Attachment 13



Final Traffic Impact Study for the Burbank Avenue Subdivision Project



Prepared for the City of Santa Rosa

Submitted by **W-Trans**

December 11, 2019





This page intentionally left blank

Table of Contents

Executi	ive Summary	1
Introdu	iction	2
Transpo	ortation Setting	4
Capacit	ty Analysis	7
Alterna	tive Modes	21
Access	and Circulation	
Parking]	
Conclu	sions and Recommendations	
Study F	Participants and References	
Figures		
1.	Study Area and Existing Lane Configurations	
2.	Existing Traffic Volumes	
3.	Baseline Traffic Volumes	
4.	Site Plan	
5.	Project Traffic Volumes and Trip Distribution	
6.	Existing plus Project Traffic Volumes	
7.	Baseline plus Project Traffic Volumes	19
Tables		
1.	Collision Rates at the Study Intersections	
2.	Planned Bicycle Facilities in the Project Vicinity	
3.	Intersection Level of Service Criteria	
4.	Existing Peak Hour Intersection Levels of Service	
5.	Baseline Peak Hour Intersection Levels of Service	
6. 7	Trip Generation Summary	
7. o	Trip Distribution Assumptions	
8. 9.	Existing and Existing plus Project Peak Hour Intersection Levels of Service Baseline and Baseline plus Project Peak Hour Intersection Levels of Service	
	Parking Analysis Summary	
Append	dices	
Α.	Collision Rate Calculations	

- C. Proposed Street Cross-Sections
- D. Warrant Analyses





This page intentionally left blank

Executive Summary

The proposed Burbank Avenue Subdivision would be located at 1400, 1690, 1720, and 1780 Burbank Avenue and would consist of 64 apartments, 62 single-family detached residences, and 12 single-family duplex units. Based on application of standard trip generation rates, the project is anticipated to generate an average of 1,158 daily vehicle trips, including 83 trips during the weekday morning peak hour and 108 trips during the weekday evening peak hour.

The study area includes the intersections of Burbank Avenue with Sebastopol Road, Hughes Avenue, and Hearn Avenue. Analysis indicates that these are currently operating acceptably at LOS A overall during both peak hours, though the southbound approach at Hearn Avenue/Burbank Avenue is operating at LOS F during both the morning peak hour and evening peak hour. Upon the addition of project-related traffic to Existing volumes, all three study intersections would continue to operate acceptably overall and the project's impact would be considered less-than-significant, though the southbound approach at Hearn Avenue/Burbank Avenue would experience increased delays during both peak hours.

Under Baseline volumes, which include the addition of traffic associated with Roseland Accelerated Middle School, Roseland Village, and Sebastopol Road Town Homes, the study intersections would be expected to continue operating acceptably overall without or with the proposed project and the southbound approach at Hearn Avenue/Burbank Avenue would continue to operate with substantial delays during both peak hours. With the addition of project traffic, the intersection would operate at LOS E overall during the a.m. peak hour. It is understood that the City is aware of the high delays experienced on the southbound approach of Hearn Avenue/ Burbank Avenue and has plans to signalize the intersection, as contained in the *Santa Rosa Roseland Area/ Sebastopol Road Specific Plan*, though with a realignment that would place the signalized intersection north of its current location. While the traffic added from this project would result in the intersection reaching LOS E, the project would not cause a significant impact were it not for the substantial volume of traffic added by the Roseland Accelerated Middle School. In recognition of this, City staff has identified that the project should pay a fee \$96,000 for the signalization of the intersection of Hearn Avenue/Burbank Avenue.

Access for pedestrians and bicyclists will be adequate upon completion of the planned future improvements to Burbank Avenue, which include the provision of sidewalks on both sides of the street and Class II bike lanes in both directions of travel. The project will complete a portion of these improvements along their frontage. The City of Santa Rosa should consider initiating a CityBus route along Burbank Avenue to serve the developing area.

A left-turn lane on Burbank Avenue at the new street connections is not warranted under Baseline plus Project volumes during either the a.m. or p.m. peak hour. A traffic signal is warranted at the intersection of Hearn Avenue/Burbank Avenue under Baseline and Baseline plus Project volumes during both peak hours. All-way stop-controls are not warranted at the intersection of Hughes Road/Burbank Avenue under any scenario evaluated.

Site access and circulation are expected to operate acceptably, and adequate sight distance is available in each direction at the project driveway.

Based on the most recent site plan, the proposed parking supply is adequate to meet City requirements. Bicycle parking would be adequate because the units have private garages for bicycle storage.



Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of 64 apartments, 62 single-family detached residences, and 12 single-family duplex units at 1400, 1690, 1720 and 1780 Burbank Avenue in the City of Santa Rosa. The traffic study was completed in accordance with the criteria established by the City of Santa Rosa, reflects a scope of work reviewed and approved by City staff, and is consistent with standard traffic engineering techniques.

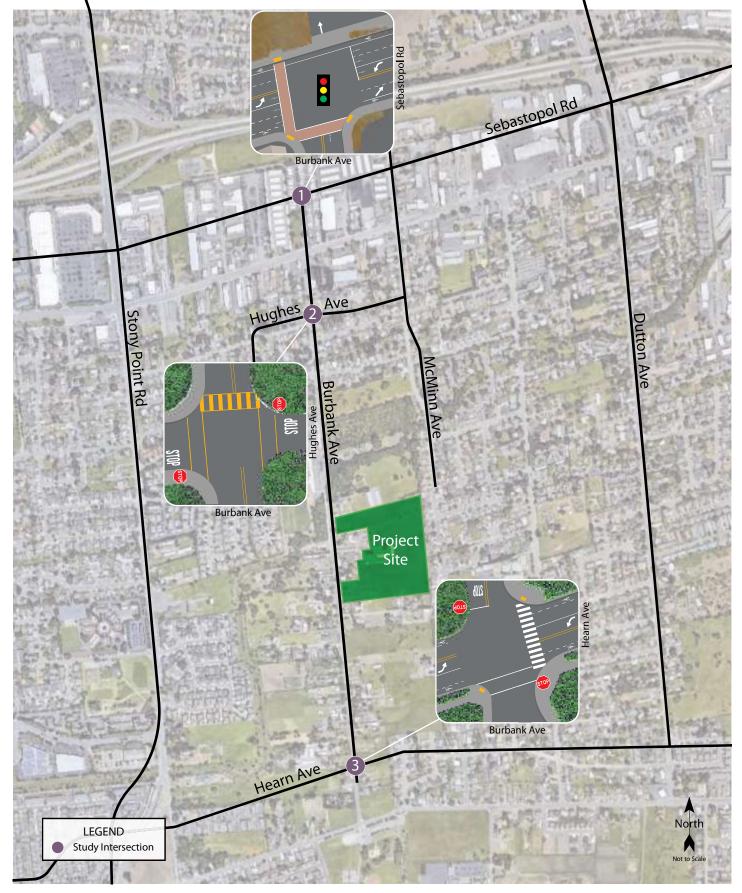
Prelude

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

The project site is located on the east side of Burbank Avenue opposite Roseland Creek Elementary School, as shown in Figure 1. As proposed, the project would merge four parcels at 1400, 1690, 1720 and 1780 Burbank Avenue to construct 64 apartments, 62 single-family detached residences, and 12 single-family duplex units. To make room for the new housing, one existing single-family residence would be removed. The development would be accessed via two new street connections to Burbank Avenue.





sro496.ai 11/19

Traffic Impact Study for the Burbank Avenue Subdivision Project Figure 1 – Study Area and Existing Lane Configurations



Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the following intersections:

- 1. Sebastopol Road/Burbank Avenue
- 2. Hughes Avenue/Burbank Avenue
- 3. Hearn Avenue/Burbank Avenue

Operating conditions during the weekday 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

Sebastopol Road/Burbank Avenue is a signalized "tee" intersection with a private one-way northbound driveway entrance to Roseland Mobile Home Park forming the north leg of the intersection. Left-turn lanes are provided on the westbound and eastbound Sebastopol Road approaches and there is protected left-turn phasing on the westbound approach, but permitted left-turn phasing eastbound. There are marked crosswalks on the south and west legs.

Hughes Avenue/Burbank Avenue is an unsignalized intersection that is stop-controlled on the eastbound and westbound approaches. Marked yellow crosswalks are present on the north and west legs.

Hearn Avenue/Burbank Avenue is an unsignalized intersection stop-controlled on the northbound Southwest Community Park access point and the southbound Burbank Avenue approach. Left-turn lanes are provided on the eastbound and westbound Hearn Avenue approaches and the east leg has a marked crosswalk.

On Burbank Avenue at the northern border of the Roseland School District building, there is an existing actuated flashing warning beacon and a yellow zebra striped crosswalk. The crosswalk and beacon connect the multi-use path on the west side of Burbank Avenue to the asphalt curb separated path on the east side of the street.

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

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is December 1, 2013 through November 30, 2018.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in 2014 Collision Data on California State Highways,



California Department of Transportation (Caltrans). Two of the three study intersections have above-average collision rates. The collision rate calculations are provided in Appendix A.

Table 1 – Collision Rates at the Study Intersections									
Study Intersection	Number of Collisions (2013-2018)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)						
1. Sebastopol Rd/Burbank Ave	16	0.56	0.43						
2. Hughes Ave/Burbank Ave	2	0.21	0.26						
3. Hearn Ave/Burbank Ave	8	0.33	0.26						

Note: c/mve = collisions per million vehicles entering; **bold** text indicates a collision rate that exceeds the Statewide average for similar facilities

At Sebastopol Road/Burbank Avenue, 10 out of the 16 collisions were either broadsides (six) or rear-ends (four). The rear-end crashes are common at signalized intersections during congested conditions and the broadside crashes, five of which were between westbound left-turning vehicles and eastbound through vehicles, are likely due to the left-turning drivers entering at the end of the yellow clearance interval. Consideration could be given to increasing the red-clearance interval to give motorists more time to clear the intersection prior to the green indication for the next movement, which would likely help to reduce the incidence of broadside crashes.

