOS	D_R
8	I-15 SB On-ramp from North Stoddard Wells	F	65.3

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 5-8, all the ramp junctions operate at unacceptable level of service conditions under this scenario. This indicates that the existing ramp configuration would not be able to handle the future volume growth in the area.

2. *2013 Baseline plus DMU Alternative Conditions*

The DMU project alternative volumes were added to the 2013 baseline volumes to obtain the 2013 baseline plus DMU alternative condition volumes. These volumes are presented in the Appendix. Table 5-9 presents the results of the ramp junction analysis for 2013 baseline plus DMU conditions. HCS calculation sheets are provided in the Appendix.

Table 5-9
Ramp Junction Level of Service – 2013 Baseline plus DMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	F	42.3
2	I-15 SB Off-ramp to Stoddard Wells	F	47.5
3	I-15 NB On-ramp from Stoddard Wells	F	48.5
4	I-15 SB On-ramp from Stoddard Wells	F	73.4
5	I-15 NB Off-ramp to North Stoddard Wells	F	39.8
6	I-15 SB Off-ramp to North Stoddard Wells	F	47.0
7	I-15 NB On-ramp from North Stoddard Wells	F	44.2
8	I-15 SB On-ramp from North Stoddard Wells	F	68.4

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

Comparing results from tables 5-8 and 5-9, it can be noted that all the ramp junctions continue to operate at unacceptable conditions under this scenario. The densities at the ramp influence area only increase with the addition of the DMU project volumes.

3. *2013 Baseline plus EMU Alternative Conditions*

The EMU project alternative volumes were added to the 2013 baseline volumes to obtain the 2013 baseline plus EMU alternative condition volumes. These volumes are presented in the

Appendix. Table 5-10 presents the results of the ramp junction analysis for 2013 baseline plus EMU conditions. HCS calculation sheets are provided in the Appendix.

Table 5-10
Ramp Junction Level of Service – 2013 Baseline plus EMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	F	42.7
2	I-15 SB Off-ramp to Stoddard Wells	F	47.5
3	I-15 NB On-ramp from Stoddard Wells	F	48.6
4	I-15 SB On-ramp from Stoddard Wells	F	74.9
5	I-15 NB Off-ramp to North Stoddard Wells	F	40.3
6	I-15 SB Off-ramp to North Stoddard Wells	F	47.0
7	I-15 NB On-ramp from North Stoddard Wells	F	44.3
8	I-15 SB On-ramp from North Stoddard Wells	F	69.7

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

Comparing results from tables 5-8 and 5-10, it can be noted that all the ramp junctions continue to operate at unacceptable conditions under this scenario. The densities at the ramp influence area only increase with the addition of the EMU project volumes.

5.7 2030 Cumulative Conditions

This section presents the analysis of 2030 Cumulative conditions without and with project (both DMU and EMU options).

5.7.1 Freeway Analysis

1. 2030 Baseline Conditions

For the mainline analysis sections in California, cumulative conditions volumes for the future year 2030 were obtained from the San Bernardino Association of Government's (SANBAG) travel demand model. Similarly for the mainline analysis sections in Nevada, cumulative conditions volumes for the future year 2030 were obtained from the Regional Transportation Commission (RTC) travel demand model.

Future year 2030 lane configuration for all the analysis sections is presented in Figure 5-5. The mainline section AM and PM peak hour volumes are presented on Figure 5-6.

2030 Mainline Geometry rev1.ai

DESERT XPRESS

Figure 5-5

I-15 MAINLINE FUTURE YEAR 2030 GEOMETRY

DMJM HARRIS | AECOM

DESERT XPRESS

Figure 5-6

I-15 MAINLINE 2030 NO BUILD VOLUMES

AM (PM) Peak Hour

Table 5-11
HCS Assumptions – 2030 Conditions

Description	California	Nevada
Peak Hour Factor		
Number of Lanes	0.95	0.95
North Stoddard Wells to Junction I-40 (NB, SB)	3 NB, 3 SB	
Junction I-40 to Nevada State line (NB, SB)	2 NB, 2 SB	
Primm to Sloan (NB, SB)		4 NB, 4 SB
Sloan to I-215 (NB, SB)		5 NB, 5 SB

SOURCE: DMJM Harris, 2008.

Based on the assumptions presented in Table 5-11 and mainline volumes presented in Figure 5-6, HCS analysis has been performed. Table 5-12 presents the results of 2030 Baseline condition analysis for the freeway mainline sections.

Table 5-12
Freeway Mainline Level of Service – 2030 Baseline Conditions

No.	Section	Peak Hour	NB		SB	
			LOS	Density	LOS	Density
1	North Stoddard Wells to Junction I-40	AM	D	27.4	C	22.2
		PM	B	17.8	**F**	**>45.0**
2	Junction I-40 to Nevada State line	AM	**E**	**35.8**	D	27.0
		PM	C	21.0	**F**	**>45.0**
3	Primm to Sloan	AM	**E**	**40.6**	**F**	**>45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**
4	Sloan to I-215	AM	**F**	**>45.0**	**F**	**>45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln
Bold indicates unacceptable conditions

SOURCE: DMJM Harris, 2008.

As indicated in Table 5-12, all the freeway sections operate at unacceptable conditions (LOS E or F), except section 1 in the northbound direction in the AM and PM peak hours, in the southbound direction in the AM peak hour and section 2 in southbound direction during the AM peak hour as well as in the northbound direction during the PM peak hour.

2. 2030 Baseline plus DMU Alternative Conditions

Based on the mainline traffic reduction for DMU alternative presented in Section 4.2, the project trips associated with the alternative were reduced from the 2030 Baseline volumes to generate 2030 Baseline plus DMU alternative volumes, presented in Figure 5-7.

DMJM HARRIS | AECOM

DESERT XPRESS

Figure 5-7

I-15 MAINLINE 2030 PLUS DMU ALTERNATIVE VOLUMES

AM (PM) Peak Hour

Based on the assumptions presented in Table 5-11 and mainline volumes presented in Figure 5-7, HCS analysis has been performed. Table 5-13 presents the results of 2030 Baseline plus DMU alternative conditions for the freeway mainline sections.

Table 5-13
Freeway Mainline Level of Service – 2030 Baseline plus DMU Conditions

No.	Section	Peak Hour	2030 Baseline Conditions				2030 Baseline plus DMU Conditions			
			NB		SB		NB		SB	
			LOS	Density	LOS	Density	LOS	Density	LOS	Density
1	North Stoddard Wells to Junction I-40	AM	D	27.4	C	22.2	C	20.3	B	16.0
		PM	B	17.8	**F**	**>45.0**	B	11.7	D	33.4
2	Junction I-40 to Nevada State line	AM	**E**	**35.8**	D	27.0	C	22.1	B	17.0
		PM	C	21.0	**F**	**>45.0**	B	11.9	**E**	**42.2**
3	Primm to Sloan	AM	**E**	**40.6**	**F**	**>45.0**	D	30.9	**E**	**44.0**
		PM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**
4	Sloan to I-215	AM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln
Bold indicates unacceptable conditions

SOURCE: DMJM Harris, 2008.

Comparing the HCS analysis results from 2030 Baseline conditions to 2030 Baseline plus DMU conditions, it can be seen from Table 5-13 that following freeway section operating conditions improve from unacceptable to acceptable conditions with the reduction in volume with the DMU project alternative:

AM Peak Hour:

- #2. Section from Junction I-40 to Nevada State Line improves from LOS E to LOS C in the northbound direction.
- #3. Section from Primm to Sloan improves from LOS E to LOS D in the northbound direction.

It can also be noted from Table 5-13 that sections 2 and 3 improve operating conditions from LOS F to LOS E in the southbound direction.

PM Peak Hour:

- #1. Section from North Stoddard Wells to Junction I-40 improves from LOS F to LOS D in the southbound direction.

All the other freeway sections operating at unacceptable conditions under the 2030 Baseline conditions continue to operate at unacceptable conditions under the 2030 DMU project conditions.

3. 2030 Baseline plus EMU Alternative Conditions

Based on the mainline traffic reduction for EMU alternative presented in Section 4.2, the project trips associated with the alternative were reduced from the 2030 Baseline volumes to generate 2030 Baseline plus EMU alternative volumes, presented in Figure 5-8.

Based on the assumptions presented in Table 5-11 and mainline volumes presented in Figure 5-8, HCS analysis has been performed. Table 5-14 presents the results of 2030 Baseline plus EMU alternative conditions for the freeway mainline sections.

Table 5-14
Freeway Mainline Level of Service – 2030 Baseline plus EMU Conditions

No.	Section	Peak Hour	2030 Baseline Conditions NB LOS	NB Density	SB LOS	SB Density	2030 Baseline plus EMU Conditions NB LOS	NB Density	SB LOS	SB Density
1	North Stoddard Wells to Junction I-40	AM	D	27.4	C	22.2	C	18.7	B	14.4
		PM	B	17.8	**F**	**>45.0**	A	10.1	D	30.4
2	Junction I-40 to Nevada State line	AM	**E**	**35.8**	D	27.0	C	19.6	B	14.5
		PM	C	21.0	**F**	**>45.0**	A	9.5	**E**	**35.6**
3	Primm to Sloan	AM	**E**	**40.6**	**F**	**>45.0**	D	29.0	**E**	**40.3**
		PM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**
4	Sloan to I-215	AM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**
		PM	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**	**F**	**>45.0**

Notes: SOURCE: DMJM Harris, 2008.
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density reported in pc/mi/ln
Bold indicates unacceptable conditions

Comparing the HCS analysis results from 2030 Baseline conditions to 2030 Baseline plus EMU conditions, it can be seen from Table 5-14 that following freeway section operating conditions improve from unacceptable to acceptable conditions with the reduction in volume with the EMU project alternative:

AM Peak Hour:

- #2. Section from Junction I-40 to Nevada State Line improves from LOS E to LOS C in the northbound direction..

DMJM HARRIS | AECOM

2030 + EMU volumes rev1.ai

DESERT XPRESS

Figure 5-8

I-15 MAINLINE 2030 PLUS EMU ALTERNATIVE VOLUMES

AM (PM) Peak Hour

- #3. Section from Primm to Sloan improves from LOS E to LOS D in the northbound direction.

It can also be noted from Table 5-14 that section 3 improves operating conditions from LOS F to LOS E in the southbound direction.

PM Peak Hour:

- #1. Section from North Stoddard Wells to Junction I-40 improves from LOS F to LOS D in the southbound direction.

It can also be noted from Table 5-10 that section 2 improves operating conditions from LOS F to LOS E in the southbound direction.

All the other freeway sections operating at unacceptable conditions under the 2030 Baseline conditions continue to operate at unacceptable conditions under the 2030 EMU project conditions. Although it can be noted from Table 5-14 that freeway section 2 improves from LOS F to LOS E.

5.7.2 Ramp Junction Analysis

1. 2030 Baseline Conditions

The future year 2030 baseline volumes were obtained by interpolating between the existing year and future year 2035 travel demand volumes. The 2030 baseline condition volumes are presented in the Appendix. For analysis purposes, existing geometry was assumed for the mainline and two lanes were considered for the on- and off-ramps. Table 5-15 presents the results of the ramp junction analysis for 2013 baseline conditions. HCS calculation sheets are provided in the Appendix.

Table 5-15
Ramp Junction Level of Service – 2030 Baseline Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	F	96.8
2	I-15 SB Off-ramp to Stoddard Wells	F	115.5
3	I-15 NB On-ramp from Stoddard Wells	F	118.4
4	I-15 SB On-ramp from Stoddard Wells	F	163.1
5	I-15 NB Off-ramp to North Stoddard Wells	F	84.3
6	I-15 SB Off-ramp to North Stoddard Wells	F	116.7
7	I-15 NB On-ramp from North Stoddard Wells	F	106.1
8	I-15 SB On-ramp from North Stoddard Wells	F	156.7

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 5-15, all the ramp junctions operate at unacceptable conditions under this scenario. This indicates that the future ramp configuration would not be able to handle the future volume growth in the area

2. 2030 Baseline plus DMU Alternative Conditions

The DMU project alternative volumes were added to the 2030 baseline volumes to obtain the 2030 baseline plus DMU alternative condition volumes. These volumes are presented in the Appendix. Table 5-16 presents the results of the ramp junction analysis for 2030 baseline plus DMU conditions. HCS calculation sheets are provided in the Appendix.

Table 5-16
Ramp Junction Level of Service – 2030 Baseline plus DMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	F	99.9
2	I-15 SB Off-ramp to Stoddard Wells	F	115.7
3	I-15 NB On-ramp from Stoddard Wells	F	118.6
4	I-15 SB On-ramp from Stoddard Wells	F	166.8
5	I-15 NB Off-ramp to North Stoddard Wells	F	87.9
6	I-15 SB Off-ramp to North Stoddard Wells	F	116.9
7	I-15 NB On-ramp from North Stoddard Wells	F	106.3
8	I-15 SB On-ramp from North Stoddard Wells	F	159.8

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

Comparing results from tables 5-15 and 5-16, it can be noted that all the ramp junctions continue to operate at unacceptable conditions under this scenario. The densities at the ramp influence area only increase with the addition of the DMU project volumes.

3. 2030 Baseline plus EMU Alternative Conditions

The EMU project alternative volumes were added to the 2030 baseline volumes to obtain the 2030 baseline plus EMU alternative condition volumes. These volumes are presented in the Appendix. Table 5-17 presents the results of the ramp junction analysis for 2030 baseline plus EMU conditions. HCS calculation sheets are provided in the Appendix.

Table 5-17
Ramp Junction Level of Service – 2030 Baseline plus EMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Stoddard Wells	F	101.2
2	I-15 SB Off-ramp to Stoddard Wells	F	115.8
3	I-15 NB On-ramp from Stoddard Wells	F	118.7
4	I-15 SB On-ramp from Stoddard Wells	F	168.3
5	I-15 NB Off-ramp to North Stoddard Wells	F	89.3
6	I-15 SB Off-ramp to North Stoddard Wells	F	117.0
7	I-15 NB On-ramp from North Stoddard Wells	F	106.3
8	I-15 SB On-ramp from North Stoddard Wells	F	161.0

Bold indicates unacceptable conditions SOURCE: DMJM Harris, 2008.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

Comparing results from tables 5-15 and 5-17, it can be noted that all the ramp junctions continue to operate at unacceptable conditions under this scenario. The densities at the ramp influence area only increase with the addition of the EMU project volumes.

6.0 VICTORVILLE STATION LOCATION

6.1 Victorville Station Location Option 1

The proposed station in Victorville would be located along the west side of I-15 between the two existing Stoddard Wells Road interchanges. Access to this station would be via the two existing Stoddard Wells Road interchanges.

6.1.1 Existing Conditions

EXISTING ROADWAY NETWORK

The two Stoddard Wells Road interchanges with I-15 will provide the most direct regional access to the proposed Victorville train station. Currently, Stoddard Wells Road has a single travel lane in each direction and because of the relatively low traffic volumes intersections in the area are stop controlled. The existing lane geometry at the Victorville study intersections is shown in Figure 6-1.

EXISTING TRANSIT CONDITIONS

The Victor Valley Transit Authority (VVTA) provides local transit service throughout the Victor Valley, including Victorville and San Bernardino County communities. The only bus line operating in the vicinity of the proposed station location is Route 22.

Route 22- Helendale is a local service running between Silver Lakes Market and Lorene Transfer with approximately 120 minute headways from 6:00 AM to 8:00PM, Monday to Saturday.

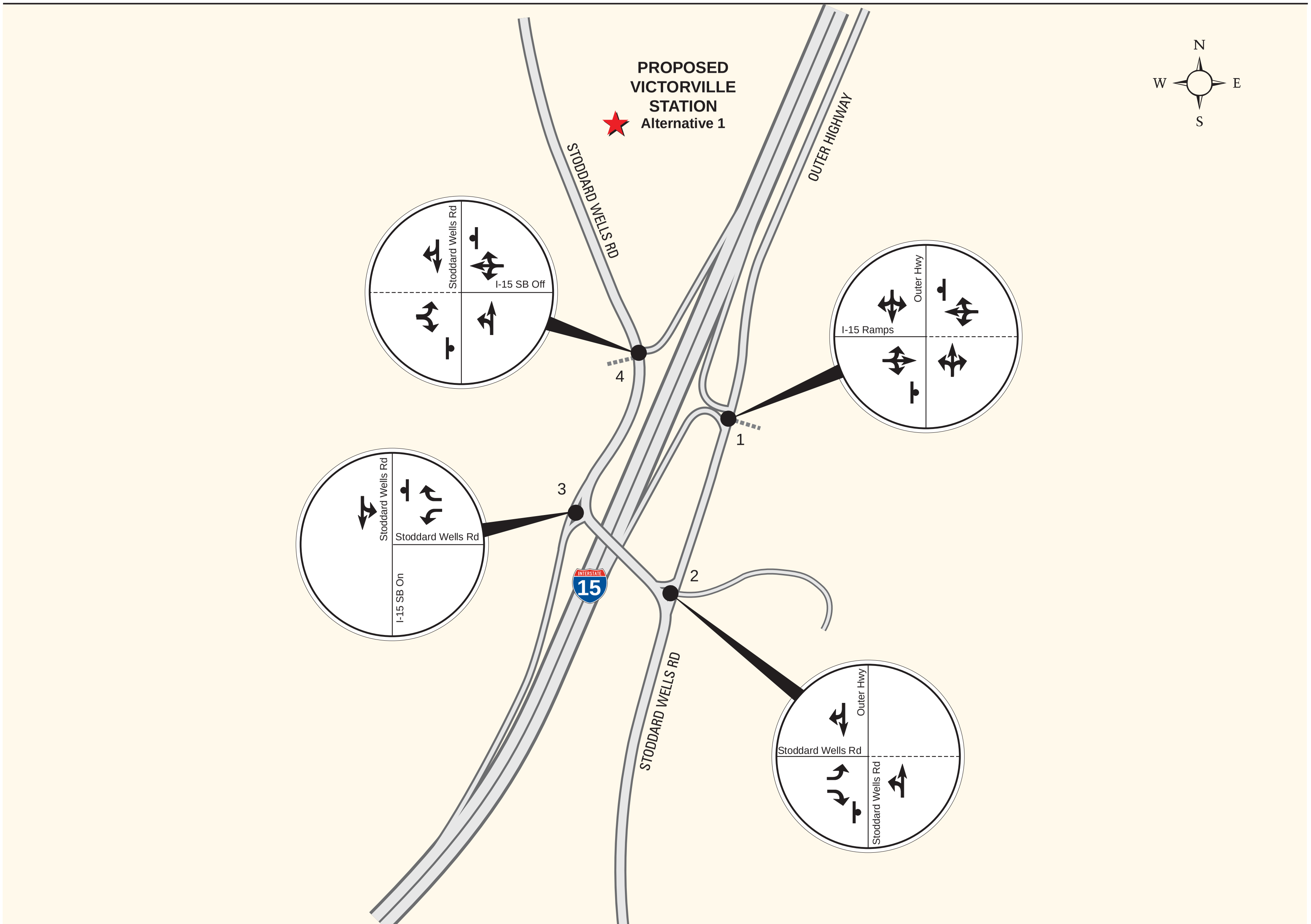
EXISTING INTERSECTION OPERATIONS

The intersection analysis was performed using the Highway Capacity Manual (HCM) methodologies, a requirement of the San Bernardino Congestion Management Program (CMP), which was implemented using SYNCHRO Version 7 software. Level of Service designation and corresponding delay thresholds are provided in Table 6-1.

Table 6-1
Intersection Level of Service Description

Level of Service	Signalized Intersections Delay Thresholds	Unsignalized Intersections Delay Thresholds
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Notes: Delay reported in seconds per vehicle SOURCE: Highway Capacity Manual, 2000.



DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-1

EXISTING INTERSECTION LANE GEOMETRY

Victorville Station Alternative 1

In Victorville, level of service values A through D are considered satisfactory service levels, and LOS E and F conditions are considered unsatisfactory service levels. Unsignalized intersections are considered to operate at unsatisfactory conditions if one approach operates at LOS E or F and Caltrans peak hour volume signal warrants are met.

Based on the station location, the following intersections were identified for analysis purposes as shown on Figure 6-1:

- Outer Highway & I-15 NB Ramps
- Outer Highway & Stoddard Wells Rd
- Stoddard Wells Rd & I-15 SB Off-Ramp
- Stoddard Wells Rd & I-15 SB On-Ramp

Afternoon peak hour turning movement counts were obtained at the study intersections and are shown in Figure 6-2. Intersection Level of Service (LOS) conditions were analyzed for weekday PM peak period (4:00 PM to 6:00 PM) at the study intersections. The results of the analysis are presented in Table 6-2. SYNCHRO analysis worksheets are provided in the Appendix.

Table 6-2
Victorville Option 1 - Intersection Level of Service - Existing Conditions

Intersection		Traffic Control	Existing Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Unsignalized[2]	C (WB)[3]	16.3
2	Outer Highway & Stoddard Wells Rd	Unsignalized[2]	B (EB)[3]	12.7
3	Stoddard Wells Rd & I-15 SB On-Ramp	Unsignalized[2]	B (WB)[3]	10.4
4	Stoddard Wells Rd & I-15 SB Off-Ramp	Unsignalized[2]	B (WB)[3]	11.9

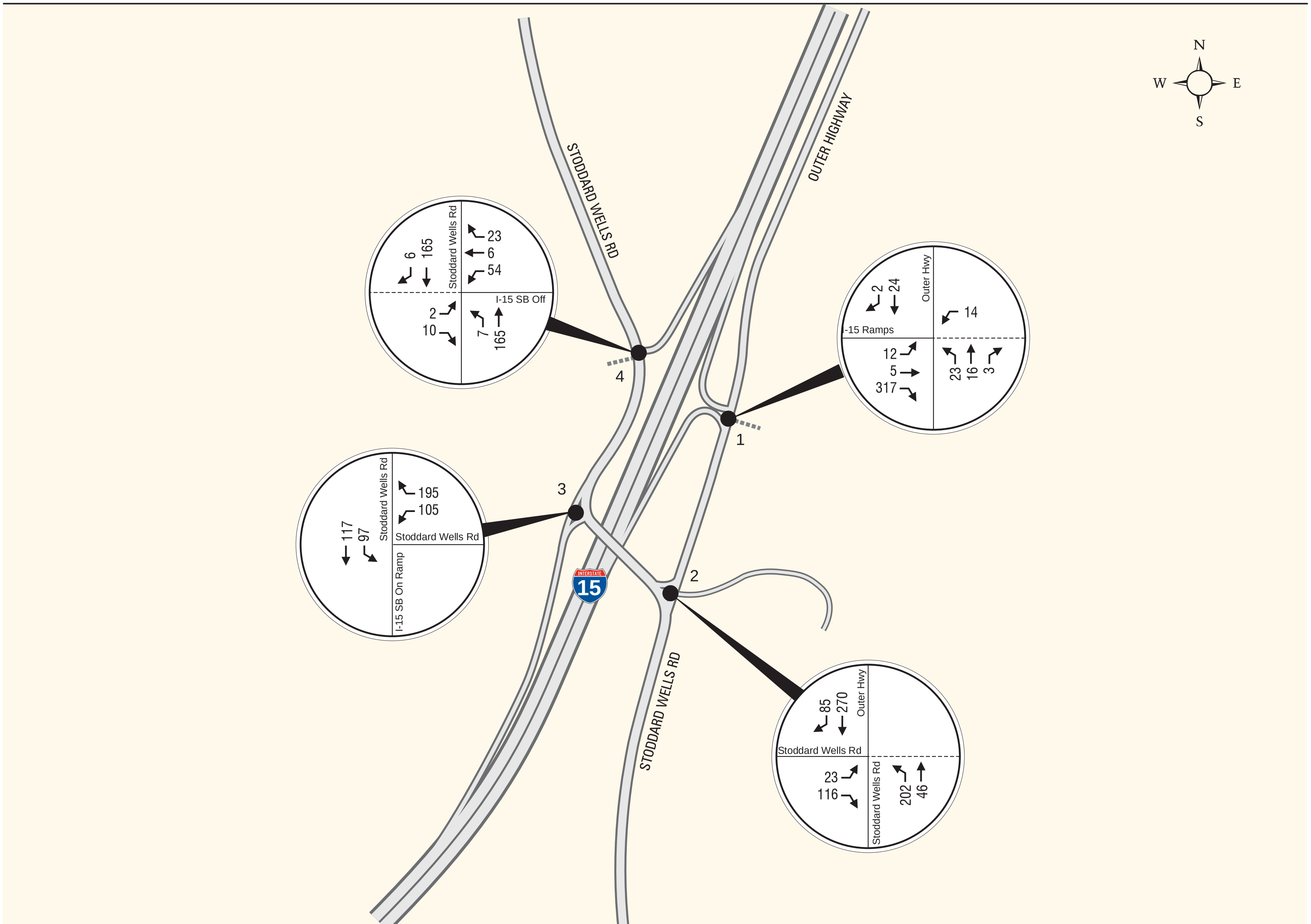
Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, WB=Westbound

As indicated in Table 6-2, all the analysis intersections have acceptable conditions (LOS D or better) under existing conditions.

6.1.2 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- Existing plus Project Conditions;
- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project (DMU and EMU alternatives) Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project (DMU and EMU alternatives) Conditions



existing volumes alt 1.ai

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-2

EXISTING INTERSECTION TRAFFIC VOLUMES

Victorville Station Alternative 1

SIGNIFICANCE CRITERIA

The following are the significance criteria used by the City of Victorville and San Bernardino County CMP guidelines for the determination of impacts associated with a proposed project:

- If the proposed site adds 5% or more to the peak hour traffic of an intersection.
- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted.

PROJECT TRAVEL DEMAND

The Victor Valley Area Transportation Study (VVATS) travel demand forecasting model was used to develop the base “no-project” travel forecasts for future year 2013 and 2030 traffic analysis. The City of Victorville provided future year 2035 travel forecasts from the model to DMJM Harris. DMJM Harris has applied a straight line methodology to interpolate the intermediate year growth factors for each network link in the model. The calculated growth factors were applied to the existing volumes to generate analysis year volumes. The growth factor calculations are presented in the Appendix. The project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 6-3. This station is served primarily by I-15 and Stoddard Wells Road. Due to its proximity to the southern I-15 / Stoddard Wells Road interchange, it is assumed that all vehicle trips generated by the proposed station would use this interchange. Hence, no project traffic is assigned to the northern I-15 / Stoddard Wells Road interchange.

6.1.3 Existing plus Project Conditions

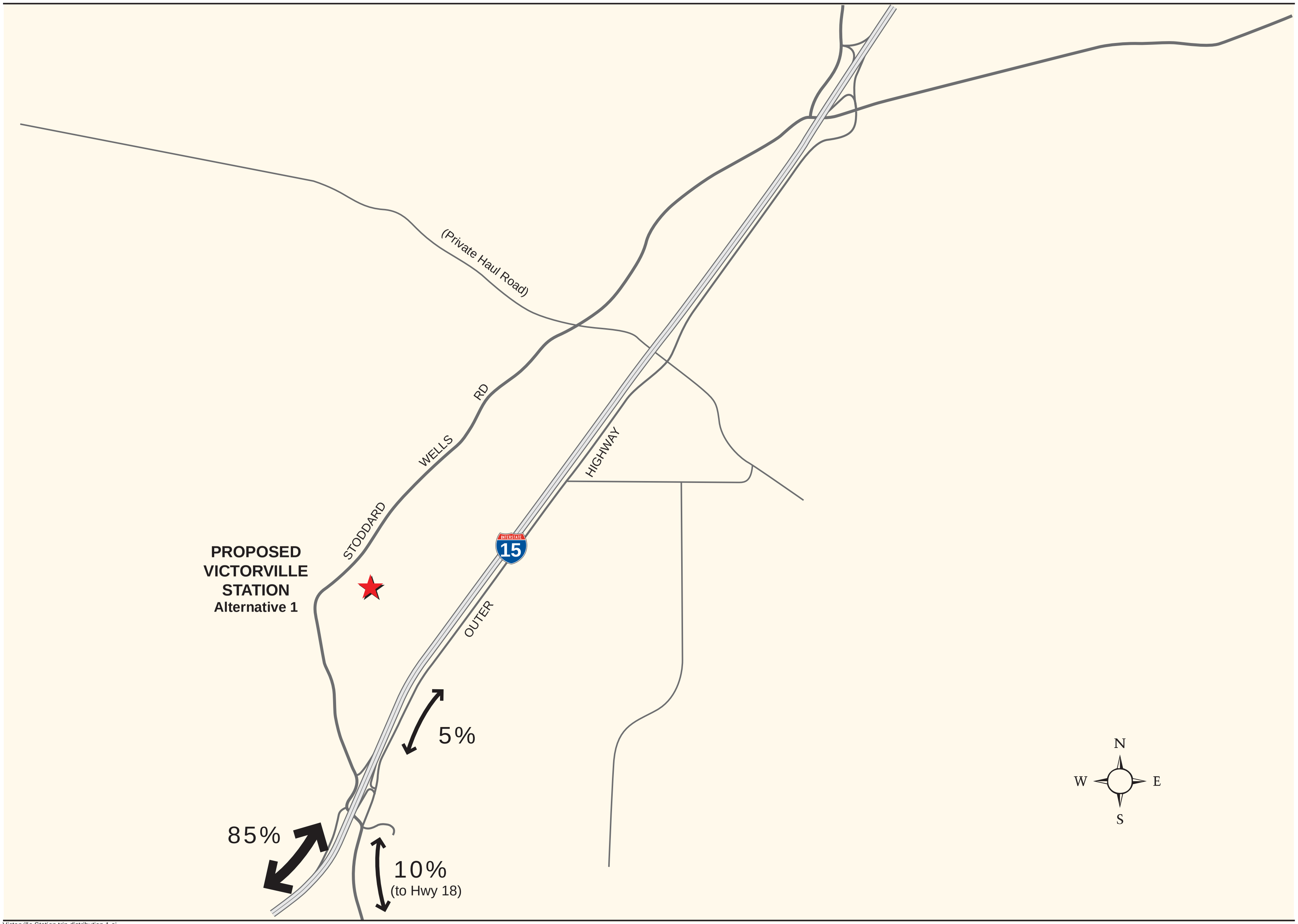
EXISTING PLUS DIESEL ELECTRIC MULTIPLE UNIT (DMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 6-3, project trips accessing the station were assigned to the analysis intersections. The project trips for DMU alternative conditions for existing conditions are presented in the Appendix. These project trips were added to the existing volumes to generate the Existing plus DMU volumes.

Based on the Existing plus DMU volumes and the existing geometry, intersection level of service analysis was performed. Table 6-3 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 6-3, the intersections of Outer highway and I-15 northbound ramps and Stoddard Wells Road and I-15 southbound off-ramp operate at unacceptable conditions, while all other intersections operate at acceptable conditions.

DMJM HARRIS | AECOM



Victorville Station trip distribution 1.ai

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-3

VICTORVILLE STATION TRIP DISTRIBUTION

Alternative 1

Table 6-3
Victorville Option 1 - Existing plus DMU Conditions LOS

Intersection		Traffic Control	Existing Conditions		Existing plus DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Unsignalized[2]	C (WB)[3]	16.3	F (WB)[3]	-
2	Outer Highway & Stoddard Wells Road	Unsignalized[2]	B (EB)[3]	12.7	D (EB)[3]	32.5
3	Stoddard Wells Road & I-15 SB On-Ramp	Unsignalized[2]	B (WB)[3]	10.4	D (WB)[3]	25.1
4	Stoddard Wells Road & I-15 SB Off-Ramp	Unsignalized[2]	B (WB)[3]	11.9	F (WB)[3]	179.5
5	Stoddard Wells Road & Station Access #1[4]	Signalized	-	-	B	15.7
6	Stoddard Wells Road & Station Access #2[4]	Unsignalized[2]	-	-	A	0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, WB=Westbound
4. See Figure 6-4 for locations

Comparing the results of the Existing plus DMU conditions to the Existing conditions level of service, it can be noted that due to the addition of project volumes, the intersections of Outer highway and I-15 northbound ramps and Stoddard Wells Road at I-15 southbound off-ramp deteriorate from acceptable (LOS C or better) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the existing volume to these intersections, project impacts at these intersections are considered to be significant.

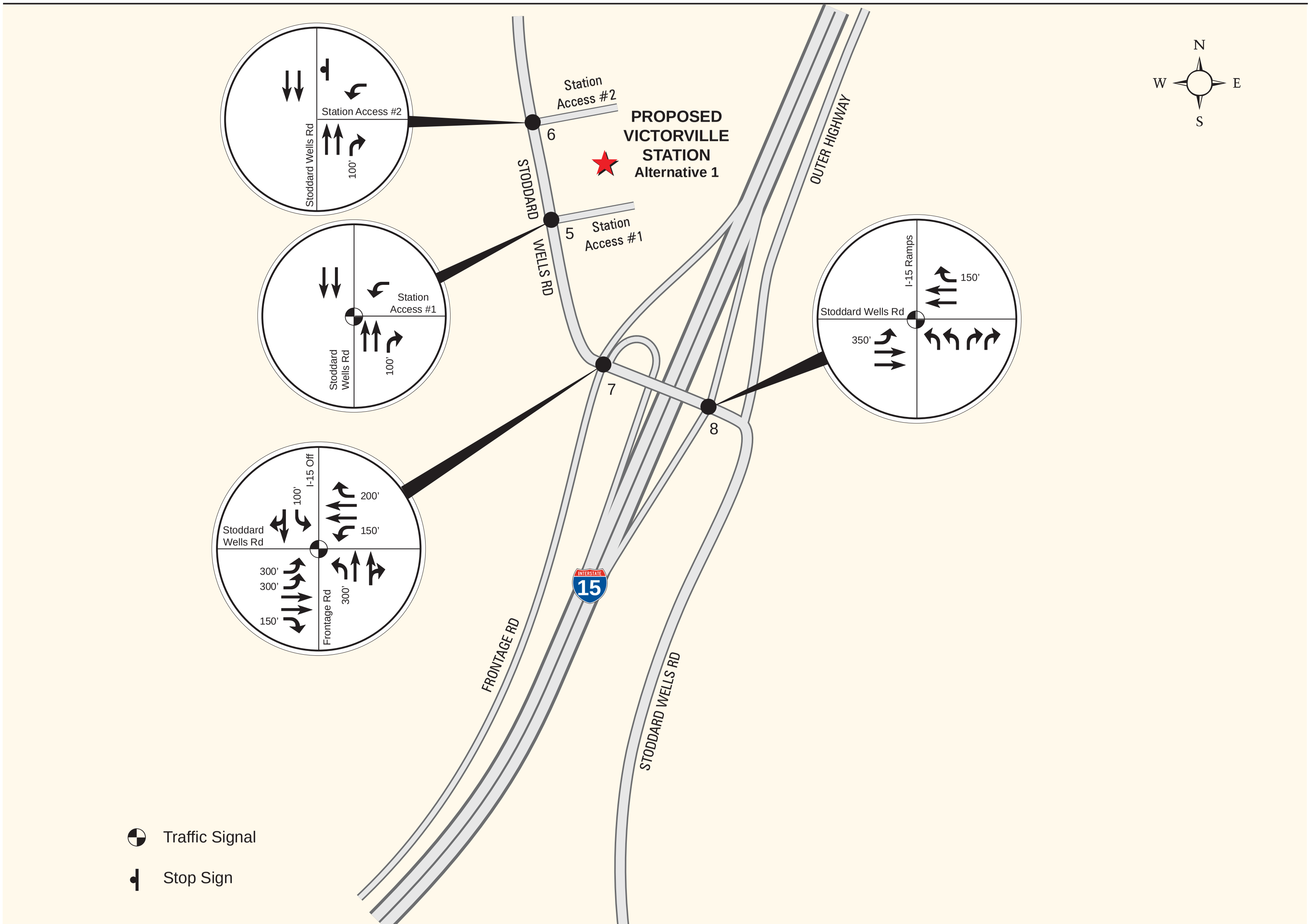
EXISTING PLUS ELECTRIC MULTIPLE UNIT (EMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 6-3, project trips for EMU alternative conditions were calculated. These project trips were added to the existing volumes to generate the Existing plus EMU volumes. Based on the Existing plus EMU volumes and the existing geometry, intersection level of service analysis was performed. Table 6-4 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 6-4, all the intersections, except those at the station access roads, operate at unacceptable conditions (LOS F).

Comparing the results of the Existing plus EMU conditions to the Existing conditions level of service, it can be noted that due to the addition of project volumes, all the existing intersections deteriorate from acceptable (LOS C or better) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the existing volume to these intersections, project impacts at these intersections are considered to be significant.

DMJM HARRIS | AECOM



DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-4

FUTURE YEAR 2030 INTERSECTION LANE GEOMETRY

Victorville Station Alternative 1

Table 6-4
Victorville Option 1 - Existing plus EMU Conditions LOS

Intersection		Traffic Control	Existing Conditions		Existing plus EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Unsignalized[2]	C (WB)[3]	16.3	F (WB)[3]	-
2	Outer Highway & Stoddard Wells Road	Unsignalized[2]	B (EB)[3]	12.7	F (EB)[3]	335.8
3	Stoddard Wells Road & I-15 SB On-Ramp	Unsignalized[2]	B (WB)[3]	10.4	F (WB)[3]	204.6
4	Stoddard Wells Road & I-15 SB Off-Ramp	Unsignalized[2]	B (WB)[3]	11.9	F (WB)[3]	839.2
5	Stoddard Wells Road & Station Access #1[4]	Signalized	-	-	C	22.5
6	Stoddard Wells Road & Station Access #2[4]	Unsignalized[2]	-	-	A	0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, WB=Westbound
4. See Figure 6-4 for location

6.1.4 2013 Baseline Conditions (Opening Year Analysis)

2013 BASELINE CONDITIONS

Future year 2013 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions.

Based on the 2013 base volumes and the existing geometry, intersection level service analysis was performed. Table 6-5 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 6-5, all the intersections except Stoddard Wells Road and I-15 SB Off-ramp operate at unacceptable conditions (LOS F) during the analysis period.

2013 BASELINE PLUS DIESEL-ELECTRIC MULTIPLE UNIT (DMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 6-2, project trips accessing the station were assigned to the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base volumes to generate the 2013 base plus DMU volumes.

Based on the 2013 Baseline plus DMU volumes and the existing geometry, intersection level service analysis was performed. Table 6-6 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

Table 6-5
Victorville Option 1 - 2013 Baseline Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Unsignalized[2]	F (WB)[3]	324.0
2	Outer Highway & Stoddard Wells Road	Unsignalized[2]	F (EB)[3]	154.9
3	Stoddard Wells Rd. & I-15 SB On-Ramp	Unsignalized[2]	F (WB)[3]	113.4
4	Stoddard Wells Rd. & I-15 SB Off-Ramp	Unsignalized[2]	C (WB)[3]	20.5

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, WB=Westbound

Table 6-6
Victorville Option 1 – 2013 Baseline plus DMU Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions		2013 Baseline plus DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Unsignalized[2]	F (WB)[3]	324.0	F (WB)[3]	-
2	Outer Highway & Stoddard Wells Road	Unsignalized[2]	F (EB)[3]	154.9	F (EB)[3]	-
3	Stoddard Wells Road & I-15 SB On-Ramp	Unsignalized[2]	F (WB)[3]	113.4	F (WB)[3]	-
4	Stoddard Wells Road & I-15 SB Off-Ramp	Unsignalized[2]	C (WB)[3]	20.5	F (WB)[3]	-
5	Stoddard Wells Road & Station Access #1[4]	Signalized	-	-	B	14.9
6	Stoddard Wells Road & Station Access #2[4]	Unsignalized[2]	-	-	A	0.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, WB=Westbound
4. See Figure 6-4 for location

As indicated in Table 6-6, all the intersections except station access roads operate at unacceptable conditions during the analysis period.

Comparing the results of 2013 Baseline plus DMU conditions to the 2013 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersections already operating at LOS F would worsen with higher delays. As the project trips account for more than 5% of the volume at these intersections, project impacts at these intersections are considered to be significant.

2013 BASELINE PLUS ELECTRIC MULTIPLE UNIT (EMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 6-2, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 20103 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and the existing geometry, intersection level service analysis was performed. Table 6-7 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

Table 6-7
Victorville Option 1 – 2013 Baseline plus EMU Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions		2013 Baseline plus EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Unsignalized[2]	F (WB)[3]	324.0	F (WB)[3]	-
2	Outer Highway & Stoddard Wells Rd	Unsignalized[2]	F (EB)[3]	154.9	F (EB)[3]	-
3	Stoddard Wells Rd & I-15 SB On-Ramp	Unsignalized[2]	F (WB)[3]	113.4	F (WB)[3]	-
4	Stoddard Wells Rd & I-15 SB Off-Ramp	Unsignalized[2]	C (WB)[3]	20.5	F (WB)[3]	-
5	Stoddard Wells Rd & Station Access #1[4]	Signalized	-	-	D	38.6
6	Stoddard Wells Rd & Station Access #2[4]	Unsignalized[2]	-	-	A	0.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, WB=Westbound
4. See Figure 6-4 for location

As indicated in Table 6-7, all the intersections except station access roads operate at unacceptable conditions during the analysis period.

Comparing the results of 2013 Baseline plus EMU conditions to the 2013 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersections already operating at LOS F would worsen with higher delays. As the project trips account for more than 5% of the volume at these intersections, project impacts at these intersections are considered to be significant.

6.1.5 2030 Cumulative Conditions

Under this scenario, the proposed improvements include a new Stoddard Wells Road interchange at existing southerly Stoddard Wells ramps as shown in Figure 6-4. Improvements also include signalized intersections at the ramp interchange locations. Based on the arterial lane geometry information provided by the City of Victorville travel demand model, intersection geometry presented in Figure 6-4 was assumed for future year 2030.

2030 BASELINE CONDITIONS

Future year 2030 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix.

Based on the future base volumes and geometry presented in Figure 6-4, intersection level service analysis was performed. Table 6-8 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 6-8
Victorville Option 1 - 2030 Baseline Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
7	Stoddard Wells Road and I-15 SB Ramps	Signalized	F	102.9
8	Stoddard Wells Road and I-15 NB Ramps	Signalized	F	216.4

Notes: Delay reported in seconds per vehicle SOURCE: DMJM Harris, 2008.

As indicated in Table 6-8, all the intersections operate at unacceptable conditions during the analysis period.

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 6-3, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes geometry presented in Figure 6-4, intersection level service analysis was performed. Table 6-9 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 6-9, all the intersections except Stoddard Wells Road at Station Access #2 operate at unacceptable conditions during the analysis period.

Comparing the results of 2030 Baseline plus DMU conditions to the 2030 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersections already operating at LOS F would continue to operate at LOS F.

Table 6-9
Victorville Option 1 – 2030 Baseline plus DMU Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions		2030 Baseline DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
5	Stoddard Wells Road & Station Access #1	Signalized	-	-	E	58.6
6	Stoddard Wells Road & Station Access #2	Unsignalized	-	-	A	0.0
7	Stoddard Wells Road & I-15 SB Ramps	Signalized	F	102.9	F	192.8
8	Stoddard Wells Road & I-15 NB Ramps	Signalized	F	216.4	F	162.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

2030 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 6-3, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2030 Baseline plus EMU volumes geometry presented in Figure 6-4, intersection level service analysis was performed. Table 6-10 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 6-10
Victorville Option 1 – 2030 Baseline plus EMU Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions		2030 Baseline EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
5	Stoddard Wells Road & Station Access #1	Signalized	-	-	F	95.6
6	Stoddard Wells Road & Station Access #2	Unsignalized	-	-	A	0.0
7	Stoddard Wells Road & I-15 SB Ramps	Signalized	F	102.9	F	261.4
8	Stoddard Wells Road & I-15 NB Ramps	Signalized	F	216.4	F	214.3

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 6-10, all the intersections except Stoddard Wells Road at Station Access #2 operate at unacceptable conditions during the analysis period.

Comparing the results of 2030 Baseline plus EMU conditions to the 2030 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersections already operating at LOS F would continue to operate at LOS F.

6.1.6 Mitigation Measures

EXISTING PLUS DMU CONDITIONS

As indicated in Table 6-3, intersections at Outer Highway and I-15 northbound ramps and Stoddard Wells Road and I-15 southbound on-ramp are significantly impacted by the proposed project. To mitigate these intersections, the following mitigation measures are proposed:

- #1: Signalize intersection of Outer Highway at I-15 northbound ramps.
- #4: Signalize intersection of Stoddard Wells Road at I-15 southbound off-ramp.

After applying the above mitigation measures to the existing roadway network, the intersection level of service was calculated. Table 6-11 presents the results of the Existing plus DMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix. The signal warrant analysis at both these intersections indicates that the warrant for peak hour (Warrants 3A and 3B) are met. The signal warrant analysis worksheets are provided in the Appendix. As indicated in Table 6-11, signalization at both the impacted intersections improves the operating conditions to acceptable levels (LOS C).

Table 6-11
Victorville Option 1 - Existing plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	Existing plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Signalized	C	20.9
4	Stoddard Wells Rd & I-15 SB Off-Ramp	Signalized	C	20.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

EXISTING PLUS EMU CONDITIONS

As indicated in Table 6-4, all the existing intersections except project access roads are significantly impacted by the proposed project. To mitigate these intersections, following mitigation measures are proposed:

- #1: Signalize intersection of Outer Highway at I-15 northbound ramps.
- #2: Signalize intersection of Outer Highway at Stoddard Wells Road and add a northbound left turn lane and a southbound right turn lane.

- #3: Signalize the intersection of Stoddard Wells Road at I-15 southbound on-ramp.
- #4: Signalize the intersection of Stoddard Wells Road at I-15 southbound off-ramp.

After applying the above mitigation measures to the existing roadway network, intersection level of service was calculated. Table 6-12 presents the results of the Existing plus EMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix. The signal warrant analysis indicates that the warrant for peak hour (Warrants 3A and 3B) are met for intersections 1, 2 and 4 and only Warrant 3B is satisfied for intersection 3. The signal warrant analysis worksheets are provided in the Appendix.

Table 6-12
Victorville Option 1 - Existing plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	Existing plus EMU Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Signalized	B	16.4
2	Outer Highway & Stoddard Wells Rd	Signalized	C	25.3
3	Stoddard Wells Rd & I-15 SB On-Ramp	Signalized	D	41.7
4	Stoddard Wells Rd & I-15 SB Off-Ramp	Signalized	A	7.3

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 6-12, installing traffic signals at both the impacted intersections improves the operating conditions to acceptable levels (LOS D or better).

2013 BASELINE CONDITIONS

As indicated in Table 6-5, three study intersections operate at unacceptable conditions in the 2013 baseline conditions. To improve operating conditions at these intersections and accommodate the future volume growth, following mitigation measures are proposed:

- #1: Signalize the intersection of Outer Highway at I-15 northbound ramps and add an eastbound right turn lane.
- #2: Signalize the intersection of Outer Highway at Stoddard Wells Road and add a northbound left turn lane and southbound right turn lane.
- # 3: Signalize the intersection of Stoddard Wells Road at I-15 southbound on-ramp and add a southbound left turn lane.

After applying above mitigation measures to the existing roadway network, intersection level of service was calculated. Table 6-13 presents the results of 2013 baseline mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix. The signal warrant analysis indicates that the warrant for peak hour (Warrants 3A and 3B) are met for intersections 1 and 2 and only Warrant 3B is satisfied for intersection 3. The signal warrant analysis worksheets are provided in the Appendix.

As indicated in Table 6-13, applying the proposed mitigation measures at the impacted intersections improves the operating conditions to acceptable levels (LOS C or better).

Table 6-13
Victorville Option 1 – 2013 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline Mitigation Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Signalized	A	8.9
2	Outer Highway & Stoddard Wells Rd	Signalized	C	22.5
3	Stoddard Wells Rd & I-15 SB On-Ramp	Signalized	A	7.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

2013 Baseline plus DMU Conditions

As indicated in Table 6-6, four study intersections operate at unacceptable conditions in the 2013 baseline plus DMU conditions. To improve the operating conditions at these intersections, along with the mitigation measures identified in the 2013 Baseline conditions, the following mitigation measures are proposed:

- # 1: Add a second eastbound right turn lane at Outer highway and I-15 northbound ramps intersection.
- # 4: Signalize intersection of Stoddard Wells Road at I-15 southbound off-ramp

After applying the mitigation measures from 2013 baseline conditions and the mitigation measures suggested above to the existing roadway network, intersection level of service was calculated. Table 6-14 presents the results of 2013 baseline plus DMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix. The signal warrant analysis at intersection 4 indicates that the warrant for peak hour (Warrants 3A and 3B) is met. The signal warrant analysis worksheet is provided in the Appendix.

As indicated in Table 6-14, the impacted intersections operating conditions improve to acceptable levels (LOS B or better).

Table 6-14
Victorville Option 1 - 2013 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Signalized	A	8.3
2	Outer Highway & Stoddard Wells Rd	Signalized	B	11.4
3	Stoddard Wells Rd & I-15 SB On-Ramp	Signalized	B	15.2
4	Stoddard Wells Rd & I-15 SB Off-Ramp	Signalized	A	7.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

2013 BASELINE PLUS EMU CONDITIONS

As indicated in Table 6-7, four study intersections operate at unacceptable conditions in the 2013 baseline plus EMU conditions. To improve the operating conditions at these intersections, along with the mitigation measures identified in the 2013 Baseline conditions, following mitigation measure are proposed:

- #1: Add a second eastbound right turn lane at Outer Highway and I-15 northbound ramps intersection.
- #2: Add a second northbound left turn lane and second southbound right turn lane at Stoddard Wells Road and Outer Highway intersection.
- #3: Add a southbound left turn lane at Stoddard Wells Road and I-15 southbound on-ramp intersection.
- #4: Signalize the intersection of Stoddard Wells Road at I-15 southbound off-ramp

After applying mitigation measures from 2013 baseline conditions and the mitigation measrues suggested above to the existing roadway network, intersection level of service was calculated. Table 6-15 presents the results of 2013 baseline plus EMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix. The signal warrant analysis at intersection 4 indicates that the warrant for peak hour (Warrants 3A and 3B) is met. The signal warrant analysis worksheet is provided in the Appendix.

Table 6-15
Victorville Option 1 - 2013 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	Outer Highway & I-15 NB Ramps	Signalized	B	19.5
2	Outer Highway & Stoddard Wells Road	Signalized	B	16.4
3	Stoddard Wells Road & I-15 SB On-Ramp	Signalized	C	28.8
4	Stoddard Wells Road & I-15 SB Off-Ramp	Signalized	B	27.5

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 6-15, the impacted intersections operating conditions improve to acceptable levels (LOS C or better).

2030 BASELINE CONDITIONS

As indicated in Table 6-8, both the study intersections operate at unacceptable conditions in the 2030 baseline conditions. To mitigate these intersections and accommodate the future volume growth, following mitigation measures are proposed:

- #7: Add an eastbound left turn lane and an eastbound through lane to the intersection of Stoddard Wells Road at I-15 southbound ramps.

- #8: Add an eastbound left turn lane and a northbound right turn late at the intersection of Stoddard Wells Road at I-15 northbound ramps.

After applying above mitigations to the existing roadway network, the intersection level of service was calculated. Table 6-16 presents the results of 2030 baseline mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 6-16
Victorville Option 1 – 2030 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline Mitigation Conditions	
			LOS	Delay[1]
7	Stoddard Wells Rd and I-15 SB Ramps	Signalized	E	61.5
8	Stoddard Wells Rd and I-15 NB Ramps	Signalized	F	83.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 6-16, both the study intersections continue to operate at unacceptable conditions even when mitigated.

The addition of project volumes at these intersections operating at unacceptable conditions would only worsen the operating conditions. Hence mitigation analysis for 2030 Baseline plus DMU and 2030 Baseline plus EMU conditions was not performed. However, the intersection of Stoddard Wells Road at Station Access #1 can be mitigated under the DMU and EMU conditions with the addition of third southbound lane. With this mitigation, the intersection operating condition improves to LOS C with 25.3 seconds of delay under DMU conditions and to LOS D with 49.6 seconds of delay under EMU conditions.

6.1.7 Queuing Analysis

Queuing analysis was performed to identify the required length of turn pockets under the future year 2030 cumulative conditions at the ramp locations. Table 6-17 presents the results of queuing analysis for 2030 baseline and project conditions with and without mitigations. Queuing analysis worksheets are included in the Appendix.

It can be noted from table 6-17 that the queue lengths under the mitigated conditions are considerably lower than the baseline conditions. However, some of the turn pockets experience higher queues under the mitigated conditions than the baseline conditions. This occurs because of the signal timing, which provides more green time to the heavier traffic volumes movements to bring the operating conditions at the intersection to acceptable levels. For example, under the 2030 baseline conditions, the westbound left-turn and right-turn queue lengths are shorter than the 2030 mitigated conditions.

Table 6-17
Victorville Option 1 – Queuing Analysis

	Intersection	Movement	95th % queue length (ft)		
			2030	2030 + DMU	2030 + EMU
Baseline Conditions					
7	Stoddard Wells Rd & I-15 SB Ramps	EBL	947	1050	1048
		EBR	33	63	7
		WBL	82	83	76
		WBR	54	156	265
		NBL	200	336	348
		SBL	141	211	223
8	Stoddard Wells Rd & I-15 NB Ramps	EBL	412	430	464
		WBR	21	23	25
		NBL	289	829	1011
		NBR	1861	1768	1882
With Mitigations					
7	Stoddard Wells Rd & I-15 SB Ramps	EBL	608	718	846
		EBR	22	m29	43
		WBL	115	102	130
		WBR	323	228	346
		NBL	197	290	312
		SBL	139	180	173
8	Stoddard Wells Rd & I-15 NB Ramps	EBL	187	175	218
		WBR	21	21	26
		NBL	269	347	414
		NBR	1207	997	1155
SOURCE: DMJM Harris, 2008.					

6.2 Victorville Station Location Option 2

The proposed station in Victorville would be located along the west side of I-15 between the two existing Stoddard Wells Road interchanges. Access to this station would be via the existing northerly Stoddard Wells Road interchange.

6.2.1 Existing Conditions

EXISTING ROADWAY NETWORK

The two Stoddard Wells Road interchanges with I-15 will provide the most direct regional access to the proposed Victorville train station. Currently the Stoddard Wells Road in this area has a single travel lane in each direction and because of the relatively low traffic volumes, intersections in the area are stop controlled. The existing lane geometry at the Victorville study intersections is shown in Figure 6-5.

EXISTING INTERSECTION OPERATIONS

Based on the station location options, following intersections in the vicinity of the station location were identified for analysis purposes:

- Stoddard Wells Road and I-15 NB Ramps
- Stoddard Wells Road and Quarry Road
- I-15 SB Ramps and Quarry Road

The afternoon peak hour turning movement counts were obtained at the study intersections and are presented in Figure 6-6.

Intersection Level of Service (LOS) conditions were analyzed for weekday PM peak period (4:00 PM to 6:00 PM) at the study intersections. The results of the analysis are presented in Table 6-18**.** SYNCHRO analysis worksheets are provided in the Appendix.

Table 6-18
Victorville Option 2 - Existing Conditions LOS

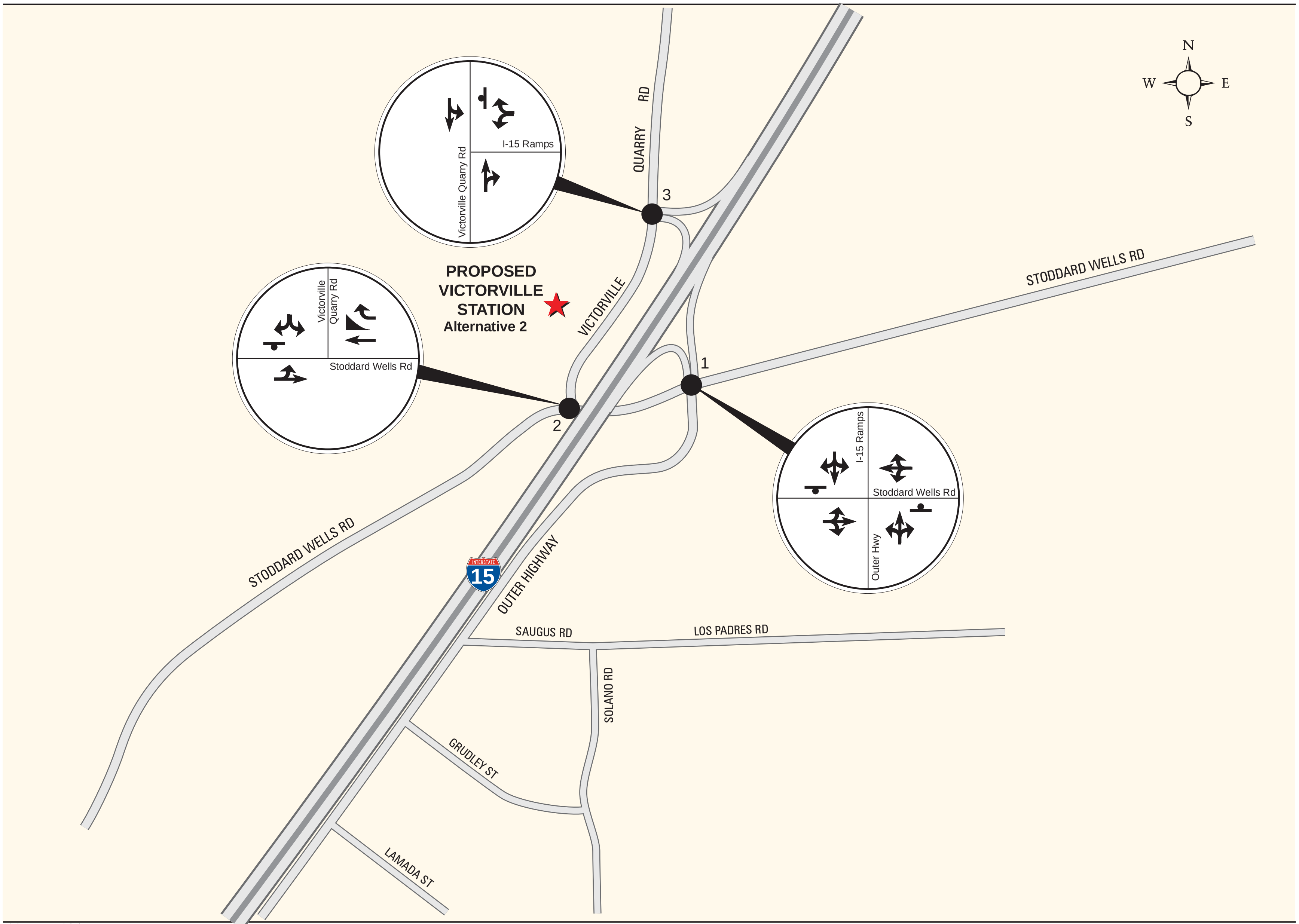
Intersection		Traffic Control	Existing Conditions	
			LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Unsignalized[2]	A (SB)	10.0
2	Stoddard Wells Rd and Quarry Road	Unsignalized[2]	A (SB)	8.6
3	I-15 SB Ramps and Quarry Road	Unsignalized[2]	A (WB)	8.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound, WB=Westbound

As indicated in Table 6-18, all the study intersections operate at acceptable conditions under existing conditions.

In Victorville, LOS A through D is considered satisfactory levels, and LOS E and F conditions are considered unsatisfactory service levels. Unsignalized intersections are considered to operate at unsatisfactory conditions if one approach operates at LOS E or F and Caltrans peak hour volume signal warrants are met.

AECOM



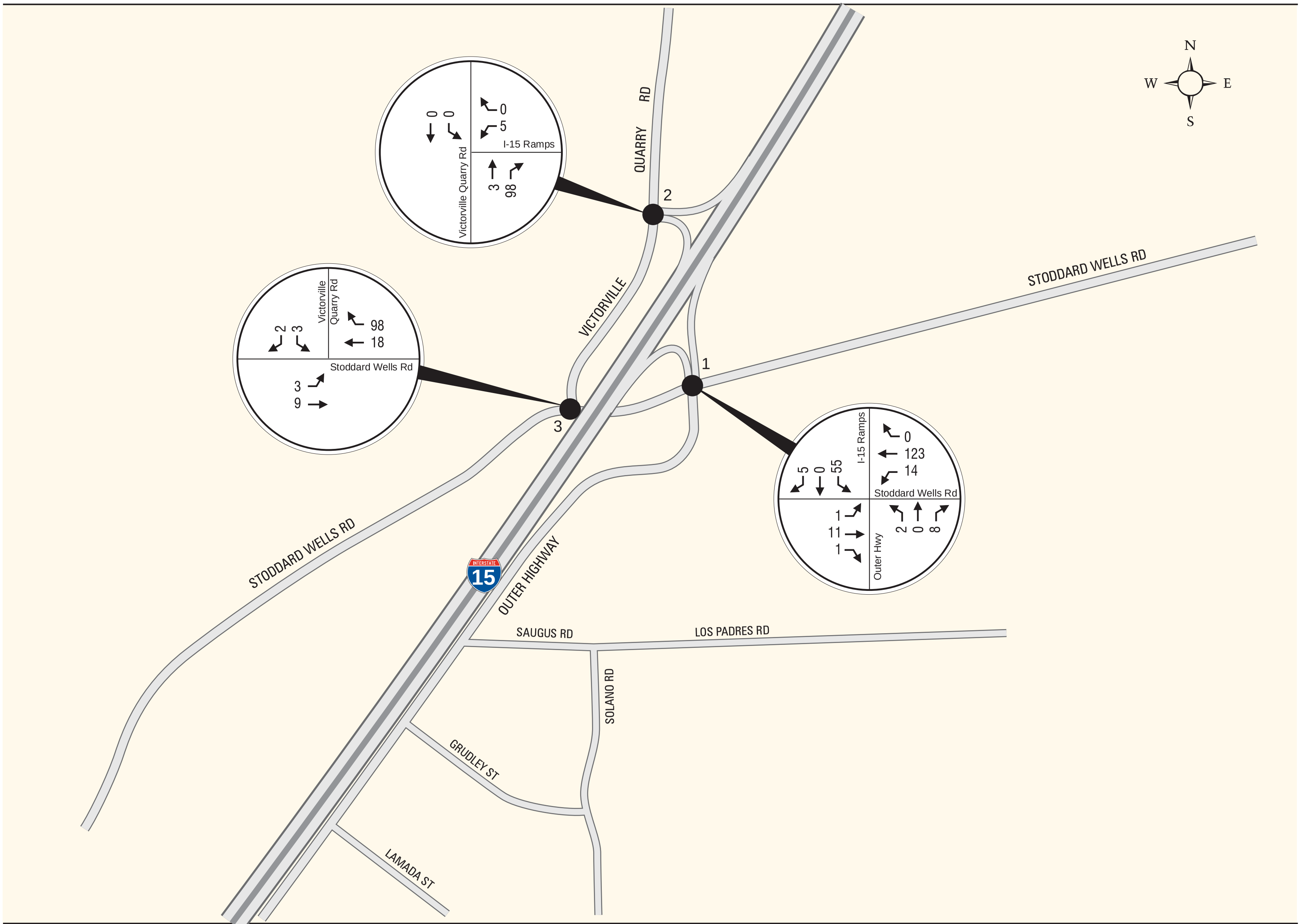
existing geometry alt 2.ai

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-5

EXISTING INTERSECTION LANE GEOMETRY

Victorville Station Alternative 2



DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-6

EXISTING INTERSECTION TRAFFIC VOLUMES

Victorville Station Alternative 2

6.2.2 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- Existing plus Project Conditions;
- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project Conditions.

SIGNIFICANCE CRITERIA

The following are the significance criteria used by the City of Victorville and San Bernardino County CMP guidelines for the determination of impacts associated with a proposed project:

- If the proposed site adds 5% or more to the peak hour traffic of an intersection.
- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted.

PROJECT TRAVEL DEMAND

The Victor Valley Area Transportation Study (VVATS) travel demand forecasting model was used to develop the base “no-project” travel forecasts for future year 2013 and 2030 traffic analysis. The City of Victorville provided future year 2035 travel forecasts from the model to DMJM Harris. DMJM Harris has applied a straight line method to interpolate the intermediate year growth factors for each network link in the model. The calculated growth factors were applied to the existing volumes to generate analysis year volumes. The growth factor calculations are presented in the Appendix. The project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 6-7. This station is served primarily by I-15 and Stoddard Wells Road. Due to its proximity to the northern I-15 / Stoddard Wells Road interchange, it is assumed that all vehicles generated by the proposed station would use this interchange. Hence, no project traffic is assigned to the southern I-15 / Stoddard Wells Road interchange.

EXISTING PLUS PROJECT CONDITIONS

a) Existing plus Diesel Electric Multiple Unit (DMU) Alternative Conditions

Based on the trip distribution presented in Figure 6-7, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for existing conditions are presented in the Appendix. These project trips were added to the existing volumes to generate the Existing plus DMU volumes.

Based on the Existing plus DMU volumes and the existing geometry, intersection level of service analysis was performed. Table 6-19 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 6-19, all the study intersections operate at acceptable conditions under existing plus DMU project conditions.

Table 6-19
Victorville Option 2 – Existing plus DMU Conditions LOS

Intersection		Traffic Control	Existing Conditions		Existing plus DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Stoddard Wells Road & I-15 NB Ramps	Unsignalized[2]	A (SB)	10.0	D (SB)	28.8
2	Stoddard Wells Road & Quarry Road	Unsignalized[2]	A (SB)	8.6	C (SB)	25.0
3	I-15 SB Ramps & Quarry Road	Unsignalized[2]	A (WB)	8.8	B (WB)	10.8
4	Quarry Road & Station Access #1	Unsignalized[2]	-	-	A (NB)	9.3
5	Stoddard Wells Road & Station Access #2	Unsignalized[2]	-	-	B (SB)	13.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, WB=Westbound

b) Existing plus Electric Multiple Unit (EMU) Alternative Conditions

Based on the trip distribution presented in Figure 6-7, project trips accessing the station were assigned to the analysis intersections. The project trips for EMU alternative conditions for existing conditions are presented in the Appendix. These project trips were added to the existing volumes to generate the Existing plus EMU volumes.

Based on the Existing plus EMU volumes and the existing geometry, intersection level of service analysis was performed. Table 6-20 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 6-20, all the study intersections operate at acceptable conditions except Stoddard Wells Road and I-15 northbound ramps and Stoddard Wells Road and Quarry Road intersections.

DMJM HARRIS | AECOM

Victorville Station trip distribution 2.ai

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-7

VICTORVILLE STATION TRIP DISTRIBUTION

Alternative 2

Table 6-20
Victorville Option 2 – Existing plus EMU Conditions LOS

Intersection		Traffic Control	Existing Conditions		Existing plus EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Stoddard Wells Road & I-15 NB Ramps	Unsignalized[2]	A (SB)	10.0	F (NB)	-
2	Stoddard Wells Road & Quarry Road	Unsignalized[2]	A (SB)	8.6	F (SB)	63.2
3	I-15 SB Ramps & Quarry Road	Unsignalized[2]	A (WB)	8.8	B (WB)	12.0
4	Quarry Road & Station Access #1	Unsignalized[2]	-	-	A (NB)	9.9
5	Stoddard Wells Road & Station Access #2	Unsignalized[2]	-	-	C (SB)	19.9

Notes: SOURCE: DMJM Harris, 2008.

1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, WB=Westbound

Comparing the results of the Existing plus EMU conditions to the Existing conditions level of service, it can be noted that due to the addition of project volumes, intersections approaches at Stoddard Wells Road at I-15 northbound ramps and Stoddard Wells Road at Quarry Road deteriorate from acceptable (LOS A) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the existing volumes at these intersections, project impacts at these intersections are considered to be significant.

6.2.3 2013 Opening Year Conditions

2013 BASELINE CONDITIONS

Future year 2013 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, the existing intersection geometry was assumed for future year 2013 conditions. Based on the future base volumes and the existing geometry, intersection level of service analysis was performed.

Table 6-21 presents the results of intersection operating conditions for future year 2013 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 6-21
Victorville Option 2 – 2013 Baseline Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Unsignalized[2]	C (SB)	17.3
2	Stoddard Wells Rd and Quarry Road	Unsignalized[2]	A (SB)	9.4
3	I-15 SB Ramps and Quarry Road	Unsignalized[2]	A (WB)	9.6

Notes:
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound, WB=Westbound

SOURCE: DMJM Harris, 2008.

As indicated in Table 6-21, all the study intersections continue to operate at acceptable conditions under 2013 Baseline conditions.

2013 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 6-7, project trips accessing the station were assigned to the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus DMU volumes. For analysis purposes, the existing intersection geometry was assumed for future year 2013 conditions.

Based on the 2013 Baseline plus DMU volumes and the existing geometry, intersection level of service analysis was performed. Table 6-22 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 6-22, intersection of Stoddard Wells Road at I-15 northbound ramps operates at unacceptable conditions (LOS F) while all others operate at acceptable conditions (LOS D or better).

Table 6-22
Victorville Option 2 – 2013 Baseline plus DMU Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions		2013 Baseline DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Unsignalized[2]	C (SB)[3]	17.3	F (NB[3])	-
2	Stoddard Wells Rd and Quarry Road	Unsignalized[2]	A (SB)[3]	9.4	D (SB)[3]	34.2
3	I-15 SB Ramps and Quarry Road	Unsignalized[2]	A (WB)[3]	9.6	C (WB)[3]	16.0
4	Quarry Road and Station Access #1	Unsignalized[2]	-	-	A (NB)[3]	9.3
5	Stoddard Wells Road and Station Access #2	Unsignalized[2]	-	-	C (SB)[3]	15.9

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB= Northbound, SB=Southbound, WB=Westbound

Comparing the results of 2013 Baseline plus DMU conditions to the 2013 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersections approaches at Stoddard Wells Road and I-15 northbound ramps deteriorates from acceptable (LOS C) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the existing volume at these intersections, the project impacts at these intersections are considered to be significant.

