APPENDIX L

TRANSPORTATION IMPACT ANALYSIS

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IS/MND Transportation Analysis for the 1095 Rollins Road Project

Prepared for the City of Burlingame

Submitted by
W-Trans

October 9, 2019

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Executive Summary

The proposed 1095 Rollins Road project would result in construction of 150-unit rental apartment and demolition of an existing restaurant and tennis/basketball court. The project's anticipated trip generation includes a reduction of 198 daily trips on average during a weekday, with a net increase of 46 trips during the a.m. peak hour and 28 fewer trips during the p.m. peak hour.

The study area was established by the City and includes thirteen intersections, including along Rollins Road, intersections in the vicinity of the project and intersection on Oak Grove Avenue. Analysis indicates that the thirteen study intersections are operating acceptably under Existing conditions.

For the Baseline scenario, projects volumes from approved projects in the vicinity of the project were added to the roadway network. Under the Baseline plus Project scenario, the study intersections are expected to continue operating acceptably.

Under the Future and Future plus Project scenarios, the study intersections are expected to operate acceptably, except for Rollins Road/Toyon Drive and California Drive/Broadway, which are expected to operate unacceptably at LOS F and E, respectively, during the p.m. peak hour. It should be noted, however, that the project decreases delay at both these intersections as there would be a net reduction of trips during the p.m. peak hour, which in turn makes it a less-than-significant impact.

Vehicles would access the project via one driveway on Rollins Road. Sight distances at the project driveway for both entering and exiting drivers is expected to be adequate if clear lines of sight are maintained, and on-street parking south of the driveway is removed.

The project was also reviewed for impacts in regards to the CEQA Initial Study checklist. The proposed project is expected to have a less than significant impact.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of a proposed 150-unit rental apartment project with 192 off-street parking spaces, to be located at 1095 Rollins Road in the City of Burlingame. The traffic study was completed in accordance with the criteria established by the City of Burlingame and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to a level of insignificance as defined by the City's General Plan or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

To make way for the proposed apartment project an existing restaurant and basketball/tennis court would be demolished. The location of the project site is shown in Figure 1.

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Figure 1 – Study Area and Existing Lane Configurations

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Transportation Setting

Operational Analysis

Study Area and Periods

The study area includes the following intersections:

1. US 101 NB Ramps/Bayshore Highway
2. Broadway-Airport Boulevard/Bayshore Highway
3. US 101 SB Ramps/Broadway
4. Rollins Road/Broadway
5. Rollins Road/Cadillac Way
6. Rollins Road/Toyon Drive
7. Carolan Avenue/Broadway
8. Carolan Avenue/Cadillac Way
9. California Drive/Broadway
10. California Drive/Carmelita Avenue
11. Chula Vista Avenue/Broadway
12. Carolan Avenue/Oak Grove Avenue
13. California Drive/Oak Grove Avenue

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

Study Intersections

US 101 NB Ramps/Bayshore Highway is a signalized four-legged intersection with the west leg being US 101 Northbound on and off-ramps, and the east leg is a private driveway.

Broadway-Airport Boulevard/Bayshore Highway is a signalized four-legged intersection. There are crosswalks on the north, south, and east legs.

US 101 SB Ramps/Broadway is a signalized four-legged intersection. There is one crosswalk on the US 101 SB off-ramp approach.

Rollins Road/Broadway is a signalized four-legged intersection. There are crosswalks on the north leg of Rollins Road and west leg of Broadway.

Rollins Road/Cadillac Way is a signalized T intersection with crosswalks on the west leg of Cadillac Way and the south leg of Rollins Road.

Rollins Road/Toyon Drive is an all-way stop-controlled t-intersection. There are no crosswalks.

Carolan Avenue/Broadway is a signalized t-intersection with crosswalks on both Carolan Avenue legs and the east leg of Broadway.

Carolan Avenue/Cadillac Way is a t-intersection with crosswalks on the Cadillac Way leg. There is a stop sign on Cadillac Way.

California Drive/Broadway is a signalized four-legged intersection. There are crosswalks on each leg.

California Drive/Carmelita Avenue is a four-legged signalized intersection with the east leg being the Caltrain Broadway Station Parking lot.

Chula Vista Avenue/Broadway is a T intersection with no stop controls. There are crosswalks on the Chula Vista leg and west Broadway leg.

Carolan Avenue/Oaks Grove Avenue is a four-legged stop-controlled intersection. There are crosswalks on the Carolan Avenue legs.

California Drive/Oaks Grove Avenue is a four-legged signalized intersection. There are crosswalks on all legs.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for the intersections with side street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections with stop signs on all approaches were analyzed using the "All-Way Stop-Controlled" Intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole and then related to a Level of Service.

The study intersections that are currently controlled by a traffic signal, or may be in the future, were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from the City of Burlingame. Traffic signal timing is currently being revised for the intersections of Rollins Road/Broadway and Rollins Road/Cadillac Way, and therefore an optimized signal timing plan was used in the analysis.

The ranges of delay associated with the various levels of service are indicated in Table 1.

Table 1 – Intersection Level of Service Criteria			
LOS	**Two-Way Stop-Controlled**	**All-Way Stop-Controlled**	**Signalized**
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Upon stopping, drivers are immediately able to proceed.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 15 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 15 to 25 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 25 to 35 seconds. Queues of more than two vehicles are encountered on one or more approaches.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 35 to 50 seconds. Longer queues are encountered on more than one approach to the intersection.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 50 seconds. Drivers enter long queues on all approaches.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual,* Transportation Research Board, 2000

Traffic Operation Standards

Traffic Operation Standards

The City of Burlingame does not have Traffic Impact Study guidelines; therefore, a Level of Service (LOS) standard of LOS D or better was applied to align with other traffic studies done in the area.

- Further, as the City does not have a criterion indicating the significance of a change in delay for intersections already operating at LOS E or F, the County of San Mateo Traffic Impact Study Requirements, 2013, were consulted. Under this criterion if the intersection is currently not in compliance with the LOS standard, "a project will be considered to have a significant impact if the project will cause the intersection to operate at a level of service that violates the standard LOS mentioned above and the proposed project increases average control delay at the intersection by four (4) seconds or more.''

The City of Burlingame does not have any definitions or thresholds for significance at unsignalized intersections. However, previous traffic studies completed for projects in the City of Burlingame have stated that a project would

have a significant adverse impact on traffic conditions at an unsignalized intersection with an unacceptable level of service (LOS E or LOS F) on any approach if the project adds at least 10 trips for any peak hour.

The project site is also near two Congestion Management Program (CMP) corridors. These are State Route (SR) 82 (El Camino Real) between Trousdale Drive and East Third Avenue, and US 101 between Broadway Avenue and Peninsula Avenue. Both corridors are located less than one mile from the project site.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Traffic data was collected when while local schools were in session.

Intersection Levels of Service

Under existing conditions, all study intersections operate acceptably. A summary of the intersection level of service calculations is contained in Table 2, and copies of the Level of Service calculations are provided in Appendix A. The existing traffic volumes are shown in Figure 2.

Table 2 – Existing Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. US 101 NB Ramps/Bayshore Hwy	30.3	C	25.8	C
2. Broadway-Airport Blvd/Bayshore Hwy	12.6	B	15.3	B
3. US 101 SB Ramps/Broadway	21.1	C	14.5	B
4. Rollins Rd/Broadway	24.5	C	20.4	C
5. Rollins Rd/Cadillac Way	7.4	A	6.8	A
6. Rollins Rd/Toyon Dr	10.5	B	29.2	D
7. Carolan Ave/Broadway	21.3	C	22.5	C
8. Carolan Ave/Cadillac Way	4.4	A	7.2	A
Westbound approach	27.9	D	24.7	C
9. California Dr/Broadway	30.4	C	38.0	D
10. California Dr/Carmelita Ave	15.5	B	12.1	B
11. Chula Vista Ave/Broadway	1.4	A	3.2	A
13. California Dr/Oak Grove Ave	28.9	C	23.6	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

The stop sign configuration on only three legs at the Oak Grove Avenue/Carolan Avenue intersection does not allow for the LOS to be determined using the standard methodologies contained in the HCM. Based on field observations, the eastbound approach is free-flowing, corresponding to LOS A operation with a volume of 656 vehicles during the a.m. peak hour and 380 vehicles during the p.m. peak hour. A long queue often develops on the westbound approach, especially during the evening peak period. Professional judgment indicates a worst-case operation on this approach of LOS E. Northbound traffic has long queues of traffic around high school start and end times, which can result in LOS F conditions during the peak drop-off periods. Southbound traffic is estimated as operating at LOS C during peak periods. Overall intersection operations can be described as

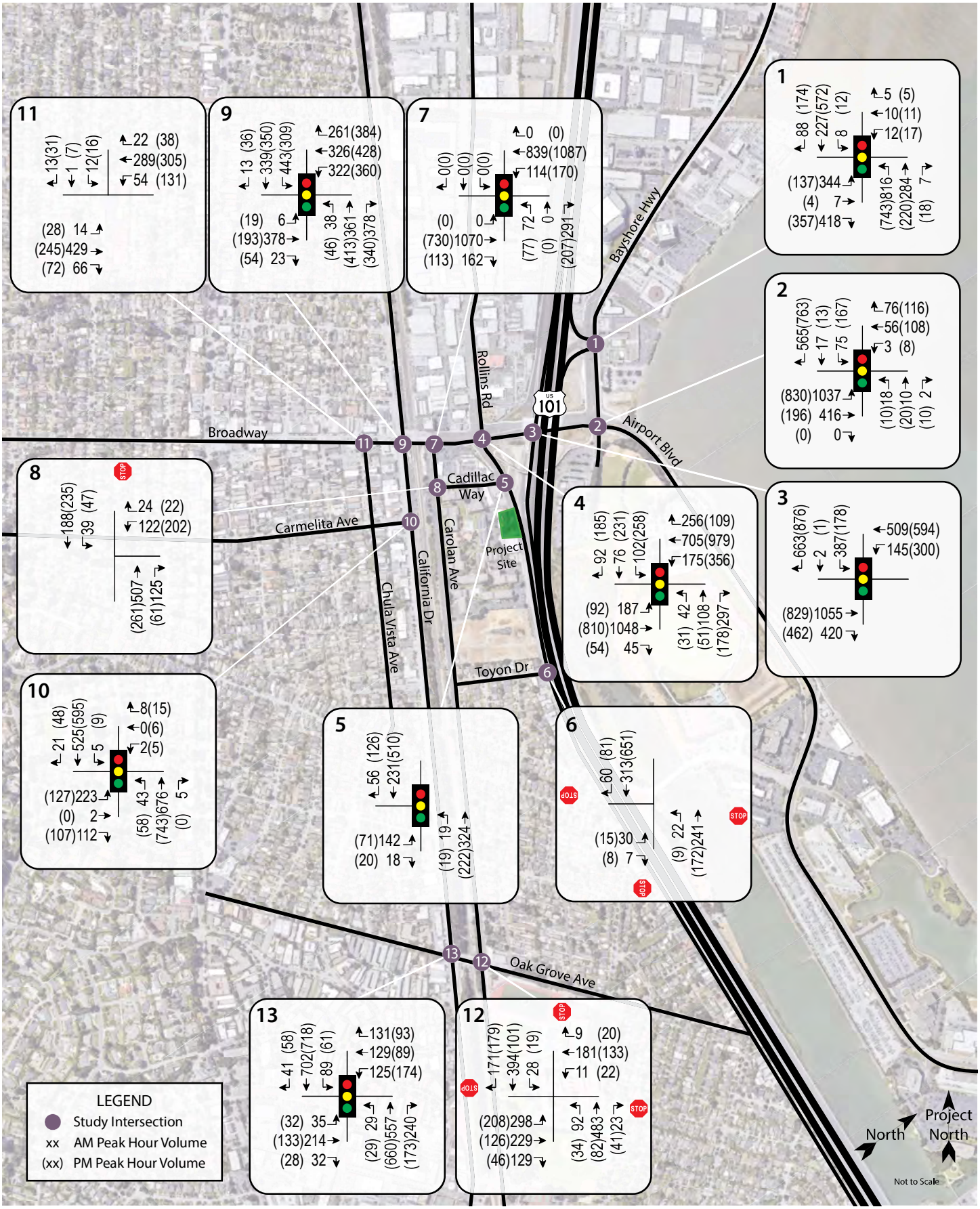

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Figure 2 – Existing Traffic Volumes

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approximately LOS C based on an average of the four approaches. During the a.m. peak hour, the northbound approach has the highest volume of traffic on the stop-controlled legs, with 598 vehicles. The southbound approach has the next highest volume of traffic during the p.m. peak hour with 299 vehicles.

Baseline Conditions

Baseline operating conditions were determined by adding traffic from the approved projects in the vicinity of the proposed project, listed below, to existing volumes. Under these conditions, all study intersections are expected to continue operating at the same overall service levels as under Existing Conditions. These results are summarized in Table 3, and Baseline volumes are shown in Figure 3.

- 225 California Drive – 43,235 square feet of office and 1,820 square feet of retail
- 250 California Drive – 44,118 square feet of office
- 240 Lorton Avenue – 13,801 square feet of office and 1,375 square feet of retail
- 988 Howard Avenue – 15,352 square feet of mixed-use including office and retail
- 1008-1028 Carolan Avenue – Residential, 268 apartments and 22 townhomes
- 1128 Douglas Avenue – 27-unit apartment complex
- 920 Bayswater Avenue – 128-unit apartment complex
- The Village at Burlingame – 132-unit apartment complex for elderly and workforce

Table 3 – Baseline Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. US 101 NB Ramps/Bayshore Hwy	30.4	C	26.2	C
2. Broadway-Airport Blvd/Bayshore Hwy	12.4	B	15.3	B
3. US 101 SB Ramps/Broadway	21.0	C	14.7	B
4. Rollins Rd/Broadway	25.7	C	20.5	C
5. Rollins Rd/Cadillac Way	7.4	A	6.8	A
6. Rollins Rd/Toyon Dr	10.6	B	29.2	D
7. Carolan Ave/Broadway	21.7	C	25.5	C
8. Carolan Ave/Cadillac Way	4.5	A	9.0	A
Westbound approach	*28.5*	*D*	*30.4*	*D*
9. California Dr/Broadway	32.3	C	38.6	D
10. California Dr/Carmelita Ave	15.6	B	12.6	B
11. Chula Vista Ave/Broadway	1.4	A	3.4	A
13. California Dr/Oak Grove Ave	30.0	C	23.6	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Cumulative Conditions

Cumulative 2040 peak hour volume projections for most of the study intersections were taken from the build out analysis contained in the *Burlingame General Plan,* Hexagon Transportation Consultants, 2018. For the Rollins Road/Toyon Drive, Carolan Avenue/Cadillac Way, California Drive/Carmelita Avenue, and Chula Vista

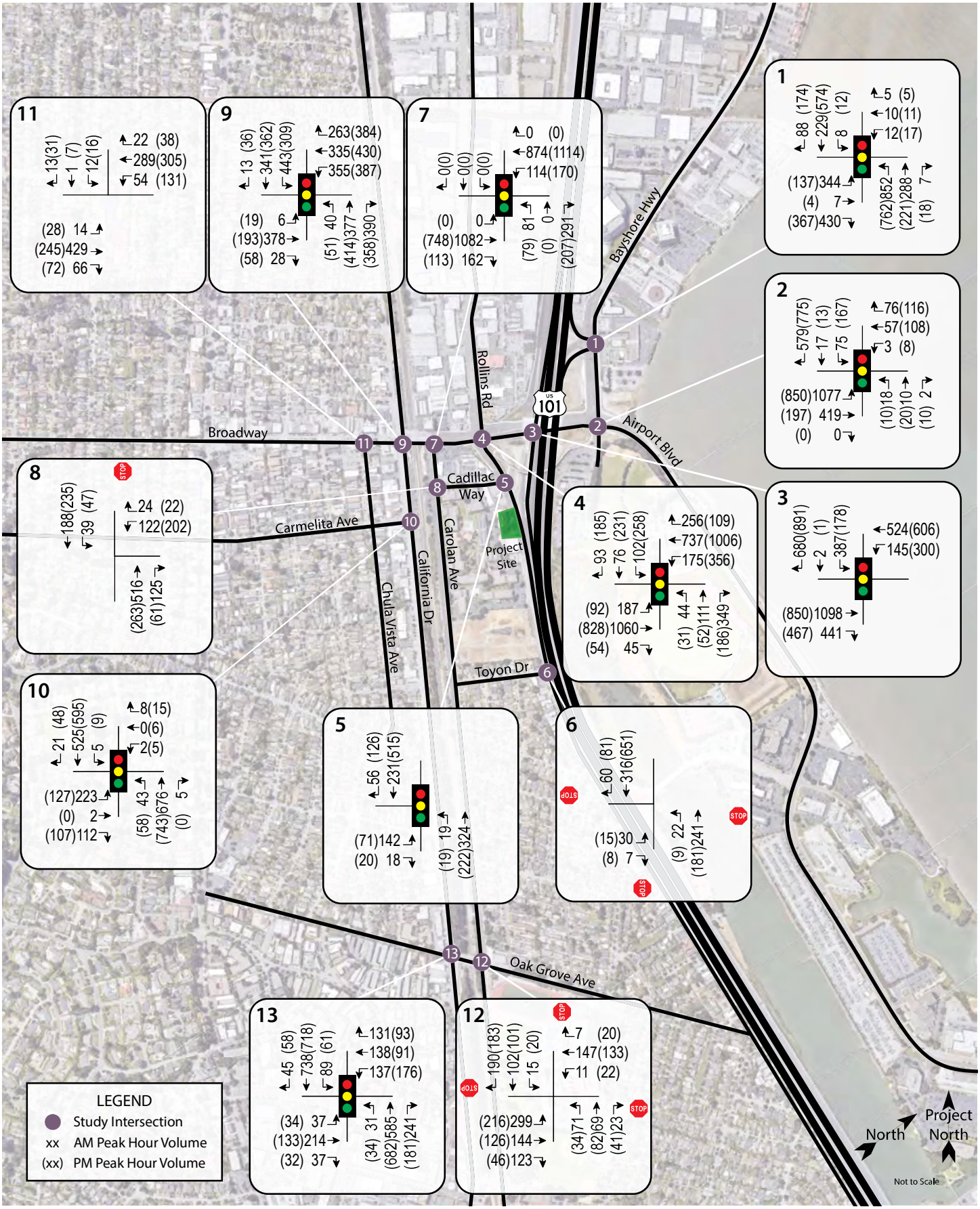

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Figure 3 – Baseline Traffic Volumes

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Ave/Broadway intersections, an average growth factor was calculated based on the analysis of other intersections in the *Burlingame General Plan*.

This scenario represents cumulative traffic conditions that would be expected upon build out of the land uses identified in the *Burlingame General Plan* including the construction of 300 Airport Boulevard.

Under the anticipated Cumulative volumes, the study intersections are expected to continue operating acceptably, with the exception of Rollins Road/Toyon Drive, Carolan Avenue/Broadway and California Drive/Broadway during the p.m. peak hour. Operating conditions are summarized in Table 4 and cumulative volumes are shown in Figure 4.

Table 4 – Cumulative Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. US 101 NB Ramps/Bayshore Hwy	**37.5**	**D**	29.0	C
2. Broadway-Airport Blvd/Bayshore Hwy	13.4	B	18.2	B
3. US 101 SB Ramps/Broadway	27.6	C	15.9	B
4. Rollins Rd/Broadway	27.0	C	22.3	C
5. Rollins Rd/Cadillac Way	11.1	B	6.8	A
6. Rollins Rd/Toyon Dr	11.1	B	**73.0**	**F**
7. Carolan Ave/Broadway	25.2	C	39.1	D
8. Carolan Ave/Cadillac Way	5.5	A	14.7	A
Westbound approach	*35.8*	*E*	*52.8*	*F*
9. California Dr/Broadway	33.0	C	**57.0**	**E**
10. California Dr/Carmelita Ave	18.8	B	13.4	B
11. Chula Vista Ave/Broadway	*1.5*	*A*	4.1	A
13. California Dr/Oak Grove Ave	30.2	C	27.2	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation

Project Description

The project consists of demolition of an existing restaurant and basketball court and construction of a new 150-unit, six-story rental apartment residential project with 192 off-street parking spaces. The proposed project site plan is shown in Figure 5.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 10th Edition, 2017 for "Multifamily Housing (Mid-Rise)" (ITE LU 221). Because the site is currently occupied by a restaurant and basketball court above a parking lot, the trip generation of the restaurant was considered. "Quality Restaurant" rates (ITE LU 931) were applied to the existing restaurant. It should be noted that while the existing restaurant may currently be underutilized, the restaurant use could increase and generate more trips, or it could be replaced by another restaurant that would generate the number of trips shown below. As a result, the credit for existing restaurant

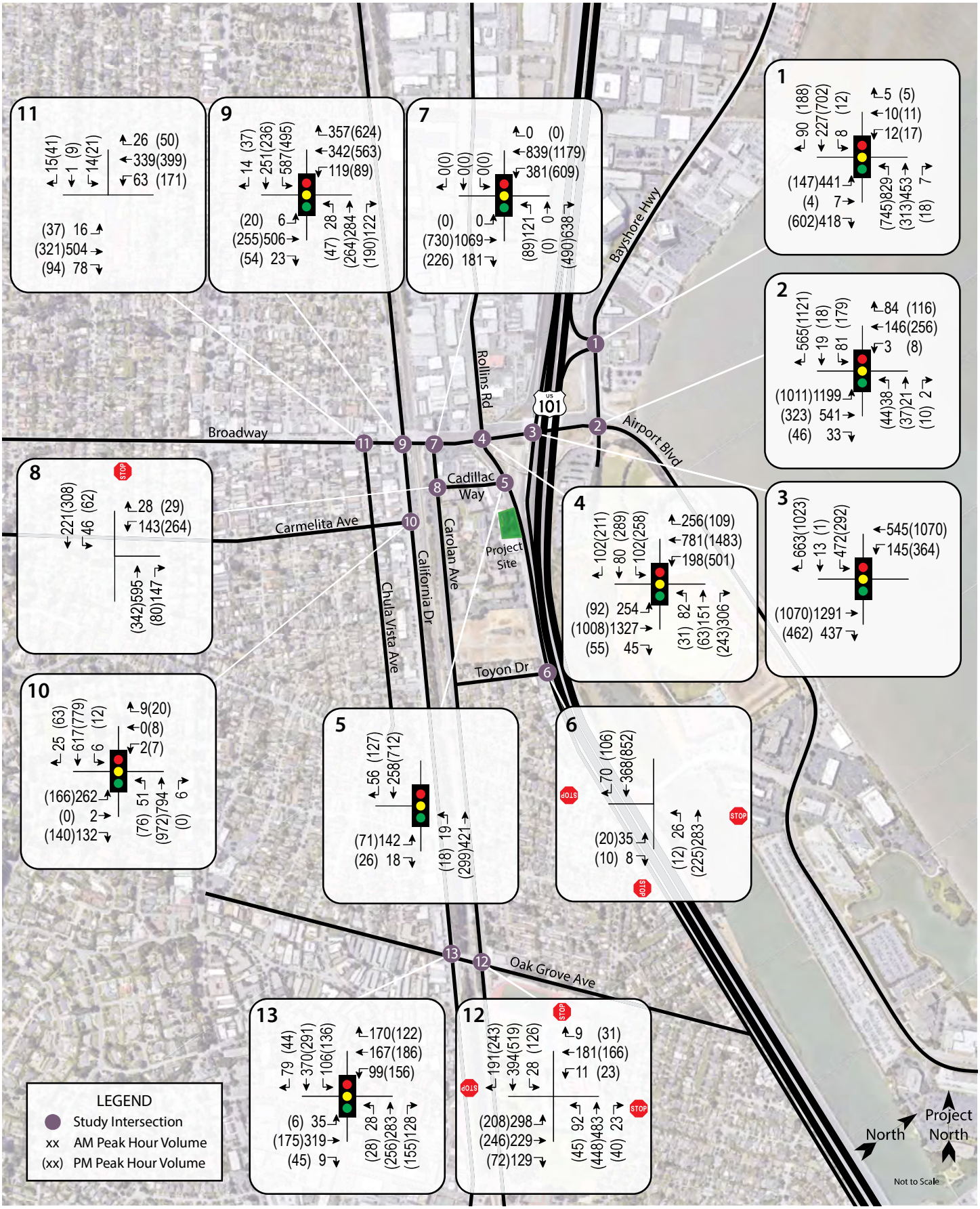

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Figure 4 – Cumulative Traffic Volumes

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L01 GROUND FLOOR LEGEND

- L1 Concrete Sidewalk
- L2 Decorative Paving
- L3 Street Tree
- L4 Parkway Planter
- L5 Planting at Building
- L6 Ornamental Tree
- L7 Firelane w/ Grass Pave System & Synthetic Turf
- L8 Decorative Pot
- L9 Screening Hedge
- L10 Firelane w/ Grass Pave System & Sod
- L11 Entry Stoop
- L12 Wood Fence (7'-0" Ht.)
- L13 Stepping Pads w/ Tile Veneer
- L14 Seat Wall
- L15 Gravel
- L16 Outdoor Furniture
- L17 6'-0" Ht. Metal Fence & Gate
- L18 Street Light

Project North

North

Not to Scale

Source: BDE Architecture, 11/18

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Figure 5 – Site Plan

trips is based on full use of the restaurant. Also, due to the nature of the basketball court, no deductions were made as it is typically used by neighborhood children.

Total Project Trip Generation

The expected trip generation potential for the proposed project is indicated in Table 5, with deductions taken for trips made to and from the restaurant at the site, which would cease with the construction of the project. The proposed project is expected to generate an average of 816 trips per day, including 54 trips during the a.m. peak hour and 66 during the p.m. peak hour. After deductions are taken into account for full use of the restaurant, the project would be expected to generate 198 fewer trips on a daily basis, though with 46 new trips during the morning peak hour but 28 fewer trips during the evening peak hour; these new trips represent the increase in traffic associated with the project compared to existing volumes.

Table 5 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Existing											
Quality Restaurant	-12.1 ksf	83.84	-1,014	0.73	-8	-4	-4	7.80	-94	-63	-31
Proposed											
Multifamily Housing (Mid-Rise)	150 du	5.44	816	0.36	54	14	40	0.44	66	40	26
Total			**-198**		**46**	**10**	**36**		**-28**	**-23**	**-5**

Note: du = dwelling unit; ksf = 1,000 square feet

Trip Distribution

The pattern used to allocate new project trips to the street network was based on the trip distribution in the *Carolan Avenue and Rollins Road Residential Draft Traffic Impact Analysis*, Hexagon Transportation Consultants, 2014 which used existing travel patterns surrounding the site and locations of complementary land uses. The applied distribution assumptions and resulting trips are summarized in Table 6. It should be noted, that half the trips are going to/from US 101. Project traffic volumes and trip distribution is shown in Figure 6.