The predominant crash type at Hearn Avenue/Burbank Avenue was broadside collisions; of five such crashes three involved vehicles entering Hearn Avenue from either Burbank Avenue or the Southwest Community Park. It is noted that with fewer than five preventable crashes in a year (the highest number was three in twelve months) a traffic signal is not currently warranted for safety reasons, but the City may wish to monitor the crash history at this location to ensure that conditions do not worsen.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. Although a connected sidewalk network is lacking on Burbank Avenue, pedestrian access is provided via a combination of sidewalks and multi-use paths on the shoulders of the roadway. The section along Roseland Creek Elementary School has a sidewalk along its frontage, while the section between the school and Hearn Avenue has a multi-use path on the eastern shoulder and the section north of the school has a multi-use path on the western shoulder. The path is separated from the travel lanes by an asphalt curb. A crosswalk with an actuated flashing warning beacon connects the facilities on the east side of the street with those on the west side near the southern end of the school property.

The Santa Rosa Roseland Area/Sebastopol Road Specific Plan (Specific Plan), completed in November 2016, identifies plans to redesign Burbank Avenue with a greater focus on safety for pedestrians and bicyclists. As proposed, the roadway would have sidewalks on both sides of the street and Class II bike lanes in both directions of travel; furthermore, the segment between the project site and Hearn Avenue would include a tree-lined bioswale that would separate the sidewalk from the bike lanes and travel lanes. The plan references an existing segment of Burbank Avenue adjacent to Roseland Creek Elementary School, which already has a Class II bike lane and separated sidewalk, as an example for the rest of the roadway.



Bicycle Facilities

The Highway Design Manual, Caltrans, 2017, classifies bikeways into four categories:

- **Class I Multi-Use Path** a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

Per the Specific Plan Burbank Avenue is to have six-foot bike lanes in both directions of travel that would connect to the existing bike lane along the school frontage as well as to the existing bike lanes on Sebastopol Road and Hearn Avenue. The document also indicates that in the future there will be a Class I trail along Roseland Creek from Stony Point Road to McMinn Avenue that would cross Burbank Avenue just south of the project site. Table 2 summarizes the planned bicycle facilities in the project vicinity, as contained in the Specific Plan.

Table 2 – Planned Bicycle Facilities in the Project Vicinity										
Facility	Class	Length (miles)	Begin Point	End Point						
Roseland Creek Trail	I	1.0	Stony Point Rd	McMinn Ave						
Burbank Ave	Ш	1.0	Sebastopol Rd	Hearn Ave						

Source: Santa Rosa Roseland Area/Sebastopol Road Specific Plan, City of Santa Rosa, 2016

Transit Facilities

Santa Rosa CityBus provides fixed route bus service in Santa Rosa. There are no CityBus stops located within onequarter mile of the project site, but Routes 2, 12, and 15 serve southwest Santa Rosa seven days a week. Route 2 stops on Sebastopol Road approximately 200 feet east of Burbank Avenue. Routes 12 and 15 stop at Southwest Community Park approximately 120 feet south of the intersection of Hearn Avenue/Burbank Avenue. These transit stops are roughly one-half mile from the project site so transit would be a viable option for most project residents, though not as convenient as is typically considered desirable.

Sonoma County Transit (SCT) provides regional service throughout Sonoma County. Route 22 stops on Sebastopol Road at Burbank Avenue and operates Monday through Friday with approximately one- to six-hour headways between 7:15 a.m. and 5:30 p.m.

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

Paratransit, also known as dial-a-ride, 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. CityBus paratransit is contracted out to MV Transportation and is designed to serve the needs of individuals with disabilities within three-quarters (3/4) of a mile from existing CityBus routes. Paratransit service is available seven days a week, but rides must be scheduled one day in advance.



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, 6th Edition, 2018. 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 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. Delays were calculated using signal timing obtained from the City staff.

The ranges of delay associated with the various levels of service are indicated in Table 3.



Table	Table 3 – Intersection Level of Service Criteria								
LOS	Two-Way Stop-Controlled	Signalized							
Α	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.							
В	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 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.							
С	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 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 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 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 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.							

Reference: Highway Capacity Manual, Transportation Research Board, 6th Edition, 2018

Traffic Operation Standards

City of Santa Rosa

Section 5.8 Transportation Goals & Policy of the City of Santa Rosa General Plan states:

- **T-D-1** Maintain a Level of Service (LOS) D or better along all major corridors. Exceptions to meeting the standard include:
 - Within downtown;
 - Where attainment would result in significant degradation;
 - Where topography or impacts makes the improvement impossible; or
 - Where attainment would ensure loss of an area's unique character.

The LOS is to be calculated using the average traffic demand over the highest 60-minute period.

Traffic Engineering Division will require a level of service evaluation of arterial and collector corridors if deemed necessary.

T-D-2 – Monitor level of service at intersections to assure that improvements or alterations to improve corridor level of service do not cause severe impacts at any single intersection.

<u>General interpretation of Policy T-D-2</u>. The impact to an intersection is considered significant if the project related and/or future trips result in:

1. The level of service (LOS) at an intersection degrading from LOS D or better to LOS E or F, OR



- 2. An increase in average vehicle delay of greater than 5 seconds at a signalized intersection where the current LOS operates at either LOS E or F.
- 3. Queuing impacts based on a comparative analysis between the design queue length and the available queue storage capacity. Impacts include, but are not limited to, spillback queue at project access locations (both ingress and egress), turn lanes at intersections, lane drops, spill back that impacts upstream intersections or interchange ramps.
- 4. Exceptions may be granted under the following conditions:
 - a. Within downtown,
 - b. Where attainment would result in significant degradation,
 - c. Where topography or impacts makes the improvement impossible; or
 - d. Where attainment would ensure loss of an area's unique character.
- **T-C-3** Implement traffic calming techniques on streets subject to high speed and/or cut-through traffic, in order to improve neighborhood livability, Techniques Include:
 - Narrow Streets
 - On-street parking
 - Choker or diverters
 - Decorative crosswalks
 - Planted islands

<u>General interpretation of Policy T-C-3</u>. An impact is considered significant if the project has the potential to alter community character by significantly increasing cut-through traffic, unexpected vehicle maneuvers or commercial vehicle trips in a residential area.

T-H-3 – Require new development to provide transit improvements, where a rough proportionality to demand from the project is established. Transit improvements may include:

- Direct and paved pedestrian access to transit stops
- Bus turnouts and shelters
- Lane width to accommodate buses.

<u>General interpretation of Policy T-H-3</u>. An impact is considered significant if the project has the potential to disrupt existing transit operations or establishes transit facilities and equipment such that it creates a sight distance deficiency or vehicle conflict point.

T-J – Provide attractive and safe streets for pedestrian and bicyclists.

<u>General interpretation of Policy T-J</u>. An impact is considered significant if the project generates 20 pedestrians in any single hour at an unsignalized intersection, mid-block crossing or where no crossing has been established.

An impact is further considered significant if the project interrupts existing or proposed pedestrian, bicycle and transit facilities, path or travel, direct access resulting in excessive rerouting or creates a vehicle conflict condition which affects the safety of other roadway users.

Reporting of Peak Hour Delay

Per the City of Santa Rosa's General Plan policy T-D-1, LOS is calculated based on the average traffic demand over the hour, rather than the peak 15 minutes within the hour; therefore, a peak hour factor (PHF) of 1.0 was used in the analysis.



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 hours. This condition does not include project-generated traffic volumes. Volume data was collected in September 2019 during clear weather and while local schools were in session.

Intersection Levels of Service

Under Existing Conditions, the study intersections operate acceptably at LOS A overall during both peak hours studied. A summary of the intersection level of service calculations is contained in Table 4, and copies of the Level of Service calculations for all evaluated scenarios are provided in Appendix B. The existing traffic volumes are shown in Figure 2.

Ta	Table 4 – Existing Peak Hour Intersection Levels of Service								
Stu	udy Intersection	AM F	Peak	PM F	'eak				
	Approach	Delay	LOS	Delay	LOS				
1.	Sebastopol Rd/Burbank Ave	9.1	А	7.0	А				
2.	Hughes Ave/Burbank Ave	3.2	А	2.6	А				
	Eastbound Approach	14.8	В	12.5	В				
	Westbound Approach	17.1	С	12.2	В				
3.	Hearn Ave/Burbank Ave	8.9	А	7.0	А				
	Northbound Approach	21.8	С	23.3	С				
	Southbound Approach	64.7	F	50.3	F				