2013 Baseline plus EMU Conditions

Based on the trip distribution presented in Figure 6-7, project trips accessing the station were assigned to the analysis intersections. The project trips for EMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and the existing geometry, intersection level of service analysis was performed. Table 6-23 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 6-23, intersections of Stoddard Wells Road at northbound ramps intersection and Stoddard Wells Road at Quarry Road intersection operate at unacceptable conditions while all others operate at acceptable conditions.

Comparing the results of 2013 Baseline plus EMU conditions to the 2013 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersections of Stoddard Wells Road and I-15 northbound ramps and Stoddard Wells Road at Quarry Road deteriorate from acceptable (LOS C or better) to unacceptable (LOS F) conditions. As the project trips add more than 5% of existing volume at these intersections, project impacts at these intersections are considered to be significant.

Table 6-23
Victorville Option 2 – 2013 Baseline plus EMU Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions		2013 Baseline EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Unsignalized[2]	C (SB) [3]	17.3	F (NB) [3]	-
2	Stoddard Wells Rd and Quarry Road	Unsignalized[2]	A (SB) [3]	9.4	F (SB) [3]	141.8
3	I-15 SB Ramps and Quarry Road	Unsignalized[2]	A (WB) [3]	9.6	C (WB) [3]	22.3
4	Quarry Road and Station Access #1	Unsignalized[2]	-	-	D (NB) [3]	26.5
5	Stoddard Wells Road and Station Access #2	Unsignalized[2]	-	-	A (NB) [3]	9.9

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB= Northbound, SB=Southbound, WB=Westbound

6.2.4 2030 Cumulative Conditions

Under this scenario, the proposed improvements include signalization at all study intersections. Future year 2030 roadway geometry and signal control are presented in Figure 6-8.

2030 BASELINE CONDITIONS

Future year 2030 base volumes were calculated by applying a growth factor to the existing year volumes. These volumes are presented in the Appendix.

Based on the future base volumes and geometry presented in Figure 6-8, intersection level of service analysis was performed. Table 6-24 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

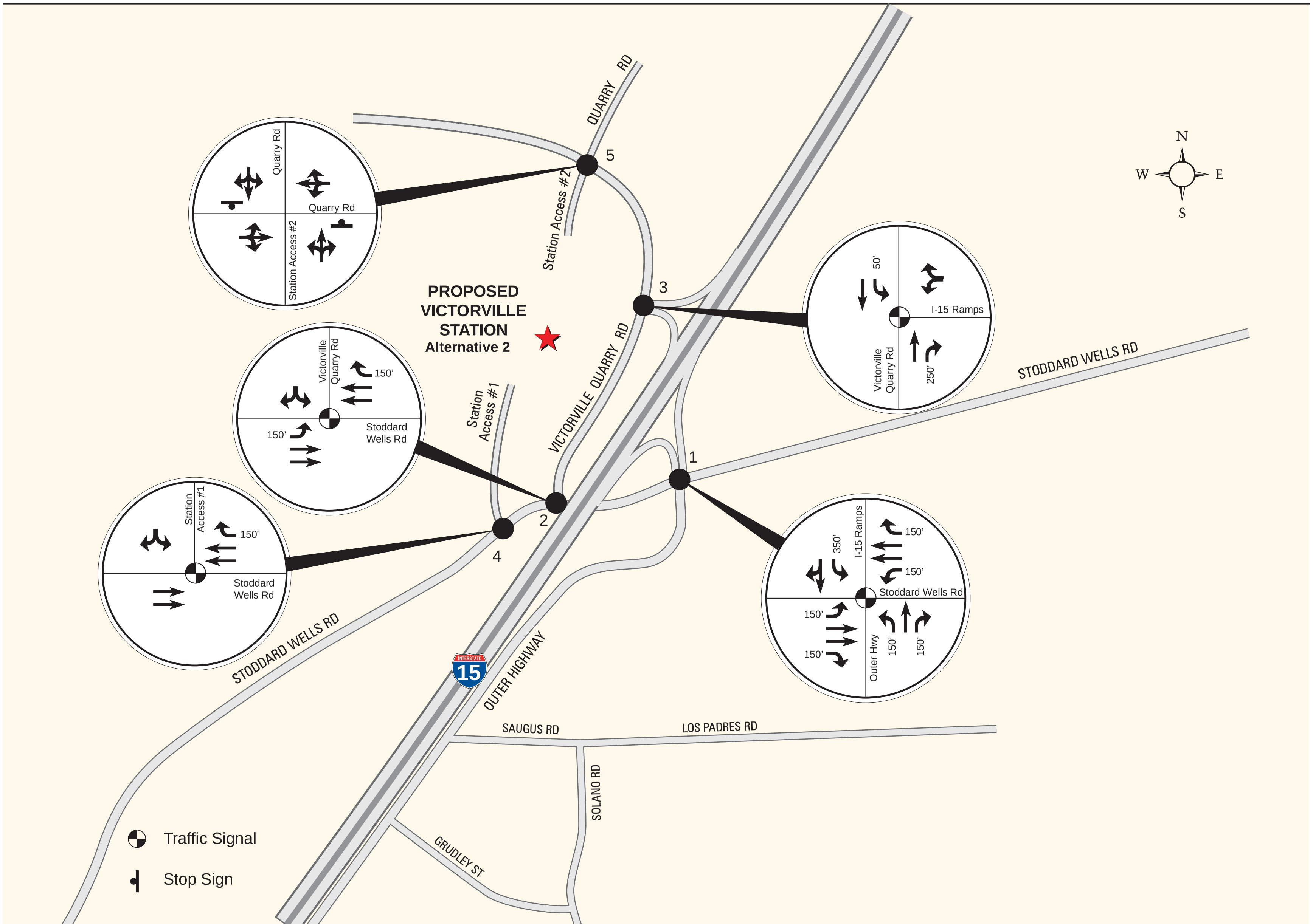
As indicated in Table 6-24, all the study intersections operate at acceptable conditions under this scenario.

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 6-7, project trips accessing the station were assigned to the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes and geometry presented in Figure 6-8, intersection level of service analysis was performed. Table 6-25 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

DMJM HARRIS | AECOM



Victorville 2030 geometry 2.ai

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6-8

FUTURE YEAR 2030 INTERSECTION LANE GEOMETRY

Victorville Station Alternative 2

Table 6-24
Victorville Option 2 - 2030 Baseline Conditions LOS

	Intersection	Traffic Control	2030 Baseline Conditions LOS	2030 Baseline Conditions Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Signalized	C	28.3
2	Stoddard Wells Rd and Quarry Road	Signalized	B	19.2
3	I-15 SB Ramps and Quarry Road	Signalized	C	31.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 6-25, all the study intersections operate at acceptable conditions under this scenario.

Table 6-25
Victorville Option 2 - 2030 Baseline plus DMU Conditions LOS

	Intersection	Traffic Control	2030 Baseline Conditions		2030 Baseline DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Stoddard Wells Road & I-15 NB Ramps	Signalized	C	28.3	D	49.4
2	Stoddard Wells Road & Quarry Road	Signalized	B	19.2	B	15.4
3	I-15 SB Ramps & Quarry Road	Signalized	C	31.2	C	22.9
4	Quarry Road & Station Access #1	Unsignalized[2]	-	-	A (NB) [3]	2.6
5	Stoddard Wells Road & Station Access #2	Signalized	-	-	A	7.3

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB= Northbound, SB=Southbound, WB=Westbound

2030 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 6-7, project trips accessing the station were assigned to the analysis intersections. The project trips for EMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2030 Baseline plus EMU volumes geometry presented in Figure 6-8, intersection level of service analysis was performed. Table 6-26 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 6-26, all the study intersections operate at acceptable conditions except the Stoddard Wells Road and I-15 northbound ramps intersection.

Table 6-26
Victorville Option 2 - 2030 Baseline plus EMU Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions		2030 Baseline EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	Stoddard Wells Road & I-15 NB Ramps	Signalized	C	28.3	F	99.2
2	Stoddard Wells Road & Quarry Road	Signalized	B	19.2	B	19.6
3	I-15 SB Ramps & Quarry Road	Signalized	C	31.2	C	23.9
4	Quarry Road & Station Access #1	Unsignalized[2]	-	-	A (NB) [3]	2.8
5	Stoddard Wells Road & Station Access #2	Signalized	-	-	B	11.0

Notes:
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB= Northbound, SB=Southbound, WB=Westbound

SOURCE: DMJM Harris, 2008.

Comparing the results of 2030 Baseline plus EMU conditions to the 2030 Baseline conditions level of service, it can be noted that due to the addition of project volumes, intersection of Stoddard Wells Road and I-15 northbound ramps and deteriorates from acceptable (LOS C) to unacceptable (LOS F) conditions.

6.2.5 Mitigation Measures

EXISTING PLUS EMU CONDITIONS

As indicated in Table 6-20, two existing intersections are significantly impacted by the proposed project. To mitigate these intersections, following mitigation measures are proposed:

- # 1: Signalize intersection of Stoddard Wells Road at I-15 northbound ramps.
- # 2: Signalize intersection of Stoddard Wells Road at Quarry Road.

After applying above mitigation measures to the existing roadway network, the intersection level of service was calculated. Table 6-27 presents the results of Existing plus EMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 6-27, intersections of Stoddard Wells Road at I-15 northbound ramps and Stoddard Wells Road at Quarry Road operate at acceptable conditions (LOS B or better) with mitigation measures.

Table 6-27
Victorville Option 2 - Existing plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	Existing plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Signalized	B	12.9
2	Stoddard Wells Rd and Quarry Road	Signalized	A	6.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

The signal warrant analysis at intersection 1 indicates that the warrant for peak hour (Warrants 3A and 3B) is met while it is not satisfied at intersection 2. The signal warrant analysis worksheets are provided in the Appendix.

2013 BASELINE PLUS DMU CONDITIONS

As indicated in Table 6-22, one study intersection operates at unacceptable conditions in the 2013 baseline plus DMU conditions. To mitigate this intersection, following mitigation measure is proposed:

- # 1: Signalize intersection of Stoddard Wells Road at I-15 northbound ramps.

After applying above mitigation measure to the existing roadway network, the intersection level of service was calculated. Table 6-28 presents the results of 2013 baseline plus DMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix. The signal warrant analysis at intersection 1 indicates that the warrant for peak hour (Warrants 3A and 3B) is met. The signal warrant analysis worksheets is provided in the Appendix.

Table 6-28
Victorville Option 2 - 2013 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Signalized	C	22.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 6-28, intersection of Stoddard Wells Road at I-15 northbound ramps operates at acceptable conditions (LOS C) with the mitigation measures.

2013 BASELINE PLUS EMU CONDITIONS

As indicated in Table 6-23, two study intersections operate at unacceptable conditions in the 2013 baseline plus EMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- # 1: Signalize the intersection of Stoddard Wells Road at I-15 northbound ramps and add northbound left turn lane.
- # 2: Signalize the intersection of Stoddard Wells Road at Quarry Road.

After applying above mitigation measures to the existing roadway network, the intersection level of service was calculated. Table 6-29 presents the results of 2013 baseline plus EMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 6-29, the intersections of Stoddard Wells Road at I-15 northbound ramps and Stoddard Wells Road at Quarry Road operate at acceptable conditions (LOS C or better) with mitigation measures.

Table 6-29
Victorville Option 2 - 2013 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	Stoddard Wells Rd and I-15 NB Ramps	Signalized	C	31.0
2	Stoddard Wells Rd and Quarry Rd	Signalized	A	9.5

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

The signal warrant analysis at intersection 1 indicates that the warrant for peak hour (Warrants 3A and 3B) is met while it is not satisfied at intersection 2. The signal warrant analysis worksheets are provided in the Appendix

2030 BASELINE PLUS EMU CONDITIONS

As indicated in Table 6-26, one study intersection operates at unacceptable conditions in the 2030 baseline plus EMU conditions. To mitigate this intersection, following mitigation measure is proposed:

- #11**:** Add a second southbound right turn lane at the intersection of Stoddard Wells Road at I-15 northbound ramps.

After applying above mitigation to the 2030 base roadway network, the intersection level of service was calculated. Table 6-30 presents the results of 2030 baseline plus EMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 6-30
Victorville Option 2 - 2030 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	Stoddard Wells Rd & I-15 NB Ramps	Signalized	D	50.2

Notes: SOURCE: DMJM Harris, 2008.

1. Delay reported in seconds per vehicle

As indicated in Table 6-30, intersection of Stoddard Wells Road at I-15 northbound ramps operates at acceptable conditions (LOS D) with mitigation measure.

6.2.6 Queuing Analysis

Queuing analysis was performed to identify the required length of turn pockets under the future year 2030 cumulative conditions at the ramp locations. Table 6-31 presents the results of queuing analysis for 2030 baseline and project conditions with and without mitigation measures. The queuing analysis worksheets are included in the Appendix.

It can be noted from table 6-31 that the queue lengths under the mitigated conditions are considerably shorter than the baseline conditions.

Table 6-31
Victorville Option 2 – Queuing Analysis

	Intersection	Movement	95th % queue length (ft)		
			2030	2030 + DMU	2030 + EMU
Baseline Conditions					
1	Stoddard Wells Rd & I-15 NB Ramps	EBL	35	59	98
		EBR	170	68	62
		WBL	119	165	235
		WBR	16	20	30
		NBL	178	230	343
		NBR	43	51	36
		SBL	146	105	216
		SBR	36	712	1379
3	I-15 SB Ramps & Quarry Rd	NBR	51	52	348
		SBL	4	60	109
With Mitigations					
1	Stoddard Wells Rd & I-15 NB Ramps	EBL	N/A	N/A	72
		EBR			66
		WBL			199
		WBR			24
		NBL			284
		NBR			46
		SBL			216
		SBR			542
3	I-15 SB Ramps & Quarry Rd	NBR	N/A	N/A	298
		SBL			109

SOURCE: DMJM Harris, 2008.

7.0 LAS VEGAS AREA ANALYSIS

7.1 Downtown Station Location Alternative

The proposed Downtown station would be located east of I-15 in the downtown area. This station is bounded by Union Pacific Railroad to the west, South Main Street to the east, West Charleston Boulevard to the south and West Bonneville Avenue to the north. The proposed downtown station can be accessed from I-15 via ramps located at South Grand Central Parkway and West Charleston Boulevard and from I-515 via ramps located at North Las Vegas Boulevard.

7.1.1 Existing Conditions

Local Access. The existing local access roadway network for Las Vegas, Nevada near the proposed station locations are described below. These descriptions were adopted from "Roadway Functional Classification" map published by Federal Aid Highway System of Nevada in 2004. This map is included in the Appendix.

Las Vegas Boulevard is a two-way north-south minor arterial. The roadway generally has three lanes in each direction with sidewalks on both sides of the street in the study area. In the vicinity of the proposed Downtown station location, this street provides access to I-515 via the ramps located north of the station.

Main Street is a two-way north-south minor arterial. This roadway extends between Las Vegas Boulevard / 5th Street at the north and Las Vegas Boulevard / E St. Louis Avenue intersection at the south. In the vicinity of the proposed Downtown station location, this street generally has one lane in each direction with sidewalks on both sides of the street. On-street parking is permitted on the east side of the street.

Grand Central Parkway is a two-way north-south minor collector. This roadway extends between Main Street at the north and Charleston Boulevard at the south. In the vicinity of the proposed Downtown station location, this street generally has two lanes in each direction with a sidewalk on the west side of the street. On-street parking is generally not permitted on both sides of the street.

Martin Luther King Boulevard is a two-way north-south minor arterial. This roadway extends between Craig Road at the north and Oakey Boulevard at the south. In the vicinity of the proposed Downtown station location, this street generally has two lanes in each direction with a sidewalk on the west side of the street. On-street parking is generally not permitted on both sides of the street. Southbound I-15 from the Downtown station can be accessed via the ramps on Martin Luther King Boulevard south of Charleston Avenue.

Rancho Drive is a two-way north-south roadway that extends between highway 95 at the north and I-15 at the south. In the vicinity of the proposed Downtown station location, this street generally has two lanes in each direction and a center turning lane, with sidewalks on both sides of the street. On-street parking is generally not permitted on both sides of the street.

Bonneville Avenue/Alta Drive is a two-way east-west minor arterial. Bonneville Avenue extends from east of I-15 to Charleston Boulevard. On the west of I-15, Bonneville Avenue continues as Alta Drive and extends west outside the project limits.

Charleston Boulevard is a two-way east-west principal arterial. This roadway extends from west of Decatur Boulevard to east of Las Vegas Boulevard. In the vicinity of the proposed Downtown station location, this street generally has three lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

EXISTING TRANSIT CONDITIONS

The proposed station locations in Las Vegas, Nevada are well served by public transit. Following section describes the various transit facilities operating near the proposed station locations:

- The **103-Decatur** is a 24-hour bus service running along Decatur Boulevard. This service runs from Decatur/Rome to Decatur/Tropicana with approximately 20 minute headways from 5:00AM to 8:00PM and 40-60 minute headways for the rest during weekdays.

- The **104-Valley View/ Torrey Pines** is running from Alexander/ Rancho to South Strip Transfer Terminal with approximately 30 minute headways from 4:30 AM to 7:00 PM and 40-60 minute headways for the rest during weekdays.

- The **105-Martin L. King** is a 24-hour bus service running along Martin Luther King Blvd. This service runs from Camino Al Norte/ Ann to Downtown Transportation Center with approximately 30 minute headways from 5:00AM to 8:00 PM and 60 minute headways for the rest during weekdays.

- The **113-Las Vegas Blvd** is a 24-hour service running along Las Vegas Blvd. This service connects from Las Vegas Blvd (Wal-mart Supercenter) to Downtown Transportation Center. This service runs with approximately 30 minute headways.

- The **204-Sahara** is a 24 hour bus service running along Sahara Avenue. This service runs from Sahara/ Fort Apache to Sahara/ Sloan intersection with approximately 20 minute headways from 5:00 AM to 8:00 PM and approximately 30-60 minute headways for the rest of the weekdays.

- The **206-Charleston** is a 24- hour bus service running along Charleston Blvd. This service runs from the Red Rock Station to the Charleston and Sloan intersection with approximately 45 minute headways for the weekdays and 20-35 minute headways for the weekends and holidays.

- The **207-Alta/Stewart** is running from Rainbow/ Westcliff to Bonanza/ Nellis with approximately 60 minute headways for Eastbound. For the Westbound, it runs approximately 30 minute headways from 5:30 AM to 6:30 PM and 40-60 minute headways for the rest during weekdays.

- The **Deuce-Las Vegas Blvd** is a 24-hour bus service running along Las Vegas Blvd. This service runs from Las Vegas/ Stewart to South Strip Transfer Terminal Center (SSTT) with 7 minute headways from 3:00 PM to 11:00 PM and 8-17 minute headways at all other times. This service stops at virtually every hotel, casino and every quarter mile in each direction along the Las Vegas Strip.

EXISTING PARKING CONDITIONS

On-Street parking is generally not permitted on any street in the local roadway network near the proposed station location, except the east side of Main Street.

EXISTING INTERSECTION OPERATIONS

The intersection analysis was performed using the Highway Capacity Manual (HCM) methodologies, a requirement of the Regional Transportation Commission, which was implemented using SYNCHRO Version 7 software. Level of Service thresholds and corresponding delays for signalized and unsignalized intersections are provided in Table 6-1.

In Clark County, LOS A through D is considered satisfactory levels, and LOS E and F conditions are considered unsatisfactory service levels. Unsignalized intersections are considered to operate at unsatisfactory conditions if one approach operates at LOS E or F and peak hour volume signal warrants are met.

Based on the station location options, intersections in the vicinity of the station location were identified for analysis purposes. Figure 7-1 presents the existing lane geometry at the study intersections. Intersection Level of Service (LOS) conditions were analyzed for weekday PM peak period (4:00 PM to 6:00 PM) at the study intersections. The results of the analysis are presented in Table 7-1. SYNCHRO analysis worksheets are provided in the Appendix.

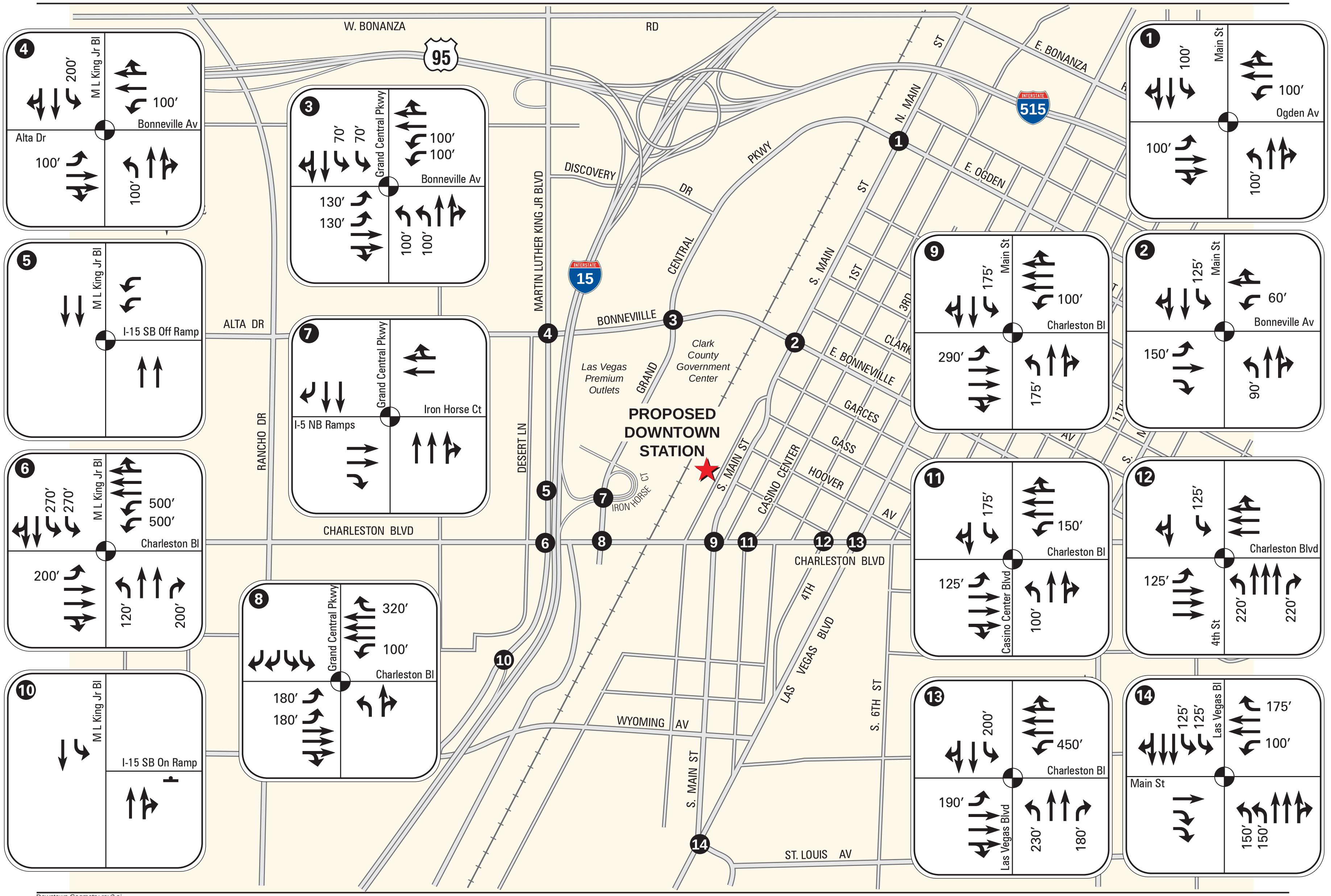
As indicated in Table 7-1, all the study intersections operate at acceptable conditions except two intersections along Martin Luther King at Charleston Boulevard and I-15 SB on-ramp and Grand Central Parkway at Charleston Boulevard that operate at unacceptable conditions (LOS F).

7.1.2 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project (DMU and EMU alternatives) Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project (DMU and EMU alternatives) Conditions

AECOM



Downtown Geometry rev2.ai

DESERT XPRESS PROPOSED LAS VEGAS DOWNTOWN STATION

Figure 7-1

EXISTING INTERSECTION GEOMETRY

Downtown Station

Table 7-1
Downtown Station Location Alternative - Existing Conditions LOS

Intersection		Traffic Control	Existing Conditions LOS	Existing Conditions Delay[1]
1	N. Main St & S. Grand Central Pkwy	Signalized	B	14.1
2	E. Bonneville & N. Main St	Signalized	D	52.1
3	E. Bonneville & S. Grand Central Pkwy	Signalized	C	30.7
4	W. Bonneville & S. MLK	Signalized	D	54.6
5	S. MLK & I-15 SB Off-Ramp	Signalized	A	9.5
6	S. MLK & W. Charleston	Signalized	F	117.3
7	S. Grand Central Pkwy & Iron Horse Ct / I-15 NB ramps	Signalized	B	16.9
8	S. Grand Central Pkwy & W. Charleston	Signalized	E	71.2
9	S. Main St & W. Charleston	Signalized	D	53.2
10	S. MLK & I-15 SB On-Ramp	Unsignalized[2]	F (NB)[3]	85.1
11	Casino Center & Charleston	Signalized	A	9.7
12	4th Street & Charleston	Signalized	B	10.5
13	Las Vegas Blvd & Charleston	Signalized	D	46.0
14	S. Las Vegas Blvd & S. Main St	Signalized	D	39.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound

SIGNIFICANCE CRITERIA

The following are the significance criteria required by the Regional Transportation Commission in Nevada for the determination of impacts associated with a proposed project:

- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted for site and non-site traffic.

PROJECT TRAVEL DEMAND

The Regional Transportation Commission (RTC) travel demand forecasting model was used to develop the base “no-project” travel forecasts for the future year 2013 and 2030 traffic analysis. RTC provided future year 2030 travel forecasts from the model to DMJM Harris. DMJM Harris has applied a straight line method to interpolate the intermediate year growth factors. The calculated growth factors were applied to the existing volumes to generate analysis year volumes. The growth factor calculations are presented in the Appendix. The additional project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 7-2. This station is served primarily by I-15 and Main Street in the north-south direction and Charleston Road and Bonneville Avenue in the east-west direction. Passengers at the train station would mainly originate or end their trips in commercial developments along ‘the Strip’. As such, most traffic would be using local streets instead of the freeways. Most traffic would head south as the station location is at the northern end of 'The Strip'. Most traffic coming from I-15 would use the Charleston Road interchange. Only a small percentage would use the on/off ramp of I-515.

7.1.3 2013 Conditions (Opening Year Analysis)

2013 BASELINE CONDITIONS

Future year 2013 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions.

Based on the 2013 base volumes and the existing geometry, intersection level service analysis was performed. Table 7-2 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 7-2, intersections along Martin Luther King at Bonneville Avenue, Charleston Boulevard and I-15 SB on-ramp and intersections of Bonneville Avenue at Main Street, Grand Central Parkway at Charleston Boulevard operate at unacceptable conditions (LOS E or F). All other intersections operate at acceptable conditions.

2013 BASELINE PLUS DIESEL-ELECTRIC MULTIPLE UNIT (DMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-2, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base volumes to generate the 2013 base plus DMU volumes.

Based on the 2013 Baseline plus DMU volumes and the existing geometry, intersection level service analysis was performed. Table 7-3 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-3, the intersections along Martin Luther King at Bonneville Avenue, Charleston Boulevard and I-15 SB on-ramp and the intersections of Bonneville Avenue at Main Street and Grand Central Parkway at Charleston Boulevard continue to operate at unacceptable conditions (LOS F), while the intersection of Main Street at Charleston deteriorates from acceptable (LOS D) to unacceptable conditions (LOS F) with the addition of project volumes. All other intersections operate at acceptable conditions.

Downtown Station Trip Distribution.ai

DESERT XPRESS PROPOSED LAS VEGAS DOWNTOWN STATION

Figure 7-2

DOWNTOWN STATION TRIP DISTRIBUTION

Table 7-2
Downtown Station Location Alternative - 2013 Baseline Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions LOS	2013 Baseline Conditions Delay[1]
1	N. Main St & S. Grand Central Pkwy	Signalized	B	13.2
2	E. Bonneville & N. Main St	Signalized	F	82.2
3	E. Bonneville & S. Grand Central Pkwy	Signalized	C	34.2
4	W. Bonneville & S. MLK	Signalized	E	56.3
5	S. MLK & I-15 SB Off-Ramp	Signalized	B	10.8
6	S. MLK & W. Charleston	Signalized	E	60.0
7	S. Grand Central Pkwy & Iron Horse Ct / I-15 NB ramps	Signalized	B	18.1
8	S. Grand Central Pkwy & W. Charleston	Signalized	E	79.2
9	S. Main St & W. Charleston	Signalized	D	54.9
10	S. MLK & I-15 SB On-Ramp	Unsignalized[2]	F (NB)[3]	154.3
11	Casino Center & Charleston	Signalized	A	9.9
12	4th Street & Charleston	Signalized	B	10.9
13	Las Vegas Blvd & Charleston	Signalized	D	46.8
14	S. Las Vegas Blvd & S. Main St	Signalized	D	40.3

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound

2013 BASELINE PLUS ELECTRIC MULTIPLE UNIT (EMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-2, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2013 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and geometry presented in Figure 7-1, intersection level service analysis was performed. Table 7-4 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-4, the intersections along Martin Luther King at Bonneville Avenue, Charleston Boulevard and I-15 SB on-ramp and the intersections of Grand Central Parkway at Charleston Boulevard and Bonneville at Main Street continue to operate at unacceptable conditions (LOS F) with the addition of project volumes. The intersection of Main Street at Charleston Boulevard deteriorates from acceptable conditions (LOS D) to unacceptable conditions (LOS F) with the addition of project volumes. All other intersections operate at acceptable conditions (LOS D or better).

Table 7-3
Downtown Station Location Alternative - 2013 Baseline plus DMU Conditions LOS

Intersection		2013 Baseline Conditions LOS	2013 Baseline Conditions Delay[1]	2013 Baseline plus DMU Conditions LOS	2013 Baseline plus DMU Conditions Delay[1]
1	N. Main St & S. Grand Central Pkwy	B	13.2	B	16.4
2	E. Bonneville & N. Main St	F	82.2	F	96.2
3	E. Bonneville & S. Grand Central Pkwy	C	34.2	C	33.9
4	W. Bonneville & S. MLK	E	56.3	E	56.2
5	S. MLK & I-15 SB Off-Ramp	B	10.8	B	13.3
6	S. MLK & W. Charleston	E	60.0	F	101.4
7	S. Grand Central Pkwy & Iron Horse Ct / I-15 NB ramps	B	18.1	B	19.7
8	S. Grand Central Pkwy & W. Charleston	E	79.2	F	96.0
9	S. Main St & W. Charleston	D	54.9	F	163.8
10	S. MLK & I-15 SB On-Ramp	F (NB)[3]	154.3	F (NB)[3]	236.7
11	Casino Center & Charleston	A	9.9	A	9.7
12	4th Street & Charleston	B	10.9	B	11.1
13	Las Vegas Blvd & Charleston	D	46.8	D	49.3
14	S. Las Vegas Blvd & S. Main St	D	40.3	D	46.4

Notes: SOURCE: DMJM Harris, 2008.

1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound

7.1.4 2030 Cumulative Conditions

In the future year 2030, the proposed roadway improvements in the vicinity of the Downtown station location include the following:

- Interchange reconfiguration at Charleston Boulevard and I-15 northbound and southbound ramps. This interchange will be configured as a Single Point Urban Interchange (SPUI) at Charleston Boulevard.
- Intersection of Martin Luther King Boulevard at Charleston Boulevard would be grade separated in the future.
- Bonneville Avenue would be one-way in the eastbound direction west of Main Street.

Due to the above roadway improvements, the existing southbound on and off ramp intersections at Martin Luther King Boulevard, the existing northbound ramps at Iron Horse Court and Grand Central Parkway and the existing at grade intersection at Martin Luther King Boulevard and Charleston Boulevard would not be analyzed under the 2030 cumulative conditions. Hence for SYNCHRO analysis, intersections 5, 6, 7 and 10 from previous scenarios were replaced by intersection 15 for the 2030 Cumulative (Baseline, DMU and EMU) conditions.

Table 7-4
Downtown Station Location Alternative
2013 Baseline plus EMU Conditions LOS

Intersection		2013 Baseline Conditions		2013 Baseline plus EMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	N. Main St & S. Grand Central Pkwy	B	13.2	B	17.9
2	E. Bonneville & N. Main St	F	82.2	F	103.6
3	E. Bonneville & S. Grand Central Pkwy	C	34.2	C	33.8
4	W. Bonneville & S. MLK	E	56.3	E	56.1
5	S. MLK & I-15 SB Off-Ramp	B	10.8	B	15.5
6	S. MLK & W. Charleston	E	60.0	F	125.7
7	S. Grand Central Pkwy & Iron Horse Ct / I-15 NB ramps	B	18.1	C	20.9
8	S. Grand Central Pkwy & W. Charleston	E	79.2	F	105.7
9	S. Main St & W. Charleston	D	54.9	F	240.8
10	S. MLK & I-15 SB On-Ramp	F (NB)[3]	154.3	F (NB)[3]	280.2
11	Casino Center & Charleston	A	9.9	A	9.7
12	4th Street & Charleston	B	10.9	B	11.2
13	Las Vegas Blvd & Charleston	D	46.8	D	51.2
14	S. Las Vegas Blvd & S. Main St	D	40.3	D	49.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound

2030 BASELINE CONDITIONS

Future year 2030 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix.

Based on the future base volumes and future analysis intersections, level of service analysis was performed. Table 7-5 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-5, the intersections of Bonneville at Main Street, Bonneville at Martin Luther King Boulevard, Grand Central Parkway at Charleston Boulevard, Main Street at Charleston Boulevard and the new SPUI interchange at Charleston Boulevard operate at unacceptable conditions (LOS E or F). All the other intersections operate at acceptable conditions during the analysis period.

Table 7-5
Downtown Station Location Alternative
2030 Baseline Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
1	N. Main St & S. Grand Central Pkwy	Signalized	B	13.4
2	E. Bonneville & N. Main St	Signalized	E	66.7
3	E. Bonneville & S. Grand Central Pkwy	Signalized	D	48.1
4	W. Bonneville & S. MLK	Signalized	E	65.8
8	S. Grand Central Pkwy & W. Charleston	Signalized	F	97.6
9	S. Main St & W. Charleston	Signalized	E	66.5
11	Casino Center & Charleston	Signalized	B	10.6
12	4th Street & Charleston	Signalized	B	12.0
13	Las Vegas Blvd & Charleston	Signalized	D	50.2
14	S. Las Vegas Blvd & S. Main St	Signalized	D	41.8
15	I-15 ramps & Charleston	Signalized	E	56.9

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 7-2, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes and future analysis intersections, level service analysis was performed. Table 7-6 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-6, the intersections of Bonneville at Main Street, Bonneville at Martin Luther King Boulevard, Grand Central Parkway at Charleston Boulevard, Main Street at Charleston Boulevard and the new SPUI interchange at Charleston Boulevard continue to operate at unacceptable conditions (LOS E or F) with the addition of project traffic. All the other intersections operate at acceptable conditions during the analysis period.

2030 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 7-2, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Table 7-6
Downtown Station Location Alternative - 2030 Baseline plus DMU Conditions LOS

Intersection		2030 Baseline Conditions		2030 Baseline plus DMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	N. Main St & S. Grand Central Pkwy	B	13.4	B	15.2
2	E. Bonneville & N. Main St	E	66.7	F	86.3
3	E. Bonneville & S. Grand Central Pkwy	D	48.1	D	47.9
4	W. Bonneville & S. MLK	E	65.8	E	71.3
8	S. Grand Central Pkwy & W. Charleston	F	97.6	F	152.1
9	S. Main St & W. Charleston	E	66.5	F	237.5
11	Casino Center & Charleston	B	10.6	B	10.7
12	4th Street & Charleston	B	12.0	B	11.8
13	Las Vegas Blvd & Charleston	D	50.2	D	50.9
14	S. Las Vegas Blvd & S. Main St	D	41.8	D	47.3
15	I-15 ramps & Charleston	E	56.9	F	80.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

Based on the 2030 Baseline plus EMU volumes and future analysis intersections, level service analysis was performed. Table 7-7 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-7
Downtown Station Location Alternative - 2030 Baseline plus EMU Conditions LOS

Intersection		2030 Baseline Conditions		2030 Baseline plus EMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	N. Main St & S. Grand Central Pkwy	B	13.4	B	16.1
2	E. Bonneville & N. Main St	E	66.7	F	95.2
3	E. Bonneville & S. Grand Central Pkwy	D	48.1	D	47.8
4	W. Bonneville & S. MLK	E	65.8	E	74.1
8	S. Grand Central Pkwy & W. Charleston	F	97.6	F	177.2
9	S. Main St & W. Charleston	E	66.5	F	327.5
11	Casino Center & Charleston	B	10.6	B	10.7
12	4th Street & Charleston	B	12.0	B	11.8
13	Las Vegas Blvd & Charleston	D	50.2	D	51.3
14	S. Las Vegas Blvd & S. Main St	D	41.8	D	52.6
15	I-15 ramps & Charleston	E	56.9	F	93.9

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-7, the intersections of Bonneville at Main Street, Bonneville at Martin Luther King Boulevard, Grand Central Parkway at Charleston Boulevard, Main Street at Charleston Boulevard and the new SPUI interchange at Charleston Boulevard continue to operate at unacceptable conditions (LOS E or F) with the addition of project traffic. All the other intersections operate at acceptable conditions (LOS D or better) during the analysis period.

7.1.5 Mitigation Measures

It should be noted that the proposed mitigations suggested in this section have not been field verified.

2013 BASELINE CONDITIONS

As indicated in Table 7-2, the intersections along Martin Luther King at Bonneville Avenue, Charleston Boulevard and I-15 SB on-ramp, the intersections of Bonneville Avenue at Main Street and Grand Central Parkway at Charleston Boulevard operate with unacceptable conditions (LOS E or F). To mitigate these intersections, the following mitigations measures are proposed:

- #2. Bonneville/Main Street
  - Add exclusive westbound right turn lane.
- #4. Bonneville/S. Martin Luther King Boulevard
  - Add second eastbound left turn lane.
- #6. Charleston/S. Martin Luther King Boulevard
  - Optimize network offset and signal timing.
- #8. Grand Central Parkway/W. Charleston Boulevard
  - Optimize network offset and signal timing.
- #10. S. Martin Luther King Boulevard/ I-15 southbound On-ramp
  - Signalize the intersection.

Applying above mitigations, intersection level of service was calculated. Table 7-8 presents the results of 2013 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-8, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

Table 7-8
Downtown Station Location Alternative
2013 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline Mitigation Conditions LOS	Delay[1]
2	E. Bonneville & N. Main St	Signalized	D	47.3
4	W. Bonneville & S. MLK	Signalized	D	35.2
6	S. MLK & W. Charleston	Signalized	D	43.4
8	S. Grand Central Pkwy & W. Charleston	Signalized	C	24.6
10	S. MLK & I-15 SB On-Ramp	Signalized	A	4.7

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

2013 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-3, the intersections along Martin Luther King at Bonneville Avenue, Charleston Boulevard and I-15 SB on-ramp and the intersections of Bonneville Avenue at Main Street, Grand Central Parkway at Charleston Boulevard and Main Street at Charleston operate with unacceptable conditions (LOS E or F) under 2013 Baseline plus DMU conditions. To mitigate these intersections, the following mitigations measures are proposed:

- #2. Bonneville/Main Street
  - Add exclusive westbound right turn lane.
- #4. Bonneville/S. Martin Luther King Boulevard
  - Add second eastbound left turn lane.
- #6. Charleston/S. Martin Luther King Boulevard
  - Optimize network offset and signal timing.
- #8. Grand Central Parkway/W. Charleston Boulevard
  - Optimize network offset and signal timing.
- #9. Main Street/Charleston Boulevard
  - Add second eastbound left turn lane.
  - Add exclusive dual southbound right turn lanes.
- #10. S. Martin Luther King Boulevard/ I-15 southbound On-ramp
  - Signalize the intersection.

Applying above mitigations, intersection level of service was calculated. Table 7-9 presents the results of 2013 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-9
Downtown Station Location Alternative
2013 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus DMU Mitigation Conditions LOS	2013 Baseline plus DMU Mitigation Conditions Delay[1]
2	E. Bonneville & N. Main St	Signalized	D	47.1
4	W. Bonneville & S. MLK	Signalized	D	35.2
6	S. MLK & W. Charleston	Signalized	D	50.4
8	S. Grand Central Pkwy & W. Charleston	Signalized	D	38.0
9	S. Main St & W. Charleston	Signalized	D	52.2
10	S. MLK & I-15 SB On-Ramp	Signalized	A	8.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-9, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2013 BASELINE PLUS EMU CONDITIONS

As indicated in Table 7-4, the intersections along Martin Luther King at Bonneville Avenue, Charleston Boulevard and I-15 SB on-ramp and the intersections of Grand Central Parkway at Charleston Boulevard and Main Street at Charleston Boulevard operate with unacceptable conditions (LOS E or F) under 2013 Baseline plus EMU conditions. To mitigate these intersections, following mitigations measures are proposed:

- #2. Bonneville/Main Street
  - Add exclusive westbound right turn lane.
- #4. Bonneville/S. Martin Luther King Boulevard
  - Add second eastbound left turn lane.
- #6. Charleston/S. Martin Luther King Boulevard
  - Add exclusive eastbound right turn lane.
- #8. Grand Central Parkway/W. Charleston Boulevard
  - Optimize network offset and signal timing.
- #9. Main Street/Charleston Boulevard
  - Add fourth westbound through lane.
  - Add exclusive westbound right turn lane.
  - Add second eastbound left turn lane.
  - Add exclusive eastbound right turn lane.
  - Add exclusive dual southbound right turn lanes.
- #10. S. Martin Luther King Boulevard/ I-15 southbound On-ramp

- Signalize the intersection.

Applying above mitigations, intersection level of service was calculated. Table 7-10 presents the results of 2013 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-10
Downtown Station Location Alternative
2013 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
2	E. Bonneville & N. Main St	Signalized	D	52.1
4	W. Bonneville & S. MLK	Signalized	D	35.1
6	S. MLK & W. Charleston	Signalized	D	48.5
8	S. Grand Central Pkwy & W. Charleston	Signalized	D	40.5
9	S. Main St & W. Charleston	Signalized	D	49.4
10	S. MLK & I-15 SB On-Ramp	Signalized	B	12.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-10, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 Baseline Conditions

As indicated in Table 7-5, intersections of Bonneville at Main Street, Bonneville at Martin Luther King Boulevard, Grand Central Parkway at Charleston Boulevard, Main Street at Charleston Boulevard and the new SPUI interchange at Charleston Boulevard operate at unacceptable conditions (LOS E or F) under 2030 Baseline conditions. To mitigate these intersections, following mitigations measures are proposed:

- #2. Bonneville/Main Street
  - Optimize network offset and signal timing.
- #4. Bonneville/S. Martin Luther King Boulevard
  - Add exclusive southbound right turn lane.
- #8. Grand Central Parkway/W. Charleston Boulevard
  - Add second eastbound left turn lane.
  - Add third southbound right turn lane.
- #9. Main Street/Charleston Boulevard
  - Optimize network offset and signal timing.

- #15. I-15 Ramps/Charleston Boulevard (SPUI Interchange)
  - Optimize network offset and signal timing.

Applying the above mitigations, intersection level of service was calculated. Table 7-11 presents the results of 2030 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-11
Downtown Station Location Alternative
2030 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline Mitigation Conditions	
			LOS	Delay[1]
2	E. Bonneville & N. Main St	Signalized	D	43.6
4	W. Bonneville & S. MLK	Signalized	D	49.0
8	S. Grand Central Pkwy & W. Charleston	Signalized	D	42.6
9	S. Main St & W. Charleston	Signalized	D	53.9
15	I-15 ramps & Charleston	Signalized	D	45.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-11, all impacted intersections operate at acceptable conditions (LOS D) with mitigations.

2030 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-6, the intersections of Bonneville at Main Street, Bonneville at Martin Luther King Boulevard, Grand Central Parkway at Charleston Boulevard, Main Street at Charleston Boulevard and the new SPUI interchange at Charleston Boulevard operate at unacceptable conditions (LOS E or F) under 2030 Baseline plus DMU conditions. To mitigate these intersections, following mitigations measures are proposed:

- #2. Bonneville/Main Street
  - Optimize network offset and signal timing.
- #4. Bonneville/S. Martin Luther King Boulevard
  - Add exclusive southbound right turn lane.
- #8. Grand Central Parkway/W. Charleston Boulevard
  - Add second eastbound left turn lane.
  - Add fourth westbound through lane.
  - Add third southbound right turn lane.

- #9. Main Street/Charleston Boulevard
  - Add two eastbound left turn lanes.
  - Add exclusive eastbound right turn lane.
  - Add exclusive dual southbound right turn lanes.
- #15. I-15 Ramps/Charleston Boulevard (SPUI Interchange)
  - Add third southbound left turn lane.

Applying the above mitigations, intersection level of service was calculated. Table 7-12 presents the results of 2030 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-12
Downtown Station Location Alternative
2030 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
2	E. Bonneville & N. Main St	Signalized	D	50.6
4	W. Bonneville & S. MLK	Signalized	D	52.4
8	S. Grand Central Pkwy & W. Charleston	Signalized	D	40.0
9	S. Main St & W. Charleston	Signalized	D	52.5
15	I-15 ramps & Charleston	Signalized	D	49.6

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-12, all impacted intersections operate at acceptable conditions (LOS D) with mitigations.

2030 BASELINE PLUS EMU CONDITIONS

As indicated in Table 7-7, the intersections of Bonneville at Main Street, Bonneville at Martin Luther King Boulevard, Grand Central Parkway at Charleston Boulevard, Main Street at Charleston Boulevard and the new SPUI interchange at Charleston Boulevard operate at unacceptable conditions (LOS E or F) under 2030 Baseline plus EMU conditions. To mitigate these intersections, the following mitigations measures are proposed:

- #2. Bonneville/Main Street
  - Optimize network offset and signal timing.
- #4. Bonneville/S. Martin Luther King Boulevard
  - Add exclusive southbound right turn lane.
  - Add exclusive westbound right turn lane.
- #8. Grand Central Parkway/W. Charleston Boulevard

- Add second eastbound left turn lane.
- Add fourth westbound through lane.
- Add third southbound right turn lane.

- #9. Main Street/Charleston Boulevard
  - Add two eastbound left turn lanes.
  - Add exclusive eastbound right turn lane.
  - Add second northbound left turn lane.
  - Add exclusive northbound right turn lane.
  - Add two westbound through lanes.
  - Add exclusive westbound right turn lane.
  - Add exclusive dual southbound right turn lanes.
  - Add second southbound left turn lane.

- #15. I-15 Ramps/Charleston Boulevard (SPUI Interchange)
  - Add third southbound left turn lane.
  - Add fourth westbound through lane.

Applying the above mitigations, intersection level of service was calculated. Table 7-13 presents the results of 2030 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-13
Downtown Station Location Alternative
2030 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
2	E. Bonneville & N. Main St	Signalized	D	53.5
4	W. Bonneville & S. MLK	Signalized	D	41.4
8	S. Grand Central Pkwy & W. Charleston	Signalized	D	51.8
9	S. Main St & W. Charleston	Signalized	D	52.6
15	I-15 ramps & Charleston	Signalized	D	48.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-13, all impacted intersections operate at acceptable conditions (LOS D) with mitigations.

7.2 Central Station Location "A" Alternative

The proposed Central Station would be located west of I-15, near the existing Rio Suites Hotel and Casino. This station is bounded by South Valley View Boulevard to the west, the Union Pacific Railroad to the east, West Flamingo Road (Route – 592) to the south and West Twain

Avenue to the north. The proposed Central "A" station can be accessed from I-15 via ramps located at Flamingo Road.

7.2.1 Existing Conditions

EXISTING ROADWAY NETWORK

For other north-south streets description, refer to section 7.1.1.

Industrial Boulevard is a two-way north-south minor arterial. This roadway extends from north of Sahara Avenue to Twain Avenue where it merges into Dean Martin Drive. In the vicinity of the proposed Central "A" station, this street generally has two lanes in each direction with sidewalk on the east side of the street. On-street parking is generally not permitted on both sides of the street.

Valley View Boulevard is a two-way north-south minor arterial. This roadway extends from Washington Avenue at the north to Flamingo Road at the south. In the vicinity of the proposed Central "A" station location, this street generally has two lanes in each direction and a center turning lane, with sidewalks on both sides of the street. On-street parking is generally not permitted on both sides of the street.

For other north-south streets description, refer to section 7.1.1.

Spring Mountain Road is a two-way east-west minor collector. This roadway extends from east of Decatur Blvd to Las Vegas Boulevard Avenue where it merges into Sands Avenue. In the vicinity of the proposed Central "A" Station location, this street generally has three lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

Twain Avenue is a two-way east-west minor collector. This roadway extends from Town Center Drive to the east of Frank Sinatra Drive. In the vicinity of the proposed Central "A" Station location, this street generally has three lanes in the westbound direction and two lanes in the eastbound direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

Flamingo Road is a two-way east-west minor arterial. This roadway extends from south of Desert Inn Road/ Red Rock Ranch Road to Stephanie St. In the vicinity of the proposed Central "A" Station location, this street generally has three lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

EXISTING TRANSIT CONDITIONS

Refer to section 7.1.1 under for other transit lines serving the area.

- The **202-Flamingo** is a 24-hour bus service running along Flamingo Road from Grand Canyon Parkway Shopping Center to Harmon/ Boulder Hwy with approximately 10-15 minute headways from 5:00 AM to 7:00 PM and 20-30 minute headways for the rest during weekdays.

- The **203-Spring Mountain/Twain** is running from Durango/ Tropicana to Flamingo/ Pecos with approximately 30-minute headways from 5:30 AM to 6:30 PM and 40-60 minute headways for the rest during weekdays.

EXISTING PARKING CONDITIONS

On-street parking is generally not permitted on any street in the local roadway network near the proposed station location.

EXISTING INTERSECTION OPERATIONS

Based on the station location options, intersections in the vicinity of the station location were identified for analysis purposes. The existing lane geometry at the study intersections is shown in Figure 7-3. Intersection Level of Service (LOS) conditions were analyzed for weekday PM peak period (4:00 PM to 6:00 PM). The results of the analysis are presented in Table 7-14. SYNCHRO analysis worksheets are provided in the Appendix.

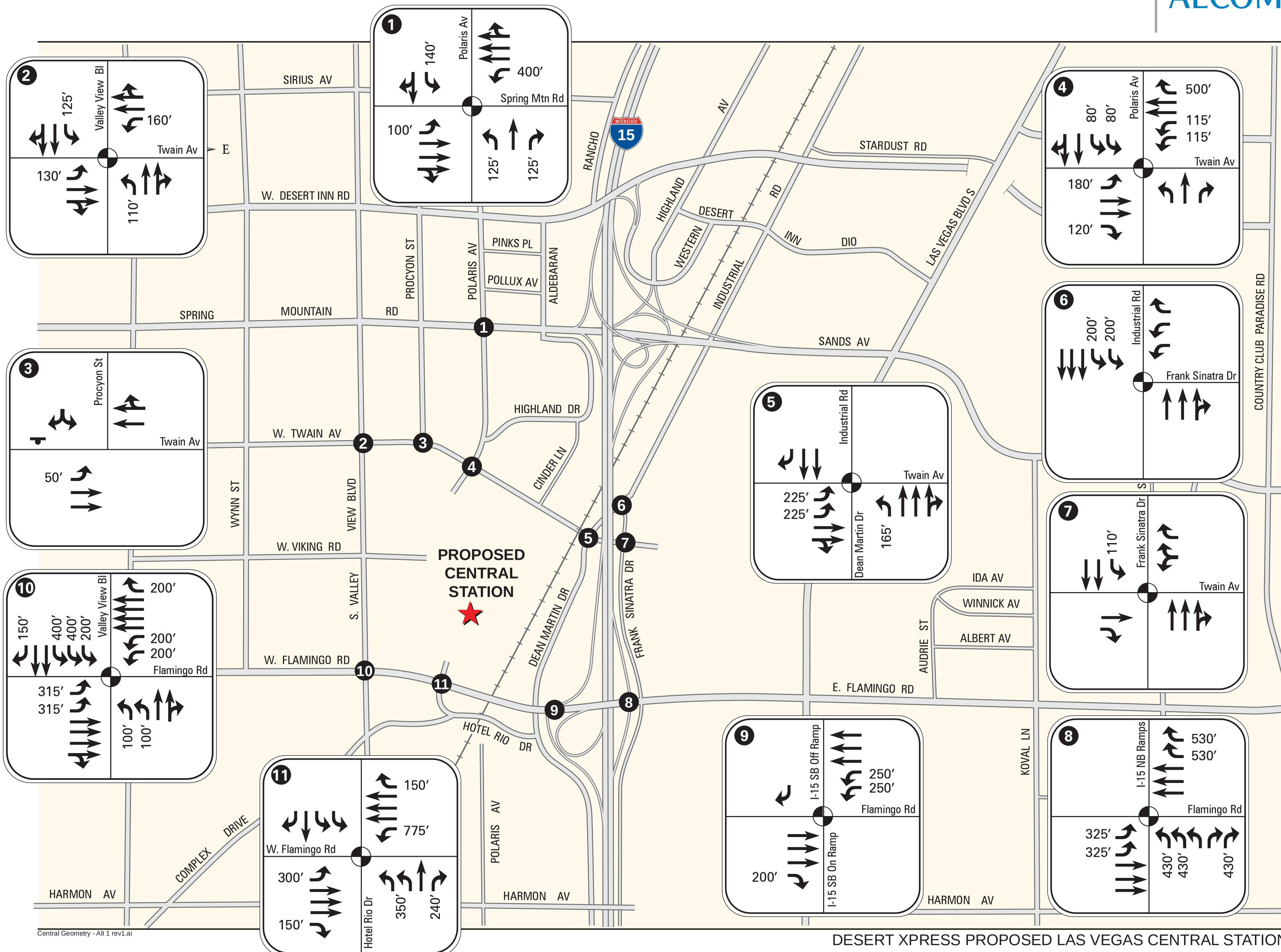
Table 7-14
Central Station Location "A" Alternative - Existing Conditions LOS

Intersection		Traffic Control	Existing Conditions	
			LOS	Delay[1]
1	Spring Mountain & Polaris	Signalized	C	24.6
2	W. Twain & S. Valley View	Signalized	D	53.0
3	W. Twain & Procyon	Unsignalized[2]	B (SB)[3]	11.8
4	W. Twain & Polaris	Signalized	C	25.7
5	W. Twain & Dean Marin Dr/Industrial	Signalized	C	30.9
6	Industrial & Frank Sinatra	Signalized	C	31.0
7	W. Twain & Frank Sinatra	Signalized	C	20.4
8	W. Flamingo & I-15 NB Ramps	Signalized	C	27.7
9	W. Flamingo & I-15 SB Ramps	Signalized	A	7.2
10	W. Flamingo & S. Valley View	Signalized	D	38.2
11	W. Flamingo & Hotel Rio Dr	Signalized	D	41.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

As indicated in Table 7-14, all intersections operate at acceptable conditions in the existing conditions (LOS D or better).

AECOM



DESERT XPRESS PROPOSED LAS VEGAS CENTRAL STATION

Figure 7-3

EXISTING INTERSECTION GEOMETRY

Central Station Alternative A

7.2.2 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project Conditions

SIGNIFICANCE CRITERIA

The following are the significance criteria required by the Regional Transportation Commission in Nevada for the determination of impacts associated with a proposed project:

- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted for site and non-site traffic.

PROJECT TRAVEL DEMAND

The Regional Transportation Commission (RTC) travel demand forecasting model was used to develop the base “no-project” travel forecasts for future year 2013 and 2030 traffic analysis. RTC provided future year 2030 travel forecasts from the model to DMJM Harris. DMJM Harris has applied a straight line method to interpolate the intermediate year growth factors. The calculated growth factors were applied to the existing volumes to generate analysis year volumes. The growth factor calculations are presented in the Appendix. The additional project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 7-4. This station is served primarily by I-15, Industrial Road – Dean Martin Drive in the north-south direction and Flamingo Road, Twain Avenue and Spring Mountain Road in the east-west direction. Most train passengers would have origins or destinations at the commercial developments on ‘The Strip’; only a small percentage of 10% would travel to/from the west of the proposed location. A good proportion of vehicles heading towards the commercial developments on ‘The Strip’ would choose to use Industrial Road / Dean-Martin Drive as travel time on Las Vegas Boulevard tends to be higher.

7.2.3 2013 Conditions (Opening Year Analysis)

Under the future with project conditions, station access from Twain Avenue will be located east of the Twain Avenue and Polaris Avenue intersection. It should be noted that this intersection would be analyzed in “with-project conditions” and is designated as intersection 12 on the SYNCHRO network.

AECOM

DESERT XPRESS PROPOSED LAS VEGAS CENTRAL STATION

Figure 7-4

CENTRAL STATION A TRIP DISTRIBUTION

2013 BASELINE CONDITIONS

Future year 2013 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions. Based on the future base volumes and the existing geometry, intersection level service analysis was performed.

Table 7-15 presents the results of intersection operating conditions for future year 2013 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-15
Central Station Location "A" Alternative – 2013 Baseline Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
1	Spring Mountain & Polaris	Signalized	C	24.9
2	W. Twain & S. Valley View	Signalized	E	59.3
3	W. Twain & Procyon	Unsignalized[2]	B (SB)[3]	12.0
4	W. Twain & Polaris	Signalized	C	26.5
5	W. Twain & Dean Martin Dr/Industrial	Signalized	C	30.4
6	Industrial & Frank Sinatra	Signalized	D	36.2
7	W. Twain & Frank Sinatra	Signalized	C	20.2
8	W. Flamingo & I-15 NB Ramps	Signalized	C	29.5
9	W. Flamingo & I-15 SB Ramps	Signalized	A	7.5
10	W. Flamingo & S. Valley View	Signalized	D	41.6
11	W. Flamingo & Hotel Rio Dr	Signalized	D	39.1

Notes: SOURCE: DMJM Harris, 2008.

1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

As indicated in Table 7-15, all the intersections operate at acceptable conditions except intersection of Twain Avenue at Valley View.

2013 BASELINE PLUS DIESEL-ELECTRIC MULTIPLE UNIT (DMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-4, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus DMU volumes. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions.

Based on the 2013 Baseline plus DMU volumes and the existing geometry, intersection level service analysis was performed. Table 7-16 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-16
Central Station Location "A" Alternative
2013 Baseline plus DMU Conditions LOS

Intersection		2013 Baseline Conditions		2013 Baseline plus DMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	Spring Mountain & Polaris	C	24.9	C	24.9
2	W. Twain & S. Valley View	E	59.3	E	62.9
3	W. Twain & Procyon	B (SB)[3]	12.0	B (SB)[3]	12.4
4	W. Twain & Polaris	C	26.5	C	29.5
5	W. Twain & Dean Martin Dr/Industrial	C	30.4	E	62.1
6	Industrial & Frank Sinatra	D	36.2	D	45.9
7	W. Twain & Frank Sinatra	C	20.2	C	23.4
8	W. Flamingo & I-15 NB Ramps	C	29.5	E	57.3
9	W. Flamingo & I-15 SB Ramps	A	7.5	A	9.0
10	W. Flamingo & S. Valley View	D	41.6	D	42.6
11	W. Flamingo & Hotel Rio Dr	D	39.1	E	76.5
12	W. Twain & Station Access	-	-	B	13.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

As indicated in Table 7-16, intersections of Twain at Valley View continues to operate at unacceptable conditions (LOS E) while intersections of Twain at Dean Martin Drive, Flamingo at I-15 northbound ramps and Flamingo at Hotel Rio Drive deteriorate from acceptable conditions (LOS D or better) in 2013 baseline conditions to unacceptable conditions (LOS E) with the addition of project volumes.

2013 BASELINE PLUS ELECTRIC MULTIPLE UNIT (EMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-4, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and geometry presented in Figure 7-3, intersection level service analysis was performed. Table 7-17 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-17
Central Station Location "A" Alternative – 2013 Baseline plus EMU Conditions LOS

		2013 Baseline Conditions		2013 Baseline plus EMU Conditions	
Intersection		**LOS**	**Delay[1]**	**LOS**	**Delay[1]**
1	Spring Mountain & Polaris	C	24.9	C	24.9
2	W. Twain & S. Valley View	E	59.3	E	64.8
3	W. Twain & Procyon	B (SB)[3]	12.0	B (SB)[3]	12.5
4	W. Twain & Polaris	C	26.5	C	30.4
5	W. Twain & Dean Martin Dr/Industrial	C	30.4	F	94.6
6	Industrial & Frank Sinatra	D	36.2	E	55.9
7	W. Twain & Frank Sinatra	C	20.2	C	24.8
8	W. Flamingo & I-15 NB Ramps	C	29.5	E	76.4
9	W. Flamingo & I-15 SB Ramps	A	7.5	B	10.1
10	W. Flamingo & S. Valley View	D	41.6	D	42.9
11	W. Flamingo & Hotel Rio Dr	D	39.1	F	105.7
12	W. Twain & Station Access	-	-	C	31.7

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

As indicated in Table 7-17, intersections of Twain at Valley View continues to operate at unacceptable conditions (LOS E) while intersections of Twain at Dean Martin Drive, Industrial at Frank Sinatra, Flamingo at I-15 northbound ramps and Flamingo at Hotel Rio Drive deteriorate from acceptable conditions (LOS D or better) in 2013 baseline conditions to unacceptable conditions (LOS E) with the addition of project volumes.

7.2.4 2030 Cumulative Conditions

2030 BASELINE CONDITIONS

Future year 2030 base volumes were calculated by applying the growth factor to the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2030 conditions.

Based on the future base volumes and geometry presented in Figure 7-3, intersection level service analysis was performed. Table 7-18 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-18
Central Station Location "A" Alternative – 2030 Baseline Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
1	Spring Mountain & Polaris	Signalized	C	26.1
2	W. Twain & S. Valley View	Signalized	E	70.8
3	W. Twain & Procyon	Unsignalized[2]	B (SB) [3]	12.5
4	W. Twain & Polaris	Signalized	C	28.2
5	W. Twain & Dean Martin Dr/Industrial	Signalized	D	38.1
6	Industrial & Frank Sinatra	Signalized	E	61.2
7	W. Twain & Frank Sinatra	Signalized	B	17.0
8	W. Flamingo & I-15 NB Ramps	Signalized	D	37.9
9	W. Flamingo & I-15 SB Ramps	Signalized	A	8.6
10	W. Flamingo & S. Valley View	Signalized	F	95.8
11	W. Flamingo & Hotel Rio Dr	Signalized	D	39.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

As indicated in Table 7-18, intersections of Twain at Valley View, Industrial at Frank Sinatra and Flamingo at Valley View operate with unacceptable conditions (LOS E or F) under the analysis scenario.

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 7-4, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes geometry presented in Figure 7-3, intersection level service analysis was performed. Table 7-19 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-19, intersections of Twain Avenue at Valley View, Industrial at Frank Sinatra and Flamingo at Valley View continue to operate with unacceptable conditions (LOS E or F) while intersections of Twain at Dean Martin Drive/Industrial Avenue, Flamingo at I-15 northbound ramps, and Flamingo at Hotel Rio Drive deteriorate from acceptable (LOS D) to unacceptable (LOS E or F) conditions with the addition of project volumes.

Table 7-19
Central Station Location "A" Alternative
2030 Baseline plus DMU Conditions LOS

		2030 Baseline Conditions		2030 Baseline plus DMU Conditions	
Intersection		**LOS**	**Delay[1]**	**LOS**	**Delay[1]**
1	Spring Mountain & Polaris	C	26.1	C	26.1
2	W. Twain & S. Valley View	E	70.8	E	76.1
3	W. Twain & Procyon	B (SB)[3]	12.5	B (SB)[3]	12.8
4	W. Twain & Polaris	C	28.2	C	30.5
5	W. Twain & Dean Martin Dr/Industrial	D	38.1	F	105.4
6	Industrial & Frank Sinatra	E	61.2	E	79.5
7	W. Twain & Frank Sinatra	B	17.0	C	22.4
8	W. Flamingo & I-15 NB Ramps	D	37.9	E	71.8
9	W. Flamingo & I-15 SB Ramps	A	8.6	B	10.9
10	W. Flamingo & S. Valley View	F	95.8	F	95.9
11	W. Flamingo & Hotel Rio Dr	D	39.1	E	77.2
12	W. Twain & Station Access Road	-	-	B	13.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

2030 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 7-4, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2030 Baseline plus EMU volumes geometry presented in Figure 7-3, intersection level service analysis was performed. Table 7-20 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-20, intersections of Twain Avenue at Valley View, Industrial at Frank Sinatra and Flamingo at Valley View continue to operate with unacceptable conditions (LOS E or F) while intersections of Twain at Dean Martin Drive/Industrial Avenue, Flamingo at I-15 northbound ramps, and Flamingo at Hotel Rio Drive deteriorate from acceptable (LOS D) to unacceptable (LOS E or F) conditions with the addition of project volumes.

Table 7-20
Central Station Location "A" Alternative
2030 Baseline plus EMU Conditions LOS

		2030 Baseline Conditions		2030 Baseline plus EMU Conditions	
Intersection		**LOS**	**Delay**[1]	**LOS**	**Delay**[1]
1	Spring Mountain & Polaris	C	26.1	C	26.1
2	W. Twain & S. Valley View	E	70.8	E	79.1
3	W. Twain & Procyon	B (SB)[3]	12.5	B (SB)[3]	13.0
4	W. Twain & Polaris	C	28.2	C	31.3
5	W. Twain & Dean Martin Dr/Industrial	D	38.1	F	142.2
6	Industrial & Frank Sinatra	E	61.2	F	90.4
7	W. Twain & Frank Sinatra	B	17.0	C	25.4
8	W. Flamingo & I-15 NB Ramps	D	37.9	F	92.1
9	W. Flamingo & I-15 SB Ramps	A	8.6	B	11.9
10	W. Flamingo & S. Valley View	F	95.8	F	95.8
11	W. Flamingo & Hotel Rio Dr	D	39.1	F	107.2
12	W. Twain & Station Access Road	-	-	D	35.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound

7.2.5 Mitigation Measures

It should be noted that the proposed mitigations suggested in this section have not been field verified.

2013 BASELINE CONDITIONS

As indicated in Table 7-15, the intersection of Twain Avenue at Valley View operates at unacceptable conditions under 2013 Baseline conditions. To mitigate this intersection, following mitigation measure is proposed:

- #2. Twain Avenue & Valley View
  - Optimize network offset.

Applying above mitigation, intersection level of service was calculated. Table 7-21 presents the results of 2013 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-21
Central Station Location "A" Alternative
2013 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
2	W. Twain & S. Valley View	Signalized	D	48.4

Notes:
1. Delay reported in seconds per vehicle

SOURCE: DMJM Harris, 2008.

As indicated in Table 7-21, the intersection of Twain at Valley View operates at acceptable conditions (LOS D) with mitigations.

2013 Baseline plus DMU Conditions

As indicated in Table 7-16, the intersections of Twain at Valley View, Twain at Dean Martin Drive, Flamingo at I-15 northbound ramps and Flamingo at Hotel Rio Drive operate with unacceptable conditions under 2013 Baseline plus DMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #2. Twain Avenue & Valley View
  - Optimize network offset.
- #5. Twain Avenue & Dean Martin Drive/Industrial
  - Optimize network offset.
- #8. Flamingo & I-15 NB Ramps
  - Optimize network offset.
- #11. Flamingo & Hotel Rio Drive
  - Add third southbound left turn lane.
  - Add fourth westbound through lane.
  - Add second westbound right turn lane.
  - Add fourth eastbound through lane.

Applying above mitigations, intersection level of service was calculated. Table 7-22 presents the results of 2013 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-22, all impacted intersections operate at acceptable conditions (LOS D) with mitigations.

Table 7-22
Central Station Location "A" Alternative
2013 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
2	W. Twain & S. Valley View	Signalized	D	49.8
5	W. Twain & Dean Martin Dr/Industrial	Signalized	D	51.3
8	W. Flamingo & I-15 NB Ramps	Signalized	D	51.0
11	W. Flamingo & Hotel Rio Drive	Signalized	D	40.4

Notes:
1. Delay reported in seconds per vehicle

SOURCE: DMJM Harris, 2008.

2013 Baseline plus EMU Conditions

As indicated in Table 7-17, the intersections of Twain at Valley View, Twain at Dean Martin Drive, Industrial at Frank Sinatra, Flamingo at I-15 northbound ramps and Flamingo at Hotel Rio Drive operate with unacceptable conditions (LOS E of F) under 2013 Baseline plus EMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #2. Twain Avenue & Valley View
  - Optimize network offset.
- #5. Twain Avenue & Dean Martin Drive/Industrial
  - Add second southbound right turn lane.
- #6. Industrial & Frank Sinatra
  - Add second westbound right turn lane
- #8. Flamingo & I-15 NB Ramps
  - Add third eastbound right turn lane
- #11. Flamingo & Hotel Rio Drive
  - Add third southbound left turn lane.
  - Add fourth westbound through lane.
  - Add second westbound right turn lane.
  - Add fourth eastbound through lane.