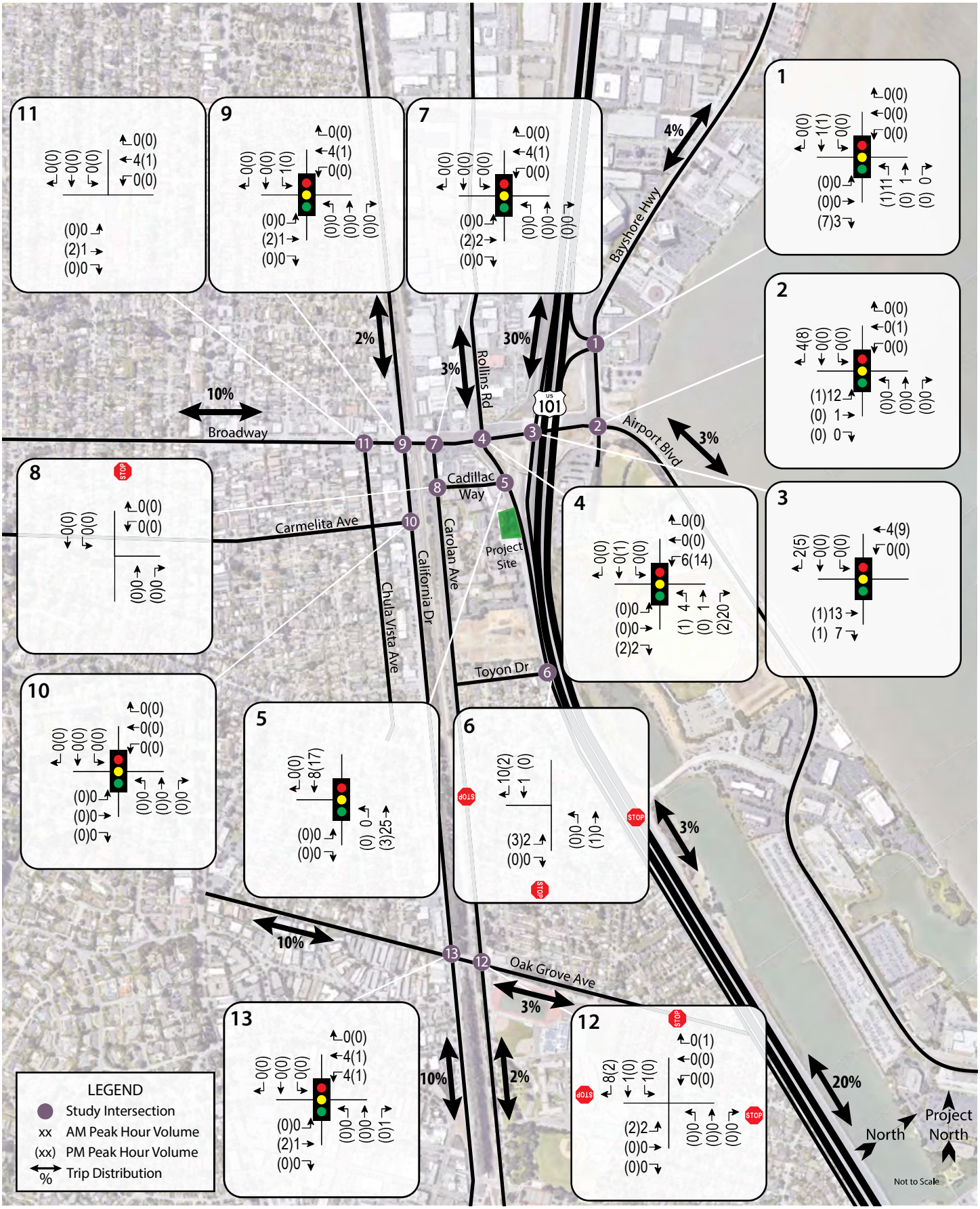

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Figure 6 – Project Traffic Volumes and Trip Distribution

Table 6 – Trip Distribution Assumptions				
Route	**Percent**	**Daily Trips**	**AM Trips**	**PM Trips**
To/from north on California Dr	2%	-4	1	-0
To/from north on Rollins Rd	3%	-6	1	-1
To/from north on US 101	30%	-59	14	-8
To/from north on Old Bayshore Hwy	4%	-7	2	-1
To/from west on Broadway	10%	-20	5	-3
To/from east on Airport Blvd	3%	-6	1	-1
To/from south on US 101	20%	-40	9	-6
To/from south on Rollins Rd	3%	-6	1	-1
To/from south on Carolan Ave	2%	-4	1	-0
To/from south on California Dr	10%	-20	5	-3
To/from west on Oak Grove Ave	10%	-20	5	-3
To/from east on Oak Grove Ave	3%	-6	1	-1
TOTAL	**100%**	**-198**	**46**	**-28**

Vehicle Miles Traveled (VMT)

An evaluation of vehicle miles travelled (VMT) is not a requirement contained in either the City of Burlingame or San Mateo County guidelines but is provided for informational purposes as lead agencies work to adopt revised transportation significance criteria in alignment with the Final Adopted Text for Revisions to the CEQA Guidelines, December 2019. Specifically, Section 15064.3, Determining the Significance of Transportation Impacts, which states that for land use projects where the "vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact." The proposed project is located within approximately one-quarter of a mile of the Broadway Millbrae Shuttle, and based on the Final Adopted Text would be presumed to have a less than significant impact upon adoption of updated significance criteria.

As requested, an informational VMT analysis has been prepared; however, as noted above the project would be presumed to have a less than significant impact based on transit access. Since the City of Burlingame has not yet adopted an applicable threshold of significance regarding VMT analysis, the recommended threshold of significance from the California Office of Planning and Research (OPR) Technical Advisory on Evaluating Transportation Impact in CEQA, November 2017 for residential projects has been applied to this study. The recommended threshold states: "A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita."

To develop an estimate of the VMT per capita generated by the proposed project three pieces of data are required; the total number of daily vehicle trips anticipated to be generated by the project, the average length of those trips, and the total number of residents for the proposed project. The daily trip generation estimate was developed as part of this study. The average daily trip length data was collected from Table 4.3 *Trip Type Information* from Appendix A of the Burlingame General Plan Draft Environmental Impact Report (DEIR). An estimate for the number of residents was developed using the total number of proposed apartments and the estimated total

number of residents living in apartments at buildout of the General Plan, from Appendix A of the DEIR. The following data was used to develop the estimate of VMT per capita:

- Daily Trip Generation: 816 trips
- Average trip length: 5.26 miles
- Average residents per apartment: 2.86 persons

The estimated VMT per capita for the projected project, without taking into consideration travel demand management strategies, is 10.01 VMT per capita. The existing VMT per capita for the City of Burlingame was published in Appendix D of the DEIR *Burlingame General Plan TIA Hexagon Supporting Analysis and Data,* Hexagon Transportation Consultants, 2018. This study estimated the existing VMT per capital at 8.18 miles. The proposed project exceeds a level of 15 percent below the existing VMT per capita. However, as noted above, the proximity to high-quality transit service would be presumed to result in a less than significant impact.

Intersection Operation

Baseline plus Project Conditions

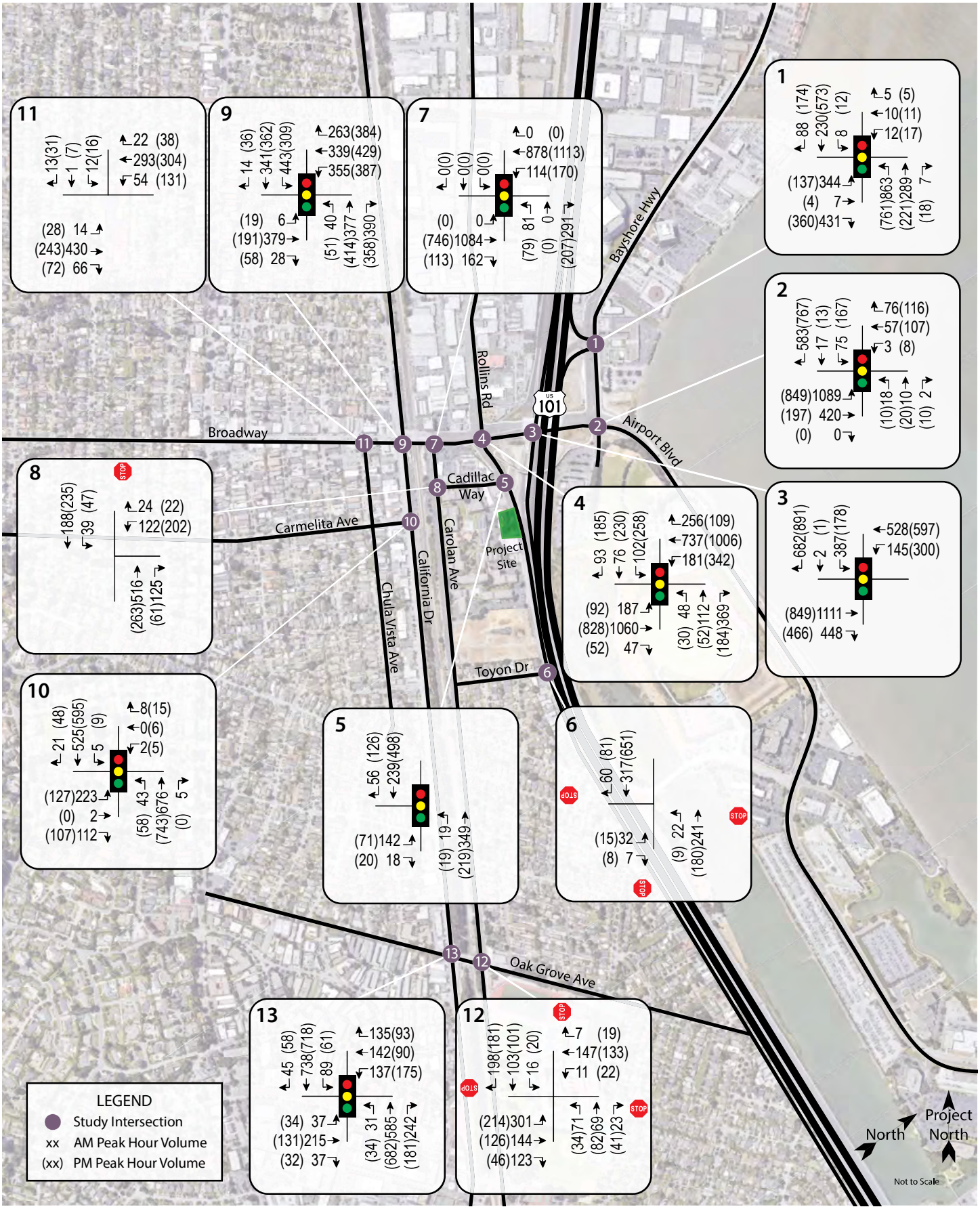
With project-related traffic added to baseline volumes, the study intersections are expected to operate at the same Levels of Service as without the proposed project. Baseline plus Project traffic volumes are shown in Figure 7. These results are summarized in Table 7.

Table 7 – Baseline and Baseline plus Project Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	**Baseline Conditions**				**Baseline plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. US 101 NB Ramps/Bayshore Hwy	30.4	C	26.2	C	30.5	C	26.2	C
2. Broadway-Airport Blvd/Bayshore Hwy	12.4	B	15.3	B	12.3	B	15.4	B
3. US 101 SB Ramps/Broadway	21.0	C	14.7	B	20.8	C	14.7	B
4. Rollins Rd/Broadway	25.7	C	20.5	C	26.7	C	20.4	C
5. Rollins Rd/Cadillac Way	7.4	A	6.8	A	7.4	A	6.8	A
6. Rollins Rd/Toyon Dr	10.6	B	29.4	D	10.6	B	29.4	D
7. Carolan Ave/Broadway	21.7	C	25.9	C	21.7	C	25.9	C
8. Carolan Ave/Cadillac Way	4.5	A	7.2	A	4.5	A	7.2	A
Westbound approach	*28.5*	*D*	*24.8*	*C*	28.5	D	24.8	C
9. California Dr/Broadway	32.3	C	40.0	D	32.2	C	40.0	D
10. California Dr/Carmelita Ave	15.6	B	12.0	B	15.6	B	12.0	B
11. Chula Vista Ave/Broadway	1.4	A	3.2	A	1.4	A	3.2	A
13. California Dr/Oak Grove Ave	30.0	C	24.0	C	30.4	C	24.0	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

It should be noted that with the addition of project-related traffic volumes, average delay at the intersection of US 101 SB Ramps/Broadway would be expected to decrease during the a.m. peak hour. While this is counter-intuitive, this condition occurs when a project adds trips to movements that are currently underutilized or have delays that



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IS/MND Transportation Analysis for the 1095 Rollins Road Project

Figure 7 – Baseline plus Project Traffic Volumes

W-Trans

are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project adds traffic predominantly to the right-turn and through movements, both of which have average delays that are lower than the average for the intersection as a whole, resulting in a slight reduction in the overall average delay. The conclusion could incorrectly be drawn that the project actually improves operation based on this data alone; however, it is more appropriate to conclude that the project trips are expected to make use of excess capacity, so drivers will experience little, if any, change in conditions as a result of the project.

Finding – The study intersections are expected to continue operating at the same levels of service upon the addition of project-generated traffic. Project-added traffic causes less than a four-second increase in average delay; therefore, the impact is considered less-than-significant.

Cumulative plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Cumulative volumes, the study intersections are expected to operate at the same service levels as without project trips. Cumulative plus Project traffic volumes are shown in Figure 8. The Cumulative plus Project operating conditions are summarized in Table 8.

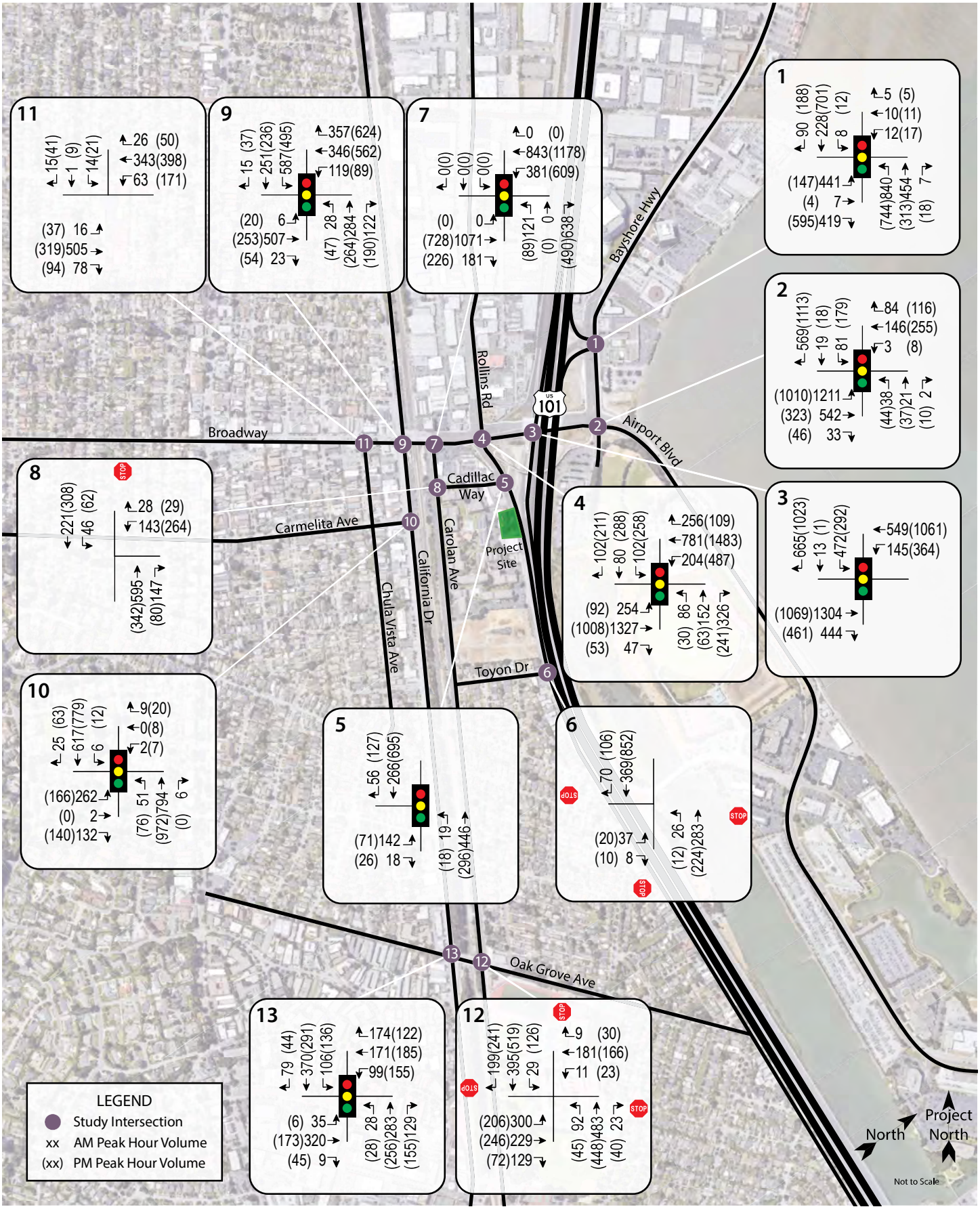
Table 8 – Cumulative and Cumulative plus Project Peak Hour Intersection Levels of Service

Study Intersection ***Approach***	**Cumulative Conditions**				**Cumulative plus Project**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. US 101 NB Ramps/Bayshore Hwy	37.5	D	29.0	C	37.6	D	29.6	C
2. Broadway-Airport Blvd/Bayshore Hwy	13.4	B	18.2	B	13.2	B	17.7	B
3. US 101 SB Ramps/Broadway	27.6	C	15.9	B	27.6	C	15.9	B
4. Rollins Rd/Broadway	27.0	C	22.3	C	27.2	C	23.7	C
5. Rollins Rd/Cadillac Way	11.1	B	6.8	A	11.6	B	6.4	A
6. Rollins Rd/Toyon Dr	11.1	B	**73.0**	**F**	11.2	B	**72.9**	**F**
7. Carolan Ave/Broadway	25.2	C	39.1	D	25.2	C	39.1	D
8. Carolan Ave/Cadillac Way	5.5	A	14.7	B	5.5	A	14.7	B
Westbound approach	*35.8*	*E*	*52.8*	*F*	*35.8*	*E*	*52.7*	*F*
9. California Dr/Broadway	33.0	C	**57.0**	**E**	33.0	C	**56.8**	**E**
10. California Dr/Carmelita Ave	18.8	B	13.4	B	18.8	B	13.4	B
11. Chula Vista Ave/Broadway	*1.5*	*A*	4.1	A	1.5	B	4.1	C
13. California Dr/Oak Grove Ave	30.2	C	27.2	C	30.5	C	27.1	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

It should be noted that with the addition of project-related traffic volumes, average delay at the intersection of Broadway/Airport Boulevard & Bayshore Highway would be expected to decrease during the a.m. peak hour. The project adds traffic predominantly to the right-turn movement, which has an average delay that is lower than the average for the intersection as a whole, resulting in a slight reduction in the overall average delay.

Finding – The study intersections would continue operating at the same Levels of Service with project traffic added as under Cumulative Conditions without the project. The increase in delay resulting from adding project trips would be less than four seconds, making the impact less-than-significant.



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IS/MND Transportation Analysis for the 1095 Rollins Road Project

Figure 8 – Cumulative plus Project Traffic Volumes

W-Trans

Access and Circulation

Site Access

The proposed driveway would be located approximately 30 feet north of the existing north driveway. This driveway is proposed to have access to the parking garage.

Sight Distance

A substantially clear line of sight should be maintained between the driver of a vehicle waiting at a driveway and the driver of an approaching vehicle. Sight distances along Rollins Road from the project driveway was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for driveway approaches is based on stopping sight distance using the approach travel speed as the basis for determining the recommended sight distance. Based on the posted speed limit of 35 mph, the minimum stopping sight distance required is 250 feet. A review in the field shows that that sight distances at the project driveway are expected to be adequate, provided any vegetation is planted and maintained to ensure adequate sight lines are retained, and also that parking is prohibited in two on-street parking spaces along the project frontage, approximately 165 feet south of the driveway. The curbs on either side of the driveway should be painted red for a distance of 20 feet.

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient to accommodate the anticipated parking demand. The project site as proposed would provide a total of 192 standard parking spaces for the apartment complex. The proposed parking supply would not be shared with any other land uses. It was previously recommended that the on street parking along the project frontage should be removed; this would not have an effect on the City's off-street parking requirements.

Jurisdiction parking supply requirements are based on the *City of Burlingame Downtown Specific Plan*, Table 3-3; Parking Standards. The proposed parking supply and City of Burlingame Code requirements are shown in Table 9.

Table 9 – Parking Analysis Summary

Land Use	Units	Supply (spaces)	Burlingame Requirements	
			Rate	Spaces Required
Studio or One-Bedroom	109 du	110	1	109
Two Bedroom	41 du	82	2	82
Total	**150 du**	**192**		**191**

Note: du = dwelling unit

The site plan shows that out of the 192 spaces proposed for residential use, there would be five accessible stalls for the residential use. Based on requirements stipulated by the Federal Accessibility Guidelines, the required number of accessible stalls is six stalls, or one more than proposed.

City parking stall sizes are based on the City of Burlingame Municipal Code, Chapter 22.70; Off Street Parking. Required parking stall sizes for the City of Burlingame are 9 feet by 20 feet for residential uses. According to the site plan, the regular parking stall sizes as proposed would be approximately 9 feet by 20 feet and satisfy the City's size requirements.

Finding – The proposed parking supply of 192 spaces would exceed the City's parking requirement of 191 spaces.

Recommendation – One additional ADA parking space should be provided.

CEQA Initial Study Checklist

This section provides a discussion to support the CEQA Initial Study checklist for potential transportation/traffic impacts, as shown in Table 10.

Table 10 – CEQA Initial Study Checklist

Would the project:	Potentially Significant Impact	Less than Significant Impact with Mitigation	Less than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?			X	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

Would the project:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

According to the *Burlingame Draft General Plan*, MIG, January 2019, numerous objectives, policies and programs have been established supporting the need for all modes of travel to be accommodated by the transportation system. This is demonstrated through General Plan Goals M1- through M-15, which state:

- **Goal M-1**: Achieve and maintain a citywide circulation network that provides safe, efficient, and convenient mobility for all users and modes of transit.
- **Goal M-2**: Ensure Burlingame's streets are comfortable, safe and attractive for people of all ages and abilities to walk.
- **Goal M-3**: Develop a network of high-quality, convenient, safe and easy-to-use bicycle facilities to increase the number of people who use bicycles for everyday transportation.
- **Goal M-4**: Improve transit access, frequency, connectivity, and amenities to increase transit ridership and convenience.
- **Goal M-5**: Implement TDM strategies that reduce overall vehicle trips and encourage the use of transportation modes that reduce VMT and greenhouse gas emissions.
- **Goal M-6**: Create an integrated transportation program that reduces peak-period vehicle trips and vehicle miles traveled.
- **Goal M-7**: Use parking management strategies that promote parking availability, housing affordability, congestion management, and improved air quality.
- **Goal M-8**: Achieve air quality, sustainability, and greenhouse gas emission reduction objectives through technology upgrades and improved management of Burlingame's streets.
- **Goal M-9**: Achieve an improved paradigm for measuring the traffic impacts of development projects.
- **Goal M-10**: California Drive will be redesigned to support multimodal access, with facilities that encourage active transportation and improved linkages to commercial and residential areas.

- **Goal M-11**: Ensure that El Camino Real retains its distinct character as a residential street lines with a historic tree grove, with its function as a regional commute corridor secondary to Burlingame's vision of the corridor as a lower-speed tree-lined thoroughfare.
- **Goal M-12**: Allow Broadway to function for dual purposes: as a slow-speed roadway through the Broadway commercial district and as a connector to Highway 101.
- **Goal M-13**: Ensure that Rollins Road meets the needs of all users within the Rollins Road District.
- **Goal M-14**: Reinvent Old Bayshore Highway and Airport Boulevard as multimodal streets, and enhance connections between the Bayfront and the balance of the City.
- **Goal M-15**: Ensure that neighborhood streets are safe and provide efficient vehicular access to residential neighborhoods and schools.

Each of these goals is followed by discussion and specific policies outlining implementation.

The proposed project would result in the removal of one building and a basketball court and the construction of a multistory apartment complex. As proposed, the project would result in less than 50 net new additional trips during the a.m. peak hour and a reduction in trips during the p.m. peak hour. Therefore, roadway impacts would be *less than significant*, and no mitigation measures are required.

Pedestrian Facilities

The proposed project includes interior walkways to provide pedestrian circulation between Rollins Road and the courtyard, along with to the rest of the site and connecting to continuous sidewalks along the street frontage. Therefore, pedestrian impacts would be *less than significant*, and no mitigation measures are required.

Bicycle Facilities

There are no proposed changes to bicycle facilities. Therefore, bicycle impacts would be *less than significant*, and no mitigation measures are required.

Transit

San Mateo Transit (SamTrans) provides fixed route bus service through San Mateo County. SamTrans Route 292 runs between San Mateo and Downtown San Francisco and stops approximately 0.4 miles from the project site near the Caltrain Broadway Station. Route 292 operates Monday through Friday with approximately one-half hour headways between 4:00 a.m. and 1:00 a.m. Weekend service operates with approximately one-hour headways between 4:30 a.m. and 1:00 a.m.

Two bicycles can be carried on most SamTrans buses. Bike rack space is on a first-come, first-served basis. Additional bicycles are allowed on SamTrans buses at the discretion of the driver.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. Redi-Wheels Paratransit is designed to serve the needs of individuals with disabilities within Burlingame and the greater Burlingame area.

Caltrain is the commuter rail line serving the San Francisco Peninsula. It connects Burlingame with San Francisco to the north and San Jose and Gilroy to the south. The Broadway Station is less than one-half mile from the project site; however, the stop is only used on weekends. On weekends there are ten to twelve trains that stop at the station daily. On weekdays there are 30 trains servicing the Burlingame Station in the northbound and southbound directions which is approximately 1.2 miles from the project location. There are four trains during the 7:00 to 9:00 a.m. and 4:00 to -6:00 p.m. peak periods in the northbound direction, and four to five trains during each of the a.m. and p.m. peak periods in the southbound direction. Bicycle racks are available on a first-come-first-served basis, while lockers must be reserved. Paid vehicle parking is available at both the Broadway and Burlington stations for riders.

Therefore, transit impacts would be *less than significant*, and no mitigation measures are required.

b) Conflict or be inconsistent with CEQA Guidelines §15064.3, subdivision (b)?

CEQA Guidelines § 15064.3, subdivision (b) indicates that land use projects would have a significant impact if the project resulted in vehicle miles traveled (VMT) exceeding an applicable threshold of significance. It further notes that if existing models or methods are not available to estimate the vehicle miles traveled for the project being considered, a lead agency may analyze the project's vehicle miles traveled qualitatively.

The project site is located on a transit corridor. Therefore, the project would have a *less than significant* impact on vehicle miles traveled.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The project would relocate an existing driveway by a few feet but would not otherwise involve changes to vehicle infrastructure. Any site improvements would need to be built to current design standards. Therefore, there would be a *less than significant* impact caused by the project related to an increase in hazards due to design features or incompatible uses.

d) Would the project result in inadequate emergency access?

Emergency access is provided via Rollins Road. The project would not impact emergency access on nearby streets. The project site would have adequate emergency access and would result in a *less than significant* impact related to emergency access.