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*

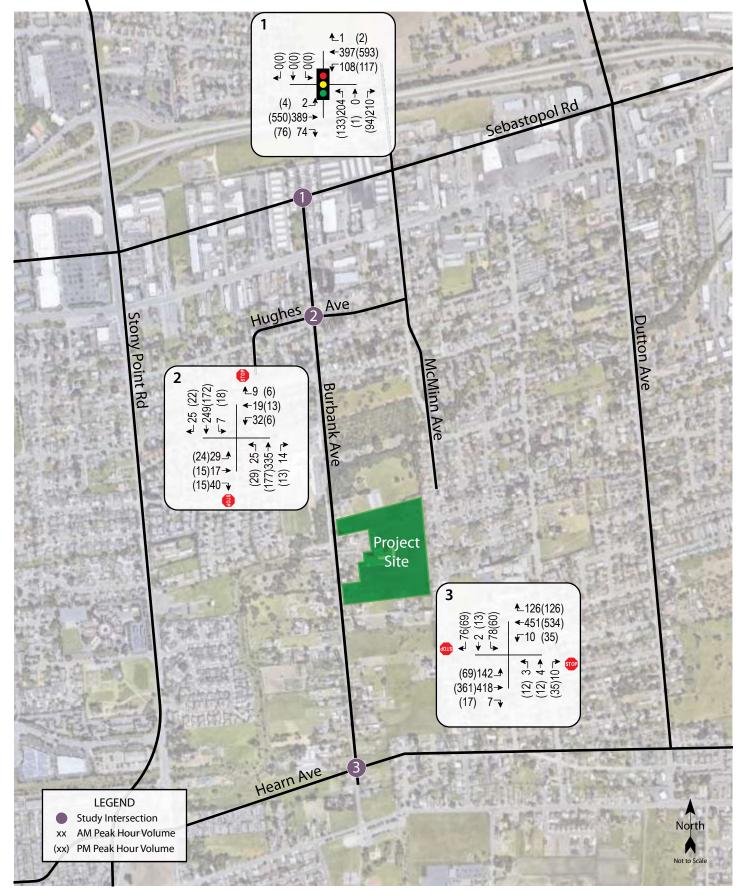
Though the intersection of Hearn Avenue/Burbank Avenue is operating acceptably at LOS A overall, the City is aware of the high delays experienced on the southbound approach and has plans to signalize the intersection, as detailed in the Specific Plan. The installation of a signal would be expected to reduce the delays on the southbound approach to a tolerable level.

Baseline Conditions

Baseline (Existing plus Approved or Pending) operating conditions were determined with traffic from approved and pending projects in and near the study area added to the Existing volumes. As directed by staff, the following projects contained in the Citywide Summary of Pending Development Report were included for Baseline Conditions. The same trip generation and trip distribution assumptions used in the traffic studies for the projects were used in this analysis. Standard rates as published in *Trip Generation Manual*, 10th Edition, 2017, were applied in both traffic studies.

Roseland Accelerated Middle School is a proposed project that would relocate an existing 300-student middle school campus to the Roseland Creek Elementary School site on Burbank Avenue. The project is expected to generate 567 trips per day, including 189 trips during the morning peak hour and 105 trips during the evening peak hour.





sro496.ai 11/19

Traffic Impact Study for the Burbank Avenue Subdivision Project Figure 2 – Existing Traffic Volumes



Roseland Village is a pending 175-unit multifamily residential development with up to 20,000 square feet of retail space that would be located at 665 Sebastopol Road. The project is expected to generate 1,775 new trips per day, including 109 trips during the morning peak hour and 183 trips during the evening peak hour.

Sebastopol Road Town Homes is an approved 198-unit multifamily residential development to be located at 1755 Sebastopol Road. The project is expected to generate 1,456 new trips per day, including 184 trips during the morning peak hour and 131 trips during the evening peak hour.

Intersection Levels of Service

Upon adding trips from the approved and pending projects to Existing volumes, the study intersections are expected to continue operating at acceptable service levels overall, and the southbound approach to Hearn Avenue/Burbank Avenue would experience increased delays. These results are summarized in Table 5, and Baseline volumes are shown in Figure 3.

Ta	Table 5 – Baseline Peak Hour Intersection Levels of Service							
Stu	udy Intersection	AM P	eak	PM F	Peak			
	Approach	Delay	LOS	Delay	LOS			
1.	Sebastopol Rd/Burbank Ave	10.4	В	7.8	А			
2.	Hughes Ave/Burbank Ave	3.2	А	2.5	А			
	Eastbound Approach	16.4	С	13.2	В			
	Westbound Approach	19.4	С	12.8	В			
3.	Hearn Ave/Burbank Ave	28.1	D	13.2	В			
	Northbound Approach	32.6	D	27.1	D			
	Southbound Approach	188.5*	F	91.5*	F			

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*; * = delay exceeds reliable threshold of methodology

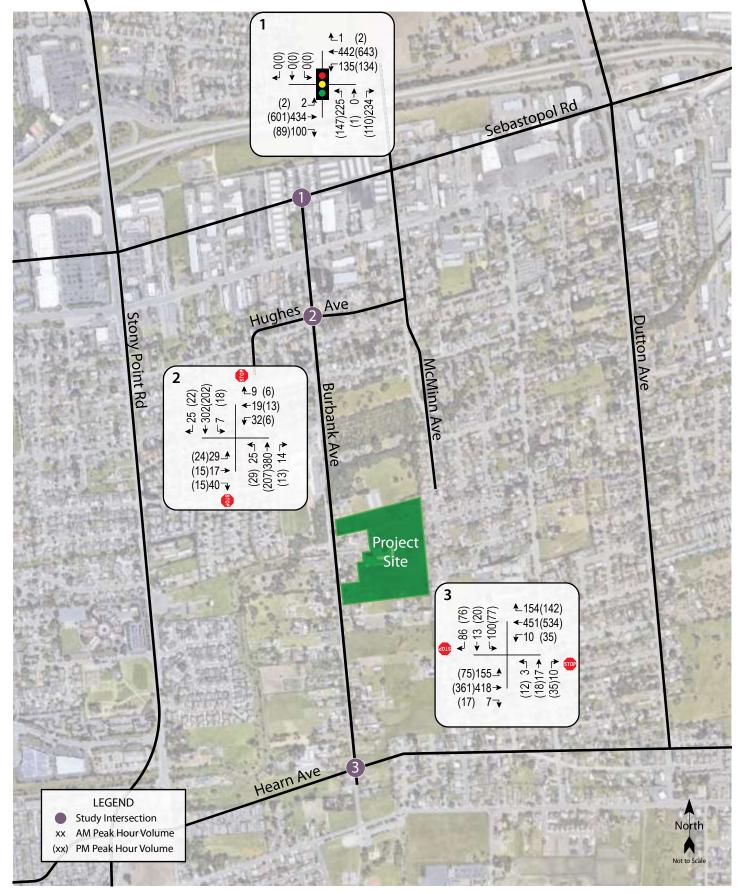
Project Description

The project site is located on the east side of Burbank Avenue opposite Roseland Creek Elementary School. As proposed, the project would merge four parcels at 1400, 1690, 1720 and 1780 Burbank Avenue to construct 64 apartments, 62 single-family detached residences, and 12 single-family duplex units. To make room for the new housing, one existing single-family residence would be removed. The development would be accessed via two new street connections to Burbank Avenue. The proposed project site plan is shown in Figure 4.

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. Rates for "Single-Family Detached Housing" (LU #210) were applied to the proposed single-family homes and duplex units and to the existing residence that would be removed. Rates for "Multifamily Housing (Low-Rise)" (LU #220) were applied to the proposed apartment units. Based on application of these rates, the proposed project would be expected to result in 1,167 daily trips on average, including 84 trips during the weekday a.m. peak hour and 109 trips during the p.m. peak hour; these results are shown in Table 6. After deductions for the existing residence are taken into account, the project would result in 1,158 new daily trips on average to the surrounding roadway network, including 83 new trips during the morning peak hour and 108 new trips during the evening peak hour.





sro496.ai 11/19

Traffic Impact Study for the Burbank Avenue Subdivision Project Figure 3 – Baseline Traffic Volumes





W-Trans

sro496.ai 10/19

Table 6 – Trip Generation Summary											
Land Use	Units	D	aily		AM Pea	k Hou	ır	PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Existing											
Single-Family Detached Housing	1 du	9.44	9	0.74	1	0	1	0.99	1	1	0
Proposed											
Multifamily Housing (Low-Rise)	64 du	7.32	468	0.46	29	7	22	0.56	36	23	13
Single-Family Detached Housing	74 du	9.44	699	0.74	55	14	41	0.99	73	46	27
Total Proposed			1,167		84	21	63		109	69	40
Net New Trips			1,158		83	21	62		108	68	40

Note: du = dwelling unit

Trip Distribution

The pattern used to allocate new project trips to the street network was based on a review of existing turning movements at the study intersections and knowledge of the area and surrounding region, including previous analyses prepared for other projects in the vicinity. The applied distribution assumptions are shown in Table 7.

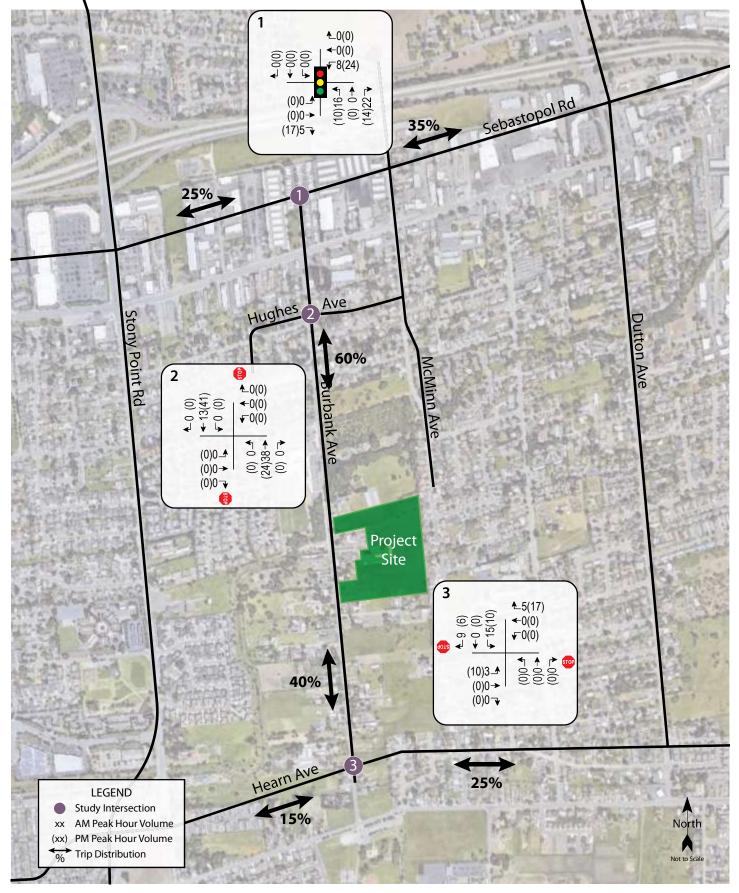
Table 7 – Trip Distribution Assumptions						
Route	Percent					
Sebastopol Rd (East of Burbank Ave)	35%					
Sebastopol Rd (West of Burbank Ave)	25%					
Hearn Ave (East of Burbank Ave)	25%					
Hearn Ave (West of Burbank Ave)	15%					
TOTAL	100%					

Intersection Operation

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to continue operating acceptably at LOS A or B overall, though the southbound approach to Hearn Avenue/Burbank Avenue would experience increased delays. Project traffic volumes are shown in Figure 5 and Existing plus Project volumes are shown in Figure 6. These results are summarized in Table 8.