Applying above mitigations, intersection level of service was calculated. Table 7-23 presents the results of 2013 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-23
Central Station Location "A" Alternative
2013 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Conditions	
			LOS	Delay[1]
2	W. Twain & S. Valley View	Signalized	D	50.5
5	W. Twain & Dean Martin Dr/Industrial	Signalized	C	26.5
6	Industrial & Frank Sinatra	Signalized	C	22.5
8	W. Flamingo & I-15 NB Ramps	Signalized	D	42.0
11	W. Flamingo & Hotel Rio Dr	Signalized	D	48.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-23, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 BASELINE CONDITIONS

As indicated in Table 7-18, the intersections of Twain at Valley View, Industrial at Frank Sinatra and Flamingo at Valley View operate with unacceptable conditions (LOS E or F) under 2030 Baseline conditions. To mitigate these intersections, following mitigation measures are proposed:

- #2. Twain Avenue & Valley View
  - Add exclusive westbound right turn lane.
- #6. Industrial & Frank Sinatra
  - Add second westbound right turn lane
- #10. Flamingo & Valley View
  - Add exclusive northbound right turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-24 presents the results of 2030 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-24
Central Station Location "A" Alternative
2030 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
2	W. Twain & S. Valley View	Signalized	D	50.5
6	Industrial & Frank Sinatra	Signalized	C	25.5
10	W. Flamingo & S. Valley View	Signalized	D	50.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-24, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-19, the intersections of Twain Avenue at Valley View, Industrial at Frank Sinatra, Flamingo at Valley View, Twain at Dean Martin Drive/Industrial Avenue, Flamingo at I-15 northbound ramps, and Flamingo at Hotel Rio Drive operate at unacceptable conditions (LOS E or F) under 2030 Baseline plus DMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #2. Twain Avenue & Valley View
  - Add exclusive westbound right turn lane.
- #5. Twain Avenue & Dean Martin Drive/Industrial
  - Add second southbound right turn lane.
- #6. Industrial & Frank Sinatra
  - Add second westbound right turn lane
- #8. Flamingo & I-15 NB Ramps
  - Add third eastbound left turn lane
- #10. Flamingo & Valley View
  - Add exclusive northbound right turn lane.
- #11. Flamingo & Hotel Rio Drive
  - Add third southbound left turn lane.
  - Add fourth westbound through lane.

Applying the above mitigations, intersection level of service was calculated. Table 7-25 presents the results of 2030 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-25
Central Station Location "A" Alternative
2030 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus DMU Conditions	
			LOS	Delay[1]
2	W. Twain & S. Valley View	Signalized	D	53.7
5	W. Twain & Dean Martin Dr/Industrial	Signalized	C	26.5
6	Industrial & Frank Sinatra	Signalized	C	26.3
8	W. Flamingo & I-15 NB Ramps	Signalized	D	47.5
10	W. Flamingo & S. Valley View	Signalized	D	48.3
11	W. Flamingo & Hotel Rio Dr	Signalized	D	46.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-25, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 Baseline plus EMU Conditions

As indicated in Table 7-20, the intersections of Twain Avenue at Valley View, Industrial at Frank Sinatra, Flamingo at Valley View, Twain at Dean Martin Drive/Industrial Avenue, Flamingo at I-15 northbound ramps, and Flamingo at Hotel Rio Drive operate at unacceptable conditions under 2030 Baseline plus EMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #2. Twain Avenue & Valley View
  - Add exclusive westbound right turn lane.
- #5. Twain Avenue & Dean Martin Drive/Industrial
  - Add second southbound right turn lane.
- #6. Industrial & Frank Sinatra
  - Add second westbound right turn lane.
- #8. Flamingo & I-15 NB Ramps
  - Add third eastbound left turn lane.
  - Add fourth westbound through lane.
- #10. Flamingo & Valley View
  - Add exclusive northbound right turn lane.
- #11. Flamingo & Hotel Rio Drive
  - Add third southbound left turn lane.
  - Add fourth westbound through lane.
  - Add second westbound right turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-26 presents the results of 2030 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-26
Central Station Location "A" Alternative
2030 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Conditions	
			LOS	Delay[1]
2	W. Twain & S. Valley View	Signalized	D	54.6
5	W. Twain & Dean Martin Dr/Industrial	Signalized	C	24.5
6	Industrial & Frank Sinatra	Signalized	C	29.0
8	W. Flamingo & I-15 NB Ramps	Signalized	D	40.6
10	W. Flamingo & S. Valley View	Signalized	D	49.3
11	W. Flamingo & Hotel Rio Dr	Signalized	D	50.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-26, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

7.3 South Station Location Alternative

The proposed South Station would be located west of I-15, to the south end of the Strip. This station is bounded by Polaris Avenue to the west, I-15 to the east, West Russell Road to the south and West Hacienda Avenue to the north. The proposed south station can be accessed from I-15 via ramps located at West Russell Road.

7.3.1 Existing Conditions

EXISTING ROADWAY NETWORK

For north-south streets description, refer to section 7.1.1.

Tropicana Avenue is a two-way east-west principal arterial. This roadway extends from south of Town Center Drive to the north of Broadbent Boulevard. In the vicinity of the proposed South Station location, this street generally has three lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

Hacienda Avenue is a two-way east-west minor collector. This roadway extends from Wynn Road to Dean Martin Drive where it merges Mandalay Bay Road. In the vicinity of the proposed South Station location, this street generally has two lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

Mandalay Bay Road is a two-way east-west minor collector. This roadway extends from Dean Martin Drive to Las Vegas Blvd where it merges Hacienda Ave. In the vicinity of the proposed South Station location, this street generally has three lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

Russell Road is a two-way east-west minor arterial. This roadway extends from John Boulevard to west of Las Vegas Boulevard. In the vicinity of the proposed South Station location, this street generally has three lanes in each direction with sidewalks on the both sides of the street. On-street parking is generally not permitted on both sides of the street.

EXISTING TRANSIT CONDITIONS

Refer to section 7.1.1 under for other transit lines serving the area.

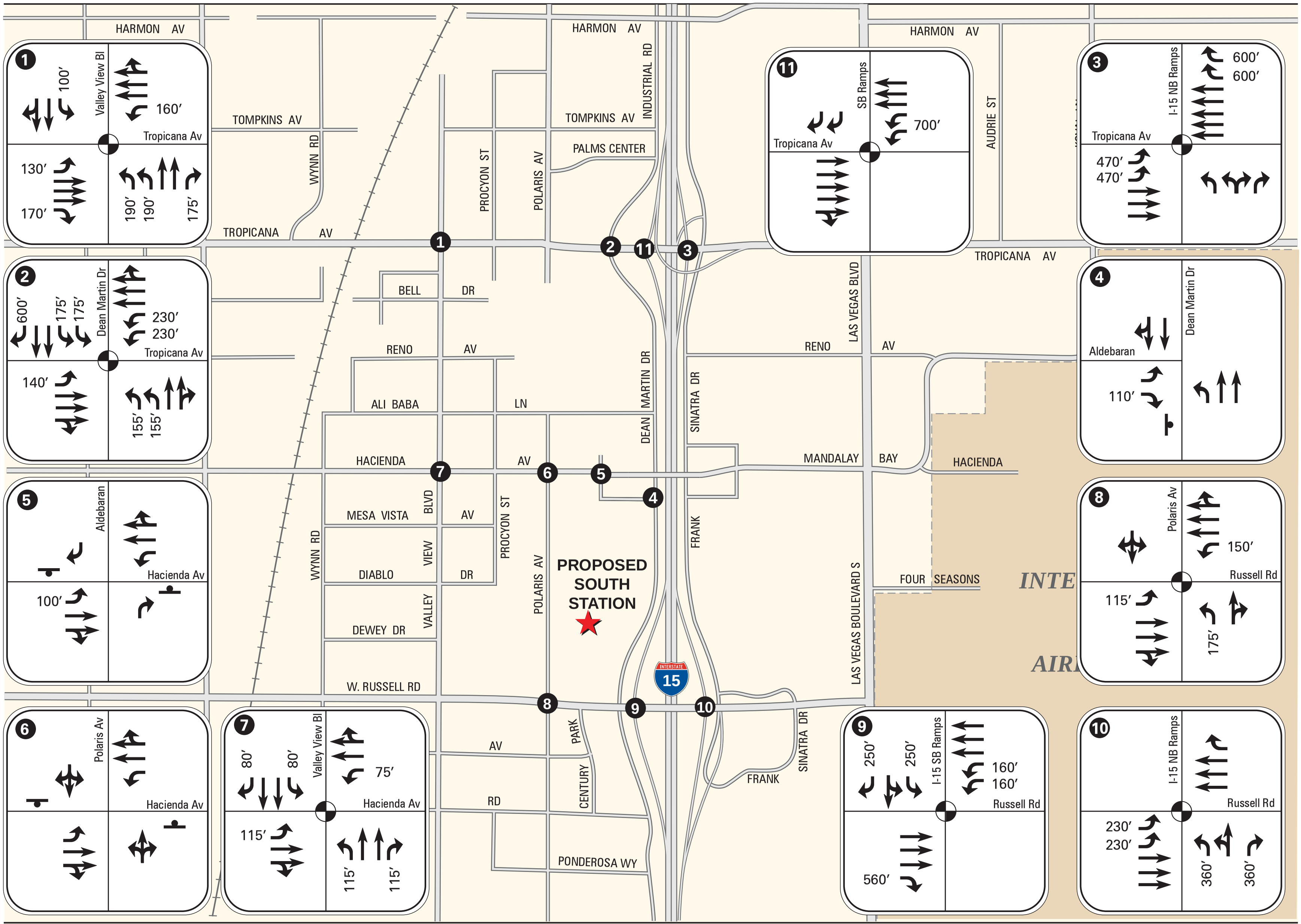
- The **201-Tropicana** is a 24-hour bus service running along Tropicana Avenue. This service connects Andover on the east (east of I-515) to Durango Avenue intersection on the west (west of I-15). This service runs with approximately 15 minute headways from 5:00 AM to 8:00 PM and approximately 20-60 minute headways for the rest during weekdays.

EXISTING PARKING CONDITIONS

On-Street parking is generally not permitted on any street in the local roadway network near the proposed station location.

EXISTING INTERSECTION OPERATIONS

Based on the station location options, intersections in the vicinity of the station location were identified for analysis purposes. The existing lane geometry at the study intersections is shown in Figure 7-5. Intersection Level of Service (LOS) conditions were analyzed for weekday PM peak period (4:00 PM to 6:00 PM). The results of the analysis are presented in Table 7-27. SYNCHRO analysis worksheets are provided in the Appendix.



South Geometry rev1.ai

DESERT XPRESS PROPOSED LAS VEGAS SOUTH STATION

Figure 7-5

EXISTING INTERSECTION GEOMETRY

South Station

Table 7-27
South Station Location Alternative
Existing Conditions LOS

Intersection		Traffic Control	Existing Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	E	55.2
2	W. Tropicana & Dean Martin Dr	Signalized	D	52.6
3	W. Tropicana & I-15 NB Ramps	Signalized	C	26.4
4	Dean Martin Dr & Circulation	Unsignalized[2]	C (EB)[3]	16.9
5	Aldebaran & W. Hacienda	Unsignalized[2]	B (SB)[3]	12.9
6	W. Hacienda & Polaris Ave	Unsignalized[2]	F (NB)[3]	128.8
7	W. Hacienda & S. Valley View	Signalized	C	24.1
8	W. Russell & Polaris	Signalized	D	46.2
9	W. Russell & I-15 SB Ramps	Signalized	E	68.1
10	W. Russell & I-15 NB Ramps	Signalized	C	33.5
11	W. Tropicana & I-15 SB Ramps	Signalized	B	15.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

As indicated in Table 7-27, the signalized intersections of Tropicana at Valley View and I-15 southbound ramps at Russell Road and unsignalized intersection of Hacienda at Polaris operate at unacceptable conditions (LOS E or F) under the existing conditions.

7.3.2 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project Conditions

SIGNIFICANCE CRITERIA

The following are the significance criteria required by the Regional Transportation Commission of Southern Nevada for the determination of impacts associated with a proposed project:

- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted for site and non-site traffic.

PROJECT TRAVEL DEMAND

The Regional Transportation Commission (RTC) travel demand forecasting model was used to develop the base “no-project” travel forecasts for future year 2013 and 2030 traffic analysis. RTC provided future year 2030 travel forecasts from the model to DMJM Harris. DMJM Harris has applied a straight line method to interpolate the intermediate year growth factors. The calculated growth factors were applied to the existing volumes to generate analysis year volumes. The growth factor calculations are presented in the Appendix. The additional project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 7-6. This station is served primarily by I-15, Industrial Road – Dean Martin Drive and Frank Sinatra Drive in the north-south direction. Industrial Road – Dean Martin Drive and Frank Sinatra Drive provided an alternative to Las Vegas Boulevard on which travel time tends to be high. Most passengers of the proposed DesertXpress train would contribute to local traffic with origin or destination on or near ‘The Strip’. As a result, only a small percentage would make use of the freeway system.

7.3.3 2013 Conditions (Opening Year Analysis)

Under the future with project conditions, project trips along Dean Martin Drive would access the station by turning at Circulation Road and making left turns at the Hacienda/Circulation-Aldebaran and Hacienda/Polaris intersections. Under the existing conditions, there is no left turn lane at Hacienda/Circulation-Aldebaran intersection. The project would add a left turn lane at this intersection. It should be noted that this intersection would be analyzed with a northbound left turn lane under “with-project conditions”.

2013 BASELINE CONDITIONS

Future year 2013 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions. Based on the future base volumes and the existing geometry, intersection level service analysis was performed.

Table 7-28 presents the results of intersection operating conditions for future year 2013 baseline conditions. SYNCHRO analysis worksheets are provided in the Appendix.

South Study Trip Distribution.ai

DESERT XPRESS PROPOSED LAS VEGAS SOUTH STATION

Figure 7-6

SOUTH STATION TRIP DISTRIBUTION

Table 7-28
South Station Location Alternative
2013 Baseline Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	E	70.3
2	W. Tropicana & Dean Martin Dr	Signalized	E	59.8
3	W. Tropicana & I-15 NB Ramps	Signalized	C	31.3
4	Dean Martin Dr & Circulation	Unsignalized[2]	C (EB)[3]	18.2
5	Circulation/Aldebaran & W. Hacienda	Unsignalized[2]	B (SB)[3]	13.8
6	W. Hacienda & Polaris Ave	Unsignalized[2]	F (NB)[3]	336.9
7	W. Hacienda & S. Valley View	Signalized	D	35.2
8	W. Russell & Polaris	Signalized	D	52.9
9	W. Russell & I-15 SB Ramps	Signalized	F	83.1
10	W. Russell & I-15 NB Ramps	Signalized	D	36.4
11	W. Tropicana & I-15 SB Ramps	Signalized	B	16.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle e
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

As indicated in Table 7-28, signalized intersections of Tropicana at Valley View, Tropicana at Dean Martin Drive and I-15 southbound ramps at Russell Road and unsignalized intersection of Hacienda at Polaris operate at unacceptable conditions (LOS E or F) under the 2013 baseline conditions.

2013 BASELINE PLUS DIESEL-ELECTRIC MULTIPLE UNIT (DMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-6, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus DMU volumes. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions.

Based on the 2013 Baseline plus DMU volumes and the existing geometry, intersection level service analysis was performed. Table 7-29 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-29
South Station Location Alternative
2013 Baseline plus DMU Conditions LOS

Intersection		2013 Baseline Conditions LOS	2013 Baseline Conditions Delay[1]	2013 Baseline plus DMU Conditions LOS	2013 Baseline plus DMU Conditions Delay[1]
1	W. Tropicana & S. Valley View	E	70.3	E	74.7
2	W. Tropicana & Dean Martin Dr	E	59.8	E	70.5
3	W. Tropicana & I-15 NB Ramps	C	31.3	C	31.5
4	Dean Martin Dr & Circulation	C (EB) [3]	18.2	C (EB) [3]	18.8
5	Circulation/Aldebaran & W. Hacienda	B (SB) [3]	13.8	F (NB) [3]	232.1
6	W. Hacienda & Polaris Ave	F (NB) [3]	336.9	F (NB) [3]	-
7	W. Hacienda & S. Valley View	D	35.2	D	40.1
8	W. Russell & Polaris	D	52.9	F	327.7
9	W. Russell & I-15 SB Ramps	F	83.1	F	89.1
10	W. Russell & I-15 NB Ramps	D	36.4	D	37.5
11	W. Tropicana & I-15 SB Ramps	B	16.2	B	18.0

Notes:
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

SOURCE: DMJM Harris, 2008.

As indicated in Table 7-29, signalized intersections of Tropicana at Valley View, Tropicana at Dean Martin Drive and I-15 southbound ramps at Russell Road and unsignalized intersection of Hacienda at Polaris continue to operate at unacceptable conditions (LOS E or F). However, intersections at Hacienda/Circulation-Aldebaran and Russell at Polaris deteriorate from acceptable (LOS D or better) to unacceptable conditions (LOS F) with the addition of project volumes.

2013 BASELINE PLUS ELECTRIC MULTIPLE UNIT (EMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-6, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and geometry presented in Figure 7-5, intersection level service analysis was performed. Table 7-30 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-30
South Station Location Alternative
2013 Baseline plus EMU Conditions LOS

Intersection		2013 Baseline Conditions		2013 Baseline plus EMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W. Tropicana & S. Valley View	E	70.3	E	76.4
2	W. Tropicana & Dean Marin Dr	E	59.8	E	76.7
3	W. Tropicana & I-15 NB Ramps	C	31.3	C	31.6
4	Dean Marin Dr & Circulation	C (EB) [3]	18.2	C (EB) [3]	19.0
5	Circulation/Aldebaran & W. Hacienda	B (SB) [3]	13.8	F (NB) [3]	-
6	W. Hacienda & Polaris Ave	F (NB) [3]	336.9	F (NB) [3]	-
7	W. Hacienda & S. Valley View	D	35.2	D	42.4
8	W. Russell & Polaris	D	52.9	F	550.8
9	W. Russell & I-15 SB Ramps	F	83.1	F	94.9
10	W. Russell & I-15 NB Ramps	D	36.4	D	38.9
11	W. Tropicana & I-15 SB Ramps	B	16.2	B	19.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

As indicated in Table 7-30, signalized intersections of Tropicana at Valley View, Tropicana at Dean Martin Drive and I-15 southbound ramps at Russell Road and unsignalized intersection of Hacienda at Polaris continue to operate at unacceptable conditions (LOS E or F). However, intersections at Hacienda/Circulation-Aldebaran and Russell at Polaris deteriorate from acceptable (LOS D or better) to unacceptable conditions (LOS F) with the addition of project volumes.

7.3.4 2030 Cumulative Conditions

Under the future with project conditions, project trips along Dean Martin Drive would access the station by turning at Circulation Road and making left turns at the Hacienda/Circulation-Aldebaran and Hacienda/Polaris intersections. Under existing conditions, there is no left turn lane at Hacienda/Circulation-Aldebaran intersection. The project would add a left turn lane at this intersection. It should be noted that this intersection would be analyzed with a northbound left turn lane under “with-project conditions”.

2030 BASELINE CONDITIONS

Future year 2030 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2030 conditions.

Based on the future base volumes and geometry presented in Figure 7-5, intersection level service analysis was performed. Table 7-31 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-31
South Station Location Alternative
2030 Baseline Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	F	425.2
2	W. Tropicana & Dean Martin Dr	Signalized	F	80.0
3	W. Tropicana & I-15 NB Ramps	Signalized	E	78.3
4	Dean Martin Dr & Circulation	Unsignalized[2]	C (EB)[3]	24.9
5	Circulation/Aldebaran & W. Hacienda	Unsignalized[2]	C (SB)[3]	17.3
6	W. Hacienda & Polaris Ave	Unsignalized[2]	F (NB)[3]	-
7	W. Hacienda & S. Valley View	Signalized	F	618.8
8	W. Russell & Polaris	Signalized	F	81.3
9	W. Russell & I-15 SB Ramps	Signalized	F	144.1
10	W. Russell & I-15 NB Ramps	Signalized	E	67.7
11	W. Tropicana & I-15 SB Ramps	Signalized	C	20.7

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

As indicated in Table 7-31, all the intersections operate at unacceptable conditions during the analysis period except two unsignalized intersections of Dean Martin Drive at Aldebaran and Hacienda at Circulation/Aldebaran.

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 7-6, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes geometry presented in Figure 7-5, intersection level service analysis was performed. Table 7-32 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-32
South Station Location Alternative
2030 Baseline plus DMU Conditions LOS

Intersection		2030 Baseline Conditions		2030 Baseline plus DMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W. Tropicana & S. Valley View	F	425.2	F	423.4
2	W. Tropicana & Dean Martin Dr	F	80.0	F	95.4
3	W. Tropicana & I-15 NB Ramps	E	78.3	E	78.4
4	Dean Martin Dr & Circulation	C (EB) [3]	24.9	D (EB) [3]	26.0
5	Circulation/Aldebaran & W. Hacienda	C (SB) [3]	17.3	F (SB) [3]	-
6	W. Hacienda & Polaris Ave	F (NB) [3]	-	F (NB) [3]	-
7	W. Hacienda & S. Valley View	F	618.8	F	617.4
8	W. Russell & Polaris	F	81.3	F	472.6
9	W. Russell & I-15 SB Ramps	F	144.1	F	158.0
10	W. Russell & I-15 NB Ramps	E	67.7	F	90.8
11	W. Tropicana & I-15 SB Ramps	C	20.7	C	23.9

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

As indicated in Table 7-32, all the intersections continue to operate at unacceptable conditions during the analysis period except the unsignalized intersection of Dean Martin and Aldebaran that operates at acceptable conditions (LOS D). However, intersection of Hacienda/Circulation-Aldebaran deteriorates from LOS C to LOS F with the addition of project volumes.

2030 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 7-6, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2030 Baseline plus EMU volumes geometry presented in Figure 7-5, intersection level service analysis was performed. Table 7-33 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-33
South Station Location Alternative
2030 Baseline plus EMU Conditions LOS

Intersection		2030 Baseline Conditions		2030 Baseline plus EMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W. Tropicana & S. Valley View	F	425.2	F	422.4
2	W. Tropicana & Dean Martin Dr	F	80.0	F	103.2
3	W. Tropicana & I-15 NB Ramps	E	78.3	E	78.4
4	Dean Martin Dr & Circulation	C (EB) [3]	24.9	D (EB) [3]	26.5
5	Circulation/Aldebaran & W. Hacienda	C (SB) [3]	17.3	F (SB) [3]	-
6	W. Hacienda & Polaris Ave	F (NB) [3]	-	F (NB) [3]	-
7	W. Hacienda & S. Valley View	F	618.8	F	617.2
8	W. Russell & Polaris	F	81.3	F	818.7
9	W. Russell & I-15 SB Ramps	F	144.1	F	164.8
10	W. Russell & I-15 NB Ramps	E	67.7	F	103.6
11	W. Tropicana & I-15 NB Ramps	C	20.7	C	25.3

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. EB=Eastbound, NB=Northbound, SB=Southbound

As indicated in Table 7-33, all the intersections continue to operate at unacceptable conditions during the analysis period except the unsignalized intersection of Dean Martin and Aldebaran that operates at acceptable conditions (LOS D). However, the intersection of Hacienda/Circulation-Aldebaran deteriorates from LOS C to LOS F with the addition of project volumes.

7.3.5 Mitigation Measures

It should be noted that the feasibility of the proposed mitigations suggested in this section have not been field verified.

2013 BASELINE CONDITIONS

As indicated in Table 7-28, intersections of Tropicana at Valley View, Tropicana at Dean Martin Drive, I-15 southbound ramps at Russell Road, and Hacienda at Polaris operate at unacceptable conditions (LOS E or F) under the 2013 baseline conditions. To mitigate these intersections, following mitigation measures are proposed:

- #1. Tropicana/Valley View
  - Add exclusive southbound free right turn lane.
- #2. Tropicana & Dean Martin Drive/Industrial
  - Optimize signal offset along Tropicana.

- #6. Hacienda/Polaris
  - Signalize this intersection.
- #9. Russell/I-15 SB Ramps
  - Optimize signal offset along Russell Road.

Applying above mitigations, intersection level of service was calculated. Table 7-34 presents the results of 2013 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-34
South Station Location Alternative
2013 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline Mitigation Conditions	
			LOS	**Delay[1]**
1	W. Tropicana & S. Valley View	Signalized	D	41.3
2	W. Tropicana & Dean Martin Dr	Signalized	D	50.0
6	W. Hacienda & Polaris Ave	Signalized	A	7.5
9	W. Russell & I-15 SB Ramps	Signalized	D	44.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-34, all intersections operate at acceptable conditions (LOS D or better) with mitigations.

2013 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-29, intersections of Tropicana at Valley View, Tropicana at Dean Martin Drive and I-15 southbound ramps at Russell Road, Hacienda at Polaris, Hacienda/Circulation-Aldebaran and Russell at Polaris operate with unacceptable conditions (LOS E or F) under 2013 Baseline plus DMU conditions. To mitigate these intersections, following mitigations measures are proposed:

- #1. Tropicana & Valley View
  - Add exclusive southbound free right turn lane
- #2. Tropicana & Dean Martin Drive/Industrial
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
- #5. Hacienda & Aldebaran
  - Signalize this intersection.

- #6. Hacienda & Polaris
  - Signalize this intersection.
  - Add exclusive northbound left turn lane.
- #8. Russell/Polaris
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
  - Add southbound dual left turn lanes.
- #9. Russell/I-15 SB Ramps
  - Optimize signal offsets along Russell Road.

Applying above mitigations, intersection level of service was calculated. Table 7-35 presents the results of 2013 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-35
South Station Location Alternative
2013 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	D	49.0
2	W. Tropicana & Dean Martin Dr	Signalized	D	40.6
5	Circulation/Aldebaran & W. Hacienda	Signalized	B	11.0
6	W. Hacienda & Polaris Ave	Signalized	D	37.5
8	W. Russell & Polaris	Signalized	C	31.7
9	W. Russell & I-15 SB Ramps	Signalized	D	37.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-35, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2013 BASELINE PLUS EMU CONDITIONS

As indicated in Table 7-30, intersections of Tropicana at Valley View, Tropicana at Dean Martin Drive, I-15 southbound ramps at Russell Road, Hacienda at Polaris, Hacienda/Circulation-Aldebaran and Russell at Polaris operate with unacceptable conditions (LOS E or F) under 2013 Baseline plus EMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #1. Tropicana & Valley View
  - Add exclusive southbound free right turn lane.

- #2. Tropicana & Dean Martin Drive/Industrial
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
- #5. Hacienda & Aldebaran
  - Signalize this intersection.
- #6. Hacienda & Polaris
  - Signalize this intersection.
  - Add exclusive eastbound right turn lane.
  - Add second westbound left turn lane.
  - Add exclusive northbound left turn lane.
- #8. Russell/Polaris
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
  - Add southbound dual left turn lanes.
  - Add exclusive southbound right turn lane.
- #9. Russell/I-15 SB Ramps
  - Add second southbound right turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-36 presents the results of 2013 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-36
South Station Location Alternative
2013 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	D	54.4
2	W. Tropicana & Dean Martin Dr	Signalized	D	43.0
5	Circulation/Aldebaran & W. Hacienda	Signalized	A	9.2
6	W. Hacienda & Polaris Ave	Signalized	D	44.7
8	W. Russell & Polaris	Signalized	D	47.3
9	W. Russell & I-15 SB Ramps	Signalized	D	49.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-36, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 BASELINE CONDITIONS

As indicated in Table 7-31, the intersections along Tropicana at Valley View, Dean Martin Drive, and I-15 northbound ramps, the intersections along Hacienda at Valley View and Polaris, and the intersections along Russell Road at Polaris, I-15 northbound ramps and I-15 southbound ramps operate with unacceptable conditions under 2030 Baseline conditions. To mitigate these intersections, following mitigation measures are proposed:

- #1. Tropicana & Valley View
  - Add exclusive westbound right turn lane.
  - Add exclusive southbound free right turn lane.
  - Add second southbound left turn lane.
- #2. Tropicana & Dean Martin Drive/Industrial
  - Add fourth eastbound through lane.
  - Add fourth westbound through lane.
- #3. Tropicana & I-15 NB Ramps
  - Add second northbound right turn lane.
- #6. Hacienda & Polaris
  - Signalize this intersection.
- #7. Hacienda & Valley View
  - Add second eastbound left turn lane.
  - Add exclusive eastbound right turn lane.
  - Add third eastbound through lane.
  - Add exclusive westbound right turn lane.
  - Add third westbound through lane.
  - Add second northbound left turn lane.
  - Add third northbound through lane.
- #8. Russell & Polaris
  - Add exclusive northbound right turn lane.
  - Add exclusive southbound left turn lane.
- #9. Russell & I-15 SB Ramps
  - Add second southbound right turn lane.
- #10. Russell/I-15 NB Ramps
  - Optimize signal offset along Russell Road.

Applying above mitigations, intersection level of service was calculated. Table 7-37 presents the results of 2030 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-37
South Station Location Alternative
2030 Baseline Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline Mitigation Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	D	51.7
2	W. Tropicana & Dean Marin Dr	Signalized	D	53.4
3	W. Tropicana & I-15 NB Ramps	Signalized	D	45.7
6	W. Hacienda & Polaris Ave	Signalized	B	16.1
7	W. Hacienda & S. Valley View	Signalized	D	49.8
8	W. Russell & Polaris	Signalized	D	37.1
9	W. Russell & I-15 SB Ramps	Signalized	D	48.9
10	W. Russell & I-15 NB Ramps	Signalized	D	50.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-37, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-32, all the intersections operate at unacceptable conditions during the analysis period except the unsignalized intersection of Dean Martin and Aldebaran that operates at acceptable conditions (LOS D). To mitigate these intersections, following mitigation measures are proposed:

- #1. Tropicana & Valley View
  - Add exclusive westbound right turn lane.
  - Add second westbound left turn lane.
  - Add exclusive southbound free right turn lane.
  - Add second southbound left turn lane.
- #2. Tropicana & Dean Martin Drive/Industrial
  - Add fourth eastbound through lane.
  - Add fourth westbound through lane.
- #3. Tropicana & I-15 NB Ramps
  - Add second northbound right turn lane.
- #5. Hacienda & Aldebaran
  - Signalize this intersection.
- #6. Hacienda & Polaris
  - Signalize this intersection.
  - Add exclusive northbound left turn lane.
  - Add exclusive northbound right turn lane.

- #7. Hacienda & Valley View
  - Add two additional eastbound left turn lanes.
  - Add exclusive eastbound right turn lane.
  - Add third eastbound through lane.
  - Add second westbound left turn lane.
  - Add second northbound left turn lane.
- #8. Russell & Polaris
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
  - Add three southbound left turn lanes.
- #9. Russell & I-15 SB Ramps
  - Add second eastbound right turn lane.
  - Add second southbound right turn lane.
- #10. Russell/I-15 NB Ramps
  - Add second northbound left turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-38 presents the results of 2030 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-38
South Station Location Alternative -
2030 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	D	49.5
2	W. Tropicana & Dean Martin Dr	Signalized	D	43.6
3	W. Tropicana & I-15 NB Ramps	Signalized	D	46.2
5	Circulation/Aldebaran & W. Hacienda	Signalized	A	7.1
6	W. Hacienda & Polaris Ave	Signalized	C	27.1
7	W. Hacienda & S. Valley View	Signalized	D	54.0
8	W. Russell & Polaris	Signalized	D	54.2
9	W. Russell & I-15 SB Ramps	Signalized	C	32.4
10	W. Russell & I-15 NB Ramps	Signalized	D	49.6

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-38, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 BASELINE PLUS EMU CONDITIONS

As indicated in Table 7-33, all the intersections operate at unacceptable conditions during the analysis period except unsignalized intersection of Dean Martin and Aldebaran that operates at acceptable conditions (LOS D). To mitigate these intersections, following mitigation measures are proposed:

- #1. Tropicana & Valley View
  - Add exclusive westbound right turn lane.
  - Add second westbound left turn lane.
  - Add second southbound left turn lane.
  - Add exclusive southbound free right turn lane.
- #2. Tropicana & Dean Martin Drive/Industrial
  - Add fourth eastbound through lane.
  - Add fourth westbound through lane.
  - Add exclusive westbound right turn lane.
  - Add third northbound through lane.
  - Add exclusive northbound right turn lane.
- #3. Tropicana & I-15 NB Ramps
  - Add second northbound right turn lane.
- #5. Hacienda & Aldebaran
  - Signalize this intersection.
- #6. Hacienda & Polaris
  - Signalize this intersection.
  - Add two additional westbound left turn lanes.
  - Add exclusive northbound left turn lane.
  - Add exclusive northbound right turn lane.
- #7. Hacienda & Valley View
  - Add two additional eastbound left turn lanes.
  - Add exclusive eastbound right turn lane.
  - Add third eastbound through lane.
  - Add second westbound left turn lane
  - Add second northbound left turn lane.
  - Add second southbound left turn lane.
- #8. Russell & Polaris
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
  - Add three southbound left turn lanes.

- #9. Russell & I-15 SB Ramps
  - Add second eastbound right turn lane.
  - Add second westbound left turn lane.
  - Add second southbound right turn lane.
- #10. Russell/I-15 NB Ramps
  - Add third eastbound left turn lane.
  - Add second northbound left turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-39 presents the results of 2030 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-39
South Station Location Alternative
2030 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	W. Tropicana & S. Valley View	Signalized	D	50.4
2	W. Tropicana & Dean Martin Dr	Signalized	D	41.5
3	W. Tropicana & I-15 NB Ramps	Signalized	D	46.0
5	Circulation/Aldebaran & W. Hacienda	Signalized	A	6.2
6	W. Hacienda & Polaris Ave	Signalized	D	39.5
7	W. Hacienda & S. Valley View	Signalized	D	53.7
8	W. Russell & Polaris	Signalized	D	40.9
9	W. Russell & I-15 SB Ramps	Signalized	D	44.2
10	W. Russell & I-15 NB Ramps	Signalized	D	36.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-39, all impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

7.4 Central Station Location "B" Alternative

The proposed Central Station Alternative "B" would be located west of I-15, near the existing Rio Suites Hotel and Casino. This station is bounded by Union Pacific Railroad and Polaris Avenue to the west, Dean Martin Drive to the east, Hotel Rio Drive to the North and West Harmon Avenue to the South. The proposed central station can be accessed from I-15 via ramps located at Flamingo Road and Tropicana Avenue.

7.4.1 Existing Conditions

EXISTING ROADWAY NETWORK

- **Las Vegas Boulevard** Refer to Section 7.1.1
- **Flamingo Road** Refer to Section 7.2.1
- **Tropicana Avenue** Refer to Section 7.3.1

EXISTING TRANSIT CONDITIONS

- **Deuce-Las Vegas Blvd** Refer to Section 7.1.1
- **202-Flamingo** Refer to Section 7.2.1
- **201-Tropicana** Refer to Section 7.3.1

EXISTING PARKING CONDITIONS

On-Street parking is generally not permitted on any street in the local roadway network near the proposed station location.

EXISTING INTERSECTION OPERATIONS

Based on the station location options, intersections in the vicinity of the station location were identified for analysis purposes. The existing lane geometry at the study intersections is shown in Figure 7-7. Intersection Level of Service (LOS) conditions were analyzed for weekday PM peak period (4:00 PM to 6:00 PM). The results of the analysis are presented in Table 7-40. SYNCHRO analysis worksheets are provided in the Appendix.

Table 7-40
Central Station Location "B" Alternative - Existing Conditions LOS

Intersection		Traffic Control	Existing Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	40.9
2	Flamingo/I-15 SB Ramps	Signalized	A	7.2
3	Flamingo/I-15 NB Ramps	Signalized	C	27.1
4	Hotel Rio Dr/Dean Martin Dr	Signalized	C	24.1
5	W Harmon Ave/Polaris Ave	Signalized	C	20.2
6	W Tropicana Ave/Polaris Ave	Signalized	B	11.4
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	53.6
8	Tropicana/I-15 SB Ramps	Signalized	B	15.3
9	Tropicana/I-15 NB Ramps	Signalized	C	26.5
10	W Harmon Ave/Aldebaran Ave	Signalized	B	11.7

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

AECOM

Central Geometry - Alt 2.ai

DESERT XPRESS PROPOSED LAS VEGAS CENTRAL STATION

Figure 7-7

EXISTING INTERSECTION GEOMETRY

Central Station Alternative B

As indicated in Table 7-40, all intersections operate at acceptable conditions (LOS D or better) in the existing conditions.

7.4.2 Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project (DMU and EMU alternatives) Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project (DMU and EMU alternatives) Conditions

SIGNIFICANCE CRITERIA

The following are the significance criteria required by the Regional Transportation Commission of Southern Nevada for the determination of impacts associated with a proposed project:

- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted for site and non-site traffic.

PROJECT TRAVEL DEMAND

The Regional Transportation Commission (RTC) travel demand forecasting model was used to develop the base “no-project” travel forecasts for future year 2013 and 2030 traffic analysis. RTC provided future year 2030 travel forecasts from the model to DMJM Harris. DMJM Harris has applied a straight line method to interpolate the intermediate year growth factors. The calculated growth factors were applied to the existing volumes to generate analysis year volumes. The growth factor calculations are presented in the **Appendix**. The additional project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 7-8. This station is served primarily by I-15 and Industrial Road – Dean Martin Drive in the north-south direction; Flamingo Road and Tropicana Avenue serve the east-east direction. Most trips to/from the commercial developments on ‘The Strip’ would use Tropicana Avenue and Flamingo Road due to accessibility.

DESERT XPRESS PROPOSED LAS VEGAS CENTRAL STATION

Figure 7-8

CENTRAL STATION B TRIP DISTRIBUTION

2013 Conditions (Opening Year Analysis)

2013 BASELINE CONDITIONS

Future year 2013 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions. Based on the future base volumes and the existing geometry, intersection level service analysis was performed.

Table 7-41 presents the results of intersection operating conditions for future year 2013 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-41
Central Station Location "B" Alternative
2013 Baseline Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	39.0
2	Flamingo/I-15 SB	Signalized	A	7.5
3	Flamingo/I-15 NB	Signalized	C	29.0
4	Hotel Rio Dr/Dean Martin Dr	Signalized	C	24.5
5	W Harmon Ave/Polaris Ave	Signalized	C	20.6
6	W Tropicana Ave/Polaris Ave	Signalized	B	12.7
7	W Tropicana Ave/Dean Martin Dr	Signalized	E	60.2
8	Tropicana/I-15 SB Ramp	Signalized	B	16.2
9	Tropicana/I-15 NB Ramp	Signalized	C	31.2
10	W Harmon Ave/Aldebaran Ave	Signalized	B	11.6

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-41, all the intersections operate at acceptable conditions except intersection of Tropicana Avenue at Dean Martin Drive that operates at unacceptable conditions (LOS E) under 2013 Baseline conditions.

2013 BASELINE PLUS DIESEL-ELECTRIC MULTIPLE UNIT (DMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-8, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus DMU volumes. For analysis purposes, existing intersection geometry was assumed for future year 2013 conditions.

Based on the 2013 Baseline plus DMU volumes and the existing geometry, intersection level service analysis was performed. Table 7-42 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-42
Central Station Location "B" Alternative
2013 Baseline plus DMU Conditions LOS

Intersection		2013 Baseline Conditions		2013 Baseline plus DMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	D	39.0	F	180.0
2	Flamingo/I-15 SB	A	7.5	A	7.4
3	Flamingo/I-15 NB	C	29.0	D	38.5
4	Hotel Rio Dr/Dean Martin Dr	C	24.5	D	46.9
5	W Harmon Ave/Polaris Ave	C	20.6	C	22.8
6	W Tropicana Ave/Polaris Ave	B	12.7	C	20.7
7	W Tropicana Ave/Dean Martin Dr	E	60.2	F	115.3
8	Tropicana/I-15 SB Ramp	B	16.2	B	15.5
9	Tropicana/I-15 NB Ramp	C	31.2	C	34.0
10	W Harmon Ave/Aldebaran Ave	B	11.6	C	22.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-42, intersection of Tropicana Avenue at Dean Martin Drive continues to operate at unacceptable conditions while intersection of Flamingo at Hotel Rio Drive deteriorates from acceptable conditions (LOS D) to unacceptable conditions (LOS F) with addition of the project volumes.

2013 BASELINE PLUS ELECTRIC MULTIPLE UNIT (EMU) ALTERNATIVE CONDITIONS

Based on the trip distribution presented in Figure 7-8, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and geometry presented in Figure 7-7, intersection level service analysis was performed. Table 7-43 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-43, intersection of Tropicana Avenue at Dean Martin Drive continues to operate at unacceptable conditions while intersections of Flamingo at Hotel Rio Drive deteriorates from acceptable conditions (LOS D) to unacceptable conditions (LOS F) and Hotel Rio Drive at Dean Martin Drive deteriorates from acceptable (LOS C) to unacceptable (LOS F) conditions with addition of the project volumes.

7.4.3 2030 Cumulative Conditions

2030 BASELINE CONDITIONS

Future year 2030 base volumes were calculated by applying the growth factor on the existing year volumes. These volumes are presented in the Appendix. For analysis purposes, existing intersection geometry was assumed for future year 2030 conditions.

Table 7-43
Central Station Location "B" Alternative
2013 Baseline plus EMU Conditions LOS

Intersection		2013 Baseline Conditions		2013 Baseline plus EMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	D	39.0	F	293.4
2	Flamingo/I-15 SB	A	7.5	A	7.7
3	Flamingo/I-15 NB	C	29.0	D	45.5
4	Hotel Rio Dr/Dean Martin Dr	C	24.5	F	87.6
5	W Harmon Ave/Polaris Ave	C	20.6	C	25.7
6	W Tropicana Ave/Polaris Ave	B	12.7	C	26.5
7	W Tropicana Ave/Dean Martin Dr	E	60.2	F	149.7
8	Tropicana/I-15 SB Ramp	B	16.2	B	15.4
9	Tropicana/I-15 NB Ramp	C	31.2	D	35.7
10	W Harmon Ave/Aldebaran Ave	B	11.6	C	23.7

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

Based on the future base volumes and geometry presented in Figure 7-7, intersection level service analysis was performed. Table 7-44 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-44
Central Station Location "B" Alternative
2030 Baseline Conditions

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	39.1
2	Flamingo/I-15 SB	Signalized	A	8.6
3	Flamingo/I-15 NB	Signalized	D	37.9
4	Hotel Rio Dr/Dean Martin Dr	Signalized	C	26.6
5	W Harmon Ave/Polaris Ave	Signalized	B	18.7
6	W Tropicana Ave/Polaris Ave	Signalized	B	17.6
7	W Tropicana Ave/Dean Martin Dr	Signalized	F	80.2
8	Tropicana/I-15 SB Ramp	Signalized	C	20.7
9	Tropicana/I-15 NB Ramp	Signalized	E	77.0
10	W Harmon Ave/Aldebaran Ave	Signalized	B	11.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-44, all the study intersections operate at acceptable conditions except intersections of Tropicana Avenue at Dean Martin Drive and Tropicana Avenue at I-15 northbound ramps that operate at unacceptable conditions (LOS E or F) under 2030 Baseline conditions.

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 7-8, project trips accessing the station were assigned at the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes geometry presented in Figure 7-7, intersection level service analysis was performed. Table 7-45 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-45, the intersections of Tropicana Avenue at Dean Martin Drive and Tropicana Avenue at I-15 northbound ramps continue to operate at unacceptable conditions (LOS E or F). However, the intersections of Flamingo Road at Hotel Rio Drive deteriorate from LOS D to LOS F and Flamingo Road at I-15 northbound ramps deteriorates from LOS D to LOS E with the addition of project volumes.

Table 7-45
Central Station Location "B" Alternative
2030 Baseline plus DMU Conditions LOS

Intersection		2030 Baseline Conditions		2030 Baseline plus DMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	D	39.1	F	185.7
2	Flamingo/I-15 SB	A	8.6	A	8.7
3	Flamingo/I-15 NB	D	37.9	E	55.4
4	Hotel Rio Dr/Dean Martin Dr	C	26.6	D	49.2
5	W Harmon Ave/Polaris Ave	B	18.7	C	24.3
6	W Tropicana Ave/Polaris Ave	B	17.6	C	27.8
7	W Tropicana Ave/Dean Martin Dr	F	80.2	F	146.1
8	Tropicana/I-15 SB Ramp	C	20.7	C	20.1
9	Tropicana/I-15 NB Ramp	E	77.0	F	85.3
10	W Harmon Ave/Aldebaran Ave	B	11.8	C	22.9

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

2030 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 7-8, project trips accessing the station were assigned at the analysis intersections. The project trips for EMU alternative conditions for year

2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2030 Baseline plus EMU volumes geometry presented in Figure 7-7, intersection level service analysis was performed. Table 7-46 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-46
Central Station Location "B" Alternative
2030 Baseline plus EMU Conditions LOS

Intersection		2030 Baseline Conditions		2030 Baseline plus EMU Conditions	
		LOS	Delay[1]	LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	D	39.1	F	301.2
2	Flamingo/I-15 SB	A	8.6	A	9.0
3	Flamingo/I-15 NB	D	37.9	E	64.4
4	Hotel Rio Dr/Dean Martin Dr	C	26.6	F	87.0
5	W Harmon Ave/Polaris Ave	B	18.7	C	27.5
6	W Tropicana Ave/Polaris Ave	B	17.6	D	35.0
7	W Tropicana Ave/Dean Martin Dr	F	80.2	F	181.2
8	Tropicana/I-15 SB Ramp	C	20.7	C	20.1
9	Tropicana/I-15 NB Ramp	E	77.0	F	87.6
10	W Harmon Ave/Aldebaran Ave	B	11.8	C	23.8

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-46, the intersections of Tropicana Avenue at Dean Martin Drive and Tropicana Avenue at I-15 northbound ramps continue to operate at unacceptable conditions (LOS E or F). However, the intersections of Flamingo Road at Hotel Rio Drive deteriorates from LOS D to LOS F, Flamingo Road at I-15 northbound ramps deteriorates from LOS D to LOS E and Hotel Rio Drive at Dean Martin Drive deteriorates from LOS C to LOS F with the addition of project volumes.

7.4.4 Mitigation Measures

It should be noted that the feasibility of the proposed mitigations suggested in this section have not been field verified.

2013 BASELINE CONDITIONS

As indicated in Table 7-41, all the intersections operate at acceptable conditions except the intersection of Tropicana Avenue at Dean Martin Drive that operates at unacceptable conditions (LOS E) under 2013 Baseline conditions. To mitigate this intersection, following mitigation measure is proposed:

- #7. Tropicana Avenue & Dean Martin Drive
  - Optimize signal offset along Tropicana Avenue.

Applying above mitigation, intersection level of service was calculated. Table 7-47 presents the results of 2013 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-47
Central Station Location "B" Alternative
2013 Baseline Mitigation Conditions

Intersection		Traffic Control	2013 Baseline Mitigation Conditions	
			LOS	Delay[1]
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	46.1

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-47, the intersection of Tropicana Avenue at Dean Martin Drive operates at acceptable conditions (LOS D) with mitigation.

2013 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-42, the intersections of Tropicana Avenue at Dean Martin Drive and Flamingo Road at Hotel Rio Drive operate at unacceptable conditions (LOS F) under 2013 Baseline plus DMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #1. Flamingo Road & Hotel Rio Drive
  - Add fourth eastbound through lane.
  - Add second westbound left turn lane.
  - Add second northbound right turn lane.
- #7. Tropicana Avenue & Dean Martin Drive
  - Add exclusive eastbound right turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-48 presents the results of 2013 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 7-48, all the impacted intersections operate at acceptable conditions (LOS D) with mitigations.

2013 BASELINE PLUS EMU CONDITIONS

As indicated in Table 7-43, the intersections of Tropicana Avenue at Dean Martin Drive, Flamingo at Hotel Rio Drive and Hotel Rio Drive at Dean Martin Drive operate at unacceptable conditions under 2013 Baseline plus EMU conditions. To mitigate these intersections, following mitigation measures are proposed:

Table 7-48
Central Station Location "B" Alternative
2013 Baseline plus DMU Mitigation Conditions

Intersection		Traffic Control	2013 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	46.1
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	49.0

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

- #1. Flamingo Road & Hotel Rio Drive
  - Add fourth eastbound through lane.
  - Add second westbound left turn lane.
  - Add fourth westbound through lane.
  - Add second northbound right turn lane.
- #4. Hotel Rio Drive & Dean Martin Drive
  - Modify eastbound right turn to have overlap phasing.
- #7. Tropicana Avenue & Dean Martin Drive
  - Add exclusive eastbound right turn lane.
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
  - Add third southbound left turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-49 presents the results of 2013 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-49
Central Station Location "B" Alternative
2013 Baseline plus EMU Mitigation Conditions

Intersection		Traffic Control	2013 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	51.6
4	Hotel Rio Dr/Dean Martin Dr	Signalized	C	30.5
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	42.2

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-49, all the impacted intersections operate at acceptable conditions (LOS D or better) with mitigations.

2030 BASELINE CONDITIONS

As indicated in Table 7-44, the intersections of Tropicana Avenue at Dean Martin Drive and Tropicana Avenue at I-15 northbound ramps operate at unacceptable conditions (LOS E or F) under 2030 Baseline conditions. To mitigate these intersections, following mitigation measures are proposed:

- #7. Tropicana Avenue & Dean Martin Drive
  - Add exclusive northbound right turn lane.
- #9. Tropicana Avenue & I-15 NB Ramps
  - Optimize signal offsets along Tropicana Avenue.

Applying above mitigations, intersection level of service was calculated. Table 7-50 presents the results of 2030 Baseline mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-50
Central Station Location "B" Alternative
2030 Baseline Mitigation Conditions

Intersection		Traffic Control	2030 Baseline Mitigation Conditions	
			LOS	**Delay[1]**
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	54.0
9	Tropicana/I-15 NB Ramps	Signalized	D	46.3

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-50, all the impacted intersections operate at acceptable conditions (LOS D) with mitigations.

2030 BASELINE PLUS DMU CONDITIONS

As indicated in Table 7-45, the intersections of Tropicana Avenue at Dean Martin Drive, Tropicana Avenue at I-15 northbound ramps, Flamingo Road at Hotel Rio Drive and Flamingo Road at I-15 northbound ramps operate at unacceptable conditions under 2030 Baseline plus DMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #1. Flamingo & Hotel Rio Drive
  - Add fourth eastbound through lane.
  - Add fourth westbound through lane.
  - Stripe existing northbound through lane as share through right lane.
- #3. Flamingo Road & I-15 NB Ramps
  - Optimize signal offsets along Flamingo Road.
- #7. Tropicana Avenue & Dean Martin Drive

- Add fourth eastbound through lane.
- Add fourth westbound through lane.
- Add exclusive westbound right turn lane.
- Add exclusive northbound right turn lane.
- Add third southbound left turn lane.

- #9. Tropicana Avenue & I-15 NB Ramps
  - Add second northbound right turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-51 presents the results of 2030 Baseline plus DMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-51
Central Station Location "B" Alternative
2030 Baseline plus DMU Mitigation Conditions

Intersection		Traffic Control	2030 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	42.5
3	Flamingo/I-15 NB Ramps	Signalized	D	51.4
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	42.8
9	Tropicana/I-15 NB Ramps	Signalized	D	51.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-51, all the impacted intersections operate at acceptable conditions (LOS D) with mitigations.

2030 BASELINE PLUS EMU CONDITIONS

As indicated in Table 7-46, the intersections of Tropicana Avenue at Dean Martin Drive, Tropicana Avenue at I-15 northbound ramps, Flamingo Road at Hotel Rio Drive, Flamingo Road at I-15 northbound ramps and Hotel Rio Drive at Dean Martin Drive operate at unacceptable conditions under 2030 Baseline plus EMU conditions. To mitigate these intersections, following mitigation measures are proposed:

- #1. Flamingo & Hotel Rio Drive
  - Add fourth eastbound through lane.
  - Add fourth westbound through lane.
  - Stripe existing northbound through lane as share through right lane.

- #3. Flamingo & I-15 NB Ramps
  - Add fourth westbound through lane.

- #4. Hotel Rio Drive & Dean Martin Drive
  - Add second northbound left turn lane.

- #7. Tropicana Avenue & Dean Martin Drive
  - Add fourth eastbound through lane.
  - Add fourth westbound through lane.
  - Add exclusive westbound right turn lane.
  - Add exclusive northbound right turn lane.
  - Add third southbound left turn lane.
- #9. Tropicana Avenue & I-15 NB Ramps
  - Add second northbound right turn lane.

Applying above mitigations, intersection level of service was calculated. Table 7-52 presents the results of 2030 Baseline plus EMU mitigation analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 7-52
Central Station Location "B" Alternative
2030 Baseline plus EMU Mitigation Conditions

Intersection		Traffic Control	2030 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	W Flamingo Rd/Hotel Rio Dr	Signalized	D	48.4
3	Flamingo/I-15 NB	Signalized	D	37.0
4	Hotel Rio Dr/Dean Martin Dr	Signalized	D	54.2
7	W Tropicana Ave/Dean Martin Dr	Signalized	D	47.1
9	Tropicana/I-15 NB Ramp	Signalized	D	54.4

Notes: SOURCE: DMJM Harris, 2008.
1. Delay reported in seconds per vehicle

As indicated in Table 7-52, all the impacted intersections operate at acceptable conditions (LOS D) with mitigations.

8.0 SUMMARY AND CONCLUSIONS

The preceding analysis indicates that implementation of the DesertXpress project would result in a reduction in traffic on Interstate 15 between Victorville and Las Vegas, when compared to the no-project condition. This reduction ranges from 400 to 500 vehicles per peak hour in the peak direction in 2013, and 1,100 to 1,400 vehicles in 2030, depending on whether the DMU or EMU alternative is selected.

In the areas around the proposed rail stations, the DesertXpress project would result in higher traffic volumes through some nearby intersections. In general, these higher volumes can be mitigated by adding signalization and/or adding lanes to the intersection approaches. Tables 8-1 and 8-2 summarize the mitigation measures recommended for the DMU and EMU alternatives respectively.

The following paragraphs describe the mitigation measures identified for the EMU alternative in 2013 for each alternative station site:

Victorville Station – Option 1: Signalize all four intersections that comprise the South Stoddard Wells Road interchange with I-15, and add a left turn lane to the southbound approach of the southbound ramp intersection.

Victorville Station – Option 2: Signalize the two intersections on Stoddard Wells Road that serve the I-15 interchange, and add a left turn lane to the northbound approach of the northbound ramp intersection.

Las Vegas Station – Downtown Alternative: At Main Street/Charleston Boulevard, which is the primary intersection serving the station, add:

- Fourth westbound through lane.
- Exclusive westbound right turn lane.
- Second eastbound left turn lane.
- Exclusive eastbound right turn lane.
- Exclusive dual southbound right turn lanes.

Also add a right turn lane to the eastbound approach of the Charleston Boulevard/South Martin Luther King Boulevard intersection.

Las Vegas Station – Central Location "A" Alternative: Add the following to the Flamingo Road/Hotel Rio Drive intersection, which would be one of the primary access points to the station:

- Third southbound left turn lane.
- Fourth westbound through lane.
- Second westbound right turn lane.
- Fourth eastbound through lane.

Add one right turn lane to one approach at each of the following intersections: Twain Avenue/Dean Martin Drive/Industrial, Industrial/Frank Sinatra Drive, and Flamingo Road/Northbound I-15 Ramps.

Las Vegas Station – South Alternative: At the Polaris Avenue/Hacienda Avenue intersection, add one turn lane to the eastbound, westbound and northbound approaches. At the Polaris Avenue/Russell Road intersection, add the following:

- Exclusive eastbound right turn lane.
- Second westbound left turn lane.
- Exclusive northbound left turn lane.

Signalize the Hacienda Avenue/Aldebaran intersection. Add a right turn lane to the southbound approach of the Russell Road/Southbound I-15 Ramps intersection. At the Tropicana Avenue/Dean Martin Drive/Industrial Road intersection, add right turn lanes to the westbound and northbound approaches. (Note that of the four Las Vegas alternatives, this location is in the least developed neighborhood with the lowest-capacity existing street system.)

Las Vegas Station – Central Location "B" Alternative: Add the following to the Flamingo Road/Hotel Rio Drive intersection, which would be one of the primary access points to the station:

- Fourth eastbound through lane.
- Second westbound left turn lane.
- Fourth westbound through lane.
- Second northbound right turn lane.

At Tropicana Avenue/Dean Martin Drive add one lane to each approach.

Table 8-1
Project Mitigations – DMU Alternatives

Station Location Alternative	Existing	2013	2030
Victorville Option 1	#1. Outer Highway & I-15 NB Ramps − Signalize #4. Stoddard Wells Road & I-15 SB Off-ramp − Signalize		#5. Stoddard Wells Road & Station Access #1 − Add third southbound through lane #7 & #8. Stoddard Wells Road & i-15 Ramps − Future intersections cannot be mitigated under 2030 Baseline (No build) conditions.

Station Location Alternative	Existing	2013	2030
Victorville Option 2	No mitigations required under this scenario.	#1. Stoddard Wells Road & I-15 NB Ramps − Signalize	No mitigations required under this scenario.
Downtown Station Location Alternative	No analysis performed for Existing plus DMU project conditions.	#9. Main Street / Charleston Boulevard − Add second eastbound left turn lane − Add exclusive dual southbound right turn lanes	#8. Grand Central Parkway / W. Charleston Boulevard − Add fourth westbound through lane. #9. Main Street/Charleston Boulevard − Add third eastbound left turn lane. − Add exclusive eastbound right turn lane. #15. I15 Ramps/Charleston Boulevard (SPUI Interchange) − Add third southbound left turn lane
Central Station Location "A"	No analysis performed for Existing plus DMU project conditions.	#5. Twain Avenue & Dean Martin Drive/Industrial − Optimize network offset. #8. Flamingo & I-15 NB Ramps − Optimize network offset. #11. Flamingo & Hotel Rio Drive − Add third southbound left turn lane. − Add fourth westbound through lane. − Add second westbound right turn lane. − Add fourth eastbound through lane.	#5. Twain Avenue & Dean Martin Drive/Industrial − Add second southbound right turn lane. #8. Flamingo & I-15 NB Ramps − Add third eastbound left turn lane
South Station Location	No analysis performed for Existing plus DMU project conditions.	#2. Tropicana & Dean Martin Drive/Industrial − Add exclusive westbound right turn lane. − Add exclusive northbound right turn lane. #5. Hacienda & Aldebaran − Signalize this intersection. #6. Hacienda & Polaris − Add exclusive northbound left turn lane. #8. Russell/Polaris − Add exclusive westbound right turn lane.	#1. Tropicana & Valley View − Add second westbound left turn lane. #6. Hacienda & Polaris − Add exclusive northbound right turn lane. #7. Hacienda & Valley View − Add third eastbound left turn lane. − Add second westbound left turn lane. #8. Russell & Polaris − Add third southbound left turn lane.

Station Location Alternative	Existing	2013	2030
		− Add exclusive northbound right turn lane. − Add southbound dual left turn lanes.	#9. Russell & I-15 SB Ramps − Add second eastbound right turn lane. #10. Russell/I-15 NB Ramps − Add second north-bound left turn lane.
Central Station Location "B"	No analysis performed for Existing plus DMU project conditions.	#1. Flamingo Road & Hotel Rio Drive − Add fourth eastbound through lane. − Add second westbound left turn lane. − Add second northbound right turn lane. #7. Tropicana Avenue & Dean Martin Drive − Add exclusive eastbound right turn lane.	#1. Flamingo & Hotel Rio Drive − Add fourth westbound through lane. − Stripe existing northbound through lane as shared through/right lane. #3. Flamingo Road & I-15 NB Ramps − Optimize signal offsets along Flamingo Road. #7. Tropicana Avenue & Dean Martin Drive − Add fourth eastbound through lane. − Add fourth westbound through lane. − Add exclusive westbound right turn lane. − Add third southbound left turn lane. #9. Tropicana Avenue & I-15 NB Ramps − Add second northbound right turn lane.

Table 8-2
Project Mitigations – EMU Alternatives

Station Location Alternative	Existing	2013	2030
Victorville Option 1	#1. Outer Highway & I-15 NB Ramps − Signalize #2. Outer Highway & Stoddard Wells Road − Signalize − Add northbound left turn lane − Add south-bound right turn lane #3. Stoddard Wells Road & I-15 SB On-ramp − Signalize #4. Stoddard Wells Road & I-15 SB Off-ramp − Signalize		#5. Stoddard Wells Road & Station Access #1 − Add third southbound through lane #7 & #8. Stoddard Wells Road & i-15 Ramps Future intersections cannot be mitigated under 2030 Baseline (No build) conditions.
Victorville Option 2	#1. Stoddard Wells Road & I-15 NB Ramps − Signalize #2. Stoddard Wells Road & Quarry Road − Signalize	#1. Stoddard Wells Road & I-15 NB Ramps − Add northbound left turn lane	#1. Stoddard Wells Road & I-15 NB Ramps − Add second southbound right turn lane
Downtown Station Location Alternative	No analysis performed for Existing plus EMU project conditions.	#6. Charleston/S. Martin Luther King Boulevard − Add exclusive eastbound right turn lane. #9. Main Street/Charleston Boulevard − Add fourth westbound through lane. − Add exclusive westbound right turn lane. − Add second eastbound left turn lane. − Add exclusive eastbound right turn lane. − Add exclusive dual southbound right turn lanes.	#4. Bonneville/S. Martin Luther King Boulevard − Add exclusive westbound right turn lane. #8. Grand Central Parkway/W. Charleston Boulevard − Add fourth westbound through lane. #9. Main Street/Charleston Boulevard − Add third eastbound left turn lane. − Add second northbound left turn lane. − Add exclusive northbound right turn lane.

Station Location Alternative	Existing	2013	2030
			− Add fifth westbound through lane. − Add second southbound left turn lane. #15. I-15 Ramps / Charleston Boulevard (SPUI Interchange) − Add third southbound left turn lane. − Add fourth westbound through lane.
Central Station Location "A"	No analysis performed for Existing plus EMU project conditions.	#5. Twain Avenue & Dean Martin Drive/Industrial − Add second southbound right turn lane. #6. Industrial & Frank Sinatra − Add second westbound right turn lane #8. Flamingo & I-15 NB Ramps − Add third eastbound right turn lane #11. Flamingo & Hotel Rio Drive − Add third southbound left turn lane. − Add fourth westbound through lane. − Add second westbound right turn lane. − Add fourth eastbound through lane.	#8. Flamingo & I-15 NB Ramps − Add third eastbound left turn lane. − Add fourth westbound through lane.
South Station Location	No analysis performed for Existing plus EMU project conditions.	#2. Tropicana & Dean Martin Drive/Industrial − Add exclusive westbound right turn lane. − Add exclusive northbound right turn lane. #5. Hacienda & Aldebaran − Signalize this intersection. #6. Hacienda & Polaris − Add exclusive eastbound right turn lane. − Add second westbound left turn lane. − Add exclusive northbound left turn lane. #8. Russell/Polaris	#1. Tropicana & Valley View − Add second westbound left turn lane. #2. Tropicana & Dean Martin Drive/Industrial − Add exclusive westbound right turn lane. − Add third northbound through lane. − Add exclusive northbound right turn lane. #6. Hacienda & Polaris − Add third westbound left turn lane. − Add exclusive northbound right turn lane.

Station Location Alternative	Existing	2013	2030
		− Add exclusive westbound right turn lane. − Add exclusive northbound right turn lane. − Add southbound dual left turn lanes. − Add exclusive southbound right turn lane. #9. Russell/I-15 SB Ramps − Add second southbound right turn lane.	#7. Hacienda & Valley View − Add third eastbound left turn lane. − Add second westbound left turn lane − Add second southbound left turn lane. #8. Russell & Polaris − Add third southbound left turn lane. #9. Russell & I-15 SB Ramps − Add second eastbound right turn lane. − Add second westbound left turn lane. #10. Russell/I-15 NB Ramps − Add third eastbound left turn lane. − Add second northbound left turn lane.
Central Station Location "B"	No analysis performed for Existing plus EMU project conditions.	#1. Flamingo Road & Hotel Rio Drive − Add fourth eastbound through lane. − Add second westbound left turn lane. − Add fourth westbound through lane. − Add second northbound right turn lane. #4. Hotel Rio Drive & Dean Martin Drive − Modify eastbound right turn to have overlap phasing. #7. Tropicana Avenue & Dean Martin Drive − Add exclusive eastbound right turn lane. − Add exclusive westbound right turn lane. − Add exclusive northbound right turn lane. − Add third southbound left turn lane.	#1. Flamingo & Hotel Rio Drive − Stripe existing northbound through lane as shared through/right lane. #3. Flamingo & I-15 NB Ramps − Add fourth westbound through lane. #4. Hotel Rio Drive & Dean Martin Drive − Add second northbound left turn lane. #7. Tropicana Avenue & Dean Martin Drive − Add fourth eastbound through lane. − Add fourth westbound through lane. #9. Tropicana Avenue & I-15 NB Ramp − Add second northbound right turn lane.

Victorville Station Site 3 (VV3)
Supplemental Traffic Impact Analysis

Victorville Station Location Option 3

The proposed station in Victorville would be located along the west side of I-15 near the Dale Evans Parkway interchange. Access to this station would be via the Dale Evans Parkway ramps.

EXISTING RAMP JUNCTION ANALYSIS

Ramp junction analysis is performed for the PM peak hour only as done for the intersection analysis. The following ramp junctions were evaluated.

1. I-15 NB Off-ramp to Dale Evans Parkway (Diverge analysis)
2. I-15 SB Off-ramp to Dale Evans Parkway (Diverge analysis)
3. I-15 NB On-ramp from Dale Evans Parkway (Merge analysis)
4. I-15 SB On-ramp from Dale Evans Parkway (Merge analysis)

For the above ramp junctions, volumes for existing (year 2009) conditions were obtained by interpolating between year 2006 and year 2035 volumes provided by the San Bernardino Association of Government's (SANBAG) travel demand model. These volumes were used to perform the analysis. Table 1 presents the results of the ramp junction analysis. HCS calculation sheets are provided in the Appendix.

Table 1
Ramp Junction Level of Service – Existing Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	B	16.0
2	I-15 SB Off-ramp to Dale Evans Parkway	C	26.6
3	I-15 NB On-ramp from Dale Evans Parkway	B	16.1
4	I-15 SB On-ramp from Dale Evans Parkway	C	26.3

SOURCE: AECOM, 2010.

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 1, all the ramp junctions operate at acceptable conditions under existing conditions.

RAMP JUNCTION IMPACT ANALYSIS

2013 Baseline Conditions

The future year 2013 baseline volumes were obtained by interpolating between the existing year and future year 2035 travel demand volumes from SANBAG. For analysis purposes, existing geometry was assumed for the future year 2013 conditions. Table 2 presents the results of the ramp junction analysis for 2013 baseline conditions. HCS calculation sheets are provided in the Appendix.

Table 2
Ramp Junction Level of Service – 2013 Baseline Conditions

	Location	LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	B	18.8
2	I-15 SB Off-ramp to Dale Evans Parkway	D	28.8
3	I-15 NB On-ramp from Dale Evans Parkway	B	18.8
4	I-15 SB On-ramp from Dale Evans Parkway	D	29.6

SOURCE: AECOM, 2010.

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 2, all the ramp junctions operate at acceptable conditions under 2013 baseline conditions.

2013 Baseline plus DMU Alternative Conditions

The DMU project alternative volumes were added to the 2013 baseline volumes to obtain the 2013 baseline plus DMU alternative condition volumes. These volumes were used to perform the analysis. Table 3 presents the results of the ramp junction analysis for 2013 baseline plus DMU conditions. HCS calculation sheets are provided in the Appendix.

Table 3
Ramp Junction Level of Service – 2013 Baseline plus DMU Alternative Conditions

	Location	LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	C	23.4
2	I-15 SB Off-ramp to Dale Evans Parkway	D	29.0
3	I-15 NB On-ramp from Dale Evans Parkway	C	22.2
4	I-15 SB On-ramp from Dale Evans Parkway	D	30.2

SOURCE: AECOM, 2010.

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 3, all the ramp junctions continue to operate at acceptable conditions under 2013 baseline plus DMU project alternative conditions.

2013 Baseline plus EMU Alternative Conditions

The EMU project alternative volumes were added to the 2013 baseline volumes to obtain the 2013 baseline plus EMU alternative condition volumes. These volumes were used to perform the analysis. Table 4 presents the results of the ramp junction analysis for 2013 baseline plus EMU conditions. HCS calculation sheets are provided in the Appendix.

Table 4
Ramp Junction Level of Service – 2013 Baseline plus EMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	C	25.3
2	I-15 SB Off-ramp to Dale Evans Parkway	D	29.1
3	I-15 NB On-ramp from Dale Evans Parkway	C	23.6
4	I-15 SB On-ramp from Dale Evans Parkway	D	34.8

SOURCE: AECOM, 2010.

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 4, all the ramp junctions continue to operate at acceptable conditions under 2013 baseline plus EMU project alternative conditions.

2030 Baseline Conditions

The future year 2030 baseline volumes were obtained by interpolating between the existing year and future year 2035 travel demand volumes from SANBAG. For analysis purposes, existing geometry was assumed for the on- and off-ramps and three lanes were assumed for the freeway mainline. Table 5 presents the results of the ramp junction analysis for 2030 baseline conditions. HCS calculation sheets are provided in the Appendix.

Table 5
Ramp Junction Level of Service – 2030 Baseline Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	D	28.2
2	I-15 SB Off-ramp to Dale Evans Parkway	**E**	**35.5**
3	I-15 NB On-ramp from Dale Evans Parkway	D	29.1
4	I-15 SB On-ramp from Dale Evans Parkway	**F**	**41.6**

Bold indicates unacceptable conditions SOURCE: AECOM, 2009.

Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

As indicated in Table 5, northbound on and off-ramp junctions operate at acceptable conditions (LOS D), while southbound on and off-ramp junctions operate at unacceptable conditions (LOS E or F).

2030 Baseline plus DMU Alternative Conditions

The DMU project alternative volumes were added to the 2030 baseline volumes to obtain the 2030 baseline plus DMU alternative condition volumes. These volumes were used to perform the analysis. Table 6 presents the results of the ramp junction analysis for 2030 baseline plus DMU conditions. HCS calculation sheets are provided in the Appendix.