Conclusions and Recommendations

Conclusions

- Under existing conditions, all study intersections operate acceptably.
- Baseline operating conditions were determined with traffic from approved projects in the vicinity of the project added to existing volumes. Under these conditions, all intersections are expected to continue operating at the same Levels of Service as under existing conditions.
- The study intersections are expected to continue operating acceptably under future conditions with the exception of Rollin Road/Toyon drive and Carolan Avenue/Broadway during the p.m. peak hour.
- The project would be expected to generate 198 fewer trips on a daily basis, though there would be 46 net new trips during the morning peak hour and 28 fewer trips during the evening peak hour.
- The estimated VMT per capita for the projected project, without taking into consideration travel demand management strategies, is 10.01 VMT per capita.
- With the addition of project related to Baseline Conditions, all study intersections are expected to continue operating at the same service levels and with less than a four-second increase in average delay at any location operating below LOS D without the project, resulting in less than significant impacts.
- Under Future plus Project conditions all study intersections are expected to continue operating at the same Levels of Service and project-added delay is expected to be less than four seconds at intersections already operating unacceptably without the project, resulting in less-than-significant impacts.

Recommendations

- Prohibit parking in two on-street spaces approximately 165 feet south of the driveway to maintain adequate sight distance.
- Parking should be prohibited for a distance of 20 feet on either side on the driveway.
- Provide one additional ADA parking space.

Study Participants and References

Study Participants

Principal in Charge	Mark E. Spencer, TE
Associate Planner	Nick Bleich, AICP, EIT
Assistant Engineer	Allison Jaromin, EIT
Graphics	Katia Wolfe
Editing/Formatting	Alex Scrobonia
Quality Control	Dalene J. Whitlock, PE, PTOE

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Appendix A

Intersection Level of Service Calculations

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HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	344	7	418	12	10	5	816	284	7	8	227	88
Future Volume (vph)	344	7	418	12	10	5	816	284	7	8	227	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.90	0.85		0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1501	1504		1780		3433	3526		1770	3539	1583
Flt Permitted	0.95	0.99	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1501	1504		1780		3433	3526		1770	3539	1583
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)	374	8	454	13	11	5	887	309	8	9	247	96
RTOR Reduction (vph)	0	63	212	0	5	0	0	1	0	0	0	86
Lane Group Flow (vph)	292	213	56	0	24	0	887	316	0	9	247	10
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	25.0	25.0	25.0		4.3		61.6	74.2		1.3	12.9	12.9
Effective Green, g (s)	25.0	25.0	25.0		4.3		61.6	74.2		1.3	12.9	12.9
Actuated g/C Ratio	0.21	0.21	0.21		0.04		0.51	0.62		0.01	0.11	0.11
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	350	312	313		63		1762	2180		19	380	170
v/s Ratio Prot	c0.17	0.14			c0.01		c0.26	0.09		0.01	c0.07	
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.83	0.68	0.18		0.38		0.50	0.15		0.47	0.65	0.06
Uniform Delay, d1	45.5	43.9	39.1		56.6		19.2	9.6		59.0	51.4	48.1
Progression Factor	1.00	1.00	1.00		1.00		0.56	0.31		1.00	1.00	1.00
Incremental Delay, d2	15.0	4.9	0.1		1.4		0.9	0.1		6.6	3.0	0.1
Delay (s)	60.5	48.7	39.2		58.0		11.6	3.1		65.6	54.4	48.2
Level of Service	E	D	D		E		B	A		E	D	D
Approach Delay (s)		49.8			58.0			9.4			53.0	
Approach LOS		D			E			A			D	

Intersection Summary				
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1037	416	0	3	56	76	18	10	2	75	17	565
Future Volume (vph)	1037	416	0	3	56	76	18	10	2	75	17	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	1.00		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (prot)	3433	3539		1770	3539	1583		3404		1681	1714	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (perm)	3433	3539		1770	3539	1583		3404		1681	1714	2787
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)	1127	452	0	3	61	83	20	11	2	82	18	614
RTOR Reduction (vph)	0	0	0	0	0	77	0	2	0	0	0	157
Lane Group Flow (vph)	1127	452	0	3	61	6	0	31	0	49	51	457
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	82.3	90.0		1.1	8.8	8.8		5.3		7.1	7.1	89.4
Effective Green, g (s)	82.3	90.0		1.1	8.8	8.8		5.3		7.1	7.1	89.4
Actuated g/C Ratio	0.69	0.75		0.01	0.07	0.07		0.04		0.06	0.06	0.75
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	2354	2654		16	259	116		150		99	101	2145
v/s Ratio Prot	c0.33	0.13		0.00	c0.02			c0.01		0.03	c0.03	0.15
v/s Ratio Perm						0.00						0.02
v/c Ratio	0.48	0.17		0.19	0.24	0.05		0.21		0.49	0.50	0.21
Uniform Delay, d1	8.8	4.3		59.0	52.4	51.7		55.3		54.7	54.7	4.6
Progression Factor	0.63	0.69		1.00	1.00	1.00		1.00		1.16	1.16	2.38
Incremental Delay, d2	0.6	0.1		2.1	0.2	0.1		0.3		1.3	1.3	0.0
Delay (s)	6.2	3.1		61.1	52.6	51.8		55.6		64.6	64.7	11.1
Level of Service	A	A		E	D	D		E		E	E	B
Approach Delay (s)		5.3			52.3			55.6			18.6	
Approach LOS		A			D			E			B	

Intersection Summary				
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	53.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1055	420	145	509	0	0	0	0	387	2	663
Future Volume (vph)	0	1055	420	145	509	0	0	0	0	387	2	663
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.99	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)		4748	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4748	1362	3433	3539						1774	3610
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	1147	457	158	553	0	0	0	0	421	2	721
RTOR Reduction (vph)	0	10	177	0	0	0	0	0	0	0	0	312
Lane Group Flow (vph)	0	1238	179	158	553	0	0	0	0	0	423	409
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		54.1	54.1	9.9	59.3						44.3	49.0
Effective Green, g (s)		54.1	54.1	9.9	59.3						44.3	49.0
Actuated g/C Ratio		0.45	0.45	0.08	0.49						0.37	0.41
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		2140	614	283	1748						654	1474
v/s Ratio Prot		c0.26		c0.05	0.16						c0.24	0.01
v/s Ratio Perm			0.13									0.10
v/c Ratio		0.58	0.29	0.56	0.32						0.65	0.28
Uniform Delay, d1		24.5	20.8	52.9	18.2						31.4	23.7
Progression Factor		0.66	0.39	1.21	0.67						1.00	1.00
Incremental Delay, d2		1.1	1.1	1.3	0.5						1.7	0.0
Delay (s)		17.1	9.3	65.5	12.7						33.0	23.7
Level of Service		B	A	E	B						C	C
Approach Delay (s)		15.4			24.4			0.0			27.2	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	59.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	1048	45	175	705	256	42	108	297	102	76	92
Future Volume (vph)	187	1048	45	175	705	256	42	108	297	102	76	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5054		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5054		3433	5085	1583	1770	1863	1583	3433	1863	1583
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)	203	1139	49	190	766	278	46	117	323	111	83	100
RTOR Reduction (vph)	0	3	0	0	0	114	0	0	247	0	0	86
Lane Group Flow (vph)	203	1186	0	190	766	164	46	117	76	111	83	14
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	11.5	70.0		12.1	70.6	70.6	6.7	12.7	12.7	11.2	17.2	17.2
Effective Green, g (s)	11.5	70.0		12.1	70.6	70.6	6.7	12.7	12.7	11.2	17.2	17.2
Actuated g/C Ratio	0.10	0.58		0.10	0.59	0.59	0.06	0.11	0.11	0.09	0.14	0.14
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	328	2948		346	2991	931	98	197	167	320	267	226
v/s Ratio Prot	c0.06	c0.23		c0.06	0.15		0.03	c0.06		0.03	c0.04	
v/s Ratio Perm						0.10			0.05			0.01
v/c Ratio	0.62	0.40		0.55	0.26	0.18	0.47	0.59	0.46	0.35	0.31	0.06
Uniform Delay, d1	52.1	13.6		51.4	12.0	11.3	54.9	51.2	50.4	51.0	46.1	44.4
Progression Factor	1.00	1.00		0.84	0.65	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.4		0.9	0.2	0.4	1.3	3.2	0.7	0.2	0.2	0.0
Delay (s)	54.6	14.0		44.1	8.0	6.3	56.2	54.4	51.1	51.2	46.3	44.5
Level of Service	D	B		D	A	A	E	D	D	D	D	D
Approach Delay (s)		19.9			13.2			52.4			47.5	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	142	18	19	324	231	56
Future Volume (vph)	142	18	19	324	231	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.98		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1756		1770	1863	3435	
Flt Permitted	0.96		0.56	1.00	1.00	
Satd. Flow (perm)	1756		1047	1863	3435	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	20	21	352	251	61
RTOR Reduction (vph)	9	0	0	0	36	0
Lane Group Flow (vph)	165	0	21	352	276	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	10.1		11.6	11.6	11.6	
Effective Green, g (s)	10.1		11.6	11.6	11.6	
Actuated g/C Ratio	0.33		0.38	0.38	0.38	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	577		395	703	1297	
v/s Ratio Prot	c0.09			c0.19	0.08	
v/s Ratio Perm			0.02			
v/c Ratio	0.29		0.05	0.50	0.21	
Uniform Delay, d1	7.6		6.1	7.3	6.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.1	0.6	0.1	
Delay (s)	7.9		6.1	7.9	6.5	
Level of Service	A		A	A	A	
Approach Delay (s)	7.9			7.8	6.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	30.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	30	7	22	241	313	60
Future Volume (vph)	30	7	22	241	313	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	8	24	262	340	65

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	41	286	405
Volume Left (vph)	33	24	0
Volume Right (vph)	8	0	65
Hadj (s)	0.08	0.05	-0.06
Departure Headway (s)	5.5	4.5	4.3
Degree Utilization, x	0.06	0.36	0.48
Capacity (veh/h)	581	783	825
Control Delay (s)	8.8	9.9	11.1
Approach Delay (s)	8.8	9.9	11.1
Approach LOS	A	A	B

Intersection Summary			
Delay	10.5		
Level of Service	B		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1070	162	114	839	0	72	0	291	0	0	0
Future Volume (vph)	0	1070	162	114	839	0	72	0	291	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4985		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4985		1770	5085			1770	1583			
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	1163	176	124	912	0	78	0	316	0	0	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	264	0	0	0
Lane Group Flow (vph)	0	1319	0	124	912	0	0	78	52	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		54.5		17.1	36.3			16.4	16.4			
Effective Green, g (s)		54.5		17.1	36.3			16.4	16.4			
Actuated g/C Ratio		0.54		0.17	0.36			0.16	0.16			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		2716		302	1845			290	259			
v/s Ratio Prot		c0.26		c0.07	0.18							
v/s Ratio Perm								0.04	0.03			
v/c Ratio		0.49		0.41	0.49			0.27	0.20			
Uniform Delay, d1		14.1		37.0	24.7			36.6	36.1			
Progression Factor		0.88		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		0.3	0.9			0.2	0.1			
Delay (s)		12.5		37.3	25.7			36.7	36.3			
Level of Service		B		D	C			D	D			
Approach Delay (s)		12.5			27.1			36.4			0.0	
Approach LOS		B			C			D			A	

Intersection Summary				
HCM 2000 Control Delay	21.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	49.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/18/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	24	507	125	39	188
Future Volume (Veh/h)	122	24	507	125	39	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)	133	26	551	136	42	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)						332
pX, platoon unblocked						
vC, conflicting volume	907	619			687	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	907	619			687	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	95			95	
cM capacity (veh/h)	292	489			907	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	159	687	42	204
Volume Left	133	0	42	0
Volume Right	26	136	0	0
cSH	313	1700	907	1700
Volume to Capacity	0.51	0.40	0.05	0.12
Queue Length 95th (ft)	68	0	4	0
Control Delay (s)	27.9	0.0	9.2	0.0
Lane LOS	D		A	
Approach Delay (s)	27.9	0.0	1.6	
Approach LOS	D			

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	378	23	322	326	261	38	361	378	443	339	13
Future Volume (vph)	6	378	23	322	326	261	38	361	378	443	339	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3509		1770	1863	1583	1770	3539	1583	3433	1853	
Flt Permitted	0.55	1.00		0.43	1.00	1.00	0.54	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1023	3509		793	1863	1583	997	3539	1583	3433	1853	
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)	7	411	25	350	354	284	41	392	411	482	368	14
RTOR Reduction (vph)	0	4	0	0	0	123	0	0	279	0	1	0
Lane Group Flow (vph)	7	432	0	350	354	161	41	392	132	482	381	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	36.3	36.3		49.7	56.7	56.7	17.1	17.1	17.1	14.2	35.3	
Effective Green, g (s)	36.3	36.3		49.7	56.7	56.7	17.1	17.1	17.1	14.2	35.3	
Actuated g/C Ratio	0.36	0.36		0.50	0.57	0.57	0.17	0.17	0.17	0.14	0.35	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	371	1273		525	1056	897	170	605	270	487	654	
v/s Ratio Prot		0.12		c0.09	0.19			0.11		c0.14	c0.21	
v/s Ratio Perm	0.01			c0.24		0.10	0.04		0.08			
v/c Ratio	0.02	0.34		0.67	0.34	0.18	0.24	0.65	0.49	0.99	0.58	
Uniform Delay, d1	20.4	23.1		16.0	11.6	10.4	35.8	38.6	37.5	42.8	26.3	
Progression Factor	1.00	1.00		1.37	0.18	0.11	0.79	0.86	0.70	1.00	1.00	
Incremental Delay, d2	0.1	0.7		2.9	0.1	0.0	0.3	1.7	0.5	37.6	0.9	
Delay (s)	20.5	23.9		24.8	2.2	1.2	28.6	34.8	26.8	80.4	27.2	
Level of Service	C	C		C	A	A	C	C	C	F	C	
Approach Delay (s)		23.8			9.9			30.6			56.9	
Approach LOS		C			A			C			E	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	2	112	2	0	8	43	676	5	5	525	21
Future Volume (vph)	223	2	112	2	0	8	43	676	5	5	525	21
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.89		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1642		1770	3536		1770	3519	
Flt Permitted		0.79			0.96		0.40	1.00		0.33	1.00	
Satd. Flow (perm)		1413			1590		744	3536		616	3519	
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)	242	2	122	2	0	9	47	735	5	5	571	23
RTOR Reduction (vph)	0	23	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	343	0	0	3	0	47	740	0	5	592	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		30.4			30.4		61.6	61.6		61.6	61.6	
Effective Green, g (s)		30.4			30.4		61.6	61.6		61.6	61.6	
Actuated g/C Ratio		0.30			0.30		0.62	0.62		0.62	0.62	
Clearance Time (s)		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	
Lane Grp Cap (vph)		429			483		458	2178		379	2167	
v/s Ratio Prot								c0.21			0.17	
v/s Ratio Perm		c0.24			0.00		0.06			0.01		
v/c Ratio		0.80			0.01		0.10	0.34		0.01	0.27	
Uniform Delay, d1		32.0			24.3		7.9	9.3		7.4	8.9	
Progression Factor		1.00			1.00		1.00	1.00		0.88	0.73	
Incremental Delay, d2		10.0			0.0		0.4	0.4		0.1	0.2	
Delay (s)		42.0			24.3		8.3	9.7		6.6	6.7	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		42.0			24.3			9.7			6.7	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	429	66	54	289	22	0	0	0	12	1	13
Future Volume (Veh/h)	14	429	66	54	289	22	0	0	0	12	1	13
Sign Control		Free			Free			Yield			Yield	
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)	15	466	72	59	314	24	0	0	0	13	1	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	338			538			990	988	502	976	1012	326
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207			538			933	930	502	917	957	194
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 %	99			94			100	100	100	94	100	98
cM capacity (veh/h)	1226			1030			205	224	569	215	216	762

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	553	397	28
Volume Left	15	59	13
Volume Right	72	24	14
cSH	1226	1030	336
Volume to Capacity	0.01	0.06	0.08
Queue Length 95th (ft)	1	5	7
Control Delay (s)	0.4	1.8	16.7
Lane LOS	A	A	C
Approach Delay (s)	0.4	1.8	16.7
Approach LOS			C

Intersection Summary			
Average Delay			1.4
Intersection Capacity Utilization			53.5%
Analysis Period (min)			15

ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/18/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	214	32	125	129	131	29	557	240	89	702	41
Future Volume (vph)	35	214	32	125	129	131	29	557	240	89	702	41
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1826		1770	1722		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1826		1770	1722		1770	3539	1583	1770	3539	1583
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)	38	233	35	136	140	142	32	605	261	97	763	45
RTOR Reduction (vph)	0	5	0	0	29	0	0	0	116	0	0	30
Lane Group Flow (vph)	38	263	0	136	253	0	32	605	145	97	763	15
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	18.3	18.3		18.3	18.3		4.3	24.8	24.8	8.5	29.0	29.0
Effective Green, g (s)	18.3	18.3		18.3	18.3		4.3	24.8	24.8	8.5	29.0	29.0
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.05	0.29	0.29	0.10	0.34	0.34
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	377	389		377	366		88	1021	457	175	1194	534
v/s Ratio Prot	0.02	c0.14		0.08	c0.15		0.02	0.17		c0.05	c0.22	
v/s Ratio Perm									0.09			0.01
v/c Ratio	0.10	0.68		0.36	0.69		0.36	0.59	0.32	0.55	0.64	0.03
Uniform Delay, d1	27.2	31.1		28.8	31.2		39.5	26.2	23.9	36.9	24.0	19.0
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	0.1	4.6		0.6	5.5		2.5	0.9	0.4	3.8	1.1	0.0
Delay (s)	27.3	35.7		29.4	36.7		42.0	27.1	24.3	40.7	25.2	19.0
Level of Service	C	D		C	D		D	C	C	D	C	B
Approach Delay (s)		34.7			34.3			26.9			26.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	85.9	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	56.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	4	357	17	11	5	743	220	18	12	572	174
Future Volume (vph)	137	4	357	17	11	5	743	220	18	12	572	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.86	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1459	1504		1781		3433	3498		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1459	1504		1781		3433	3498		1770	3539	1583
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)	149	4	388	18	12	5	808	239	20	13	622	189
RTOR Reduction (vph)	0	158	172	0	5	0	0	3	0	0	0	101
Lane Group Flow (vph)	134	47	30	0	30	0	808	256	0	13	622	88
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	12.2	12.2		3.6		25.2	50.1		1.0	24.9	24.9
Effective Green, g (s)	12.2	12.2	12.2		3.6		25.2	50.1		1.0	24.9	24.9
Actuated g/C Ratio	0.15	0.15	0.15		0.04		0.31	0.61		0.01	0.30	0.30
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	249	216	223		78		1053	2134		21	1073	480
v/s Ratio Prot	c0.08	0.03			c0.02		c0.24	0.07		0.01	c0.18	
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.54	0.22	0.13		0.39		0.77	0.12		0.62	0.58	0.18
Uniform Delay, d1	32.3	30.7	30.4		38.2		25.8	6.7		40.4	24.2	21.1
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.1		1.2		3.1	0.0		32.5	0.5	0.1
Delay (s)	33.5	30.9	30.5		39.3		28.9	6.7		72.9	24.7	21.2
Level of Service	C	C	C		D		C	A		E	C	C
Approach Delay (s)		31.4			39.3			23.5			24.6	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	63.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	830	196	0	8	108	116	10	20	10	167	13	763
Future Volume (vph)	830	196	0	8	108	116	10	20	10	167	13	763
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	1.00		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3433	3539		1770	3539	1583		3364		1681	1697	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3433	3539		1770	3539	1583		3364		1681	1697	2787
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)	902	213	0	9	117	126	11	22	11	182	14	829
RTOR Reduction (vph)	0	0	0	0	0	105	0	10	0	0	0	382
Lane Group Flow (vph)	902	213	0	9	117	21	0	34	0	98	98	447
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	29.0	39.5		0.9	11.4	11.4		4.1		8.5	8.5	37.5
Effective Green, g (s)	29.0	39.5		0.9	11.4	11.4		4.1		8.5	8.5	37.5
Actuated g/C Ratio	0.42	0.57		0.01	0.16	0.16		0.06		0.12	0.12	0.54
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1432	2011		22	580	259		198		205	207	1503
v/s Ratio Prot	c0.26	0.06		0.01	c0.03			c0.01		c0.06	0.06	0.12
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.63	0.11		0.41	0.20	0.08		0.17		0.48	0.47	0.30
Uniform Delay, d1	16.0	6.9		34.0	25.1	24.6		31.1		28.4	28.4	8.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0		4.5	0.1	0.0		0.1		0.6	0.6	0.0
Delay (s)	16.6	6.9		38.5	25.2	24.7		31.2		29.1	29.0	8.8
Level of Service	B	A		D	C	C		C		C	C	A
Approach Delay (s)		14.8			25.4			31.2			12.7	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	69.5	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	50.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	829	462	300	594	0	0	0	0	178	1	876
Future Volume (vph)	0	829	462	300	594	0	0	0	0	178	1	876
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.97	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)		4683	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4683	1362	3433	3539						1774	3610
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	901	502	326	646	0	0	0	0	193	1	952
RTOR Reduction (vph)	0	35	198	0	0	0	0	0	0	0	0	122
Lane Group Flow (vph)	0	1052	118	326	646	0	0	0	0	0	194	830
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		19.3	19.3	10.1	23.8						10.8	16.4
Effective Green, g (s)		19.3	19.3	10.1	23.8						10.8	16.4
Actuated g/C Ratio		0.37	0.37	0.19	0.46						0.21	0.32
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		1741	506	668	1622						369	1140
v/s Ratio Prot		c0.22		c0.09	0.18						0.11	c0.08
v/s Ratio Perm			0.09									0.15
v/c Ratio		0.60	0.23	0.49	0.40						0.53	0.73
Uniform Delay, d1		13.2	11.2	18.6	9.3						18.3	15.8
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.2	0.1						0.6	2.0
Delay (s)		13.6	11.3	18.8	9.4						18.9	17.8
Level of Service		B	B	B	A						B	B
Approach Delay (s)		13.1			12.5			0.0			18.0	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	48.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	810	54	356	979	109	31	51	178	258	231	185
Future Volume (vph)	92	810	54	356	979	109	31	51	178	258	231	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5037		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5037		3433	5085	1583	1770	1863	1583	3433	1863	1583
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)	100	880	59	387	1064	118	34	55	193	280	251	201
RTOR Reduction (vph)	0	9	0	0	0	76	0	0	157	0	0	139
Lane Group Flow (vph)	100	930	0	387	1064	42	34	55	36	280	251	62
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	4.8	16.5		10.7	22.4	22.4	2.1	11.8	11.8	9.4	19.1	19.1
Effective Green, g (s)	4.8	16.5		10.7	22.4	22.4	2.1	11.8	11.8	9.4	19.1	19.1
Actuated g/C Ratio	0.08	0.26		0.17	0.36	0.36	0.03	0.19	0.19	0.15	0.31	0.31
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	264	1331		588	1825	568	59	352	299	517	570	484
v/s Ratio Prot	0.03	c0.18		c0.11	0.21		0.02	0.03		c0.08	c0.13	
v/s Ratio Perm						0.03			0.02			0.04
v/c Ratio	0.38	0.70		0.66	0.58	0.07	0.58	0.16	0.12	0.54	0.44	0.13
Uniform Delay, d1	27.4	20.7		24.1	16.2	13.2	29.7	21.1	21.0	24.5	17.4	15.6
Progression Factor	1.00	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	1.3		2.0	0.3	0.0	8.2	0.1	0.1	0.6	0.2	0.0
Delay (s)	27.7	22.0		26.2	16.5	13.2	37.9	21.2	21.1	25.1	17.6	15.7
Level of Service	C	C		C	B	B	D	C	C	C	B	B
Approach Delay (s)		22.6			18.7			23.1			19.9	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	71	20	19	222	510	126
Future Volume (vph)	71	20	19	222	510	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.97		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1739		1770	1863	3434	
Flt Permitted	0.96		0.39	1.00	1.00	
Satd. Flow (perm)	1739		720	1863	3434	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	22	21	241	554	137
RTOR Reduction (vph)	16	0	0	0	39	0
Lane Group Flow (vph)	83	0	21	241	652	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	9.1		12.8	12.8	12.8	
Effective Green, g (s)	9.1		12.8	12.8	12.8	
Actuated g/C Ratio	0.29		0.41	0.41	0.41	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	512		298	771	1422	
v/s Ratio Prot	c0.05			0.13	c0.19	
v/s Ratio Perm			0.03			
v/c Ratio	0.16		0.07	0.31	0.46	
Uniform Delay, d1	8.1		5.5	6.1	6.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.1	0.2	0.2	
Delay (s)	8.2		5.6	6.3	6.8	
Level of Service	A		A	A	A	
Approach Delay (s)	8.2			6.3	6.8	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	30.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	30.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	15	8	9	172	651	81
Future Volume (vph)	15	8	9	172	651	81
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	9	10	187	708	88

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	25	197	796
Volume Left (vph)	16	10	0
Volume Right (vph)	9	0	88
Hadj (s)	-0.05	0.04	-0.03
Departure Headway (s)	6.0	4.8	4.2
Degree Utilization, x	0.04	0.26	0.92
Capacity (veh/h)	575	736	857
Control Delay (s)	9.2	9.5	34.7
Approach Delay (s)	9.2	9.5	34.7
Approach LOS	A	A	D

Intersection Summary			
Delay		29.2	
Level of Service		D	
Intersection Capacity Utilization		49.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	730	113	170	1087	0	77	0	207	0	0	0
Future Volume (vph)	0	730	113	170	1087	0	77	0	207	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4983		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4983		1770	5085			1770	1583			
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	793	123	185	1182	0	84	0	225	0	0	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	185	0	0	0
Lane Group Flow (vph)	0	896	0	185	1182	0	0	84	40	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		50.2		20.0	36.2			17.8	17.8			
Effective Green, g (s)		50.2		20.0	36.2			17.8	17.8			
Actuated g/C Ratio		0.50		0.20	0.36			0.18	0.18			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		2501		354	1840			315	281			
v/s Ratio Prot		c0.18		c0.10	c0.23							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.36		0.52	0.64			0.27	0.14			
Uniform Delay, d1		15.1		35.7	26.5			35.5	34.7			
Progression Factor		1.09		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		0.6	1.7			0.2	0.1			
Delay (s)		16.5		36.4	28.3			35.6	34.7			
Level of Service		B		D	C			D	C			
Approach Delay (s)		16.5			29.4			35.0			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/18/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	202	22	261	61	47	235
Future Volume (Veh/h)	202	22	261	61	47	235
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)	220	24	284	66	51	255
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						332
pX, platoon unblocked						
vC, conflicting volume	674	317			350	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	674	317			350	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	97			96	
cM capacity (veh/h)	402	724			1209	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	244	350	51	255
Volume Left	220	0	51	0
Volume Right	24	66	0	0
cSH	421	1700	1209	1700
Volume to Capacity	0.58	0.21	0.04	0.15
Queue Length 95th (ft)	89	0	3	0
Control Delay (s)	24.7	0.0	8.1	0.0
Lane LOS	C		A	
Approach Delay (s)	24.7	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay		7.2	
Intersection Capacity Utilization		43.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	193	54	360	428	384	46	413	340	309	350	36
Future Volume (vph)	19	193	54	360	428	384	46	413	340	309	350	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3423		1770	1863	1583	1770	3539	1583	3433	1837	
Flt Permitted	0.50	1.00		0.56	1.00	1.00	0.46	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	924	3423		1048	1863	1583	866	3539	1583	3433	1837	
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)	21	210	59	391	465	417	50	449	370	336	380	39
RTOR Reduction (vph)	0	25	0	0	0	162	0	0	296	0	4	0
Lane Group Flow (vph)	21	244	0	391	465	255	50	449	74	336	415	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	36.2	36.2		51.0	58.0	58.0	20.0	20.0	20.0	10.0	34.0	
Effective Green, g (s)	36.2	36.2		51.0	58.0	58.0	20.0	20.0	20.0	10.0	34.0	
Actuated g/C Ratio	0.36	0.36		0.51	0.58	0.58	0.20	0.20	0.20	0.10	0.34	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	334	1239		641	1080	918	173	707	316	343	624	
v/s Ratio Prot		0.07		c0.09	0.25			0.13		c0.10	c0.23	
v/s Ratio Perm	0.02			c0.22		0.16	0.06		0.05			
v/c Ratio	0.06	0.20		0.61	0.43	0.28	0.29	0.64	0.23	0.98	0.67	
Uniform Delay, d1	20.8	21.9		15.4	11.8	10.5	34.0	36.7	33.6	44.9	28.1	
Progression Factor	1.00	1.00		0.96	0.19	0.59	1.14	1.14	3.59	1.00	1.00	
Incremental Delay, d2	0.4	0.4		1.3	0.1	0.0	0.3	1.3	0.1	42.4	2.1	
Delay (s)	21.2	22.3		16.1	2.4	6.2	39.0	43.0	120.6	87.3	30.2	
Level of Service	C	C		B	A	A	D	D	F	F	C	
Approach Delay (s)		22.2			7.8			75.8			55.6	
Approach LOS		C			A			E			E	