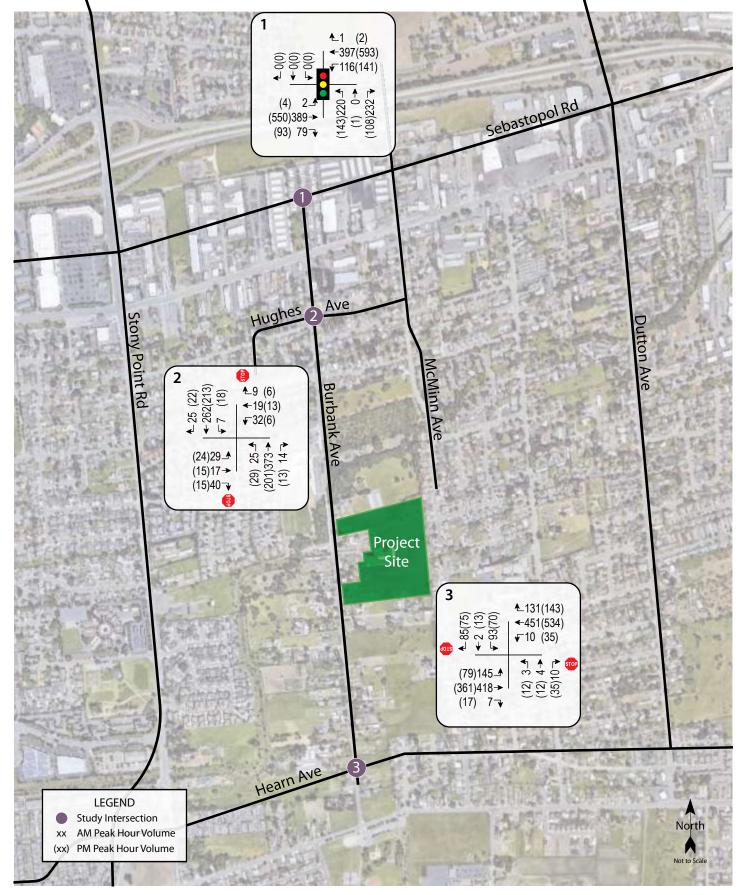




sro496.ai 11/19

Traffic Impact Study for the Burbank Avenue Subdivision Project Figure 5 – Project Traffic Volumes and Trip Distribution





sro496.ai 11/19

Traffic Impact Study for the Burbank Avenue Subdivision Project Figure 6 – Existing plus Project Traffic Volumes



Study Intersection Approach		Existing Conditions				Existing plus Project			
		AMF	AM Peak PM Peak		AM Peak		PM Peak		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1.	Sebastopol Rd/Burbank Ave	9.1	А	7.0	А	9.8	А	7.7	Α
2.	Hughes Ave/Burbank Ave	3.2	А	2.6	А	3.2	А	2.4	А
	Eastbound Approach	14.8	В	12.5	В	15.5	С	13.2	В
	Westbound Approach	17.1	С	12.2	В	18.2	С	12.9	В
3.	Hearn Ave/Burbank Ave	8.9	А	7.0	А	13.8	В	9.5	А
	Northbound Approach	21.8	С	23.3	С	22.2	С	24.6	С
	Southbound Approach	64.7	F	50.3	F	94.0	F	67.8	F

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

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*

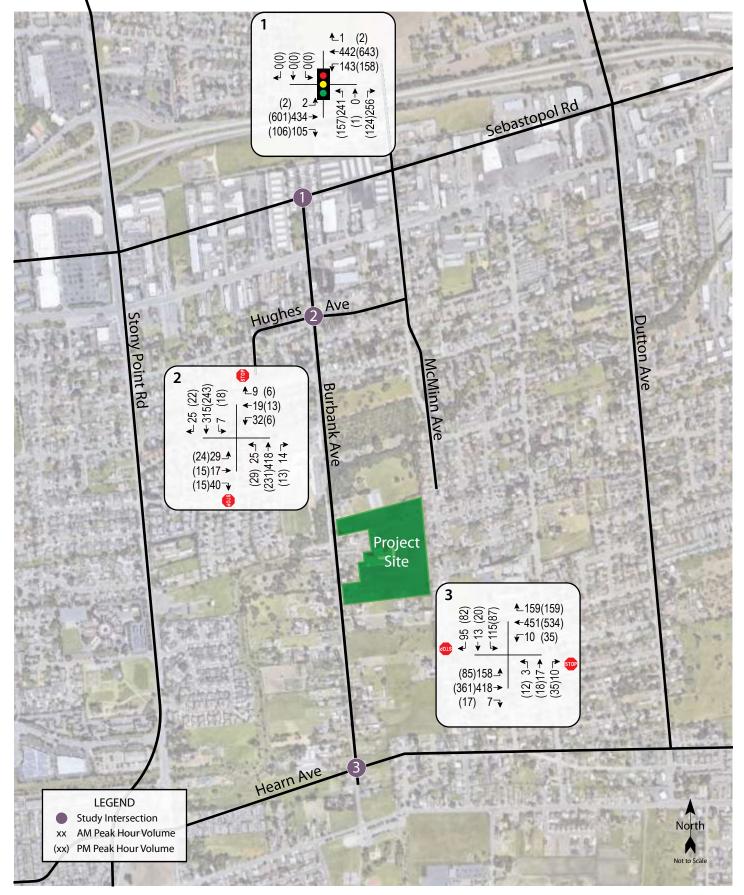
It should be noted that with the addition of project-related traffic volumes, average delay at the intersection of Hughes Avenue/Burbank Avenue decreases slightly during the p.m. peak hour. While this is counter-intuitive, this condition occurs when a project adds trips to movements that are currently underutilized or have delays that are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project would add traffic predominantly to the northbound and southbound through movements, 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 at this location, 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 acceptably overall during both peak hours upon the addition of project-related traffic to Existing volumes. Although the southbound approach at Hearn Avenue/Burbank Avenue is expected to operate at LOS F, the project's impact would be considered less-than-significant as the intersection would be expected to continue operating acceptably overall.

Baseline plus Project Conditions

With project-related traffic added to Baseline volumes, the study intersections Sebastopol Road/Burbank Avenue and Hughes Avenue/Burbank Avenue are expected to continue operating acceptably at LOS B or better overall. However, the intersection of Hearn Avenue/Burbank Avenue would be expected to operate at LOS E overall during the a.m. peak hour. Baseline plus Project volumes are shown in Figure 7 and these results are summarized in Table 9.





sro496.ai 11/19

Traffic Impact Study for the Burbank Avenue Subdivision Project Figure 7 – Baseline plus Project Traffic Volumes



Study Intersection Approach		Ba	Baseline Conditions				Baseline plus Project			
		AM F	Peak	PM Peak		AM Peak		PM Peak		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1.	Sebastopol Rd/Burbank Ave	10.4	В	7.8	А	11.2	В	8.6	А	
2.	Hughes Ave/Burbank Ave	3.2	А	2.5	А	3.2	А	2.3	А	
	Eastbound Approach	16.4	С	13.2	В	17.4	С	14.0	В	
	Westbound Approach	19.4	С	12.8	В	20.8	С	13.6	В	
3.	Hearn Ave/Burbank Ave	28.1	D	13.2	В	41.1	Е	19.3	С	
	Northbound Approach	32.6	D	27.1	D	33.5	D	29.0	D	
	Southbound Approach	188.5*	F	91.5*	F	256.7*	F	132.0*	F	

Table 9 – Baseline and Baseline plus Project Peak Hour Intersection Levels of Service

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 indicates unacceptable operation under the County's standard; * = delay exceeds reliable threshold of methodology

Finding –Two of the study intersections are expected to continue operating acceptably overall during both peak hours upon the addition of project-related traffic to Baseline volumes. However, operation at Hearn Avenue/Burbank Avenue would drop from LOS D to E during the a.m. peak hour. It is noted that without the addition of traffic from the proposed Roseland Accelerated Middle School, the intersection would operate at an acceptable LOS C overall, even with project traffic added to volumes with the other approved projects. Because the contribution of traffic from this proposed would not warrant the signalization of Hearn Avenue/Burbank Avenue without the substantially higher additional volume of traffic associated with the Roseland Accelerated Middle School, it appears reasonable for the project to contribute a proportional share of the cost for the traffic signal rather than being responsible for its entire cost.