Table 6
Ramp Junction Level of Service – 2030 Baseline plus DMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	D	32.0
2	I-15 SB Off-ramp to Dale Evans Parkway	**E**	**35.6**
3	I-15 NB On-ramp from Dale Evans Parkway	D	32.4
4	I-15 SB On-ramp from Dale Evans Parkway	**F**	**42.2**

Bold indicates unacceptable conditions SOURCE: AECOM, 2009.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

Comparing results from tables 5 and 6, it can be noted that the southbound on and off-ramp junctions continue to operate at unacceptable conditions under this scenario. The densities at the ramp influence area only increase with the addition of the DMU project volumes.

2030 Baseline plus EMU Alternative Conditions

The EMU project alternative volumes were added to the 2030 baseline volumes to obtain the 2030 baseline plus EMU alternative condition volumes. These volumes were used to perform the analysis. Table 7 presents the results of the ramp junction analysis for 2030 baseline plus DMU conditions. HCS calculation sheets are provided in the Appendix.

Comparing results from tables 5 and 7, it can be noted that the southbound on and off-ramp junctions continue to operate at unacceptable conditions under this scenario. The densities at the ramp influence area only increase with the addition of the EMU project volumes.

Table 7
Ramp Junction Level of Service – 2030 Baseline plus EMU Alternative Conditions

Location		LOS	D_R
1	I-15 NB Off-ramp to Dale Evans Parkway	D	33.5
2	I-15 SB Off-ramp to Dale Evans Parkway	**E**	**35.7**
3	I-15 NB On-ramp from Dale Evans Parkway	D	33.7
4	I-15 SB On-ramp from Dale Evans Parkway	**F**	**46.5**

Bold indicates unacceptable conditions SOURCE: AECOM, 2009.
Notes:
a) NB = Northbound; SB = Southbound
b) LOS = Level of Service
c) Density of ramp (D_R) reported in pc/mi/ln

EXISTING ROADWAY NETWORK AROUND THE STATION LOCATION

The Dale Evans Parkway interchanges with I-15 will provide the most direct regional access to the proposed Victorville train station location option 3. Currently this roadway has a single travel lane in each direction; because of the relatively low traffic volume, intersections in the area are stop controlled. The existing lane geometry at the Victorville study intersections is shown in Figure 1.

EXISTING INTERSECTION OPERATIONS

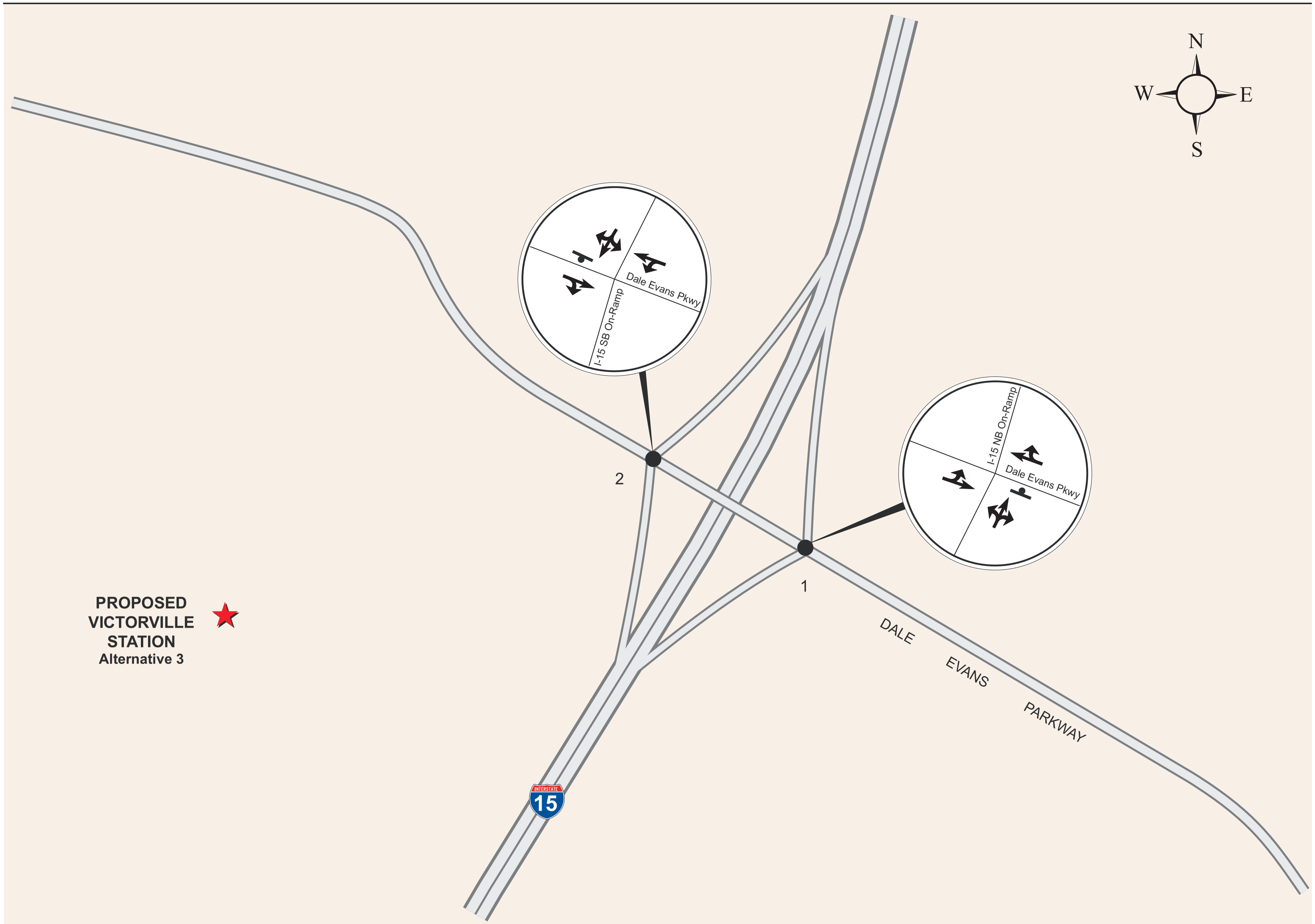
Based on the station location, the following existing intersections in the station vicinity have been identified for analysis:

- Dale Evans Parkway and I-15 NB Ramps
- Dale Evans Parkway and I-15 SB Ramps

The evening peak hour turning movement counts were obtained at these study intersections on Thursday, May 28 2009. These volumes are presented in Figure 2.

Intersection LOS for the weekday PM peak period (4:00 PM to 6:00 PM) was calculated for the study intersections. The results of the analysis are presented in Table 8. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 8, both the study intersections operate at acceptable conditions under existing conditions.



Stop Sign

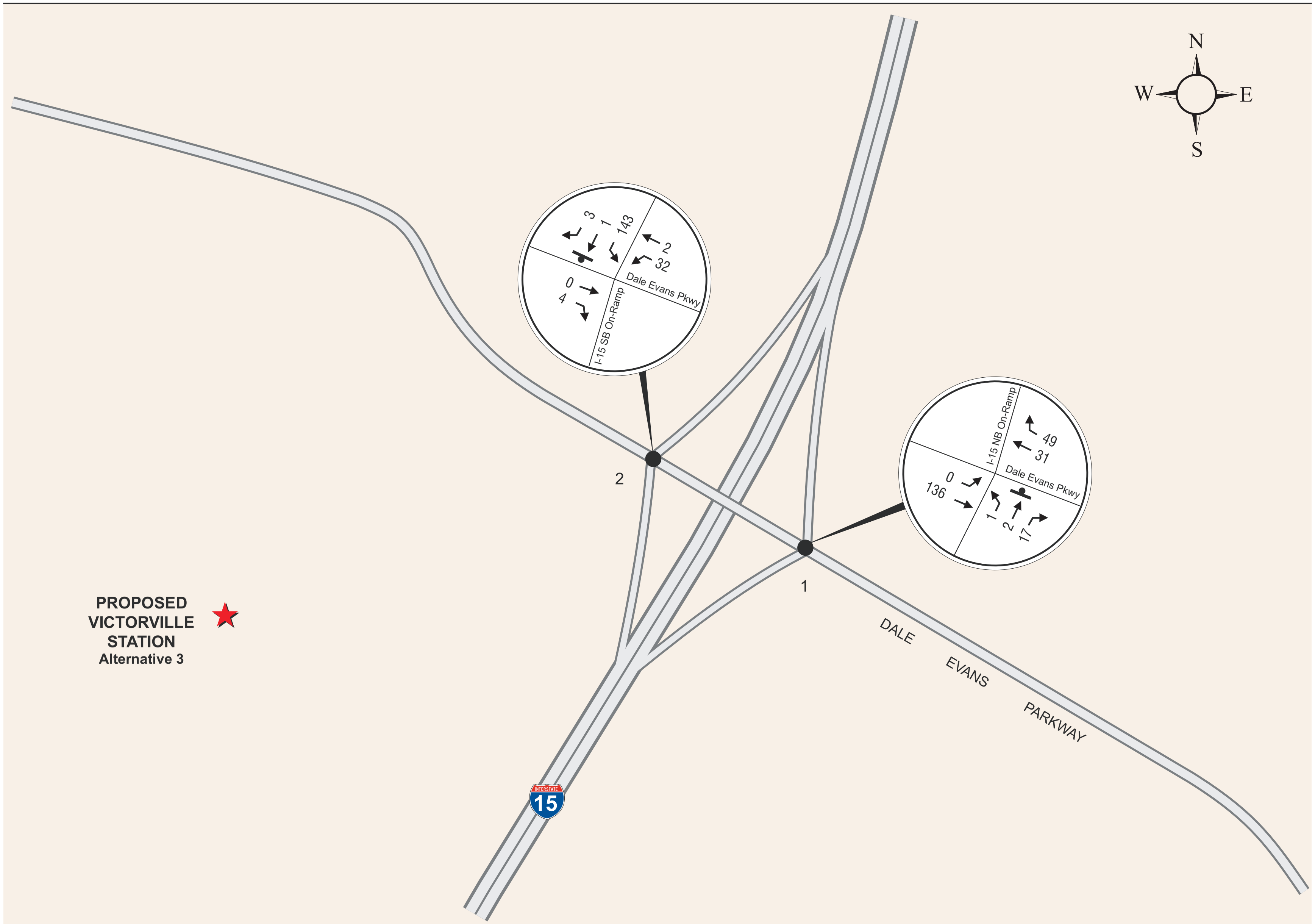
DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 1

EXISTING INTERSECTION LANE GEOMETRY

Victorville Station Alternative 3

AECOM



Stop Sign

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 2

EXISTING INTERSECTION TRAFFIC VOLUMES

Victorville Station Alternative 3

Table 8
Victorville Option 3 - Existing Conditions LOS

Intersection		Traffic Control	Existing Conditions LOS	Existing Conditions Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Unsignalized[2]	A (NB)	9.3
2	I-15 Southbound Ramps / Dale Evans Parkway	Unsignalized[2]	A (SB)	9.8

Notes:
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. SB=Southbound, WB=Westbound

Source: AECOM, 2009.

In Victorville, LOS A through D are considered satisfactory levels and LOS E and F conditions are considered unsatisfactory service levels. Unsignalized intersections are considered to operate at unsatisfactory conditions if one approach operates at LOS E or F and Caltrans peak hour volume signal warrants are met.

Impact Analysis

This section presents the assessment of transportation impacts due to the proposed project. The transportation conditions were assessed for the following scenarios:

- Existing plus Project Conditions;
- 2013 Opening Year Conditions;
- 2013 Opening Year plus Project Conditions;
- 2030 Cumulative Baseline Conditions; and,
- 2030 Cumulative Baseline plus Project Conditions.

SIGNIFICANCE CRITERIA

The following are the significance criteria used by the City of Victorville and San Bernardino County CMP guidelines for the determination of impacts associated with a proposed project:

- If the proposed site adds 5% or more to the peak hour traffic of an intersection.
- Level of service C will be the design objective for capacity and under no circumstances will less than level of service D be accepted.

PROJECT TRAVEL DEMAND

The Victor Valley Area Transportation Study (VVATS) travel demand forecasting model was used to develop the base “no-project” travel forecasts for future year 2013 and 2030 traffic analysis. The City of Victorville provided future year 2035 travel forecasts from the model to AECOM. AECOM has applied a straight line method to interpolate the intermediate year volumes for project purpose. The project-related trips were then added to the future year base volumes to determine the “with project conditions”.

TRIP DISTRIBUTION

The overall trip distribution for the station is shown in Figure 3. This station is served primarily by I-15 and Dale Evans Parkway. Due to its proximity to the northern I-15 / Dale Evans Parkway interchange, it is assumed that all vehicles generated by the proposed station would use this interchange.

There are a total of 5 station accesses leading to 7 parking areas within the station boundary. Project trip distribution within the station boundary is based on the proportion of parking spaces served by each access. It is assumed that all non self-drive passengers will use Parking Area 6 and self-drive passengers will use all 7 parking areas. As a result, trips by self-drive passengers will be accounted for at all 5 accesses whereas non self-drive passenger trips will only be accounted for at Intersection 3 (Station Access #1 / Dale Evans Parkway) that provides direct access to parking area 6. Half of area 6 is assumed to be assigned for uses other than self-drive passengers. Table 9 presents the number of parking spaces in each area and the corresponding portion used for distributing self-drive trips. The proposed parking layout and allocation plan is presented in Figure 4. It can be seen that each parking access is shared between two parking areas.

Table 9
Self-Drive Trip Distribution

Parking Area	Total # spaces	Self-drive # spaces	Self Drive Proportion [2]
6 [1]	6021	3011	0.22
5	1872	1872	0.14
4	1134	1134	0.08
3	2272	2272	0.17
2	2442	2442	0.18
1	2117	2117	0.16
7	670	670	0.05
Total	**16528**	**13518**	**1**

Notes:
1. Remaining 3010 parking spaces are assumed to be used by non self-drive passengers.
2. Self-drive proportion determined by parking spaces allocation to be used for trip assignment at study intersections.

EXISTING PLUS PROJECT CONDITIONS

Existing plus Diesel Electric Multiple Unit (DMU) Alternative Conditions

Based on the trip distribution presented in Figure 3 and the parking distribution, project trips accessing the station were assigned at the study intersections. The project trips for DMU alternative conditions are presented in the Appendix. These project trips were added to the existing volumes to generate the Existing plus DMU volumes.

AECOM

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 3

VICTORVILLE STATION TRIP DISTRIBUTION

Victorville Station Alternative 3

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 4

STATION PARKING LAYOUT AND ALLOCATION

Victorville Station Alternative 3

F-G-171

Based on the Existing plus DMU volumes and the existing geometry, intersection level of service analysis was performed. Table 10 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 10, both ramp intersections operate at unacceptable level of service (LOS F) under this scenario. All the other intersections operate at acceptable conditions.

Table 10
Victorville Option 3 – Existing plus DMU Conditions LOS

Intersection		Traffic Control	Existing Conditions		Existing plus DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Unsignalized[2]	A (NB)	9.3	F (NB)	163.4
2	I-15 Southbound Ramps / Dale Evans Parkway	Unsignalized[2]	A (SB)	9.8	F (SB)	115.3
3	Station Access #1 / Dale Evans Parkway	Unsignalized[2]	-	-	B (NB)	12.6
4	Station Access #2 / Dale Evans Parkway	Unsignalized[2]	-	-	A (NB)	9.6
5	Future Street / Dale Evans Parkway	Unsignalized[2]	-	-	A (NB)	9.1
6	Future Street / Station Access #3	Unsignalized[2]	-	-	A (WB)	9.3
7	Future Street / Station Access #4	Unsignalized[2]	-	-	A (WB)	9.0
8	Future Street / Station Access #5	Unsignalized[2]	-	-	A (WB)	8.7

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, WB=Westbound
4. Intersections 3, 4, 5, 6, 7 and 8 exist with Project conditions only

Comparing the results of the Existing plus DMU conditions to the Existing conditions level of service, it can be noted that due to the addition of project volumes, intersections approaches at Dale Evans Parkway at I-15 northbound and southbound ramps deteriorate from acceptable (LOS A) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the existing volumes at these intersections, project impacts at these intersections are considered to be significant.

Existing plus Electric Multiple Unit (EMU) Alternative Conditions

Based on the trip distribution presented in Figure 3 and the parking distribution, project trips accessing the station were assigned to the analysis intersections. The project trips for EMU alternative conditions are presented in the Appendix.

These project trips were added to the existing volumes to generate the Existing plus EMU volumes.

Based on the Existing plus EMU volumes and the existing geometry, intersection level of service analysis was performed. Table 11 presents the results of the analysis. SYNCHRO analysis worksheets are provided in the Appendix.

As indicated in Table 11, both ramp intersections operate at unacceptable level of service (LOS F) under this scenario. All the other intersections operate at acceptable conditions.

Table 11
Victorville Option 3 – Existing plus EMU Conditions LOS

Intersection		Traffic Control	Existing Conditions		Existing plus EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Unsignalized[2]	A (NB)	9.3	F (NB)	529.5
2	I-15 Southbound Ramps / Dale Evans Parkway	Unsignalized[2]	A (SB)	9.8	F (SB)	567.8
3	Station Access #1 / Dale Evans Parkway	Unsignalized[2]	-	-	C (NB)	19.4
4	Station Access #2 / Dale Evans Parkway	Unsignalized[2]	-	-	B (NB)	10.4
5	Future Street / Dale Evans Parkway	Unsignalized[2]	-	-	A (NB)	9.5
6	Future Street / Station Access #3	Unsignalized[2]	-	-	A (WB)	9.8
7	Future Street / Station Access #4	Unsignalized[2]	-	-	A (WB)	9.4
8	Future Street / Station Access #5	Unsignalized[2]	-	-	A (WB)	8.8

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, WB=Westbound
4. Intersections 3, 4, 5, 6, 7 and 8 exist with Project conditions only

Comparing the results of the Existing plus EMU conditions to the Existing conditions level of service, it can be noted that due to the addition of project volumes, intersections approaches at Dale Evans Parkway at I-15 northbound and southbound ramps deteriorate from acceptable (LOS A) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the existing volumes at these intersections, project impacts at these intersections are considered to be significant.

2013 Opening Year Conditions

2013 BASELINE CONDITIONS (NO PROJECT)

Future year 2013 base volumes were calculated by linear interpolation between the existing year (traffic counts) and future year volumes (horizon year of SANBAG travel demand model). These volumes are presented in the Appendix. For analysis purposes, the existing intersection geometry was assumed for future year 2013 conditions at the ramp locations and future intersections were assumed to be stop controlled as presented in Figure 5. Based on the future base volumes and the geometry presented in Figure 5, intersection level of service analysis was performed.

It should be noted that, intersections 3, 4 and 8 do not exist without Project and, intersections 6 and 7 are T-intersections without the fourth leg leading into the Project site under 2013 Baseline Conditions.

Table 12 presents the results of intersection operating conditions for future year 2013 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

Table 12
Victorville Option 3 – 2013 Baseline Conditions LOS

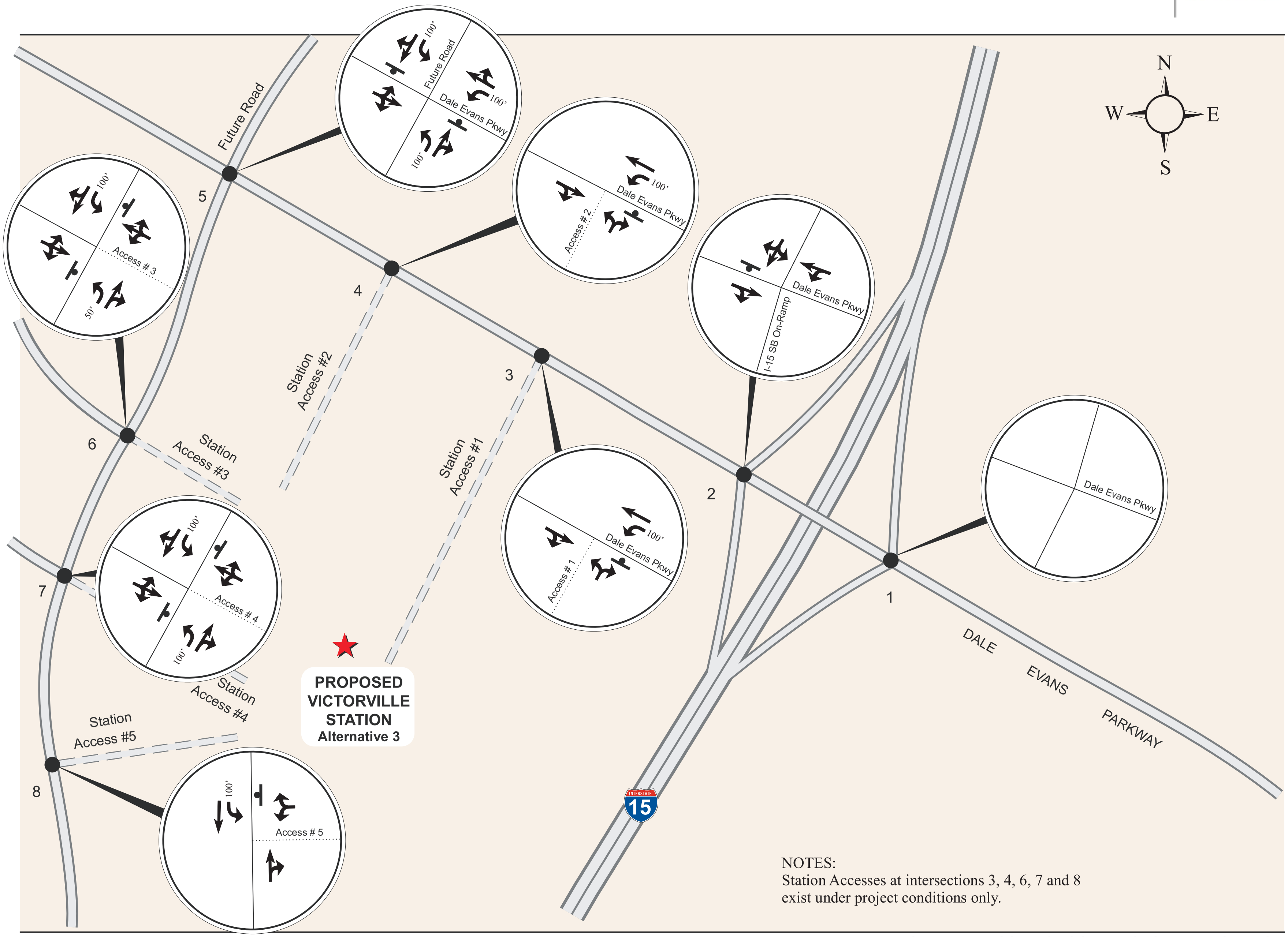
Intersection		Traffic Control	2013 Baseline Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Unsignalized[2]	B (NB)	12.0
2	I-15 Southbound Ramps / Dale Evans Parkway	Unsignalized[2]	C (SB)	15.5
5	Future Street / Dale Evans Parkway	Unsignalized[2]	C (SB)	16.0
6	Future Street / Station Access #3	Unsignalized[2]	B (EB)	11.9
7	Future Street / Station Access #4	Unsignalized[2]	B (EB)	13.2

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound
4. Intersections 6 and 7 are T-intersections under 2013 Baseline conditions

As indicated in Table 12, all the study intersections continue to operate at acceptable conditions under 2013 Baseline conditions.

2013 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 3 and the parking distribution, project trips accessing the station were assigned to the analysis intersections. The project trips for DMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus DMU volumes.



Stop Sign

DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 5

FUTURE YEAR 2013 INTERSECTION LANE GEOMETRY

Victorville Station Alternative 3

Based on the 2013 Baseline plus DMU volumes and the geometry presented in Figure 5, intersection level of service analysis was performed. Table 13 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 13, the intersections of Dale Evans Parkway at I-15 northbound ramps, I-15 southbound ramps and Future Street operate at unacceptable conditions (LOS F) while all other intersections operate at acceptable conditions (LOS D or better).

Table 13
Victorville Option 3 – 2013 Baseline plus DMU Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions		2013 Baseline plus DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Unsignalized[2]	B (NB)	12.0	F (NB)	586.3
2	I-15 Southbound Ramps / Dale Evans Parkway	Unsignalized[2]	C (SB)	15.5	F (SB)	666.9
3	Station Access #1 / Dale Evans Parkway	Unsignalized[2]	-	-	C (NB)	19.3
4	Station Access #2 / Dale Evans Parkway	Unsignalized[2]	-	-	B (NB)	11.7
5	Future Street / Dale Evans Parkway	Unsignalized[2]	C (SB)	16.0	F (NB)	-
6	Future Street / Station Access #3	Unsignalized[2]	B (EB)	11.9	C (EB)	21.7
7	Future Street / Station Access #4	Unsignalized[2]	B (EB)	13.2	D (EB)	27.6
8	Future Street / Station Access #5	Unsignalized[2]	-	-	B (WB)	11.5

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound
4. Intersections 6 and 7 are T-intersections under 2013 Baseline conditions
5. Intersection 3, 4 and 8 exist with Project conditions only

Comparing the results of 2013 Baseline plus DMU conditions to the 2013 Baseline conditions level of service, it can be noted that due to the addition of project volumes, approaches at the intersections of Dale Evans Parkway at I-15 northbound ramps, I-15 southbound ramps and the future street deteriorate from acceptable (LOS C or better) to unacceptable (LOS F) conditions. As the project trips add more than 5% of the 2013 baseline volumes at the intersections, the project impacts at these intersections are considered to be significant.

2013 BASELINE PLUS EMU CONDITIONS

Based on the trip distribution presented in Figure 3 and the parking distribution, project trips accessing the station were assigned to the analysis intersections. The project trips for EMU alternative conditions for year 2013 are presented in the Appendix. These project trips were added to the 2013 base conditions volumes to generate the 2013 baseline plus EMU volumes.

Based on the 2013 Baseline plus EMU volumes and the geometry presented in Figure 5, intersection level of service analysis was performed. Table 14 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 14, all the intersections operate at unacceptable levels of services (LOS E or F) except intersections 4, 6 and 8.

Comparing the results of 2013 Baseline plus EMU conditions to the 2013 Baseline conditions level of service, it can be noted that due to the addition of project volumes, approaches at the above mentioned intersections deteriorate from acceptable (LOS C or better) to unacceptable (LOS E or F) conditions. As the project trips add more than 5% of the 2013 Baseline volumes at the intersections, the project impacts at these intersections are considered to be significant.

Table 14
Victorville Option 3 – 2013 Baseline plus EMU Conditions LOS

Intersection		Traffic Control	2013 Baseline Conditions		2013 Baseline plus EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Unsignalized[2]	B (NB)	12.0	F (NB)	-
2	I-15 Southbound Ramps / Dale Evans Parkway	Unsignalized[2]	C (SB)	15.5	F (SB)	-
3	Station Access #1 / Dale Evans Parkway	Unsignalized[2]	-	-	F (NB)	65.1
4	Station Access #2 / Dale Evans Parkway	Unsignalized[2]	-	-	B (NB)	13.0
5	Future Street / Dale Evans Parkway	Unsignalized[2]	C (SB)	16.0	F (NB)	-
6	Future Street / Station Access #3	Unsignalized[2]	B (EB)	11.9	D (EB)	29.9
7	Future Street / Station Access #4	Unsignalized[2]	B (EB)	13.2	E (EB)	40.7
8	Future Street / Station Access #5	Unsignalized[2]	-	-	B (WB)	12.0

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. NB=Northbound, SB=Southbound, EB=Eastbound, WB=Westbound
4. Intersections 6 and 7 are T-intersections under 2013 Baseline conditions
5. Intersection 3, 4 and 8 exist with Project conditions only
6. Operating conditions at intersections 1, 2 and 5 breakdown under 2013 baseline + EMU project conditions, hence no delay reported.

2030 Cumulative Conditions

Under this scenario, the proposed improvements include signalization at all study intersections. Future year 2030 roadway geometry and signal control are presented in Figure 6.

Future year 2030 base volumes were calculated by linear interpolation between the existing year (traffic counts) and future year volumes (SANBAG travel demand model). These volumes are presented in the Appendix.

It should be noted that, intersections 3, 4 and 8 do not exist without Project while intersections 6 and 7 are T-intersections without the fourth leg leading into the Project site under 2030 Baseline Conditions.

Using the future base volumes and the proposed geometry presented in Figure 6, intersection level of service analysis was performed. Table 15 presents the results of intersection operating conditions for future year 2030 baseline conditions. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 15, all the study intersections operate at acceptable conditions (LOS D or better) under this scenario.

Table 15
Victorville Option 3 - 2030 Baseline Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	30.8
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	C	24.3
5	Future Street / Dale Evans Parkway	Signalized	D	49.3
6	Future Street / Station Access #3	Signalized	A	7.4
7	Future Street / Station Access #4	Signalized	B	12.4

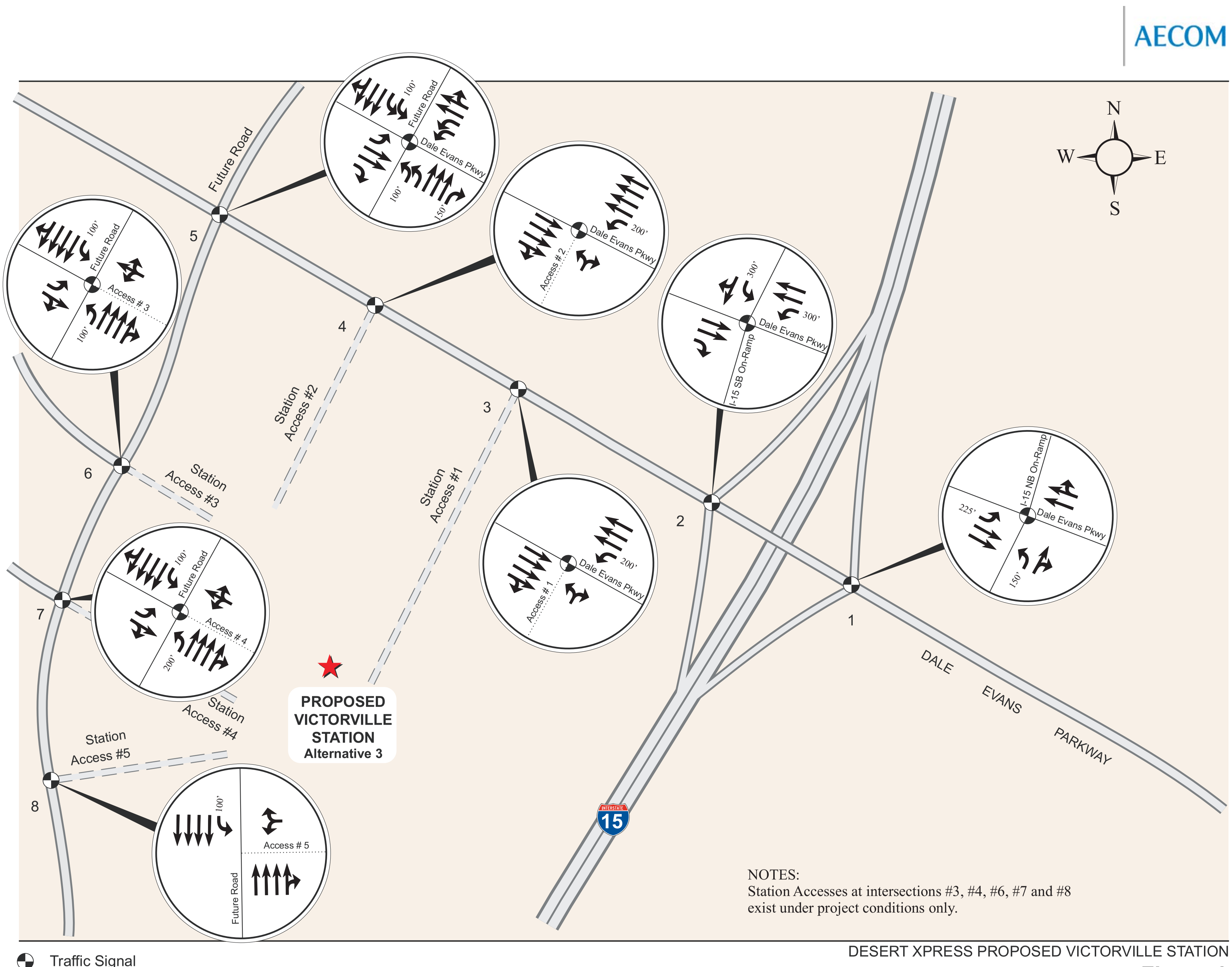
Notes: Source: AECOM, 2009.

1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. Intersections 6 and 7 are T-intersections under 2030 Baseline conditions

2030 BASELINE PLUS DMU CONDITIONS

Based on the trip distribution presented in Figure 3 and the parking distribution, project trips accessing the station were assigned to the analysis intersections. The project trips for DMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus DMU volumes.

Based on the 2030 Baseline plus DMU volumes and the geometry presented in Figure 6, intersection level of service analysis was performed. Table 16 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.



DESERT XPRESS PROPOSED VICTORVILLE STATION

Figure 6

FUTURE YEAR 2030 INTERSECTION LANE GEOMETRY

Victorville Station Alternative 3

As indicated in Table 16, the intersections of Dale Evans Parkway at I-15 northbound ramps, southbound ramps and at Future Street operate at unacceptable conditions (LOS E or F) while all other intersections operate at acceptable conditions (LOS B or better).

Table 16
Victorville Option 3 - 2030 Baseline plus DMU Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions		2030 Baseline plus DMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	30.8	F	89.9
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	C	24.3	F	83.0
3	Station Access #1 / Dale Evans Parkway	Signalized	-	-	B	18.5
4	Station Access #2 / Dale Evans Parkway	Signalized	-	-	B	13.4
5	Future Street / Dale Evans Parkway	Signalized	D	49.3	E	56.6
6	Future Street / Station Access #3	Signalized	A	7.4	A	9.1
7	Future Street / Station Access #4	Signalized	B	12.4	B	15.5
8	Future Street / Station Access #5	Signalized	-	-	A	6.5

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. Intersections 6 and 7 are T-intersections under 2030 Baseline conditions
4. Intersection 3, 4 and 8 exist with Project conditions only

Comparing the results of 2030 Baseline plus DMU conditions to the 2030 Baseline conditions level of service, it can be noted that due to the addition of project volumes, the above mentioned intersections deteriorate from acceptable (LOS C or better) to unacceptable (LOS E or F) conditions. As the project trips add more than 5% of the 2030 Baseline volumes at the intersections, the project impacts at these intersections are considered to be significant.

2030 Baseline plus EMU Conditions

Based on the trip distribution presented in Figure 3 and the parking distribution, project trips accessing the station were assigned to the analysis intersections. The project trips for EMU alternative conditions for year 2030 are presented in the Appendix. These project trips were added to the 2030 base conditions volumes to generate the 2030 baseline plus EMU volumes.

Based on the 2030 Baseline volumes and the proposed geometry presented in Figure 6, intersection level of service analysis was performed. Table 17 presents the results of the analysis. SYNCHRO analysis worksheets are presented in the Appendix.

As indicated in Table 17, the intersections of Dale Evans Parkway at I-15 northbound ramps, I-15 southbound ramps and at Future Street operate at unacceptable conditions (LOS E or F) while all other intersections operate at acceptable conditions (LOS C or better).

Table 17
Victorville Option 3 - 2030 Baseline plus EMU Conditions LOS

Intersection		Traffic Control	2030 Baseline Conditions		2030 Baseline plus EMU Conditions	
			LOS	Delay[1]	LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	30.8	F	162.3
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	C	24.3	F	150.6
3	Station Access #1 / Dale Evans Parkway	Signalized	-	-	C	31.4
4	Station Access #2 / Dale Evans Parkway	Signalized	-	-	B	13.6
5	Future Street / Dale Evans Parkway	Signalized	D	49.3	E	58.7
6	Future Street / Station Access #3	Signalized	A	7.4	A	9.5
7	Future Street / Station Access #4	Signalized	B	12.4	B	15.8
8	Future Street / Station Access #5	Signalized	-	-	A	8.2

Notes: Source: AECOM, 2009.
1. Delay reported in seconds per vehicle
2. LOS and Delay reported for worst approach
3. Intersections 6 and 7 are T-intersections under 2030 Baseline conditions
4. Intersection 3, 4 and 8 exist with Project conditions only

Comparing the results of 2030 Baseline plus EMU conditions to the 2030 Baseline conditions level of service, it can be noted that due to the addition of project volumes, the above mentioned intersections deteriorate from acceptable (LOS D or better) to unacceptable (LOS E or F) conditions. As the project trips add more than 5% of the 2030 Baseline volumes at the intersections, the project impacts at these intersections are considered to be significant.

Mitigation Measures

EXISTING PLUS DMU CONDITIONS

As indicated in Table 10, two existing intersections at the ramp locations are significantly impacted by the proposed project. To mitigate the impacts at these intersections, the following mitigation measures are proposed:

- # 1: Signalize the intersection of Dale Evans Parkway at I-15 northbound ramps.
- # 2: Signalize the intersection of Dale Evans Parkway at I-15 southbound ramps.

A traffic signal warrant analysis was performed at these intersections to study if a signal can be considered as mitigation measure. The traffic signal warrant analysis at intersections 1 and 2 indicates that the warrant for peak hour (Warrants 3A and 3B) is met. The signal warrant analysis worksheets are provided in the Appendix.

As indicated in Table 18, both intersections would operate at acceptable conditions (LOS B) with mitigation measures. SYNCHRO analysis worksheets are presented in the Appendix.

Table 18
Victorville Option 3 - Existing plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	Existing plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	B	14.1
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	B	11.5

Notes: Source: AECOM, 2009
1. Delay reported in seconds per vehicle

EXISTING PLUS EMU CONDITIONS

As indicated in Table 11, two existing intersections at the ramp locations are significantly impacted by the proposed project. To mitigate these intersections, the following mitigation measures are proposed:

- # 1: Signalize intersection of Dale Evans Parkway at I-15 northbound ramps.
- # 2: Signalize intersection of Dale Evans Parkway at I-15 southbound ramps.

A traffic signal warrant analysis was performed at these intersections to study if a signal can be considered as mitigation measure. The traffic signal warrant analysis at intersections 1 and 2 indicates that the warrant for peak hour (Warrants 3A and 3B) is met. The signal warrant analysis worksheets are provided in the Appendix.

As indicated in Table 19, both intersections operate at acceptable conditions (LOS C or better) with mitigation measures. SYNCHRO analysis worksheets are presented in the Appendix.

Table 19
Victorville Option 3 - Existing plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	Existing plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	20.3
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	B	17.0

Notes: Source: AECOM, 2009
1. Delay reported in seconds per vehicle

2013 Baseline plus DMU Conditions

As indicated in Table 13, three study intersections operate at unacceptable conditions in the 2013 baseline plus DMU conditions. To mitigate this intersection, the following mitigation measures are proposed:

- # 1: Signalize intersection of Dale Evans Parkway at I-15 northbound ramps and add one northbound left turn lane.
- # 2: Signalize intersection of Dale Evans Parkway at I-15 southbound ramps and add an eastbound right turn lane and a westbound left turn lane.
- #5: Signalize intersection of Dale Evans Parkway at Future Street.

A traffic signal warrant analysis was performed at these intersections to study if a signal can be considered as mitigation measure. The traffic signal warrant analysis at intersections 1, 2 and 5 indicates that the warrant for peak hour (Warrants 3A and 3B) is met. The signal warrant analysis worksheets are provided in the Appendix.

Table 20
Victorville Option 3 - 2013 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	22.6
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	C	30.9
5	Future Street / Dale Evans Parkway	Signalized	D	50.3

Notes: Source: AECOM, 2009
1. Delay reported in seconds per vehicle

As indicated in Table 20, all the impacted intersections operate at acceptable conditions (LOS D or better) with the mitigation measures.

2013 BASELINE PLUS EMU CONDITIONS

As indicated in Table 14, five study intersections operate at unacceptable conditions in the 2013 baseline plus EMU conditions. To mitigate these intersections, the following mitigation measures are proposed:

- # 1: Signalize intersection of Dale Evans Parkway at I-15 northbound ramps and add two northbound left turn lanes.
- # 2: Signalize intersection of Dale Evans Parkway at I-15 southbound ramps and add an eastbound right turn lane, second westbound through lane and a westbound left turn lane.
- #3: Signalize intersection of Dale Evans Parkway at Station Access #1 and add second westbound left turn lane.
- #5: Signalize intersection of Dale Evans Parkway at Future Street and add second westbound left turn lane.
- #7: Signalize intersection of Future Street at Station Access #4.

A traffic signal warrant analysis was performed at these intersections to study if a signal can be considered as mitigation measure. The traffic signal warrant analysis at intersections 1, 2, 3 and 5 indicates that the warrant for peak hour (Warrants 3A and 3B) is met, but intersection 7 does not meet peak hour warrant. However, given the estimated high future volumes, it is proposed that the intersection be signalized to enhance safety. The signal warrant analysis worksheets are provided in the Appendix.

Table 21
Victorville Option 3 - 2013 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2013 Baseline plus EMU Mitigation Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	21.5
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	C	33.8
3	Station Access #1 / Dale Evans Parkway	Signalized	C	26.9
5	Future Street / Dale Evans Parkway	Signalized	D	39.6
7	Future Street / Station Access #4	Signalized	B	16.7

Notes: Source: AECOM, 2009
1. Delay reported in seconds per vehicle

As indicated in Table 21, all the impacted intersections operate at acceptable conditions (LOS D or better) with the mitigation measures.

2030 BASELINE PLUS DMU CONDITIONS

As indicated in Table 16, three study intersections operate at unacceptable conditions in the 2030 baseline plus DMU conditions. To mitigate these intersections, the following mitigation measures are proposed:

- # 1: At the intersection of Dale Evans Parkway at I-15 northbound ramps add second northbound left turn lane.
- # 2: At the intersection of Dale Evans Parkway at I-15 southbound ramps optimize the intersection timing.
- # 5: At the intersection of Dale Evans Parkway at Future Street optimize the intersection timing

After applying above mitigation to the 2030 roadway network, the intersection level of service was calculated. Table 22 presents the results of 2030 baseline plus DMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 22
Victorville Option 3 - 2030 Baseline plus DMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus DMU Mitigation Conditions	
			LOS	Delay[1]
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	C	22.8
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	D	54.8
5	Future Street / Dale Evans Parkway	Signalized	D	54.2

Notes: Source: AECOM, 2009
1. Delay reported in seconds per vehicle

As indicated in Table 22, all the impacted intersections operate at acceptable conditions (LOS D or better) with the mitigation measures.

2030 BASELINE PLUS EMU CONDITIONS

As indicated in Table 17, three study intersections operate at unacceptable conditions in the 2030 baseline plus EMU conditions. To mitigate these intersections, the following mitigation measures are proposed:

- # 1: At the intersection of Dale Evans Parkway at I-15 northbound ramps add second northbound left turn lane.
- # 2: At the intersection of Dale Evans Parkway at I-15 southbound ramps add second eastbound right turn lane.
- # 5: At the intersection of Dale Evans Parkway at Future Street add third westbound left turn lane

After applying above mitigation to the 2030 roadway network, the intersection level of service was calculated. Table 23 presents the results of 2030 baseline plus EMU mitigation conditions analysis. SYNCHRO analysis worksheets are presented in the Appendix.

Table 23
Victorville Option 3 - 2030 Baseline plus EMU Mitigation Conditions LOS

Intersection		Traffic Control	2030 Baseline plus EMU Mitigation Conditions	
			LOS	**Delay[1]**
1	I-15 Northbound Ramps / Dale Evans Parkway	Signalized	D	40.7
2	I-15 Southbound Ramps / Dale Evans Parkway	Signalized	C	30.6
5	Future Street / Dale Evans Parkway	Signalized	D	53.0

Notes: Source: AECOM, 2009

1. Delay reported in seconds per vehicle

As indicated in Table 23, all the impacted intersections operate at acceptable conditions (LOS D or better) with the mitigation measures.

Queuing Analysis

Queuing analysis was performed to identify the required length of turn pockets under the future year 2030 cumulative conditions at the ramp locations. Table 24 presents the results of queuing analysis for 2030 baseline and project conditions with and without mitigation measures. The queuing analysis worksheets are included in the Appendix.

It can be noted from Table 24 that the queue lengths under the mitigated conditions are considerably shorter than the baseline conditions.

Table 24
Victorville Option 3 – Queuing Analysis

Intersection		Movement	95th % queue length (ft) 2030	2030 + DMU	2030 + EMU
Baseline Conditions					
1	I-15 Northbound Ramps / Dale Evans Parkway	EBL	261	254	251
		NBL	124	697	944
2	I-15 Southbound Ramps / Dale Evans Parkway	EBR	86	528	715
		WBL	286	133	116
		SBL	203	203	203
5	Future Street / Dale Evans Parkway	WBL	316	634	763
		NBL	360	319	322
		NBR	173	253	559
		SBL	324	324	324
With Mitigations					
1	I-15 Northbound Ramps / Dale Evans Parkway	EBL	NA	236	342
		NBL	NA	264	547
2	I-15 Southbound Ramps / Dale Evans Parkway	EBR	NA	381	261
		WBL	NA	326	374
		SBL	NA	244	349
5	Future Street / Dale Evans Parkway	WBL	NA	562	414
		NBL	NA	443	414
		NBR	NA	304	244
		SBL	NA	407	390

Source: AECOM, 2009.

Summary and Conclusions

In the areas around the proposed rail station, the DesertXpress project would result in higher traffic volumes through some nearby intersections. In general, these higher volumes can be mitigated by adding signalization and/or travel lanes to the intersection approaches. Tables 25 and 26 summarize the mitigation measures recommended for the DMU and EMU alternatives respectively.

Table 25

Project Mitigations – DMU Alternatives

Station Location Alternative	Existing	2013	2030
Victorville Option 3	#1 Dale Evans Parkway & I-15 NB Ramps − Signalize #2 Dale Evans Parkway & I-15 SB Ramps − Signalize	#1 Dale Evans Parkway & I-15 NB Ramps − Add northbound left turn lane #2 Dale Evans Parkway & I-15 SB Ramps − Add eastbound right turn lane − Add westbound left turn lane #5 Dale Evans Parkway & Future Street − Signalize	#1 Dale Evans Parkway & I-15 NB Ramps − Add second northbound left turn lane #2 Dale Evans Parkway & I-15 SB Ramps − Optimize signal timing #5 Dale Evans Parkway & Future Street − Optimize signal timing

Table 26

Project Mitigations – EMU Alternatives

Station Location Alternative	Existing	2013	2030
Victorville Option 3	#1 Dale Evans Parkway & I-15 NB Ramps − Signalize #2 Dale Evans Parkway & I-15 SB Ramps − Signalize	#1 Dale Evans Parkway & I-15 NB Ramps − Add two northbound left turn lanes #2 Dale Evans Parkway & I-15 SB Ramps − Add eastbound right turn lane − Add second westbound through lane − Add westbound left turn lane #3 Dale Evans Parkway & Station Access #1 − Signalize − Add second westbound left turn lane #5 Dale Evans Parkway & Future Street − Signalize − Add second westbound left turn lane #7 Future Street & Station Access #4 − Signalize	#1 Dale Evans Parkway & I-15 NB Ramps − Add second northbound left turn lane #2 Dale Evans Parkway & I-15 SB Ramps − Add second eastbound right turn lane #5 Dale Evans Parkway & Future Street − Add third westbound left turn lane

HCS Analysis Worksheets

Ramp Analysis

Ramp Analysis

Existing Conditions

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 NB
Junction:	Dale Evans Pkwy(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	Existing 2009
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2194	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	157	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	165	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2194		157		165	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	609		44		46	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	2682	176	185	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.685 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 1892 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2682	7200	No
v_{12}	1892	4400	No
$v_{FO} = v_F - v_R$	2506	7200	No
v_R	176	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 16.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	D_S = 0.444	
Space mean speed in ramp influence area,	S_R = 58	mph
Space mean speed in outer lanes,	S_0 = 76.8	mph
Space mean speed for all vehicles,	S = 62.2	mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 NB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	Existing 2009
Description:	DesertXpress

Freeway Data

Type of analysis	64.0	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2194	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	165	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	157	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2194	165	157	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	609	46	44	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	2682	185	176	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 1586 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	2867	7200	No
v_{R12}	1771	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 16.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable,	M_S = 0.309	
Space mean speed in ramp influence area,	S_R = 61.4	mph
Space mean speed in outer lanes,	S_0 = 67.9	mph
Space mean speed for all vehicles,	S = 63.7	mph

Ramp Analysis

Existing Conditions

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy SB(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	Existing 2009
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3954	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	194	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	201	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3954		194		201	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	1098		54		56	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	4833	218	226	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.629 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3122 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4833	7200	No
v_{12}	3122	4400	No
$v_{FO} = v_F - v_R$	4615	7200	No
v_R	218	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 26.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.448

Space mean speed in ramp influence area, S_R = 57 mph

Space mean speed in outer lanes, S_0 = 74.0 mph

Space mean speed for all vehicles, S = 62.4 mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	Existing 2009
Description:	DesertXpress

Freeway Data

Type of analysis	62.9	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3954	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	201	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	194	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3954	201	194	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1098	56	54	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	4833	226	218	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM}) =$ 2859 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5059	7200	No
v_{R12}	3085	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 26.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.371	
Space mean speed in ramp influence area,	S_R = 59.6	mph
Space mean speed in outer lanes,	S_0 = 64.7	mph
Space mean speed for all vehicles,	S = 61.5	mph

Ramp Analysis

2013 Base and Project Conditions

Ramp Analysis

2013 Base

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 NB
Junction:	Dale Evans Pkwy(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 No Build
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2602	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	258	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	222	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2602		258		222	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	723		72		62	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	3180	290	249	pcph

Estimation of V12 Diverge Areas

$L_{EQ} =$ 0.00 (Equation 25-8 or 25-9)

$P_{FD} =$ 0.667 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD} =$ 2218 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3180	7200	No
v_{12}	2218	4400	No
$v_{FO} = v_F - v_R$	2890	7200	No
v_R	290	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D =$ 18.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, $D_S = 0.454$

Space mean speed in ramp influence area, $S_R = 57$ mph

Space mean speed in outer lanes, $S_0 = 76.8$ mph

Space mean speed for all vehicles, $S = 62.1$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 03/31/2010
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2013 No Build
Description: DesertXpress

Freeway Data

Type of analysis	63.7	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	2602	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	222	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	258	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2602	222	258	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	723	62	72	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	3180	249	290	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.591 Using Equation 1
$v_{12} = v_F (P_{FM})$ = 1881 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	3429	7200	No
v_{R12}	2130	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 18.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence B

Speed Estimation

Intermediate speed variable, M_S = 0.319
Space mean speed in ramp influence area, S_R = 61.1 mph
Space mean speed in outer lanes, S_0 = 67.1 mph
Space mean speed for all vehicles, S = 63.2 mph

Ramp Analysis

2013 + EMU

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 NB
Junction:	Dale Evans Pkwy(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 EMU
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3396	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1052	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	259	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3396		1052		259	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	943		292		72	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Dale Evans PkwyNBOff-Ramp-PM.txt

Flow rate, vp	4151	1181	291	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.602 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2969 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4151	7200	No
v_{12}	2969	4400	No
$v_{FO} = v_F - v_R$	2970	7200	No
v_R	1181	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 25.3 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, D_S = 0.534

Space mean speed in ramp influence area, S_R = 55 mph

Space mean speed in outer lanes, S_0 = 76.1 mph

Space mean speed for all vehicles, S = 59.7 mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 NB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 EMU
Description:	DesertXpress

Freeway Data

Type of analysis	63.1	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3396	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	259	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1052	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3396		259		1052	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	943		72		292	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade		%		%		%
Length		mi		mi		mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	4151	291	1181	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM}) =$ 2455 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4442	7200	No
v_{R12}	2746	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A =$ 23.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	M_S = 0.347	
Space mean speed in ramp influence area,	S_R = 60.3	mph
Space mean speed in outer lanes,	S_0 = 65.7	mph
Space mean speed for all vehicles,	S = 62.2	mph

Ramp Analysis

2013 + DEMU

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 03/31/2010
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy(Off-ramp)
Jurisdiction: Caltrans
Analysis Year: 2013 DEMU
Description: DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3165	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	821	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	248	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	3165		821		248	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	879		228		69	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	3868	921	278	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.621 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 2751 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	3868	7200	No
v_{12}	2751	4400	No
$v_{FO} = v_F - v_R$	2947	7200	No
v_R	921	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 23.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable,	D_S = 0.511	
Space mean speed in ramp influence area,	S_R = 56	mph
Space mean speed in outer lanes,	S_0 = 76.3	mph
Space mean speed for all vehicles,	S = 60.4	mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 03/31/2010
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2013 DEMU
Description: DesertXpress

Freeway Data

Type of analysis	63.3	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	3165	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	248	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	821	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3165	248	821	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	879	69	228	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	3868	278	921	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.591 Using Equation 1
$v_{12} = v_F (P_{FM}) =$ 2288 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	4146	7200	No
v_{R12}	2566	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A$ = 22.2 pc/mi/ln
Level of service for ramp-freeway junction areas of influence C

Speed Estimation

Intermediate speed variable, M_S = 0.337
Space mean speed in ramp influence area, S_R = 60.6 mph
Space mean speed in outer lanes, S_0 = 66.1 mph
Space mean speed for all vehicles, S = 62.6 mph

Ramp Analysis

2013 Base

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 03/31/2010
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 SB
Junction: Dale Evans Pkwy (Off-ramp)
Jurisdiction: Caltrans
Analysis Year: 2013 No Build
Description: DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4337	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	290	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	344	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4337		290		344	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	1205		81		96	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	5301	325	386	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.613 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3373 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5301	7200	No
v_{12}	3373	4400	No
$v_{FO} = v_F - v_R$	4976	7200	No
v_R	325	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D$ = 28.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, D_S = 0.457

Space mean speed in ramp influence area, S_R = 57 mph

Space mean speed in outer lanes, S_0 = 73.2 mph

Space mean speed for all vehicles, S = 62.1 mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 No Build
Description:	DesertXpress

Freeway Data

Type of analysis	62.4	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4337	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	344	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	290	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4337	344	290	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1205	96	81	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	5301	386	325	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3136 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5687	7200	No
v_{R12}	3522	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ = 29.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M_S = 0.418

Space mean speed in ramp influence area, S_R = 58.3 mph

Space mean speed in outer lanes, S_0 = 64.0 mph

Space mean speed for all vehicles, S = 60.3 mph

Ramp Analysis

2013 + EMU

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy SB(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 EMU
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4387	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	340	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	935	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4387		340		935	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	1219		94		260	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Dale Evans PkwySBOff-Ramp-PM.txt

Flow rate, vp	5362	382	1049	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.608 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3412 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5362	7200	No
v_{12}	3412	4400	No
$v_{FO} = v_F - v_R$	4980	7200	No
v_R	382	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 29.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.462	
Space mean speed in ramp influence area,	S_R = 57	mph
Space mean speed in outer lanes,	S_0 = 73.1	mph
Space mean speed for all vehicles,	S = 62.0	mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 03/31/2010
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 SB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2013 EMU
Description: DesertXpress

Freeway Data

Type of analysis	61.2	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4387	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	935	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	340	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4387	935	340	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1219	260	94	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Dale Evans PkwySBOn-Ramp-PM.txt

Flow rate, vp	5362	1049	382	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)
P_{FM} = 0.591 Using Equation 1
$v_{12} = v_F (P_{FM})$ = 3172 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6411	7200	No
v_{R12}	4221	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 34.8 pc/mi/ln
Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M_S = 0.552
Space mean speed in ramp influence area, S_R = 54.6 mph
Space mean speed in outer lanes, S_0 = 63.9 mph
Space mean speed for all vehicles, S = 57.4 mph

Ramp Analysis

2013 + DEMU

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy SB(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 DEMU
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4372	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	325	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	394	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4372		325		394	vph
Peak-hour factor, PHF	0.90		0.90		0.90	
Peak 15-min volume, v15	1214		90		109	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	

Flow rate, vp	5344	365	442	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.610 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3400 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5344	7200	No
v_{12}	3400	4400	No
$v_{FO} = v_F - v_R$	4979	7200	No
v_R	365	2000	No

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D$ = 29.0 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	D_S = 0.461	
Space mean speed in ramp influence area,	S_R = 57	mph
Space mean speed in outer lanes,	S_0 = 73.1	mph
Space mean speed for all vehicles,	S = 62.0	mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	03/31/2010
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2013 DEMU
Description:	DesertXpress

Freeway Data

Type of analysis	62.3	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4372	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	394	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	325	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4372	394	325	vph
Peak-hour factor, PHF	0.90	0.90	0.90	
Peak 15-min volume, v15	1214	109	90	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	

Flow rate, vp	5344	442	365	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3161 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5786	7200	No
v_{R12}	3603	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A$ = 30.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, M_S = 0.429

Space mean speed in ramp influence area, S_R = 58.0 mph

Space mean speed in outer lanes, S_0 = 63.9 mph

Space mean speed for all vehicles, S = 60.1 mph

Ramp Analysis

2030 Base and Project Conditions

Ramp Analysis

2030 Base

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy(Off-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 No Build
Description: DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4336	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	689	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	466	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4336	689	466	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1141	181	123	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	%
Length	0.00 mi	0.00 mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5021	733	495	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.601 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3309 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5021	7200	No
v_{12}	3309	4400	No
$v_{FO} = v_F - v_R$	4288	7200	No
v_R	733	2000	No

R

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 28.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D_S = 0.494$

Space mean speed in ramp influence area, $S_R = 56$ mph

Space mean speed in outer lanes, $S_0 = 74.0$ mph

Space mean speed for all vehicles, $S = 61.2$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 No Build
Description: DesertXpress

Freeway Data

Type of analysis	62.3	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4336	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	466	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	689	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4336	466	689	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1141	123	181	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5021	495	733	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 2970 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	5516	7200	No
v_{R12}	3465	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 29.1$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M_S = 0.411$

Space mean speed in ramp influence area, $S_R = 58.5$ mph

Space mean speed in outer lanes, $S_0 = 64.4$ mph

Space mean speed for all vehicles, $S = 60.6$ mph

Ramp Analysis

2030 + EMU

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy(Off-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 EMU
Description: DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5130	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1483	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	503	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5130	1483	503	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1350	390	132	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00 %	
Length	0.00 mi	0.00 mi	0.00 mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5940	1577	535	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.539 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3928 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5940	7200	No
v_{12}	3928	4400	No
$v_{FO} = v_F - v_R$	4363	7200	No
v_R	1577	2000	No

R

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 33.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D_S = 0.570$

Space mean speed in ramp influence area, $S_R = 54$ mph

Space mean speed in outer lanes, $S_0 = 72.8$ mph

Space mean speed for all vehicles, $S = 59.2$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	06/04/2009
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 NB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2030 EMU
Description:	DesertXpress

Freeway Data

Type of analysis	61.8	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5130	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	503	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	1483	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5130	503	1483	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1350	132	390	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5940	535	1577	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 3514 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	6475	7200	No
v_{R12}	4049	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\,v_R + 0.0078\,v_{12} - 0.00627\,L_A = 33.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M_S = 0.510$

Space mean speed in ramp influence area, $S_R = 55.7$ mph

Space mean speed in outer lanes, $S_0 = 62.7$ mph

Space mean speed for all vehicles, $S = 58.2$ mph

Ramp Analysis

2030 + DEMU

NB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy(Off-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 DEMU
Description: DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4899	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1252	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	492	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	4899		1252		492	vph
Peak-hour factor, PHF	0.95		0.95		0.95	
Peak 15-min volume, v15	1289		329		129	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	5673		1331		523	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.557 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 3749 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	5673	7200	No
v_{12}	3749	4400	No
$v_{FO} = v_F - v_R$	4342	7200	No
v_R	1331	2000	No

R

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 32.0$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $D_S = 0.548$

Space mean speed in ramp influence area, $S_R = 55$ mph

Space mean speed in outer lanes, $S_0 = 73.2$ mph

Space mean speed for all vehicles, $S = 59.8$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 NB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 DEMU
Description: DesertXpress

Freeway Data

Type of analysis	62.0	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	4899	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	492	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist? Yes

Volume on adjacent Ramp	1252	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	4899	492	1252	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1289	129	329	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	5673	523	1331	pcph

Estimation of V12 Merge Areas

L = (Equation 25-2 or 25-3)
EQ
P = 0.591 Using Equation 1
FM
v = v (P) = 3356 pc/h
12 F FM

Capacity Checks

	Actual	Maximum	LOS F?
v FO	6196	7200	No
v R12	3879	4600	No

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 32.4$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable, $M_S = 0.475$

Space mean speed in ramp influence area, $S_R = 56.7$ mph

Space mean speed in outer lanes, $S_0 = 63.4$ mph

Space mean speed for all vehicles, $S = 59.0$ mph

Ramp Analysis

2030 Base

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	06/04/2009
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy SB(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2030 No Build
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5963	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	698	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	950	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5963	698	950	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1569	184	250	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	%
Length	0.00 mi	0.00 mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6905	742	1010	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.553 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4152 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6905	7200	No
v_{12}	4152	4400	No
$v_{FO} = v_F - v_R$	6163	7200	No
v_R	742	2000	No

R

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 35.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D_S = 0.495$

Space mean speed in ramp influence area, $S_R = 56$ mph

Space mean speed in outer lanes, $S_0 = 70.0$ mph

Space mean speed for all vehicles, $S = 60.9$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	06/04/2009
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy (on-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2030 No Build
Description:	DesertXpress

Freeway Data

Type of analysis	60.5	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5963	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	950	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	698	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5963	950	698	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1569	250	184	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6905	1010	742	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 4084 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	7915	7200	Yes
v_{R12}	5094	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\ v_R + 0.0078\ v_{12} - 0.00627\ L_A = 41.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $M_S = 0.922$

Space mean speed in ramp influence area, $S_R = 44.2$ mph

Space mean speed in outer lanes, $S_0 = 60.3$ mph

Space mean speed for all vehicles, $S = 48.8$ mph

Ramp Analysis

2030 + EMU

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst:	HD
Agency/Co.:	AECOM
Date performed:	06/04/2009
Analysis time period:	PM Peak Hour
Freeway/dir or travel:	I-15 SB
Junction:	Dale Evans Pkwy SB(Off-ramp)
Jurisdiction:	Caltrans
Analysis Year:	2030 EMU
Description:	DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6013	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	748	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1541	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	6013		748		1541	vph
Peak-hour factor, PHF	0.95		0.95		0.95	
Peak 15-min volume, v15	1582		197		406	v
Trucks and buses	20		2		2	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level		Level	
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	
Heavy vehicle adjustment, fHV	0.909		0.990		0.990	
Driver population factor, fP	1.00		1.00		1.00	
Flow rate, vp	6962		795		1638	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.549 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4183 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6962	7200	No
v_{12}	4183	4400	No
$v_{FO} = v_F - v_R$	6167	7200	No
v_R	795	2000	No

R

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\ v_{12} - 0.009\ L_D = 35.7$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D_S = 0.500$

Space mean speed in ramp influence area, $S_R = 56$ mph

Space mean speed in outer lanes, $S_0 = 69.9$ mph

Space mean speed for all vehicles, $S = 60.8$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 SB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 EMU
Description: DesertXpress

Freeway Data

Type of analysis	59.4	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	6013	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1541	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	748	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	6013	1541	748	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1582	406	197	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6962	1638	795	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 4118 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	8600	7200	Yes
v_{R12}	5756	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734\, v_R + 0.0078\, v_{12} - 0.00627\, L_A = 46.5$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $M_S = 1.519$

Space mean speed in ramp influence area, $S_R = 27.5$ mph

Space mean speed in outer lanes, $S_0 = 60.2$ mph

Space mean speed for all vehicles, $S = 33.5$ mph

Ramp Analysis

2030 + DEMU

SB

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 SB
Junction: Dale Evans Pkwy SB(Off-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 DEMU
Description: DesertXpress

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5998	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	733	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent ramp	1000	vph
Position of adjacent ramp	Downstream	
Type of adjacent ramp	On	
Distance to adjacent ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5998	733	1000	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1578	193	263	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	0.00 %	0.00 %	0.00	%
Length	0.00 mi	0.00 mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6945	779	1063	pcph

Estimation of V12 Diverge Areas

L_{EQ} = 0.00 (Equation 25-8 or 25-9)

P_{FD} = 0.551 Using Equation 5

$v_{12} = v_R + (v_F - v_R) P_{FD}$ = 4174 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	6945	7200	No
v_{12}	4174	4400	No
$v_{FO} = v_F - v_R$	6166	7200	No
v_R	779	2000	No

R

Level of Service Determination (if not F)

Density, $D_R = 4.252 + 0.0086\, v_{12} - 0.009\, L_D = 35.6$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable, $D_S = 0.498$

Space mean speed in ramp influence area, $S_R = 56$ mph

Space mean speed in outer lanes, $S_0 = 69.9$ mph

Space mean speed for all vehicles, $S = 60.9$ mph

HCS2000: Ramps and Ramp Junctions Release 4.1

Phone: Fax:
E-mail:

Merge Analysis

Analyst: HD
Agency/Co.: AECOM
Date performed: 06/04/2009
Analysis time period: PM Peak Hour
Freeway/dir or travel: I-15 SB
Junction: Dale Evans Pkwy (on-ramp)
Jurisdiction: Caltrans
Analysis Year: 2030 DEMU
Description: DesertXpress

Freeway Data

Type of analysis	60.4	
Number of lanes in freeway	3	
Free-flow speed on freeway	70.0	mph
Volume on freeway	5998	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	1000	vph
Length of first accel/decel lane	500	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	Yes	
Volume on adjacent Ramp	733	vph
Position of adjacent Ramp	Upstream	
Type of adjacent Ramp	Off	
Distance to adjacent Ramp	1000	ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	5998	1000	733	vph
Peak-hour factor, PHF	0.95	0.95	0.95	
Peak 15-min volume, v15	1578	263	193	v
Trucks and buses	20	2	2	%
Recreational vehicles	0	0	0	%
Terrain type:	Level	Level	Level	
Grade	%	%	%	
Length	mi	mi	mi	
Trucks and buses PCE, ET	1.5	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	1.2	
Heavy vehicle adjustment, fHV	0.909	0.990	0.990	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	6945	1063	779	pcph

Estimation of V12 Merge Areas

L_{EQ} = (Equation 25-2 or 25-3)

P_{FM} = 0.591 Using Equation 1

$v_{12} = v_F (P_{FM})$ = 4108 pc/h

Capacity Checks

	Actual	Maximum	LOS F?
v_{FO}	8008	7200	Yes
v_{R12}	5171	4600	Yes

Level of Service Determination (if not F)

Density, $D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 42.2$ pc/mi/ln

Level of service for ramp-freeway junction areas of influence F

Speed Estimation

Intermediate speed variable, $M_S = 0.973$

Space mean speed in ramp influence area, $S_R = 42.8$ mph

Space mean speed in outer lanes, $S_0 = 60.2$ mph

Space mean speed for all vehicles, $S = 47.7$ mph

Victorville Option 3

Intersection Volumes

PROPOSED VICTORVILLE STATION ALTERNATIVE #3

Existing	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	1	0	17	0	0	0	0	143	0	0	33	49
#2	0	0	0	143	0	3	0	0	4	32	2	0

2013 Base	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	39	0	95	0	0	0	44	222	0	0	101	73
#2	0	0	0	176	0	78	0	89	110	87	52	0
#3	0	0	0	0	0	0	0	195	0	0	126	0
#4	0	0	0	0	0	0	0	195	0	0	126	0
#5	98	138	76	92	185	4	3	27	69	80	17	29
#6	14	303	0	0	322	12	9	0	19	0	0	0
#7	46	289	0	0	299	41	28	0	57	0	0	0
#8	0	334	0	0	356	0	0	0	0	0	0	0

2030 Base	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	199	0	427	0	0	0	229	557	0	0	389	176
#2	0	0	0	318	0	396	0	468	558	321	267	0
#3	0	0	0	0	0	0	0	1026	0	0	662	0
#4	0	0	0	0	0	0	0	1026	0	0	662	0
#5	515	722	401	485	969	20	17	141	363	420	89	153
#6	71	1590	0	0	1688	65	48	0	99	0	0	0
#7	239	1515	0	0	1570	216	145	0	297	0	0	0
#8	0	1754	0	0	1867	0	0	0	0	0	0	0

Existing + DEMU	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	564	0	17	0	0	0	26	222	0	0	139	49
#2	0	0	0	143	0	38	0	105	423	32	670	0
#3	0	0	283	0	0	0	0	240	0	355	348	0
#4	0	0	56	0	0	0	0	185	0	81	267	0
#5	0	0	185	0	0	0	0	0	0	267	0	0
#6	0	146	0	56	211	0	0	0	0	0	0	39
#7	0	92	0	78	133	0	0	0	0	0	0	54
#8	0	0	0	133	0	0	0	0	0	0	0	92

Existing + DEMU	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	795	0	17	0	0	0	37	254	0	0	182	49
#2	0	0	0	143	0	53	0	148	595	32	945	0
#3	0	0	400	0	0	0	0	339	0	501	492	0
#4	0	0	79	0	0	0	0	261	0	115	378	0
#5	0	0	261	0	0	0	0	0	0	378	0	0
#6	0	206	0	80	298	0	0	0	0	0	0	55
#7	0	129	0	110	188	0	0	0	0	0	0	76
#8	0	0	0	188	0	0	0	0	0	0	0	129