Intersection Summary				
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	66.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	0	107	5	6	15	58	743	0	9	595	48
Future Volume (vph)	127	0	107	5	6	15	58	743	0	9	595	48
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.94			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1702			1704		1770	3539		1770	3500	
Flt Permitted		0.82			0.96		0.37	1.00		0.32	1.00	
Satd. Flow (perm)		1425			1649		685	3539		602	3500	
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)	138	0	116	5	7	16	63	808	0	10	647	52
RTOR Reduction (vph)	0	33	0	0	13	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	221	0	0	15	0	63	808	0	10	694	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		20.5			20.5		71.5	71.5		71.5	71.5	
Effective Green, g (s)		20.5			20.5		71.5	71.5		71.5	71.5	
Actuated g/C Ratio		0.20			0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		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	
Lane Grp Cap (vph)		292			338		489	2530		430	2502	
v/s Ratio Prot								c0.23			0.20	
v/s Ratio Perm		c0.15			0.01		0.09			0.02		
v/c Ratio		0.76			0.05		0.13	0.32		0.02	0.28	
Uniform Delay, d1		37.4			31.9		4.5	5.3		4.1	5.1	
Progression Factor		1.00			1.00		1.00	1.00		1.33	1.27	
Incremental Delay, d2		10.6			0.1		0.5	0.3		0.1	0.2	
Delay (s)		48.0			32.0		5.0	5.6		5.6	6.7	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		48.0			32.0			5.6			6.7	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	245	72	131	305	38	0	0	0	16	7	31
Future Volume (Veh/h)	28	245	72	131	305	38	0	0	0	16	7	31
Sign Control		Free			Free			Yield			Yield	
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	266	78	142	332	41	0	0	0	17	8	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	373			344			1040	1022	305	1002	1040	352
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	190			344			965	944	305	921	966	166
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			88			100	100	100	91	96	95
cM capacity (veh/h)	1190			1215			167	194	735	193	189	755

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	374	515	59
Volume Left	30	142	17
Volume Right	78	41	34
cSH	1190	1215	336
Volume to Capacity	0.03	0.12	0.18
Queue Length 95th (ft)	2	10	16
Control Delay (s)	0.9	3.2	18.0
Lane LOS	A	A	C
Approach Delay (s)	0.9	3.2	18.0
Approach LOS			C

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/18/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	133	28	174	89	93	29	660	173	61	718	58
Future Volume (vph)	32	133	28	174	89	93	29	660	173	61	718	58
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1815		1770	1720		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1815		1770	1720		1770	3539	1583	1770	3539	1583
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)	35	145	30	189	97	101	32	717	188	66	780	63
RTOR Reduction (vph)	0	7	0	0	31	0	0	0	65	0	0	39
Lane Group Flow (vph)	35	168	0	189	167	0	32	717	123	66	780	24
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	13.8	13.8		14.6	14.6		4.2	26.3	26.3	7.0	29.1	29.1
Effective Green, g (s)	13.8	13.8		14.6	14.6		4.2	26.3	26.3	7.0	29.1	29.1
Actuated g/C Ratio	0.18	0.18		0.19	0.19		0.05	0.34	0.34	0.09	0.37	0.37
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	314	322		332	323		95	1197	535	159	1325	592
v/s Ratio Prot	0.02	c0.09		c0.11	0.10		0.02	0.20		c0.04	c0.22	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.11	0.52		0.57	0.52		0.34	0.60	0.23	0.42	0.59	0.04
Uniform Delay, d1	26.8	29.0		28.7	28.4		35.4	21.3	18.4	33.4	19.5	15.4
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	0.2	1.5		2.2	1.4		2.1	0.8	0.2	1.8	0.7	0.0
Delay (s)	27.0	30.5		30.9	29.8		37.5	22.1	18.6	35.2	20.2	15.5
Level of Service	C	C		C	C		D	C	B	D	C	B
Approach Delay (s)		29.9			30.3			22.0			20.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	344	7	430	12	10	5	852	288	7	8	229	88
Future Volume (vph)	344	7	430	12	10	5	852	288	7	8	229	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.90	0.85		0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1498	1504		1780		3433	3526		1770	3539	1583
Flt Permitted	0.95	0.99	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1498	1504		1780		3433	3526		1770	3539	1583
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)	374	8	467	13	11	5	926	313	8	9	249	96
RTOR Reduction (vph)	0	68	215	0	5	0	0	1	0	0	0	86
Lane Group Flow (vph)	295	215	56	0	24	0	926	320	0	9	249	10
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	24.9	24.9	24.9		4.3		61.7	74.3		1.3	12.9	12.9
Effective Green, g (s)	24.9	24.9	24.9		4.3		61.7	74.3		1.3	12.9	12.9
Actuated g/C Ratio	0.21	0.21	0.21		0.04		0.51	0.62		0.01	0.11	0.11
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	348	310	312		63		1765	2183		19	380	170
v/s Ratio Prot	c0.18	0.14			c0.01		c0.27	0.09		0.01	c0.07	
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.85	0.69	0.18		0.38		0.52	0.15		0.47	0.66	0.06
Uniform Delay, d1	45.7	44.0	39.1		56.6		19.4	9.6		59.0	51.4	48.1
Progression Factor	1.00	1.00	1.00		1.00		0.56	0.32		1.00	1.00	1.00
Incremental Delay, d2	16.5	5.3	0.1		1.4		1.0	0.1		6.6	3.1	0.1
Delay (s)	62.2	49.3	39.2		58.0		11.8	3.2		65.6	54.5	48.2
Level of Service	E	D	D		E		B	A		E	D	D
Approach Delay (s)		50.6			58.0			9.6			53.1	
Approach LOS		D			E			A			D	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1077	419	0	3	57	76	18	10	2	75	17	579
Future Volume (vph)	1077	419	0	3	57	76	18	10	2	75	17	579
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	1.00		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (prot)	3433	3539		1770	3539	1583		3404		1681	1714	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (perm)	3433	3539		1770	3539	1583		3404		1681	1714	2787
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)	1171	455	0	3	62	83	20	11	2	82	18	629
RTOR Reduction (vph)	0	0	0	0	0	77	0	2	0	0	0	160
Lane Group Flow (vph)	1171	455	0	3	62	6	0	31	0	49	51	469
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	82.3	90.0		1.1	8.8	8.8		5.3		7.1	7.1	89.4
Effective Green, g (s)	82.3	90.0		1.1	8.8	8.8		5.3		7.1	7.1	89.4
Actuated g/C Ratio	0.69	0.75		0.01	0.07	0.07		0.04		0.06	0.06	0.75
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	2354	2654		16	259	116		150		99	101	2145
v/s Ratio Prot	c0.34	0.13		0.00	c0.02			c0.01		0.03	c0.03	0.15
v/s Ratio Perm						0.00						0.02
v/c Ratio	0.50	0.17		0.19	0.24	0.05		0.21		0.49	0.50	0.22
Uniform Delay, d1	9.0	4.3		59.0	52.4	51.7		55.3		54.7	54.7	4.7
Progression Factor	0.62	0.65		1.00	1.00	1.00		1.00		1.15	1.17	2.35
Incremental Delay, d2	0.6	0.1		2.1	0.2	0.1		0.3		1.3	1.3	0.0
Delay (s)	6.2	2.9		61.1	52.6	51.8		55.6		64.4	65.1	11.0
Level of Service	A	A		E	D	D		E		E	E	B
Approach Delay (s)		5.3			52.3			55.6			18.4	
Approach LOS		A			D			E			B	

Intersection Summary				
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1098	441	145	524	0	0	0	0	387	2	680
Future Volume (vph)	0	1098	441	145	524	0	0	0	0	387	2	680
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.99	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)		4748	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4748	1362	3433	3539						1774	3610
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	1193	479	158	570	0	0	0	0	421	2	739
RTOR Reduction (vph)	0	10	178	0	0	0	0	0	0	0	0	298
Lane Group Flow (vph)	0	1288	196	158	570	0	0	0	0	0	423	441
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		54.3	54.3	9.9	59.5						44.1	48.8
Effective Green, g (s)		54.3	54.3	9.9	59.5						44.1	48.8
Actuated g/C Ratio		0.45	0.45	0.08	0.50						0.37	0.41
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		2148	616	283	1754						651	1468
v/s Ratio Prot		c0.27		c0.05	0.16						c0.24	0.01
v/s Ratio Perm			0.14									0.11
v/c Ratio		0.60	0.32	0.56	0.32						0.65	0.30
Uniform Delay, d1		24.7	21.0	52.9	18.2						31.5	24.1
Progression Factor		0.64	0.35	1.21	0.67						1.00	1.00
Incremental Delay, d2		1.1	1.2	1.3	0.5						1.7	0.0
Delay (s)		17.0	8.6	65.5	12.7						33.2	24.1
Level of Service		B	A	E	B						C	C
Approach Delay (s)		15.1			24.2			0.0			27.4	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	1060	45	175	737	256	44	111	349	102	76	93
Future Volume (vph)	187	1060	45	175	737	256	44	111	349	102	76	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5054		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5054		3433	5085	1583	1770	1863	1583	3433	1863	1583
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)	203	1152	49	190	801	278	48	121	379	111	83	101
RTOR Reduction (vph)	0	3	0	0	0	118	0	0	241	0	0	85
Lane Group Flow (vph)	203	1198	0	190	801	160	48	121	138	111	83	16
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	11.5	68.4		12.2	69.1	69.1	6.8	15.4	15.4	10.0	18.6	18.6
Effective Green, g (s)	11.5	68.4		12.2	69.1	69.1	6.8	15.4	15.4	10.0	18.6	18.6
Actuated g/C Ratio	0.10	0.57		0.10	0.58	0.58	0.06	0.13	0.13	0.08	0.16	0.16
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	328	2880		349	2928	911	100	239	203	286	288	245
v/s Ratio Prot	c0.06	c0.24		c0.06	0.16		0.03	0.06		c0.03	0.04	
v/s Ratio Perm						0.10			c0.09			0.01
v/c Ratio	0.62	0.42		0.54	0.27	0.18	0.48	0.51	0.68	0.39	0.29	0.06
Uniform Delay, d1	52.1	14.5		51.3	12.8	12.0	54.9	48.8	50.0	52.1	44.8	43.3
Progression Factor	1.00	1.00		0.82	0.67	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.4		0.9	0.2	0.4	1.3	0.6	7.3	0.3	0.2	0.0
Delay (s)	54.6	15.0		43.1	8.8	6.5	56.2	49.4	57.3	52.4	45.0	43.3
Level of Service	D	B		D	A	A	E	D	E	D	D	D
Approach Delay (s)		20.7			13.4			55.4			47.2	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	142	18	19	324	231	56
Future Volume (vph)	142	18	19	324	231	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.98		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1756		1770	1863	3435	
Flt Permitted	0.96		0.56	1.00	1.00	
Satd. Flow (perm)	1756		1047	1863	3435	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	20	21	352	251	61
RTOR Reduction (vph)	9	0	0	0	36	0
Lane Group Flow (vph)	165	0	21	352	276	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	10.1		11.6	11.6	11.6	
Effective Green, g (s)	10.1		11.6	11.6	11.6	
Actuated g/C Ratio	0.33		0.38	0.38	0.38	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	577		395	703	1297	
v/s Ratio Prot	c0.09			c0.19	0.08	
v/s Ratio Perm			0.02			
v/c Ratio	0.29		0.05	0.50	0.21	
Uniform Delay, d1	7.6		6.1	7.3	6.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.1	0.6	0.1	
Delay (s)	7.9		6.1	7.9	6.5	
Level of Service	A		A	A	A	
Approach Delay (s)	7.9			7.8	6.5	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	30.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	30	7	22	241	316	60
Future Volume (vph)	30	7	22	241	316	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	8	24	262	343	65

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	41	286	408
Volume Left (vph)	33	24	0
Volume Right (vph)	8	0	65
Hadj (s)	0.08	0.05	-0.06
Departure Headway (s)	5.5	4.5	4.3
Degree Utilization, x	0.06	0.36	0.48
Capacity (veh/h)	580	782	825
Control Delay (s)	8.8	9.9	11.2
Approach Delay (s)	8.8	9.9	11.2
Approach LOS	A	A	B

Intersection Summary			
Delay	10.6		
Level of Service	B		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1082	162	114	874	0	81	0	291	0	0	0
Future Volume (vph)	0	1082	162	114	874	0	81	0	291	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4986		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4986		1770	5085			1770	1583			
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	1176	176	124	950	0	88	0	316	0	0	0
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	265	0	0	0
Lane Group Flow (vph)	0	1333	0	124	950	0	0	88	51	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		54.0		17.8	36.3			16.2	16.2			
Effective Green, g (s)		54.0		17.8	36.3			16.2	16.2			
Actuated g/C Ratio		0.54		0.18	0.36			0.16	0.16			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		2692		315	1845			286	256			
v/s Ratio Prot		c0.27		c0.07	0.19							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.50		0.39	0.51			0.31	0.20			
Uniform Delay, d1		14.4		36.3	25.0			37.0	36.3			
Progression Factor		0.89		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		0.3	1.0			0.2	0.1			
Delay (s)		12.8		36.6	26.0			37.2	36.4			
Level of Service		B		D	C			D	D			
Approach Delay (s)		12.8			27.2			36.6			0.0	
Approach LOS		B			C			D			A	

Intersection Summary				
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/18/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	24	516	125	39	188
Future Volume (Veh/h)	122	24	516	125	39	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)	133	26	561	136	42	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)						332
pX, platoon unblocked						
vC, conflicting volume	917	629			697	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	917	629			697	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	95			95	
cM capacity (veh/h)	288	482			899	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	159	697	42	204
Volume Left	133	0	42	0
Volume Right	26	136	0	0
cSH	308	1700	899	1700
Volume to Capacity	0.52	0.41	0.05	0.12
Queue Length 95th (ft)	70	0	4	0
Control Delay (s)	28.5	0.0	9.2	0.0
Lane LOS	D		A	
Approach Delay (s)	28.5	0.0	1.6	
Approach LOS	D			

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	378	28	355	335	263	40	377	390	443	341	13
Future Volume (vph)	6	378	28	355	335	263	40	377	390	443	341	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3503		1770	1863	1583	1770	3539	1583	3433	1853	
Flt Permitted	0.54	1.00		0.42	1.00	1.00	0.53	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1014	3503		786	1863	1583	994	3539	1583	3433	1853	
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)	7	411	30	386	364	286	43	410	424	482	371	14
RTOR Reduction (vph)	0	5	0	0	0	124	0	0	277	0	1	0
Lane Group Flow (vph)	7	436	0	386	364	162	43	410	147	482	384	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	36.3	36.3		49.5	56.5	56.5	17.8	17.8	17.8	13.7	35.5	
Effective Green, g (s)	36.3	36.3		49.5	56.5	56.5	17.8	17.8	17.8	13.7	35.5	
Actuated g/C Ratio	0.36	0.36		0.50	0.56	0.56	0.18	0.18	0.18	0.14	0.36	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	368	1271		518	1052	894	176	629	281	470	657	
v/s Ratio Prot		0.12		c0.10	0.20			0.12		c0.14	c0.21	
v/s Ratio Perm	0.01			c0.27		0.10	0.04		0.09			
v/c Ratio	0.02	0.34		0.75	0.35	0.18	0.24	0.65	0.52	1.03	0.58	
Uniform Delay, d1	20.4	23.2		16.9	11.8	10.5	35.3	38.2	37.3	43.1	26.2	
Progression Factor	1.00	1.00		1.44	0.18	0.06	0.79	0.86	0.69	1.00	1.00	
Incremental Delay, d2	0.1	0.7		5.1	0.1	0.0	0.2	1.7	0.8	48.2	0.9	
Delay (s)	20.5	23.9		29.5	2.1	0.6	28.2	34.6	26.6	91.3	27.1	
Level of Service	C	C		C	A	A	C	C	C	F	C	
Approach Delay (s)		23.9			11.9			30.4			62.8	
Approach LOS		C			B			C			E	

Intersection Summary				
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	2	112	2	0	8	43	676	5	5	525	21
Future Volume (vph)	223	2	112	2	0	8	43	676	5	5	525	21
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.89		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1642		1770	3536		1770	3519	
Flt Permitted		0.79			0.96		0.40	1.00		0.33	1.00	
Satd. Flow (perm)		1413			1590		744	3536		616	3519	
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)	242	2	122	2	0	9	47	735	5	5	571	23
RTOR Reduction (vph)	0	23	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	343	0	0	3	0	47	740	0	5	592	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		30.4			30.4		61.6	61.6		61.6	61.6	
Effective Green, g (s)		30.4			30.4		61.6	61.6		61.6	61.6	
Actuated g/C Ratio		0.30			0.30		0.62	0.62		0.62	0.62	
Clearance Time (s)		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	
Lane Grp Cap (vph)		429			483		458	2178		379	2167	
v/s Ratio Prot								c0.21			0.17	
v/s Ratio Perm		c0.24			0.00		0.06			0.01		
v/c Ratio		0.80			0.01		0.10	0.34		0.01	0.27	
Uniform Delay, d1		32.0			24.3		7.9	9.3		7.4	8.9	
Progression Factor		1.00			1.00		1.00	1.00		0.93	0.78	
Incremental Delay, d2		10.0			0.0		0.4	0.4		0.0	0.2	
Delay (s)		42.0			24.3		8.3	9.7		7.0	7.2	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		42.0			24.3			9.7			7.2	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	429	66	54	289	22	0	0	0	12	1	13
Future Volume (Veh/h)	14	429	66	54	289	22	0	0	0	12	1	13
Sign Control		Free			Free			Yield			Yield	
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)	15	466	72	59	314	24	0	0	0	13	1	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	338			538			990	988	502	976	1012	326
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	204			538			932	929	502	916	956	191
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 %	99			94			100	100	100	94	100	98
cM capacity (veh/h)	1226			1030			205	223	569	215	215	763

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	553	397	28
Volume Left	15	59	13
Volume Right	72	24	14
cSH	1226	1030	336
Volume to Capacity	0.01	0.06	0.08
Queue Length 95th (ft)	1	5	7
Control Delay (s)	0.4	1.8	16.7
Lane LOS	A	A	C
Approach Delay (s)	0.4	1.8	16.7
Approach LOS			C

Intersection Summary			
Average Delay			1.4
Intersection Capacity Utilization			53.5%
Analysis Period (min)			15

ICU Level of Service A

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/18/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	214	37	137	138	131	31	585	241	89	738	45
Future Volume (vph)	37	214	37	137	138	131	31	585	241	89	738	45
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1822		1770	1727		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1822		1770	1727		1770	3539	1583	1770	3539	1583
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	233	40	149	150	142	34	636	262	97	802	49
RTOR Reduction (vph)	0	5	0	0	27	0	0	0	109	0	0	32
Lane Group Flow (vph)	40	268	0	149	265	0	34	636	153	97	802	17
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	18.7	18.7		19.3	19.3		4.4	26.5	26.5	8.6	30.7	30.7
Effective Green, g (s)	18.7	18.7		19.3	19.3		4.4	26.5	26.5	8.6	30.7	30.7
Actuated g/C Ratio	0.21	0.21		0.22	0.22		0.05	0.30	0.30	0.10	0.34	0.34
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	371	382		383	374		87	1052	470	170	1219	545
v/s Ratio Prot	0.02	c0.15		0.08	c0.15		0.02	0.18		c0.05	c0.23	
v/s Ratio Perm									0.10			0.01
v/c Ratio	0.11	0.70		0.39	0.71		0.39	0.60	0.33	0.57	0.66	0.03
Uniform Delay, d1	28.5	32.6		29.9	32.3		41.1	26.8	24.3	38.5	24.7	19.3
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	0.1	5.8		0.7	6.0		2.9	1.0	0.4	4.6	1.3	0.0
Delay (s)	28.6	38.4		30.5	38.3		43.9	27.8	24.8	43.0	26.0	19.4
Level of Service	C	D		C	D		D	C	C	D	C	B
Approach Delay (s)		37.1			35.7			27.5			27.4	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	4	367	17	11	5	762	221	18	12	574	174
Future Volume (vph)	137	4	367	17	11	5	762	221	18	12	574	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.86	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1459	1504		1781		3433	3498		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1459	1504		1781		3433	3498		1770	3539	1583
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)	149	4	399	18	12	5	828	240	20	13	624	189
RTOR Reduction (vph)	0	164	176	0	5	0	0	3	0	0	0	100
Lane Group Flow (vph)	134	47	31	0	30	0	828	257	0	13	624	89
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.3	12.3	12.3		3.6		26.0	51.2		1.0	25.2	25.2
Effective Green, g (s)	12.3	12.3	12.3		3.6		26.0	51.2		1.0	25.2	25.2
Actuated g/C Ratio	0.15	0.15	0.15		0.04		0.31	0.61		0.01	0.30	0.30
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	248	215	222		76		1071	2150		21	1070	478
v/s Ratio Prot	c0.08	0.03			c0.02		c0.24	0.07		0.01	c0.18	
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.54	0.22	0.14		0.40		0.77	0.12		0.62	0.58	0.19
Uniform Delay, d1	32.9	31.3	30.9		38.8		26.0	6.7		41.0	24.6	21.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	0.1		1.2		3.2	0.0		32.5	0.5	0.1
Delay (s)	34.2	31.5	31.0		40.0		29.2	6.7		73.5	25.1	21.5
Level of Service	C	C	C		D		C	A		E	C	C
Approach Delay (s)		31.9			40.0			23.8			25.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	83.3	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	850	197	0	8	108	116	10	20	10	167	13	775
Future Volume (vph)	850	197	0	8	108	116	10	20	10	167	13	775
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	1.00		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3433	3539		1770	3539	1583		3364		1681	1697	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3433	3539		1770	3539	1583		3364		1681	1697	2787
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)	924	214	0	9	117	126	11	22	11	182	14	842
RTOR Reduction (vph)	0	0	0	0	0	106	0	10	0	0	0	384
Lane Group Flow (vph)	924	214	0	9	117	20	0	34	0	98	98	458
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	29.9	40.4		0.9	11.4	11.4		4.2		8.4	8.4	38.3
Effective Green, g (s)	29.9	40.4		0.9	11.4	11.4		4.2		8.4	8.4	38.3
Actuated g/C Ratio	0.42	0.57		0.01	0.16	0.16		0.06		0.12	0.12	0.54
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1458	2030		22	573	256		200		200	202	1516
v/s Ratio Prot	c0.27	0.06		0.01	c0.03			c0.01		c0.06	0.06	0.13
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.63	0.11		0.41	0.20	0.08		0.17		0.49	0.49	0.30
Uniform Delay, d1	15.9	6.8		34.5	25.6	25.0		31.4		29.0	29.0	8.8
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0		4.5	0.1	0.0		0.1		0.7	0.7	0.0
Delay (s)	16.6	6.8		38.9	25.6	25.1		31.6		29.7	29.6	8.8
Level of Service	B	A		D	C	C		C		C	C	A
Approach Delay (s)		14.8			25.8			31.6			12.7	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	850	467	300	606	0	0	0	0	178	1	891
Future Volume (vph)	0	850	467	300	606	0	0	0	0	178	1	891
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.98	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)		4687	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4687	1362	3433	3539						1774	3610
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	924	508	326	659	0	0	0	0	193	1	968
RTOR Reduction (vph)	0	33	203	0	0	0	0	0	0	0	0	115
Lane Group Flow (vph)	0	1074	122	326	659	0	0	0	0	0	194	853
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		19.7	19.7	10.2	24.1						11.0	16.8
Effective Green, g (s)		19.7	19.7	10.2	24.1						11.0	16.8
Actuated g/C Ratio		0.37	0.37	0.19	0.46						0.21	0.32
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		1755	510	665	1621						370	1153
v/s Ratio Prot		c0.23		c0.09	0.19						0.11	c0.08
v/s Ratio Perm			0.09									0.15
v/c Ratio		0.61	0.24	0.49	0.41						0.52	0.74
Uniform Delay, d1		13.4	11.3	18.9	9.5						18.5	16.0
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.2	0.1						0.6	2.2
Delay (s)		13.8	11.4	19.1	9.5						19.1	18.1
Level of Service		B	B	B	A						B	B
Approach Delay (s)		13.3			12.7			0.0			18.3	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	828	54	356	1006	109	31	52	186	258	231	185
Future Volume (vph)	92	828	54	356	1006	109	31	52	186	258	231	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5038		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5038		3433	5085	1583	1770	1863	1583	3433	1863	1583
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)	100	900	59	387	1093	118	34	57	202	280	251	201
RTOR Reduction (vph)	0	9	0	0	0	75	0	0	164	0	0	140
Lane Group Flow (vph)	100	950	0	387	1093	43	34	57	38	280	251	61
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	4.8	16.8		10.7	22.7	22.7	2.1	11.9	11.9	9.4	19.2	19.2
Effective Green, g (s)	4.8	16.8		10.7	22.7	22.7	2.1	11.9	11.9	9.4	19.2	19.2
Actuated g/C Ratio	0.08	0.27		0.17	0.36	0.36	0.03	0.19	0.19	0.15	0.31	0.31
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	262	1347		584	1838	572	59	353	299	513	569	483
v/s Ratio Prot	0.03	c0.19		c0.11	0.21		0.02	0.03		c0.08	c0.13	
v/s Ratio Perm						0.03			0.02			0.04
v/c Ratio	0.38	0.71		0.66	0.59	0.07	0.58	0.16	0.13	0.55	0.44	0.13
Uniform Delay, d1	27.6	20.8		24.4	16.3	13.2	29.9	21.3	21.1	24.7	17.5	15.7
Progression Factor	1.00	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	1.4		2.2	0.3	0.0	8.2	0.1	0.1	0.6	0.2	0.0
Delay (s)	27.9	22.2		26.6	16.7	13.2	38.1	21.4	21.2	25.4	17.7	15.8
Level of Service	C	C		C	B	B	D	C	C	C	B	B
Approach Delay (s)		22.7			18.8			23.2			20.1	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	57.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	71	20	19	222	515	126
Future Volume (vph)	71	20	19	222	515	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.97		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1739		1770	1863	3435	
Flt Permitted	0.96		0.38	1.00	1.00	
Satd. Flow (perm)	1739		713	1863	3435	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	22	21	241	560	137
RTOR Reduction (vph)	16	0	0	0	38	0
Lane Group Flow (vph)	83	0	21	241	659	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	9.1		12.9	12.9	12.9	
Effective Green, g (s)	9.1		12.9	12.9	12.9	
Actuated g/C Ratio	0.29		0.42	0.42	0.42	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	510		296	775	1429	
v/s Ratio Prot	c0.05			0.13	c0.19	
v/s Ratio Perm			0.03			
v/c Ratio	0.16		0.07	0.31	0.46	
Uniform Delay, d1	8.1		5.4	6.1	6.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.1	0.2	0.2	
Delay (s)	8.3		5.5	6.3	6.8	
Level of Service	A		A	A	A	
Approach Delay (s)	8.3			6.2	6.8	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	31.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/18/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	15	8	9	181	651	81
Future Volume (vph)	15	8	9	181	651	81
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	9	10	197	708	88