Recommendation – The applicant should contribute a proportional share for the signalization of the intersection of Hearn Avenue/Burbank Avenue. As directed by City staff, a share of 30 percent is to be paid based on the increase in a.m. peak hour delay due to project traffic. As contained in the *Infrastructure Report for Roseland Area/ Sebastopol Road Specific Plan and Roseland Area Annexation*, Michael Baker International, 2016, the signalization project is estimated to have a total cost of \$320,000 (\$200,000 for construction and \$120,000 for soft costs), which equates to a fee of \$96,000 for the applicant.



Alternative Modes

Pedestrian Facilities

The proposed site plan identifies sidewalks along the project frontage and within the project, connecting the residences to each other and the street. However, the project site wraps around two properties along Burbank Avenue that contain existing houses and outbuildings and would remain in place, so the project frontage is not continuous along Burbank Avenue. A new sidewalk constructed by the project would connect the northern part of the project site to the crosswalk on Burbank Avenue with an actuated warning beacon, which is located approximately 180 feet south of the northern street connection. An existing path on the eastern shoulder of Burbank Avenue would connect the crosswalk with the warning beacon to the new project sidewalk proposed along the project's southern boundary with Burbank Avenue, so adequate connectivity would be provided between the project site and the surrounding pedestrian network. Children would be able to walk between the project site and the school facilities on the west side of the street by using the sidewalks within the site, the sidewalk or path on the east side of Burbank Avenue, the crosswalk with a warning beacon, and the sidewalk on the east side of the street.

As noted previously, improvements were identified in the Specific Plan to redesign Burbank Avenue to include continuous sidewalks on both sides of the street and Class II bike lanes in both directions of travel. The project would construct its frontage improvements in compliance with the City's future plans for the roadway, including adequate width for a bike lane, planter strip, and sidewalk, though the bike lanes would not be striped until they are more continuous. Upon completion of the planned improvements outlined in the Specific Plan along all properties fronting Burbank Avenue, sidewalks would be provided along the entirety of the street and would connect the project site to the surrounding neighborhoods as well as the existing pedestrian infrastructure on Sebastopol Road and Hearn Avenue.

Finding – The proposed project sidewalk is consistent with the improvements outlined in the Specific Plan and would adequately connect to the existing pedestrian facilities.

Bicycle Facilities

The planned bike lanes on Burbank Avenue and Class I trail along Roseland Creek would connect the site to the surrounding neighborhoods and existing bike lanes on Sebastopol Road and Hearn Avenue. The project would improve its frontage with Burbank Avenue consistent with the Specific Plan, including the provision of pavement width for Class II bike lanes, though the bike lanes would not be striped until a more continuous section of bike lane can be provided.

Finding – Bike access would be adequate upon completion of the planned bike lanes on Burbank Avenue. The project would dedicate sufficient right-of-way and construct adequate improvements to the project frontage to accommodate the future bike lanes.

Recommendation – Rather than striping two short sections of Class II bike lane along the project frontage, it is recommended that the project construct the pavement for the bike lane, but that it not be striped until a more continuous section can be provided.



Transit

Existing transit routes have transit stops located approximately one-half mile from the project site. Based on the distance between the project site and employment centers, it is reasonable to expect that some residents would want to travel using transit if it were available.

Finding – Transit facilities serving the project site are generally adequate, though not as convenient as would be desirable.

Recommendation – The applicant should request that the City of Santa Rosa consider initiating a CityBus route along Burbank Avenue to serve this developing area.



Access and Circulation

Site Access

The project would be accessed via two new public street connections with Burbank Avenue. The northern street connection, Public Road 1, would be located approximately 300 feet south of the drop-off loop exit for Roseland Creek Elementary School and the southern street connection, Public Road 4, would be about 520 feet south of the project's northern street connection. The proposed access points would not be in conflict with any existing street connections on the opposite side of Burbank Avenue, though there would be two private driveways, one on either side, of the southern access point. All proposed streets within the site are consistent with City street design standards so on-site circulation is expected to operate acceptably. The proposed street cross-sections are provided in Appendix C.

Finding – Site access and circulation within the site would be expected to operate acceptably as all street cross-sections would be consistent with City design standards.

Sight Distance

Sight distances along Burbank Avenue at the locations of the proposed street connections were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance at intersections of public streets is based on corner sight distances with approach travel speeds used as the basis for determining the recommended sight distance. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway is evaluated based on stopping sight distance criterion and the approach speed on the major street.

For the posted 25-mph speed limit on Burbank Avenue, the recommended corner sight distance is 275 feet and the recommended stopping sight distance is 150 feet. Based on a review of field conditions, sight lines at both of the proposed street connections extend more than 300 feet in each direction, which would be more than adequate for the posted speed limit. Additionally, as Burbank Avenue is straight and flat adjacent to the site, sight lines would be adequate for a following driver to observe and react to a motorist slowing or stopped to turn into either access point.

Finding – Adequate corner and stopping sight distances would be available to accommodate all turns into and out of the project site.

Access Analysis

Left-Turn Lane Warrants

The need for a left-turn lane on Burbank Avenue at either of the new street connections was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as an update of the methodology developed by the Washington State Department of Transportation and published in the *Method For Prioritizing Intersection Improvements*, January 1997. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes in order to determine the need for a left-turn pocket based on safety issues.

Based on Baseline plus Project volumes, as well as safety criteria, a left-turn lane would not be warranted on Burbank Avenue at either new street connection. A sensitivity analysis indicates that volumes on Burbank as well



as turning into the site would need to nearly double before a left-turn lane would be warranted. Copies of the Turn Lane Warrant Spreadsheets are provided in Appendix D.

Finding –A left-turn lane on Burbank Avenue at the new street connections would not be warranted under volumes for the Baseline plus project scenarios during both the a.m. and p.m. peak hours.

Traffic Signal Warrants

Although the Specific Plan already identifies the future need for a traffic signal at the intersection of Hearn Avenue/Burbank Avenue, a signal warrant study was performed. Chapter 4C of the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD) provides guidance on when a traffic signal should be considered. There are nine different warrants, or criteria, but for the purposes of this study, only Warrant 3 (the peak hour warrant) was evaluated.

Warrant 3: Under the Peak Hour Warrant the need for a traffic control signal shall be considered if an engineering study finds that the criteria in either of the following two categories are met:

- A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day:
 - 1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: four vehicle-hours for a one-lane approach; or five vehicle-hours for a two-lane approach, and
 - 2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
 - 3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.
- B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

The intersection of Hearn Avenue/Burbank Avenue does not currently warrant a traffic signal under Existing volumes, but would warrant one under Baseline volumes during both the a.m. and p.m. peak hours. A signal would also be warranted under Baseline plus Project volumes. Copies of the Signal Warrant Spreadsheets are provided in Appendix D.

As contained in the Specific Plan, the intersection of Hearn Avenue/Burbank Avenue would be shifted northwest and reoriented such that new segment of Hearn Avenue would become the eastbound approach and the renamed (existing) segment of West Hearn Avenue would become the northbound approach. In addition to the change in configuration and geometry, the intersection would be signalized. Because the project would contribute to the need for these improvements, the project should pay a proportional share fee toward the cost of construction. At the direction of City staff, it was determined that a proportional share fee of 30 percent of the signalization project, or \$96,000, would be appropriate based on the additional delay caused by the project during the a.m. peak hour.

As an interim measure, all-way stop-controls (AWSC) were considered for the intersection of Hearn Avenue/Burbank Avenue; however, under Baseline and Baseline plus project volumes, the major street approaches would experience LOS F operation so installation of AWSC is therefore not recommended.



Finding – The Peak Hour Volume warrant would be met under both a.m. and p.m. peak hour volumes at the intersection of Hearn Avenue/Burbank Avenue under Baseline and Baseline plus Project Conditions. Volumes are sufficient to meet the warrant without the addition of project-generated traffic, but because the intersection would operate deficiently upon the addition of project traffic, the project would contribute to the need for a signal.

Recommendation – The applicant should be responsible for contributing a proportional share fee of \$96,000 toward the cost for the planned signalization and reconfiguration of Hearn Avenue/Burbank Avenue.

All-way Stop Control Warrants

All-way Stop Warrants

Generally, warrants for all-way stop-controlled intersections are based on guidelines contained in the *California Manual on Uniform Traffic Control Devices* (CA-MUTCD). The warrants include consideration of the following issues in determining potential need for all-way stop controls.

- excessive volume
- high number of collisions
- limited visibility
- excessive speeds
- crossing residential collectors
- residential frontages

An intersection meeting any one of the criteria is considered a candidate for all-way stop controls.

Based on the counts collected at the intersection of Hughes Road/Burbank Avenue, the volumes on the minor street approach are insufficient to warrant all-way stop-control, even with the 80 percent reduction for the combination warrant. Only one collision was reported in a 12-month period susceptible to correction by AWSC; a minimum of five crashes are needed to meet the warrant. Additionally, none of the optional warrants were met. A copy of the All-Way Stop-Control Warrant is provided in Appendix D.

Finding – All-way stop-controls are not warranted at the intersection of Hughes Road/Burbank Avenue.



Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient to satisfy City requirements. City of Santa Rosa parking supply requirements are based on the City of Santa Rosa City Code, Chapter 20-36; Parking and Loading. The proposed parking supply of 437 spaces is anticipated to adequately accommodate the estimated parking demand based on City Code, as shown in Table 10.