2013 + DEMU	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	602	0	95	0	0	0	70	301	0	0	207	73
#2	0	0	0	176	0	113	0	194	529	87	720	0
#3	0	0	283	0	0	0	0	435	0	355	474	0
#4	0	0	56	0	0	0	0	380	0	81	393	0
#5	98	138	261	92	185	4	3	27	69	347	17	29
#6	14	449	0	56	533	12	9	0	19	0	0	39
#7	46	381	0	78	432	41	28	0	57	0	0	54
#8	0	334	0	133	356	0	0	0	0	0	0	92

2013 + EMU	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	833	0	95	0	0	0	81	333	0	0	250	73
#2	0	0	0	176	0	128	0	237	701	87	995	0
#3	0	0	400	0	0	0	0	534	0	501	618	0
#4	0	0	79	0	0	0	0	456	0	115	504	0
#5	98	138	337	92	185	4	3	27	69	458	17	29
#6	14	509	0	80	620	12	9	0	19	0	0	55
#7	46	418	0	110	487	41	28	0	57	0	0	76
#8	0	334	0	188	356	0	0	0	0	0	0	129

2030 + DEMU	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	762	0	427	0	0	0	255	636	0	0	495	176
#2	0	0	0	318	0	431	0	573	977	321	935	0
#3	0	0	283	0	0	0	0	1266	0	355	1010	0
#4	0	0	56	0	0	0	0	1211	0	81	929	0
#5	515	722	586	485	969	20	17	141	363	687	89	153
#6	71	1736	0	56	1899	65	48	0	99	0	0	39
#7	239	1607	0	78	1703	216	145	0	297	0	0	54
#8	0	1754	0	133	1867	0	0	0	0	0	0	92

2030 + EMU	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
#1	993	0	427	0	0	0	266	668	0	0	538	176
#2	0	0	0	318	0	446	0	616	1149	321	1210	0
#3	0	0	400	0	0	0	0	1365	0	501	1154	0
#4	0	0	79	0	0	0	0	1287	0	115	1040	0
#5	515	722	662	485	969	20	17	141	363	798	89	153
#6	71	1796	0	80	1986	65	48	0	99	0	0	55
#7	239	1644	0	110	1758	216	145	0	297	0	0	76
#8	0	1754	0	188	1867	0	0	0	0	0	0	129

Victorville Option 3

SYNCHRO Analysis Worksheet

Existing Conditions

(Base and Project Conditions)

Existing Conditions

Base

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	143	0	0	33	49	1	2	17	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	155	0	0	36	53	1	2	18	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	89			155			218	245	155	238	218	62
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			155			218	245	155	238	218	62
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	100
cM capacity (veh/h)	1506			1425			738	657	890	700	680	1002

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	155	89	22
Volume Left	0	0	1
Volume Right	0	53	18
cSH	1506	1700	851
Volume to Capacity	0.00	0.05	0.03
Queue Length 95th (ft)	0	0	2
Control Delay (s)	0.0	0.0	9.3
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	17.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	4	32	2	0	0	0	0	143	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	4	35	2	0	0	0	0	155	1	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2			4			78	74	2	74	76	2
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2			4			78	74	2	74	76	2
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	100	83	100	100
cM capacity (veh/h)	1620			1617			893	799	1082	901	797	1082

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	4	37	160
Volume Left	0	35	155
Volume Right	4	0	3
cSH	1700	1617	904
Volume to Capacity	0.00	0.02	0.18
Queue Length 95th (ft)	0	2	16
Control Delay (s)	0.0	6.9	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	6.9	9.8
Approach LOS			A

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	23.4%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Conditions

Base + EMU

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	254	0	0	182	49	795	2	17	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	276	0	0	198	53	864	2	18	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	251			276			581	608	276	601	581	224
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	251			276			581	608	276	601	581	224
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			0	99	98	100	100	100
cM capacity (veh/h)	1314			1287			415	398	763	391	412	815

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	316	251	885
Volume Left	40	0	864
Volume Right	0	53	18
cSH	1314	1700	419
Volume to Capacity	0.03	0.15	2.11
Queue Length 95th (ft)	2	0	1586
Control Delay (s)	1.2	0.0	529.5
Lane LOS	A		F
Approach Delay (s)	1.2	0.0	529.5
Approach LOS			F

Intersection Summary			
Average Delay	322.9		
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	148	595	32	945	0	0	0	0	143	1	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	161	647	35	1027	0	0	0	0	155	1	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1027			808			1639	1581	484	1581	1904	1027
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1027			808			1639	1581	484	1581	1904	1027
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	0	98	80
cM capacity (veh/h)	676			818			61	104	583	85	66	285

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	808	1062	214
Volume Left	0	35	155
Volume Right	647	0	58
cSH	1700	818	105
Volume to Capacity	0.48	0.04	2.04
Queue Length 95th (ft)	0	3	452
Control Delay (s)	0.0	1.3	567.8
Lane LOS		A	F
Approach Delay (s)	0.0	1.3	567.8
Approach LOS			F

Intersection Summary			
Average Delay	59.0		
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	339	0	501	492	0	400
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	368	0	545	535	0	435
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			368		1992	368
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			368		1992	368
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			54		100	36
cM capacity (veh/h)			1190		36	677

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	368	545	535	435
Volume Left	0	545	0	0
Volume Right	0	0	0	435
cSH	1700	1190	1700	677
Volume to Capacity	0.22	0.46	0.31	0.64
Queue Length 95th (ft)	0	61	0	117
Control Delay (s)	0.0	10.6	0.0	19.4
Lane LOS		B		C
Approach Delay (s)	0.0	5.3		19.4
Approach LOS				C

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	261	0	115	378	0	79
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	284	0	125	411	0	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			284		945	284
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			284		945	284
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			90		100	89
cM capacity (veh/h)			1279		262	755

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	284	125	411	86
Volume Left	0	125	0	0
Volume Right	0	0	0	86
cSH	1700	1279	1700	755
Volume to Capacity	0.17	0.10	0.24	0.11
Queue Length 95th (ft)	0	8	0	10
Control Delay (s)	0.0	8.1	0.0	10.4
Lane LOS		A		B
Approach Delay (s)	0.0	1.9		10.4
Approach LOS				B

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	35.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	378	0	0	261
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	411	0	0	284
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		822	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		822	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			75		100	74
cM capacity (veh/h)			1623		257	1085

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	0	411	284
Volume Left	0	411	0
Volume Right	0	0	284
cSH	1700	1623	1085
Volume to Capacity	0.00	0.25	0.26
Queue Length 95th (ft)	0	25	26
Control Delay (s)	0.0	8.0	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	8.0	9.5
Approach LOS			A

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	55	206	0	80	298
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	60	224	0	87	324
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	722	224			224	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	722	224			224	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	93			94	
cM capacity (veh/h)	368	816			1345	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	60	224	87	324
Volume Left	0	0	87	0
Volume Right	60	0	0	0
cSH	816	1700	1345	1700
Volume to Capacity	0.07	0.13	0.06	0.19
Queue Length 95th (ft)	6	0	5	0
Control Delay (s)	9.8	0.0	7.9	0.0
Lane LOS	A		A	
Approach Delay (s)	9.8	0.0	1.7	
Approach LOS	A			

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	76	129	0	110	188
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	83	140	0	120	204
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	584	140			140	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	584	140			140	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	91			92	
cM capacity (veh/h)	435	908			1443	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	83	140	324
Volume Left	0	0	120
Volume Right	83	0	0
cSH	908	1700	1443
Volume to Capacity	0.09	0.08	0.08
Queue Length 95th (ft)	7	0	7
Control Delay (s)	9.4	0.0	3.3
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	3.3
Approach LOS	A		

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	129	0	0	188	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	140	0	0	204	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	409	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	409	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	87			87	
cM capacity (veh/h)	523	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	140	0	204	0
Volume Left	0	0	204	0
Volume Right	140	0	0	0
cSH	1085	1700	1623	1700
Volume to Capacity	0.13	0.00	0.13	0.00
Queue Length 95th (ft)	11	0	11	0
Control Delay (s)	8.8	0.0	7.5	0.0
Lane LOS	A		A	
Approach Delay (s)	8.8	0.0	7.5	
Approach LOS	A			

Intersection Summary			
Average Delay	8.1		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Existing Conditions

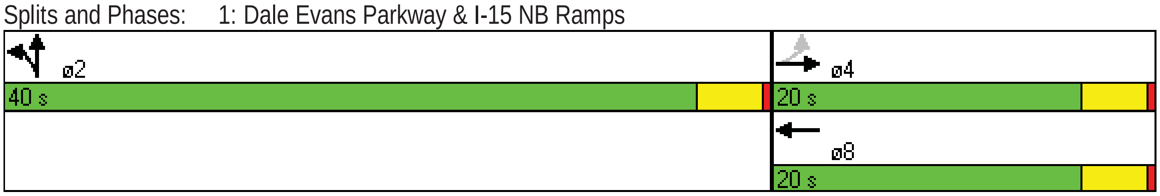
Base + EMU Mitigations

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	37	254	182	2
Turn Type	Perm			
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	66.7%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)		16.0	16.0	36.0
Actuated g/C Ratio		0.27	0.27	0.60
v/c Ratio		0.68	0.50	0.83
Control Delay		29.0	21.1	18.9
Queue Delay		0.0	0.0	0.0
Total Delay		29.0	21.1	18.9
LOS		C	C	B
Approach Delay		29.0	21.1	18.9
Approach LOS		C	C	B

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Natural Cycle: 60
Control Type: Pretimed
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 21.4 Intersection LOS: C
Intersection Capacity Utilization 83.2% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBT
Protected Phases		4	8	2
Permitted Phases	4			
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	40.0
Total Split (%)	33.3%	33.3%	33.3%	66.7%
Maximum Green (s)	16.0	16.0	16.0	36.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0
90th %ile Green (s)	16.0	16.0	16.0	36.0
90th %ile Term Code	MaxR	MaxR	MaxR	Coord
70th %ile Green (s)	16.0	16.0	16.0	36.0
70th %ile Term Code	MaxR	MaxR	MaxR	Coord
50th %ile Green (s)	16.0	16.0	16.0	36.0
50th %ile Term Code	MaxR	MaxR	MaxR	Coord
30th %ile Green (s)	16.0	16.0	16.0	36.0
30th %ile Term Code	MaxR	MaxR	MaxR	Coord
10th %ile Green (s)	16.0	16.0	16.0	36.0
10th %ile Term Code	MaxR	MaxR	MaxR	Coord

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Control Type: Pretimed

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	316	251	884
v/c Ratio	0.68	0.50	0.83
Control Delay	29.0	21.1	18.9
Queue Delay	0.0	0.0	0.0
Total Delay	29.0	21.1	18.9
Queue Length 50th (ft)	102	69	220
Queue Length 95th (ft)	#200	131	#473
Internal Link Dist (ft)	820	380	310
Turn Bay Length (ft)			
Base Capacity (vph)	463	499	1063
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.68	0.50	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	37	254	0	0	182	49	795	2	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			1.00				
Frt		1.00			0.97			1.00				
Flt Protected		0.99			1.00			0.95				
Satd. Flow (prot)		1851			1810			1771				
Flt Permitted		0.93			1.00			0.95				
Satd. Flow (perm)		1738			1810			1771				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	276	0	0	198	53	864	2	18	0	0	0
RTOR Reduction (vph)	0	0	0	0	16	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	316	0	0	235	0	0	883	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		16.0			16.0			36.0				
Effective Green, g (s)		16.0			16.0			36.0				
Actuated g/C Ratio		0.27			0.27			0.60				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		463			483			1063				
v/s Ratio Prot					0.13			c0.50				
v/s Ratio Perm		c0.18										
v/c Ratio		0.68			0.49			0.83				
Uniform Delay, d1		19.7			18.5			9.6				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		7.9			3.5			7.5				
Delay (s)		27.6			22.0			17.1				
Level of Service		C			C			B				
Approach Delay (s)		27.6			22.0			17.1			0.0	
Approach LOS		C			C			B			A	

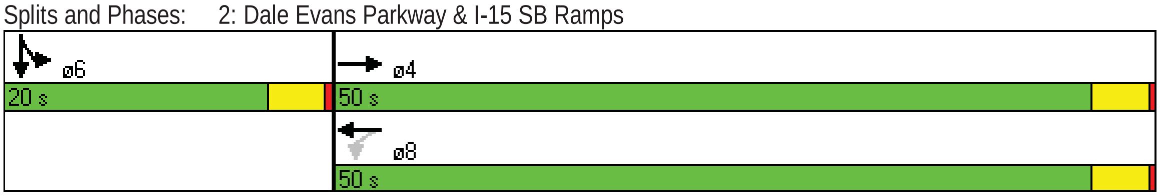
Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	148	32	945	1
Turn Type		Perm		
Protected Phases	4		8	6
Permitted Phases		8		
Detector Phase	4	8	8	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	50.0	50.0	50.0	20.0
Total Split (%)	71.4%	71.4%	71.4%	28.6%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	46.0		46.0	16.0
Actuated g/C Ratio	0.66		0.66	0.23
v/c Ratio	0.62		0.90	0.52
Control Delay	3.9		23.1	25.9
Queue Delay	0.0		0.0	0.0
Total Delay	3.9		23.1	25.9
LOS	A		C	C
Approach Delay	3.9		23.1	25.9
Approach LOS	A		C	C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 70	
Control Type: Pretimed	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 16.0	Intersection LOS: B
Intersection Capacity Utilization 93.5%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	WBL	WBT	SBT
Protected Phases	4		8	6
Permitted Phases		8		
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	50.0	50.0	50.0	20.0
Total Split (%)	71.4%	71.4%	71.4%	28.6%
Maximum Green (s)	46.0	46.0	46.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0
90th %ile Green (s)	46.0	46.0	46.0	16.0
90th %ile Term Code	MaxR	MaxR	MaxR	Coord
70th %ile Green (s)	46.0	46.0	46.0	16.0
70th %ile Term Code	MaxR	MaxR	MaxR	Coord
50th %ile Green (s)	46.0	46.0	46.0	16.0
50th %ile Term Code	MaxR	MaxR	MaxR	Coord
30th %ile Green (s)	46.0	46.0	46.0	16.0
30th %ile Term Code	MaxR	MaxR	MaxR	Coord
10th %ile Green (s)	46.0	46.0	46.0	16.0
10th %ile Term Code	MaxR	MaxR	MaxR	Coord

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green
Control Type: Pretimed

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	808	1062	214
v/c Ratio	0.62	0.90	0.52
Control Delay	3.9	23.1	25.9
Queue Delay	0.0	0.0	0.0
Total Delay	3.9	23.1	25.9
Queue Length 50th (ft)	29	326	71
Queue Length 95th (ft)	75	#653	134
Internal Link Dist (ft)	920	820	245
Turn Bay Length (ft)			
Base Capacity (vph)	1299	1179	415
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.62	0.90	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	148	595	32	945	0	0	0	0	143	1	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frt		0.89			1.00						0.96	
Flt Protected		1.00			1.00						0.97	
Satd. Flow (prot)		1661			1860						1732	
Flt Permitted		1.00			0.96						0.97	
Satd. Flow (perm)		1661			1793						1732	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	161	647	35	1027	0	0	0	0	155	1	58
RTOR Reduction (vph)	0	207	0	0	0	0	0	0	0	0	19	0
Lane Group Flow (vph)	0	601	0	0	1062	0	0	0	0	0	195	0
Turn Type				Perm						Split		
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		46.0			46.0						16.0	
Effective Green, g (s)		46.0			46.0						16.0	
Actuated g/C Ratio		0.66			0.66						0.23	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		1092			1178						396	
v/s Ratio Prot		0.36									c0.11	
v/s Ratio Perm					c0.59							
v/c Ratio		0.55			0.90						0.49	
Uniform Delay, d1		6.4			10.1						23.5	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		2.0			11.2						4.3	
Delay (s)		8.4			21.3						27.8	
Level of Service		A			C						C	
Approach Delay (s)		8.4			21.3			0.0			27.8	
Approach LOS		A			C			A			C	

Intersection Summary			
HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	93.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Existing Conditions

Base + DEMU

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	222	0	0	139	49	564	2	17	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	241	0	0	151	53	613	2	18	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	204			241			476	502	241	495	476	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204			241			476	502	241	495	476	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			0	100	98	100	100	100
cM capacity (veh/h)	1367			1325			492	462	798	464	478	865

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	270	204	634
Volume Left	28	0	613
Volume Right	0	53	18
cSH	1367	1700	497
Volume to Capacity	0.02	0.12	1.27
Queue Length 95th (ft)	2	0	654
Control Delay (s)	1.0	0.0	163.4
Lane LOS	A		F
Approach Delay (s)	1.0	0.0	163.4
Approach LOS			F

Intersection Summary			
Average Delay	93.7		
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	105	423	32	670	0	0	0	0	143	1	38
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	114	460	35	728	0	0	0	0	155	1	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	728			574			1184	1142	344	1142	1372	728
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	728			574			1184	1142	344	1142	1372	728
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	100	10	99	90
cM capacity (veh/h)	875			999			145	193	699	173	141	423

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	574	763	198
Volume Left	0	35	155
Volume Right	460	0	41
cSH	1700	999	197
Volume to Capacity	0.34	0.03	1.00
Queue Length 95th (ft)	0	3	217
Control Delay (s)	0.0	0.9	115.3
Lane LOS		A	F
Approach Delay (s)	0.0	0.9	115.3
Approach LOS			F

Intersection Summary			
Average Delay	15.3		
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	240	0	355	348	0	283
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	261	0	386	378	0	308
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			261		1411	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			261		1411	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			70		100	60
cM capacity (veh/h)			1304		107	778

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	261	386	378	308
Volume Left	0	386	0	0
Volume Right	0	0	0	308
cSH	1700	1304	1700	778
Volume to Capacity	0.15	0.30	0.22	0.40
Queue Length 95th (ft)	0	31	0	48
Control Delay (s)	0.0	8.9	0.0	12.6
Lane LOS		A		B
Approach Delay (s)	0.0	4.5		12.6
Approach LOS				B

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	185	0	81	267	0	56
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	0	88	290	0	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			201		667	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		667	201
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	93
cM capacity (veh/h)			1371		396	840

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	201	88	290	61
Volume Left	0	88	0	0
Volume Right	0	0	0	61
cSH	1700	1371	1700	840
Volume to Capacity	0.12	0.06	0.17	0.07
Queue Length 95th (ft)	0	5	0	6
Control Delay (s)	0.0	7.8	0.0	9.6
Lane LOS		A		A
Approach Delay (s)	0.0	1.8		9.6
Approach LOS				A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	0	0	267	0	0	185
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	290	0	0	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			0		580	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		580	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			82		100	81
cM capacity (veh/h)			1623		391	1085

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	0	290	201
Volume Left	0	290	0
Volume Right	0	0	201
cSH	1700	1623	1085
Volume to Capacity	0.00	0.18	0.19
Queue Length 95th (ft)	0	16	17
Control Delay (s)	0.0	7.7	9.1
Lane LOS		A	A
Approach Delay (s)	0.0	7.7	9.1
Approach LOS			A

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	39	146	0	56	211
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	42	159	0	61	229
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	510	159			159	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	510	159			159	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	95			96	
cM capacity (veh/h)	501	887			1421	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	42	159	61	229
Volume Left	0	0	61	0
Volume Right	42	0	0	0
cSH	887	1700	1421	1700
Volume to Capacity	0.05	0.09	0.04	0.13
Queue Length 95th (ft)	4	0	3	0
Control Delay (s)	9.3	0.0	7.6	0.0
Lane LOS	A		A	
Approach Delay (s)	9.3	0.0	1.6	
Approach LOS	A			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	54	92	0	78	133
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	59	100	0	85	145
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	414	100			100	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	414	100			100	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	94			94	
cM capacity (veh/h)	561	956			1493	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	59	100	229
Volume Left	0	0	85
Volume Right	59	0	0
cSH	956	1700	1493
Volume to Capacity	0.06	0.06	0.06
Queue Length 95th (ft)	5	0	5
Control Delay (s)	9.0	0.0	3.1
Lane LOS	A		A
Approach Delay (s)	9.0	0.0	3.1
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	92	0	0	133	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	100	0	0	145	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	289	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	289	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	91			91	
cM capacity (veh/h)	639	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	100	0	145	0
Volume Left	0	0	145	0
Volume Right	100	0	0	0
cSH	1085	1700	1623	1700
Volume to Capacity	0.09	0.00	0.09	0.00
Queue Length 95th (ft)	8	0	7	0
Control Delay (s)	8.7	0.0	7.4	0.0
Lane LOS	A		A	
Approach Delay (s)	8.7	0.0	7.4	
Approach LOS	A			

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	19.7%	ICU Level of Service	A
Analysis Period (min)	15		

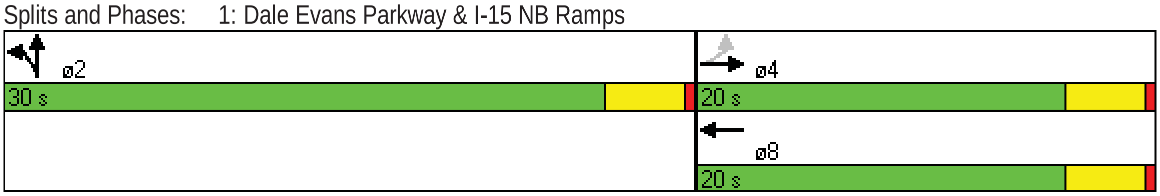
Existing Conditions

Base + DEMU Mitigations

Lane Group	EBL	EBT	WBT	NBT
Lane Configurations				
Volume (vph)	26	222	139	2
Turn Type	Perm			
Protected Phases		4	8	2
Permitted Phases	4			
Detector Phase	4	4	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	30.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)		16.0	16.0	26.0
Actuated g/C Ratio		0.32	0.32	0.52
v/c Ratio		0.47	0.34	0.69
Control Delay		17.0	12.5	13.7
Queue Delay		0.0	0.0	0.0
Total Delay		17.0	12.5	13.7
LOS		B	B	B
Approach Delay		17.0	12.5	13.7
Approach LOS		B	B	B

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 14.3	Intersection LOS: B
Intersection Capacity Utilization 65.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBT
Protected Phases		4	8	2
Permitted Phases	4			
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	20.0	20.0	20.0	30.0
Total Split (%)	40.0%	40.0%	40.0%	60.0%
Maximum Green (s)	16.0	16.0	16.0	26.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0
90th %ile Green (s)	16.0	16.0	16.0	26.0
90th %ile Term Code	MaxR	MaxR	MaxR	Coord
70th %ile Green (s)	16.0	16.0	16.0	26.0
70th %ile Term Code	MaxR	MaxR	MaxR	Coord
50th %ile Green (s)	16.0	16.0	16.0	26.0
50th %ile Term Code	MaxR	MaxR	MaxR	Coord
30th %ile Green (s)	16.0	16.0	16.0	26.0
30th %ile Term Code	MaxR	MaxR	MaxR	Coord
10th %ile Green (s)	16.0	16.0	16.0	26.0
10th %ile Term Code	MaxR	MaxR	MaxR	Coord

Intersection Summary
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:, Start of Green
Control Type: Pretimed

Lane Group	EBT	WBT	NBT
Lane Group Flow (vph)	269	204	633
v/c Ratio	0.47	0.34	0.69
Control Delay	17.0	12.5	13.7
Queue Delay	0.0	0.0	0.0
Total Delay	17.0	12.5	13.7
Queue Length 50th (ft)	62	36	122
Queue Length 95th (ft)	117	78	221
Internal Link Dist (ft)	820	380	310
Turn Bay Length (ft)			
Base Capacity (vph)	571	601	922
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.47	0.34	0.69

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	222	0	0	139	49	564	2	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0				
Lane Util. Factor		1.00			1.00			1.00				
Frt		1.00			0.96			1.00				
Flt Protected		0.99			1.00			0.95				
Satd. Flow (prot)		1853			1797			1770				
Flt Permitted		0.96			1.00			0.95				
Satd. Flow (perm)		1783			1797			1770				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	241	0	0	151	53	613	2	18	0	0	0
RTOR Reduction (vph)	0	0	0	0	25	0	0	2	0	0	0	0
Lane Group Flow (vph)	0	269	0	0	179	0	0	631	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		16.0			16.0			26.0				
Effective Green, g (s)		16.0			16.0			26.0				
Actuated g/C Ratio		0.32			0.32			0.52				
Clearance Time (s)		4.0			4.0			4.0				
Lane Grp Cap (vph)		571			575			920				
v/s Ratio Prot					0.10			c0.36				
v/s Ratio Perm		c0.15										
v/c Ratio		0.47			0.31			0.69				
Uniform Delay, d1		13.6			12.8			9.0				
Progression Factor		1.00			1.00			1.00				
Incremental Delay, d2		2.8			1.4			4.2				
Delay (s)		16.4			14.2			13.1				
Level of Service		B			B			B				
Approach Delay (s)		16.4			14.2			13.1			0.0	
Approach LOS		B			B			B			A	

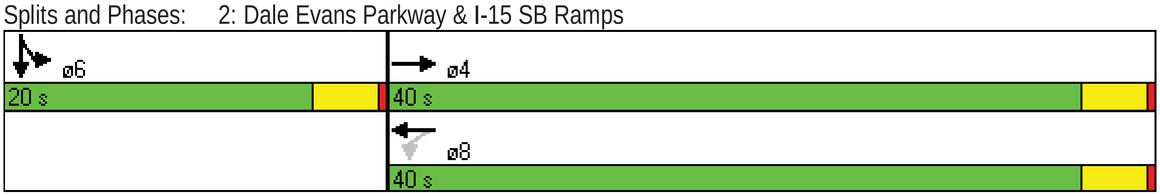
Intersection Summary			
HCM Average Control Delay	14.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	SBT
Lane Configurations				
Volume (vph)	105	32	670	1
Turn Type		Perm		
Protected Phases	4		8	6
Permitted Phases		8		
Detector Phase	4	8	8	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Max	Max	Max	Max
Act Effct Green (s)	36.0		36.0	16.0
Actuated g/C Ratio	0.60		0.60	0.27
v/c Ratio	0.49		0.71	0.41
Control Delay	2.9		13.0	19.1
Queue Delay	0.0		0.0	0.0
Total Delay	2.9		13.0	19.1
LOS	A		B	B
Approach Delay	2.9		13.0	19.1
Approach LOS	A		B	B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Pretimed	
Maximum v/c Ratio: 0.71	
Intersection Signal Delay: 10.0	Intersection LOS: A
Intersection Capacity Utilization 78.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	WBL	WBT	SBT
Protected Phases	4		8	6
Permitted Phases		8		
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%
Maximum Green (s)	36.0	36.0	36.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag				
Lead-Lag Optimize?				
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	Max	Max	Max	Max
Walk Time (s)	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0
90th %ile Green (s)	36.0	36.0	36.0	16.0
90th %ile Term Code	MaxR	MaxR	MaxR	Coord
70th %ile Green (s)	36.0	36.0	36.0	16.0
70th %ile Term Code	MaxR	MaxR	MaxR	Coord
50th %ile Green (s)	36.0	36.0	36.0	16.0
50th %ile Term Code	MaxR	MaxR	MaxR	Coord
30th %ile Green (s)	36.0	36.0	36.0	16.0
30th %ile Term Code	MaxR	MaxR	MaxR	Coord
10th %ile Green (s)	36.0	36.0	36.0	16.0
10th %ile Term Code	MaxR	MaxR	MaxR	Coord

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green
Control Type: Pretimed

Lane Group	EBT	WBT	SBT
Lane Group Flow (vph)	574	763	197
v/c Ratio	0.49	0.71	0.41
Control Delay	2.9	13.0	19.1
Queue Delay	0.0	0.0	0.0
Total Delay	2.9	13.0	19.1
Queue Length 50th (ft)	15	166	51
Queue Length 95th (ft)	52	285	103
Internal Link Dist (ft)	920	820	245
Turn Bay Length (ft)			
Base Capacity (vph)	1181	1078	481
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.49	0.71	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	105	423	32	670	0	0	0	0	143	1	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0						4.0	
Lane Util. Factor		1.00			1.00						1.00	
Frt		0.89			1.00						0.97	
Flt Protected		1.00			1.00						0.96	
Satd. Flow (prot)		1661			1858						1742	
Flt Permitted		1.00			0.96						0.96	
Satd. Flow (perm)		1661			1796						1742	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	114	460	35	728	0	0	0	0	155	1	41
RTOR Reduction (vph)	0	184	0	0	0	0	0	0	0	0	16	0
Lane Group Flow (vph)	0	390	0	0	763	0	0	0	0	0	181	0
Turn Type				Perm						Split		
Protected Phases		4			8					6	6	
Permitted Phases				8								
Actuated Green, G (s)		36.0			36.0						16.0	
Effective Green, g (s)		36.0			36.0						16.0	
Actuated g/C Ratio		0.60			0.60						0.27	
Clearance Time (s)		4.0			4.0						4.0	
Lane Grp Cap (vph)		997			1078						465	
v/s Ratio Prot		0.23									c0.10	
v/s Ratio Perm					c0.42							
v/c Ratio		0.39			0.71						0.39	
Uniform Delay, d1		6.3			8.3						18.0	
Progression Factor		1.00			1.00						1.00	
Incremental Delay, d2		1.2			3.9						2.4	
Delay (s)		7.4			12.3						20.4	
Level of Service		A			B						C	
Approach Delay (s)		7.4			12.3			0.0			20.4	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2013 Conditions

(Base and Project Conditions)

2013 Conditions

Base

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	222	0	0	101	73	39	2	95	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	241	0	0	110	79	42	2	103	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	189			241			486	526	241	591	486	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189			241			486	526	241	591	486	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			91	100	87	100	100	100
cM capacity (veh/h)	1385			1325			478	441	798	354	465	897

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	289	189	148
Volume Left	48	0	42
Volume Right	0	79	103
cSH	1385	1700	663
Volume to Capacity	0.03	0.11	0.22
Queue Length 95th (ft)	3	0	21
Control Delay (s)	1.5	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	1.5	0.0	12.0
Approach LOS			B

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	89	110	87	52	0	0	0	0	176	1	78
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	97	120	95	57	0	0	0	0	191	1	85
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	57			216			488	402	157	402	462	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57			216			488	402	157	402	462	57
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			100	100	100	64	100	92
cM capacity (veh/h)	1548			1353			425	499	889	529	462	1010

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	216	151	277
Volume Left	0	95	191
Volume Right	120	0	85
cSH	1700	1353	619
Volume to Capacity	0.13	0.07	0.45
Queue Length 95th (ft)	0	6	58
Control Delay (s)	0.0	5.1	15.5
Lane LOS		A	C
Approach Delay (s)	0.0	5.1	15.5
Approach LOS			C

Intersection Summary			
Average Delay	7.9		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	27	69	80	17	29	98	138	76	92	185	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	29	75	87	18	32	107	150	83	100	201	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	50			104			371	297	67	439	319	34
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			104			371	297	67	439	319	34
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			74	74	92	73	64	100
cM capacity (veh/h)	1557			1487			403	577	997	370	561	1039

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	108	87	50	107	233	100	205
Volume Left	3	87	0	107	0	100	0
Volume Right	75	0	32	0	83	0	4
cSH	1557	1487	1700	403	679	370	567
Volume to Capacity	0.00	0.06	0.03	0.26	0.34	0.27	0.36
Queue Length 95th (ft)	0	5	0	26	38	27	41
Control Delay (s)	0.2	7.6	0.0	17.1	13.0	18.3	14.9
Lane LOS	A	A		C	B	C	B
Approach Delay (s)	0.2	4.8		14.3		16.0	
Approach LOS				B		C	

Intersection Summary			
Average Delay	11.7		
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	19	14	303	322	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	21	15	329	350	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	716	357	363			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	716	357	363			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	97	99			
cM capacity (veh/h)	392	688	1196			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	30	15	329	363
Volume Left	10	15	0	0
Volume Right	21	0	0	13
cSH	553	1196	1700	1700
Volume to Capacity	0.06	0.01	0.19	0.21
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	11.9	8.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.9	0.4		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	28	57	46	289	299	41
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	62	50	314	325	45
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	761	347	370			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	761	347	370			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	91	96			
cM capacity (veh/h)	357	696	1189			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	92	50	314	370
Volume Left	30	50	0	0
Volume Right	62	0	0	45
cSH	530	1189	1700	1700
Volume to Capacity	0.17	0.04	0.18	0.22
Queue Length 95th (ft)	16	3	0	0
Control Delay (s)	13.2	8.2	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.2	1.1		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

2013 Conditions

Base + EMU

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	81	333	0	0	250	73	833	2	95	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	88	362	0	0	272	79	905	2	103	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	351			362			849	889	362	954	849	311
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	351			362			849	889	362	954	849	311
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			0	99	85	100	100	100
cM capacity (veh/h)	1208			1197			265	262	683	190	276	729

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	450	351	1011
Volume Left	88	0	905
Volume Right	0	79	103
cSH	1208	1700	283
Volume to Capacity	0.07	0.21	3.58
Queue Length 95th (ft)	6	0	Err
Control Delay (s)	2.2	0.0	Err
Lane LOS	A		F
Approach Delay (s)	2.2	0.0	Err
Approach LOS			F

Intersection Summary			
Average Delay	5578.9		
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	237	701	87	995	0	0	0	0	176	1	128
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	258	762	95	1082	0	0	0	0	191	1	139
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1082			1020			2049	1909	639	1909	2290	1082
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1082			1020			2049	1909	639	1909	2290	1082
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			86			100	100	100	0	97	47
cM capacity (veh/h)	645			681			17	59	476	46	34	265

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	1020	1176	332
Volume Left	0	95	191
Volume Right	762	0	139
cSH	1700	681	71
Volume to Capacity	0.60	0.14	4.70
Queue Length 95th (ft)	0	12	Err
Control Delay (s)	0.0	4.8	Err
Lane LOS		A	F
Approach Delay (s)	0.0	4.8	Err
Approach LOS			F

Intersection Summary			
Average Delay	1313.9		
Intersection Capacity Utilization	140.4%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	534	2	501	618	2	400
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	580	2	545	672	2	435
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			583		2342	582
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			583		2342	582
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			45		88	15
cM capacity (veh/h)			992		18	513

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	583	545	672	437
Volume Left	0	545	0	2
Volume Right	2	0	0	435
cSH	1700	992	1700	451
Volume to Capacity	0.34	0.55	0.40	0.97
Queue Length 95th (ft)	0	86	0	298
Control Delay (s)	0.0	13.0	0.0	65.1
Lane LOS		B		F
Approach Delay (s)	0.0	5.8		65.1
Approach LOS				F

Intersection Summary			
Average Delay	15.9		
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	456	2	115	504	2	79
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	496	2	125	548	2	86
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			498		1295	497
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			498		1295	497
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			88		99	85
cM capacity (veh/h)			1066		158	573

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	498	125	548	88
Volume Left	0	125	0	2
Volume Right	2	0	0	86
cSH	1700	1066	1700	538
Volume to Capacity	0.29	0.12	0.32	0.16
Queue Length 95th (ft)	0	10	0	15
Control Delay (s)	0.0	8.8	0.0	13.0
Lane LOS		A		B
Approach Delay (s)	0.0	1.6		13.0
Approach LOS				B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	27	69	458	17	29	98	138	337	92	185	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	29	75	498	18	32	107	150	366	100	201	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	50			104			1192	1119	67	1545	1141	34
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			104			1192	1119	67	1545	1141	34
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			67			0	0	63	0	0	100
cM capacity (veh/h)	1557			1487			0	137	997	0	133	1039

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	108	498	50	107	516	100	205
Volume Left	3	498	0	107	0	100	0
Volume Right	75	0	32	0	366	0	4
cSH	1557	1487	1700	0	354	0	136
Volume to Capacity	0.00	0.33	0.03	Err	1.46	Err	1.51
Queue Length 95th (ft)	0	37	0	Err	685	Err	354
Control Delay (s)	0.2	8.6	0.0	Err	250.7	Err	324.3
Lane LOS	A	A		F	F	F	F
Approach Delay (s)	0.2	7.8		Err		Err	
Approach LOS				F		F	

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	2	19	2	2	55	14	509	2	80	620	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	2	21	2	2	60	15	553	2	87	674	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1499	1440	680	1454	1446	554	687			555		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1499	1440	680	1454	1446	554	687			555		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	98	95	98	98	89	98			91		
cM capacity (veh/h)	81	119	451	94	118	532	907			1015		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	64	15	555	87	687
Volume Left	10	2	15	0	87	0
Volume Right	21	60	0	2	0	13
cSH	177	417	907	1700	1015	1700
Volume to Capacity	0.18	0.15	0.02	0.33	0.09	0.40
Queue Length 95th (ft)	16	13	1	0	7	0
Control Delay (s)	29.9	15.2	9.0	0.0	8.9	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	29.9	15.2	0.2		1.0	
Approach LOS	D	C				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	2	57	2	2	76	46	418	2	110	487	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	2	62	2	2	83	50	454	2	120	529	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1429	1347	552	1387	1368	455	574			457		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1429	1347	552	1387	1368	455	574			457		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	64	98	88	98	98	86	95			89		
cM capacity (veh/h)	85	128	534	93	124	605	999			1104		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	95	87	50	457	120	574
Volume Left	30	2	50	0	120	0
Volume Right	62	83	0	2	0	45
cSH	192	490	999	1700	1104	1700
Volume to Capacity	0.49	0.18	0.05	0.27	0.11	0.34
Queue Length 95th (ft)	61	16	4	0	9	0
Control Delay (s)	40.7	13.9	8.8	0.0	8.7	0.0
Lane LOS	E	B	A		A	
Approach Delay (s)	40.7	13.9	0.9		1.5	
Approach LOS	E	B				

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	129	334	2	188	356
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	140	363	2	204	387
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1160	364			365	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1160	364			365	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	79			83	
cM capacity (veh/h)	179	681			1193	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	142	365	204	387
Volume Left	2	0	204	0
Volume Right	140	2	0	0
cSH	653	1700	1193	1700
Volume to Capacity	0.22	0.21	0.17	0.23
Queue Length 95th (ft)	21	0	15	0
Control Delay (s)	12.0	0.0	8.6	0.0
Lane LOS	B		A	
Approach Delay (s)	12.0	0.0	3.0	
Approach LOS	B			

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

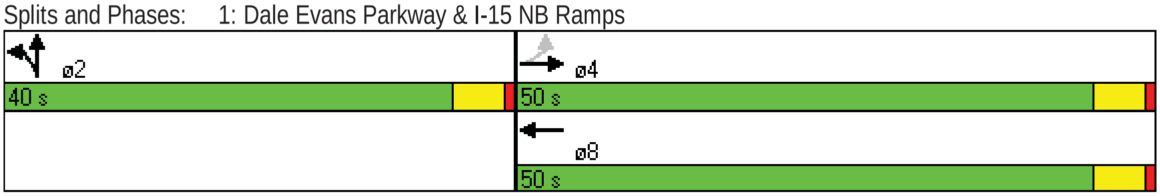
2013 Conditions

Base + EMU Mitigations

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	81	333	250	833	2
Turn Type	Perm			Split	
Protected Phases		4	8	2	2
Permitted Phases	4				
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0
Total Split (s)	50.0	50.0	50.0	40.0	40.0
Total Split (%)	55.6%	55.6%	55.6%	44.4%	44.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Min	Min
Act Effct Green (s)		49.9	49.9	30.1	30.1
Actuated g/C Ratio		0.55	0.55	0.33	0.33
v/c Ratio		0.51	0.35	0.79	0.17
Control Delay		11.8	12.3	32.2	4.8
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		11.8	12.3	32.2	4.8
LOS		B	B	C	A
Approach Delay		11.8	12.3		29.3
Approach LOS		B	B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 45	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 75.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases		4	8	2	2
Permitted Phases	4				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0
Total Split (s)	50.0	50.0	50.0	40.0	40.0
Total Split (%)	55.6%	55.6%	55.6%	44.4%	44.4%
Maximum Green (s)	45.0	45.0	45.0	35.0	35.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	Min	Min
Walk Time (s)	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	5	5	5	5	5
90th %ile Green (s)	45.0	45.0	45.0	35.0	35.0
90th %ile Term Code	Coord	Coord	Coord	Max	Max
70th %ile Green (s)	46.6	46.6	46.6	33.4	33.4
70th %ile Term Code	Coord	Coord	Coord	Gap	Gap
50th %ile Green (s)	49.5	49.5	49.5	30.5	30.5
50th %ile Term Code	Coord	Coord	Coord	Gap	Gap
30th %ile Green (s)	51.9	51.9	51.9	28.1	28.1
30th %ile Term Code	Coord	Coord	Coord	Gap	Gap
10th %ile Green (s)	56.3	56.3	56.3	23.7	23.7
10th %ile Term Code	Coord	Coord	Coord	Gap	Gap

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	450	351	905	105
v/c Ratio	0.51	0.35	0.79	0.17
Control Delay	11.8	12.3	32.2	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.8	12.3	32.2	4.8
Queue Length 50th (ft)	125	97	235	1
Queue Length 95th (ft)	190	173	282	32
Internal Link Dist (ft)	820	380		2691
Turn Bay Length (ft)				
Base Capacity (vph)	890	1011	1335	681
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.35	0.68	0.15

Intersection Summary

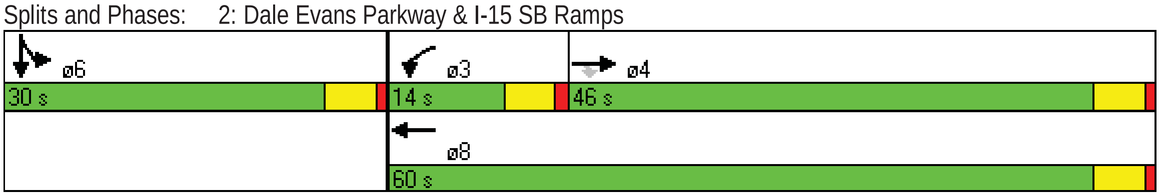
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	81	333	0	0	250	73	833	2	95	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0				
Lane Util. Factor		1.00			1.00		0.97	1.00				
Frt		1.00			0.97		1.00	0.85				
Flt Protected		0.99			1.00		0.95	1.00				
Satd. Flow (prot)		1845			1806		3433	1589				
Flt Permitted		0.86			1.00		0.95	1.00				
Satd. Flow (perm)		1606			1806		3433	1589				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	88	362	0	0	272	79	905	2	103	0	0	0
RTOR Reduction (vph)	0	0	0	0	10	0	0	69	0	0	0	0
Lane Group Flow (vph)	0	450	0	0	341	0	905	36	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		49.9			49.9		30.1	30.1				
Effective Green, g (s)		49.9			49.9		30.1	30.1				
Actuated g/C Ratio		0.55			0.55		0.33	0.33				
Clearance Time (s)		5.0			5.0		5.0	5.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		890			1001		1148	531				
v/s Ratio Prot					0.19		c0.26	0.02				
v/s Ratio Perm		c0.28										
v/c Ratio		0.51			0.34		0.79	0.07				
Uniform Delay, d1		12.4			11.0		27.1	20.4				
Progression Factor		0.71			1.00		1.00	1.00				
Incremental Delay, d2		1.9			0.9		3.7	0.1				
Delay (s)		10.7			11.9		30.7	20.5				
Level of Service		B			B		C	C				
Approach Delay (s)		10.7			11.9			29.7			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	21.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Configurations					
Volume (vph)	237	701	87	995	1
Turn Type		Perm	Prot		
Protected Phases	4		3	8	6
Permitted Phases		4			
Detector Phase	4	4	3	8	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0
Total Split (s)	46.0	46.0	14.0	60.0	30.0
Total Split (%)	51.1%	51.1%	15.6%	66.7%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	C-Max	C-Max	None	C-Max	Min
Act Effct Green (s)	48.4	48.4	8.8	59.9	20.1
Actuated g/C Ratio	0.54	0.54	0.10	0.67	0.22
v/c Ratio	0.26	0.63	0.55	0.46	0.80
Control Delay	13.5	10.0	51.4	3.9	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	10.0	51.4	3.9	43.7
LOS	B	B	D	A	D
Approach Delay	10.9			7.7	43.7
Approach LOS	B			A	D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 78.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBT
Protected Phases	4		3	8	6
Permitted Phases		4			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0
Total Split (s)	46.0	46.0	14.0	60.0	30.0
Total Split (%)	51.1%	51.1%	15.6%	66.7%	33.3%
Maximum Green (s)	41.0	41.0	9.0	55.0	25.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Min
Walk Time (s)	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	5	5		5	5
90th %ile Green (s)	41.0	41.0	9.0	55.0	25.0
90th %ile Term Code	Coord	Coord	Max	Coord	Max
70th %ile Green (s)	41.0	41.0	10.1	56.1	23.9
70th %ile Term Code	Coord	Coord	Max	Coord	Gap
50th %ile Green (s)	44.1	44.1	10.1	59.2	20.8
50th %ile Term Code	Coord	Coord	Gap	Coord	Gap
30th %ile Green (s)	48.7	48.7	8.6	62.3	17.7
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap
10th %ile Green (s)	67.0	67.0	0.0	67.0	13.0
10th %ile Term Code	Coord	Coord	Skip	Coord	Gap

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Group Flow (vph)	258	762	95	1082	331
v/c Ratio	0.26	0.63	0.55	0.46	0.80
Control Delay	13.5	10.0	51.4	3.9	43.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	10.0	51.4	3.9	43.7
Queue Length 50th (ft)	130	222	37	22	157
Queue Length 95th (ft)	m118	329	m72	135	239
Internal Link Dist (ft)	920			820	1037
Turn Bay Length (ft)		100	100		
Base Capacity (vph)	1001	1203	186	2356	503
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.63	0.51	0.46	0.66

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

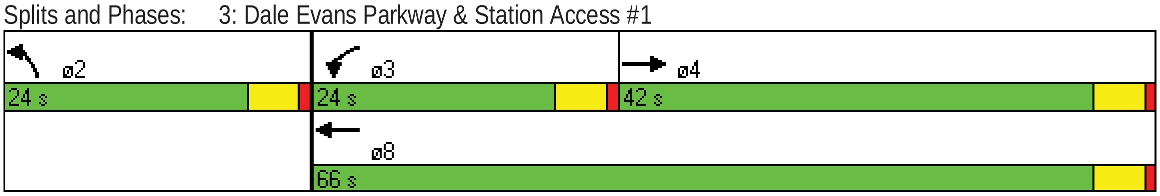
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	237	701	87	995	0	0	0	0	176	1	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		1.00	1.00	1.00	0.95						1.00	
Frt		1.00	0.85	1.00	1.00						0.94	
Flt Protected		1.00	1.00	0.95	1.00						0.97	
Satd. Flow (prot)		1863	1583	1770	3539						1708	
Flt Permitted		1.00	1.00	0.95	1.00						0.97	
Satd. Flow (perm)		1863	1583	1770	3539						1708	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	258	762	95	1082	0	0	0	0	191	1	139
RTOR Reduction (vph)	0	0	362	0	0	0	0	0	0	0	31	0
Lane Group Flow (vph)	0	258	400	95	1082	0	0	0	0	0	300	0
Turn Type			Perm	Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases			4									
Actuated Green, G (s)		47.3	47.3	7.6	59.9						20.1	
Effective Green, g (s)		47.3	47.3	7.6	59.9						20.1	
Actuated g/C Ratio		0.53	0.53	0.08	0.67						0.22	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)		979	832	149	2355						381	
v/s Ratio Prot		0.14		c0.05	c0.31						c0.18	
v/s Ratio Perm			0.25									
v/c Ratio		0.26	0.48	0.64	0.46						0.79	
Uniform Delay, d1		11.8	13.6	39.9	7.3						32.9	
Progression Factor		0.95	5.66	1.07	0.42						1.00	
Incremental Delay, d2		0.5	1.4	7.0	0.5						10.3	
Delay (s)		11.7	78.2	49.8	3.6						43.2	
Level of Service		B	E	D	A						D	
Approach Delay (s)		61.4			7.3			0.0			43.2	
Approach LOS		E			A			A			D	

Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	534	501	618	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	9.0	21.0	21.0
Total Split (s)	42.0	24.0	66.0	24.0
Total Split (%)	46.7%	26.7%	73.3%	26.7%
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Min
Act Effct Green (s)	32.5	18.5	56.0	24.0
Actuated g/C Ratio	0.36	0.21	0.62	0.27
v/c Ratio	0.87	0.77	0.58	0.58
Control Delay	48.2	25.6	13.5	6.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.2	25.6	13.5	6.9
LOS	D	C	B	A
Approach Delay	48.2		18.9	6.9
Approach LOS	D		B	A

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 24.2	Intersection LOS: C
Intersection Capacity Utilization 79.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Dale Evans Parkway & Station Access #1



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	9.0	21.0	21.0
Total Split (s)	42.0	24.0	66.0	24.0
Total Split (%)	46.7%	26.7%	73.3%	26.7%
Maximum Green (s)	37.0	19.0	61.0	19.0
Yellow Time (s)	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Min
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	5		5	5
90th %ile Green (s)	37.0	19.1	61.1	18.9
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	37.1	22.0	64.1	15.9
70th %ile Term Code	Gap	Gap	Hold	Coord
50th %ile Green (s)	33.6	19.3	57.9	22.1
50th %ile Term Code	Gap	Gap	Hold	Coord
30th %ile Green (s)	30.1	17.4	52.5	27.5
30th %ile Term Code	Gap	Gap	Hold	Coord
10th %ile Green (s)	24.6	14.6	44.2	35.8
10th %ile Term Code	Gap	Gap	Hold	Coord

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	582	545	672	437
v/c Ratio	0.87	0.77	0.58	0.58
Control Delay	48.2	25.6	13.5	6.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	48.2	25.6	13.5	6.9
Queue Length 50th (ft)	343	94	351	1
Queue Length 95th (ft)	m312	217	457	81
Internal Link Dist (ft)	920		920	951
Turn Bay Length (ft)		150		
Base Capacity (vph)	766	751	1276	758
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.76	0.73	0.53	0.58

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

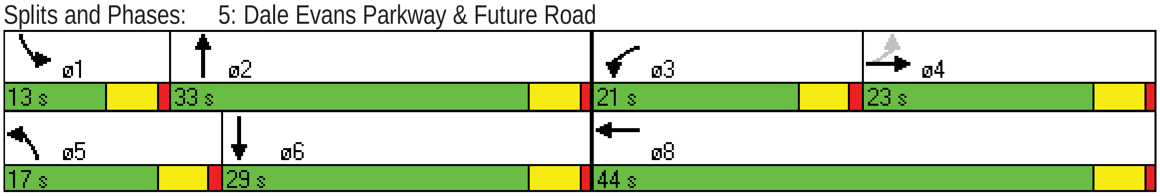
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	534	2	501	618	2	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0	
Lane Util. Factor	1.00		0.97	1.00	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	1862		3433	1863	1612	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	1862		3433	1863	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	580	2	545	672	2	435
RTOR Reduction (vph)	0	0	0	0	319	0
Lane Group Flow (vph)	582	0	545	672	118	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	32.5		18.5	56.0	24.0	
Effective Green, g (s)	32.5		18.5	56.0	24.0	
Actuated g/C Ratio	0.36		0.21	0.62	0.27	
Clearance Time (s)	5.0		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	672		706	1159	430	
v/s Ratio Prot	c0.31		c0.16	0.36	c0.07	
v/s Ratio Perm						
v/c Ratio	0.87		0.77	0.58	0.27	
Uniform Delay, d1	26.7		33.8	10.0	26.1	
Progression Factor	1.40		0.54	1.20	1.00	
Incremental Delay, d2	8.9		4.7	0.6	1.6	
Delay (s)	46.4		23.0	12.7	27.7	
Level of Service	D		C	B	C	
Approach Delay (s)	46.4			17.3	27.7	
Approach LOS	D			B	C	

Intersection Summary			
HCM Average Control Delay	26.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	3	27	458	17	98	138	92	185
Turn Type	Perm		Prot		Prot		Prot	
Protected Phases		4	3	8	5	2	1	6
Permitted Phases	4							
Detector Phase	4	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	23.0	23.0	21.0	44.0	17.0	33.0	13.0	29.0
Total Split (%)	25.6%	25.6%	23.3%	48.9%	18.9%	36.7%	14.4%	32.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	None	Min
Act Effct Green (s)		23.7	15.7	44.4	10.1	25.2	7.7	22.8
Actuated g/C Ratio		0.26	0.17	0.49	0.11	0.28	0.09	0.25
v/c Ratio		0.22	0.83	0.06	0.54	0.91	0.66	0.43
Control Delay		13.2	41.6	1.0	43.6	41.2	61.2	30.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		13.2	41.6	1.0	43.6	41.2	61.2	30.8
LOS		B	D	A	D	D	E	C
Approach Delay		13.2		37.9		41.6		40.8
Approach LOS		B		D		D		D

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 38.2	Intersection LOS: D
Intersection Capacity Utilization 65.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4	3	8	5	2	1	6
Permitted Phases	4							
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	23.0	23.0	21.0	44.0	17.0	33.0	13.0	29.0
Total Split (%)	25.6%	25.6%	23.3%	48.9%	18.9%	36.7%	14.4%	32.2%
Maximum Green (s)	18.0	18.0	16.0	39.0	12.0	28.0	8.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	None	Min
Walk Time (s)	5.0	5.0		5.0		5.0		5.0
Flash Dont Walk (s)	11.0	11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)	5	5		0		5		5
90th %ile Green (s)	18.0	18.0	16.0	39.0	12.0	28.0	8.0	24.0
90th %ile Term Code	Coord	Coord	Max	Coord	Max	Max	Max	Hold
70th %ile Green (s)	18.0	18.0	16.0	39.0	12.0	28.0	8.0	24.0
70th %ile Term Code	Coord	Coord	Max	Coord	Max	Max	Max	Hold
50th %ile Green (s)	18.0	18.0	16.0	39.0	10.7	28.0	8.0	25.3
50th %ile Term Code	Coord	Coord	Max	Coord	Gap	Max	Max	Hold
30th %ile Green (s)	21.4	21.4	16.6	43.0	9.0	24.0	8.0	23.0
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap	Max	Hold
10th %ile Green (s)	43.2	43.2	14.0	62.2	0.0	17.8	0.0	17.8
10th %ile Term Code	Coord	Coord	Gap	Coord	Skip	Gap	Skip	Hold

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	498	50	107	516	100	205
v/c Ratio	0.22	0.83	0.06	0.54	0.91	0.66	0.43
Control Delay	13.2	41.6	1.0	43.6	41.2	61.2	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	41.6	1.0	43.6	41.2	61.2	30.8
Queue Length 50th (ft)	15	95	6	58	225	56	93
Queue Length 95th (ft)	59	#206	m1	88	#383	#126	160
Internal Link Dist (ft)	464		920		920		859
Turn Bay Length (ft)		100		100		100	
Base Capacity (vph)	497	615	848	236	616	157	501
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.81	0.06	0.45	0.84	0.64	0.41

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	27	69	458	17	29	98	138	337	92	185	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		0.97	1.00		1.00	1.00		1.00	1.00	
Frt		0.91		1.00	0.90		1.00	0.89		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684		3433	1684		1770	1665		1770	1857	
Flt Permitted		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1679		3433	1684		1770	1665		1770	1857	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	29	75	498	18	32	107	150	366	100	201	4
RTOR Reduction (vph)	0	56	0	0	17	0	0	102	0	0	1	0
Lane Group Flow (vph)	0	51	0	498	33	0	107	414	0	100	204	0
Turn Type	Perm			Prot			Prot			Prot		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		22.7		15.7	43.4		8.7	25.2		6.4	22.9	
Effective Green, g (s)		22.7		15.7	43.4		8.7	25.2		6.4	22.9	
Actuated g/C Ratio		0.25		0.17	0.48		0.10	0.28		0.07	0.25	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		423		599	812		171	466		126	473	
v/s Ratio Prot				c0.15	0.02		c0.06	c0.25		0.06	0.11	
v/s Ratio Perm		c0.03										
v/c Ratio		0.12		0.83	0.04		0.63	0.89		0.79	0.43	
Uniform Delay, d1		26.0		35.9	12.3		39.1	31.0		41.1	28.1	
Progression Factor		1.00		0.83	0.11		0.90	0.90		1.00	1.00	
Incremental Delay, d2		0.6		8.4	0.1		6.7	17.7		28.1	0.6	
Delay (s)		26.5		38.1	1.5		41.9	45.5		69.2	28.7	
Level of Service		C		D	A		D	D		E	C	
Approach Delay (s)		26.5			34.8			44.9			42.0	
Approach LOS		C			C			D			D	

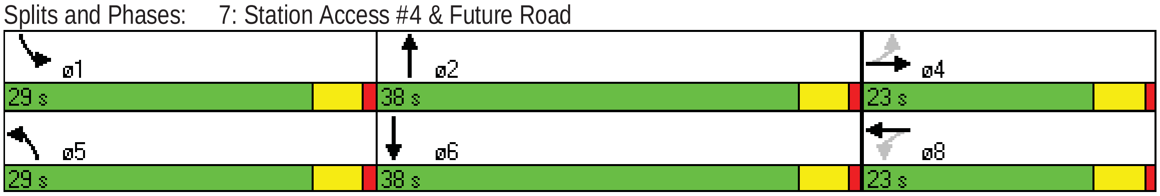
Intersection Summary			
HCM Average Control Delay	39.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	28	2	2	2	46	418	110	487
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	23.0	23.0	23.0	23.0	29.0	38.0	29.0	38.0
Total Split (%)	25.6%	25.6%	25.6%	25.6%	32.2%	42.2%	32.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Act Effct Green (s)		8.0		8.0	8.0	57.7	11.4	66.6
Actuated g/C Ratio		0.09		0.09	0.09	0.64	0.13	0.74
v/c Ratio		0.51		0.40	0.32	0.38	0.53	0.42
Control Delay		26.2		15.2	43.0	10.7	43.7	9.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		26.2		15.2	43.0	10.7	43.7	9.9
LOS		C		B	D	B	D	A
Approach Delay		26.2		15.2		13.9		15.7
Approach LOS		C		B		B		B

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.53
Intersection Signal Delay: 15.7 Intersection LOS: B
Intersection Capacity Utilization 55.8% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 7: Station Access #4 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	23.0	23.0	23.0	23.0	29.0	38.0	29.0	38.0
Total Split (%)	25.6%	25.6%	25.6%	25.6%	32.2%	42.2%	32.2%	42.2%
Maximum Green (s)	18.0	18.0	18.0	18.0	24.0	33.0	24.0	33.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Min	None	C-Min
Walk Time (s)	5.0	5.0	5.0	5.0		5.0		5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0		11.0		11.0
Pedestrian Calls (#/hr)	0	0	0	0		0		0
90th %ile Green (s)	12.2	12.2	12.2	12.2	10.8	46.9	15.9	52.0
90th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Gap	Coord
70th %ile Green (s)	9.3	9.3	9.3	9.3	9.1	52.5	13.2	56.6
70th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Gap	Coord
50th %ile Green (s)	7.4	7.4	7.4	7.4	7.9	56.2	11.4	59.7
50th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Gap	Coord
30th %ile Green (s)	5.5	5.5	5.5	5.5	0.0	59.9	9.6	74.5
30th %ile Term Code	Gap	Gap	Gap	Gap	Skip	Coord	Gap	Coord
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	73.0	7.0	85.0
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Coord	Gap	Coord

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	94	87	50	456	120	574
v/c Ratio	0.51	0.40	0.32	0.38	0.53	0.42
Control Delay	26.2	15.2	43.0	10.7	43.7	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	15.2	43.0	10.7	43.7	9.9
Queue Length 50th (ft)	17	2	27	117	74	144
Queue Length 95th (ft)	62	44	61	234	m106	m81
Internal Link Dist (ft)	560	751		420		420
Turn Bay Length (ft)			100		100	
Base Capacity (vph)	338	388	472	1193	472	1362
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.22	0.11	0.38	0.25	0.42

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	2	57	2	2	76	46	418	2	110	487	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.91			0.87		1.00	1.00		1.00	0.99	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1670			1621		1770	1862		1770	1841	
Flt Permitted		0.85			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1444			1610		1770	1862		1770	1841	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	2	62	2	2	83	50	454	2	120	529	45
RTOR Reduction (vph)	0	57	0	0	77	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	37	0	0	10	0	50	456	0	120	572	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		6.9			6.9		5.6	56.7		11.4	62.5	
Effective Green, g (s)		6.9			6.9		5.6	56.7		11.4	62.5	
Actuated g/C Ratio		0.08			0.08		0.06	0.63		0.13	0.69	
Clearance Time (s)		5.0			5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		111			123		110	1173		224	1278	
v/s Ratio Prot							0.03	0.24		c0.07	c0.31	
v/s Ratio Perm		c0.03			0.01							
v/c Ratio		0.33			0.08		0.45	0.39		0.54	0.45	
Uniform Delay, d1		39.4			38.6		40.7	8.2		36.8	6.1	
Progression Factor		1.00			1.00		1.00	1.00		1.02	1.20	
Incremental Delay, d2		1.8			0.3		3.0	1.0		1.9	0.9	
Delay (s)		41.1			38.9		43.7	9.1		39.5	8.2	
Level of Service		D			D		D	A		D	A	
Approach Delay (s)		41.1			38.9			12.5			13.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

2013 Conditions

Base + DEMU

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	70	301	0	0	207	73	602	2	95	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	327	0	0	225	79	654	2	103	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	304			327			744	784	327	848	744	265
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	304			327			744	784	327	848	744	265
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			0	99	86	100	100	100
cM capacity (veh/h)	1256			1232			315	305	714	228	322	774

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	403	304	760
Volume Left	76	0	654
Volume Right	0	79	103
cSH	1256	1700	341
Volume to Capacity	0.06	0.18	2.23
Queue Length 95th (ft)	5	0	1433
Control Delay (s)	2.0	0.0	586.3
Lane LOS	A		F
Approach Delay (s)	2.0	0.0	586.3
Approach LOS			F

Intersection Summary			
Average Delay	304.1		
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	194	529	87	720	0	0	0	0	176	1	113
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	211	575	95	783	0	0	0	0	191	1	123
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	783			786			1593	1470	498	1470	1758	783
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	783			786			1593	1470	498	1470	1758	783
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			89			100	100	100	0	99	69
cM capacity (veh/h)	835			833			54	113	572	96	75	394

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	786	877	315
Volume Left	0	95	191
Volume Right	575	0	123
cSH	1700	833	136
Volume to Capacity	0.46	0.11	2.32
Queue Length 95th (ft)	0	10	670
Control Delay (s)	0.0	2.9	666.9
Lane LOS		A	F
Approach Delay (s)	0.0	2.9	666.9
Approach LOS			F

Intersection Summary			
Average Delay	107.6		
Intersection Capacity Utilization	112.2%	ICU Level of Service	H
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	435	2	355	474	2	283
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	473	2	386	515	2	308
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			475		1761	474
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			475		1761	474
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			65		96	48
cM capacity (veh/h)			1087		60	590

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	475	386	515	310
Volume Left	0	386	0	2
Volume Right	2	0	0	308
cSH	1700	1087	1700	556
Volume to Capacity	0.28	0.35	0.30	0.56
Queue Length 95th (ft)	0	41	0	85
Control Delay (s)	0.0	10.1	0.0	19.3
Lane LOS		B		C
Approach Delay (s)	0.0	4.3		19.3
Approach LOS				C

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	380	2	81	393	2	56
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	413	2	88	427	2	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			415		1017	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			415		1017	414
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		99	90
cM capacity (veh/h)			1144		243	638

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	415	88	427	63
Volume Left	0	88	0	2
Volume Right	2	0	0	61
cSH	1700	1144	1700	604
Volume to Capacity	0.24	0.08	0.25	0.10
Queue Length 95th (ft)	0	6	0	9
Control Delay (s)	0.0	8.4	0.0	11.7
Lane LOS		A		B
Approach Delay (s)	0.0	1.4		11.7
Approach LOS				B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	27	69	347	17	29	98	138	261	92	185	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	29	75	377	18	32	107	150	284	100	201	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	50			104			951	878	67	1221	899	34
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			104			951	878	67	1221	899	34
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			75			0	30	72	0	3	100
cM capacity (veh/h)	1557			1487			23	214	997	40	207	1039

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	108	377	50	107	434	100	205
Volume Left	3	377	0	107	0	100	0
Volume Right	75	0	32	0	284	0	4
cSH	1557	1487	1700	23	439	40	211
Volume to Capacity	0.00	0.25	0.03	4.58	0.99	2.49	0.97
Queue Length 95th (ft)	0	25	0	Err	310	273	211
Control Delay (s)	0.2	8.2	0.0	Err	70.7	893.1	102.9
Lane LOS	A	A		F	F	F	F
Approach Delay (s)	0.2	7.3		2028.4		361.6	
Approach LOS				F		F	

Intersection Summary			
Average Delay	876.1		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	2	19	2	2	39	14	449	2	56	533	12
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	2	21	2	2	42	15	488	2	61	579	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1270	1228	586	1242	1234	489	592			490		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1270	1228	586	1242	1234	489	592			490		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	99	96	98	99	93	98			94		
cM capacity (veh/h)	126	165	510	136	164	579	983			1073		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	33	47	15	490	61	592
Volume Left	10	2	15	0	61	0
Volume Right	21	42	0	2	0	13
cSH	248	456	983	1700	1073	1700
Volume to Capacity	0.13	0.10	0.02	0.29	0.06	0.35
Queue Length 95th (ft)	11	9	1	0	5	0
Control Delay (s)	21.7	13.8	8.7	0.0	8.6	0.0
Lane LOS	C	B	A		A	
Approach Delay (s)	21.7	13.8	0.3		0.8	
Approach LOS	C	B				

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	28	5	57	2	2	54	46	381	2	78	432	41
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	5	62	2	2	59	50	414	2	85	470	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1235	1178	492	1219	1199	415	514			416		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1235	1178	492	1219	1199	415	514			416		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	76	97	89	98	99	91	95			93		
cM capacity (veh/h)	125	168	577	124	163	637	1051			1143		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	98	63	50	416	85	514
Volume Left	30	2	50	0	85	0
Volume Right	62	59	0	2	0	45
cSH	256	513	1051	1700	1143	1700
Volume to Capacity	0.38	0.12	0.05	0.24	0.07	0.30
Queue Length 95th (ft)	43	10	4	0	6	0
Control Delay (s)	27.6	13.0	8.6	0.0	8.4	0.0
Lane LOS	D	B	A		A	
Approach Delay (s)	27.6	13.0	0.9		1.2	
Approach LOS	D	B				

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	50.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	92	334	2	133	356
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	100	363	2	145	387
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1040	364			365	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1040	364			365	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	85			88	
cM capacity (veh/h)	224	681			1193	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	102	365	145	387
Volume Left	2	0	145	0
Volume Right	100	2	0	0
cSH	653	1700	1193	1700
Volume to Capacity	0.16	0.21	0.12	0.23
Queue Length 95th (ft)	14	0	10	0
Control Delay (s)	11.5	0.0	8.4	0.0
Lane LOS	B		A	
Approach Delay (s)	11.5	0.0	2.3	
Approach LOS	B			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

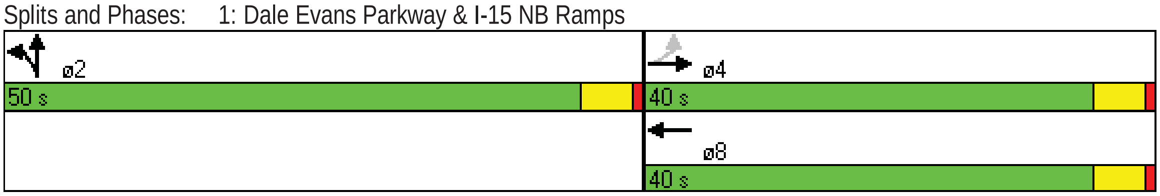
2013 Conditions

Base + DEMU Mitigations

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	70	301	207	602	2
Turn Type	Perm			Split	
Protected Phases		4	8	2	2
Permitted Phases	4				
Detector Phase	4	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0
Total Split (s)	40.0	40.0	40.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	55.6%	55.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	C-Max	C-Max	C-Max	Min	Min
Act Effct Green (s)		40.9	40.9	39.1	39.1
Actuated g/C Ratio		0.45	0.45	0.43	0.43
v/c Ratio		0.54	0.37	0.85	0.14
Control Delay		15.1	17.8	33.8	3.2
Queue Delay		0.0	0.0	0.0	0.0
Total Delay		15.1	17.8	33.8	3.2
LOS		B	B	C	A
Approach Delay		15.1	17.8		29.6
Approach LOS		B	B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 23.2	Intersection LOS: C
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases		4	8	2	2
Permitted Phases	4				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0
Total Split (s)	40.0	40.0	40.0	50.0	50.0
Total Split (%)	44.4%	44.4%	44.4%	55.6%	55.6%
Maximum Green (s)	35.0	35.0	35.0	45.0	45.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag					
Lead-Lag Optimize?					
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	Min	Min
Walk Time (s)	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	5	5	5	5	5
90th %ile Green (s)	35.0	35.0	35.0	45.0	45.0
90th %ile Term Code	Coord	Coord	Coord	Max	Max
70th %ile Green (s)	36.0	36.0	36.0	44.0	44.0
70th %ile Term Code	Coord	Coord	Coord	Gap	Gap
50th %ile Green (s)	39.4	39.4	39.4	40.6	40.6
50th %ile Term Code	Coord	Coord	Coord	Gap	Gap
30th %ile Green (s)	43.5	43.5	43.5	36.5	36.5
30th %ile Term Code	Coord	Coord	Coord	Gap	Gap
10th %ile Green (s)	50.6	50.6	50.6	29.4	29.4
10th %ile Term Code	Coord	Coord	Coord	Gap	Gap