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	25	207	796
Volume Left (vph)	16	10	0
Volume Right (vph)	9	0	88
Hadj (s)	-0.05	0.04	-0.03
Departure Headway (s)	6.0	4.8	4.2
Degree Utilization, x	0.04	0.28	0.92
Capacity (veh/h)	573	736	855
Control Delay (s)	9.2	9.6	35.2
Approach Delay (s)	9.2	9.6	35.2
Approach LOS	A	A	E

Intersection Summary			
Delay			29.4
Level of Service			D
Intersection Capacity Utilization			49.2%
Analysis Period (min)			15

ICU Level of Service A

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	748	113	170	1114	0	79	0	207	0	0	0
Future Volume (vph)	0	748	113	170	1114	0	79	0	207	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4985		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4985		1770	5085			1770	1583			
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	813	123	185	1211	0	86	0	225	0	0	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	184	0	0	0
Lane Group Flow (vph)	0	916	0	185	1211	0	0	86	41	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		49.7		20.1	35.7			18.2	18.2			
Effective Green, g (s)		49.7		20.1	35.7			18.2	18.2			
Actuated g/C Ratio		0.50		0.20	0.36			0.18	0.18			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		2477		355	1815			322	288			
v/s Ratio Prot		c0.18		c0.10	c0.24							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.37		0.52	0.67			0.27	0.14			
Uniform Delay, d1		15.5		35.7	27.1			35.2	34.3			
Progression Factor		1.08		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		0.6	2.0			0.2	0.1			
Delay (s)		16.8		36.3	29.1			35.3	34.4			
Level of Service		B		D	C			D	C			
Approach Delay (s)		16.8			30.1			34.7			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay		25.9	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio		0.54	
Actuated Cycle Length (s)		100.0	Sum of lost time (s) 19.0
Intersection Capacity Utilization		40.8%	ICU Level of Service A
Analysis Period (min)		15	

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/18/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	202	22	263	61	47	235
Future Volume (Veh/h)	202	22	263	61	47	235
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)	220	24	286	66	51	255
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						332
pX, platoon unblocked						
vC, conflicting volume	676	319			352	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676	319			352	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	97			96	
cM capacity (veh/h)	401	722			1207	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	244	352	51	255
Volume Left	220	0	51	0
Volume Right	24	66	0	0
cSH	419	1700	1207	1700
Volume to Capacity	0.58	0.21	0.04	0.15
Queue Length 95th (ft)	90	0	3	0
Control Delay (s)	24.8	0.0	8.1	0.0
Lane LOS	C		A	
Approach Delay (s)	24.8	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay		7.2	
Intersection Capacity Utilization		43.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	193	58	387	430	384	51	414	358	309	362	36
Future Volume (vph)	19	193	58	387	430	384	51	414	358	309	362	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3417		1770	1863	1583	1770	3539	1583	3433	1838	
Flt Permitted	0.50	1.00		0.56	1.00	1.00	0.44	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	922	3417		1039	1863	1583	819	3539	1583	3433	1838	
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)	21	210	63	421	467	417	55	450	389	336	393	39
RTOR Reduction (vph)	0	28	0	0	0	162	0	0	311	0	4	0
Lane Group Flow (vph)	21	245	0	421	467	255	55	450	78	336	428	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	35.7	35.7		50.9	57.9	57.9	20.1	20.1	20.1	10.0	34.1	
Effective Green, g (s)	35.7	35.7		50.9	57.9	57.9	20.1	20.1	20.1	10.0	34.1	
Actuated g/C Ratio	0.36	0.36		0.51	0.58	0.58	0.20	0.20	0.20	0.10	0.34	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	329	1219		639	1078	916	164	711	318	343	626	
v/s Ratio Prot		0.07		c0.10	0.25			0.13		c0.10	c0.23	
v/s Ratio Perm	0.02			c0.23		0.16	0.07		0.05			
v/c Ratio	0.06	0.20		0.66	0.43	0.28	0.34	0.63	0.25	0.98	0.68	
Uniform Delay, d1	21.2	22.3		15.8	11.8	10.6	34.2	36.6	33.6	44.9	28.3	
Progression Factor	1.00	1.00		1.06	0.19	0.50	1.14	1.14	3.70	1.00	1.00	
Incremental Delay, d2	0.4	0.4		1.9	0.1	0.0	0.4	1.3	0.1	42.4	2.5	
Delay (s)	21.5	22.6		18.7	2.3	5.3	39.4	43.0	124.4	87.3	30.8	
Level of Service	C	C		B	A	A	D	D	F	F	C	
Approach Delay (s)		22.6			8.5			78.2			55.5	
Approach LOS		C			A			E			E	

Intersection Summary				
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	0	107	5	6	15	58	743	0	9	595	48
Future Volume (vph)	127	0	107	5	6	15	58	743	0	9	595	48
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.94			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1702			1704		1770	3539		1770	3500	
Flt Permitted		0.82			0.96		0.37	1.00		0.32	1.00	
Satd. Flow (perm)		1425			1649		685	3539		602	3500	
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)	138	0	116	5	7	16	63	808	0	10	647	52
RTOR Reduction (vph)	0	33	0	0	13	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	221	0	0	15	0	63	808	0	10	694	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		20.5			20.5		71.5	71.5		71.5	71.5	
Effective Green, g (s)		20.5			20.5		71.5	71.5		71.5	71.5	
Actuated g/C Ratio		0.20			0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		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	
Lane Grp Cap (vph)		292			338		489	2530		430	2502	
v/s Ratio Prot								c0.23			0.20	
v/s Ratio Perm		c0.15			0.01		0.09			0.02		
v/c Ratio		0.76			0.05		0.13	0.32		0.02	0.28	
Uniform Delay, d1		37.4			31.9		4.5	5.3		4.1	5.1	
Progression Factor		1.00			1.00		1.00	1.00		1.28	1.21	
Incremental Delay, d2		10.6			0.1		0.5	0.3		0.1	0.2	
Delay (s)		48.0			32.0		5.0	5.6		5.4	6.4	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		48.0			32.0			5.6			6.4	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	245	72	131	305	38	0	0	0	16	7	31
Future Volume (Veh/h)	28	245	72	131	305	38	0	0	0	16	7	31
Sign Control		Free			Free			Yield			Yield	
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	266	78	142	332	41	0	0	0	17	8	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	373			344			1040	1022	305	1002	1040	352
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	185			344			963	942	305	919	964	161
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			88			100	100	100	91	96	96
cM capacity (veh/h)	1191			1215			167	194	735	193	188	757

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	374	515	59
Volume Left	30	142	17
Volume Right	78	41	34
cSH	1191	1215	336
Volume to Capacity	0.03	0.12	0.18
Queue Length 95th (ft)	2	10	16
Control Delay (s)	0.9	3.2	18.0
Lane LOS	A	A	C
Approach Delay (s)	0.9	3.2	18.0
Approach LOS			C

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	57.8%	ICU Level of Service	B	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/18/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/18/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	133	32	176	91	93	34	682	181	61	718	58
Future Volume (vph)	34	133	32	176	91	93	34	682	181	61	718	58
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1808		1770	1722		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1808		1770	1722		1770	3539	1583	1770	3539	1583
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)	37	145	35	191	99	101	37	741	197	66	780	63
RTOR Reduction (vph)	0	7	0	0	30	0	0	0	66	0	0	39
Lane Group Flow (vph)	37	173	0	191	170	0	37	741	131	66	780	24
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	14.0	14.0		15.0	15.0		4.3	27.1	27.1	7.0	29.8	29.8
Effective Green, g (s)	14.0	14.0		15.0	15.0		4.3	27.1	27.1	7.0	29.8	29.8
Actuated g/C Ratio	0.18	0.18		0.19	0.19		0.05	0.34	0.34	0.09	0.38	0.38
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	313	320		335	326		96	1212	542	156	1333	596
v/s Ratio Prot	0.02	c0.10		c0.11	0.10		0.02	0.21		c0.04	c0.22	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.12	0.54		0.57	0.52		0.39	0.61	0.24	0.42	0.59	0.04
Uniform Delay, d1	27.4	29.6		29.1	28.8		36.1	21.6	18.6	34.1	19.7	15.6
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	0.2	1.8		2.3	1.5		2.6	0.9	0.2	1.8	0.7	0.0
Delay (s)	27.5	31.4		31.5	30.3		38.7	22.5	18.9	36.0	20.4	15.6
Level of Service	C	C		C	C		D	C	B	D	C	B
Approach Delay (s)		30.7			30.9			22.4			21.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	441	7	418	12	10	5	829	453	7	8	227	90
Future Volume (vph)	441	7	418	12	10	5	829	453	7	8	227	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.93	0.85		0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1533	1504		1777		3433	3531		1770	3539	1583
Flt Permitted	0.95	0.98	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1533	1504		1777		3433	3531		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	441	7	418	12	10	5	829	453	7	8	227	90
RTOR Reduction (vph)	0	33	215	0	5	0	0	1	0	0	0	81
Lane Group Flow (vph)	300	257	61	0	22	0	829	459	0	8	227	9
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	26.5	26.5	26.5		4.0		61.4	73.5		0.8	11.9	11.9
Effective Green, g (s)	26.5	26.5	26.5		4.0		61.4	73.5		0.8	11.9	11.9
Actuated g/C Ratio	0.22	0.22	0.22		0.03		0.51	0.61		0.01	0.10	0.10
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	371	338	332		59		1756	2162		11	350	156
v/s Ratio Prot	c0.18	0.17			c0.01		c0.24	0.13		0.00	c0.06	
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.81	0.76	0.18		0.38		0.47	0.21		0.73	0.65	0.06
Uniform Delay, d1	44.3	43.8	38.0		56.8		18.9	10.4		59.5	52.0	49.0
Progression Factor	1.00	1.00	1.00		1.00		1.41	1.83		1.00	1.00	1.00
Incremental Delay, d2	11.6	8.8	0.1		1.5		0.8	0.2		110.3	3.1	0.1
Delay (s)	55.9	52.6	38.1		58.2		27.4	19.1		169.8	55.1	49.0
Level of Service	E	D	D		E		C	B		F	E	D
Approach Delay (s)		49.1			58.2			24.5			56.3	
Approach LOS		D			E			C			E	

Intersection Summary				
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1199	541	33	3	146	84	38	21	2	81	19	565
Future Volume (vph)	1199	541	33	3	146	84	38	21	2	81	19	565
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	0.99		1.00	1.00	0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (prot)	3433	3509		1770	3539	1583		3415		1681	1716	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.78		0.72	0.77	1.00
Satd. Flow (perm)	3433	3509		1770	3539	1583		2744		1266	1365	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1199	541	33	3	146	84	38	21	2	81	19	565
RTOR Reduction (vph)	0	2	0	0	0	76	0	2	0	0	0	113
Lane Group Flow (vph)	1199	572	0	3	146	8	0	59	0	49	51	452
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	86.8	96.9		1.1	11.2	11.2		10.2		9.2	9.2	96.0
Effective Green, g (s)	86.8	96.9		1.1	11.2	11.2		10.2		9.2	9.2	96.0
Actuated g/C Ratio	0.72	0.81		0.01	0.09	0.09		0.08		0.08	0.08	0.80
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	2483	2833		16	330	147		233		97	104	2299
v/s Ratio Prot	c0.35	0.16		0.00	c0.04							0.14
v/s Ratio Perm						0.00		0.02		c0.04	0.04	0.02
v/c Ratio	0.48	0.20		0.19	0.44	0.05		0.25		0.51	0.49	0.20
Uniform Delay, d1	7.1	2.7		59.0	51.4	49.6		51.3		53.2	53.2	2.8
Progression Factor	0.34	0.24		1.00	1.00	1.00		1.00		1.04	1.04	7.35
Incremental Delay, d2	0.6	0.1		2.1	0.3	0.1		0.2		1.3	1.2	0.0
Delay (s)	3.0	0.8		61.1	51.8	49.6		51.6		56.5	56.3	21.0
Level of Service	A	A		E	D	D		D		E	E	C
Approach Delay (s)		2.2			51.1			51.6			26.3	
Approach LOS		A			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.8	
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1291	437	145	545	0	0	0	0	472	13	663
Future Volume (vph)	0	1291	437	145	545	0	0	0	0	472	13	663
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	4.6
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.99	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)		4778	1362	3433	3539						1776	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4778	1362	3433	3539						1776	3610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1291	437	145	545	0	0	0	0	472	13	663
RTOR Reduction (vph)	0	3	108	0	0	0	0	0	0	0	0	414
Lane Group Flow (vph)	0	1340	277	145	545	0	0	0	0	0	485	249
Turn Type		NA	Perm	Prot	NA					Perm	NA	Prot
Protected Phases		2		1	6						4	4
Permitted Phases			2							4		
Actuated Green, G (s)		60.1	60.1	8.9	72.0						39.3	39.3
Effective Green, g (s)		60.1	60.1	8.9	72.0						39.3	39.3
Actuated g/C Ratio		0.50	0.50	0.07	0.60						0.33	0.33
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	4.6
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		2392	682	254	2123						581	1182
v/s Ratio Prot		c0.28		c0.04	0.15							0.07
v/s Ratio Perm			0.20								0.27	
v/c Ratio		0.56	0.41	0.57	0.26						0.83	0.21
Uniform Delay, d1		20.8	18.8	53.7	11.3						37.3	29.1
Progression Factor		1.00	1.00	1.24	1.50						1.00	1.00
Incremental Delay, d2		1.0	1.8	1.9	0.3						9.6	0.0
Delay (s)		21.7	20.6	68.3	17.3						47.0	29.2
Level of Service		C	C	E	B						D	C
Approach Delay (s)		21.5			28.0			0.0			36.7	
Approach LOS		C			C			A			D	

Intersection Summary				
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	69.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	254	1327	45	198	781	256	82	151	306	102	80	102
Future Volume (vph)	254	1327	45	198	781	256	82	151	306	102	80	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5060		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5060		3433	5085	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	254	1327	45	198	781	256	82	151	306	102	80	102
RTOR Reduction (vph)	0	5	0	0	0	179	0	0	164	0	0	76
Lane Group Flow (vph)	254	1367	0	198	781	77	82	151	142	102	80	26
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	7.5	23.0		5.5	21.0	21.0	5.5	18.2	18.2	5.3	18.0	18.0
Effective Green, g (s)	7.5	23.0		5.5	21.0	21.0	5.5	18.2	18.2	5.3	18.0	18.0
Actuated g/C Ratio	0.11	0.33		0.08	0.30	0.30	0.08	0.26	0.26	0.08	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)	367	1662		269	1525	474	139	484	411	259	479	407
v/s Ratio Prot	c0.07	c0.27		0.06	0.15		c0.05	0.08		0.03	0.04	
v/s Ratio Perm						0.05			c0.09			0.02
v/c Ratio	0.69	0.82		0.74	0.51	0.16	0.59	0.31	0.34	0.39	0.17	0.06
Uniform Delay, d1	30.1	21.6		31.5	20.3	18.0	31.2	20.9	21.1	30.8	20.2	19.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.3	4.7		16.4	1.2	0.7	17.1	1.7	2.3	4.4	0.8	0.3
Delay (s)	40.4	26.4		47.9	21.5	18.8	48.2	22.5	23.3	35.3	20.9	19.9
Level of Service	D	C		D	C	B	D	C	C	D	C	B
Approach Delay (s)		28.5			25.2			26.9			25.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/24/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	142	18	19	421	258	56
Future Volume (vph)	142	18	19	421	258	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.98		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1757		1770	1863	3445	
Flt Permitted	0.96		0.56	1.00	1.00	
Satd. Flow (perm)	1757		1045	1863	3445	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	18	19	421	258	56
RTOR Reduction (vph)	11	0	0	0	35	0
Lane Group Flow (vph)	149	0	19	421	279	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	16.0		15.0	15.0	15.0	
Effective Green, g (s)	16.0		15.0	15.0	15.0	
Actuated g/C Ratio	0.40		0.38	0.38	0.38	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Lane Grp Cap (vph)	702		391	698	1291	
v/s Ratio Prot	c0.08			c0.23	0.08	
v/s Ratio Perm			0.02			
v/c Ratio	0.21		0.05	0.60	0.22	
Uniform Delay, d1	7.9		8.0	10.1	8.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.2	3.8	0.4	
Delay (s)	8.6		8.2	13.9	8.9	
Level of Service	A		A	B	A	
Approach Delay (s)	8.6			13.7	8.9	
Approach LOS	A			B	A	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/24/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	35	8	26	283	368	70
Future Volume (vph)	35	8	26	283	368	70
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	8	26	283	368	70

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	43	309	438
Volume Left (vph)	35	26	0
Volume Right (vph)	8	0	70
Hadj (s)	0.09	0.05	-0.06
Departure Headway (s)	5.6	4.5	4.3
Degree Utilization, x	0.07	0.39	0.52
Capacity (veh/h)	565	775	819
Control Delay (s)	9.0	10.4	11.9
Approach Delay (s)	9.0	10.4	11.9
Approach LOS	A	B	B

Intersection Summary			
Delay	11.1		
Level of Service	B		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1069	181	381	839	0	121	0	638	0	0	0
Future Volume (vph)	0	1069	181	381	839	0	121	0	638	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4975		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4975		1770	5085			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1069	181	381	839	0	121	0	638	0	0	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	450	0	0	0
Lane Group Flow (vph)	0	1232	0	381	839	0	0	121	188	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		6		5	2			4				
Permitted Phases	6						4		4			
Actuated Green, G (s)		44.4		25.5	73.9			18.1	18.1			
Effective Green, g (s)		44.4		25.5	73.9			18.1	18.1			
Actuated g/C Ratio		0.44		0.26	0.74			0.18	0.18			
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)		2208		451	3757			320	286			
v/s Ratio Prot		c0.25		c0.22	0.16							
v/s Ratio Perm								0.07	c0.12			
v/c Ratio		0.56		0.84	0.22			0.38	0.66			
Uniform Delay, d1		20.5		35.4	4.1			36.0	38.1			
Progression Factor		1.00		1.00	1.00			1.00	1.00			
Incremental Delay, d2		1.0		13.5	0.1			0.8	5.4			
Delay (s)		21.6		48.9	4.2			36.8	43.5			
Level of Service		C		D	A			D	D			
Approach Delay (s)		21.6			18.2			42.4			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/24/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	143	28	595	147	46	221
Future Volume (Veh/h)	143	28	595	147	46	221
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	143	28	595	147	46	221
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						332
pX, platoon unblocked						
vC, conflicting volume	982	668			742	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	982	668			742	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	94			95	
cM capacity (veh/h)	262	458			865	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	171	742	46	221
Volume Left	143	0	46	0
Volume Right	28	147	0	0
cSH	281	1700	865	1700
Volume to Capacity	0.61	0.44	0.05	0.13
Queue Length 95th (ft)	92	0	4	0
Control Delay (s)	35.8	0.0	9.4	0.0
Lane LOS	E		A	
Approach Delay (s)	35.8	0.0	1.6	
Approach LOS	E			

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	506	23	119	342	357	28	284	122	587	251	14
Future Volume (vph)	6	506	23	119	342	357	28	284	122	587	251	14
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	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3516		1770	1863	1583	1770	3539	1583	3433	1848	
Flt Permitted	0.56	1.00		0.38	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1034	3516		708	1863	1583	1770	3539	1583	3433	1848	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	506	23	119	342	357	28	284	122	587	251	14
RTOR Reduction (vph)	0	2	0	0	0	169	0	0	105	0	2	0
Lane Group Flow (vph)	6	527	0	119	342	188	28	284	17	587	263	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6			6		2			4			
Actuated Green, G (s)	51.5	51.5		61.1	63.1	63.1	11.8	16.9	16.9	26.0	31.1	
Effective Green, g (s)	51.5	51.5		61.1	63.1	63.1	11.8	16.9	16.9	26.0	31.1	
Actuated g/C Ratio	0.43	0.43		0.51	0.53	0.53	0.10	0.14	0.14	0.22	0.26	
Clearance Time (s)	4.0	4.0		4.0	6.0	6.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	443	1508		445	979	832	174	498	222	743	478	
v/s Ratio Prot		0.15		0.02	c0.18		0.02	c0.08		c0.17	c0.14	
v/s Ratio Perm	0.01			0.11		0.12			0.01			
v/c Ratio	0.01	0.35		0.27	0.35	0.23	0.16	0.57	0.08	0.79	0.55	
Uniform Delay, d1	19.7	23.0		15.9	16.5	15.3	49.6	48.2	44.8	44.4	38.4	
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	0.1	0.6		0.3	1.0	0.6	0.4	1.6	0.1	5.7	1.3	
Delay (s)	19.7	23.6		16.2	17.5	15.9	50.0	49.7	44.9	50.1	39.7	
Level of Service	B	C		B	B	B	D	D	D	D	D	
Approach Delay (s)		23.6			16.6			48.4			46.9	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	2	132	2	0	9	51	794	6	6	617	25
Future Volume (vph)	262	2	132	2	0	9	51	794	6	6	617	25
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.89		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1642		1770	3535		1770	3519	
Flt Permitted		0.79			0.97		0.29	1.00		0.19	1.00	
Satd. Flow (perm)		1413			1601		535	3535		360	3519	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	262	2	132	2	0	9	51	794	6	6	617	25
RTOR Reduction (vph)	0	23	0	0	5	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	373	0	0	6	0	51	799	0	6	637	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		38.9			38.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)		38.9			38.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio		0.56			0.56		0.33	0.33		0.33	0.33	
Clearance Time (s)		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	
Lane Grp Cap (vph)		785			889		176	1166		118	1161	
v/s Ratio Prot								c0.23			0.18	
v/s Ratio Perm		c0.26			0.00		0.10			0.02		
v/c Ratio		0.48			0.01		0.29	0.69		0.05	0.55	
Uniform Delay, d1		9.4			6.9		17.4	20.3		16.0	19.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1			0.0		0.9	1.7		0.2	0.5	
Delay (s)		11.5			6.9		18.3	22.0		16.2	19.7	
Level of Service		B			A		B	C		B	B	
Approach Delay (s)		11.5			6.9			21.8			19.7	
Approach LOS		B			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	504	78	63	339	26	0	0	0	14	1	15
Future Volume (Veh/h)	16	504	78	63	339	26	0	0	0	14	1	15
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	504	78	63	339	26	0	0	0	14	1	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	365			582			1068	1066	543	1053	1092	352
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228			582			1016	1014	543	999	1043	213
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 %	99			94			100	100	100	93	99	98
cM capacity (veh/h)	1196			992			177	197	540	187	189	738

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	598	428	30
Volume Left	16	63	14
Volume Right	78	26	15
cSH	1196	992	298
Volume to Capacity	0.01	0.06	0.10
Queue Length 95th (ft)	1	5	8
Control Delay (s)	0.4	1.9	18.4
Lane LOS	A	A	C
Approach Delay (s)	0.4	1.9	18.4
Approach LOS			C

Intersection Summary			
Average Delay			1.5
Intersection Capacity Utilization			61.2%
Analysis Period (min)			15

ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/24/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/24/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	319	9	99	167	170	28	283	128	106	370	79
Future Volume (vph)	35	319	9	99	167	170	28	283	128	106	370	79
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1855		1770	1722		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1855		1770	1722		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	319	9	99	167	170	28	283	128	106	370	79
RTOR Reduction (vph)	0	1	0	0	32	0	0	0	104	0	0	58
Lane Group Flow (vph)	35	327	0	99	305	0	28	283	24	106	370	21
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	21.0	21.0		21.3	21.3		1.8	15.4	15.4	8.4	22.0	22.0
Effective Green, g (s)	21.0	21.0		21.3	21.3		1.8	15.4	15.4	8.4	22.0	22.0
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.02	0.19	0.19	0.10	0.27	0.27
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	452	474		459	446		38	663	296	181	948	424
v/s Ratio Prot	0.02	c0.18		0.06	c0.18		0.02	0.08		c0.06	c0.10	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.08	0.69		0.22	0.68		0.74	0.43	0.08	0.59	0.39	0.05
Uniform Delay, d1	23.2	27.6		23.8	27.4		39.9	29.5	27.5	35.2	24.6	22.3
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	0.1	4.3		0.2	4.3		53.2	0.4	0.1	4.8	0.3	0.0
Delay (s)	23.3	31.9		24.1	31.7		93.2	29.9	27.6	40.0	24.8	22.3
Level of Service	C	C		C	C		F	C	C	D	C	C
Approach Delay (s)		31.1			30.0			33.3			27.4	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	49.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	4	602	17	11	5	745	313	18	12	702	188
Future Volume (vph)	147	4	602	17	11	5	745	313	18	12	702	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.86	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1453	1504		1779		3433	3510		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1453	1504		1779		3433	3510		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	4	602	17	11	5	745	313	18	12	702	188
RTOR Reduction (vph)	0	260	271	0	5	0	0	6	0	0	0	127
Lane Group Flow (vph)	132	54	36	0	28	0	745	325	0	12	702	61
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	6.2	6.2	6.2		2.0		11.1	28.6		0.7	17.2	17.2
Effective Green, g (s)	6.2	6.2	6.2		2.0		11.1	28.6		0.7	17.2	17.2
Actuated g/C Ratio	0.12	0.12	0.12		0.04		0.21	0.54		0.01	0.33	0.33
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	197	170	176		67		723	1904		23	1155	516
v/s Ratio Prot	c0.08	0.04			c0.02		c0.22	0.09		0.01	c0.20	
v/s Ratio Perm			0.02									0.04
v/c Ratio	0.67	0.32	0.21		0.42		1.03	0.17		0.52	0.61	0.12
Uniform Delay, d1	22.3	21.3	21.0		24.8		20.8	6.1		25.8	14.9	12.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.8	0.4	0.2		1.6		41.5	0.0		9.5	0.6	0.0
Delay (s)	29.1	21.7	21.2		26.3		62.3	6.1		35.3	15.5	12.5
Level of Service	C	C	C		C		E	A		D	B	B
Approach Delay (s)		22.8			26.3			45.0			15.2	
Approach LOS		C			C			D			B	