Table 10 – Parking Analysis Summary								
Land Use	Units	Supply	City Requirements					
		(spaces)	Rate	Spaces Required				
1 bdr Apartment	17 du	64 covered sp	1.0 covered sp/unit 0.5 visitor sp/unit	17 covered sp 9 visitor sp				
2+ bdr Apartment	47 du	32 tandem sp 58 open sp	1.0 covered sp/unit 1.5 visitor sp/unit	47 covered sp 70 visitor sp				
Duplex	12 du	24 covered sp 24 tandem sp	1.0 covered sp/unit 1.5 visitor sp/unit	12 covered sp 18 visitor sp				
Detatched Single-Family Dwelling	62 du	124 covered sp 124 tandem sp	1 covered sp/unit 3 additional sp/unit	62 covered sp 186 other sp				
Total		450		421				

Notes: du = dwelling unit; bdr = bedrooms; sp = space

Finding – The proposed parking supply for the project would be adequate to meet the City's parking requirements.

Bicycle Parking

The City of Santa Rosa's Municipal Code also stipulates the City's bicycle parking requirements for new developments. According to the City of Santa Rosa Municipal Code, bicycle parking is required for multifamily residential units at a ratio of one space per four units if units do not have a private garage or private storage space for bike storage. For the proposed project, bicycle parking would be adequate because the units have private garages for bicycle storage.



Conclusions

- The proposed project is expected to generate an average of 1,158 new daily vehicle trips, including 83 trips during the weekday morning peak hour and 108 trips during the weekday evening peak hour.
- The study intersections of Burbank Avenue with Sebastopol Road, Hughes Avenue, and Hearn Avenue are currently operating acceptably at LOS A overall during both peak hours, though it is noted that the southbound approach at Hearn Avenue/Burbank Avenue is operating at LOS F during both the a.m. and p.m. peak hours.
- The study intersections are expected to continue operating acceptably overall during both peak hours upon the addition of project-related traffic to Existing volumes. Although the southbound approach at Hearn Avenue/Burbank Avenue is expected to operate at LOS F during both peak hours, the project's impact would be considered less-than-significant as the intersection would operate acceptably overall.
- Under Baseline volumes, which include the addition of traffic associated with Roseland Accelerated Middle School, Roseland Village, and Sebastopol Road Town Homes, the study intersections would be expected to continue operating acceptably overall and the southbound approach at Hearn Avenue/Burbank Avenue would continue to operate with substantial delays. The intersection would drop to LOS E during the a.m. peak hour with the addition of project traffic, which would be considered a significant impact. It is noted, however, that without the Roseland Accelerated Middle School operation with the project and the remaining Baseline projects would remain at LOS C, indicating that the school is the primary trip generator contributing to the need for a traffic signal.
- The proposed pedestrian facilities along the project frontage are consistent with the planned improvements to Burbank Avenue outlined in the *Santa Rosa Roseland Area/Sebastopol Road Specific Plan*. Upon completion of the planned improvements to the rest of Burbank Avenue, pedestrian and bicycle facilities would be adequate.
- Site access and circulation is expected to operate acceptably.
- A left-turn lane would not be warranted on Burbank Avenue at either new street connection created by the project.
- The Peak Hour Volume Warrant indicating potential need for a traffic signal is met under Baseline and Baseline plus Project volumes during both the a.m. and p.m. peak hours at Hearn Avenue/Burbank Avenue. The need for a traffic signal is identified in the Specific Plan.
- All-way stop-controls are not warranted at the intersection of Hughes Avenue/Burbank Avenue under any scenario evaluated.
- The proposed parking supply satisfies City requirements. Bicycle parking is not necessary because private garages would provide adequate bicycle storage.



Recommendations

- Hearn Avenue/Burbank Avenue is planned to be converted to a signalized intersection in the future. The applicant should pay \$96,000 as a proportional share for the signalization project, as negotiated with City staff.
- The project should include installation of full frontage improvements consistent with the *Santa Rosa Roseland Area/Sebastopol Road Specific Plan*, though striping of the pavement to include a bike lane should be deferred until a more continuous facility can be provided.
- The applicant should request that the City of Santa Rosa consider initiating a CityBus route along Burbank Avenue to serve this developing area.



Study Participants and References

Study Participants

Principal in Charge	
Associate Engineer	
Assistant Engineer	
Graphics	
Editing/Formatting	
Quality Control	

Dalene J. Whitlock, PE, PTOE Cameron Nye, EIT Allison Woodworth, EIT Katia Wolfe Alex Scrobonia Dalene J. Whitlock, PE, PTOE

References

2014 Collision Data on California State Highways, California Department of Transportation, 2017 California Manual on Uniform Traffic Control Devices for Streets and Highways, California Department of Transportation, 2014 Highway Capacity Manual, 6th Edition, Transportation Research Board, 2018 Highway Design Manual, 6th Edition, California Department of Transportation, 2017 Infrastructure Report for Roseland Area/ Sebastopol Road Specific Plan and Roseland Area Annexation, Michael Baker International, 2016 Intersection Channelization Design Guide, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985 Method for Prioritizing Intersection Improvements, Washington State Transportation Center, 1997 Santa Rosa CityBus, http://srcity.org/1661/Maps-and-Schedules Santa Rosa City Code, Quality Code Publishing, 2017 Santa Rosa General Plan 2035, City of Santa Rosa, 2014 Santa Rosa Roseland Area/Sebastopol Road Specific Plan, City of Santa Rosa, 2016 Sonoma County Transit, http://sctransit.com/ Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol, 2013-2018 The Villas Traffic Impact Study, Final Report, W-Trans, December 23, 2005 Traffic Impact Study for the Roseland Accelerated Middle School, W-Trans, October 10, 2017 Traffic Impact Study for the Roseland Village Project, Final Report, W-Trans, June 14, 2018 Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, 2017