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	403	304	654	105
v/c Ratio	0.54	0.37	0.85	0.14
Control Delay	15.1	17.8	33.8	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.1	17.8	33.8	3.2
Queue Length 50th (ft)	140	104	313	1
Queue Length 95th (ft)	195	185	422	25
Internal Link Dist (ft)	820	380		310
Turn Bay Length (ft)				
Base Capacity (vph)	743	830	885	846
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.54	0.37	0.74	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	301	0	0	207	73	602	2	95	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		5.0	5.0				
Lane Util. Factor		1.00			1.00		1.00	1.00				
Frt		1.00			0.96		1.00	0.85				
Flt Protected		0.99			1.00		0.95	1.00				
Satd. Flow (prot)		1845			1797		1770	1589				
Flt Permitted		0.88			1.00		0.95	1.00				
Satd. Flow (perm)		1636			1797		1770	1589				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	327	0	0	225	79	654	2	103	0	0	0
RTOR Reduction (vph)	0	0	0	0	13	0	0	58	0	0	0	0
Lane Group Flow (vph)	0	403	0	0	291	0	654	47	0	0	0	0
Turn Type	Perm						Split					
Protected Phases		4			8		2	2				
Permitted Phases	4											
Actuated Green, G (s)		40.9			40.9		39.1	39.1				
Effective Green, g (s)		40.9			40.9		39.1	39.1				
Actuated g/C Ratio		0.45			0.45		0.43	0.43				
Clearance Time (s)		5.0			5.0		5.0	5.0				
Vehicle Extension (s)		3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)		743			817		769	690				
v/s Ratio Prot					0.16		c0.37	0.03				
v/s Ratio Perm		c0.25										
v/c Ratio		0.54			0.36		0.85	0.07				
Uniform Delay, d1		17.8			16.0		22.8	14.8				
Progression Factor		0.62			1.00		1.00	1.00				
Incremental Delay, d2		2.6			1.2		8.9	0.0				
Delay (s)		13.7			17.2		31.8	14.9				
Level of Service		B			B		C	B				
Approach Delay (s)		13.7			17.2			29.4			0.0	
Approach LOS		B			B			C			A	

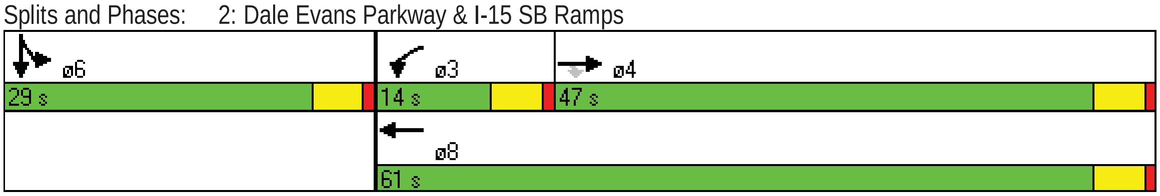
Intersection Summary			
HCM Average Control Delay	22.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Configurations					
Volume (vph)	194	529	87	720	1
Turn Type		Perm	Prot		
Protected Phases	4		3	8	6
Permitted Phases		4			
Detector Phase	4	4	3	8	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0
Total Split (s)	47.0	47.0	14.0	61.0	29.0
Total Split (%)	52.2%	52.2%	15.6%	67.8%	32.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	C-Max	C-Max	None	C-Max	Min
Act Effct Green (s)	49.1	49.1	8.8	60.6	19.4
Actuated g/C Ratio	0.55	0.55	0.10	0.67	0.22
v/c Ratio	0.21	0.51	0.55	0.62	0.80
Control Delay	17.3	8.3	46.1	10.6	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	8.3	46.1	10.6	44.2
LOS	B	A	D	B	D
Approach Delay	10.7			14.4	44.2
Approach LOS	B			B	D

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 17.7 Intersection LOS: B
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBT
Protected Phases	4		3	8	6
Permitted Phases		4			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0
Total Split (s)	47.0	47.0	14.0	61.0	29.0
Total Split (%)	52.2%	52.2%	15.6%	67.8%	32.2%
Maximum Green (s)	42.0	42.0	9.0	56.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Min
Walk Time (s)	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	5	5		5	5
90th %ile Green (s)	42.0	42.0	9.0	56.0	24.0
90th %ile Term Code	Coord	Coord	Max	Coord	Max
70th %ile Green (s)	42.0	42.0	9.9	56.9	23.1
70th %ile Term Code	Coord	Coord	Max	Coord	Gap
50th %ile Green (s)	44.8	44.8	10.1	59.9	20.1
50th %ile Term Code	Coord	Coord	Gap	Coord	Gap
30th %ile Green (s)	49.3	49.3	8.6	62.9	17.1
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap
10th %ile Green (s)	67.4	67.4	0.0	67.4	12.6
10th %ile Term Code	Coord	Coord	Skip	Coord	Gap

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBT
Lane Group Flow (vph)	211	575	95	783	315
v/c Ratio	0.21	0.51	0.55	0.62	0.80
Control Delay	17.3	8.3	46.1	10.6	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	8.3	46.1	10.6	44.2
Queue Length 50th (ft)	93	98	42	357	151
Queue Length 95th (ft)	m138	m169	m75	477	233
Internal Link Dist (ft)	920			820	245
Turn Bay Length (ft)		100	100		
Base Capacity (vph)	1016	1125	185	1255	482
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.51	0.51	0.62	0.65

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	194	529	87	720	0	0	0	0	176	1	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0						5.0	
Lane Util. Factor		1.00	1.00	1.00	1.00						1.00	
Frt		1.00	0.85	1.00	1.00						0.95	
Flt Protected		1.00	1.00	0.95	1.00						0.97	
Satd. Flow (prot)		1863	1583	1770	1863						1713	
Flt Permitted		1.00	1.00	0.95	1.00						0.97	
Satd. Flow (perm)		1863	1583	1770	1863						1713	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	211	575	95	783	0	0	0	0	191	1	123
RTOR Reduction (vph)	0	0	268	0	0	0	0	0	0	0	27	0
Lane Group Flow (vph)	0	211	307	95	783	0	0	0	0	0	288	0
Turn Type			Perm	Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases			4									
Actuated Green, G (s)		48.1	48.1	7.5	60.6						19.4	
Effective Green, g (s)		48.1	48.1	7.5	60.6						19.4	
Actuated g/C Ratio		0.53	0.53	0.08	0.67						0.22	
Clearance Time (s)		5.0	5.0	5.0	5.0						5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)		996	846	148	1254						369	
v/s Ratio Prot		0.11		0.05	c0.42						c0.17	
v/s Ratio Perm			0.19									
v/c Ratio		0.21	0.36	0.64	0.62						0.78	
Uniform Delay, d1		11.0	12.1	39.9	8.3						33.3	
Progression Factor		1.31	4.61	0.94	0.91						1.00	
Incremental Delay, d2		0.5	1.1	7.1	1.8						10.0	
Delay (s)		14.9	56.9	44.8	9.4						43.3	
Level of Service		B	E	D	A						D	
Approach Delay (s)		45.6			13.2			0.0			43.3	
Approach LOS		D			B			A			D	

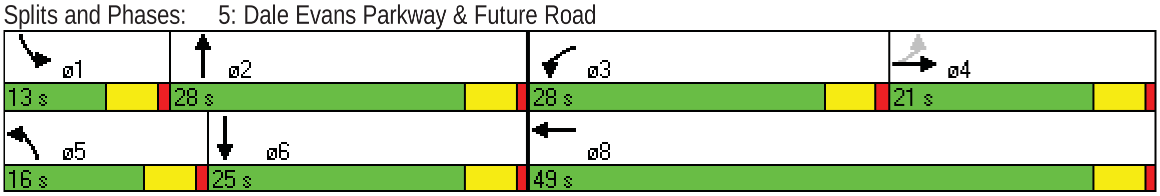
Intersection Summary			
HCM Average Control Delay	30.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	3	27	347	17	98	138	92	185
Turn Type	Perm		Prot		Prot		Prot	
Protected Phases		4	3	8	5	2	1	6
Permitted Phases	4							
Detector Phase	4	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	1.0	1.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	21.0	21.0	28.0	49.0	16.0	28.0	13.0	25.0
Total Split (%)	23.3%	23.3%	31.1%	54.4%	17.8%	31.1%	14.4%	27.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	None	Min
Act Effct Green (s)		21.4	21.7	48.2	9.7	21.4	7.7	19.5
Actuated g/C Ratio		0.24	0.24	0.54	0.11	0.24	0.09	0.22
v/c Ratio		0.23	0.88	0.05	0.56	0.91	0.66	0.51
Control Delay		14.1	64.0	11.0	49.7	49.9	61.2	35.7
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		14.1	64.0	11.0	49.7	49.9	61.2	35.7
LOS		B	E	B	D	D	E	D
Approach Delay		14.1		57.8		49.9		44.1
Approach LOS		B		E		D		D

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 53 (59%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 48.3 Intersection LOS: D
Intersection Capacity Utilization 66.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4	3	8	5	2	1	6
Permitted Phases	4							
Minimum Initial (s)	1.0	1.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	9.0	21.0	9.0	21.0
Total Split (s)	21.0	21.0	28.0	49.0	16.0	28.0	13.0	25.0
Total Split (%)	23.3%	23.3%	31.1%	54.4%	17.8%	31.1%	14.4%	27.8%
Maximum Green (s)	16.0	16.0	23.0	44.0	11.0	23.0	8.0	20.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead		Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	None	Min	None	Min
Walk Time (s)	5.0	5.0		5.0		5.0		5.0
Flash Dont Walk (s)	11.0	11.0		11.0		11.0		11.0
Pedestrian Calls (#/hr)	5	5		5		5		5
90th %ile Green (s)	16.0	16.0	23.0	44.0	11.0	23.0	8.0	20.0
90th %ile Term Code	Coord	Coord	Max	Coord	Max	Max	Max	Max
70th %ile Green (s)	16.0	16.0	23.0	44.0	11.0	23.0	8.0	20.0
70th %ile Term Code	Coord	Coord	Max	Coord	Max	Max	Max	Hold
50th %ile Green (s)	16.0	16.0	23.0	44.0	10.7	23.0	8.0	20.3
50th %ile Term Code	Coord	Coord	Max	Coord	Gap	Max	Max	Hold
30th %ile Green (s)	18.1	18.1	22.1	45.2	9.0	21.8	8.0	20.8
30th %ile Term Code	Coord	Coord	Gap	Coord	Gap	Gap	Max	Hold
10th %ile Green (s)	41.0	41.0	17.6	63.6	0.0	16.4	0.0	16.4
10th %ile Term Code	Coord	Coord	Gap	Coord	Skip	Gap	Skip	Hold

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 53 (59%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	107	377	50	107	434	100	205
v/c Ratio	0.23	0.88	0.05	0.56	0.91	0.66	0.51
Control Delay	14.1	64.0	11.0	49.7	49.9	61.2	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	64.0	11.0	49.7	49.9	61.2	35.7
Queue Length 50th (ft)	15	231	3	58	184	56	102
Queue Length 95th (ft)	61	#360	m20	111	#353	#126	171
Internal Link Dist (ft)	1539		920		920		986
Turn Bay Length (ft)		100		100		100	
Base Capacity (vph)	456	452	916	216	505	157	418
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.83	0.05	0.50	0.86	0.64	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	3	27	69	347	17	29	98	138	261	92	185	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.91		1.00	0.90		1.00	0.90		1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1684		1770	1684		1770	1680		1770	1857	
Flt Permitted		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1678		1770	1684		1770	1680		1770	1857	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	29	75	377	18	32	107	150	284	100	201	4
RTOR Reduction (vph)	0	58	0	0	15	0	0	78	0	0	1	0
Lane Group Flow (vph)	0	49	0	377	35	0	107	356	0	100	204	0
Turn Type	Perm			Prot			Prot			Prot		
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4											
Actuated Green, G (s)		20.5		21.7	47.2		8.3	21.4		6.4	19.5	
Effective Green, g (s)		20.5		21.7	47.2		8.3	21.4		6.4	19.5	
Actuated g/C Ratio		0.23		0.24	0.52		0.09	0.24		0.07	0.22	
Clearance Time (s)		5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		382		427	883		163	399		126	402	
v/s Ratio Prot				c0.21	0.02		c0.06	c0.21		0.06	0.11	
v/s Ratio Perm		c0.03										
v/c Ratio		0.13		0.88	0.04		0.66	0.89		0.79	0.51	
Uniform Delay, d1		27.6		32.9	10.4		39.5	33.2		41.1	31.0	
Progression Factor		1.00		1.38	1.72		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.7		15.5	0.1		9.2	21.4		28.1	1.0	
Delay (s)		28.3		61.1	17.9		48.6	54.6		69.2	32.0	
Level of Service		C		E	B		D	D		E	C	
Approach Delay (s)		28.3			56.0			53.4			44.2	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	50.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

2030 Conditions

(Base and Project Conditions)

2030 Conditions

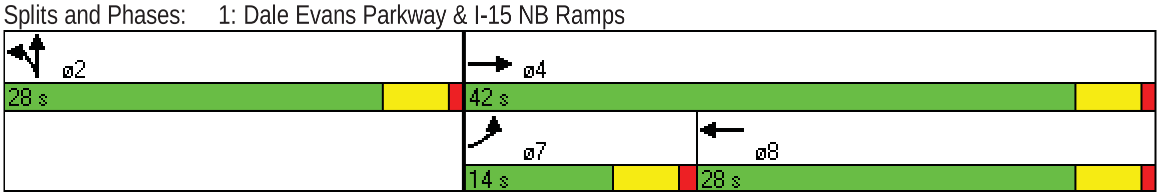
Base

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	229	557	389	199	2
Turn Type	Prot			Split	
Protected Phases	7	4	8	2	2
Permitted Phases					
Detector Phase	7	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	14.0	42.0	28.0	28.0	28.0
Total Split (%)	20.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Max	C-Max	Max	Max
Act Effct Green (s)	9.0	37.0	23.0	23.0	23.0
Actuated g/C Ratio	0.13	0.53	0.33	0.33	0.33
v/c Ratio	1.09	0.32	0.52	0.37	0.68
Control Delay	119.7	14.3	17.2	20.3	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	119.7	14.3	17.2	20.3	15.1
LOS	F	B	B	C	B
Approach Delay		45.0	17.2		16.7
Approach LOS		D	B		B

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 28.1 Intersection LOS: C
Intersection Capacity Utilization 89.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases	7	4	8	2	2
Permitted Phases					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	14.0	42.0	28.0	28.0	28.0
Total Split (%)	20.0%	60.0%	40.0%	40.0%	40.0%
Maximum Green (s)	9.0	37.0	23.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	Max	Max
Walk Time (s)		5.0	5.0	5.0	5.0
Flash Dont Walk (s)		18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)		5	5	5	5
90th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
90th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
70th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
70th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
50th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
50th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
30th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
30th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
10th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
10th %ile Term Code	Max	Coord	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	249	605	614	216	466
v/c Ratio	1.09	0.32	0.52	0.37	0.68
Control Delay	119.7	14.3	17.2	20.3	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	119.7	14.3	17.2	20.3	15.1
Queue Length 50th (ft)	~123	68	89	70	74
Queue Length 95th (ft)	#261	101	135	124	177
Internal Link Dist (ft)		820	380		2022
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	228	1871	1183	582	686
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.09	0.32	0.52	0.37	0.68

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

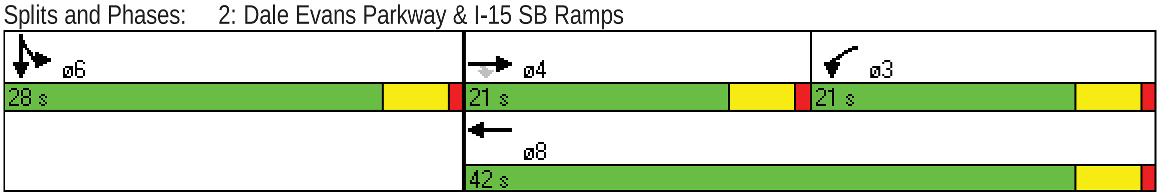
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	229	557	0	0	389	176	199	2	427	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00				
Frt	1.00	1.00			0.95		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3374		1770	1585				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1770	3539			3374		1770	1585				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	249	605	0	0	423	191	216	2	464	0	0	0
RTOR Reduction (vph)	0	0	0	0	75	0	0	165	0	0	0	0
Lane Group Flow (vph)	249	605	0	0	539	0	216	301	0	0	0	0
Turn Type	Prot						Split					
Protected Phases	7	4			8		2	2				
Permitted Phases												
Actuated Green, G (s)	9.0	37.0			23.0		23.0	23.0				
Effective Green, g (s)	9.0	37.0			23.0		23.0	23.0				
Actuated g/C Ratio	0.13	0.53			0.33		0.33	0.33				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	228	1871			1109		582	521				
v/s Ratio Prot	c0.14	0.17			c0.16		0.12	c0.19				
v/s Ratio Perm												
v/c Ratio	1.09	0.32			0.49		0.37	0.58				
Uniform Delay, d1	30.5	9.4			18.8		18.0	19.5				
Progression Factor	1.30	1.47			1.00		1.00	1.00				
Incremental Delay, d2	79.8	0.4			1.5		1.8	4.6				
Delay (s)	119.3	14.1			20.3		19.8	24.1				
Level of Service	F	B			C		B	C				
Approach Delay (s)		44.8			20.3			22.7			0.0	
Approach LOS		D			C			C			A	

Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Configurations						
Volume (vph)	468	558	321	267	318	1
Turn Type		Perm	Prot		Split	
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Detector Phase	4	4	3	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	21.0	21.0	21.0	42.0	28.0	28.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Act Effct Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
Actuated g/C Ratio	0.23	0.23	0.23	0.53	0.33	0.33
v/c Ratio	0.63	0.73	0.86	0.15	0.59	0.53
Control Delay	28.4	8.4	43.4	8.3	24.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	8.4	43.4	8.3	24.7	4.8
LOS	C	A	D	A	C	A
Approach Delay	17.5			27.5		13.7
Approach LOS	B			C		B

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 89.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	21.0	21.0	21.0	42.0	28.0	28.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Maximum Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	18.0	18.0
Pedestrian Calls (#/hr)	5	5		5	5	5
90th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
90th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
70th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
70th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
50th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
50th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
30th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
30th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
10th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
10th %ile Term Code	Coord	Coord	Hold	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	509	607	349	290	346	431
v/c Ratio	0.63	0.73	0.86	0.15	0.59	0.53
Control Delay	28.4	8.4	43.4	8.3	24.7	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	8.4	43.4	8.3	24.7	4.8
Queue Length 50th (ft)	104	0	118	30	123	0
Queue Length 95th (ft)	152	86	#286	46	203	57
Internal Link Dist (ft)	920			820		1339
Turn Bay Length (ft)			300		300	
Base Capacity (vph)	809	830	405	1871	582	809
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.73	0.86	0.15	0.59	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	468	558	321	267	0	0	0	0	318	1	396
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					1770	1584	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					1770	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	509	607	349	290	0	0	0	0	346	1	430
RTOR Reduction (vph)	0	0	468	0	0	0	0	0	0	0	289	0
Lane Group Flow (vph)	0	509	139	349	290	0	0	0	0	346	142	0
Turn Type			Perm	Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases			4									
Actuated Green, G (s)		16.0	16.0	16.0	37.0					23.0	23.0	
Effective Green, g (s)		16.0	16.0	16.0	37.0					23.0	23.0	
Actuated g/C Ratio		0.23	0.23	0.23	0.53					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		809	362	405	1871					582	520	
v/s Ratio Prot		c0.14		c0.20	0.08					c0.20	0.09	
v/s Ratio Perm			0.09									
v/c Ratio		0.63	0.38	0.86	0.15					0.59	0.27	
Uniform Delay, d1		24.3	22.8	25.9	8.5					19.6	17.3	
Progression Factor		1.00	1.00	0.83	0.95					1.00	1.00	
Incremental Delay, d2		3.7	3.1	15.5	0.2					4.4	1.3	
Delay (s)		28.0	25.9	36.9	8.2					24.0	18.6	
Level of Service		C	C	D	A					C	B	
Approach Delay (s)		26.9			23.9			0.0			21.0	
Approach LOS		C			C			A			C	

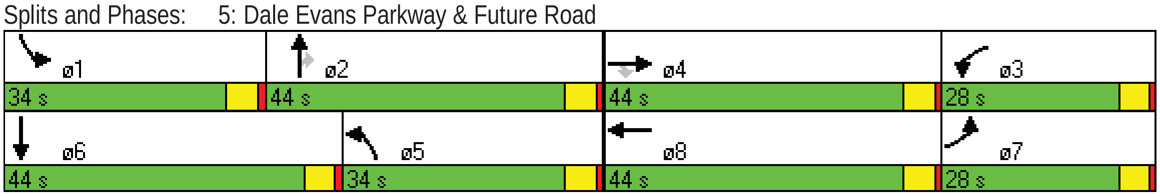
Intersection Summary			
HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	17	141	363	420	89	515	722	401	485	969
Turn Type	Prot		Perm	Prot		Prot		Perm	Prot	
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	28.0	44.0	44.0	28.0	44.0	34.0	44.0	44.0	34.0	44.0
Total Split (%)	18.7%	29.3%	29.3%	18.7%	29.3%	22.7%	29.3%	29.3%	22.7%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	18.8	17.0	17.0	24.0	26.6	29.0	61.9	61.9	27.1	59.9
Actuated g/C Ratio	0.13	0.11	0.11	0.16	0.18	0.19	0.41	0.41	0.18	0.40
v/c Ratio	0.08	0.38	0.77	0.83	0.37	0.84	0.37	0.51	0.85	0.53
Control Delay	53.8	62.0	17.3	74.4	22.0	66.1	30.1	12.1	73.1	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	62.0	17.3	74.4	22.0	66.1	30.1	12.1	73.1	37.4
LOS	D	E	B	E	C	E	C	B	E	D
Approach Delay		30.5			55.2		37.0			49.2
Approach LOS		C			E		D			D

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 96 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 43.2 Intersection LOS: D
Intersection Capacity Utilization 66.4% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	28.0	44.0	44.0	28.0	44.0	34.0	44.0	44.0	34.0	44.0
Total Split (%)	18.7%	29.3%	29.3%	18.7%	29.3%	22.7%	29.3%	29.3%	22.7%	29.3%
Maximum Green (s)	23.0	39.0	39.0	23.0	39.0	29.0	39.0	39.0	29.0	39.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0		5.0
Flash Dont Walk (s)		34.0	34.0		34.0		34.0	34.0		34.0
Pedestrian Calls (#/hr)		5	5		5		5	5		5
90th %ile Green (s)	23.0	39.0	39.0	23.0	39.0	29.0	39.0	39.0	29.0	39.0
90th %ile Term Code	Hold	Ped	Ped	Max	Ped	Max	Coord	Coord	Max	Coord
70th %ile Green (s)	30.9	15.2	15.2	27.9	12.2	29.0	56.3	56.3	30.6	57.9
70th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord
50th %ile Green (s)	28.5	11.9	11.9	25.7	9.1	29.0	64.3	64.3	28.1	63.4
50th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord
30th %ile Green (s)	0.0	10.5	10.5	23.4	38.9	29.0	70.4	70.4	25.7	67.1
30th %ile Term Code	Skip	Gap	Gap	Gap	Hold	Hold	Coord	Coord	Gap	Coord
10th %ile Green (s)	0.0	8.6	8.6	20.1	33.7	29.0	79.3	79.3	22.0	72.3
10th %ile Term Code	Skip	Gap	Gap	Gap	Hold	Hold	Coord	Coord	Gap	Coord

Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 96 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	153	395	457	263	560	785	436	527	1075
v/c Ratio	0.08	0.38	0.77	0.83	0.37	0.84	0.37	0.51	0.85	0.53
Control Delay	53.8	62.0	17.3	74.4	22.0	66.1	30.1	12.1	73.1	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	62.0	17.3	74.4	22.0	66.1	30.1	12.1	73.1	37.4
Queue Length 50th (ft)	15	77	20	223	49	278	172	79	258	279
Queue Length 95th (ft)	41	93	112	#316	77	#360	245	173	324	421
Internal Link Dist (ft)		1660			920		920			1521
Turn Bay Length (ft)						100		150	100	
Base Capacity (vph)	303	920	688	563	956	664	2097	855	671	2027
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.17	0.57	0.81	0.28	0.84	0.37	0.51	0.79	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

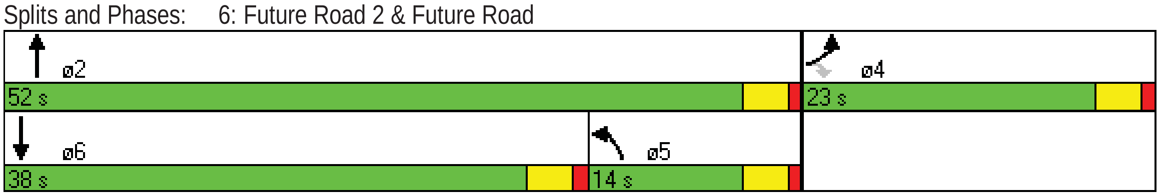
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	141	363	420	89	153	515	722	401	485	969	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	153	395	457	97	166	560	785	436	527	1053	22
RTOR Reduction (vph)	0	0	332	0	137	0	0	0	207	0	1	0
Lane Group Flow (vph)	18	153	63	457	126	0	560	785	229	527	1074	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	16.5	17.0	17.0	26.1	26.6		29.1	59.8	59.8	27.1	57.8	
Effective Green, g (s)	16.5	17.0	17.0	26.1	26.6		29.1	59.8	59.8	27.1	57.8	
Actuated g/C Ratio	0.11	0.11	0.11	0.17	0.18		0.19	0.40	0.40	0.18	0.39	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	195	401	179	597	568		666	2027	631	620	1954	
v/s Ratio Prot	0.01	c0.04		c0.13	0.04		c0.16	0.15		c0.15	c0.21	
v/s Ratio Perm			0.04						0.14			
v/c Ratio	0.09	0.38	0.35	0.77	0.22		0.84	0.39	0.36	0.85	0.55	
Uniform Delay, d1	60.0	61.6	61.4	59.0	52.8		58.2	32.1	31.7	59.5	35.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.92	0.89	1.13	1.00	1.00	
Incremental Delay, d2	0.2	0.6	1.2	5.8	0.2		9.1	0.5	1.6	10.8	1.1	
Delay (s)	60.2	62.2	62.6	64.9	53.0		62.8	29.1	37.5	70.3	37.1	
Level of Service	E	E	E	E	D		E	C	D	E	D	
Approach Delay (s)		62.5			60.5			41.7			48.0	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	49.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	48	99	71	1590	1688
Turn Type		Perm	Prot		
Protected Phases	4		5	2	6
Permitted Phases		4			
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0
Total Split (s)	23.0	23.0	14.0	52.0	38.0
Total Split (%)	30.7%	30.7%	18.7%	69.3%	50.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead
Lead-Lag Optimize?			Yes		Yes
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	8.8	8.8	9.1	60.9	49.7
Actuated g/C Ratio	0.12	0.12	0.12	0.81	0.66
v/c Ratio	0.25	0.38	0.36	0.33	0.45
Control Delay	31.2	10.3	31.6	2.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	10.3	31.6	2.2	10.8
LOS	C	B	C	A	B
Approach Delay	17.1			3.4	10.8
Approach LOS	B			A	B

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 42.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Future Road 2 & Future Road



Lane Group	EBL	EBR	NBL	NBT	SBT
Protected Phases	4		5	2	6
Permitted Phases		4			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0
Total Split (s)	23.0	23.0	14.0	52.0	38.0
Total Split (%)	30.7%	30.7%	18.7%	69.3%	50.7%
Maximum Green (s)	19.0	19.0	10.0	48.0	34.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag			Lag		Lead
Lead-Lag Optimize?			Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max	C-Max
Walk Time (s)	5.0	5.0			5.0
Flash Dont Walk (s)	11.0	11.0			11.0
Pedestrian Calls (#/hr)	5	5			5
90th %ile Green (s)	16.0	16.0	10.0	51.0	37.0
90th %ile Term Code	Ped	Ped	Max	Coord	Coord
70th %ile Green (s)	8.6	8.6	10.0	58.4	44.4
70th %ile Term Code	Gap	Gap	Hold	Coord	Coord
50th %ile Green (s)	7.6	7.6	10.0	59.4	45.4
50th %ile Term Code	Gap	Gap	Hold	Coord	Coord
30th %ile Green (s)	6.5	6.5	10.0	60.5	46.5
30th %ile Term Code	Gap	Gap	Hold	Coord	Coord
10th %ile Green (s)	0.0	0.0	0.0	71.0	71.0
10th %ile Term Code	Skip	Skip	Skip	Coord	Coord

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	52	108	77	1728	1906
v/c Ratio	0.25	0.38	0.36	0.33	0.45
Control Delay	31.2	10.3	31.6	2.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	10.3	31.6	2.2	10.8
Queue Length 50th (ft)	23	0	33	40	390
Queue Length 95th (ft)	48	37	73	62	179
Internal Link Dist (ft)	813			420	920
Turn Bay Length (ft)			100		
Base Capacity (vph)	448	482	236	5200	4222
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.22	0.33	0.33	0.45

Intersection Summary

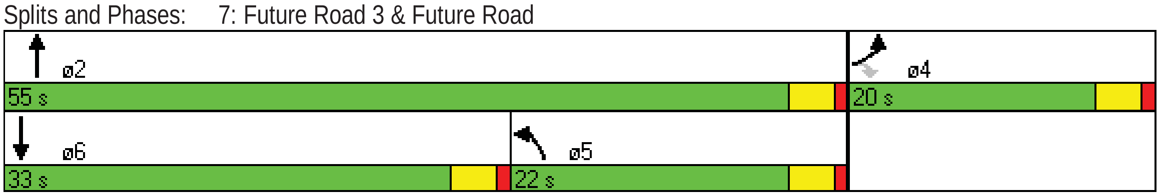
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	48	99	71	1590	1688	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	6408	6372	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	6408	6372	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	108	77	1728	1835	71
RTOR Reduction (vph)	0	97	0	0	5	0
Lane Group Flow (vph)	52	11	77	1728	1901	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	7.7	7.7	8.0	59.3	47.3	
Effective Green, g (s)	7.7	7.7	8.0	59.3	47.3	
Actuated g/C Ratio	0.10	0.10	0.11	0.79	0.63	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	182	163	189	5067	4019	
v/s Ratio Prot	c0.03		0.04	c0.27	c0.30	
v/s Ratio Perm		0.01				
v/c Ratio	0.29	0.07	0.41	0.34	0.47	
Uniform Delay, d1	31.1	30.4	31.3	2.2	7.3	
Progression Factor	1.00	1.00	0.90	0.73	1.27	
Incremental Delay, d2	0.9	0.2	1.4	0.2	0.3	
Delay (s)	32.0	30.6	29.7	1.8	9.6	
Level of Service	C	C	C	A	A	
Approach Delay (s)	31.0			3.0	9.6	
Approach LOS	C			A	A	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	145	297	239	1515	1570
Turn Type		Perm	Prot		
Protected Phases	4		5	2	6
Permitted Phases		4			
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	22.0	55.0	33.0
Total Split (%)	26.7%	26.7%	29.3%	73.3%	44.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0
Lead/Lag			Lag		Lead
Lead-Lag Optimize?			Yes		Yes
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	11.8	11.8	18.0	55.2	33.2
Actuated g/C Ratio	0.16	0.16	0.24	0.74	0.44
v/c Ratio	0.57	0.62	0.61	0.35	0.69
Control Delay	36.7	9.1	32.6	4.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	9.1	32.6	4.0	13.4
LOS	D	A	C	A	B
Approach Delay	18.2			7.9	13.4
Approach LOS	B			A	B

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 57.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 7: Future Road 3 & Future Road



Lane Group	EBL	EBR	NBL	NBT	SBT
Protected Phases	4		5	2	6
Permitted Phases		4			
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	22.0	55.0	33.0
Total Split (%)	26.7%	26.7%	29.3%	73.3%	44.0%
Maximum Green (s)	16.0	16.0	18.0	51.0	29.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag			Lag		Lead
Lead-Lag Optimize?			Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max	C-Max
Walk Time (s)	5.0	5.0			5.0
Flash Dont Walk (s)	11.0	11.0			11.0
Pedestrian Calls (#/hr)	5	5			5
90th %ile Green (s)	16.0	16.0	18.0	51.0	29.0
90th %ile Term Code	Max	Max	Max	Coord	Coord
70th %ile Green (s)	13.8	13.8	18.0	53.2	31.2
70th %ile Term Code	Gap	Gap	Max	Coord	Coord
50th %ile Green (s)	11.9	11.9	18.0	55.1	33.1
50th %ile Term Code	Gap	Gap	Hold	Coord	Coord
30th %ile Green (s)	10.0	10.0	18.0	57.0	35.0
30th %ile Term Code	Gap	Gap	Hold	Coord	Coord
10th %ile Green (s)	7.3	7.3	18.0	59.7	37.7
10th %ile Term Code	Gap	Gap	Hold	Coord	Coord

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	158	323	260	1647	1942
v/c Ratio	0.57	0.62	0.61	0.35	0.69
Control Delay	36.7	9.1	32.6	4.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	9.1	32.6	4.0	13.4
Queue Length 50th (ft)	69	0	108	62	80
Queue Length 95th (ft)	118	62	183	98	200
Internal Link Dist (ft)	873			420	420
Turn Bay Length (ft)			200		
Base Capacity (vph)	378	592	425	4716	2816
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.55	0.61	0.35	0.69

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	145	297	239	1515	1570	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	0.86	0.86	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1770	1583	1770	6408	6292	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1770	1583	1770	6408	6292	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	323	260	1647	1707	235
RTOR Reduction (vph)	0	272	0	0	30	0
Lane Group Flow (vph)	158	51	260	1647	1912	0
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	11.8	11.8	18.0	55.2	33.2	
Effective Green, g (s)	11.8	11.8	18.0	55.2	33.2	
Actuated g/C Ratio	0.16	0.16	0.24	0.74	0.44	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	278	249	425	4716	2785	
v/s Ratio Prot	c0.09		c0.15	0.26	c0.30	
v/s Ratio Perm		0.03				
v/c Ratio	0.57	0.20	0.61	0.35	0.69	
Uniform Delay, d1	29.2	27.5	25.4	3.5	16.7	
Progression Factor	1.00	1.00	1.00	1.00	0.72	
Incremental Delay, d2	2.7	0.4	2.6	0.2	1.3	
Delay (s)	31.9	27.9	28.0	3.7	13.4	
Level of Service	C	C	C	A	B	
Approach Delay (s)	29.2			7.0	13.4	
Approach LOS	C			A	B	

Intersection Summary			
HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

2030 Conditions

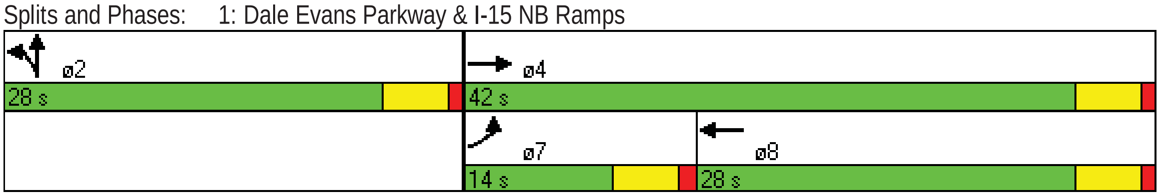
Base + EMU

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	266	668	538	993	2
Turn Type	Prot			Split	
Protected Phases	7	4	8	2	2
Permitted Phases					
Detector Phase	7	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	14.0	42.0	28.0	28.0	28.0
Total Split (%)	20.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Max	C-Max	Max	Max
Act Effct Green (s)	9.0	37.0	23.0	23.0	23.0
Actuated g/C Ratio	0.13	0.53	0.33	0.33	0.33
v/c Ratio	1.27	0.39	0.67	1.85	0.73
Control Delay	175.5	17.2	21.7	412.6	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	175.5	17.2	21.7	412.6	20.3
LOS	F	B	C	F	C
Approach Delay		62.3	21.7		294.3
Approach LOS		E	C		F

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.85
Intersection Signal Delay: 160.3 Intersection LOS: F
Intersection Capacity Utilization 129.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases	7	4	8	2	2
Permitted Phases					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	14.0	42.0	28.0	28.0	28.0
Total Split (%)	20.0%	60.0%	40.0%	40.0%	40.0%
Maximum Green (s)	9.0	37.0	23.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	Max	Max
Walk Time (s)		5.0	5.0	5.0	5.0
Flash Dont Walk (s)		18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)		5	5	5	5
90th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
90th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
70th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
70th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
50th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
50th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
30th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
30th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
10th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
10th %ile Term Code	Max	Coord	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	289	726	776	1079	466
v/c Ratio	1.27	0.39	0.67	1.85	0.73
Control Delay	175.5	17.2	21.7	412.6	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	175.5	17.2	21.7	412.6	20.3
Queue Length 50th (ft)	~162	99	135	~723	105
Queue Length 95th (ft)	m#251	m127	194	#944	#220
Internal Link Dist (ft)		820	380		2022
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	228	1871	1165	582	642
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.27	0.39	0.67	1.85	0.73

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	266	668	0	0	538	176	993	2	427	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00				
Frt	1.00	1.00			0.96		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3409		1770	1585				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1770	3539			3409		1770	1585				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	289	726	0	0	585	191	1079	2	464	0	0	0
RTOR Reduction (vph)	0	0	0	0	45	0	0	121	0	0	0	0
Lane Group Flow (vph)	289	726	0	0	731	0	1079	345	0	0	0	0
Turn Type	Prot						Split					
Protected Phases	7	4			8		2	2				
Permitted Phases												
Actuated Green, G (s)	9.0	37.0			23.0		23.0	23.0				
Effective Green, g (s)	9.0	37.0			23.0		23.0	23.0				
Actuated g/C Ratio	0.13	0.53			0.33		0.33	0.33				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	228	1871			1120		582	521				
v/s Ratio Prot	c0.16	0.21			c0.21		c0.61	0.22				
v/s Ratio Perm												
v/c Ratio	1.27	0.39			0.65		1.85	0.66				
Uniform Delay, d1	30.5	9.8			20.1		23.5	20.2				
Progression Factor	1.24	1.69			1.00		1.00	1.00				
Incremental Delay, d2	140.9	0.4			3.0		390.9	6.5				
Delay (s)	178.7	16.9			23.1		414.4	26.7				
Level of Service	F	B			C		F	C				
Approach Delay (s)		63.0			23.1			297.4			0.0	
Approach LOS		E			C			F			A	

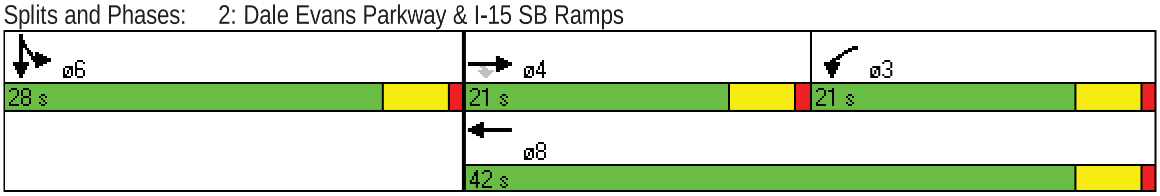
Intersection Summary			
HCM Average Control Delay	162.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	129.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Configurations						
Volume (vph)	616	1149	321	1210	318	1
Turn Type		Perm	Prot		Split	
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Detector Phase	4	4	3	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	21.0	21.0	21.0	42.0	28.0	28.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Act Effct Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
Actuated g/C Ratio	0.23	0.23	0.23	0.53	0.33	0.33
v/c Ratio	0.83	1.38	0.86	0.70	0.59	0.89
Control Delay	36.4	194.5	32.4	14.7	24.7	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	194.5	32.4	14.7	24.7	42.2
LOS	D	F	C	B	C	D
Approach Delay	139.3			18.4		34.9
Approach LOS	F			B		C

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.38
Intersection Signal Delay: 74.1 Intersection LOS: E
Intersection Capacity Utilization 129.1% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	21.0	21.0	21.0	42.0	28.0	28.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Maximum Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	18.0	18.0
Pedestrian Calls (#/hr)	5	5		5	5	5
90th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
90th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
70th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
70th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
50th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
50th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
30th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
30th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
10th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
10th %ile Term Code	Coord	Coord	Hold	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	670	1249	349	1315	346	486
v/c Ratio	0.83	1.38	0.86	0.70	0.59	0.89
Control Delay	36.4	194.5	32.4	14.7	24.7	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	194.5	32.4	14.7	24.7	42.2
Queue Length 50th (ft)	145	~478	142	234	123	182
Queue Length 95th (ft)	#228	#715	m116	m186	203	#356
Internal Link Dist (ft)	920			820		1339
Turn Bay Length (ft)			300		300	
Base Capacity (vph)	809	903	405	1871	582	546
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.83	1.38	0.86	0.70	0.59	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	616	1149	321	1210	0	0	0	0	318	1	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					1770	1584	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					1770	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	670	1249	349	1315	0	0	0	0	346	1	485
RTOR Reduction (vph)	0	0	541	0	0	0	0	0	0	0	26	0
Lane Group Flow (vph)	0	670	708	349	1315	0	0	0	0	346	460	0
Turn Type			Perm	Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases			4									
Actuated Green, G (s)		16.0	16.0	16.0	37.0					23.0	23.0	
Effective Green, g (s)		16.0	16.0	16.0	37.0					23.0	23.0	
Actuated g/C Ratio		0.23	0.23	0.23	0.53					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		809	362	405	1871					582	520	
v/s Ratio Prot		0.19		c0.20	0.37					0.20	c0.29	
v/s Ratio Perm			c0.45									
v/c Ratio		0.83	1.96	0.86	0.70					0.59	0.89	
Uniform Delay, d1		25.7	27.0	25.9	12.4					19.6	22.3	
Progression Factor		1.00	1.00	1.06	1.14					1.00	1.00	
Incremental Delay, d2		9.5	440.3	1.9	0.2					4.4	19.4	
Delay (s)		35.2	467.3	29.4	14.3					24.0	41.7	
Level of Service		D	F	C	B					C	D	
Approach Delay (s)		316.5			17.5			0.0			34.4	
Approach LOS		F			B			A			C	

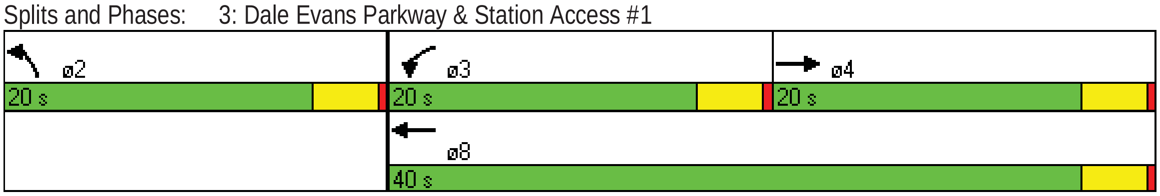
Intersection Summary			
HCM Average Control Delay	150.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	129.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1365	501	1154	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	40.0	20.0
Total Split (%)	33.3%	33.3%	66.7%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	16.0	16.0	36.0	16.0
Actuated g/C Ratio	0.27	0.27	0.60	0.27
v/c Ratio	0.87	1.15	0.41	0.58
Control Delay	28.2	116.7	6.9	5.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.2	116.7	6.9	5.9
LOS	C	F	A	A
Approach Delay	28.2		40.1	5.9
Approach LOS	C		D	A

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 31.4 Intersection LOS: C
Intersection Capacity Utilization 82.4% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: Dale Evans Parkway & Station Access #1



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	40.0	20.0
Total Split (%)	33.3%	33.3%	66.7%	33.3%
Maximum Green (s)	16.0	16.0	36.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	16.0	16.0	36.0	16.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	16.0	16.0	36.0	16.0
70th %ile Term Code	Max	Max	Hold	Coord
50th %ile Green (s)	16.0	16.0	36.0	16.0
50th %ile Term Code	Max	Max	Hold	Coord
30th %ile Green (s)	16.0	16.0	36.0	16.0
30th %ile Term Code	Max	Max	Hold	Coord
10th %ile Green (s)	16.0	16.0	36.0	16.0
10th %ile Term Code	Max	Max	Hold	Coord

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1486	545	1254	437
v/c Ratio	0.87	1.15	0.41	0.58
Control Delay	28.2	116.7	6.9	5.9
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.2	116.7	6.9	5.9
Queue Length 50th (ft)	148	~241	76	1
Queue Length 95th (ft)	#209	#406	101	60
Internal Link Dist (ft)	920		920	1731
Turn Bay Length (ft)		200		
Base Capacity (vph)	1709	472	3051	749
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.87	1.15	0.41	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

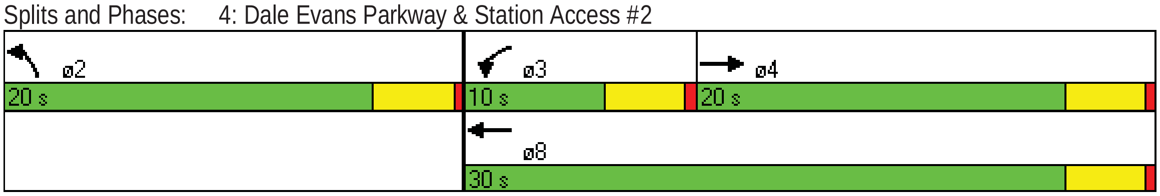
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1365	2	501	1154	2	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6407		1770	5085	1612	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6407		1770	5085	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1484	2	545	1254	2	435
RTOR Reduction (vph)	0	0	0	0	319	0
Lane Group Flow (vph)	1486	0	545	1254	118	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	16.0		16.0	36.0	16.0	
Effective Green, g (s)	16.0		16.0	36.0	16.0	
Actuated g/C Ratio	0.27		0.27	0.60	0.27	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1709		472	3051	430	
v/s Ratio Prot	c0.23		c0.31	0.25	c0.07	
v/s Ratio Perm						
v/c Ratio	0.87		1.15	0.41	0.27	
Uniform Delay, d1	21.0		22.0	6.4	17.4	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	5.0		91.3	0.1	1.6	
Delay (s)	26.0		113.3	6.5	19.0	
Level of Service	C		F	A	B	
Approach Delay (s)	26.0			38.8	19.0	
Approach LOS	C			D	B	

Intersection Summary			
HCM Average Control Delay	31.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1287	115	1040	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	10.0	30.0	20.0
Total Split (%)	40.0%	20.0%	60.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	15.7	6.0	23.7	18.3
Actuated g/C Ratio	0.31	0.12	0.47	0.37
v/c Ratio	0.70	0.59	0.37	0.14
Control Delay	17.2	35.2	8.5	4.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.2	35.2	8.5	4.5
LOS	B	D	A	A
Approach Delay	17.2		11.1	4.5
Approach LOS	B		B	A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 40.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Dale Evans Parkway & Station Access #2



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	10.0	30.0	20.0
Total Split (%)	40.0%	20.0%	60.0%	40.0%
Maximum Green (s)	16.0	6.0	26.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	16.0	6.0	26.0	16.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	16.0	6.0	26.0	16.0
70th %ile Term Code	Max	Max	Hold	Coord
50th %ile Green (s)	16.0	6.0	26.0	16.0
50th %ile Term Code	Max	Max	Hold	Coord
30th %ile Green (s)	16.0	6.0	26.0	16.0
30th %ile Term Code	Max	Max	Hold	Coord
10th %ile Green (s)	14.5	0.0	14.5	27.5
10th %ile Term Code	Gap	Skip	Hold	Coord

Intersection Summary
Cycle Length: 50
Actuated Cycle Length: 50
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1401	125	1130	88
v/c Ratio	0.70	0.59	0.37	0.14
Control Delay	17.2	35.2	8.5	4.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	17.2	35.2	8.5	4.5
Queue Length 50th (ft)	101	36	49	0
Queue Length 95th (ft)	134	#94	67	23
Internal Link Dist (ft)	920		920	736
Turn Bay Length (ft)		200		
Base Capacity (vph)	2051	212	3332	645
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.59	0.34	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1287	2	115	1040	2	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.86	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6406		1770	6408	1615	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6406		1770	6408	1615	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1399	2	125	1130	2	86
RTOR Reduction (vph)	1	0	0	0	56	0
Lane Group Flow (vph)	1400	0	125	1130	32	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	15.7		4.8	24.5	17.5	
Effective Green, g (s)	15.7		4.8	24.5	17.5	
Actuated g/C Ratio	0.31		0.10	0.49	0.35	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2011		170	3140	565	
v/s Ratio Prot	c0.22		c0.07	0.18	c0.02	
v/s Ratio Perm						
v/c Ratio	0.70		0.74	0.36	0.06	
Uniform Delay, d1	15.1		22.0	7.9	10.8	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	1.1		15.2	0.1	0.2	
Delay (s)	16.1		37.2	8.0	11.0	
Level of Service	B		D	A	B	
Approach Delay (s)	16.1			10.9	11.0	
Approach LOS	B			B	B	

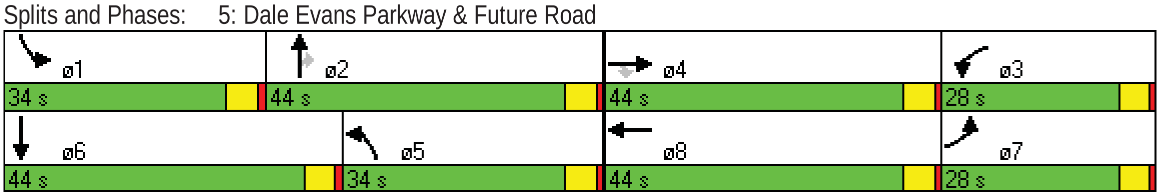
Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	17	141	363	798	89	515	722	662	485	969
Turn Type	Prot		Perm	Prot		Prot		Perm	Prot	
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	28.0	44.0	44.0	28.0	44.0	34.0	44.0	44.0	34.0	44.0
Total Split (%)	18.7%	29.3%	29.3%	18.7%	29.3%	22.7%	29.3%	29.3%	22.7%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	27.6	17.2	17.2	44.8	38.7	29.0	41.2	41.2	26.8	39.0
Actuated g/C Ratio	0.18	0.11	0.11	0.30	0.26	0.19	0.27	0.27	0.18	0.26
v/c Ratio	0.06	0.38	0.78	0.85	0.28	0.84	0.56	0.90	0.86	0.81
Control Delay	45.9	61.8	18.1	56.9	20.5	58.7	38.2	32.3	74.4	57.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	61.8	18.1	56.9	20.5	58.7	38.2	32.3	74.4	57.9
LOS	D	E	B	E	C	E	D	C	E	E
Approach Delay		30.8			48.4		41.7			63.3
Approach LOS		C			D		D			E

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 96 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 48.4 Intersection LOS: D
Intersection Capacity Utilization 77.2% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	28.0	44.0	44.0	28.0	44.0	34.0	44.0	44.0	34.0	44.0
Total Split (%)	18.7%	29.3%	29.3%	18.7%	29.3%	22.7%	29.3%	29.3%	22.7%	29.3%
Maximum Green (s)	23.0	39.0	39.0	23.0	39.0	29.0	39.0	39.0	29.0	39.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0		5.0
Flash Dont Walk (s)		34.0	34.0		34.0		34.0	34.0		34.0
Pedestrian Calls (#/hr)		5	5		5		5	5		5
90th %ile Green (s)	23.0	39.0	39.0	23.0	39.0	29.0	39.0	39.0	29.0	39.0
90th %ile Term Code	Hold	Ped	Ped	Max	Ped	Max	Coord	Coord	Max	Coord
70th %ile Green (s)	49.8	15.8	15.8	46.2	12.2	29.0	39.0	39.0	29.0	39.0
70th %ile Term Code	Hold	Gap	Gap	Max	Gap	Max	Coord	Coord	Max	Coord
50th %ile Green (s)	53.7	11.9	11.9	50.1	8.3	29.0	39.9	39.9	28.1	39.0
50th %ile Term Code	Hold	Gap	Gap	Max	Gap	Max	Coord	Coord	Gap	Coord
30th %ile Green (s)	0.0	10.5	10.5	51.5	67.0	29.0	42.3	42.3	25.7	39.0
30th %ile Term Code	Skip	Gap	Gap	Max	Hold	Hold	Coord	Coord	Gap	Coord
10th %ile Green (s)	0.0	8.6	8.6	53.4	67.0	29.0	46.0	46.0	22.0	39.0
10th %ile Term Code	Skip	Gap	Gap	Max	Hold	Hold	Coord	Coord	Gap	Coord

Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 96 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	153	395	867	263	560	785	720	527	1075
v/c Ratio	0.06	0.38	0.78	0.85	0.28	0.84	0.56	0.90	0.86	0.81
Control Delay	45.9	61.8	18.1	56.9	20.5	58.7	38.2	32.3	74.4	57.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	61.8	18.1	56.9	20.5	58.7	38.2	32.3	74.4	57.9
Queue Length 50th (ft)	11	77	24	390	49	267	190	412	258	363
Queue Length 95th (ft)	41	93	118	#763	77	#322	252	#559	324	421
Internal Link Dist (ft)		1660			920		920			1521
Turn Bay Length (ft)						100		150	100	
Base Capacity (vph)	407	920	685	1026	1183	664	1398	801	664	1320
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.58	0.85	0.22	0.84	0.56	0.90	0.79	0.81

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	141	363	798	89	153	515	722	662	485	969	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	153	395	867	97	166	560	785	720	527	1053	22
RTOR Reduction (vph)	0	0	327	0	123	0	0	0	372	0	2	0
Lane Group Flow (vph)	18	153	68	867	140	0	560	785	348	527	1073	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	25.3	17.2	17.2	46.8	38.7		29.0	39.2	39.2	26.8	37.0	
Effective Green, g (s)	25.3	17.2	17.2	46.8	38.7		29.0	39.2	39.2	26.8	37.0	
Actuated g/C Ratio	0.17	0.11	0.11	0.31	0.26		0.19	0.26	0.26	0.18	0.25	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	299	406	182	1071	827		664	1329	414	613	1251	
v/s Ratio Prot	0.01	c0.04		c0.25	0.04		0.16	0.15		0.15	c0.21	
v/s Ratio Perm			0.04						c0.22			
v/c Ratio	0.06	0.38	0.38	0.81	0.17		0.84	0.59	0.84	0.86	0.86	
Uniform Delay, d1	52.4	61.4	61.4	47.5	43.2		58.3	48.4	52.4	59.8	54.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.80	0.78	1.18	1.00	1.00	
Incremental Delay, d2	0.1	0.6	1.3	4.6	0.1		8.8	1.8	16.9	11.6	7.8	
Delay (s)	52.5	62.0	62.7	52.1	43.3		55.7	39.4	78.7	71.3	61.8	
Level of Service	D	E	E	D	D		E	D	E	E	E	
Approach Delay (s)		62.2			50.1			57.5			64.9	
Approach LOS		E			D			E			E	

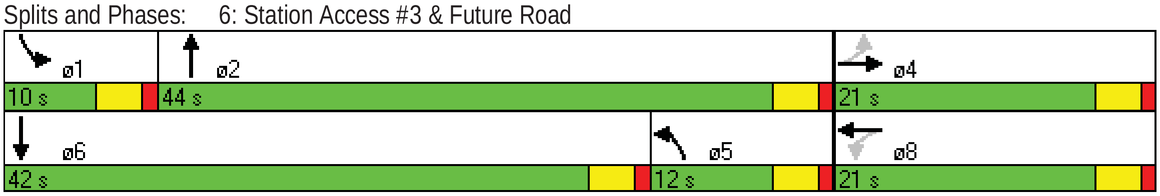
Intersection Summary			
HCM Average Control Delay	58.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	48	2	2	2	71	1796	80	1986
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	12.0	44.0	10.0	42.0
Total Split (%)	28.0%	28.0%	28.0%	28.0%	16.0%	58.7%	13.3%	56.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	9.1	9.1		9.1	7.5	50.5	8.1	51.0
Actuated g/C Ratio	0.12	0.12		0.12	0.10	0.67	0.11	0.68
v/c Ratio	0.28	0.38		0.26	0.44	0.45	0.45	0.51
Control Delay	31.9	10.4		11.5	29.5	5.3	35.6	11.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	10.4		11.5	29.5	5.3	35.6	11.2
LOS	C	B		B	C	A	D	B
Approach Delay		17.3		11.5		6.2		12.1
Approach LOS		B		B		A		B

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 9.7 Intersection LOS: A
Intersection Capacity Utilization 53.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: Station Access #3 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	12.0	44.0	10.0	42.0
Total Split (%)	28.0%	28.0%	28.0%	28.0%	16.0%	58.7%	13.3%	56.0%
Maximum Green (s)	17.0	17.0	17.0	17.0	8.0	40.0	6.0	38.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	16.0	16.0	16.0	16.0	8.0	40.0	7.0	39.0
90th %ile Term Code	Ped	Ped	Hold	Hold	Max	Coord	Max	Coord
70th %ile Green (s)	9.2	9.2	9.2	9.2	8.0	43.2	10.6	45.8
70th %ile Term Code	Gap	Gap	Hold	Hold	Max	Coord	Gap	Coord
50th %ile Green (s)	8.0	8.0	8.0	8.0	8.0	45.7	9.3	47.0
50th %ile Term Code	Gap	Gap	Hold	Hold	Max	Coord	Gap	Coord
30th %ile Green (s)	6.7	6.7	6.7	6.7	8.0	48.4	7.9	48.3
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	71.0	0.0	71.0
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Coord	Skip	Coord

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	110	64	77	1952	87	2230
v/c Ratio	0.28	0.38	0.26	0.44	0.45	0.45	0.51
Control Delay	31.9	10.4	11.5	29.5	5.3	35.6	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	10.4	11.5	29.5	5.3	35.6	11.2
Queue Length 50th (ft)	23	1	2	35	60	51	268
Queue Length 95th (ft)	48	39	31	m58	109	m77	302
Internal Link Dist (ft)		813	777		420		920
Turn Bay Length (ft)				100		100	
Base Capacity (vph)	352	444	411	189	4311	192	4341
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.25	0.16	0.41	0.45	0.45	0.51

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

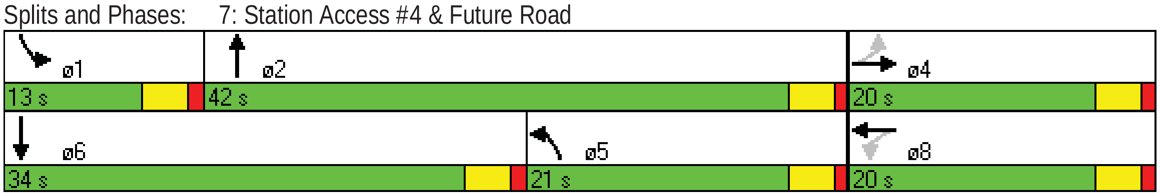
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	2	99	2	2	55	71	1796	0	80	1986	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.87		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1588			1624		1770	6408		1770	6377	
Flt Permitted	0.83	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1553	1588			1610		1770	6408		1770	6377	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	2	108	2	2	60	77	1952	0	87	2159	71
RTOR Reduction (vph)	0	96	0	0	54	0	0	0	0	0	4	0
Lane Group Flow (vph)	52	14	0	0	10	0	77	1952	0	87	2226	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	8.0	8.0			8.0		6.5	48.0		7.0	48.5	
Effective Green, g (s)	8.0	8.0			8.0		6.5	48.0		7.0	48.5	
Actuated g/C Ratio	0.11	0.11			0.11		0.09	0.64		0.09	0.65	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	166	169			172		153	4101		165	4124	
v/s Ratio Prot		0.01					0.04	c0.30		0.05	c0.35	
v/s Ratio Perm	c0.03				0.01							
v/c Ratio	0.31	0.08			0.06		0.50	0.48		0.53	0.54	
Uniform Delay, d1	31.0	30.2			30.1		32.7	7.0		32.4	7.2	
Progression Factor	1.00	1.00			1.00		0.71	0.62		0.99	1.36	
Incremental Delay, d2	1.1	0.2			0.1		2.3	0.4		1.8	0.3	
Delay (s)	32.0	30.4			30.3		25.5	4.7		33.8	10.1	
Level of Service	C	C			C		C	A		C	B	
Approach Delay (s)		30.9			30.3			5.5			11.0	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	145	2	2	2	239	1644	110	1758
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	21.0	42.0	13.0	34.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	28.0%	56.0%	17.3%	45.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.0	13.0		13.0	17.0	43.3	8.7	33.0
Actuated g/C Ratio	0.17	0.17		0.17	0.23	0.58	0.12	0.44
v/c Ratio	0.67	0.60		0.29	0.65	0.48	0.58	0.77
Control Delay	42.8	8.5		9.7	23.0	3.9	55.9	19.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	8.5		9.7	23.0	3.9	55.9	19.1
LOS	D	A		A	C	A	E	B
Approach Delay		19.8		9.7		6.3		21.0
Approach LOS		B		A		A		C

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 14.5	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Station Access #4 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	21.0	42.0	13.0	34.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	28.0%	56.0%	17.3%	45.3%
Maximum Green (s)	16.0	16.0	16.0	16.0	17.0	38.0	9.0	30.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	16.0	16.0	16.0	16.0	17.0	38.0	9.0	30.0
90th %ile Term Code	Max	Max	Hold	Hold	Max	Coord	Max	Coord
70th %ile Green (s)	16.0	16.0	16.0	16.0	17.0	38.0	9.0	30.0
70th %ile Term Code	Max	Max	Hold	Hold	Max	Coord	Max	Coord
50th %ile Green (s)	13.8	13.8	13.8	13.8	17.0	38.8	10.4	32.2
50th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
30th %ile Green (s)	11.4	11.4	11.4	11.4	17.0	42.8	8.8	34.6
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
10th %ile Green (s)	7.9	7.9	7.9	7.9	17.0	59.1	0.0	38.1
10th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Skip	Coord

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	158	325	87	260	1789	120	2146
v/c Ratio	0.67	0.60	0.29	0.65	0.48	0.58	0.77
Control Delay	42.8	8.5	9.7	23.0	3.9	55.9	19.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	8.5	9.7	23.0	3.9	55.9	19.1
Queue Length 50th (ft)	69	1	2	110	33	82	330
Queue Length 95th (ft)	125	63	36	140	43	121	247
Internal Link Dist (ft)		873	973		420		420
Turn Bay Length (ft)				200		100	
Base Capacity (vph)	289	592	354	401	3703	219	2800
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.55	0.25	0.65	0.48	0.55	0.77

Intersection Summary

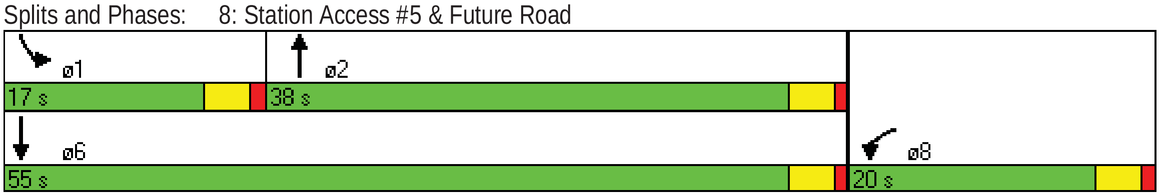
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	2	297	2	2	76	239	1644	2	110	1758	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.87		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1585			1621		1770	6407		1770	6303	
Flt Permitted	0.73	1.00			0.83		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1356	1585			1353		1770	6407		1770	6303	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	2	323	2	2	83	260	1787	2	120	1911	235
RTOR Reduction (vph)	0	267	0	0	69	0	0	0	0	0	27	0
Lane Group Flow (vph)	158	58	0	0	18	0	260	1789	0	120	2119	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	13.0	13.0			13.0		17.7	42.6		7.4	32.3	
Effective Green, g (s)	13.0	13.0			13.0		17.7	42.6		7.4	32.3	
Actuated g/C Ratio	0.17	0.17			0.17		0.24	0.57		0.10	0.43	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	235	275			235		418	3639		175	2714	
v/s Ratio Prot		0.04					c0.15	0.28		0.07	c0.34	
v/s Ratio Perm	c0.12				0.01							
v/c Ratio	0.67	0.21			0.08		0.62	0.49		0.69	0.78	
Uniform Delay, d1	29.0	26.6			26.0		25.7	9.7		32.7	18.3	
Progression Factor	1.00	1.00			1.00		0.59	0.33		1.45	0.97	
Incremental Delay, d2	7.4	0.4			0.1		2.5	0.4		9.4	2.0	
Delay (s)	36.4	27.0			26.1		17.7	3.6		56.8	19.8	
Level of Service	D	C			C		B	A		E	B	
Approach Delay (s)		30.1			26.1			5.4			21.7	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	2	1754	188	1867
Turn Type			Prot	
Protected Phases	8	2	1	6
Permitted Phases				
Detector Phase	8	2	1	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	20.0	38.0	17.0	55.0
Total Split (%)	26.7%	50.7%	22.7%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max
Act Effct Green (s)	8.0	42.2	12.7	59.0
Actuated g/C Ratio	0.11	0.56	0.17	0.79
v/c Ratio	0.48	0.53	0.68	0.40
Control Delay	11.3	11.8	49.6	0.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.3	11.8	49.6	0.5
LOS	B	B	D	A
Approach Delay	11.3	11.8		4.9
Approach LOS	B	B		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Station Access #5 & Future Road



Lane Group	WBL	NBT	SBL	SBT
Protected Phases	8	2	1	6
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	20.0	38.0	17.0	55.0
Total Split (%)	26.7%	50.7%	22.7%	73.3%
Maximum Green (s)	16.0	34.0	13.0	51.0
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0		5.0
Flash Dont Walk (s)	11.0	11.0		11.0
Pedestrian Calls (#/hr)	5	5		5
90th %ile Green (s)	16.0	34.0	13.0	51.0
90th %ile Term Code	Ped	Coord	Max	Coord
70th %ile Green (s)	7.7	39.3	16.0	59.3
70th %ile Term Code	Gap	Coord	Gap	Coord
50th %ile Green (s)	5.5	43.5	14.0	61.5
50th %ile Term Code	Gap	Coord	Gap	Coord
30th %ile Green (s)	5.5	45.6	11.9	61.5
30th %ile Term Code	Gap	Coord	Gap	Coord
10th %ile Green (s)	5.5	48.7	8.8	61.5
10th %ile Term Code	Gap	Coord	Gap	Coord

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	1909	204	2029
v/c Ratio	0.48	0.53	0.68	0.40
Control Delay	11.3	11.8	49.6	0.5
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.3	11.8	49.6	0.5
Queue Length 50th (ft)	1	140	109	5
Queue Length 95th (ft)	43	231	m137	9
Internal Link Dist (ft)	1061	848		420
Turn Bay Length (ft)			100	
Base Capacity (vph)	454	3607	326	5038
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.31	0.53	0.63	0.40

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	129	1754	2	188	1867
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.86		1.00	0.86
Frt	0.87		1.00		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1614		6407		1770	6408
Flt Permitted	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1614		6407		1770	6408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	140	1907	2	204	2029
RTOR Reduction (vph)	125	0	0	0	0	0
Lane Group Flow (vph)	17	0	1909	0	204	2029
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	8.0		42.3		12.7	59.0
Effective Green, g (s)	8.0		42.3		12.7	59.0
Actuated g/C Ratio	0.11		0.56		0.17	0.79
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	172		3614		300	5041
v/s Ratio Prot	c0.01		c0.30		c0.12	0.32
v/s Ratio Perm						
v/c Ratio	0.10		0.53		0.68	0.40
Uniform Delay, d1	30.2		10.2		29.2	2.5
Progression Factor	1.00		1.00		1.43	0.10
Incremental Delay, d2	0.3		0.6		4.2	0.2
Delay (s)	30.5		10.7		46.1	0.4
Level of Service	C		B		D	A
Approach Delay (s)	30.5		10.7			4.6
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

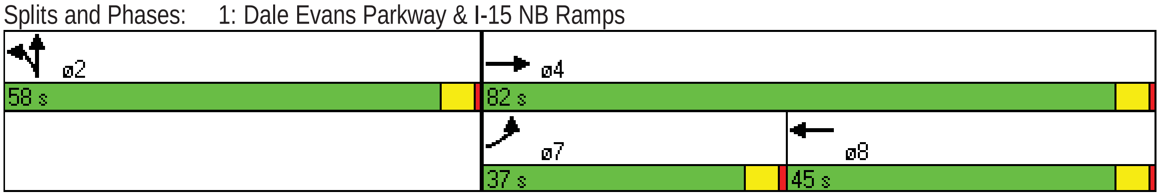
2030 Conditions

Base + EMU Mitigations

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	266	668	538	993	2
Turn Type	Prot			Split	
Protected Phases	7	4	8	2	2
Permitted Phases					
Detector Phase	7	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	37.0	82.0	45.0	58.0	58.0
Total Split (%)	26.4%	58.6%	32.1%	41.4%	41.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Max	C-Max	Max	Max
Act Effct Green (s)	27.0	77.0	45.0	53.0	53.0
Actuated g/C Ratio	0.19	0.55	0.32	0.38	0.38
v/c Ratio	0.85	0.37	0.70	0.83	0.65
Control Delay	50.5	28.1	44.5	46.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	28.1	44.5	46.1	24.8
LOS	D	C	D	D	C
Approach Delay		34.5	44.5		39.7
Approach LOS		C	D		D