Intersection Summary				
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1011	323	46	8	256	116	44	37	10	179	18	1121
Future Volume (vph)	1011	323	46	8	256	116	44	37	10	179	18	1121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	0.98		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3433	3473		1770	3539	1583		3399		1681	1700	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3433	3473		1770	3539	1583		3399		1681	1700	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1011	323	46	8	256	116	44	37	10	179	18	1121
RTOR Reduction (vph)	0	12	0	0	0	93	0	9	0	0	0	465
Lane Group Flow (vph)	1011	357	0	8	256	23	0	82	0	98	99	656
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	22.1	33.9		0.6	12.4	12.4		5.6		6.4	6.4	28.5
Effective Green, g (s)	22.1	33.9		0.6	12.4	12.4		5.6		6.4	6.4	28.5
Actuated g/C Ratio	0.35	0.54		0.01	0.20	0.20		0.09		0.10	0.10	0.45
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1204	1868		16	696	311		302		170	172	1260
v/s Ratio Prot	c0.29	0.10		0.00	c0.07			c0.02		c0.06	0.06	0.18
v/s Ratio Perm						0.01						0.05
v/c Ratio	0.84	0.19		0.50	0.37	0.07		0.27		0.58	0.58	0.52
Uniform Delay, d1	18.8	7.5		31.1	21.9	20.6		26.8		27.0	27.0	12.4
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	5.1	0.0		8.7	0.1	0.0		0.2		2.9	2.9	0.2
Delay (s)	23.9	7.5		39.7	22.0	20.7		27.0		29.9	29.9	12.5
Level of Service	C	A		D	C	C		C		C	C	B
Approach Delay (s)		19.5			22.0			27.0			15.1	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1070	462	364	1070	0	0	0	0	292	1	1023
Future Volume (vph)	0	1070	462	364	1070	0	0	0	0	292	1	1023
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.98	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)		4733	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4733	1362	3433	3539						1774	3610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1070	462	364	1070	0	0	0	0	292	1	1023
RTOR Reduction (vph)	0	27	217	0	0	0	0	0	0	0	0	86
Lane Group Flow (vph)	0	1163	125	364	1070	0	0	0	0	0	293	937
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		16.9	16.9	7.7	20.5						9.9	14.0
Effective Green, g (s)		16.9	16.9	7.7	20.5						9.9	14.0
Actuated g/C Ratio		0.37	0.37	0.17	0.44						0.21	0.30
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		1731	498	572	1570						380	1093
v/s Ratio Prot		0.25		c0.11	c0.30						0.17	c0.08
v/s Ratio Perm			0.09									0.18
v/c Ratio		0.67	0.25	0.64	0.68						0.77	0.86
Uniform Delay, d1		12.3	10.2	17.9	10.2						17.1	15.2
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.8	0.1	1.7	1.0						8.5	6.5
Delay (s)		13.1	10.3	19.7	11.2						25.6	21.7
Level of Service		B	B	B	B						C	C
Approach Delay (s)		12.5			13.4			0.0			22.6	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	46.2	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	61.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1008	55	501	1483	109	31	63	243	258	289	211
Future Volume (vph)	92	1008	55	501	1483	109	31	63	243	258	289	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5046		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5046		3433	5085	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	92	1008	55	501	1483	109	31	63	243	258	289	211
RTOR Reduction (vph)	0	7	0	0	0	65	0	0	198	0	0	150
Lane Group Flow (vph)	92	1056	0	501	1483	44	31	63	45	258	289	61
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	4.7	18.7		13.2	27.2	27.2	2.2	12.4	12.4	9.2	19.4	19.4
Effective Green, g (s)	4.7	18.7		13.2	27.2	27.2	2.2	12.4	12.4	9.2	19.4	19.4
Actuated g/C Ratio	0.07	0.28		0.20	0.40	0.40	0.03	0.18	0.18	0.14	0.29	0.29
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	239	1397		671	2049	637	57	342	290	467	535	454
v/s Ratio Prot	0.03	0.21		c0.15	c0.29		0.02	0.03		c0.08	c0.16	
v/s Ratio Perm						0.03			0.03			0.04
v/c Ratio	0.38	0.76		0.75	0.72	0.07	0.54	0.18	0.15	0.55	0.54	0.13
Uniform Delay, d1	30.0	22.3		25.6	17.0	12.4	32.2	23.3	23.1	27.2	20.3	17.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	2.1		4.0	1.1	0.0	5.6	0.1	0.1	0.8	0.6	0.0
Delay (s)	30.4	24.4		29.5	18.1	12.4	37.7	23.4	23.2	28.0	20.9	17.9
Level of Service	C	C		C	B	B	D	C	C	C	C	B
Approach Delay (s)		24.9			20.5			24.6			22.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	67.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	71	26	18	299	712	127
Future Volume (vph)	71	26	18	299	712	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.96		1.00	1.00	0.98	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1732		1770	1863	3459	
Flt Permitted	0.96		0.30	1.00	1.00	
Satd. Flow (perm)	1732		568	1863	3459	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	26	18	299	712	127
RTOR Reduction (vph)	19	0	0	0	24	0
Lane Group Flow (vph)	78	0	18	299	815	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	9.1		14.8	14.8	14.8	
Effective Green, g (s)	9.1		14.8	14.8	14.8	
Actuated g/C Ratio	0.28		0.45	0.45	0.45	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	479		255	838	1556	
v/s Ratio Prot	c0.05			0.16	c0.24	
v/s Ratio Perm			0.03			
v/c Ratio	0.16		0.07	0.36	0.52	
Uniform Delay, d1	9.0		5.1	5.9	6.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.1	0.3	0.3	
Delay (s)	9.2		5.3	6.2	6.8	
Level of Service	A		A	A	A	
Approach Delay (s)	9.2			6.1	6.8	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	32.9	Sum of lost time (s)	9.0
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	20	10	12	225	852	106
Future Volume (vph)	20	10	12	225	852	106
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	10	12	225	852	106

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	30	237	958
Volume Left (vph)	20	12	0
Volume Right (vph)	10	0	106
Hadj (s)	-0.03	0.04	-0.03
Departure Headway (s)	6.1	4.8	4.2
Degree Utilization, x	0.05	0.32	1.13
Capacity (veh/h)	565	733	838
Control Delay (s)	9.5	10.1	90.5
Approach Delay (s)	9.5	10.1	90.5
Approach LOS	A	B	F

Intersection Summary			
Delay		73.0	
Level of Service		F	
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	730	226	609	1179	0	89	0	490	0	0	0
Future Volume (vph)	0	730	226	609	1179	0	89	0	490	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.96		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4905		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4905		1770	5085			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	730	226	609	1179	0	89	0	490	0	0	0
RTOR Reduction (vph)	0	54	0	0	0	0	0	0	443	0	0	0
Lane Group Flow (vph)	0	902	0	609	1179	0	0	89	47	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		42.0		36.0	27.0			10.0	10.0			
Effective Green, g (s)		42.0		36.0	27.0			10.0	10.0			
Actuated g/C Ratio		0.40		0.35	0.26			0.10	0.10			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		1980		612	1320			170	152			
v/s Ratio Prot		c0.18		c0.34	c0.23							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.46		1.00	0.89			0.52	0.31			
Uniform Delay, d1		22.6		33.9	37.1			44.7	43.8			
Progression Factor		0.43		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		34.9	7.9			1.3	0.4			
Delay (s)		9.7		68.8	45.0			46.1	44.2			
Level of Service		A		E	D			D	D			
Approach Delay (s)		9.7			53.1			44.5			0.0	
Approach LOS		A			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	264	29	342	80	62	308
Future Volume (Veh/h)	264	29	342	80	62	308
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	264	29	342	80	62	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)						332
pX, platoon unblocked						
vC, conflicting volume	814	382			422	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	814	382			422	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	20	96			95	
cM capacity (veh/h)	329	665			1137	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	293	422	62	308
Volume Left	264	0	62	0
Volume Right	29	80	0	0
cSH	346	1700	1137	1700
Volume to Capacity	0.85	0.25	0.05	0.18
Queue Length 95th (ft)	192	0	4	0
Control Delay (s)	52.8	0.0	8.3	0.0
Lane LOS	F		A	
Approach Delay (s)	52.8	0.0	1.4	
Approach LOS	F			

Intersection Summary			
Average Delay		14.7	
Intersection Capacity Utilization		52.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	255	54	89	563	624	47	264	190	495	236	37
Future Volume (vph)	20	255	54	89	563	624	47	264	190	495	236	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3446		1770	1863	1583	1770	3539	1583	3433	1825	
Flt Permitted	0.27	1.00		0.49	1.00	1.00	0.51	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	510	3446		908	1863	1583	956	3539	1583	3433	1825	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	255	54	89	563	624	47	264	190	495	236	37
RTOR Reduction (vph)	0	17	0	0	0	369	0	0	124	0	6	0
Lane Group Flow (vph)	20	292	0	89	563	255	47	264	66	495	267	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	27.0	27.0		34.0	41.0	41.0	36.0	36.0	36.0	15.0	55.0	
Effective Green, g (s)	27.0	27.0		34.0	41.0	41.0	36.0	36.0	36.0	15.0	55.0	
Actuated g/C Ratio	0.26	0.26		0.33	0.39	0.39	0.35	0.35	0.35	0.14	0.53	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	132	894		354	734	624	330	1225	547	495	965	
v/s Ratio Prot		0.08		0.02	c0.30			0.07		c0.14	c0.15	
v/s Ratio Perm	0.04			0.07		0.16	0.05		0.04			
v/c Ratio	0.15	0.33		0.25	0.77	0.41	0.14	0.22	0.12	1.00	0.28	
Uniform Delay, d1	29.7	31.1		24.9	27.4	22.7	23.4	24.0	23.2	44.5	13.5	
Progression Factor	1.00	1.00		0.66	0.67	5.84	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.2	2.1	0.1	0.1	0.0	0.0	40.5	0.1	
Delay (s)	29.9	31.2		16.7	20.5	133.0	23.5	24.1	23.2	85.0	13.6	
Level of Service	C	C		B	C	F	C	C	C	F	B	
Approach Delay (s)		31.1			75.2			23.7			59.6	
Approach LOS		C			E			C			E	

Intersection Summary				
HCM 2000 Control Delay	57.0	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	0	140	7	8	20	76	972	0	12	779	63
Future Volume (vph)	166	0	140	7	8	20	76	972	0	12	779	63
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.94			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1702			1702		1770	3539		1770	3499	
Flt Permitted		0.81			0.94		0.30	1.00		0.26	1.00	
Satd. Flow (perm)		1419			1623		564	3539		477	3499	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	166	0	140	7	8	20	76	972	0	12	779	63
RTOR Reduction (vph)	0	37	0	0	15	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	269	0	0	20	0	76	972	0	12	838	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		25.3			25.3		70.7	70.7		70.7	70.7	
Effective Green, g (s)		25.3			25.3		70.7	70.7		70.7	70.7	
Actuated g/C Ratio		0.24			0.24		0.68	0.68		0.68	0.68	
Clearance Time (s)		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	
Lane Grp Cap (vph)		345			394		383	2405		324	2378	
v/s Ratio Prot								c0.27			0.24	
v/s Ratio Perm		c0.19			0.01		0.13			0.03		
v/c Ratio		0.78			0.05		0.20	0.40		0.04	0.35	
Uniform Delay, d1		36.7			30.1		6.2	7.4		5.5	7.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.6			0.1		1.2	0.5		0.2	0.4	
Delay (s)		47.4			30.2		7.3	7.9		5.7	7.4	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		47.4			30.2			7.8			7.4	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	321	94	171	399	50	0	0	0	21	9	41
Future Volume (Veh/h)	37	321	94	171	399	50	0	0	0	21	9	41
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	37	321	94	171	399	50	0	0	0	21	9	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)					303							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	449			415			1254	1233	368	1208	1255	424
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			415			1164	1136	368	1102	1166	33
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			85			100	100	100	82	92	95
cM capacity (veh/h)	1125			1144			97	122	677	120	117	763

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	452	620	71
Volume Left	37	171	21
Volume Right	94	50	41
cSH	1125	1144	232
Volume to Capacity	0.03	0.15	0.31
Queue Length 95th (ft)	3	13	31
Control Delay (s)	1.0	3.7	27.2
Lane LOS	A	A	D
Approach Delay (s)	1.0	3.7	27.2
Approach LOS			D

Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	72.3%	ICU Level of Service	C	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/31/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	175	45	156	186	122	28	256	155	136	291	44
Future Volume (vph)	6	175	45	156	186	122	28	256	155	136	291	44
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1806		1770	1752		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1806		1770	1752		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	175	45	156	186	122	28	256	155	136	291	44
RTOR Reduction (vph)	0	12	0	0	28	0	0	0	121	0	0	32
Lane Group Flow (vph)	6	208	0	156	280	0	28	256	34	136	291	12
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	12.9	12.9		14.9	14.9		1.6	14.0	14.0	5.3	17.7	17.7
Effective Green, g (s)	12.9	12.9		14.9	14.9		1.6	14.0	14.0	5.3	17.7	17.7
Actuated g/C Ratio	0.20	0.20		0.24	0.24		0.03	0.22	0.22	0.08	0.28	0.28
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	361	369		417	413		44	785	351	148	992	444
v/s Ratio Prot	0.00	c0.12		0.09	c0.16		0.02	0.07		c0.08	c0.08	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.02	0.56		0.37	0.68		0.64	0.33	0.10	0.92	0.29	0.03
Uniform Delay, d1	20.0	22.6		20.2	21.9		30.5	20.6	19.5	28.7	17.8	16.5
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	0.0	2.0		0.6	4.4		26.4	0.2	0.1	49.9	0.2	0.0
Delay (s)	20.1	24.5		20.8	26.3		56.8	20.8	19.7	78.5	18.0	16.5
Level of Service	C	C		C	C		E	C	B	E	B	B
Approach Delay (s)		24.4			24.4			22.7			35.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	63.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	344	7	431	12	10	5	863	289	7	8	230	88
Future Volume (vph)	344	7	431	12	10	5	863	289	7	8	230	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.90	0.85		0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.99	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1498	1504		1780		3433	3526		1770	3539	1583
Flt Permitted	0.95	0.99	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1498	1504		1780		3433	3526		1770	3539	1583
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)	374	8	468	13	11	5	938	314	8	9	250	96
RTOR Reduction (vph)	0	69	215	0	5	0	0	1	0	0	0	86
Lane Group Flow (vph)	295	215	56	0	24	0	938	321	0	9	250	10
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	24.8	24.8	24.8		4.3		61.8	74.4		1.3	12.9	12.9
Effective Green, g (s)	24.8	24.8	24.8		4.3		61.8	74.4		1.3	12.9	12.9
Actuated g/C Ratio	0.21	0.21	0.21		0.04		0.51	0.62		0.01	0.11	0.11
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	347	309	310		63		1767	2186		19	380	170
v/s Ratio Prot	c0.18	0.14			c0.01		c0.27	0.09		0.01	c0.07	
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.85	0.70	0.18		0.38		0.53	0.15		0.47	0.66	0.06
Uniform Delay, d1	45.8	44.1	39.2		56.6		19.4	9.5		59.0	51.4	48.1
Progression Factor	1.00	1.00	1.00		1.00		0.56	0.33		1.00	1.00	1.00
Incremental Delay, d2	17.1	5.4	0.1		1.4		1.0	0.1		6.6	3.1	0.1
Delay (s)	62.9	49.5	39.3		58.0		11.9	3.2		65.6	54.6	48.2
Level of Service	E	D	D		E		B	A		E	D	D
Approach Delay (s)		50.9			58.0			9.7			53.1	
Approach LOS		D			E			A			D	

Intersection Summary				
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1089	420	0	3	57	76	18	10	2	75	17	583
Future Volume (vph)	1089	420	0	3	57	76	18	10	2	75	17	583
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	1.00		1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (prot)	3433	3539		1770	3539	1583		3404		1681	1714	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (perm)	3433	3539		1770	3539	1583		3404		1681	1714	2787
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)	1184	457	0	3	62	83	20	11	2	82	18	634
RTOR Reduction (vph)	0	0	0	0	0	77	0	2	0	0	0	162
Lane Group Flow (vph)	1184	457	0	3	62	6	0	31	0	49	51	472
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	82.3	90.0		1.1	8.8	8.8		5.3		7.1	7.1	89.4
Effective Green, g (s)	82.3	90.0		1.1	8.8	8.8		5.3		7.1	7.1	89.4
Actuated g/C Ratio	0.69	0.75		0.01	0.07	0.07		0.04		0.06	0.06	0.75
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	2354	2654		16	259	116		150		99	101	2145
v/s Ratio Prot	c0.34	0.13		0.00	c0.02			c0.01		0.03	c0.03	0.15
v/s Ratio Perm						0.00						0.02
v/c Ratio	0.50	0.17		0.19	0.24	0.05		0.21		0.49	0.50	0.22
Uniform Delay, d1	9.0	4.3		59.0	52.4	51.7		55.3		54.7	54.7	4.7
Progression Factor	0.60	0.66		1.00	1.00	1.00		1.00		1.15	1.16	2.34
Incremental Delay, d2	0.7	0.1		2.1	0.2	0.1		0.3		1.3	1.3	0.0
Delay (s)	6.1	2.9		61.1	52.6	51.8		55.6		64.4	64.9	10.9
Level of Service	A	A		E	D	D		E		E	E	B
Approach Delay (s)		5.2			52.3			55.6			18.3	
Approach LOS		A			D			E			B	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1111	448	145	528	0	0	0	0	387	2	682
Future Volume (vph)	0	1111	448	145	528	0	0	0	0	387	2	682
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.99	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)		4747	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4747	1362	3433	3539						1774	3610
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	1208	487	158	574	0	0	0	0	421	2	741
RTOR Reduction (vph)	0	10	178	0	0	0	0	0	0	0	0	296
Lane Group Flow (vph)	0	1305	202	158	574	0	0	0	0	0	423	445
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		54.6	54.6	9.9	59.8						43.8	48.5
Effective Green, g (s)		54.6	54.6	9.9	59.8						43.8	48.5
Actuated g/C Ratio		0.46	0.46	0.08	0.50						0.36	0.40
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		2159	619	283	1763						647	1459
v/s Ratio Prot		c0.27		c0.05	0.16						c0.24	0.01
v/s Ratio Perm			0.15									0.11
v/c Ratio		0.60	0.33	0.56	0.33						0.65	0.30
Uniform Delay, d1		24.6	20.9	52.9	18.0						31.8	24.3
Progression Factor		0.63	0.33	1.22	0.65						1.00	1.00
Incremental Delay, d2		1.1	1.3	1.3	0.5						1.8	0.0
Delay (s)		16.7	8.2	65.7	12.1						33.6	24.3
Level of Service		B	A	E	B						C	C
Approach Delay (s)		14.8			23.7			0.0			27.7	
Approach LOS		B			C			A			C	

Intersection Summary				
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	1060	47	181	737	256	48	112	369	102	76	93
Future Volume (vph)	187	1060	47	181	737	256	48	112	369	102	76	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5053		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5053		3433	5085	1583	1770	1863	1583	3433	1863	1583
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)	203	1152	51	197	801	278	52	122	401	111	83	101
RTOR Reduction (vph)	0	3	0	0	0	120	0	0	237	0	0	85
Lane Group Flow (vph)	203	1200	0	197	801	158	52	122	164	111	83	16
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	11.5	67.4		12.2	68.1	68.1	7.0	16.8	16.8	9.6	19.4	19.4
Effective Green, g (s)	11.5	67.4		12.2	68.1	68.1	7.0	16.8	16.8	9.6	19.4	19.4
Actuated g/C Ratio	0.10	0.56		0.10	0.57	0.57	0.06	0.14	0.14	0.08	0.16	0.16
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	328	2838		349	2885	898	103	260	221	274	301	255
v/s Ratio Prot	c0.06	c0.24		c0.06	0.16		0.03	0.07		c0.03	0.04	
v/s Ratio Perm						0.10			c0.10			0.01
v/c Ratio	0.62	0.42		0.56	0.28	0.18	0.50	0.47	0.74	0.41	0.28	0.06
Uniform Delay, d1	52.1	15.1		51.4	13.3	12.5	54.8	47.5	49.5	52.5	44.1	42.6
Progression Factor	1.00	1.00		0.83	0.69	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.4	0.5		1.2	0.2	0.4	1.4	0.5	11.0	0.4	0.2	0.0
Delay (s)	54.6	15.6		43.7	9.5	7.0	56.2	48.0	60.5	52.8	44.3	42.6
Level of Service	D	B		D	A	A	E	D	E	D	D	D
Approach Delay (s)		21.2			14.2			57.5			47.0	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	142	18	19	349	239	56
Future Volume (vph)	142	18	19	349	239	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.98		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1756		1770	1863	3438	
Flt Permitted	0.96		0.56	1.00	1.00	
Satd. Flow (perm)	1756		1038	1863	3438	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	20	21	379	260	61
RTOR Reduction (vph)	9	0	0	0	34	0
Lane Group Flow (vph)	165	0	21	379	287	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	10.2		12.5	12.5	12.5	
Effective Green, g (s)	10.2		12.5	12.5	12.5	
Actuated g/C Ratio	0.32		0.39	0.39	0.39	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	565		409	734	1355	
v/s Ratio Prot	c0.09			c0.20	0.08	
v/s Ratio Perm			0.02			
v/c Ratio	0.29		0.05	0.52	0.21	
Uniform Delay, d1	8.0		5.9	7.3	6.3	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.3		0.1	0.6	0.1	
Delay (s)	8.3		6.0	7.9	6.4	
Level of Service	A		A	A	A	
Approach Delay (s)	8.3			7.8	6.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	31.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	32	7	22	241	317	60
Future Volume (vph)	32	7	22	241	317	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	8	24	262	345	65

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	43	286	410
Volume Left (vph)	35	24	0
Volume Right (vph)	8	0	65
Hadj (s)	0.09	0.05	-0.06
Departure Headway (s)	5.5	4.5	4.3
Degree Utilization, x	0.07	0.36	0.49
Capacity (veh/h)	579	780	824
Control Delay (s)	8.9	10.0	11.2
Approach Delay (s)	8.9	10.0	11.2
Approach LOS	A	A	B

Intersection Summary			
Delay	10.6		
Level of Service	B		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1084	162	114	878	0	81	0	291	0	0	0
Future Volume (vph)	0	1084	162	114	878	0	81	0	291	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4986		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4986		1770	5085			1770	1583			
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	1178	176	124	954	0	88	0	316	0	0	0
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	265	0	0	0
Lane Group Flow (vph)	0	1335	0	124	954	0	0	88	51	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		54.0		17.8	36.3			16.2	16.2			
Effective Green, g (s)		54.0		17.8	36.3			16.2	16.2			
Actuated g/C Ratio		0.54		0.18	0.36			0.16	0.16			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		2692		315	1845			286	256			
v/s Ratio Prot		c0.27		c0.07	c0.19							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.50		0.39	0.52			0.31	0.20			
Uniform Delay, d1		14.4		36.3	25.0			37.0	36.3			
Progression Factor		0.89		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		0.3	1.0			0.2	0.1			
Delay (s)		12.8		36.6	26.0			37.2	36.4			
Level of Service		B		D	C			D	D			
Approach Delay (s)		12.8			27.2			36.6			0.0	
Approach LOS		B			C			D			A	

Intersection Summary				
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	122	24	516	125	39	188
Future Volume (Veh/h)	122	24	516	125	39	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)	133	26	561	136	42	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)						332
pX, platoon unblocked						
vC, conflicting volume	917	629			697	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	917	629			697	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	54	95			95	
cM capacity (veh/h)	288	482			899	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	159	697	42	204
Volume Left	133	0	42	0
Volume Right	26	136	0	0
cSH	308	1700	899	1700
Volume to Capacity	0.52	0.41	0.05	0.12
Queue Length 95th (ft)	70	0	4	0
Control Delay (s)	28.5	0.0	9.2	0.0
Lane LOS	D		A	
Approach Delay (s)	28.5	0.0	1.6	
Approach LOS	D			

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	379	28	355	339	263	40	377	390	443	341	14
Future Volume (vph)	6	379	28	355	339	263	40	377	390	443	341	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3503		1770	1863	1583	1770	3539	1583	3433	1852	
Flt Permitted	0.54	1.00		0.42	1.00	1.00	0.53	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1010	3503		785	1863	1583	993	3539	1583	3433	1852	
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)	7	412	30	386	368	286	43	410	424	482	371	15
RTOR Reduction (vph)	0	5	0	0	0	124	0	0	276	0	1	0
Lane Group Flow (vph)	7	437	0	386	368	162	43	410	148	482	385	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	36.3	36.3		49.5	56.5	56.5	17.8	17.8	17.8	13.7	35.5	
Effective Green, g (s)	36.3	36.3		49.5	56.5	56.5	17.8	17.8	17.8	13.7	35.5	
Actuated g/C Ratio	0.36	0.36		0.50	0.56	0.56	0.18	0.18	0.18	0.14	0.36	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	366	1271		518	1052	894	176	629	281	470	657	
v/s Ratio Prot		0.12		c0.10	0.20			0.12		c0.14	c0.21	
v/s Ratio Perm	0.01			c0.27		0.10	0.04		0.09			
v/c Ratio	0.02	0.34		0.75	0.35	0.18	0.24	0.65	0.53	1.03	0.59	
Uniform Delay, d1	20.4	23.2		16.9	11.8	10.5	35.3	38.2	37.3	43.1	26.3	
Progression Factor	1.00	1.00		1.45	0.18	0.05	0.79	0.86	0.69	1.00	1.00	
Incremental Delay, d2	0.1	0.7		5.1	0.1	0.0	0.2	1.7	0.8	48.2	0.9	
Delay (s)	20.5	23.9		29.5	2.1	0.6	28.2	34.6	26.6	91.3	27.1	
Level of Service	C	C		C	A	A	C	C	C	F	C	
Approach Delay (s)		23.9			11.9			30.4			62.8	
Approach LOS		C			B			C			E	

Intersection Summary				
HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	67.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	2	112	2	0	8	43	676	5	5	525	21
Future Volume (vph)	223	2	112	2	0	8	43	676	5	5	525	21
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.89		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1642		1770	3536		1770	3519	
Flt Permitted		0.79			0.96		0.40	1.00		0.33	1.00	
Satd. Flow (perm)		1413			1590		744	3536		616	3519	
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)	242	2	122	2	0	9	47	735	5	5	571	23
RTOR Reduction (vph)	0	23	0	0	8	0	0	0	0	0	2	0
Lane Group Flow (vph)	0	343	0	0	3	0	47	740	0	5	592	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		30.4			30.4		61.6	61.6		61.6	61.6	
Effective Green, g (s)		30.4			30.4		61.6	61.6		61.6	61.6	
Actuated g/C Ratio		0.30			0.30		0.62	0.62		0.62	0.62	
Clearance Time (s)		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	
Lane Grp Cap (vph)		429			483		458	2178		379	2167	
v/s Ratio Prot								c0.21			0.17	
v/s Ratio Perm		c0.24			0.00		0.06			0.01		
v/c Ratio		0.80			0.01		0.10	0.34		0.01	0.27	
Uniform Delay, d1		32.0			24.3		7.9	9.3		7.4	8.9	
Progression Factor		1.00			1.00		1.00	1.00		0.94	0.78	
Incremental Delay, d2		10.0			0.0		0.4	0.4		0.0	0.2	
Delay (s)		42.0			24.3		8.3	9.7		7.0	7.2	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		42.0			24.3			9.7			7.2	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	430	66	54	293	22	0	0	0	12	1	13
Future Volume (Veh/h)	14	430	66	54	293	22	0	0	0	12	1	13
Sign Control		Free			Free			Yield			Yield	
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)	15	467	72	59	318	24	0	0	0	13	1	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	342			539			996	993	503	981	1017	330
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	206			539			936	934	503	920	960	193
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 %	99			94			100	100	100	94	100	98
cM capacity (veh/h)	1222			1029			203	222	569	213	214	760