SRO496







This page intentionally left blank

Appendix A

Collision Rate Calculations





This page intentionally left blank

Traffic Impact Study for the Burbank Avenue Subdivision Project Intersection # 1: Burbank Avenue & Sebastopol Road Date of Count: Wednesday, September 11, 2019 Number of Collisions: 16 Number of Injuries: 6 Number of Fatalities: 0 ADT: 15700 Start Dat: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Signals Area: Suburban collision rate = $\frac{Number of Collisions x 1 Million}{ADT x 365 Days per Year x Number of Years}$ collision rate = $\frac{16}{ADT x 365 Days per Year x Number of Years}$ $\frac{Collision rate}{15,700 x 365 Days per Year x Number of Years}$ $collision rate = \frac{16}{ADT x 365 Days per Year x Number of Years}$ $\frac{Collision rate}{0.43 c/mve} 0.4\% 37.5\%$ ADT = average daily total vehicles entering intersection '-2013 Collision Data on California State Highways, Caltrans Mumber of Collisions: 2 Number of Collisions: 2 Number of Collisions: 2 Mumber of Collisions: 2 Mumber of Collisions: 2 $Mumber of Collisions: 2Mumber of Picture: 30Mumber of Vears: 5Mumber of Vears: 5Mumber of Vears: 5Mumber of Vears: 5Mumber of Years: 5Mumber of Collisions x 1 Million Mumber of Collisions x 1 Million X A Sto Days per Year x Number of Years$			ate Calculation	
Date of Count: Wednesday, September 11, 2019 Number of Injuries: 6 Number of Fatalities: 0 AT: 15700 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Signals Area: Suburban $collision rate = \frac{Number of Collisions x 1 Million}{ADT x 365 Days per Year x Number of Years}$ $collision rate = \frac{16}{15,700} \frac{x}{x} \frac{1,000,000}{365} \frac{x}{x} \frac{5}{5}$ ADT x 365 Days per Year x Number of Years $collision rate = \frac{16}{0.56} \frac{x}{c/mve} \frac{1,000,000}{0.43} \frac{37.5\%}{2}$ ADT = average daily total vehicles entering intersection statewide Average* $\frac{Collision Rate}{0.43} \frac{Fatality Rate}{0.0\%} \frac{11,000,000}{37.5\%}$ ADT = average daily total vehicles entering intersection t^* 2013 Collision Data on California State Highways, Caltrans Mumber of Collisions: 2 Number of State: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban Number of Years: 5 Number of Years: 6 Number of Years: 5 Number of Years: 5 Number of Years: 5 Number of Years: 6 Number of Years: 6 Number of Years: 6 Number of Years: 7 Number of Years: 7 Numbe	I raffic Impact Study	y for the Burban	Avenue Subdivi	sion Project
Date of Count: Wednesday, September 11, 2019 Number of Injuries: 6 Number of Fatalities: 0 AT: 15700 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Signals Area: Suburban $collision rate = \frac{Number of Collisions x 1 Million}{ADT x 365 Days per Year x Number of Years}$ $collision rate = \frac{16}{15,700} \frac{x}{x} \frac{1,000,000}{365} \frac{x}{x} \frac{5}{5}$ ADT x 365 Days per Year x Number of Years $collision rate = \frac{16}{0.56} \frac{x}{c/mve} \frac{1,000,000}{0.43} \frac{37.5\%}{2}$ ADT = average daily total vehicles entering intersection statewide Average* $\frac{Collision Rate}{0.43} \frac{Fatality Rate}{0.0\%} \frac{11,000,000}{37.5\%}$ ADT = average daily total vehicles entering intersection t^* 2013 Collision Data on California State Highways, Caltrans Mumber of Collisions: 2 Number of State: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban Number of Years: 5 Number of Years: 6 Number of Years: 5 Number of Years: 5 Number of Years: 5 Number of Years: 6 Number of Years: 6 Number of Years: 6 Number of Years: 7 Number of Years: 7 Numbe	Intersection # 1.	Burbank Avenue 8	Sebastonol Road	
<text></text>				
Number of Injuries: 6 Number of Patalities: 0 Er t 570 Er t Date: Pocember 1, 2013 $Er d Date: November 30, 2018Mumber of Years: 5Intersection Type: SignalsArea: Suburbancollision rate = Number of Collisions x 1 Million ADT x 365 Days per Year x Number of Yearscollision rate = \frac{16}{x} \frac{1,000,000}{365} \frac{1}{x} \frac{5}{5}collision rate = \frac{16}{0.56} \frac{x}{c/mve} \frac{1,000,000}{365} \frac{1}{x} \frac{5}{5}Attended Average*collision rate = \frac{16}{0.56} \frac{x}{c/mve} \frac{0.0\%}{0.43} \frac{37.5\%}{365}ADT = average daily total vehicles entering intersectiontrue = collisions per million vehicles entering intersection true = collision Data on California State Highways, CaltransMumber of Collisions: 2Number of Injuries: 1Number of Injuries: 2Mumber of Injuries: 2Mumber of Injuries: 3Mumber of Years: 5Mumber of Years: 5Mu$	Date of Count.	Wednesday, oopt	5111561 11, 2013	
Number of Injuries: 6 Number of Patalities: 0 Er t 570 Er t Date: Pocember 1, 2013 $Er d Date: November 30, 2018Mumber of Years: 5Intersection Type: SignalsArea: Suburbancollision rate = Number of Collisions x 1 Million ADT x 365 Days per Year x Number of Yearscollision rate = \frac{16}{x} \frac{1,000,000}{365} \frac{1}{x} \frac{5}{5}collision rate = \frac{16}{0.56} \frac{x}{c/mve} \frac{1,000,000}{365} \frac{1}{x} \frac{5}{5}Attended Average*collision rate = \frac{16}{0.56} \frac{x}{c/mve} \frac{0.0\%}{0.43} \frac{37.5\%}{365}ADT = average daily total vehicles entering intersectiontrue = collisions per million vehicles entering intersection true = collision Data on California State Highways, CaltransMumber of Collisions: 2Number of Injuries: 1Number of Injuries: 2Mumber of Injuries: 2Mumber of Injuries: 3Mumber of Years: 5Mumber of Years: 5Mu$	Number of Collisions:	16		
ADT: 15700 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Year: 5 Intersection Type: Four-Legged Control Type: Signals Area: Suburban $collision rate = \frac{Number of Collisions x 1 Million}{ADT x 365 Days per Year x Number of Years}$ $collision rate = \frac{16 \times 1,000,000}{15,700 \times 365} \times 5$ total term the term that the term that the term that the term that the term term term term term term term ter	Number of Injuries:	6		
Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Signals Area: Suburban collision rate = <u>Number of Collisions x 1 Million</u> Collision rate = <u>Number of Collisions x 1 Million</u> Collision rate = <u>16 x 1,000,000</u> 15,700 x 365 Days per Year x Number of Years collision rate = <u>16 x 1,000,000</u> 15,700 x 365 x 5 <u>Study Intersection</u> Statewide Average ¹ <u>0.56 c/mve 0,0% 37.5%</u> ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection c/mve = collision Data on California State Highways, Caltrans Mumber of Collision: 2 Number of Injurie: 1 Number of Injurie: 1 Number of Fatalitie: 0 ADT = 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Are: Suburbar				
Number of Years: 5 Intersection Type: Signals Area: Suburban collision rate = Number of Collisions x 1 Million ADT x 365 Days per Year x Number of Years collision rate = 16 x 1,000,000 15,700 x 365 collision rate = 16 x 1,000,000 15,700 x 365 Study Intersection Statewide Average* Collision Rate Fatality Rate Injury Rate 0.43 c/mve 0.4% 37.5% ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection 2013 Collision Data on California State Highways, Caltrans ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Injuries: 1 Number of Injuries: 1 Dumber of Injuries: 1 Dumber of Patalities: 0 ADT = 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburbar Number of Collisions x1 Million				
Control Type: Signals Area: Suburban collision rate = Number of Collisions x 1 Million ADT x 365 Days per Year x Number of Years collision rate = 16 x 1,000,000 15,700 x 365 x Study Intersection Collision Rate Fatality Rate Injury Rate 0.56 c/mve 0.0% 37.5% ADT = average daily total vehicles entering intersection 0.4% 37.9% ADT = average daily total vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans ADT = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Fatalities: 0 ADT : 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Stop & Yield Controls Area: Suburban			8	
Control Type: Signals Area: Suburban collision rate = Number of Collisions x 1 Million ADT x 365 Days per Year x Number of Years collision rate = 16 x 1,000,000 15,700 x 365 x Study Intersection Collision Rate Fatality Rate Injury Rate 0.56 c/mve 0.0% 37.5% ADT = average daily total vehicles entering intersection 0.4% 37.9% ADT = average daily total vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans ADT = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Fatalities: 0 ADT : 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Stop & Yield Controls Area: Suburban	Intersection Type:	Four-Leaged		
$collision rate = \frac{Number of Collisions x 1 Million}{ADT x 365 Days per Year x Number of Years}$ $collision rate = \frac{16}{15,700 x} \frac{x}{365} \frac{1,000,000}{x}$ $collision rate = \frac{16}{0.56} \frac{x}{0.0\%} \frac{1,000,000}{365}$ $Study Intersection \frac{5.56}{0.43} \frac{c/mve}{0.4\%} \frac{37.5\%}{365}$ ADT = average daily total vehicles entering intersection (mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans $Mumber of Collisions 2$ $Mumber of Collisions 2$ $Mumber of Collisions 2$ $Mumber of Injuries 3$ $Mumber of Injuries 4$ $Mumber of Number of Years 5$ $Mumber of Collisions 71 Million$				
collision rate = ADT x 365 Days per Year x Number of Years collision rate = 16 x 1,000,000 15,700 x 365 x 5 16 x 1,000,000 15,700 x 365 x 5 0.56 c/mve 0.0% 37.5% 37.5% Study Intersection Statewide Average* 0.43 c/mve 0.4% 37.9% ADT = average daily total vehicles entering intersection c/mve 0.4% 37.9% ADT = average daily total vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans ADT collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2 Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Injuries: 1 Number of Fatalities: 0 ADT : 5100 Start Date: December 1, 2013 End Date: November 30, 2018 <t< td=""><td>Area:</td><td>Suburban</td><td></td><td></td></t<>	Area:	Suburban		
nable x 365 Days per Year x Number of Years $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Years$ $nable x 365 Days per Year x Number of Injury Rate is indicated by the term in term in the term in term in term in the term in term in the term in term i$	collision rate =			
collision rate = 15,700 x 365 x 5 Study Intersection Statewide Average* Collision Rate Fatality Rate Injury Rate 0.56 c/mve 0.0% 37.5% ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Fatalities: 0 ADT : 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban		ADT x 365 I	Jays per Year x Num	ber of Years
15,700 x 365 x 5 Study Intersection Statewide Average* 0.56 c/mve 0.0% 37.5% 0.43 c/mve 0.4% 37.9% ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2 Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	collision rate =		,	
Study Intersection Statewide Average* 0.56 c/mve 0.0% 37.5% ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban		15,700 x	365	x 5
Study Intersection Statewide Average* 0.56 c/mve 0.0% 37.5% ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban		O Histor Date	Estality Pate	Injury Rate
ADT = average daily total vehicles entering intersection c/mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Collisions: 2 Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban Number of Collisions x 1 Million		Collision Rate		injury itale
c/mve = collisions per million vehicles entering intersection * 2013 Collision Data on California State Highways, Caltrans Intersection # 2: Burbank Avenue & Hughes Avenue Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Collisions: 2 Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Study Intersection			37.5%
Date of Count: Wednesday, September 11, 2019 Number of Collisions: 2 Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Statewide Average* ADT = average daily total vo c/mve = collisions per millio	0.56 c/mve 0.43 c/mve ehicles entering intern vehicles entering	0.0% 0.4%	
Number of Collisions: 2 Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on G	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv	0.0% 0.4% rsection ntersection rays, Caltrans	
Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue &	0.0% 0.4% rsection ntersection /ays, Caltrans	
Number of Injuries: 1 Number of Fatalities: 0 ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue &	0.0% 0.4% rsection ntersection /ays, Caltrans	
ADT: 5100 Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban Number of Collisions x 1 Million	Statewide Average* ADT = average daily total vu c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept	0.0% 0.4% rsection ntersection /ays, Caltrans	
Start Date: December 1, 2013 End Date: November 30, 2018 Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2	0.0% 0.4% rsection ntersection /ays, Caltrans	
Number of Years: 5 Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Fatalities:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0	0.0% 0.4% rsection ntersection /ays, Caltrans	
Intersection Type: Four-Legged Control Type: Stop & Yield Controls Area: Suburban Number of Collisions x 1 Million	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: ADT:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100	0.0% 0.4% rsection ntersection /ays, Caltrans	
Control Type: Stop & Yield Controls Area: Suburban Number of Collisions x 1 Million	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: Number of Fatalities: ADT Start Date: End Date:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 201	0.0% 0.4% rsection ntersection /ays, Caltrans	
Area: Suburban Number of Collisions x 1 Million	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: Number of Fatalities: ADT Start Date: End Date:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 201	0.0% 0.4% rsection ntersection /ays, Caltrans	
Number of Collisions x 1 Million	Statewide Average* ADT = average daily total v c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: Number of Fatalities: ADT: Start Date: End Date: Number of Years:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 207 5	0.0% 0.4% rsection ntersection /ays, Caltrans	
	Statewide Average* ADT = average daily total v. c/mve = collisions per millio * 2013 Collision Data on Callision Data on Callision Data on Callision Data on Callisions: Number of Collisions: Number of Collisions: Number of Fatalities: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type:	0.56 c/mve 0.43 c/mve ehicles entering interning alifornia State Highver Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 2075 Four-Legged Stop & Yield Cont	0.0% 0.4% rsection ntersection /ays, Caltrans	
	Statewide Average* ADT = average daily total v. c/mve = collisions per millio * 2013 Collision Data on Callision Data on Callision Data on Callision Data on Callisions: Number of Collisions: Number of Collisions: Number of Fatalities: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 2015 Four-Legged Stop & Yield Cont Suburban	0.0% 0.4% rsection ntersection /ays, Caltrans	37.9%
	Statewide Average* ADT = average daily total vo c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type: Area:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 20' 5 Four-Legged Stop & Yield Cont Suburban	0.0% 0.4% rsection ntersection /ays, Caltrans & Hughes Avenue ember 11, 2019 8 8	37.9%
collision rate = $\frac{2 \times 1,000,000}{5,100 \times 365 \times 5}$	Statewide Average* ADT = average daily total vo c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type: Area:	0.56 c/mve 0.43 c/mve ehicles entering inte n vehicles entering alifornia State Highv Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 20' 5 Four-Legged Stop & Yield Cont Suburban	0.0% 0.4% rsection ntersection /ays, Caltrans A Hughes Avenue ember 11, 2019 8 8 8 rols ber of Collisions x 1 f Days per Year x Nur	37.9% Million her of Years
	Statewide Average* ADT = average daily total vo c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Fatalities: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type: Area: collision rate =	0.56 c/mve 0.43 c/mve ehicles entering interning alifornia State Highweight Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 2075 Four-Legged Stop & Yield Cont Suburban ADT x 365 fi 2 2	0.0% 0.4% rsection ntersection /ays, Caltrans 4 Hughes Avenue ember 11, 2019 6 8 rols ber of Collisions x 1 I Days per Year x Num x 1,000	37.9% Million hber of Years
Collision Rate Fatality Rate Injury Rate	Statewide Average* ADT = average daily total vo c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Fatalities: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type: Area: collision rate =	0.56 c/mve 0.43 c/mve ehicles entering interning alifornia State Highweight Burbank Avenue & Wednesday, Sept 2 1 0 5100 December 1, 2013 November 30, 2075 Four-Legged Stop & Yield Cont Suburban ADT x 365 fi 2 2	0.0% 0.4% rsection ntersection /ays, Caltrans 4 Hughes Avenue ember 11, 2019 6 8 rols ber of Collisions x 1 I Days per Year x Num x 1,000	37.9% Million hber of Years
	Statewide Average* ADT = average daily total vo c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Fatalities: ADT: Start Date: End Date: Number of Years: Intersection Type: Control Type: Area: collision rate =	0.56 c/mve 0.43 c/mve ehicles entering intention vehicles entering alifornia State Highward and the	0.0% 0.4% rsection ntersection /ays, Caltrans A Hughes Avenue ember 11, 2019 8 8 ols ber of Collisions x 1 f Days per Year x Nurr x 1,000 365	<u>Villion</u> ber of Years 0,000 x 5
	Statewide Average* ADT = average daily total vu c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: Number of Fatalities: ADT Start Date: End Date: Number of Years: Intersection Type: Control Type: Area: collision rate = Study Intersection	0.56 c/mve 0.43 c/mve ehicles entering intention vehicles entering alifornia State Highweight Stat	0.0% 0.4% rsection ntersection /ays, Caltrans 4 Hughes Avenue ember 11, 2019 6 8 rols ber of Collisions x 1 f Days per Year x Num x 1,000 365 Fatality Rate 0.0%	37.9% Million hber of Years 0,000 x 5 Injury Rate 50.0%
Statewide Average* 0.26 c/mve 0.9% 37.4%	Statewide Average* ADT = average daily total vu c/mve = collisions per millio * 2013 Collision Data on Ca Intersection # 2: Date of Count: Number of Collisions: Number of Injuries: Number of Injuries: Number of Fatalities: ADT Start Date: End Date: Number of Years: Intersection Type: Control Type: Area: collision rate = Study Intersection	0.56 c/mve 0.43 c/mve ehicles entering intention vehicles entering alifornia State Highweight Stat	0.0% 0.4% rsection ntersection /ays, Caltrans 4 Hughes Avenue ember 11, 2019 6 8 rols ber of Collisions x 1 f Days per Year x Num x 1,000 365 Fatality Rate 0.0%	37.9% Million hber of Years 0,000 x 5 Injury Rate 50.0%