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 17 (12%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 39.2	Intersection LOS: D
Intersection Capacity Utilization 98.1%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases	7	4	8	2	2
Permitted Phases					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	37.0	82.0	45.0	58.0	58.0
Total Split (%)	26.4%	58.6%	32.1%	41.4%	41.4%
Maximum Green (s)	32.0	77.0	40.0	53.0	53.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	Max	Max
Walk Time (s)		5.0	5.0	5.0	5.0
Flash Dont Walk (s)		18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)		5	5	5	5
90th %ile Green (s)	32.0	77.0	40.0	53.0	53.0
90th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
70th %ile Green (s)	31.3	77.0	40.7	53.0	53.0
70th %ile Term Code	Gap	Coord	Coord	MaxR	MaxR
50th %ile Green (s)	28.0	77.0	44.0	53.0	53.0
50th %ile Term Code	Gap	Coord	Coord	MaxR	MaxR
30th %ile Green (s)	24.5	77.0	47.5	53.0	53.0
30th %ile Term Code	Gap	Coord	Coord	MaxR	MaxR
10th %ile Green (s)	19.4	77.0	52.6	53.0	53.0
10th %ile Term Code	Gap	Coord	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 17 (12%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	289	726	776	1079	466
v/c Ratio	0.85	0.37	0.70	0.83	0.65
Control Delay	50.5	28.1	44.5	46.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	28.1	44.5	46.1	24.8
Queue Length 50th (ft)	250	334	315	456	205
Queue Length 95th (ft)	342	382	408	547	331
Internal Link Dist (ft)		820	380		2022
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	405	1946	1116	1300	721
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.37	0.70	0.83	0.65

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	266	668	0	0	538	176	993	2	427	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00				
Frt	1.00	1.00			0.96		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3409		3433	1585				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1770	3539			3409		3433	1585				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	289	726	0	0	585	191	1079	2	464	0	0	0
RTOR Reduction (vph)	0	0	0	0	22	0	0	121	0	0	0	0
Lane Group Flow (vph)	289	726	0	0	754	0	1079	345	0	0	0	0
Turn Type	Prot						Split					
Protected Phases	7	4			8		2	2				
Permitted Phases												
Actuated Green, G (s)	27.0	77.0			45.0		53.0	53.0				
Effective Green, g (s)	27.0	77.0			45.0		53.0	53.0				
Actuated g/C Ratio	0.19	0.55			0.32		0.38	0.38				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	341	1946			1096		1300	600				
v/s Ratio Prot	c0.16	0.21			c0.22		c0.31	0.22				
v/s Ratio Perm												
v/c Ratio	0.85	0.37			0.69		0.83	0.58				
Uniform Delay, d1	54.5	17.8			41.4		39.4	34.6				
Progression Factor	0.60	1.54			1.00		1.00	1.00				
Incremental Delay, d2	14.5	0.4			3.5		6.2	4.0				
Delay (s)	47.0	27.8			44.9		45.7	38.6				
Level of Service	D	C			D		D	D				
Approach Delay (s)		33.3			44.9			43.5			0.0	
Approach LOS		C			D			D			A	

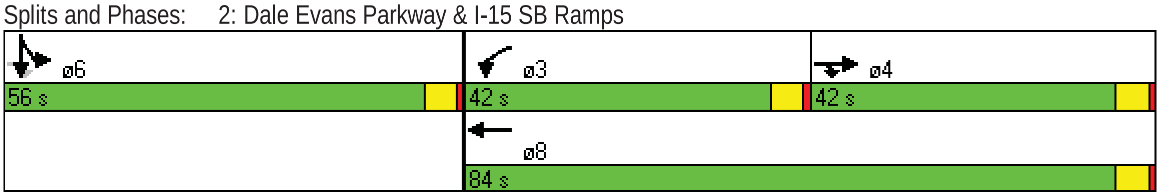
Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Configurations						
Volume (vph)	616	1149	321	1210	318	1
Turn Type		custom	Prot		Split	
Protected Phases	4	4	3	8	6	6
Permitted Phases		6				
Detector Phase	4	4	3	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	42.0	42.0	42.0	84.0	56.0	56.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Act Effct Green (s)	42.3	98.3	31.7	79.0	51.0	51.0
Actuated g/C Ratio	0.30	0.70	0.23	0.56	0.36	0.36
v/c Ratio	0.63	0.64	0.87	0.66	0.54	0.80
Control Delay	33.6	9.6	74.8	28.4	38.9	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	9.6	74.8	28.4	38.9	47.2
LOS	C	A	E	C	D	D
Approach Delay	18.0			38.2		43.8
Approach LOS	B			D		D

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58 (41%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 30.4 Intersection LOS: C
Intersection Capacity Utilization 98.1% ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Protected Phases	4	4	3	8	6	6
Permitted Phases		6				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	42.0	42.0	42.0	84.0	56.0	56.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Maximum Green (s)	37.0	37.0	37.0	79.0	51.0	51.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	18.0	18.0
Pedestrian Calls (#/hr)	5	5		5	5	5
90th %ile Green (s)	37.0	37.0	37.0	79.0	51.0	51.0
90th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
70th %ile Green (s)	37.6	37.6	36.4	79.0	51.0	51.0
70th %ile Term Code	Coord	Coord	Gap	Coord	MaxR	MaxR
50th %ile Green (s)	41.2	41.2	32.8	79.0	51.0	51.0
50th %ile Term Code	Coord	Coord	Gap	Coord	MaxR	MaxR
30th %ile Green (s)	45.0	45.0	29.0	79.0	51.0	51.0
30th %ile Term Code	Coord	Coord	Gap	Coord	MaxR	MaxR
10th %ile Green (s)	50.6	50.6	23.4	79.0	51.0	51.0
10th %ile Term Code	Coord	Coord	Gap	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58 (41%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	670	1249	349	1315	346	486
v/c Ratio	0.63	0.64	0.87	0.66	0.54	0.80
Control Delay	33.6	9.6	74.8	28.4	38.9	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	9.6	74.8	28.4	38.9	47.2
Queue Length 50th (ft)	126	426	282	336	248	361
Queue Length 95th (ft)	234	261	m374	392	349	514
Internal Link Dist (ft)	920			820		1339
Turn Bay Length (ft)		200	300		300	
Base Capacity (vph)	1069	1956	468	1997	645	607
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.64	0.75	0.66	0.54	0.80

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

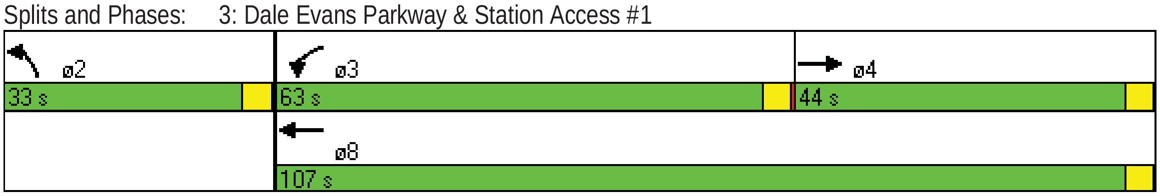
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	616	1149	321	1210	0	0	0	0	318	1	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Lane Util. Factor		0.95	0.88	1.00	0.95					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	2787	1770	3539					1770	1584	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	2787	1770	3539					1770	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	670	1249	349	1315	0	0	0	0	346	1	485
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	31	0
Lane Group Flow (vph)	0	670	1249	349	1315	0	0	0	0	346	455	0
Turn Type			custom	Prot						Split		
Protected Phases		4	4	3	8					6	6	
Permitted Phases			6									
Actuated Green, G (s)		42.3	93.3	31.7	79.0					51.0	51.0	
Effective Green, g (s)		42.3	93.3	31.7	79.0					51.0	51.0	
Actuated g/C Ratio		0.30	0.67	0.23	0.56					0.36	0.36	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1069	1957	401	1997					645	577	
v/s Ratio Prot		0.19	0.19	c0.20	c0.37					0.20	c0.29	
v/s Ratio Perm			0.26									
v/c Ratio		0.63	0.64	0.87	0.66					0.54	0.79	
Uniform Delay, d1		42.1	13.6	52.2	21.1					35.2	39.7	
Progression Factor		0.73	0.69	1.17	1.28					1.00	1.00	
Incremental Delay, d2		1.8	1.1	11.8	1.0					3.2	10.5	
Delay (s)		32.6	10.5	72.8	28.1					38.3	50.2	
Level of Service		C	B	E	C					D	D	
Approach Delay (s)		18.2			37.5			0.0			45.3	
Approach LOS		B			D			A			D	

Intersection Summary			
HCM Average Control Delay	30.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1365	501	1154	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	44.0	63.0	107.0	33.0
Total Split (%)	31.4%	45.0%	76.4%	23.6%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	40.1	49.3	93.4	38.6
Actuated g/C Ratio	0.29	0.35	0.67	0.28
v/c Ratio	0.81	0.87	0.37	0.57
Control Delay	28.2	67.6	5.8	7.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.2	67.6	5.8	7.6
LOS	C	E	A	A
Approach Delay	28.2		24.5	7.6
Approach LOS	C		C	A

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 97 (69%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 24.0	Intersection LOS: C
Intersection Capacity Utilization 82.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: Dale Evans Parkway & Station Access #1



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	44.0	63.0	107.0	33.0
Total Split (%)	31.4%	45.0%	76.4%	23.6%
Maximum Green (s)	40.0	59.0	103.0	29.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	40.0	59.0	103.0	29.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	44.2	54.7	102.9	29.1
70th %ile Term Code	Gap	Gap	Hold	Coord
50th %ile Green (s)	41.7	49.9	95.6	36.4
50th %ile Term Code	Gap	Gap	Hold	Coord
30th %ile Green (s)	39.0	45.1	88.1	43.9
30th %ile Term Code	Gap	Gap	Hold	Coord
10th %ile Green (s)	35.4	37.8	77.2	54.8
10th %ile Term Code	Gap	Gap	Hold	Coord

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 97 (69%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1486	545	1254	437
v/c Ratio	0.81	0.87	0.37	0.57
Control Delay	28.2	67.6	5.8	7.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	28.2	67.6	5.8	7.6
Queue Length 50th (ft)	191	512	101	1
Queue Length 95th (ft)	188	551	98	100
Internal Link Dist (ft)	920		920	1731
Turn Bay Length (ft)		200		
Base Capacity (vph)	1885	746	3741	760
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.79	0.73	0.34	0.57

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1365	2	501	1154	2	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6407		1770	5085	1612	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6407		1770	5085	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1484	2	545	1254	2	435
RTOR Reduction (vph)	0	0	0	0	315	0
Lane Group Flow (vph)	1486	0	545	1254	122	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	40.1		49.3	93.4	38.6	
Effective Green, g (s)	40.1		49.3	93.4	38.6	
Actuated g/C Ratio	0.29		0.35	0.67	0.28	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1835		623	3392	444	
v/s Ratio Prot	c0.23		c0.31	0.25	c0.08	
v/s Ratio Perm						
v/c Ratio	0.81		0.87	0.37	0.27	
Uniform Delay, d1	46.4		42.5	10.3	39.7	
Progression Factor	0.53		1.34	0.55	1.00	
Incremental Delay, d2	2.3		9.6	0.0	1.5	
Delay (s)	27.1		66.3	5.7	41.3	
Level of Service	C		E	A	D	
Approach Delay (s)	27.1			24.1	41.3	
Approach LOS	C			C	D	

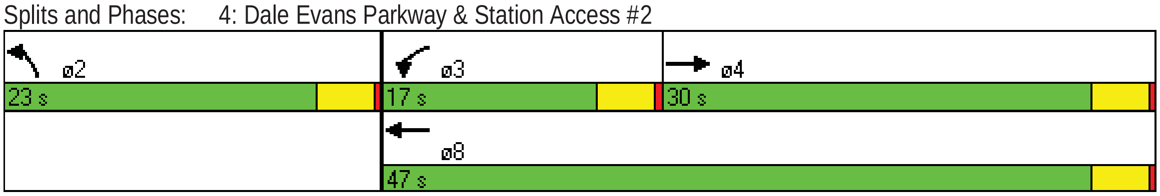
Intersection Summary			
HCM Average Control Delay	27.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1287	115	1040	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	30.0	17.0	47.0	23.0
Total Split (%)	42.9%	24.3%	67.1%	32.9%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	23.5	10.0	35.5	26.5
Actuated g/C Ratio	0.34	0.14	0.51	0.38
v/c Ratio	0.65	0.50	0.35	0.13
Control Delay	19.4	24.4	13.9	6.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.4	24.4	13.9	6.0
LOS	B	C	B	A
Approach Delay	19.4		14.9	6.0
Approach LOS	B		B	A

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Offset: 3 (4%), Referenced to phase 2:NBL and 6:, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 40.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Dale Evans Parkway & Station Access #2



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	30.0	17.0	47.0	23.0
Total Split (%)	42.9%	24.3%	67.1%	32.9%
Maximum Green (s)	26.0	13.0	43.0	19.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	26.0	13.0	43.0	19.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	26.1	11.8	41.9	20.1
70th %ile Term Code	Gap	Gap	Hold	Coord
50th %ile Green (s)	24.2	10.2	38.4	23.6
50th %ile Term Code	Gap	Gap	Hold	Coord
30th %ile Green (s)	22.1	8.6	34.7	27.3
30th %ile Term Code	Gap	Gap	Hold	Coord
10th %ile Green (s)	19.3	0.0	19.3	42.7
10th %ile Term Code	Gap	Skip	Hold	Coord

Intersection Summary

Cycle Length: 70

Actuated Cycle Length: 70

Offset: 3 (4%), Referenced to phase 2:NBL and 6:, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1401	125	1130	88
v/c Ratio	0.65	0.50	0.35	0.13
Control Delay	19.4	24.4	13.9	6.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	19.4	24.4	13.9	6.0
Queue Length 50th (ft)	184	66	159	1
Queue Length 95th (ft)	226	101	136	31
Internal Link Dist (ft)	920		920	736
Turn Bay Length (ft)		200		
Base Capacity (vph)	2382	329	3936	666
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.38	0.29	0.13

Intersection Summary

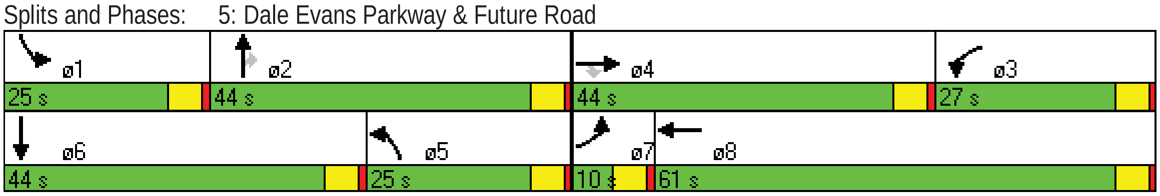
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1287	2	115	1040	2	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.86	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6406		1770	6408	1615	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6406		1770	6408	1615	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1399	2	125	1130	2	86
RTOR Reduction (vph)	0	0	0	0	54	0
Lane Group Flow (vph)	1401	0	125	1130	34	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	23.5		8.7	36.2	25.8	
Effective Green, g (s)	23.5		8.7	36.2	25.8	
Actuated g/C Ratio	0.34		0.12	0.52	0.37	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2151		220	3314	595	
v/s Ratio Prot	c0.22		c0.07	0.18	c0.02	
v/s Ratio Perm						
v/c Ratio	0.65		0.57	0.34	0.06	
Uniform Delay, d1	19.8		28.9	9.9	14.3	
Progression Factor	0.94		0.66	1.33	1.00	
Incremental Delay, d2	0.5		3.2	0.1	0.2	
Delay (s)	19.1		22.2	13.3	14.4	
Level of Service	B		C	B	B	
Approach Delay (s)	19.1			14.2	14.4	
Approach LOS	B			B	B	

Intersection Summary			
HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	17	141	363	798	89	515	722	662	485	969
Turn Type	Prot		Perm	Prot		Prot		Perm	Prot	
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	10.0	44.0	44.0	27.0	61.0	25.0	44.0	44.0	25.0	44.0
Total Split (%)	7.1%	31.4%	31.4%	19.3%	43.6%	17.9%	31.4%	31.4%	17.9%	31.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	5.0	19.7	19.7	32.9	53.6	20.0	40.1	40.1	27.3	47.4
Actuated g/C Ratio	0.04	0.14	0.14	0.24	0.38	0.14	0.29	0.29	0.20	0.34
v/c Ratio	0.29	0.31	0.84	0.74	0.20	1.14	0.54	0.85	0.79	0.63
Control Delay	77.4	52.9	30.5	38.7	10.0	127.5	30.4	18.5	63.2	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.4	52.9	30.5	38.7	10.0	127.5	30.4	18.5	63.2	41.7
LOS	E	D	C	D	A	F	C	B	E	D
Approach Delay		38.1			32.0		52.6			48.8
Approach LOS		D			C		D			D

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 30 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 140	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 45.6	Intersection LOS: D
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	10.0	44.0	44.0	27.0	61.0	25.0	44.0	44.0	25.0	44.0
Total Split (%)	7.1%	31.4%	31.4%	19.3%	43.6%	17.9%	31.4%	31.4%	17.9%	31.4%
Maximum Green (s)	5.0	39.0	39.0	22.0	56.0	20.0	39.0	39.0	20.0	39.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0		5.0
Flash Dont Walk (s)		34.0	34.0		34.0		34.0	34.0		34.0
Pedestrian Calls (#/hr)		5	5		5		5	5		5
90th %ile Green (s)	5.0	39.0	39.0	22.0	56.0	20.0	39.0	39.0	20.0	39.0
90th %ile Term Code	Max	Ped	Ped	Max	Hold	Max	Coord	Coord	Max	Coord
70th %ile Green (s)	5.0	23.4	23.4	34.2	52.6	20.0	39.0	39.0	23.4	42.4
70th %ile Term Code	Max	Gap	Gap	Gap	Hold	Max	Coord	Coord	Max	Coord
50th %ile Green (s)	0.0	16.8	16.8	34.4	56.2	20.0	39.0	39.0	29.8	48.8
50th %ile Term Code	Skip	Gap	Gap	Gap	Hold	Max	Coord	Coord	Max	Coord
30th %ile Green (s)	0.0	11.0	11.0	34.8	50.8	20.0	43.9	43.9	30.3	54.2
30th %ile Term Code	Skip	Gap	Gap	Gap	Hold	Max	Coord	Coord	Gap	Coord
10th %ile Green (s)	0.0	8.3	8.3	39.1	52.4	20.0	39.8	39.8	32.8	52.6
10th %ile Term Code	Skip	Gap	Gap	Gap	Hold	Max	Coord	Coord	Gap	Coord

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 30 (21%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	153	395	867	263	560	785	720	527	1075
v/c Ratio	0.29	0.31	0.84	0.74	0.20	1.14	0.54	0.85	0.79	0.63
Control Delay	77.4	52.9	30.5	38.7	10.0	127.5	30.4	18.5	63.2	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.4	52.9	30.5	38.7	10.0	127.5	30.4	18.5	63.2	41.7
Queue Length 50th (ft)	16	68	98	159	43	~308	195	328	231	294
Queue Length 95th (ft)	44	85	191	#414	56	#414	140	#244	#390	384
Internal Link Dist (ft)		1660			920		920			1521
Turn Bay Length (ft)						100		150	100	
Base Capacity (vph)	63	986	650	1173	1382	490	1458	852	668	1718
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.16	0.61	0.74	0.19	1.14	0.54	0.85	0.79	0.63

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	141	363	798	89	153	515	722	662	485	969	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.94	0.95		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	4990	3204		3433	5085	1583	3433	5070	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	4990	3204		3433	5085	1583	3433	5070	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	153	395	867	97	166	560	785	720	527	1053	22
RTOR Reduction (vph)	0	0	249	0	102	0	0	0	411	0	1	0
Lane Group Flow (vph)	18	153	146	867	161	0	560	785	309	527	1074	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	2.0	19.7	19.7	35.9	53.6		20.0	37.1	37.1	27.3	44.4	
Effective Green, g (s)	2.0	19.7	19.7	35.9	53.6		20.0	37.1	37.1	27.3	44.4	
Actuated g/C Ratio	0.01	0.14	0.14	0.26	0.38		0.14	0.26	0.26	0.20	0.32	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	25	498	223	1280	1227		490	1348	419	669	1608	
v/s Ratio Prot	0.01	0.04		c0.17	0.05		c0.16	0.15		c0.15	0.21	
v/s Ratio Perm			c0.09						c0.20			
v/c Ratio	0.72	0.31	0.65	0.68	0.13		1.14	0.58	0.74	0.79	0.67	
Uniform Delay, d1	68.7	54.0	56.9	46.8	28.1		60.0	44.7	47.0	53.6	41.4	
Progression Factor	1.00	1.00	1.00	0.67	0.94		0.78	0.68	0.84	1.00	1.00	
Incremental Delay, d2	68.2	0.4	6.7	1.4	0.0		85.0	1.7	10.4	6.1	2.2	
Delay (s)	136.9	54.4	63.6	32.7	26.4		131.7	32.3	49.7	59.7	43.6	
Level of Service	F	D	E	C	C		F	C	D	E	D	
Approach Delay (s)		63.5			31.2			65.3			48.9	
Approach LOS		E			C			E			D	

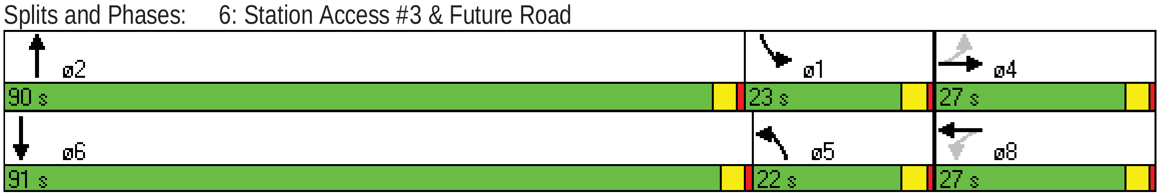
Intersection Summary			
HCM Average Control Delay	53.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	25.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	48	2	2	2	71	1796	80	1986
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	27.0	27.0	27.0	27.0	22.0	90.0	23.0	91.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	15.7%	64.3%	16.4%	65.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lead	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	11.2	11.2		11.2	11.4	104.4	12.4	105.4
Actuated g/C Ratio	0.08	0.08		0.08	0.08	0.75	0.09	0.75
v/c Ratio	0.60	0.49		0.35	0.53	0.41	0.55	0.46
Control Delay	89.5	18.0		20.4	75.8	1.7	82.2	3.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	89.5	18.0		20.4	75.8	1.7	82.2	3.3
LOS	F	B		C	E	A	F	A
Approach Delay		41.0		20.4		4.5		6.2
Approach LOS		D		C		A		A

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 3 (2%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 6.9 Intersection LOS: A
Intersection Capacity Utilization 53.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 6: Station Access #3 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	27.0	27.0	27.0	27.0	22.0	90.0	23.0	91.0
Total Split (%)	19.3%	19.3%	19.3%	19.3%	15.7%	64.3%	16.4%	65.0%
Maximum Green (s)	23.0	23.0	23.0	23.0	18.0	86.0	19.0	87.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lead	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	16.3	16.3	16.3	16.3	15.9	94.8	16.9	95.8
90th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
70th %ile Green (s)	13.2	13.2	13.2	13.2	13.2	100.6	14.2	101.6
70th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Hold	Coord
50th %ile Green (s)	11.2	11.2	11.2	11.2	11.4	104.4	12.4	105.4
50th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Hold	Coord
30th %ile Green (s)	9.1	9.1	9.1	9.1	9.6	108.3	10.6	109.3
30th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Hold	Coord
10th %ile Green (s)	6.0	6.0	6.0	6.0	7.0	114.0	8.0	115.0
10th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Hold	Coord

Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

Offset: 3 (2%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	110	64	77	1952	87	2230
v/c Ratio	0.60	0.49	0.35	0.53	0.41	0.55	0.46
Control Delay	89.5	18.0	20.4	75.8	1.7	82.2	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.5	18.0	20.4	75.8	1.7	82.2	3.3
Queue Length 50th (ft)	47	2	3	75	31	81	177
Queue Length 95th (ft)	91	59	49	m131	48	m121	69
Internal Link Dist (ft)		813	777		420		920
Turn Bay Length (ft)				100		100	
Base Capacity (vph)	176	351	315	228	4780	240	4803
Starvation Cap Reductn	0	0	0	0	356	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.31	0.20	0.34	0.44	0.36	0.46

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	2	99	2	2	55	71	1796	0	80	1986	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.87		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1588			1624		1770	6408		1770	6377	
Flt Permitted	0.57	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1071	1588			1613		1770	6408		1770	6377	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	2	108	2	2	60	77	1952	0	87	2159	71
RTOR Reduction (vph)	0	99	0	0	55	0	0	0	0	0	2	0
Lane Group Flow (vph)	52	11	0	0	9	0	77	1952	0	87	2228	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	11.2	11.2			11.2		11.4	104.4		12.4	105.4	
Effective Green, g (s)	11.2	11.2			11.2		11.4	104.4		12.4	105.4	
Actuated g/C Ratio	0.08	0.08			0.08		0.08	0.75		0.09	0.75	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	86	127			129		144	4779		157	4801	
v/s Ratio Prot		0.01					0.04	0.30		c0.05	c0.35	
v/s Ratio Perm	c0.05				0.01							
v/c Ratio	0.60	0.08			0.07		0.53	0.41		0.55	0.46	
Uniform Delay, d1	62.3	59.6			59.6		61.8	6.5		61.2	6.6	
Progression Factor	1.00	1.00			1.00		1.04	0.21		1.20	0.42	
Incremental Delay, d2	11.4	0.3			0.2		3.5	0.2		3.1	0.2	
Delay (s)	73.7	59.9			59.8		67.8	1.6		76.2	3.0	
Level of Service	E	E			E		E	A		E	A	
Approach Delay (s)		64.3			59.8			4.1			5.7	
Approach LOS		E			E			A			A	

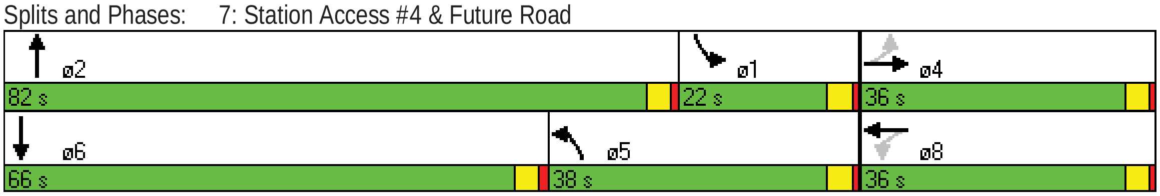
Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	145	2	2	2	239	1644	110	1758
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	36.0	36.0	36.0	36.0	38.0	82.0	22.0	66.0
Total Split (%)	25.7%	25.7%	25.7%	25.7%	27.1%	58.6%	15.7%	47.1%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lead	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	23.4	23.4		23.4	30.3	90.2	14.3	74.2
Actuated g/C Ratio	0.17	0.17		0.17	0.22	0.64	0.10	0.53
v/c Ratio	0.84	0.61		0.32	0.68	0.43	0.66	0.64
Control Delay	90.7	10.0		13.3	60.0	5.0	75.7	7.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.1
Total Delay	90.7	10.0		13.3	60.0	5.0	75.7	7.5
LOS	F	A		B	E	A	E	A
Approach Delay		36.4		13.3		12.0		11.1
Approach LOS		D		B		B		B

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 70.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Station Access #4 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	36.0	36.0	36.0	36.0	38.0	82.0	22.0	66.0
Total Split (%)	25.7%	25.7%	25.7%	25.7%	27.1%	58.6%	15.7%	47.1%
Maximum Green (s)	32.0	32.0	32.0	32.0	34.0	78.0	18.0	62.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lead	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	32.0	32.0	32.0	32.0	34.0	78.0	18.0	62.0
90th %ile Term Code	Max	Max	Hold	Hold	Hold	Coord	Max	Coord
70th %ile Green (s)	27.4	27.4	27.4	27.4	33.0	83.6	17.0	67.6
70th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
50th %ile Green (s)	23.7	23.7	23.7	23.7	30.8	89.5	14.8	73.5
50th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
30th %ile Green (s)	19.9	19.9	19.9	19.9	28.5	95.6	12.5	79.6
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
10th %ile Green (s)	14.2	14.2	14.2	14.2	25.3	104.5	9.3	88.5
10th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 4 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	158	325	87	260	1789	120	2146
v/c Ratio	0.84	0.61	0.32	0.68	0.43	0.66	0.64
Control Delay	90.7	10.0	13.3	60.0	5.0	75.7	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	90.7	10.0	13.3	60.0	5.0	75.7	7.5
Queue Length 50th (ft)	141	2	3	243	205	115	51
Queue Length 95th (ft)	213	84	49	336	47	183	137
Internal Link Dist (ft)		873	973		420		420
Turn Bay Length (ft)				200		100	
Base Capacity (vph)	255	611	339	430	4130	228	3357
Starvation Cap Reductn	0	0	0	0	495	0	162
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.53	0.26	0.60	0.49	0.53	0.67

Intersection Summary

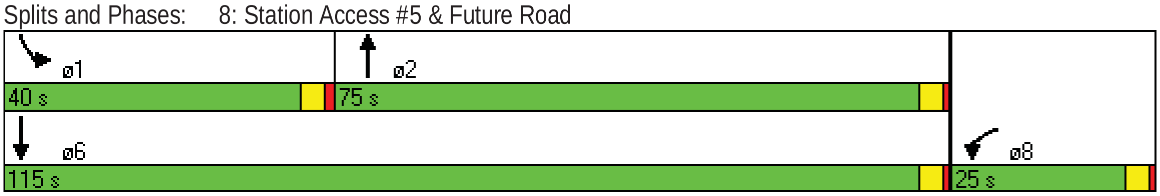
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	2	297	2	2	76	239	1644	2	110	1758	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.87		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1585			1621		1770	6407		1770	6303	
Flt Permitted	0.60	1.00			0.74		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1116	1585			1204		1770	6407		1770	6303	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	2	323	2	2	83	260	1787	2	120	1911	235
RTOR Reduction (vph)	0	269	0	0	69	0	0	0	0	0	13	0
Lane Group Flow (vph)	158	56	0	0	18	0	260	1789	0	120	2133	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	23.4	23.4			23.4		30.3	90.3		14.3	74.3	
Effective Green, g (s)	23.4	23.4			23.4		30.3	90.3		14.3	74.3	
Actuated g/C Ratio	0.17	0.17			0.17		0.22	0.64		0.10	0.53	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	187	265			201		383	4133		181	3345	
v/s Ratio Prot		0.04					c0.15	0.28		0.07	c0.34	
v/s Ratio Perm	c0.14				0.01							
v/c Ratio	0.84	0.21			0.09		0.68	0.43		0.66	0.64	
Uniform Delay, d1	56.5	50.3			49.3		50.4	12.2		60.5	23.3	
Progression Factor	1.00	1.00			1.00		1.02	0.35		0.99	0.27	
Incremental Delay, d2	27.9	0.4			0.2		4.4	0.3		8.0	0.9	
Delay (s)	84.4	50.7			49.5		55.8	4.6		68.2	7.1	
Level of Service	F	D			D		E	A		E	A	
Approach Delay (s)		61.8			49.5			11.1			10.3	
Approach LOS		E			D			B			B	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	2	1754	188	1867
Turn Type			Prot	
Protected Phases	8	2	1	6
Permitted Phases				
Detector Phase	8	2	1	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	25.0	75.0	40.0	115.0
Total Split (%)	17.9%	53.6%	28.6%	82.1%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max
Act Effct Green (s)	8.2	98.3	21.5	123.8
Actuated g/C Ratio	0.06	0.70	0.15	0.88
v/c Ratio	0.63	0.42	0.75	0.36
Control Delay	22.1	10.1	78.3	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.1	10.1	78.3	0.4
LOS	C	B	E	A
Approach Delay	22.1	10.1		7.5
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 6 (4%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 9.2	Intersection LOS: A
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Station Access #5 & Future Road



Lane Group	WBL	NBT	SBL	SBT
Protected Phases	8	2	1	6
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	25.0	75.0	40.0	115.0
Total Split (%)	17.9%	53.6%	28.6%	82.1%
Maximum Green (s)	21.0	71.0	36.0	111.0
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0		5.0
Flash Dont Walk (s)	11.0	11.0		11.0
Pedestrian Calls (#/hr)	5	5		5
90th %ile Green (s)	16.0	83.2	28.8	116.0
90th %ile Term Code	Ped	Coord	Gap	Coord
70th %ile Green (s)	8.6	94.9	24.5	123.4
70th %ile Term Code	Gap	Coord	Gap	Coord
50th %ile Green (s)	5.6	100.9	21.5	126.4
50th %ile Term Code	Gap	Coord	Gap	Coord
30th %ile Green (s)	5.5	104.0	18.5	126.5
30th %ile Term Code	Gap	Coord	Gap	Coord
10th %ile Green (s)	5.5	108.4	14.1	126.5
10th %ile Term Code	Gap	Coord	Gap	Coord

Intersection Summary
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 6 (4%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	142	1909	204	2029
v/c Ratio	0.63	0.42	0.75	0.36
Control Delay	22.1	10.1	78.3	0.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	22.1	10.1	78.3	0.4
Queue Length 50th (ft)	2	181	195	6
Queue Length 95th (ft)	66	308	271	12
Internal Link Dist (ft)	1061	848		420
Turn Bay Length (ft)			100	
Base Capacity (vph)	361	4498	455	5665
Starvation Cap Reductn	0	0	0	1174
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.42	0.45	0.45

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	129	1754	2	188	1867
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.86		1.00	0.86
Frt	0.87		1.00		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1614		6407		1770	6408
Flt Permitted	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1614		6407		1770	6408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	140	1907	2	204	2029
RTOR Reduction (vph)	132	0	0	0	0	0
Lane Group Flow (vph)	10	0	1909	0	204	2029
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	8.2		98.3		21.5	123.8
Effective Green, g (s)	8.2		98.3		21.5	123.8
Actuated g/C Ratio	0.06		0.70		0.15	0.88
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	95		4499		272	5667
v/s Ratio Prot	c0.01		c0.30		c0.12	0.32
v/s Ratio Perm						
v/c Ratio	0.11		0.42		0.75	0.36
Uniform Delay, d1	62.4		8.8		56.7	1.4
Progression Factor	1.00		1.00		1.15	0.12
Incremental Delay, d2	0.5		0.3		8.8	0.1
Delay (s)	62.9		9.1		74.0	0.3
Level of Service	E		A		E	A
Approach Delay (s)	62.9		9.1			7.0
Approach LOS	E		A			A

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

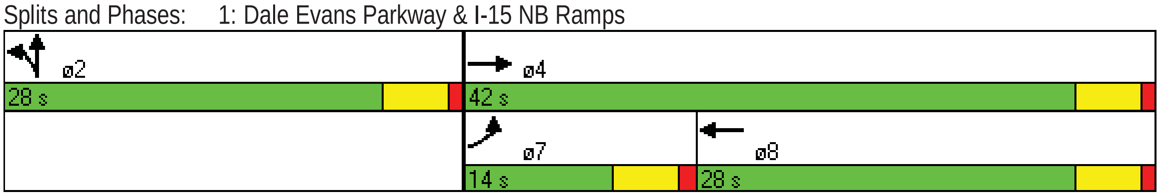
2030 Conditions

Base + DEMU

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	255	636	495	762	2
Turn Type	Prot			Split	
Protected Phases	7	4	8	2	2
Permitted Phases					
Detector Phase	7	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	14.0	42.0	28.0	28.0	28.0
Total Split (%)	20.0%	60.0%	40.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Max	C-Max	Max	Max
Act Effct Green (s)	9.0	37.0	23.0	23.0	23.0
Actuated g/C Ratio	0.13	0.53	0.33	0.33	0.33
v/c Ratio	1.21	0.37	0.62	1.42	0.71
Control Delay	157.3	16.5	20.5	224.3	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	157.3	16.5	20.5	224.3	18.8
LOS	F	B	C	F	B
Approach Delay		56.8	20.5		150.3
Approach LOS		E	C		F

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.42	
Intersection Signal Delay: 88.4	Intersection LOS: F
Intersection Capacity Utilization 117.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases	7	4	8	2	2
Permitted Phases					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	14.0	42.0	28.0	28.0	28.0
Total Split (%)	20.0%	60.0%	40.0%	40.0%	40.0%
Maximum Green (s)	9.0	37.0	23.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	Max	Max
Walk Time (s)		5.0	5.0	5.0	5.0
Flash Dont Walk (s)		18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)		5	5	5	5
90th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
90th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
70th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
70th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
50th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
50th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
30th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
30th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
10th %ile Green (s)	9.0	37.0	23.0	23.0	23.0
10th %ile Term Code	Max	Coord	Coord	MaxR	MaxR

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	277	691	729	828	466
v/c Ratio	1.21	0.37	0.62	1.42	0.71
Control Delay	157.3	16.5	20.5	224.3	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	157.3	16.5	20.5	224.3	18.8
Queue Length 50th (ft)	~150	90	122	~493	97
Queue Length 95th (ft)	m#254	m124	177	#697	204
Internal Link Dist (ft)		820	380		2022
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	228	1871	1169	582	653
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.21	0.37	0.62	1.42	0.71

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	255	636	0	0	495	176	762	2	427	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95		1.00	1.00				
Frt	1.00	1.00			0.96		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3400		1770	1585				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1770	3539			3400		1770	1585				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	277	691	0	0	538	191	828	2	464	0	0	0
RTOR Reduction (vph)	0	0	0	0	51	0	0	132	0	0	0	0
Lane Group Flow (vph)	277	691	0	0	678	0	828	334	0	0	0	0
Turn Type	Prot						Split					
Protected Phases	7	4			8		2	2				
Permitted Phases												
Actuated Green, G (s)	9.0	37.0			23.0		23.0	23.0				
Effective Green, g (s)	9.0	37.0			23.0		23.0	23.0				
Actuated g/C Ratio	0.13	0.53			0.33		0.33	0.33				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	228	1871			1117		582	521				
v/s Ratio Prot	c0.16	0.20			c0.20		c0.47	0.21				
v/s Ratio Perm												
v/c Ratio	1.21	0.37			0.61		1.42	0.64				
Uniform Delay, d1	30.5	9.7			19.7		23.5	20.0				
Progression Factor	1.25	1.63			1.00		1.00	1.00				
Incremental Delay, d2	121.4	0.4			2.5		200.1	5.9				
Delay (s)	159.6	16.2			22.2		223.6	25.9				
Level of Service	F	B			C		F	C				
Approach Delay (s)		57.2			22.2			152.4			0.0	
Approach LOS		E			C			F			A	

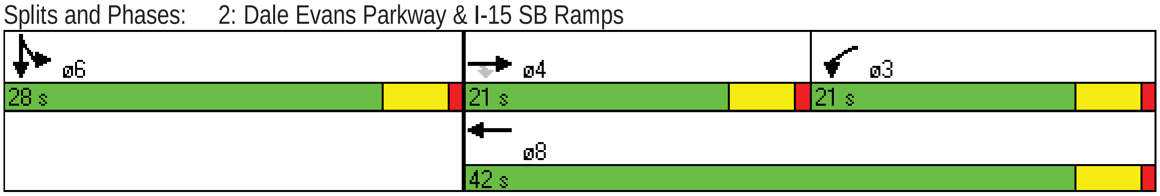
Intersection Summary			
HCM Average Control Delay	89.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Configurations						
Volume (vph)	573	977	321	935	318	1
Turn Type		Perm	Prot		Split	
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Detector Phase	4	4	3	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	21.0	21.0	21.0	42.0	28.0	28.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Act Effct Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
Actuated g/C Ratio	0.23	0.23	0.23	0.53	0.33	0.33
v/c Ratio	0.77	1.18	0.86	0.54	0.59	0.81
Control Delay	33.0	103.6	31.2	12.2	24.7	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	103.6	31.2	12.2	24.7	31.1
LOS	C	F	C	B	C	C
Approach Delay	77.5			17.1		28.4
Approach LOS	E			B		C

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 45.8 Intersection LOS: D
Intersection Capacity Utilization 117.5% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	21.0	21.0	21.0	42.0	28.0	28.0
Total Split (%)	30.0%	30.0%	30.0%	60.0%	40.0%	40.0%
Maximum Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	18.0	18.0
Pedestrian Calls (#/hr)	5	5		5	5	5
90th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
90th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
70th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
70th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
50th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
50th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
30th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
30th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
10th %ile Green (s)	16.0	16.0	16.0	37.0	23.0	23.0
10th %ile Term Code	Coord	Coord	Hold	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	623	1062	349	1016	346	469
v/c Ratio	0.77	1.18	0.86	0.54	0.59	0.81
Control Delay	33.0	103.6	31.2	12.2	24.7	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	103.6	31.2	12.2	24.7	31.1
Queue Length 50th (ft)	132	~302	140	172	123	151
Queue Length 95th (ft)	#193	#528	m133	m158	203	#308
Internal Link Dist (ft)	920			820		1339
Turn Bay Length (ft)			300		300	
Base Capacity (vph)	809	903	405	1871	582	577
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.18	0.86	0.54	0.59	0.81

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

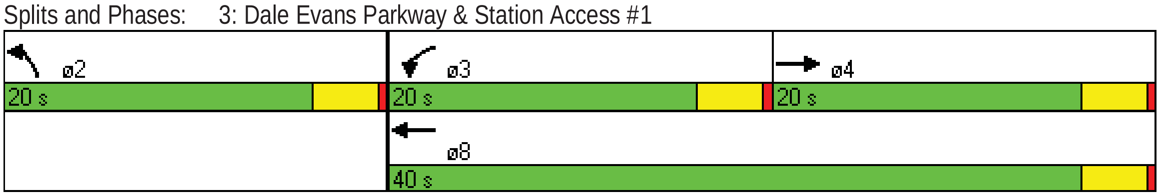
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	573	977	321	935	0	0	0	0	318	1	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					1770	1584	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					1770	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	623	1062	349	1016	0	0	0	0	346	1	468
RTOR Reduction (vph)	0	0	541	0	0	0	0	0	0	0	57	0
Lane Group Flow (vph)	0	623	521	349	1016	0	0	0	0	346	412	0
Turn Type			Perm	Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases			4									
Actuated Green, G (s)		16.0	16.0	16.0	37.0					23.0	23.0	
Effective Green, g (s)		16.0	16.0	16.0	37.0					23.0	23.0	
Actuated g/C Ratio		0.23	0.23	0.23	0.53					0.33	0.33	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		809	362	405	1871					582	520	
v/s Ratio Prot		0.18		c0.20	0.29					0.20	c0.26	
v/s Ratio Perm			c0.33									
v/c Ratio		0.77	1.44	0.86	0.54					0.59	0.79	
Uniform Delay, d1		25.3	27.0	25.9	10.9					19.6	21.3	
Progression Factor		1.00	1.00	1.01	1.09					1.00	1.00	
Incremental Delay, d2		7.0	213.1	1.9	0.1					4.4	11.7	
Delay (s)		32.3	240.1	28.2	12.0					24.0	33.1	
Level of Service		C	F	C	B					C	C	
Approach Delay (s)		163.2			16.1			0.0			29.2	
Approach LOS		F			B			A			C	

Intersection Summary			
HCM Average Control Delay	83.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1266	355	1010	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	40.0	20.0
Total Split (%)	33.3%	33.3%	66.7%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	16.0	15.4	35.4	16.6
Actuated g/C Ratio	0.27	0.26	0.59	0.28
v/c Ratio	0.80	0.85	0.37	0.46
Control Delay	25.0	41.3	6.8	5.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	41.3	6.8	5.3
LOS	C	D	A	A
Approach Delay	25.0		15.7	5.3
Approach LOS	C		B	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 60	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 18.8	Intersection LOS: B
Intersection Capacity Utilization 65.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Dale Evans Parkway & Station Access #1



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0	40.0	20.0
Total Split (%)	33.3%	33.3%	66.7%	33.3%
Maximum Green (s)	16.0	16.0	36.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	16.0	16.0	36.0	16.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	16.0	16.0	36.0	16.0
70th %ile Term Code	Max	Max	Hold	Coord
50th %ile Green (s)	16.0	16.0	36.0	16.0
50th %ile Term Code	Max	Max	Hold	Coord
30th %ile Green (s)	16.0	16.0	36.0	16.0
30th %ile Term Code	Max	Max	Hold	Coord
10th %ile Green (s)	16.2	12.8	33.0	19.0
10th %ile Term Code	Gap	Gap	Hold	Coord

Intersection Summary
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1378	386	1098	310
v/c Ratio	0.80	0.85	0.37	0.46
Control Delay	25.0	41.3	6.8	5.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.0	41.3	6.8	5.3
Queue Length 50th (ft)	134	130	64	1
Queue Length 95th (ft)	172	#262	85	51
Internal Link Dist (ft)	920		920	1731
Turn Bay Length (ft)		200		
Base Capacity (vph)	1713	472	3051	669
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.80	0.82	0.36	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

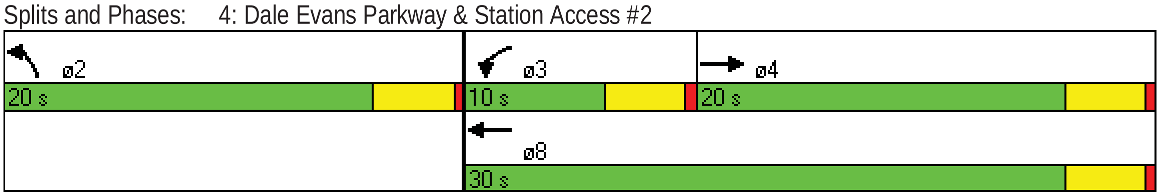
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1266	2	355	1010	2	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6406		1770	5085	1612	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6406		1770	5085	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1376	2	386	1098	2	308
RTOR Reduction (vph)	0	0	0	0	223	0
Lane Group Flow (vph)	1378	0	386	1098	87	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	16.0		15.4	35.4	16.6	
Effective Green, g (s)	16.0		15.4	35.4	16.6	
Actuated g/C Ratio	0.27		0.26	0.59	0.28	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1708		454	3000	446	
v/s Ratio Prot	c0.22		c0.22	0.22	c0.05	
v/s Ratio Perm						
v/c Ratio	0.81		0.85	0.37	0.20	
Uniform Delay, d1	20.6		21.2	6.4	16.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	2.9		14.1	0.1	1.0	
Delay (s)	23.5		35.3	6.5	17.6	
Level of Service	C		D	A	B	
Approach Delay (s)	23.5			14.0	17.6	
Approach LOS	C			B	B	

Intersection Summary			
HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1211	81	929	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	10.0	30.0	20.0
Total Split (%)	40.0%	20.0%	60.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	15.7	5.9	21.7	20.3
Actuated g/C Ratio	0.31	0.12	0.43	0.41
v/c Ratio	0.66	0.42	0.36	0.09
Control Delay	16.6	27.1	9.4	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.6	27.1	9.4	4.8
LOS	B	C	A	A
Approach Delay	16.6		10.8	4.8
Approach LOS	B		B	A

Intersection Summary	
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.7	Intersection LOS: B
Intersection Capacity Utilization 35.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Dale Evans Parkway & Station Access #2



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	20.0	10.0	30.0	20.0
Total Split (%)	40.0%	20.0%	60.0%	40.0%
Maximum Green (s)	16.0	6.0	26.0	16.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	16.0	6.0	26.0	16.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	16.0	6.0	26.0	16.0
70th %ile Term Code	Max	Max	Hold	Coord
50th %ile Green (s)	16.0	6.0	26.0	16.0
50th %ile Term Code	Max	Max	Hold	Coord
30th %ile Green (s)	16.4	0.0	16.4	25.6
30th %ile Term Code	Gap	Skip	Hold	Coord
10th %ile Green (s)	14.0	0.0	14.0	28.0
10th %ile Term Code	Gap	Skip	Hold	Coord

Intersection Summary

Cycle Length: 50

Actuated Cycle Length: 50

Offset: 0 (0%), Referenced to phase 2:NBL and 6:, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1318	88	1010	63
v/c Ratio	0.66	0.42	0.36	0.09
Control Delay	16.6	27.1	9.4	4.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.6	27.1	9.4	4.8
Queue Length 50th (ft)	93	25	43	0
Queue Length 95th (ft)	124	59	59	20
Internal Link Dist (ft)	920		920	736
Turn Bay Length (ft)		200		
Base Capacity (vph)	2061	212	3332	692
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.30	0.09

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1211	2	81	929	2	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.86	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6406		1770	6408	1617	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6406		1770	6408	1617	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1316	2	88	1010	2	61
RTOR Reduction (vph)	1	0	0	0	38	0
Lane Group Flow (vph)	1317	0	88	1010	25	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	15.7		3.6	23.3	18.7	
Effective Green, g (s)	15.7		3.6	23.3	18.7	
Actuated g/C Ratio	0.31		0.07	0.47	0.37	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2011		127	2986	605	
v/s Ratio Prot	c0.21		c0.05	0.16	c0.02	
v/s Ratio Perm						
v/c Ratio	0.66		0.69	0.34	0.04	
Uniform Delay, d1	14.8		22.7	8.5	9.9	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.8		15.1	0.1	0.1	
Delay (s)	15.6		37.8	8.5	10.1	
Level of Service	B		D	A	B	
Approach Delay (s)	15.6			10.9	10.1	
Approach LOS	B			B	B	

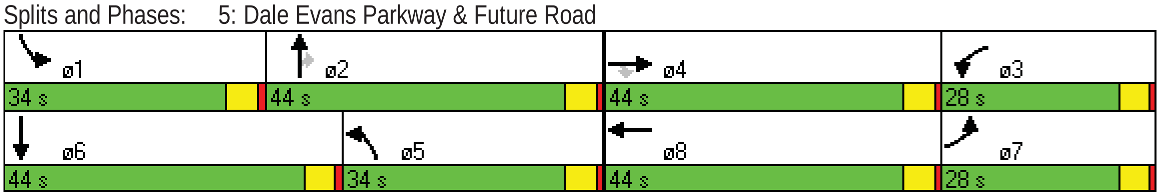
Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	17	141	363	687	89	515	722	586	485	969
Turn Type	Prot		Perm	Prot		Prot		Perm	Prot	
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	28.0	44.0	44.0	28.0	44.0	34.0	44.0	44.0	34.0	44.0
Total Split (%)	18.7%	29.3%	29.3%	18.7%	29.3%	22.7%	29.3%	29.3%	22.7%	29.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	26.7	17.1	17.1	44.0	38.7	29.0	41.8	41.8	27.1	39.9
Actuated g/C Ratio	0.18	0.11	0.11	0.29	0.26	0.19	0.28	0.28	0.18	0.27
v/c Ratio	0.06	0.38	0.78	0.74	0.28	0.84	0.55	0.79	0.85	0.80
Control Delay	46.6	61.9	17.9	52.8	20.5	60.6	39.1	21.6	73.1	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	61.9	17.9	52.8	20.5	60.6	39.1	21.6	73.1	56.4
LOS	D	E	B	D	C	E	D	C	E	E
Approach Delay		30.7			44.4		39.5			61.9
Approach LOS		C			D		D			E

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 150
Offset: 96 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 46.5 Intersection LOS: D
Intersection Capacity Utilization 74.0% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	28.0	44.0	44.0	28.0	44.0	34.0	44.0	44.0	34.0	44.0
Total Split (%)	18.7%	29.3%	29.3%	18.7%	29.3%	22.7%	29.3%	29.3%	22.7%	29.3%
Maximum Green (s)	23.0	39.0	39.0	23.0	39.0	29.0	39.0	39.0	29.0	39.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0		5.0
Flash Dont Walk (s)		34.0	34.0		34.0		34.0	34.0		34.0
Pedestrian Calls (#/hr)		5	5		5		5	5		5
90th %ile Green (s)	23.0	39.0	39.0	23.0	39.0	29.0	39.0	39.0	29.0	39.0
90th %ile Term Code	Hold	Ped	Ped	Max	Ped	Max	Coord	Coord	Max	Coord
70th %ile Green (s)	48.2	15.7	15.7	44.7	12.2	29.0	39.0	39.0	30.6	40.6
70th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Max	Coord	Coord	Max	Coord
50th %ile Green (s)	50.9	11.9	11.9	47.3	8.3	29.0	42.7	42.7	28.1	41.8
50th %ile Term Code	Hold	Gap	Gap	Gap	Gap	Max	Coord	Coord	Gap	Coord
30th %ile Green (s)	0.0	10.5	10.5	51.5	67.0	29.0	42.3	42.3	25.7	39.0
30th %ile Term Code	Skip	Gap	Gap	Max	Hold	Hold	Coord	Coord	Gap	Coord
10th %ile Green (s)	0.0	8.6	8.6	53.4	67.0	29.0	46.0	46.0	22.0	39.0
10th %ile Term Code	Skip	Gap	Gap	Max	Hold	Hold	Coord	Coord	Gap	Coord

Intersection Summary
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 96 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	153	395	747	263	560	785	637	527	1075
v/c Ratio	0.06	0.38	0.78	0.74	0.28	0.84	0.55	0.79	0.85	0.80
Control Delay	46.6	61.9	17.9	52.8	20.5	60.6	39.1	21.6	73.1	56.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	61.9	17.9	52.8	20.5	60.6	39.1	21.6	73.1	56.4
Queue Length 50th (ft)	12	77	23	330	49	278	189	166	258	353
Queue Length 95th (ft)	41	93	116	#634	77	#319	252	253	324	421
Internal Link Dist (ft)		1660			920		920			1521
Turn Bay Length (ft)						100		150	100	
Base Capacity (vph)	397	920	685	1007	1183	664	1417	803	671	1350
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.58	0.74	0.22	0.84	0.55	0.79	0.79	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

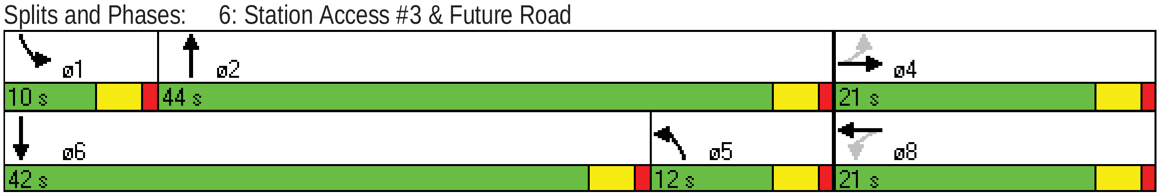
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	141	363	687	89	153	515	722	586	485	969	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	153	395	747	97	166	560	785	637	527	1053	22
RTOR Reduction (vph)	0	0	328	0	123	0	0	0	369	0	1	0
Lane Group Flow (vph)	18	153	67	747	140	0	560	785	268	527	1074	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	24.4	17.1	17.1	46.0	38.7		29.0	39.8	39.8	27.1	37.9	
Effective Green, g (s)	24.4	17.1	17.1	46.0	38.7		29.0	39.8	39.8	27.1	37.9	
Actuated g/C Ratio	0.16	0.11	0.11	0.31	0.26		0.19	0.27	0.27	0.18	0.25	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	288	403	180	1053	827		664	1349	420	620	1281	
v/s Ratio Prot	0.01	c0.04		c0.22	0.04		c0.16	0.15		0.15	c0.21	
v/s Ratio Perm			0.04						0.17			
v/c Ratio	0.06	0.38	0.37	0.71	0.17		0.84	0.58	0.64	0.85	0.84	
Uniform Delay, d1	53.1	61.5	61.5	46.1	43.2		58.3	47.9	48.7	59.5	53.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.83	0.80	1.29	1.00	1.00	
Incremental Delay, d2	0.1	0.6	1.3	2.2	0.1		9.0	1.7	6.8	10.8	6.7	
Delay (s)	53.2	62.1	62.8	48.3	43.3		57.6	40.2	69.8	70.3	59.8	
Level of Service	D	E	E	D	D		E	D	E	E	E	
Approach Delay (s)		62.3			47.0			54.6			63.2	
Approach LOS		E			D			D			E	

Intersection Summary			
HCM Average Control Delay	56.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	48	2	2	2	71	1736	56	1899
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	12.0	44.0	10.0	42.0
Total Split (%)	28.0%	28.0%	28.0%	28.0%	16.0%	58.7%	13.3%	56.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	9.2	9.2		9.2	7.5	53.3	7.3	50.9
Actuated g/C Ratio	0.12	0.12		0.12	0.10	0.71	0.10	0.68
v/c Ratio	0.24	0.38		0.20	0.44	0.41	0.36	0.49
Control Delay	30.6	10.3		12.1	30.4	4.8	33.1	10.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	10.3		12.1	30.4	4.8	33.1	10.7
LOS	C	B		B	C	A	C	B
Approach Delay		16.8		12.1		5.8		11.3
Approach LOS		B		B		A		B

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 51.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Station Access #3 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	12.0	44.0	10.0	42.0
Total Split (%)	28.0%	28.0%	28.0%	28.0%	16.0%	58.7%	13.3%	56.0%
Maximum Green (s)	17.0	17.0	17.0	17.0	8.0	40.0	6.0	38.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	16.0	16.0	16.0	16.0	8.0	40.0	7.0	39.0
90th %ile Term Code	Ped	Ped	Hold	Hold	Max	Coord	Max	Coord
70th %ile Green (s)	9.6	9.6	9.6	9.6	8.0	44.3	9.1	45.4
70th %ile Term Code	Gap	Gap	Hold	Hold	Max	Coord	Gap	Coord
50th %ile Green (s)	8.2	8.2	8.2	8.2	8.0	46.9	7.9	46.8
50th %ile Term Code	Gap	Gap	Hold	Hold	Max	Coord	Gap	Coord
30th %ile Green (s)	6.8	6.8	6.8	6.8	8.0	60.2	0.0	48.2
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Skip	Coord
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	71.0	0.0	71.0
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Coord	Skip	Coord

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	110	46	77	1889	61	2135
v/c Ratio	0.24	0.38	0.20	0.44	0.41	0.36	0.49
Control Delay	30.6	10.3	12.1	30.4	4.8	33.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	10.3	12.1	30.4	4.8	33.1	10.7
Queue Length 50th (ft)	23	1	2	35	58	37	236
Queue Length 95th (ft)	48	39	27	m58	106	m58	221
Internal Link Dist (ft)		813	777		420		920
Turn Bay Length (ft)				100		100	
Base Capacity (vph)	400	444	398	189	4552	174	4330
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.12	0.41	0.41	0.35	0.49

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	2	99	2	2	39	71	1736	2	56	1899	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1588			1630		1770	6407		1770	6376	
Flt Permitted	0.95	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1765	1588			1610		1770	6407		1770	6376	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	2	108	2	2	42	77	1887	2	61	2064	71
RTOR Reduction (vph)	0	96	0	0	37	0	0	0	0	0	5	0
Lane Group Flow (vph)	52	14	0	0	9	0	77	1889	0	61	2130	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	8.1	8.1			8.1		7.2	50.1		4.8	47.7	
Effective Green, g (s)	8.1	8.1			8.1		7.2	50.1		4.8	47.7	
Actuated g/C Ratio	0.11	0.11			0.11		0.10	0.67		0.06	0.64	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	172			174		170	4280		113	4055	
v/s Ratio Prot		0.01					0.04	c0.29		0.03	c0.33	
v/s Ratio Perm	c0.03				0.01							
v/c Ratio	0.27	0.08			0.05		0.45	0.44		0.54	0.53	
Uniform Delay, d1	30.7	30.1			30.0		32.0	5.9		34.0	7.5	
Progression Factor	1.00	1.00			1.00		0.74	0.65		0.93	1.31	
Incremental Delay, d2	0.8	0.2			0.1		1.7	0.3		3.2	0.3	
Delay (s)	31.5	30.3			30.1		25.3	4.1		34.8	10.1	
Level of Service	C	C			C		C	A		C	B	
Approach Delay (s)		30.7			30.1			5.0			10.8	
Approach LOS		C			C			A			B	

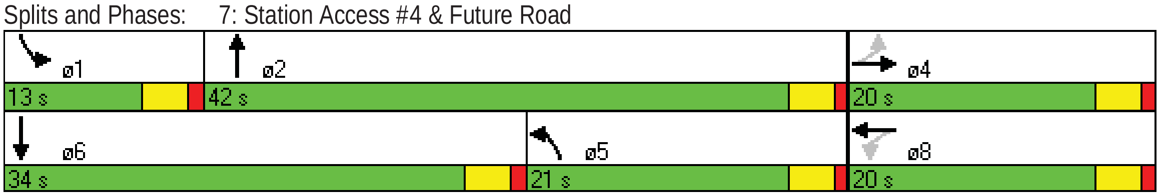
Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	145	2	2	2	239	1607	78	1703
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	21.0	42.0	13.0	34.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	28.0%	56.0%	17.3%	45.3%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	12.6	12.6		12.6	17.0	44.2	8.2	33.4
Actuated g/C Ratio	0.17	0.17		0.17	0.23	0.59	0.11	0.45
v/c Ratio	0.62	0.61		0.24	0.65	0.46	0.44	0.74
Control Delay	39.4	8.8		10.6	24.2	3.6	51.2	19.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	8.8		10.6	24.2	3.6	51.2	19.5
LOS	D	A		B	C	A	D	B
Approach Delay		18.8		10.6		6.3		20.8
Approach LOS		B		B		A		C

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 70.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Station Access #4 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	21.0	42.0	13.0	34.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	28.0%	56.0%	17.3%	45.3%
Maximum Green (s)	16.0	16.0	16.0	16.0	17.0	38.0	9.0	30.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	16.0	16.0	16.0	16.0	17.0	38.0	9.0	30.0
90th %ile Term Code	Max	Max	Hold	Hold	Max	Coord	Max	Coord
70th %ile Green (s)	15.2	15.2	15.2	15.2	17.0	38.0	9.8	30.8
70th %ile Term Code	Gap	Gap	Hold	Hold	Max	Coord	Max	Coord
50th %ile Green (s)	13.1	13.1	13.1	13.1	17.0	41.0	8.9	32.9
50th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
30th %ile Green (s)	10.8	10.8	10.8	10.8	17.0	44.7	7.5	35.2
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
10th %ile Green (s)	7.7	7.7	7.7	7.7	17.0	59.3	0.0	38.3
10th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Skip	Coord

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	158	325	63	260	1749	85	2086
v/c Ratio	0.62	0.61	0.24	0.65	0.46	0.44	0.74
Control Delay	39.4	8.8	10.6	24.2	3.6	51.2	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	8.8	10.6	24.2	3.6	51.2	19.5
Queue Length 50th (ft)	68	1	2	110	30	64	338
Queue Length 95th (ft)	122	63	31	138	39	95	244
Internal Link Dist (ft)		873	973		420		420
Turn Bay Length (ft)				200		100	
Base Capacity (vph)	324	592	321	401	3777	216	2837
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.55	0.20	0.65	0.46	0.39	0.74

Intersection Summary

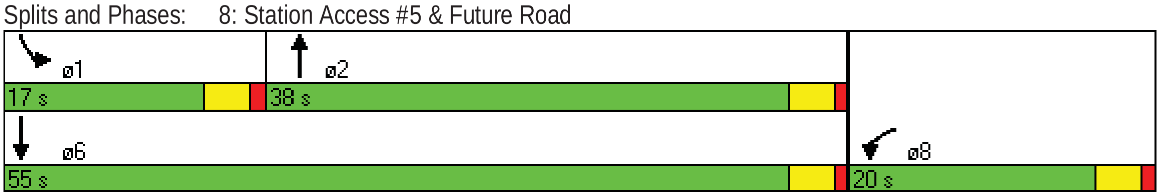
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	2	297	2	2	54	239	1607	2	78	1703	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.87		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1585			1625		1770	6407		1770	6300	
Flt Permitted	0.82	1.00			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1521	1585			1289		1770	6407		1770	6300	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	2	323	2	2	59	260	1747	2	85	1851	235
RTOR Reduction (vph)	0	269	0	0	49	0	0	0	0	0	29	0
Lane Group Flow (vph)	158	56	0	0	14	0	260	1749	0	85	2057	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	12.6	12.6			12.6		17.8	43.4		7.0	32.6	
Effective Green, g (s)	12.6	12.6			12.6		17.8	43.4		7.0	32.6	
Actuated g/C Ratio	0.17	0.17			0.17		0.24	0.58		0.09	0.43	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	256	266			217		420	3708		165	2738	
v/s Ratio Prot		0.04					c0.15	0.27		0.05	c0.33	
v/s Ratio Perm	c0.10				0.01							
v/c Ratio	0.62	0.21			0.06		0.62	0.47		0.52	0.75	
Uniform Delay, d1	29.0	26.9			26.2		25.6	9.2		32.4	17.8	
Progression Factor	1.00	1.00			1.00		0.63	0.33		1.44	1.05	
Incremental Delay, d2	4.4	0.4			0.1		2.4	0.4		2.4	1.7	
Delay (s)	33.3	27.3			26.4		18.6	3.4		49.1	20.4	
Level of Service	C	C			C		B	A		D	C	
Approach Delay (s)		29.3			26.4			5.3			21.5	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	2	1754	133	1867
Turn Type			Prot	
Protected Phases	8	2	1	6
Permitted Phases				
Detector Phase	8	2	1	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	20.0	38.0	17.0	55.0
Total Split (%)	26.7%	50.7%	22.7%	73.3%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max
Act Effct Green (s)	8.0	46.1	10.8	61.7
Actuated g/C Ratio	0.11	0.61	0.14	0.82
v/c Ratio	0.39	0.48	0.57	0.38
Control Delay	11.4	10.0	46.4	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	10.0	46.4	0.4
LOS	B	A	D	A
Approach Delay	11.4	10.0		3.5
Approach LOS	B	A		A

Intersection Summary	
Cycle Length: 75	
Actuated Cycle Length: 75	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.57	
Intersection Signal Delay: 6.6	Intersection LOS: A
Intersection Capacity Utilization 48.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 8: Station Access #5 & Future Road



Lane Group	WBL	NBT	SBL	SBT
Protected Phases	8	2	1	6
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	20.0	38.0	17.0	55.0
Total Split (%)	26.7%	50.7%	22.7%	73.3%
Maximum Green (s)	16.0	34.0	13.0	51.0
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lead/Lag		Lag	Lead	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0		5.0
Flash Dont Walk (s)	11.0	11.0		11.0
Pedestrian Calls (#/hr)	5	5		5
90th %ile Green (s)	16.0	34.0	13.0	51.0
90th %ile Term Code	Ped	Coord	Max	Coord
70th %ile Green (s)	7.3	42.6	13.1	59.7
70th %ile Term Code	Gap	Coord	Gap	Coord
50th %ile Green (s)	5.5	46.1	11.4	61.5
50th %ile Term Code	Gap	Coord	Gap	Coord
30th %ile Green (s)	5.5	47.9	9.6	61.5
30th %ile Term Code	Gap	Coord	Gap	Coord
10th %ile Green (s)	0.0	60.0	7.0	71.0
10th %ile Term Code	Skip	Coord	Gap	Coord

Intersection Summary
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	1909	145	2029
v/c Ratio	0.39	0.48	0.57	0.38
Control Delay	11.4	10.0	46.4	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.4	10.0	46.4	0.4
Queue Length 50th (ft)	1	125	82	5
Queue Length 95th (ft)	37	231	m103	9
Internal Link Dist (ft)	1061	848		420
Turn Bay Length (ft)			100	
Base Capacity (vph)	423	3941	307	5275
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.24	0.48	0.47	0.38

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	92	1754	2	133	1867
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.86		1.00	0.86
Frt	0.87		1.00		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1615		6407		1770	6408
Flt Permitted	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1615		6407		1770	6408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	100	1907	2	145	2029
RTOR Reduction (vph)	91	0	0	0	0	0
Lane Group Flow (vph)	11	0	1909	0	145	2029
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	6.9		45.3		10.8	60.1
Effective Green, g (s)	6.9		45.3		10.8	60.1
Actuated g/C Ratio	0.09		0.60		0.14	0.80
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	149		3870		255	5135
v/s Ratio Prot	c0.01		c0.30		c0.08	0.32
v/s Ratio Perm						
v/c Ratio	0.08		0.49		0.57	0.40
Uniform Delay, d1	31.1		8.4		29.9	2.2
Progression Factor	1.00		1.00		1.36	0.10
Incremental Delay, d2	0.2		0.5		2.0	0.2
Delay (s)	31.3		8.8		42.8	0.4
Level of Service	C		A		D	A
Approach Delay (s)	31.3		8.8			3.2
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

2030 Conditions

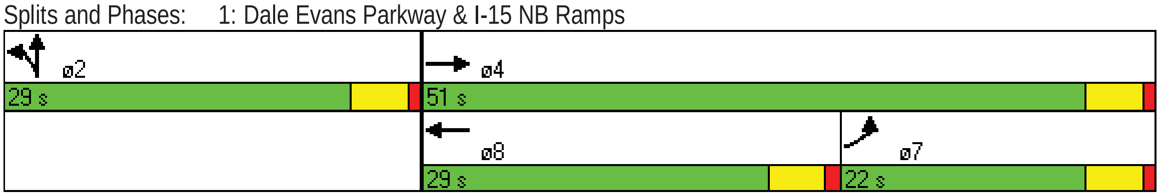
Base + DEMU Mitigations

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Configurations					
Volume (vph)	255	636	495	762	2
Turn Type	Prot			Split	
Protected Phases	7	4	8	2	2
Permitted Phases					
Detector Phase	7	4	8	2	2
Switch Phase					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	22.0	51.0	29.0	29.0	29.0
Total Split (%)	27.5%	63.8%	36.3%	36.3%	36.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Max	C-Max	Max	Max
Act Effct Green (s)	17.0	46.0	24.0	24.0	24.0
Actuated g/C Ratio	0.21	0.58	0.30	0.30	0.30
v/c Ratio	0.74	0.34	0.68	0.80	0.74
Control Delay	26.1	1.1	26.3	33.1	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	1.1	26.3	33.1	20.7
LOS	C	A	C	C	C
Approach Delay		8.3	26.3		28.6
Approach LOS		A	C		C

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 69 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 117.5% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 1: Dale Evans Parkway & I-15 NB Ramps