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	554	401	28
Volume Left	15	59	13
Volume Right	72	24	14
cSH	1222	1029	333
Volume to Capacity	0.01	0.06	0.08
Queue Length 95th (ft)	1	5	7
Control Delay (s)	0.4	1.8	16.8
Lane LOS	A	A	C
Approach Delay (s)	0.4	1.8	16.8
Approach LOS			C

Intersection Summary			
Average Delay		1.4	
Intersection Capacity Utilization		53.7%	ICU Level of Service	A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/31/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	215	37	137	142	135	31	585	242	89	738	45
Future Volume (vph)	37	215	37	137	142	135	31	585	242	89	738	45
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.93		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1822		1770	1726		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1822		1770	1726		1770	3539	1583	1770	3539	1583
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	234	40	149	154	147	34	636	263	97	802	49
RTOR Reduction (vph)	0	5	0	0	27	0	0	0	109	0	0	32
Lane Group Flow (vph)	40	269	0	149	274	0	34	636	154	97	802	17
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	18.8	18.8		19.8	19.8		4.4	26.6	26.6	8.6	30.8	30.8
Effective Green, g (s)	18.8	18.8		19.8	19.8		4.4	26.6	26.6	8.6	30.8	30.8
Actuated g/C Ratio	0.21	0.21		0.22	0.22		0.05	0.30	0.30	0.10	0.34	0.34
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	370	381		390	380		86	1048	468	169	1213	542
v/s Ratio Prot	0.02	c0.15		0.08	c0.16		0.02	0.18		c0.05	c0.23	
v/s Ratio Perm									0.10			0.01
v/c Ratio	0.11	0.71		0.38	0.72		0.40	0.61	0.33	0.57	0.66	0.03
Uniform Delay, d1	28.7	32.9		29.8	32.4		41.4	27.1	24.6	38.8	25.1	19.6
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	0.1	5.9		0.6	6.6		3.0	1.0	0.4	4.7	1.4	0.0
Delay (s)	28.8	38.8		30.4	39.0		44.4	28.1	25.1	43.5	26.4	19.6
Level of Service	C	D		C	D		D	C	C	D	C	B
Approach Delay (s)		37.6			36.2			27.8			27.8	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	89.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	4	360	17	11	5	761	221	18	12	573	174
Future Volume (vph)	137	4	360	17	11	5	761	221	18	12	573	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.86	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1459	1504		1781		3433	3498		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1459	1504		1781		3433	3498		1770	3539	1583
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)	149	4	391	18	12	5	827	240	20	13	623	189
RTOR Reduction (vph)	0	160	173	0	5	0	0	3	0	0	0	101
Lane Group Flow (vph)	134	47	30	0	30	0	827	257	0	13	623	88
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.3	12.3	12.3		3.6		26.0	51.1		1.0	25.1	25.1
Effective Green, g (s)	12.3	12.3	12.3		3.6		26.0	51.1		1.0	25.1	25.1
Actuated g/C Ratio	0.15	0.15	0.15		0.04		0.31	0.61		0.01	0.30	0.30
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	248	215	222		77		1072	2148		21	1067	477
v/s Ratio Prot	c0.08	0.03			c0.02		c0.24	0.07		0.01	c0.18	
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.54	0.22	0.14		0.39		0.77	0.12		0.62	0.58	0.19
Uniform Delay, d1	32.8	31.2	30.8		38.7		25.9	6.7		40.9	24.6	21.5
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.2	0.1		1.2		3.2	0.0		32.5	0.5	0.1
Delay (s)	34.1	31.4	30.9		39.9		29.1	6.7		73.5	25.2	21.6
Level of Service	C	C	C		D		C	A		E	C	C
Approach Delay (s)		31.9			39.9			23.7			25.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	64.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	849	197	0	8	107	116	10	20	10	167	13	767
Future Volume (vph)	849	197	0	8	107	116	10	20	10	167	13	767
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	1.00		1.00	1.00	0.85		0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (prot)	3433	3539		1770	3539	1583		3364		1681	1697	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.96	1.00
Satd. Flow (perm)	3433	3539		1770	3539	1583		3364		1681	1697	2787
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)	923	214	0	9	116	126	11	22	11	182	14	834
RTOR Reduction (vph)	0	0	0	0	0	106	0	10	0	0	0	380
Lane Group Flow (vph)	923	214	0	9	116	20	0	34	0	98	98	454
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	29.9	40.4		0.9	11.4	11.4		4.2		8.4	8.4	38.3
Effective Green, g (s)	29.9	40.4		0.9	11.4	11.4		4.2		8.4	8.4	38.3
Actuated g/C Ratio	0.42	0.57		0.01	0.16	0.16		0.06		0.12	0.12	0.54
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1458	2030		22	573	256		200		200	202	1516
v/s Ratio Prot	c0.27	0.06		0.01	c0.03			c0.01		c0.06	0.06	0.13
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.63	0.11		0.41	0.20	0.08		0.17		0.49	0.49	0.30
Uniform Delay, d1	15.9	6.8		34.5	25.6	25.0		31.4		29.0	29.0	8.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.0		4.5	0.1	0.0		0.1		0.7	0.7	0.0
Delay (s)	16.6	6.8		38.9	25.6	25.1		31.6		29.7	29.6	8.8
Level of Service	B	A		D	C	C		C		C	C	A
Approach Delay (s)		14.8			25.8			31.6			12.8	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	16.5	
Intersection Capacity Utilization	50.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	849	466	300	597	0	0	0	0	178	1	891
Future Volume (vph)	0	849	466	300	597	0	0	0	0	178	1	891
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.98	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)		4687	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4687	1362	3433	3539						1774	3610
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	923	507	326	649	0	0	0	0	193	1	968
RTOR Reduction (vph)	0	33	203	0	0	0	0	0	0	0	0	120
Lane Group Flow (vph)	0	1073	121	326	649	0	0	0	0	0	194	848
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		19.7	19.7	10.2	24.1						11.0	16.8
Effective Green, g (s)		19.7	19.7	10.2	24.1						11.0	16.8
Actuated g/C Ratio		0.37	0.37	0.19	0.46						0.21	0.32
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		1755	510	665	1621						370	1153
v/s Ratio Prot		c0.23		c0.09	0.18						0.11	c0.08
v/s Ratio Perm			0.09									0.15
v/c Ratio		0.61	0.24	0.49	0.40						0.52	0.74
Uniform Delay, d1		13.3	11.3	18.9	9.5						18.5	15.9
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.4	0.1	0.2	0.1						0.6	2.1
Delay (s)		13.8	11.4	19.1	9.5						19.1	18.0
Level of Service		B	B	B	A						B	B
Approach Delay (s)		13.2			12.7			0.0			18.2	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	828	52	342	1006	109	30	52	184	258	230	185
Future Volume (vph)	92	828	52	342	1006	109	30	52	184	258	230	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5040		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5040		3433	5085	1583	1770	1863	1583	3433	1863	1583
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)	100	900	57	372	1093	118	33	57	200	280	250	201
RTOR Reduction (vph)	0	8	0	0	0	76	0	0	162	0	0	139
Lane Group Flow (vph)	100	949	0	372	1093	42	33	57	38	280	250	62
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	4.8	16.7		10.5	22.4	22.4	2.1	11.9	11.9	9.4	19.2	19.2
Effective Green, g (s)	4.8	16.7		10.5	22.4	22.4	2.1	11.9	11.9	9.4	19.2	19.2
Actuated g/C Ratio	0.08	0.27		0.17	0.36	0.36	0.03	0.19	0.19	0.15	0.31	0.31
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	263	1346		576	1822	567	59	354	301	516	572	486
v/s Ratio Prot	0.03	c0.19		c0.11	0.21		0.02	0.03		c0.08	c0.13	
v/s Ratio Perm						0.03			0.02			0.04
v/c Ratio	0.38	0.71		0.65	0.60	0.07	0.56	0.16	0.13	0.54	0.44	0.13
Uniform Delay, d1	27.4	20.7		24.3	16.4	13.2	29.7	21.1	21.0	24.6	17.3	15.6
Progression Factor	1.00	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	1.4		1.9	0.4	0.0	6.4	0.1	0.1	0.6	0.2	0.0
Delay (s)	27.8	22.1		26.1	16.7	13.2	36.1	21.2	21.1	25.2	17.5	15.7
Level of Service	C	C		C	B	B	D	C	C	C	B	B
Approach Delay (s)		22.6			18.7			22.8			19.9	
Approach LOS		C			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	62.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	71	20	19	219	498	126
Future Volume (vph)	71	20	19	219	498	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.97		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1739		1770	1863	3432	
Flt Permitted	0.96		0.39	1.00	1.00	
Satd. Flow (perm)	1739		734	1863	3432	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	22	21	238	541	137
RTOR Reduction (vph)	16	0	0	0	40	0
Lane Group Flow (vph)	84	0	21	238	638	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	9.1		12.7	12.7	12.7	
Effective Green, g (s)	9.1		12.7	12.7	12.7	
Actuated g/C Ratio	0.30		0.41	0.41	0.41	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	513		302	768	1415	
v/s Ratio Prot	c0.05			0.13	c0.19	
v/s Ratio Perm			0.03			
v/c Ratio	0.16		0.07	0.31	0.45	
Uniform Delay, d1	8.0		5.5	6.1	6.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.2		0.1	0.2	0.2	
Delay (s)	8.2		5.6	6.3	6.8	
Level of Service	A		A	A	A	
Approach Delay (s)	8.2			6.3	6.8	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	30.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	15	8	9	180	651	81
Future Volume (vph)	15	8	9	180	651	81
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	9	10	196	708	88

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	25	206	796
Volume Left (vph)	16	10	0
Volume Right (vph)	9	0	88
Hadj (s)	-0.05	0.04	-0.03
Departure Headway (s)	6.0	4.8	4.2
Degree Utilization, x	0.04	0.27	0.92
Capacity (veh/h)	573	736	855
Control Delay (s)	9.2	9.6	35.1
Approach Delay (s)	9.2	9.6	35.1
Approach LOS	A	A	E

Intersection Summary			
Delay		29.4	
Level of Service		D	
Intersection Capacity Utilization		49.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	746	113	170	1113	0	79	0	207	0	0	0
Future Volume (vph)	0	746	113	170	1113	0	79	0	207	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4985		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4985		1770	5085			1770	1583			
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	811	123	185	1210	0	86	0	225	0	0	0
RTOR Reduction (vph)	0	20	0	0	0	0	0	0	184	0	0	0
Lane Group Flow (vph)	0	914	0	185	1210	0	0	86	41	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		49.7		20.1	35.7			18.2	18.2			
Effective Green, g (s)		49.7		20.1	35.7			18.2	18.2			
Actuated g/C Ratio		0.50		0.20	0.36			0.18	0.18			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		2477		355	1815			322	288			
v/s Ratio Prot		c0.18		c0.10	c0.24							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.37		0.52	0.67			0.27	0.14			
Uniform Delay, d1		15.5		35.7	27.1			35.2	34.3			
Progression Factor		1.09		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		0.6	2.0			0.2	0.1			
Delay (s)		16.9		36.3	29.1			35.3	34.4			
Level of Service		B		D	C			D	C			
Approach Delay (s)		16.9			30.0			34.7			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	202	22	263	61	47	235
Future Volume (Veh/h)	202	22	263	61	47	235
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)	220	24	286	66	51	255
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						332
pX, platoon unblocked						
vC, conflicting volume	676	319			352	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	676	319			352	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	97			96	
cM capacity (veh/h)	401	722			1207	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	244	352	51	255
Volume Left	220	0	51	0
Volume Right	24	66	0	0
cSH	419	1700	1207	1700
Volume to Capacity	0.58	0.21	0.04	0.15
Queue Length 95th (ft)	90	0	3	0
Control Delay (s)	24.8	0.0	8.1	0.0
Lane LOS	C		A	
Approach Delay (s)	24.8	0.0	1.4	
Approach LOS	C			

Intersection Summary			
Average Delay		7.2	
Intersection Capacity Utilization		43.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	191	58	387	429	384	51	414	358	309	362	36
Future Volume (vph)	19	191	58	387	429	384	51	414	358	309	362	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		7.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3416		1770	1863	1583	1770	3539	1583	3433	1838	
Flt Permitted	0.50	1.00		0.56	1.00	1.00	0.44	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	923	3416		1043	1863	1583	819	3539	1583	3433	1838	
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)	21	208	63	421	466	417	55	450	389	336	393	39
RTOR Reduction (vph)	0	28	0	0	0	162	0	0	311	0	4	0
Lane Group Flow (vph)	21	243	0	421	466	255	55	450	78	336	428	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	35.7	35.7		50.9	57.9	57.9	20.1	20.1	20.1	10.0	34.1	
Effective Green, g (s)	35.7	35.7		50.9	57.9	57.9	20.1	20.1	20.1	10.0	34.1	
Actuated g/C Ratio	0.36	0.36		0.51	0.58	0.58	0.20	0.20	0.20	0.10	0.34	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	329	1219		641	1078	916	164	711	318	343	626	
v/s Ratio Prot		0.07		c0.10	0.25			0.13		c0.10	c0.23	
v/s Ratio Perm	0.02			c0.23		0.16	0.07		0.05			
v/c Ratio	0.06	0.20		0.66	0.43	0.28	0.34	0.63	0.25	0.98	0.68	
Uniform Delay, d1	21.2	22.3		15.8	11.8	10.6	34.2	36.6	33.6	44.9	28.3	
Progression Factor	1.00	1.00		1.05	0.19	0.50	1.14	1.14	3.70	1.00	1.00	
Incremental Delay, d2	0.4	0.4		1.9	0.1	0.0	0.4	1.3	0.1	42.4	2.5	
Delay (s)	21.5	22.6		18.6	2.3	5.4	39.4	43.0	124.4	87.3	30.8	
Level of Service	C	C		B	A	A	D	D	F	F	C	
Approach Delay (s)		22.5			8.5			78.2			55.5	
Approach LOS		C			A			E			E	

Intersection Summary				
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	19.0	
Intersection Capacity Utilization	67.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	0	107	5	6	15	58	743	0	9	595	48
Future Volume (vph)	127	0	107	5	6	15	58	743	0	9	595	48
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.94			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1702			1704		1770	3539		1770	3500	
Flt Permitted		0.82			0.96		0.37	1.00		0.32	1.00	
Satd. Flow (perm)		1425			1649		685	3539		602	3500	
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)	138	0	116	5	7	16	63	808	0	10	647	52
RTOR Reduction (vph)	0	33	0	0	13	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	221	0	0	15	0	63	808	0	10	694	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		20.5			20.5		71.5	71.5		71.5	71.5	
Effective Green, g (s)		20.5			20.5		71.5	71.5		71.5	71.5	
Actuated g/C Ratio		0.20			0.20		0.72	0.72		0.72	0.72	
Clearance Time (s)		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	
Lane Grp Cap (vph)		292			338		489	2530		430	2502	
v/s Ratio Prot								c0.23			0.20	
v/s Ratio Perm		c0.15			0.01		0.09			0.02		
v/c Ratio		0.76			0.05		0.13	0.32		0.02	0.28	
Uniform Delay, d1		37.4			31.9		4.5	5.3		4.1	5.1	
Progression Factor		1.00			1.00		1.00	1.00		1.28	1.22	
Incremental Delay, d2		10.6			0.1		0.5	0.3		0.1	0.2	
Delay (s)		48.0			32.0		5.0	5.6		5.4	6.4	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		48.0			32.0			5.6			6.4	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	54.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	243	72	131	304	38	0	0	0	16	7	31
Future Volume (Veh/h)	28	243	72	131	304	38	0	0	0	16	7	31
Sign Control		Free			Free			Yield			Yield	
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	264	78	142	330	41	0	0	0	17	8	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.86						0.86	0.86		0.86	0.86	0.86
vC, conflicting volume	371			342			1036	1018	303	998	1036	350
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			342			959	938	303	914	960	160
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			88			100	100	100	91	96	96
cM capacity (veh/h)	1193			1217			168	195	737	194	190	759

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	372	513	59
Volume Left	30	142	17
Volume Right	78	41	34
cSH	1193	1217	338
Volume to Capacity	0.03	0.12	0.17
Queue Length 95th (ft)	2	10	16
Control Delay (s)	0.9	3.2	17.9
Lane LOS	A	A	C
Approach Delay (s)	0.9	3.2	17.9
Approach LOS			C

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/31/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	131	32	175	90	93	34	682	181	61	718	58
Future Volume (vph)	34	131	32	175	90	93	34	682	181	61	718	58
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1807		1770	1721		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1807		1770	1721		1770	3539	1583	1770	3539	1583
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)	37	142	35	190	98	101	37	741	197	66	780	63
RTOR Reduction (vph)	0	7	0	0	31	0	0	0	66	0	0	39
Lane Group Flow (vph)	37	170	0	190	168	0	37	741	131	66	780	24
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	14.0	14.0		15.0	15.0		4.3	27.0	27.0	7.0	29.7	29.7
Effective Green, g (s)	14.0	14.0		15.0	15.0		4.3	27.0	27.0	7.0	29.7	29.7
Actuated g/C Ratio	0.18	0.18		0.19	0.19		0.05	0.34	0.34	0.09	0.38	0.38
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	313	320		336	326		96	1209	541	156	1330	595
v/s Ratio Prot	0.02	c0.09		c0.11	0.10		0.02	0.21		c0.04	c0.22	
v/s Ratio Perm									0.08			0.01
v/c Ratio	0.12	0.53		0.57	0.52		0.39	0.61	0.24	0.42	0.59	0.04
Uniform Delay, d1	27.3	29.5		29.0	28.7		36.1	21.6	18.7	34.1	19.7	15.6
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	0.2	1.6		2.2	1.4		2.6	0.9	0.2	1.8	0.7	0.0
Delay (s)	27.5	31.1		31.2	30.1		38.6	22.6	18.9	35.9	20.4	15.6
Level of Service	C	C		C	C		D	C	B	D	C	B
Approach Delay (s)		30.5			30.7			22.4			21.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	441	7	419	12	10	5	840	454	7	8	228	90
Future Volume (vph)	441	7	419	12	10	5	840	454	7	8	228	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.93	0.85		0.97		1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1533	1504		1777		3433	3531		1770	3539	1583
Flt Permitted	0.95	0.98	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1533	1504		1777		3433	3531		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	441	7	419	12	10	5	840	454	7	8	228	90
RTOR Reduction (vph)	0	33	216	0	5	0	0	1	0	0	0	81
Lane Group Flow (vph)	300	257	61	0	22	0	840	460	0	8	228	9
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	26.5	26.5	26.5		4.0		61.4	73.5		0.8	11.9	11.9
Effective Green, g (s)	26.5	26.5	26.5		4.0		61.4	73.5		0.8	11.9	11.9
Actuated g/C Ratio	0.22	0.22	0.22		0.03		0.51	0.61		0.01	0.10	0.10
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	371	338	332		59		1756	2162		11	350	156
v/s Ratio Prot	c0.18	0.17			c0.01		c0.24	0.13		0.00	c0.06	
v/s Ratio Perm			0.04									0.01
v/c Ratio	0.81	0.76	0.18		0.38		0.48	0.21		0.73	0.65	0.06
Uniform Delay, d1	44.3	43.8	38.0		56.8		18.9	10.4		59.5	52.1	49.0
Progression Factor	1.00	1.00	1.00		1.00		1.43	1.85		1.00	1.00	1.00
Incremental Delay, d2	11.6	8.8	0.1		1.5		0.8	0.2		110.3	3.3	0.1
Delay (s)	55.9	52.6	38.1		58.2		27.9	19.4		169.8	55.3	49.0
Level of Service	E	D	D		E		C	B		F	E	D
Approach Delay (s)		49.1			58.2			24.9			56.4	
Approach LOS		D			E			C			E	

Intersection Summary				
HCM 2000 Control Delay	37.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1211	542	33	3	146	84	38	21	2	81	19	569
Future Volume (vph)	1211	542	33	3	146	84	38	21	2	81	19	569
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	0.99		1.00	1.00	0.85		1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97		0.95	0.97	1.00
Satd. Flow (prot)	3433	3509		1770	3539	1583		3415		1681	1716	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.78		0.72	0.77	1.00
Satd. Flow (perm)	3433	3509		1770	3539	1583		2744		1266	1365	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1211	542	33	3	146	84	38	21	2	81	19	569
RTOR Reduction (vph)	0	2	0	0	0	76	0	2	0	0	0	114
Lane Group Flow (vph)	1211	573	0	3	146	8	0	59	0	49	51	455
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases						6	8			4		4
Actuated Green, G (s)	86.8	96.9		1.1	11.2	11.2		10.2		9.2	9.2	96.0
Effective Green, g (s)	86.8	96.9		1.1	11.2	11.2		10.2		9.2	9.2	96.0
Actuated g/C Ratio	0.72	0.81		0.01	0.09	0.09		0.08		0.08	0.08	0.80
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	2483	2833		16	330	147		233		97	104	2299
v/s Ratio Prot	c0.35	0.16		0.00	c0.04							0.14
v/s Ratio Perm						0.00		0.02		c0.04	0.04	0.02
v/c Ratio	0.49	0.20		0.19	0.44	0.05		0.25		0.51	0.49	0.20
Uniform Delay, d1	7.1	2.7		59.0	51.4	49.6		51.3		53.2	53.2	2.9
Progression Factor	0.35	0.25		1.00	1.00	1.00		1.00		1.02	1.03	7.14
Incremental Delay, d2	0.6	0.1		2.1	0.3	0.1		0.2		1.3	1.2	0.0
Delay (s)	3.0	0.8		61.1	51.8	49.6		51.6		55.7	55.7	20.4
Level of Service	A	A		E	D	D		D		E	E	C
Approach Delay (s)		2.3			51.1			51.6			25.7	
Approach LOS		A			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.8	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1304	444	145	549	0	0	0	0	472	13	665
Future Volume (vph)	0	1304	444	145	549	0	0	0	0	472	13	665
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	4.6
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.99	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)		4775	1362	3433	3539						1776	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4775	1362	3433	3539						1776	3610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1304	444	145	549	0	0	0	0	472	13	665
RTOR Reduction (vph)	0	3	107	0	0	0	0	0	0	0	0	409
Lane Group Flow (vph)	0	1359	279	145	549	0	0	0	0	0	485	256
Turn Type		NA	Perm	Prot	NA					Perm	NA	Prot
Protected Phases		2		1	6						4	4
Permitted Phases			2							4		
Actuated Green, G (s)		60.3	60.3	8.7	72.0						39.3	39.3
Effective Green, g (s)		60.3	60.3	8.7	72.0						39.3	39.3
Actuated g/C Ratio		0.50	0.50	0.07	0.60						0.33	0.33
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	4.6
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		2399	684	248	2123						581	1182
v/s Ratio Prot		c0.28		c0.04	0.16							0.07
v/s Ratio Perm			0.20								0.27	
v/c Ratio		0.57	0.41	0.58	0.26						0.83	0.22
Uniform Delay, d1		20.8	18.7	53.9	11.4						37.3	29.2
Progression Factor		1.00	1.00	1.24	1.50						1.00	1.00
Incremental Delay, d2		1.0	1.8	2.2	0.3						9.6	0.0
Delay (s)		21.7	20.5	68.9	17.4						47.0	29.2
Level of Service		C	C	E	B						D	C
Approach Delay (s)		21.5			28.1			0.0			36.7	
Approach LOS		C			C			A			D	

Intersection Summary				
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	254	1327	47	204	781	256	86	152	326	102	80	102
Future Volume (vph)	254	1327	47	204	781	256	86	152	326	102	80	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5059		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5059		3433	5085	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	254	1327	47	204	781	256	86	152	326	102	80	102
RTOR Reduction (vph)	0	5	0	0	0	179	0	0	164	0	0	76
Lane Group Flow (vph)	254	1369	0	204	781	77	86	152	162	102	80	26
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	7.5	23.0		5.5	21.0	21.0	5.5	18.2	18.2	5.3	18.0	18.0
Effective Green, g (s)	7.5	23.0		5.5	21.0	21.0	5.5	18.2	18.2	5.3	18.0	18.0
Actuated g/C Ratio	0.11	0.33		0.08	0.30	0.30	0.08	0.26	0.26	0.08	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)	367	1662		269	1525	474	139	484	411	259	479	407
v/s Ratio Prot	c0.07	c0.27		0.06	0.15		c0.05	0.08		0.03	0.04	
v/s Ratio Perm						0.05			c0.10			0.02
v/c Ratio	0.69	0.82		0.76	0.51	0.16	0.62	0.31	0.39	0.39	0.17	0.06
Uniform Delay, d1	30.1	21.6		31.6	20.3	18.0	31.2	20.9	21.4	30.8	20.2	19.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.3	4.8		18.0	1.2	0.7	18.9	1.7	2.8	4.4	0.8	0.3
Delay (s)	40.4	26.4		49.6	21.5	18.8	50.2	22.6	24.2	35.3	20.9	19.9
Level of Service	D	C		D	C	B	D	C	C	D	C	B
Approach Delay (s)		28.6			25.6			27.7			25.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	142	18	19	446	266	56
Future Volume (vph)	142	18	19	446	266	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	
Lane Util. Factor	1.00		1.00	1.00	0.95	
Frt	0.98		1.00	1.00	0.97	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1757		1770	1863	3447	
Flt Permitted	0.96		0.56	1.00	1.00	
Satd. Flow (perm)	1757		1037	1863	3447	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	142	18	19	446	266	56
RTOR Reduction (vph)	11	0	0	0	35	0
Lane Group Flow (vph)	149	0	19	446	287	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	16.0		15.0	15.0	15.0	
Effective Green, g (s)	16.0		15.0	15.0	15.0	
Actuated g/C Ratio	0.40		0.38	0.38	0.38	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Lane Grp Cap (vph)	702		388	698	1292	
v/s Ratio Prot	c0.08			c0.24	0.08	
v/s Ratio Perm			0.02			
v/c Ratio	0.21		0.05	0.64	0.22	
Uniform Delay, d1	7.9		8.0	10.3	8.5	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.7		0.2	4.4	0.4	
Delay (s)	8.6		8.2	14.7	8.9	
Level of Service	A		A	B	A	
Approach Delay (s)	8.6			14.5	8.9	
Approach LOS	A			B	A	

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	37	8	26	283	369	70
Future Volume (vph)	37	8	26	283	369	70
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	37	8	26	283	369	70

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	45	309	439
Volume Left (vph)	37	26	0
Volume Right (vph)	8	0	70
Hadj (s)	0.09	0.05	-0.06
Departure Headway (s)	5.6	4.5	4.3
Degree Utilization, x	0.07	0.39	0.53
Capacity (veh/h)	564	773	818
Control Delay (s)	9.0	10.4	12.0
Approach Delay (s)	9.0	10.4	12.0
Approach LOS	A	B	B

Intersection Summary			
Delay	11.2		
Level of Service	B		
Intersection Capacity Utilization	46.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1071	181	381	843	0	121	0	638	0	0	0
Future Volume (vph)	0	1071	181	381	843	0	121	0	638	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.98		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4975		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4975		1770	5085			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1071	181	381	843	0	121	0	638	0	0	0
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	450	0	0	0
Lane Group Flow (vph)	0	1234	0	381	843	0	0	121	188	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		6		5	2			4				
Permitted Phases	6						4		4			
Actuated Green, G (s)		44.4		25.5	73.9			18.1	18.1			
Effective Green, g (s)		44.4		25.5	73.9			18.1	18.1			
Actuated g/C Ratio		0.44		0.26	0.74			0.18	0.18			
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)		2208		451	3757			320	286			
v/s Ratio Prot		c0.25		c0.22	0.17							
v/s Ratio Perm								0.07	c0.12			
v/c Ratio		0.56		0.84	0.22			0.38	0.66			
Uniform Delay, d1		20.6		35.4	4.1			36.0	38.1			
Progression Factor		1.00		1.00	1.00			1.00	1.00			
Incremental Delay, d2		1.0		13.5	0.1			0.8	5.4			
Delay (s)		21.6		48.9	4.2			36.8	43.5			
Level of Service		C		D	A			D	D			
Approach Delay (s)		21.6			18.1			42.4			0.0	
Approach LOS		C			B			D			A	

Intersection Summary			
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	143	28	595	147	46	221
Future Volume (Veh/h)	143	28	595	147	46	221
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	143	28	595	147	46	221
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						332
pX, platoon unblocked						
vC, conflicting volume	982	668			742	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	982	668			742	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	45	94			95	
cM capacity (veh/h)	262	458			865	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	171	742	46	221
Volume Left	143	0	46	0
Volume Right	28	147	0	0
cSH	281	1700	865	1700
Volume to Capacity	0.61	0.44	0.05	0.13
Queue Length 95th (ft)	92	0	4	0
Control Delay (s)	35.8	0.0	9.4	0.0
Lane LOS	E		A	
Approach Delay (s)	35.8	0.0	1.6	
Approach LOS	E			

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	507	23	119	346	357	28	284	122	587	251	15
Future Volume (vph)	6	507	23	119	346	357	28	284	122	587	251	15
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	6.0	6.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3516		1770	1863	1583	1770	3539	1583	3433	1847	
Flt Permitted	0.55	1.00		0.38	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1031	3516		707	1863	1583	1770	3539	1583	3433	1847	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	507	23	119	346	357	28	284	122	587	251	15
RTOR Reduction (vph)	0	2	0	0	0	169	0	0	105	0	2	0
Lane Group Flow (vph)	6	528	0	119	346	188	28	284	17	587	264	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases		6		5	2		7	4		3	8	
Permitted Phases	6			6		2			4			
Actuated Green, G (s)	51.5	51.5		61.1	63.1	63.1	11.8	16.9	16.9	26.0	31.1	
Effective Green, g (s)	51.5	51.5		61.1	63.1	63.1	11.8	16.9	16.9	26.0	31.1	
Actuated g/C Ratio	0.43	0.43		0.51	0.53	0.53	0.10	0.14	0.14	0.22	0.26	
Clearance Time (s)	4.0	4.0		4.0	6.0	6.0	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	3.0	3.0	3.0	
Lane Grp Cap (vph)	442	1508		445	979	832	174	498	222	743	478	
v/s Ratio Prot		0.15		0.02	c0.19		0.02	c0.08		c0.17	c0.14	
v/s Ratio Perm	0.01			0.11		0.12			0.01			
v/c Ratio	0.01	0.35		0.27	0.35	0.23	0.16	0.57	0.08	0.79	0.55	
Uniform Delay, d1	19.7	23.0		15.9	16.6	15.3	49.6	48.2	44.8	44.4	38.4	
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	0.1	0.6		0.3	1.0	0.6	0.4	1.6	0.1	5.7	1.4	
Delay (s)	19.7	23.6		16.2	17.6	15.9	50.0	49.7	44.9	50.1	39.8	
Level of Service	B	C		B	B	B	D	D	D	D	D	
Approach Delay (s)		23.6			16.7			48.4			46.9	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	2	132	2	0	9	51	794	6	6	617	25
Future Volume (vph)	262	2	132	2	0	9	51	794	6	6	617	25
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.89		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1722			1642		1770	3535		1770	3519	
Flt Permitted		0.79			0.97		0.29	1.00		0.19	1.00	
Satd. Flow (perm)		1413			1601		535	3535		360	3519	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	262	2	132	2	0	9	51	794	6	6	617	25
RTOR Reduction (vph)	0	23	0	0	5	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	373	0	0	6	0	51	799	0	6	637	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		38.9			38.9		23.1	23.1		23.1	23.1	
Effective Green, g (s)		38.9			38.9		23.1	23.1		23.1	23.1	
Actuated g/C Ratio		0.56			0.56		0.33	0.33		0.33	0.33	
Clearance Time (s)		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	
Lane Grp Cap (vph)		785			889		176	1166		118	1161	
v/s Ratio Prot								c0.23			0.18	
v/s Ratio Perm		c0.26			0.00		0.10			0.02		
v/c Ratio		0.48			0.01		0.29	0.69		0.05	0.55	
Uniform Delay, d1		9.4			6.9		17.4	20.3		16.0	19.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1			0.0		0.9	1.7		0.2	0.5	
Delay (s)		11.5			6.9		18.3	22.0		16.2	19.7	
Level of Service		B			A		B	C		B	B	
Approach Delay (s)		11.5			6.9			21.8			19.7	
Approach LOS		B			A			C			B	

Intersection Summary				
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	505	78	63	343	26	0	0	0	14	1	15
Future Volume (Veh/h)	16	505	78	63	343	26	0	0	0	14	1	15
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	16	505	78	63	343	26	0	0	0	14	1	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					303							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	369			583			1074	1071	544	1058	1097	356
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			583			1021	1018	544	1004	1047	215
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 %	99			94			100	100	100	92	99	98
cM capacity (veh/h)	1191			991			176	195	539	185	188	734

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	599	432	30
Volume Left	16	63	14
Volume Right	78	26	15
cSH	1191	991	296
Volume to Capacity	0.01	0.06	0.10
Queue Length 95th (ft)	1	5	8
Control Delay (s)	0.4	1.9	18.5
Lane LOS	A	A	C
Approach Delay (s)	0.4	1.9	18.5
Approach LOS			C

Intersection Summary			
Average Delay			1.5
Intersection Capacity Utilization			61.4%
Analysis Period (min)			15

ICU Level of Service B

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/31/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	320	9	99	171	174	28	283	129	106	370	79
Future Volume (vph)	35	320	9	99	171	174	28	283	129	106	370	79
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00		1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1855		1770	1722		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1855		1770	1722		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	35	320	9	99	171	174	28	283	129	106	370	79
RTOR Reduction (vph)	0	1	0	0	32	0	0	0	105	0	0	58
Lane Group Flow (vph)	35	328	0	99	313	0	28	283	24	106	370	21
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	21.2	21.2		21.7	21.7		1.8	15.5	15.5	8.4	22.1	22.1
Effective Green, g (s)	21.2	21.2		21.7	21.7		1.8	15.5	15.5	8.4	22.1	22.1
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.02	0.19	0.19	0.10	0.27	0.27
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	453	474		463	451		38	662	296	179	944	422
v/s Ratio Prot	0.02	c0.18		0.06	c0.18		0.02	0.08		c0.06	c0.10	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.08	0.69		0.21	0.69		0.74	0.43	0.08	0.59	0.39	0.05
Uniform Delay, d1	23.4	27.9		23.9	27.6		40.3	29.7	27.8	35.6	24.8	22.6
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	0.1	4.3		0.2	4.6		53.2	0.4	0.1	5.2	0.3	0.0
Delay (s)	23.4	32.2		24.1	32.2		93.5	30.2	27.9	40.7	25.1	22.6
Level of Service	C	C		C	C		F	C	C	D	C	C
Approach Delay (s)		31.4			30.4			33.5			27.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	82.8	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	50.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
1: Old Bayshore Highway & US 101 N/Private Driveway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	147	4	595	17	11	5	744	313	18	12	701	188
Future Volume (vph)	147	4	595	17	11	5	744	313	18	12	701	188
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	4.0	4.0
Lane Util. Factor	0.95	0.91	0.95		1.00		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.86	0.85		0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1453	1504		1779		3433	3510		1770	3539	1583
Flt Permitted	0.95	1.00	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1453	1504		1779		3433	3510		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	147	4	595	17	11	5	744	313	18	12	701	188
RTOR Reduction (vph)	0	257	267	0	5	0	0	6	0	0	0	123
Lane Group Flow (vph)	132	54	36	0	28	0	744	325	0	12	701	65
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	6.2	6.2	6.2		2.0		11.1	28.6		0.7	17.2	17.2
Effective Green, g (s)	6.3	6.3	6.3		1.0		11.1	28.7		0.7	18.3	18.3
Actuated g/C Ratio	0.12	0.12	0.12		0.02		0.21	0.54		0.01	0.35	0.35
Clearance Time (s)	4.1	4.1	4.1		3.0		4.0	4.1		4.0	5.1	5.1
Vehicle Extension (s)	2.0	2.0	2.0		2.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	200	173	179		33		723	1911		23	1228	549
v/s Ratio Prot	c0.08	0.04			c0.02		c0.22	0.09		0.01	c0.20	
v/s Ratio Perm			0.02									0.04
v/c Ratio	0.66	0.31	0.20		0.85		1.03	0.17		0.52	0.57	0.12
Uniform Delay, d1	22.2	21.2	20.9		25.8		20.8	6.0		25.8	14.0	11.7
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.2	0.4	0.2		94.5		41.1	0.0		9.5	0.4	0.0
Delay (s)	28.4	21.6	21.1		120.3		61.9	6.0		35.3	14.4	11.7
Level of Service	C	C	C		F		E	A		D	B	B
Approach Delay (s)		22.6			120.3			44.7			14.1	
Approach LOS		C			F			D			B	

Intersection Summary				
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	52.7	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Private Driveway/Old Bayshore Highway & Broadway/Airport Boulevard

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1010	323	46	8	255	116	44	37	10	179	18	1113
Future Volume (vph)	1010	323	46	8	255	116	44	37	10	179	18	1113
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	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00		0.95		0.95	0.95	0.88
Frt	1.00	0.98		1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (prot)	3433	3473		1770	3539	1583		3399		1681	1700	2787
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98		0.95	0.96	1.00
Satd. Flow (perm)	3433	3473		1770	3539	1583		3399		1681	1700	2787
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1010	323	46	8	255	116	44	37	10	179	18	1113
RTOR Reduction (vph)	0	15	0	0	0	95	0	9	0	0	0	485
Lane Group Flow (vph)	1010	354	0	8	255	21	0	82	0	98	99	628
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		4	4		3	3	5
Permitted Phases						6						3
Actuated Green, G (s)	22.4	28.0		4.2	9.8	9.8		5.6		6.3	6.3	28.7
Effective Green, g (s)	21.4	29.1		3.2	10.9	10.9		5.3		7.0	7.0	26.7
Actuated g/C Ratio	0.35	0.48		0.05	0.18	0.18		0.09		0.12	0.12	0.44
Clearance Time (s)	3.0	5.1		3.0	5.1	5.1		3.7		4.7	4.7	3.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	1212	1667		93	636	284		297		194	196	1227
v/s Ratio Prot	c0.29	0.10		0.00	c0.07			c0.02		c0.06	0.06	0.18
v/s Ratio Perm						0.01						0.04
v/c Ratio	0.83	0.21		0.09	0.40	0.07		0.28		0.51	0.51	0.51
Uniform Delay, d1	18.0	9.1		27.3	22.0	20.7		25.9		25.2	25.2	12.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	4.8	0.0		0.1	0.2	0.0		0.2		0.8	0.7	0.2
Delay (s)	22.8	9.1		27.5	22.1	20.7		26.0		25.9	25.9	12.4
Level of Service	C	A		C	C	C		C		C	C	B
Approach Delay (s)		19.1			21.8			26.0			14.4	
Approach LOS		B			C			C			B	

Intersection Summary				
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	59.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Broadway & US 101 S

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1069	461	364	1061	0	0	0	0	292	1	1023
Future Volume (vph)	0	1069	461	364	1061	0	0	0	0	292	1	1023
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Lane Util. Factor		0.86	0.86	0.97	0.95						1.00	0.76
Frt		0.98	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)		4733	1362	3433	3539						1774	3610
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		4733	1362	3433	3539						1774	3610
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1069	461	364	1061	0	0	0	0	292	1	1023
RTOR Reduction (vph)	0	27	216	0	0	0	0	0	0	0	0	89
Lane Group Flow (vph)	0	1162	125	364	1061	0	0	0	0	0	293	934
Turn Type		NA	Perm	Prot	NA					Split	NA	custom
Protected Phases		2		1	6					4	4	5
Permitted Phases			2									4
Actuated Green, G (s)		16.9	16.9	7.7	20.5						9.9	14.0
Effective Green, g (s)		16.9	16.9	7.7	20.5						9.9	14.0
Actuated g/C Ratio		0.37	0.37	0.17	0.44						0.21	0.30
Clearance Time (s)		4.1	4.1	3.0	4.1						4.6	3.0
Vehicle Extension (s)		2.0	2.0	2.0	2.0						2.0	2.0
Lane Grp Cap (vph)		1731	498	572	1570						380	1093
v/s Ratio Prot		0.25		c0.11	c0.30						0.17	c0.08
v/s Ratio Perm			0.09									0.18
v/c Ratio		0.67	0.25	0.64	0.68						0.77	0.85
Uniform Delay, d1		12.3	10.2	17.9	10.2						17.1	15.1
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.8	0.1	1.7	0.9						8.5	6.4
Delay (s)		13.1	10.3	19.7	11.1						25.6	21.6
Level of Service		B	B	B	B						C	C
Approach Delay (s)		12.5			13.3			0.0			22.5	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	46.2	Sum of lost time (s)	11.7	
Intersection Capacity Utilization	61.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Rollins Road & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	1008	53	487	1483	109	30	63	241	258	288	211
Future Volume (vph)	92	1008	53	487	1483	109	30	63	241	258	288	211
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	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5047		3433	5085	1583	1770	1863	1583	3433	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5047		3433	5085	1583	1770	1863	1583	3433	1863	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	92	1008	53	487	1483	109	30	63	241	258	288	211
RTOR Reduction (vph)	0	7	0	0	0	65	0	0	197	0	0	151
Lane Group Flow (vph)	92	1054	0	487	1483	44	30	63	44	258	288	60
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	4.7	18.6		13.6	27.5	27.5	2.2	12.5	12.5	9.1	19.4	19.4
Effective Green, g (s)	3.7	18.6		12.6	27.5	27.5	1.2	12.5	12.5	8.1	19.4	19.4
Actuated g/C Ratio	0.05	0.27		0.19	0.41	0.41	0.02	0.18	0.18	0.12	0.29	0.29
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	187	1384		637	2062	642	31	343	291	410	533	452
v/s Ratio Prot	0.03	0.21		c0.14	c0.29		0.02	0.03		c0.08	c0.15	
v/s Ratio Perm						0.03			0.03			0.04
v/c Ratio	0.49	0.76		0.76	0.72	0.07	0.97	0.18	0.15	0.63	0.54	0.13
Uniform Delay, d1	31.1	22.6		26.2	16.9	12.3	33.3	23.3	23.2	28.4	20.4	18.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	2.3		4.9	1.0	0.0	146.1	0.1	0.1	2.2	0.6	0.0
Delay (s)	31.9	24.9		31.1	17.9	12.3	179.4	23.4	23.3	30.6	21.0	18.0
Level of Service	C	C		C	B	B	F	C	C	C	C	B
Approach Delay (s)		25.4			20.7			37.3			23.5	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Rollins Road & Cadillac Way

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	71	26	18	296	695	127
Future Volume (vph)	71	26	18	296	695	127
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		1.00	1.00	0.95	
Frt	0.96		1.00	1.00	0.98	
Flt Protected	0.96		0.95	1.00	1.00	
Satd. Flow (prot)	1732		1770	1863	3457	
Flt Permitted	0.96		0.31	1.00	1.00	
Satd. Flow (perm)	1732		571	1863	3457	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	26	18	296	695	127
RTOR Reduction (vph)	18	0	0	0	25	0
Lane Group Flow (vph)	79	0	18	296	797	0
Turn Type	Prot		Perm	NA	NA	
Protected Phases	2			8	4	
Permitted Phases			8			
Actuated Green, G (s)	9.1		14.7	14.7	14.7	
Effective Green, g (s)	9.6		15.2	15.2	15.2	
Actuated g/C Ratio	0.29		0.46	0.46	0.46	
Clearance Time (s)	4.5		4.5	4.5	4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	506		264	863	1602	
v/s Ratio Prot	c0.05			0.16	c0.23	
v/s Ratio Perm			0.03			
v/c Ratio	0.16		0.07	0.34	0.50	
Uniform Delay, d1	8.6		4.9	5.6	6.1	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	0.1		0.1	0.2	0.2	
Delay (s)	8.7		5.0	5.9	6.4	
Level of Service	A		A	A	A	
Approach Delay (s)	8.7			5.8	6.4	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	32.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
6: Rollins Road & Toyon Drive

07/31/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Traffic Volume (vph)	20	10	12	224	852	106
Future Volume (vph)	20	10	12	224	852	106
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	20	10	12	224	852	106

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total (vph)	30	236	958
Volume Left (vph)	20	12	0
Volume Right (vph)	10	0	106
Hadj (s)	-0.03	0.04	-0.03
Departure Headway (s)	6.1	4.8	4.2
Degree Utilization, x	0.05	0.32	1.13
Capacity (veh/h)	565	733	838
Control Delay (s)	9.5	10.1	90.4
Approach Delay (s)	9.5	10.1	90.4
Approach LOS	A	B	F

Intersection Summary			
Delay		72.9	
Level of Service		F	
Intersection Capacity Utilization		61.3%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
7: Carolan Avenue & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	728	226	609	1178	0	89	0	490	0	0	0
Future Volume (vph)	0	728	226	609	1178	0	89	0	490	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			4.0	4.0			
Lane Util. Factor		0.91		1.00	0.91			1.00	1.00			
Frt		0.96		1.00	1.00			1.00	0.85			
Flt Protected		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (prot)		4905		1770	5085			1770	1583			
Flt Permitted		1.00		0.95	1.00			0.95	1.00			
Satd. Flow (perm)		4905		1770	5085			1770	1583			
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	728	226	609	1178	0	89	0	490	0	0	0
RTOR Reduction (vph)	0	54	0	0	0	0	0	0	443	0	0	0
Lane Group Flow (vph)	0	900	0	609	1178	0	0	89	47	0	0	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm			
Protected Phases		4 8 9		10	4			1				
Permitted Phases	4 8 9						1		1			
Actuated Green, G (s)		42.0		36.0	27.0			10.0	10.0			
Effective Green, g (s)		42.0		36.0	27.0			10.0	10.0			
Actuated g/C Ratio		0.40		0.35	0.26			0.10	0.10			
Clearance Time (s)				4.0	4.0			4.0	4.0			
Vehicle Extension (s)				2.0	2.0			1.0	1.0			
Lane Grp Cap (vph)		1980		612	1320			170	152			
v/s Ratio Prot		c0.18		c0.34	c0.23							
v/s Ratio Perm								0.05	0.03			
v/c Ratio		0.45		1.00	0.89			0.52	0.31			
Uniform Delay, d1		22.6		33.9	37.1			44.7	43.8			
Progression Factor		0.43		1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.0		34.9	7.8			1.3	0.4			
Delay (s)		9.7		68.8	44.9			46.1	44.2			
Level of Service		A		E	D			D	D			
Approach Delay (s)		9.7			53.0			44.5			0.0	
Approach LOS		A			D			D			A	

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
8: Carolan Avenue & Cadillac Way

07/31/2019

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	264	29	342	80	62	308
Future Volume (Veh/h)	264	29	342	80	62	308
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	264	29	342	80	62	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)						332
pX, platoon unblocked						
vC, conflicting volume	814	382			422	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	814	382			422	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	20	96			95	
cM capacity (veh/h)	329	665			1137	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	293	422	62	308
Volume Left	264	0	62	0
Volume Right	29	80	0	0
cSH	346	1700	1137	1700
Volume to Capacity	0.85	0.25	0.05	0.18
Queue Length 95th (ft)	192	0	4	0
Control Delay (s)	52.8	0.0	8.3	0.0
Lane LOS	F		A	
Approach Delay (s)	52.8	0.0	1.4	
Approach LOS	F			

Intersection Summary			
Average Delay		14.7	
Intersection Capacity Utilization		52.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
9: California Drive & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	253	54	89	562	624	47	264	190	495	236	37
Future Volume (vph)	20	253	54	89	562	624	47	264	190	495	236	37
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	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	0.97	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3446		1770	1863	1583	1770	3539	1583	3433	1825	
Flt Permitted	0.28	1.00		0.50	1.00	1.00	0.51	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	513	3446		926	1863	1583	956	3539	1583	3433	1825	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	20	253	54	89	562	624	47	264	190	495	236	37
RTOR Reduction (vph)	0	17	0	0	0	369	0	0	124	0	6	0
Lane Group Flow (vph)	20	290	0	89	562	255	47	264	66	495	267	0
Turn Type	Perm	NA		D.P+P	NA	Perm	Perm	NA	Perm	Prot	NA	
Protected Phases		8		5	1 4 5 8			10		9	14	
Permitted Phases	8			8		1 4 5 8	10		10			
Actuated Green, G (s)	27.0	27.0		34.0	41.0	41.0	36.0	36.0	36.0	15.0	55.0	
Effective Green, g (s)	27.0	27.0		40.0	41.0	41.0	36.0	36.0	36.0	15.0	55.0	
Actuated g/C Ratio	0.26	0.26		0.38	0.39	0.39	0.35	0.35	0.35	0.14	0.53	
Clearance Time (s)	4.0	4.0		7.0			4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	2.0	2.0		3.0			2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	133	894		437	734	624	330	1225	547	495	965	
v/s Ratio Prot		0.08		0.02	c0.30			0.07		c0.14	c0.15	
v/s Ratio Perm	0.04			0.06		0.16	0.05		0.04			
v/c Ratio	0.15	0.32		0.20	0.77	0.41	0.14	0.22	0.12	1.00	0.28	
Uniform Delay, d1	29.7	31.1		20.8	27.3	22.7	23.4	24.0	23.2	44.5	13.5	
Progression Factor	1.00	1.00		0.40	0.67	5.84	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.1		0.1	2.1	0.1	0.1	0.0	0.0	40.5	0.1	
Delay (s)	29.9	31.2		8.5	20.4	133.0	23.5	24.1	23.2	85.0	13.6	
Level of Service	C	C		A	C	F	C	C	C	F	B	
Approach Delay (s)		31.1			74.7			23.7			59.6	
Approach LOS		C			E			C			E	

Intersection Summary			
HCM 2000 Control Delay	56.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	19.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: California Drive & Camelita Avenue/Parking Lot

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	0	140	7	8	20	76	972	0	12	779	63
Future Volume (vph)	166	0	140	7	8	20	76	972	0	12	779	63
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	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.94			0.92		1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1702			1702		1770	3539		1770	3499	
Flt Permitted		0.81			0.94		0.30	1.00		0.26	1.00	
Satd. Flow (perm)		1419			1623		564	3539		477	3499	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	166	0	140	7	8	20	76	972	0	12	779	63
RTOR Reduction (vph)	0	37	0	0	15	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	269	0	0	20	0	76	972	0	12	838	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			4			2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		25.3			25.3		70.7	70.7		70.7	70.7	
Effective Green, g (s)		25.3			25.3		70.7	70.7		70.7	70.7	
Actuated g/C Ratio		0.24			0.24		0.68	0.68		0.68	0.68	
Clearance Time (s)		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	
Lane Grp Cap (vph)		345			394		383	2405		324	2378	
v/s Ratio Prot								c0.27			0.24	
v/s Ratio Perm		c0.19			0.01		0.13			0.03		
v/c Ratio		0.78			0.05		0.20	0.40		0.04	0.35	
Uniform Delay, d1		36.7			30.1		6.2	7.4		5.5	7.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.6			0.1		1.2	0.5		0.2	0.4	
Delay (s)		47.4			30.2		7.3	7.9		5.7	7.4	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		47.4			30.2			7.8			7.4	
Approach LOS		D			C			A			A	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
11: Chula Vista Avenue/Parking Lot & Broadway

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	319	94	171	398	50	0	0	0	21	9	41
Future Volume (Veh/h)	37	319	94	171	398	50	0	0	0	21	9	41
Sign Control		Free			Free			Yield			Yield	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	37	319	94	171	398	50	0	0	0	21	9	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)					303							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	448			413			1250	1230	366	1205	1252	423
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			413			1160	1132	366	1098	1162	33
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			85			100	100	100	83	92	95
cM capacity (veh/h)	1126			1146			98	123	679	121	118	764

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	450	619	71
Volume Left	37	171	21
Volume Right	94	50	41
cSH	1126	1146	233
Volume to Capacity	0.03	0.15	0.30
Queue Length 95th (ft)	3	13	31
Control Delay (s)	1.0	3.7	27.0
Lane LOS	A	A	D
Approach Delay (s)	1.0	3.7	27.0
Approach LOS			D

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
12: Carolan Avenue & Oak Grove Avenue

07/31/2019

Intersection Sign configuration not allowed in HCM analysis.

HCM Signalized Intersection Capacity Analysis
13: California Drive /California Drive & Oak Grove Avenue

07/31/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	173	45	155	185	122	28	256	155	136	291	44
Future Volume (vph)	6	173	45	155	185	122	28	256	155	136	291	44
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	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1805		1770	1752		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1805		1770	1752		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	6	173	45	155	185	122	28	256	155	136	291	44
RTOR Reduction (vph)	0	12	0	0	29	0	0	0	121	0	0	32
Lane Group Flow (vph)	6	206	0	155	278	0	28	256	34	136	291	12
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases									6			2
Actuated Green, G (s)	12.9	12.9		14.8	14.8		1.6	14.0	14.0	5.3	17.7	17.7
Effective Green, g (s)	12.9	12.9		14.8	14.8		1.6	14.0	14.0	5.3	17.7	17.7
Actuated g/C Ratio	0.20	0.20		0.23	0.23		0.03	0.22	0.22	0.08	0.28	0.28
Clearance Time (s)	4.0	4.0		4.0	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	3.0	3.0	3.0
Lane Grp Cap (vph)	362	369		415	411		44	786	351	148	994	444
v/s Ratio Prot	0.00	c0.11		0.09	c0.16		0.02	0.07		c0.08	c0.08	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.02	0.56		0.37	0.68		0.64	0.33	0.10	0.92	0.29	0.03
Uniform Delay, d1	20.0	22.5		20.2	21.9		30.4	20.5	19.5	28.6	17.7	16.4
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	0.0	1.8		0.6	4.4		26.4	0.2	0.1	49.9	0.2	0.0
Delay (s)	20.0	24.3		20.8	26.3		56.8	20.8	19.6	78.5	17.9	16.4
Level of Service	C	C		C	C		E	C	B	E	B	B
Approach Delay (s)		24.2			24.4			22.7			35.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	63.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

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