Lane Group	EBL	EBT	WBT	NBL	NBT
Protected Phases	7	4	8	2	2
Permitted Phases					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	28.0	28.0	28.0	28.0
Total Split (s)	22.0	51.0	29.0	29.0	29.0
Total Split (%)	27.5%	63.8%	36.3%	36.3%	36.3%
Maximum Green (s)	17.0	46.0	24.0	24.0	24.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag		Lead		
Lead-Lag Optimize?	Yes		Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	Max	Max
Walk Time (s)		5.0	5.0	5.0	5.0
Flash Dont Walk (s)		18.0	18.0	18.0	18.0
Pedestrian Calls (#/hr)		5	5	5	5
90th %ile Green (s)	17.0	46.0	24.0	24.0	24.0
90th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
70th %ile Green (s)	17.0	46.0	24.0	24.0	24.0
70th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
50th %ile Green (s)	17.0	46.0	24.0	24.0	24.0
50th %ile Term Code	Max	Coord	Coord	MaxR	MaxR
30th %ile Green (s)	17.0	46.0	24.0	24.0	24.0
30th %ile Term Code	Hold	Coord	Coord	MaxR	MaxR
10th %ile Green (s)	17.0	46.0	24.0	24.0	24.0
10th %ile Term Code	Hold	Coord	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 69 (86%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	277	691	729	828	466
v/c Ratio	0.74	0.34	0.68	0.80	0.74
Control Delay	26.1	1.1	26.3	33.1	20.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	26.1	1.1	26.3	33.1	20.7
Queue Length 50th (ft)	101	1	153	195	104
Queue Length 95th (ft)	m#236	1	214	#264	220
Internal Link Dist (ft)		820	380		2022
Turn Bay Length (ft)	225			150	
Base Capacity (vph)	376	2035	1065	1030	634
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.74	0.34	0.68	0.80	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

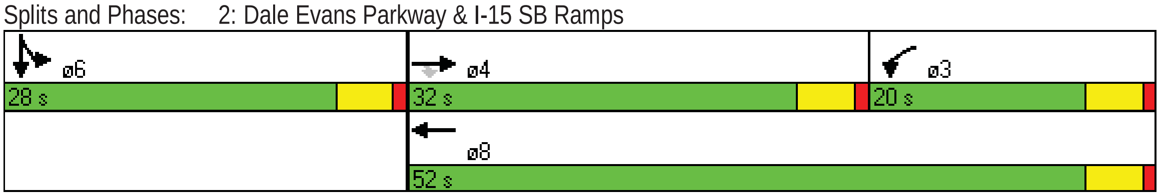
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	255	636	0	0	495	176	762	2	427	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0			5.0		5.0	5.0				
Lane Util. Factor	1.00	0.95			0.95		0.97	1.00				
Frt	1.00	1.00			0.96		1.00	0.85				
Flt Protected	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (prot)	1770	3539			3400		3433	1585				
Flt Permitted	0.95	1.00			1.00		0.95	1.00				
Satd. Flow (perm)	1770	3539			3400		3433	1585				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	277	691	0	0	538	191	828	2	464	0	0	0
RTOR Reduction (vph)	0	0	0	0	45	0	0	159	0	0	0	0
Lane Group Flow (vph)	277	691	0	0	684	0	828	307	0	0	0	0
Turn Type	Prot						Split					
Protected Phases	7	4			8		2	2				
Permitted Phases												
Actuated Green, G (s)	17.0	46.0			24.0		24.0	24.0				
Effective Green, g (s)	17.0	46.0			24.0		24.0	24.0				
Actuated g/C Ratio	0.21	0.57			0.30		0.30	0.30				
Clearance Time (s)	5.0	5.0			5.0		5.0	5.0				
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0				
Lane Grp Cap (vph)	376	2035			1020		1030	476				
v/s Ratio Prot	c0.16	0.20			c0.20		c0.24	0.19				
v/s Ratio Perm												
v/c Ratio	0.74	0.34			0.67		0.80	0.65				
Uniform Delay, d1	29.4	9.0			24.5		25.8	24.3				
Progression Factor	0.49	0.08			1.00		1.00	1.00				
Incremental Delay, d2	6.1	0.4			3.5		6.7	6.6				
Delay (s)	20.4	1.1			28.1		32.5	30.9				
Level of Service	C	A			C		C	C				
Approach Delay (s)		6.6			28.1			31.9			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Configurations						
Volume (vph)	573	977	321	935	318	1
Turn Type		Perm	Prot		Split	
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Detector Phase	4	4	3	8	6	6
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	32.0	32.0	20.0	52.0	28.0	28.0
Total Split (%)	40.0%	40.0%	25.0%	65.0%	35.0%	35.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Act Effct Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
Actuated g/C Ratio	0.34	0.34	0.19	0.59	0.29	0.29
v/c Ratio	0.52	1.07	1.05	0.49	0.68	0.88
Control Delay	6.7	63.6	85.7	5.6	33.1	40.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	63.6	85.7	5.6	33.1	40.7
LOS	A	E	F	A	C	D
Approach Delay	42.6			26.1		37.5
Approach LOS	D			C		D

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 71 (89%), Referenced to phase 4:EBT and 8:WBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 35.7	Intersection LOS: D
Intersection Capacity Utilization 117.5%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 2: Dale Evans Parkway & I-15 SB Ramps



Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Protected Phases	4		3	8	6	6
Permitted Phases		4				
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	9.0	21.0	28.0	28.0
Total Split (s)	32.0	32.0	20.0	52.0	28.0	28.0
Total Split (%)	40.0%	40.0%	25.0%	65.0%	35.0%	35.0%
Maximum Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lead	Lead	Lag			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	None	C-Max	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	18.0	18.0
Pedestrian Calls (#/hr)	5	5		5	5	5
90th %ile Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
90th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
70th %ile Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
70th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
50th %ile Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
50th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
30th %ile Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
30th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR
10th %ile Green (s)	27.0	27.0	15.0	47.0	23.0	23.0
10th %ile Term Code	Coord	Coord	Max	Coord	MaxR	MaxR

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 4:EBT and 8:WBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT
Lane Group Flow (vph)	623	1062	349	1016	346	469
v/c Ratio	0.52	1.07	1.05	0.49	0.68	0.88
Control Delay	6.7	63.6	85.7	5.6	33.1	40.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	63.6	85.7	5.6	33.1	40.7
Queue Length 50th (ft)	26	~575	~203	170	152	174
Queue Length 95th (ft)	32	#381	m#326	154	244	#350
Internal Link Dist (ft)	920			820		1339
Turn Bay Length (ft)			300		300	
Base Capacity (vph)	1194	994	332	2079	509	534
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	1.07	1.05	0.49	0.68	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

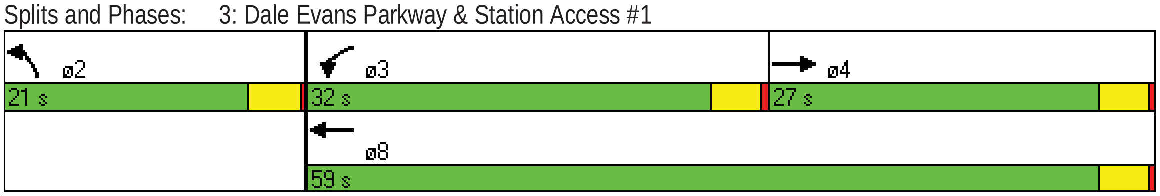
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	573	977	321	935	0	0	0	0	318	1	431
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					1.00	1.00	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3539	1583	1770	3539					1770	1584	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3539	1583	1770	3539					1770	1584	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	623	1062	349	1016	0	0	0	0	346	1	468
RTOR Reduction (vph)	0	0	460	0	0	0	0	0	0	0	79	0
Lane Group Flow (vph)	0	623	602	349	1016	0	0	0	0	346	390	0
Turn Type			Perm	Prot						Split		
Protected Phases		4		3	8					6	6	
Permitted Phases			4									
Actuated Green, G (s)		27.0	27.0	15.0	47.0					23.0	23.0	
Effective Green, g (s)		27.0	27.0	15.0	47.0					23.0	23.0	
Actuated g/C Ratio		0.34	0.34	0.19	0.59					0.29	0.29	
Clearance Time (s)		5.0	5.0	5.0	5.0					5.0	5.0	
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lane Grp Cap (vph)		1194	534	332	2079					509	455	
v/s Ratio Prot		0.18		c0.20	0.29					0.20	c0.25	
v/s Ratio Perm			c0.38									
v/c Ratio		0.52	1.13	1.05	0.49					0.68	0.86	
Uniform Delay, d1		21.3	26.5	32.5	9.5					25.2	26.9	
Progression Factor		0.26	2.18	0.91	0.52					1.00	1.00	
Incremental Delay, d2		1.2	74.4	53.4	0.5					7.2	18.4	
Delay (s)		6.7	132.2	83.0	5.5					32.4	45.4	
Level of Service		A	F	F	A					C	D	
Approach Delay (s)		85.8			25.3			0.0			39.9	
Approach LOS		F			C			A			D	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	117.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1266	355	1010	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	27.0	32.0	59.0	21.0
Total Split (%)	33.8%	40.0%	73.8%	26.3%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	23.7	22.2	49.9	22.1
Actuated g/C Ratio	0.30	0.28	0.62	0.28
v/c Ratio	0.73	0.78	0.35	0.46
Control Delay	15.1	28.9	6.6	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.1	28.9	6.6	6.2
LOS	B	C	A	A
Approach Delay	15.1		12.4	6.2
Approach LOS	B		B	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 76 (95%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 13.0	Intersection LOS: B
Intersection Capacity Utilization 65.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Dale Evans Parkway & Station Access #1



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	27.0	32.0	59.0	21.0
Total Split (%)	33.8%	40.0%	73.8%	26.3%
Maximum Green (s)	23.0	28.0	55.0	17.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	23.0	28.0	55.0	17.0
90th %ile Term Code	Max	Max	Hold	Coord
70th %ile Green (s)	25.4	25.6	55.0	17.0
70th %ile Term Code	Max	Gap	Hold	Coord
50th %ile Green (s)	25.7	22.7	52.4	19.6
50th %ile Term Code	Gap	Gap	Hold	Coord
30th %ile Green (s)	23.6	19.7	47.3	24.7
30th %ile Term Code	Gap	Gap	Hold	Coord
10th %ile Green (s)	20.8	15.1	39.9	32.1
10th %ile Term Code	Gap	Gap	Hold	Coord

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 76 (95%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1378	386	1098	310
v/c Ratio	0.73	0.78	0.35	0.46
Control Delay	15.1	28.9	6.6	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.1	28.9	6.6	6.2
Queue Length 50th (ft)	28	160	64	1
Queue Length 95th (ft)	44	m214	m69	64
Internal Link Dist (ft)	920		920	1731
Turn Bay Length (ft)		200		
Base Capacity (vph)	1934	620	3496	668
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.62	0.31	0.46

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

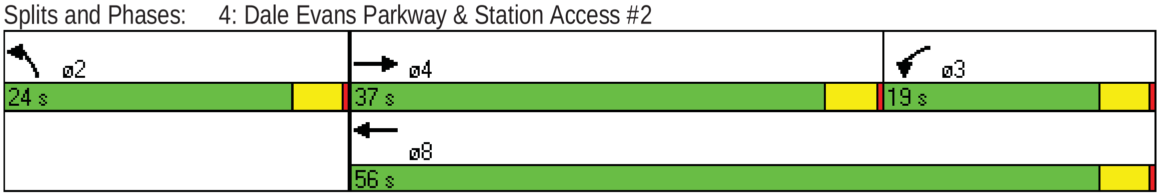
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1266	2	355	1010	2	283
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.91	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6406		1770	5085	1612	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6406		1770	5085	1612	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1376	2	386	1098	2	308
RTOR Reduction (vph)	0	0	0	0	223	0
Lane Group Flow (vph)	1378	0	386	1098	87	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	23.7		22.2	49.9	22.1	
Effective Green, g (s)	23.7		22.2	49.9	22.1	
Actuated g/C Ratio	0.30		0.28	0.62	0.28	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	1898		491	3172	445	
v/s Ratio Prot	c0.22		c0.22	0.22	c0.05	
v/s Ratio Perm						
v/c Ratio	0.73		0.79	0.35	0.20	
Uniform Delay, d1	25.2		26.7	7.2	22.2	
Progression Factor	0.51		0.74	0.92	1.00	
Incremental Delay, d2	1.3		6.5	0.1	1.0	
Delay (s)	14.1		26.2	6.7	23.1	
Level of Service	B		C	A	C	
Approach Delay (s)	14.1			11.8	23.1	
Approach LOS	B			B	C	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL
Lane Configurations				
Volume (vph)	1211	81	929	2
Turn Type		Prot		
Protected Phases	4	3	8	2
Permitted Phases				
Detector Phase	4	3	8	2
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	37.0	19.0	56.0	24.0
Total Split (%)	46.3%	23.8%	70.0%	30.0%
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		
Recall Mode	None	None	None	C-Max
Act Effct Green (s)	25.3	9.3	36.7	35.3
Actuated g/C Ratio	0.32	0.12	0.46	0.44
v/c Ratio	0.65	0.43	0.34	0.08
Control Delay	24.8	24.6	4.7	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.8	24.6	4.7	6.2
LOS	C	C	A	A
Approach Delay	24.8		6.3	6.2
Approach LOS	C		A	A

Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 6 (8%), Referenced to phase 2:NBL and 6:, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 16.1	Intersection LOS: B
Intersection Capacity Utilization 35.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Dale Evans Parkway & Station Access #2



Lane Group	EBT	WBL	WBT	NBL
Protected Phases	4	3	8	2
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	8.0	20.0	20.0
Total Split (s)	37.0	19.0	56.0	24.0
Total Split (%)	46.3%	23.8%	70.0%	30.0%
Maximum Green (s)	33.0	15.0	52.0	20.0
Yellow Time (s)	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	C-Max
Walk Time (s)	5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0	0
90th %ile Green (s)	30.6	12.8	47.4	24.6
90th %ile Term Code	Gap	Gap	Hold	Coord
70th %ile Green (s)	27.9	10.7	42.6	29.4
70th %ile Term Code	Gap	Gap	Hold	Coord
50th %ile Green (s)	25.0	9.3	38.3	33.7
50th %ile Term Code	Gap	Gap	Hold	Coord
30th %ile Green (s)	23.5	7.9	35.4	36.6
30th %ile Term Code	Gap	Gap	Hold	Coord
10th %ile Green (s)	19.7	0.0	19.7	52.3
10th %ile Term Code	Gap	Skip	Hold	Coord

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 6 (8%), Referenced to phase 2:NBL and 6:, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	1318	88	1010	63
v/c Ratio	0.65	0.43	0.34	0.08
Control Delay	24.8	24.6	4.7	6.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.8	24.6	4.7	6.2
Queue Length 50th (ft)	164	39	18	1
Queue Length 95th (ft)	178	83	17	27
Internal Link Dist (ft)	920		920	736
Turn Bay Length (ft)		200		
Base Capacity (vph)	2643	332	4165	747
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.27	0.24	0.08

Intersection Summary

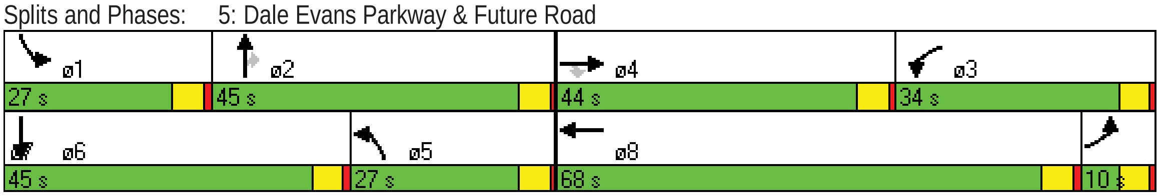
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1211	2	81	929	2	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.86		1.00	0.86	1.00	
Frt	1.00		1.00	1.00	0.87	
Flt Protected	1.00		0.95	1.00	1.00	
Satd. Flow (prot)	6406		1770	6408	1617	
Flt Permitted	1.00		0.95	1.00	1.00	
Satd. Flow (perm)	6406		1770	6408	1617	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1316	2	88	1010	2	61
RTOR Reduction (vph)	0	0	0	0	35	0
Lane Group Flow (vph)	1318	0	88	1010	28	0
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	25.3		8.1	37.4	34.6	
Effective Green, g (s)	25.3		8.1	37.4	34.6	
Actuated g/C Ratio	0.32		0.10	0.47	0.43	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	2026		179	2996	699	
v/s Ratio Prot	c0.21		c0.05	0.16	c0.02	
v/s Ratio Perm						
v/c Ratio	0.65		0.49	0.34	0.04	
Uniform Delay, d1	23.5		34.0	13.5	13.1	
Progression Factor	1.00		0.57	0.33	1.00	
Incremental Delay, d2	0.8		2.0	0.1	0.1	
Delay (s)	24.3		21.6	4.5	13.2	
Level of Service	C		C	A	B	
Approach Delay (s)	24.3			5.9	13.2	
Approach LOS	C			A	B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Volume (vph)	17	141	363	687	89	515	722	586	485	969
Turn Type	Prot		Perm	Prot		Prot		Perm	Prot	
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Detector Phase	7	4	4	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	10.0	44.0	44.0	34.0	68.0	27.0	45.0	45.0	27.0	45.0
Total Split (%)	6.7%	29.3%	29.3%	22.7%	45.3%	18.0%	30.0%	30.0%	18.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Act Effct Green (s)	15.8	17.6	17.6	29.2	37.4	22.2	40.3	40.3	22.2	40.3
Actuated g/C Ratio	0.12	0.14	0.14	0.23	0.29	0.17	0.31	0.31	0.17	0.31
v/c Ratio	0.08	0.32	0.83	0.96	0.25	0.95	0.50	0.76	0.90	0.68
Control Delay	47.7	50.6	28.8	74.6	16.3	80.4	38.9	15.7	72.0	42.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	50.6	28.8	74.6	16.3	80.4	38.9	15.7	72.0	42.8
LOS	D	D	C	E	B	F	D	B	E	D
Approach Delay		35.3			59.4		43.2			52.4
Approach LOS		D			E		D			D

Intersection Summary	
Cycle Length: 150	
Actuated Cycle Length: 129.4	
Natural Cycle: 150	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.96	
Intersection Signal Delay: 48.3	Intersection LOS: D
Intersection Capacity Utilization 74.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 5: Dale Evans Parkway & Future Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4		3	8	5	2		1	6
Permitted Phases			4					2		
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	9.0	44.0	44.0	9.0	44.0	9.0	44.0	44.0	9.0	44.0
Total Split (s)	10.0	44.0	44.0	34.0	68.0	27.0	45.0	45.0	27.0	45.0
Total Split (%)	6.7%	29.3%	29.3%	22.7%	45.3%	18.0%	30.0%	30.0%	18.0%	30.0%
Maximum Green (s)	5.0	39.0	39.0	29.0	63.0	22.0	40.0	40.0	22.0	40.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max
Walk Time (s)		5.0	5.0		5.0		5.0	5.0		5.0
Flash Dont Walk (s)		34.0	34.0		34.0		34.0	34.0		34.0
Pedestrian Calls (#/hr)		5	5		5		5	5		5
90th %ile Green (s)	29.0	39.0	39.0	29.0	39.0	22.0	40.0	40.0	22.0	40.0
90th %ile Term Code	Hold	Ped	Ped	Max	Ped	Max	MaxR	MaxR	Max	MaxR
70th %ile Green (s)	38.6	21.0	21.0	29.0	11.4	22.0	40.0	40.0	22.0	40.0
70th %ile Term Code	Hold	Gap	Gap	Max	Gap	Max	MaxR	MaxR	Max	MaxR
50th %ile Green (s)	0.0	14.5	14.5	29.0	48.5	22.0	40.0	40.0	22.0	40.0
50th %ile Term Code	Skip	Gap	Gap	Max	Hold	Max	MaxR	MaxR	Max	MaxR
30th %ile Green (s)	0.0	9.5	9.5	29.0	43.5	22.0	40.0	40.0	22.0	40.0
30th %ile Term Code	Skip	Gap	Gap	Max	Hold	Max	MaxR	MaxR	Max	MaxR
10th %ile Green (s)	0.0	7.9	7.9	29.0	41.9	22.0	40.0	40.0	22.0	40.0
10th %ile Term Code	Skip	Gap	Gap	Max	Hold	Max	MaxR	MaxR	Max	MaxR

Intersection Summary

Cycle Length: 150
Actuated Cycle Length: 129.4
Control Type: Semi Act-Uncoord
90th %ile Actuated Cycle: 150
70th %ile Actuated Cycle: 132
50th %ile Actuated Cycle: 125.5
30th %ile Actuated Cycle: 120.5
10th %ile Actuated Cycle: 118.9

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	153	395	747	263	560	785	637	527	1075
v/c Ratio	0.08	0.32	0.83	0.96	0.25	0.95	0.50	0.76	0.90	0.68
Control Delay	47.7	50.6	28.8	74.6	16.3	80.4	38.9	15.7	72.0	42.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	50.6	28.8	74.6	16.3	80.4	38.9	15.7	72.0	42.8
Queue Length 50th (ft)	15	61	76	309	25	233	187	85	217	275
Queue Length 95th (ft)	39	93	195	#562	77	#443	293	304	#407	417
Internal Link Dist (ft)		1660			920		920			1521
Turn Bay Length (ft)						100		150	100	
Base Capacity (vph)	216	1074	690	775	1655	588	1583	842	588	1580
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.14	0.57	0.96	0.16	0.95	0.50	0.76	0.90	0.68

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	141	363	687	89	153	515	722	586	485	969	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.91	1.00	0.97	0.91	
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3539	1583	3433	3204		3433	5085	1583	3433	5070	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	153	395	747	97	166	560	785	637	527	1053	22
RTOR Reduction (vph)	0	0	260	0	119	0	0	0	353	0	1	0
Lane Group Flow (vph)	18	153	135	747	144	0	560	785	284	527	1074	0
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	12.6	17.6	17.6	32.4	37.4		22.2	40.3	40.3	22.2	40.3	
Effective Green, g (s)	12.6	17.6	17.6	32.4	37.4		22.2	40.3	40.3	22.2	40.3	
Actuated g/C Ratio	0.10	0.13	0.13	0.24	0.28		0.17	0.30	0.30	0.17	0.30	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	168	470	210	839	904		575	1547	481	575	1542	
v/s Ratio Prot	0.01	0.04		c0.22	0.04		c0.16	0.15		c0.15	c0.21	
v/s Ratio Perm			c0.09						0.18			
v/c Ratio	0.11	0.33	0.64	0.89	0.16		0.97	0.51	0.59	0.92	0.70	
Uniform Delay, d1	54.8	52.1	54.5	48.3	35.7		54.9	37.9	39.1	54.2	40.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.4	6.6	11.6	0.1		30.7	1.2	5.3	19.4	2.6	
Delay (s)	55.1	52.5	61.0	60.0	35.8		85.6	39.1	44.4	73.6	43.3	
Level of Service	E	D	E	E	D		F	D	D	E	D	
Approach Delay (s)		58.5			53.7			53.9			53.3	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	54.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	132.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	48	2	2	2	71	1736	56	1899
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	22.0	22.0	22.0	22.0	15.0	47.0	11.0	43.0
Total Split (%)	27.5%	27.5%	27.5%	27.5%	18.8%	58.8%	13.8%	53.8%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	9.4	9.4		9.4	9.9	57.7	7.8	53.3
Actuated g/C Ratio	0.12	0.12		0.12	0.12	0.72	0.10	0.67
v/c Ratio	0.26	0.39		0.20	0.35	0.41	0.35	0.50
Control Delay	33.6	11.0		13.0	25.0	1.4	39.2	9.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	11.0		13.0	25.0	1.4	39.2	9.7
LOS	C	B		B	C	A	D	A
Approach Delay		18.2		13.0		2.3		10.5
Approach LOS		B		B		A		B

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 10 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Natural Cycle: 55

Control Type: Actuated-Coordinated

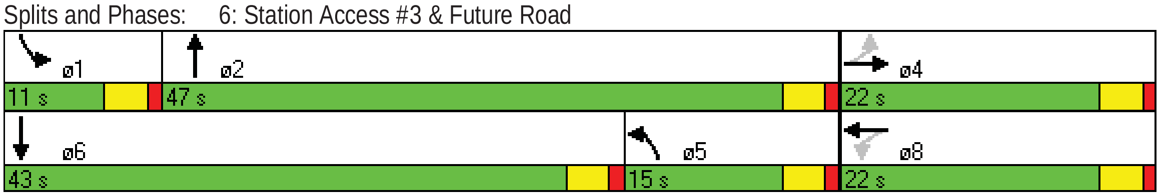
Maximum v/c Ratio: 0.50

Intersection Signal Delay: 7.2 Intersection LOS: A

Intersection Capacity Utilization 51.9% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 6: Station Access #3 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	20.0	20.0	9.0	21.0	8.0	21.0
Total Split (s)	22.0	22.0	22.0	22.0	15.0	47.0	11.0	43.0
Total Split (%)	27.5%	27.5%	27.5%	27.5%	18.8%	58.8%	13.8%	53.8%
Maximum Green (s)	18.0	18.0	18.0	18.0	11.0	43.0	7.0	39.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lag	Lead	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	16.0	16.0	16.0	16.0	11.0	43.0	9.0	41.0
90th %ile Term Code	Ped	Ped	Hold	Hold	Max	Coord	Max	Coord
70th %ile Green (s)	9.9	9.9	9.9	9.9	11.0	48.8	9.3	47.1
70th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
50th %ile Green (s)	8.4	8.4	8.4	8.4	11.0	51.5	8.1	48.6
50th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
30th %ile Green (s)	7.0	7.0	7.0	7.0	11.0	65.0	0.0	50.0
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Skip	Coord
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	76.0	0.0	76.0
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Coord	Skip	Coord

Intersection Summary
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 10 (13%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	52	110	46	77	1889	61	2135
v/c Ratio	0.26	0.39	0.20	0.35	0.41	0.35	0.50
Control Delay	33.6	11.0	13.0	25.0	1.4	39.2	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	11.0	13.0	25.0	1.4	39.2	9.7
Queue Length 50th (ft)	24	1	2	36	23	29	163
Queue Length 95th (ft)	52	41	28	m77	41	64	252
Internal Link Dist (ft)		813	777		420		920
Turn Bay Length (ft)				100		100	
Base Capacity (vph)	386	441	395	243	4619	179	4255
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.25	0.12	0.32	0.41	0.34	0.50

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	2	99	2	2	39	71	1736	2	56	1899	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.88		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1588			1630		1770	6407		1770	6376	
Flt Permitted	0.92	1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1718	1588			1611		1770	6407		1770	6376	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	2	108	2	2	42	77	1887	2	61	2064	71
RTOR Reduction (vph)	0	97	0	0	38	0	0	0	0	0	4	0
Lane Group Flow (vph)	52	13	0	0	8	0	77	1889	0	61	2131	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	8.3	8.3			8.3		9.7	54.4		5.3	50.0	
Effective Green, g (s)	8.3	8.3			8.3		9.7	54.4		5.3	50.0	
Actuated g/C Ratio	0.10	0.10			0.10		0.12	0.68		0.07	0.62	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	178	165			167		215	4357		117	3985	
v/s Ratio Prot		0.01					0.04	c0.29		0.03	c0.33	
v/s Ratio Perm	c0.03				0.01							
v/c Ratio	0.29	0.08			0.05		0.36	0.43		0.52	0.53	
Uniform Delay, d1	33.1	32.4			32.3		32.3	5.8		36.1	8.4	
Progression Factor	1.00	1.00			1.00		0.66	0.17		1.00	1.00	
Incremental Delay, d2	0.9	0.2			0.1		0.9	0.3		4.1	0.5	
Delay (s)	34.1	32.6			32.4		22.2	1.3		40.3	9.0	
Level of Service	C	C			C		C	A		D	A	
Approach Delay (s)		33.1			32.4			2.1			9.8	
Approach LOS		C			C			A			A	

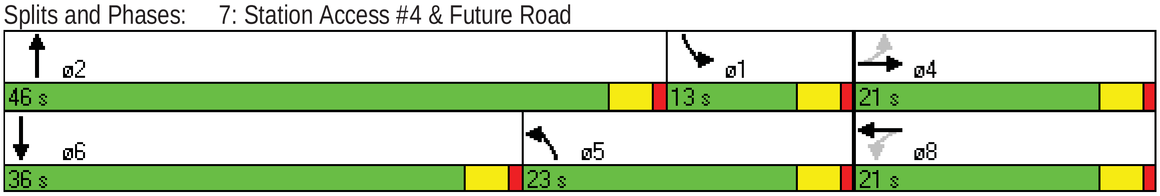
Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	145	2	2	2	239	1607	78	1703
Turn Type	Perm		Perm		Prot		Prot	
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	21.0	21.0	21.0	21.0	23.0	46.0	13.0	36.0
Total Split (%)	26.3%	26.3%	26.3%	26.3%	28.8%	57.5%	16.3%	45.0%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lag	Lead	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	13.3	13.3		13.3	17.1	48.6	8.1	37.6
Actuated g/C Ratio	0.17	0.17		0.17	0.21	0.61	0.10	0.47
v/c Ratio	0.64	0.61		0.24	0.69	0.45	0.47	0.70
Control Delay	42.8	9.0		11.1	38.3	1.4	37.7	10.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	9.0		11.1	38.3	1.4	37.7	10.1
LOS	D	A		B	D	A	D	B
Approach Delay		20.0		11.1		6.2		11.2
Approach LOS		C		B		A		B

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 2 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 10.0 Intersection LOS: A
Intersection Capacity Utilization 70.0% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 7: Station Access #4 & Future Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Protected Phases		4		8	5	2	1	6
Permitted Phases	4		8					
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	21.0	21.0	21.0	21.0	23.0	46.0	13.0	36.0
Total Split (%)	26.3%	26.3%	26.3%	26.3%	28.8%	57.5%	16.3%	45.0%
Maximum Green (s)	17.0	17.0	17.0	17.0	19.0	42.0	9.0	32.0
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lead/Lag					Lag	Lead	Lag	Lead
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0	5.0	5.0				5.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0				11.0
Pedestrian Calls (#/hr)	5	5	0	0				5
90th %ile Green (s)	17.0	17.0	17.0	17.0	19.0	42.0	9.0	32.0
90th %ile Term Code	Max	Max	Hold	Hold	Max	Coord	Max	Coord
70th %ile Green (s)	16.0	16.0	16.0	16.0	19.0	43.0	9.0	33.0
70th %ile Term Code	Gap	Gap	Hold	Hold	Max	Coord	Max	Coord
50th %ile Green (s)	13.8	13.8	13.8	13.8	19.0	45.2	9.0	35.2
50th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Max	Coord
30th %ile Green (s)	11.4	11.4	11.4	11.4	17.8	48.8	7.8	38.8
30th %ile Term Code	Gap	Gap	Hold	Hold	Hold	Coord	Gap	Coord
10th %ile Green (s)	8.1	8.1	8.1	8.1	10.8	63.9	0.0	49.1
10th %ile Term Code	Gap	Gap	Hold	Hold	Gap	Coord	Skip	Coord

Intersection Summary

Cycle Length: 80

Actuated Cycle Length: 80

Offset: 2 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green

Control Type: Actuated-Coordinated

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	158	325	63	260	1749	85	2086
v/c Ratio	0.64	0.61	0.24	0.69	0.45	0.47	0.70
Control Delay	42.8	9.0	11.1	38.3	1.4	37.7	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.8	9.0	11.1	38.3	1.4	37.7	10.1
Queue Length 50th (ft)	74	1	2	143	5	45	67
Queue Length 95th (ft)	129	65	33	218	10	93	79
Internal Link Dist (ft)		873	973		420		420
Turn Bay Length (ft)				200		100	
Base Capacity (vph)	316	591	315	420	3891	199	2988
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.55	0.20	0.62	0.45	0.43	0.70

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	2	297	2	2	54	239	1607	2	78	1703	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.86		1.00	0.86	
Frt	1.00	0.85			0.87		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1585			1625		1770	6407		1770	6300	
Flt Permitted	0.80	1.00			0.78		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1485	1585			1261		1770	6407		1770	6300	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	158	2	323	2	2	59	260	1747	2	85	1851	235
RTOR Reduction (vph)	0	269	0	0	49	0	0	0	0	0	26	0
Lane Group Flow (vph)	158	56	0	0	14	0	260	1749	0	85	2060	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	13.3	13.3			13.3		18.0	47.7		7.0	36.7	
Effective Green, g (s)	13.3	13.3			13.3		18.0	47.7		7.0	36.7	
Actuated g/C Ratio	0.17	0.17			0.17		0.22	0.60		0.09	0.46	
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	247	264			210		398	3820		155	2890	
v/s Ratio Prot		0.04					c0.15	0.27		0.05	c0.33	
v/s Ratio Perm	c0.11				0.01							
v/c Ratio	0.64	0.21			0.07		0.65	0.46		0.55	0.71	
Uniform Delay, d1	31.1	28.8			28.1		28.2	9.0		35.0	17.4	
Progression Factor	1.00	1.00			1.00		1.03	0.11		0.88	0.50	
Incremental Delay, d2	5.4	0.4			0.1		3.4	0.4		3.5	1.4	
Delay (s)	36.5	29.2			28.2		32.3	1.3		34.3	10.1	
Level of Service	D	C			C		C	A		C	B	
Approach Delay (s)		31.6			28.2			5.3			11.1	
Approach LOS		C			C			A			B	

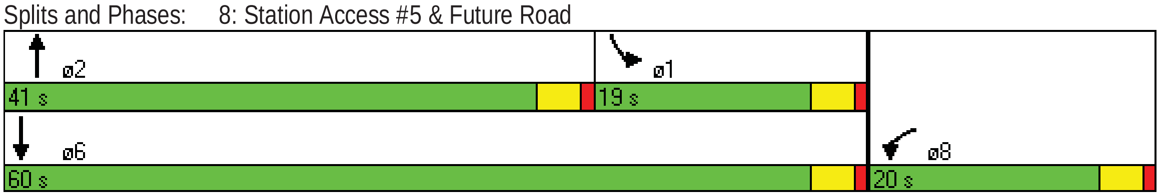
Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Volume (vph)	2	1754	133	1867
Turn Type			Prot	
Protected Phases	8	2	1	6
Permitted Phases				
Detector Phase	8	2	1	6
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	20.0	41.0	19.0	60.0
Total Split (%)	25.0%	51.3%	23.8%	75.0%
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0
Lead/Lag		Lead	Lag	
Lead-Lag Optimize?		Yes	Yes	
Recall Mode	None	C-Max	None	C-Max
Act Effct Green (s)	8.0	46.9	15.0	66.7
Actuated g/C Ratio	0.10	0.59	0.19	0.83
v/c Ratio	0.41	0.51	0.44	0.38
Control Delay	12.2	11.4	20.5	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.2	11.4	20.5	0.4
LOS	B	B	C	A
Approach Delay	12.2	11.4		1.7
Approach LOS	B	B		A

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 75 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 6.4 Intersection LOS: A
Intersection Capacity Utilization 48.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 8: Station Access #5 & Future Road



Lane Group	WBL	NBT	SBL	SBT
Protected Phases	8	2	1	6
Permitted Phases				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0	8.0	20.0
Total Split (s)	20.0	41.0	19.0	60.0
Total Split (%)	25.0%	51.3%	23.8%	75.0%
Maximum Green (s)	16.0	37.0	15.0	56.0
Yellow Time (s)	3.0	3.0	3.0	3.0
All-Red Time (s)	1.0	1.0	1.0	1.0
Lead/Lag		Lead	Lag	
Lead-Lag Optimize?		Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	None	C-Max
Walk Time (s)	5.0	5.0		5.0
Flash Dont Walk (s)	11.0	11.0		11.0
Pedestrian Calls (#/hr)	5	5		5
90th %ile Green (s)	16.0	37.0	15.0	56.0
90th %ile Term Code	Ped	Coord	Max	Coord
70th %ile Green (s)	7.4	45.6	15.0	64.6
70th %ile Term Code	Gap	Coord	Hold	Coord
50th %ile Green (s)	5.6	47.4	15.0	66.4
50th %ile Term Code	Gap	Coord	Hold	Coord
30th %ile Green (s)	5.5	47.5	15.0	66.5
30th %ile Term Code	Gap	Coord	Hold	Coord
10th %ile Green (s)	0.0	57.0	15.0	76.0
10th %ile Term Code	Skip	Coord	Hold	Coord

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 75 (94%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Control Type: Actuated-Coordinated

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	1909	145	2029
v/c Ratio	0.41	0.51	0.44	0.38
Control Delay	12.2	11.4	20.5	0.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.2	11.4	20.5	0.4
Queue Length 50th (ft)	1	146	70	5
Queue Length 95th (ft)	39	242	m93	10
Internal Link Dist (ft)	1061	848		420
Turn Bay Length (ft)			100	
Base Capacity (vph)	403	3757	332	5343
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.25	0.51	0.44	0.38

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	2	92	1754	2	133	1867
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		0.86		1.00	0.86
Frt	0.87		1.00		1.00	1.00
Flt Protected	1.00		1.00		0.95	1.00
Satd. Flow (prot)	1615		6407		1770	6408
Flt Permitted	1.00		1.00		0.95	1.00
Satd. Flow (perm)	1615		6407		1770	6408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	100	1907	2	145	2029
RTOR Reduction (vph)	91	0	0	0	0	0
Lane Group Flow (vph)	11	0	1909	0	145	2029
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	6.9		46.1		15.0	65.1
Effective Green, g (s)	6.9		46.1		15.0	65.1
Actuated g/C Ratio	0.09		0.58		0.19	0.81
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	139		3692		332	5215
v/s Ratio Prot	c0.01		c0.30		0.08	c0.32
v/s Ratio Perm						
v/c Ratio	0.08		0.52		0.44	0.39
Uniform Delay, d1	33.6		10.2		28.8	2.0
Progression Factor	1.00		1.00		0.59	0.10
Incremental Delay, d2	0.2		0.5		0.7	0.2
Delay (s)	33.9		10.8		17.7	0.4
Level of Service	C		B		B	A
Approach Delay (s)	33.9		10.8			1.5
Approach LOS	C		B			A

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Victorville Option 3

Signal Warrant Analysis Worksheets

Warrants Volume

Information

Analyst	AB	Intersection	I-15 NB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 NB Ramps
File Name	Vic3-Int 1 Ex+DMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

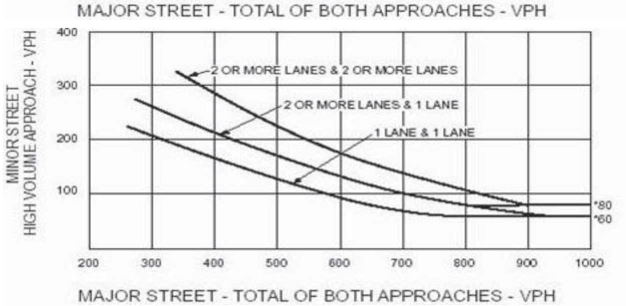
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

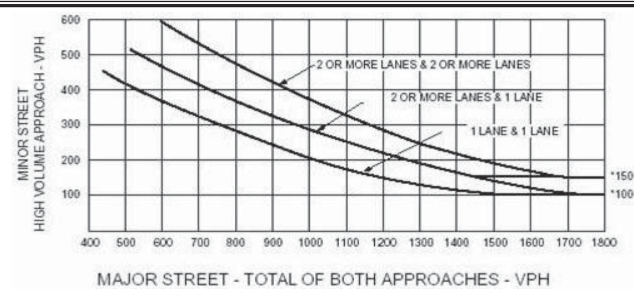
Condition B - Interruption of Continuous Traffic

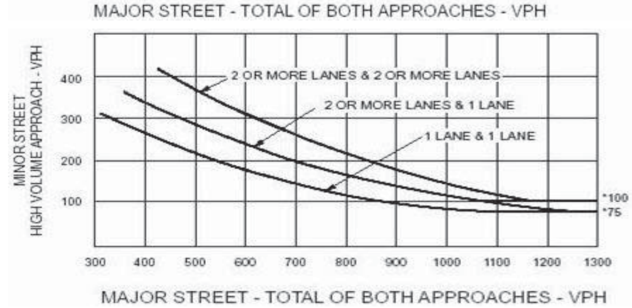
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2



Warrant 3





Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	436	583	1019	No	Yes	No	No	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	436	583	1019	0	1	0	0	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:06 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 SB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 SB Ramps
File Name	Vic3-Int 2 Ex+DMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

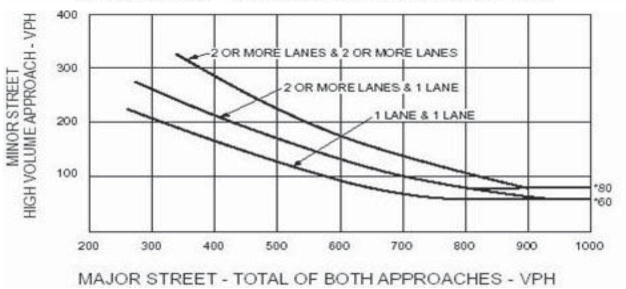
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more ...	1................	600	480	420	150	120	105
2 or more ...	2 or more ...	600	480	420	200	160	140
1................	2 or more	500	400	350	200	160	140

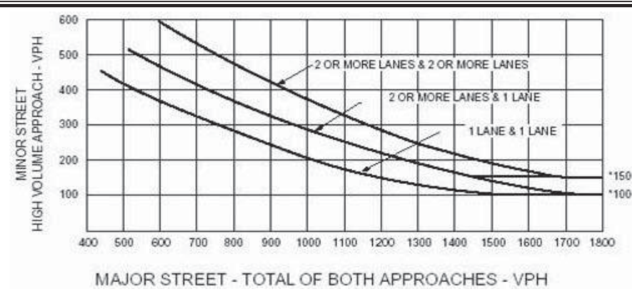
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more ...	1................	900	720	630	75	60	53
2 or more ...	2 or more ...	900	720	630	100	80	70
1................	2 or more	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	1230	182	1412	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	1230	182	1412	1	1	1	1	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:08 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 NB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 NB Ramps
File Name	Vic3-Int 1 Ex+EMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

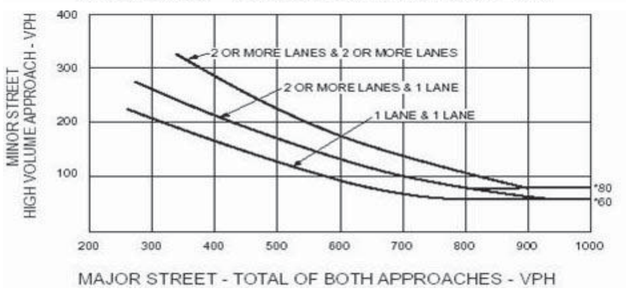
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

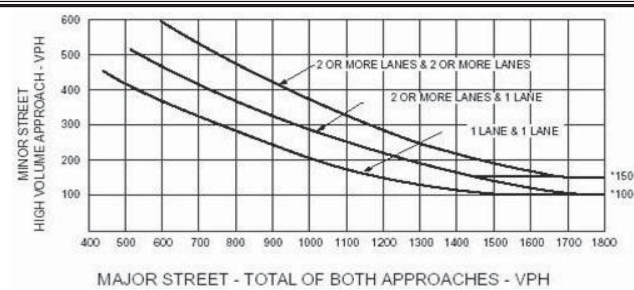
Condition B - Interruption of Continuous Traffic

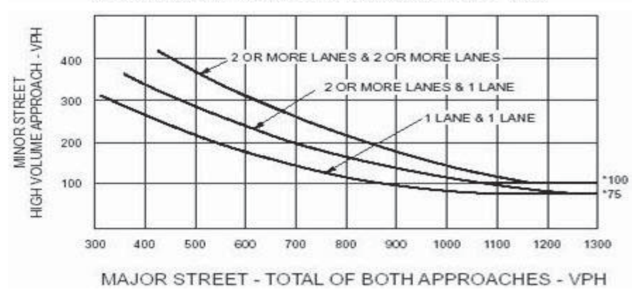
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2



Warrant 3





Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	522	814	1336	Yes	Yes	No	No	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	522	814	1336	1	1	0	0	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:07 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 SB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 SB Ramps
File Name	Vic3-Int 2 Ex+EMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

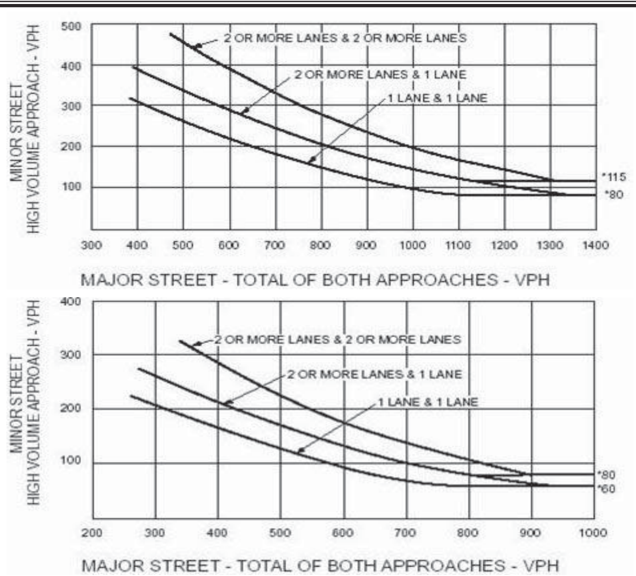
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

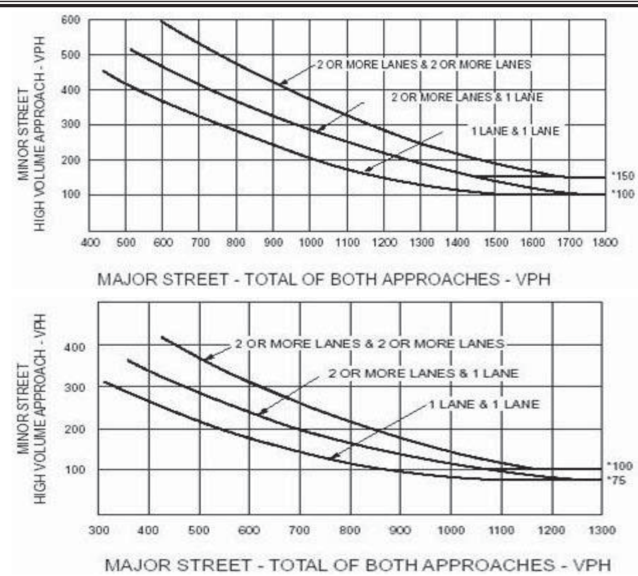
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	1720	197	1917	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	1720	197	1917	1	1	1	1	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:09 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 NB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 NB Ramps
File Name	Vic3-Int 1 2013+DMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

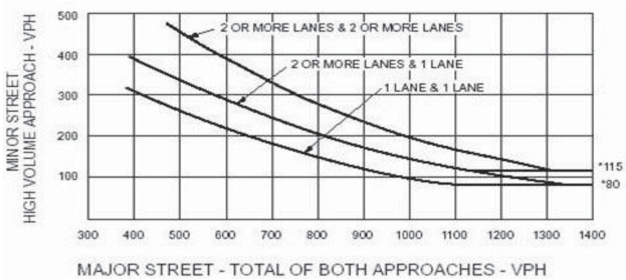
Condition A - Minimum Vehicular Volume

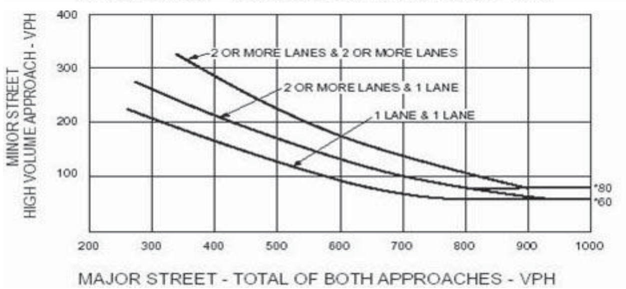
Number of lanes for moving traffic on each approach: Major Street	Minor Street	Vehicles per hour on major street (total of both approaches): 100%[a]	80%[b]	70%[c]	Vehicles per hour on higher-volume minor-street approach (one direction only): 100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

Condition B - Interruption of Continuous Traffic

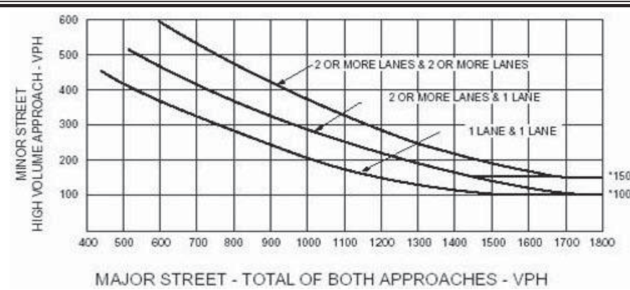
Number of lanes for moving traffic on each approach: Major Street	Minor Street	Vehicles per hour on major street (total of both approaches): 100%[a]	80%[b]	70%[c]	Vehicles per hour on higher-volume minor-street approach (one direction only): 100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2





Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	651	699	1350	Yes	Yes	No	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	651	699	1350	1	1	0	1	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:04 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 SB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 SB Ramps
File Name	Vic3-Int 2 2013+DMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

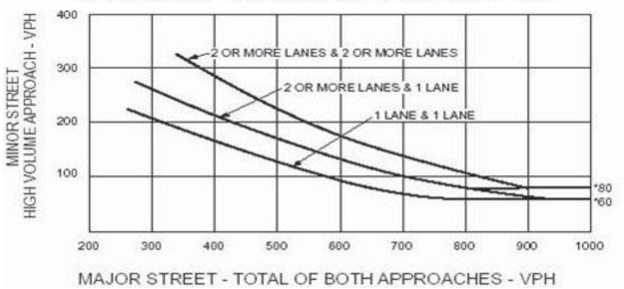
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1...............	1...............	500	400	350	150	120	105
2 or more ...	1...............	600	480	420	150	120	105
2 or more ...	2 or more ...	600	480	420	200	160	140
1...............	2 or more	500	400	350	200	160	140

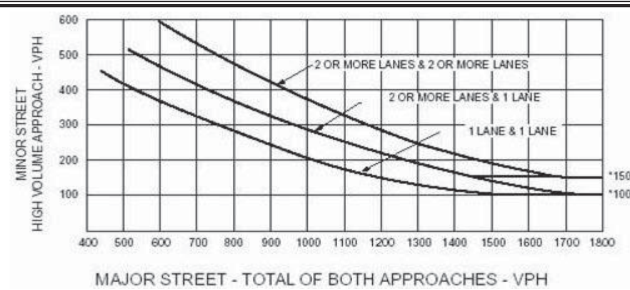
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1...............	1...............	750	600	525	75	60	53
2 or more ...	1...............	900	720	630	75	60	53
2 or more ...	2 or more ...	900	720	630	100	80	70
1...............	2 or more	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	1530	290	1820	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	1530	290	1820	1	1	1	1	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:07 PM

Warrants Volume

Information

Analyst	AB	Intersection	Future Street/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	Future Street
File Name	Vic3-Int 5 2013+DMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

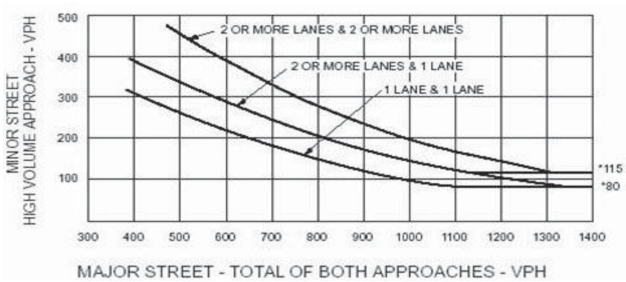
Condition A - Minimum Vehicular Volume

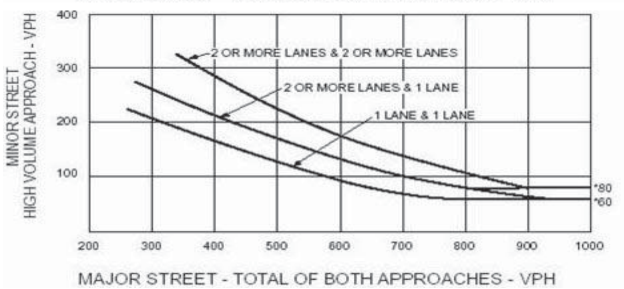
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

Condition B - Interruption of Continuous Traffic

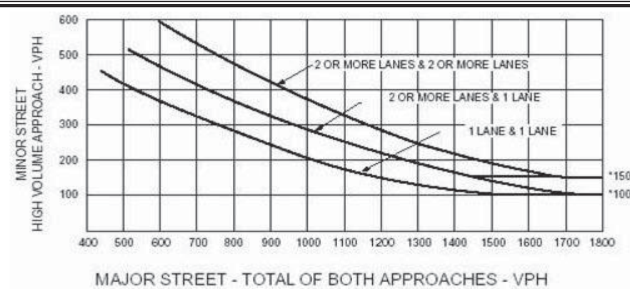
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2





Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	492	497	1270	No	Yes	No	No	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	492	497	1270	0	1	0	0	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:10 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 NB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 NB Ramps
File Name	Vic3-Int 1 2013+EMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

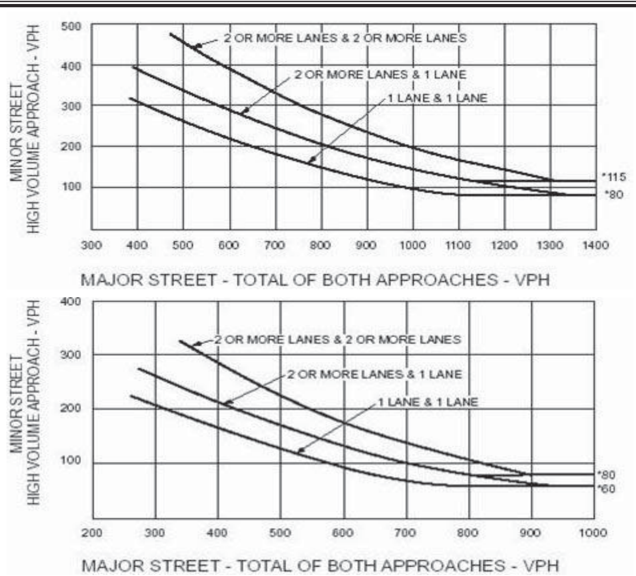
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more ...	1................	600	480	420	150	120	105
2 or more ...	2 or more ...	600	480	420	200	160	140
1................	2 or more	500	400	350	200	160	140

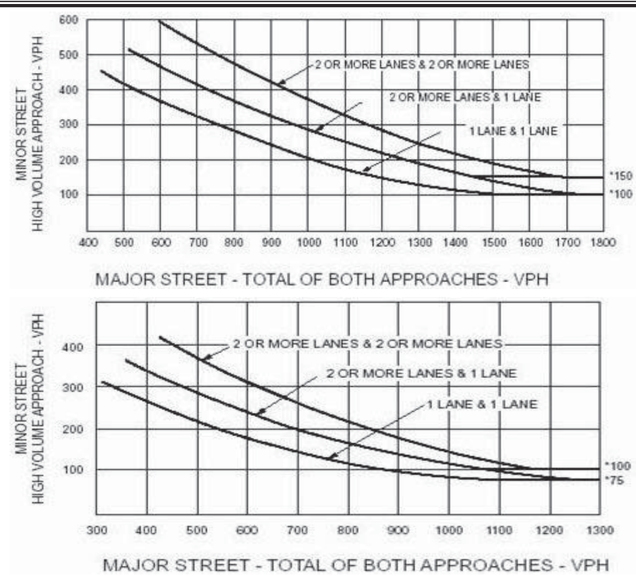
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more ...	1................	900	720	630	75	60	53
2 or more ...	2 or more ...	900	720	630	100	80	70
1................	2 or more	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1	**Minor Street Lanes** 1	**Speed**	30	**Population**	10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	737	930	1667	Yes	Yes	No	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	737	930	1667	1	1	0	1	1	1	1

 *HCS+*TM Version 5.3 Generated: 11/2/2009 12:05 PM

Warrants Volume

Information

Analyst	AB	Intersection	I-15 SB Ramps/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	I-15 SB Ramps
File Name	Vic3-Int 2 2013+EMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

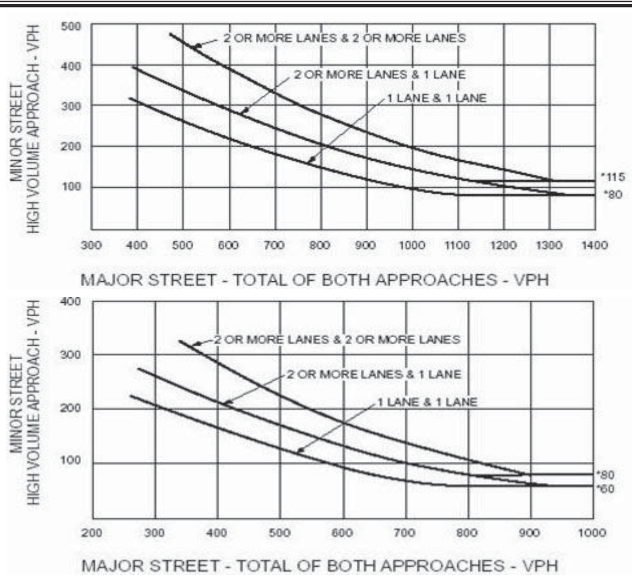
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more ...	1................	600	480	420	150	120	105
2 or more ...	2 or more ...	600	480	420	200	160	140
1................	2 or more	500	400	350	200	160	140

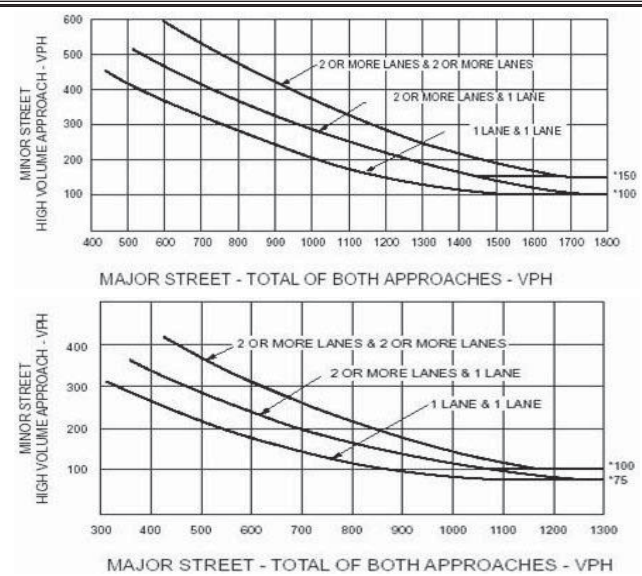
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more ...	1................	900	720	630	75	60	53
2 or more ...	2 or more ...	900	720	630	100	80	70
1................	2 or more	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 30 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	2020	305	2325	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	2020	305	2325	1	1	1	1	1	1	1

 HCS+TM Version 5.3 Generated: 11/2/2009 12:08 PM

Warrants Volume

Information

Analyst	AB	Intersection	Station Access 1/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	Station Access #1
File Name	Vic3-Int 3 2013+EMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

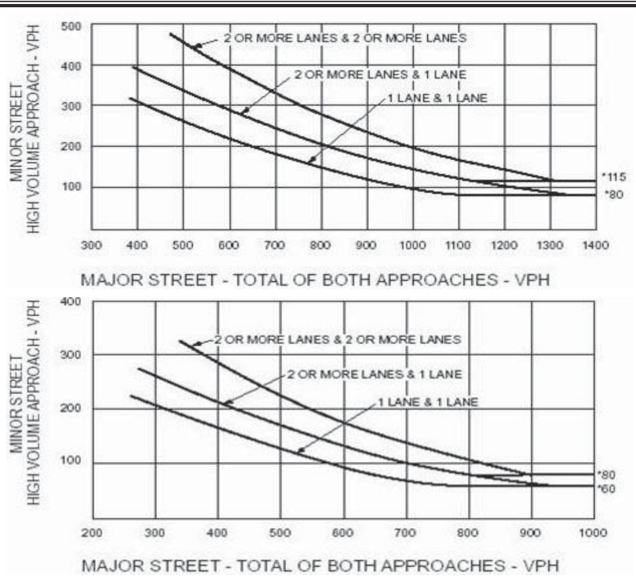
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach: Major Street	Minor Street	Vehicles per hour on major street (total of both approaches): 100%ª	80%ᵇ	70%ᶜ	Vehicles per hour on higher-volume minor-street approach (one direction only): 100%ª	80%ᵇ	70%ᶜ
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

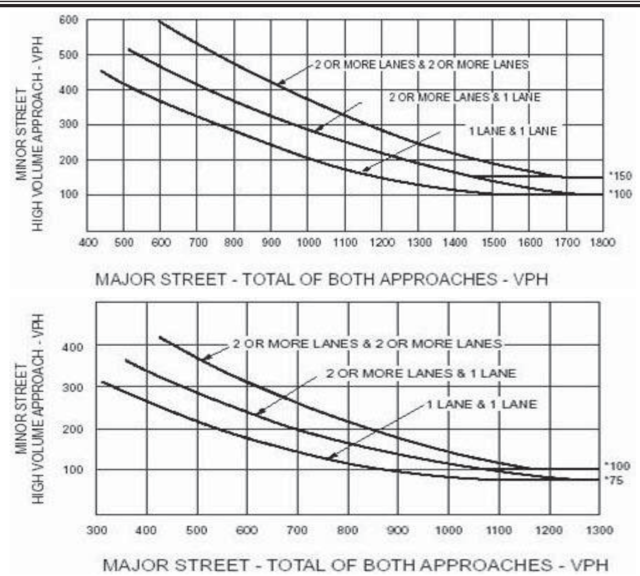
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach: Major Street	Minor Street	Vehicles per hour on major street (total of both approaches): 100%ª	80%ᵇ	70%ᶜ	Vehicles per hour on higher-volume minor-street approach (one direction only): 100%ª	80%ᵇ	70%ᶜ
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1 **Minor Street Lanes** 1 **Speed** 15 **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	1655	402	2057	Yes	Yes	Yes	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	1655	402	2057	1	1	1	1	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:09 PM

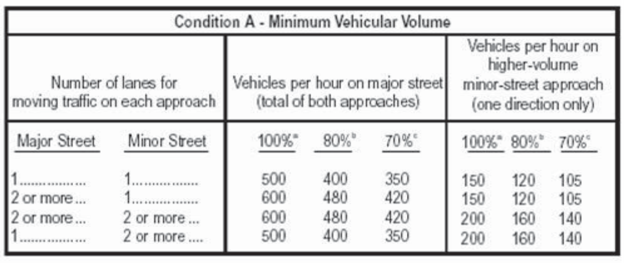
Warrants Volume

Information

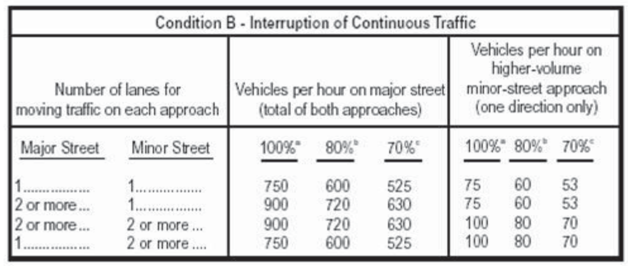
Analyst	AB	Intersection	Future Street/DaleEvansPkwy
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Dale Evans Parkway	North/South Street	Future Street
File Name	Vic3-Int 5 2013+EMU.xhy	Major Street	East-West

Project Description *DesertXpress*

Warrant 1

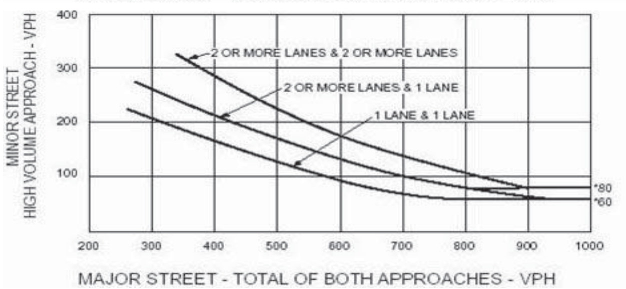


Condition A - Minimum Vehicular Volume							
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	500	400	350	150	120	105
2 or more...	1................	600	480	420	150	120	105
2 or more...	2 or more...	600	480	420	200	160	140
1................	2 or more....	500	400	350	200	160	140

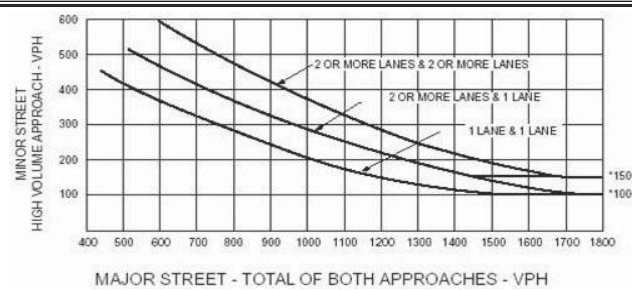


Condition B - Interruption of Continuous Traffic							
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%[a]	80%[b]	70%[c]	100%[a]	80%[b]	70%[c]
1................	1................	750	600	525	75	60	53
2 or more...	1................	900	720	630	75	60	53
2 or more...	2 or more...	900	720	630	100	80	70
1................	2 or more....	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1		**Minor Street Lanes** 1		**Speed**	30	**Population**	10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	603	573	1457	Yes	Yes	No	Yes	Yes	Yes	Yes
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	603	573	1457	1	1	0	1	1	1	1

 HCS+™ Version 5.3 Generated: 11/2/2009 12:10 PM

Warrants Volume

Information

Analyst	AB	Intersection	Station Access4/Future Street
Agency/Co	AECOM	Jurisdiction	Caltrans
Date Performed	06/15/09	Units	U.S. Customary
Project ID	DesertXpress	Time Period Analyzed	PM
East/West Street	Station Access #4	North/South Street	Future Street
File Name	Vic3-Int 7 2013+EMU.xhy	Major Street	North-South

Project Description *DesertXpress*

Warrant 1

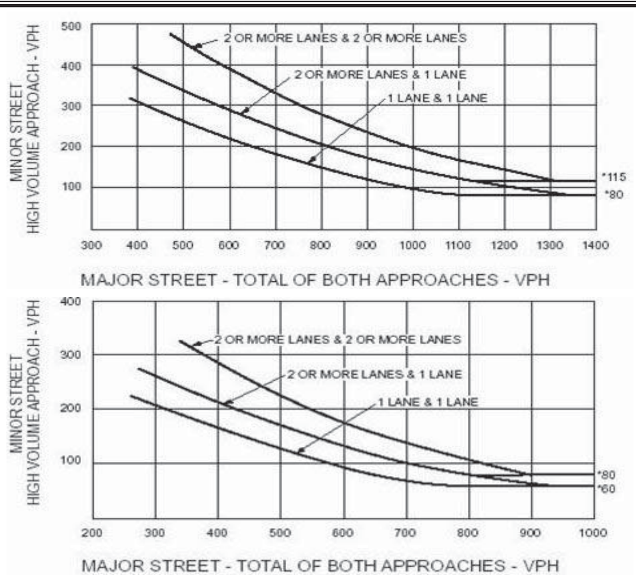
Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%a	80%b	70%c	100%a	80%b	70%c
1................	1................	500	400	350	150	120	105
2 or more ...	1................	600	480	420	150	120	105
2 or more ...	2 or more ...	600	480	420	200	160	140
1................	2 or more	500	400	350	200	160	140

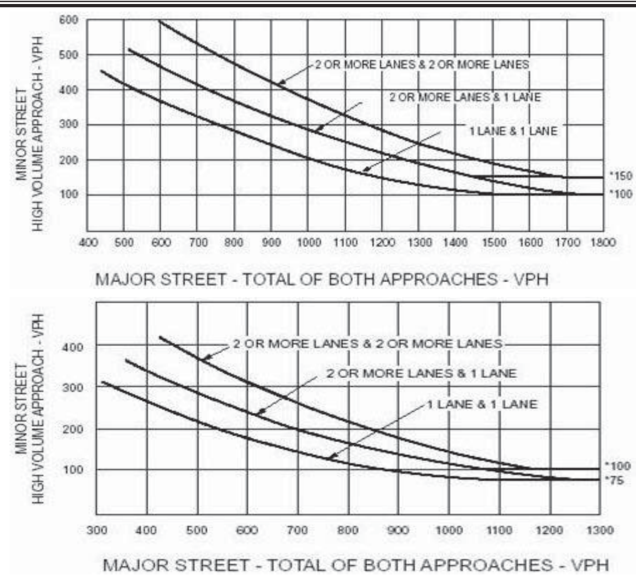
Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on higher-volume minor-street approach (one direction only)		
Major Street	Minor Street	100%a	80%b	70%c	100%a	80%b	70%c
1................	1................	750	600	525	75	60	53
2 or more ...	1................	900	720	630	75	60	53
2 or more ...	2 or more ...	900	720	630	100	80	70
1................	2 or more	750	600	525	100	80	70

Warrant 2



Warrant 3



Volume Summary

Major Street Lanes 1 | **Minor Street Lanes** 1 | **Speed** 30 | **Population** 10000+

Hours	Major Volume	Minor Volume	Total Volume	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (100%)
07-08	0	0	0	No	No	No	No	No	No	No
08-09	0	0	0	No	No	No	No	No	No	No
09-10	0	0	0	No	No	No	No	No	No	No
10-11	0	0	0	No	No	No	No	No	No	No
11-12	0	0	0	No	No	No	No	No	No	No
12-13	0	0	0	No	No	No	No	No	No	No
13-14	0	0	0	No	No	No	No	No	No	No
14-15	0	0	0	No	No	No	No	No	No	No
15-16	0	0	0	No	No	No	No	No	No	No
16-17	1104	87	1271	No	No	Yes	Yes	Yes	No	No
17-18	0	0	0	No	No	No	No	No	No	No
18-19	0	0	0	No	No	No	No	No	No	No
Totals	1104	87	1271	0	0	1	1	1	0	0

 *HCS+*TM Version 5.3 Generated: 11/2/2009 12:11 PM