Intersec	ection Collision Rate Calculaions	
Traffic Impact Study for	or the Burbank Avenue Subdivision Project	
Intersection # 3:	Burbank Avenue & Hearn Avenue	
Date of Count:	: Wednesday, September 11, 2019	
Start Date: End Date: Number of Years: Intersection Type: Control Type:	6 6 13400 December 1, 2013 November 30, 2018 5	
collision rate =	Number of Collisions x 1 Million ADT x 365 Days per Year x Number of Years	
collision rate =	<u>8 x 1,000,000</u> <u>13,400 x 365 x 5</u>	
Study Intersection Statewide Average*		9
c/mve = collisions per million	vehicles entering intersection on vehicles entering intersection California State Highways, Caltrans	

Appendix **B**

Intersection Level of Service Calculations





This page intentionally left blank

1: Burbank Äve & Sebastopol Rd	astopo	Rd	Ì							10/07/2019	2: Burbank Ave & Hughes Ave	10/07/2019
	,	/* 	*	÷	√	*	+	*	۶	`* →		
Movement	EBL	EBT EBR	R WB	3L WB1	T WBR	R NBL	. NBT	NBR	SBL	SBT SBR	reserved in the section	
Lane Configurations	*						-				Int Delay, siveh 3.2	
Traffic Volume (veh/h)	0 0	389 7	74 10	108 397	6	204	0	210	0	0	0 Movement EBL EBT EBR WBL WBT WBR NBL NBT SBL SBT SBR	
Future Volume (ven/h)								012	0	Ð	¢	
	0 0	0		0			0	0			29 17 40 32 19 9 25 335 14 7 249	
(Idd	0.99	-	1.00 1.00					-			29 17 40 32 19 9 25 335 14 7 249	
		1.00 1.00		00.1.00	0 1.00	1.00	1.00	1.00			#/hr 2 0 0 0 0 2 10 0 0 0	
Work Zone Un Approach											Stop Stop Stop Stop Stop Free Free Free Free Free F	
Adj Sat Flow, veh/h/In	1870 18	1870 1870	70 1870	70 1870	0 1870	1900	1870	1900			zed None None	
Adj Flow Rate, veh/h												
Peak Hour Factor	1.00	1.00 1.00	00 1.00	00 1.00	0 1.00	1.00	1.00	,			striarde # - 0 0 0 0	
avy Veh, %												
	499 8	854 109	139 139	39 1743		1 299		172			r Factor 100 100 100 100 100 100 100 100 100 10	
_					8 0.48							
Sat Flow, veh/h					9	1080		619			2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
Grp Volume(v), veh/h								0				
Grp Sat Flow(s),veh/h/In	978 1		75 1781	_		3 1699		0				
Q Serve(g_s), s											Major/Minor Minor2 Minor1 Major1 Major2	
Cycle Q Clear(g_c), s											272	
Prop In Lane	1.00	0.23			0.00			0.36			286 286 - 392 392 -	
-ane Grp Cap(c), veh/h				39 852			0				408 399 - 304 298	
//C Ratio(X)								0				
Avail Cap(c_a), veh/h	916 12	1240 123		9 2278							Critical Hdwy Stg 1 6.12 5.52 - 6.12 5.52	
HCM Platoon Ratio											J2 6.12 5.52 - 6.12 5.52 −	
Jpstream Filter(I)	1.00	1.00 1.00	00 1.00	00 1.00		1.00		0.00			3.518 4.018 3.318 3.518 4.018 3.318 2.218 -	
Jniform Delay (d), s/veh											leuver	
ncr Delay (d2), s/veh	0.0	0.7 0.7		3.4 0.1	1 0.1	1 0.7	0.0				721 675 - 633	
nitial Q Delay(d3),s/veh								0.0			620	
%ile BackOfQ(50%),veh/ln		0.9 0.9		0.7 0.4		1.5	0.0	0.0			•	
Jnsig. Movement Delay, s/veh												
-nGrp Delay(d),s/veh	8.2 1	10.0 10.0	.0 17.4	.4 4.8	8 4.8	3 10.6	0.0	0.0			neuver 326 356 - 317	
-nGrp LOS											697 665 - 617	
Approach Vol, veh/h		441		506	ç		321				- 287	
Approach Delay, s/veh	-	10.0		7.	5		10.6					
Approach LOS		ш		~	A		B				Approach EB WB NB SB	
imer - Assianed Phs		2	3	4			œ				17.1 0.5	
Phs Duration (G+Y+Rc). s		12.5 6.	6.4 11.9	6			18.3				C	
Change Period (Y+Rc), s				3.5			3.5					
Max Green Setting (Gmax), s	(1)	33.0 14.0		5			39.5				Minor I and Major Munt - NIDI - NIDI EDI AUMELA - ODI - ODI - ODI	
Max Q Clear Time (q c+11), s				2			4.0					
Green Ext Time (p_c), s			.1 2.4	4			2.5					
ntersection summary		ľ									ay (s) 7.9 0 - 14.0 17.1 8 0	
HCM 6th Ctrl Delay		9.1										
HCM 6th LOS			A								0.0	
									,			

Burbank Avenue Subdivision TIS AM Existing

Synchro 10 Report Page 2

Synchro 10 Report Page 1

Burbank Avenue Subdivision TIS AM Existing

HCM 6th TWSC 3: Burbank Ave & Hearn Ave	∍& He	am A	Ave										10/07/2019
Intersection													
Int Delay, síveh	8.9												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	۴	\$		*	\$			¢			¢		
Traffic Vol, veh/h	142	418	2	9	451	126	ო	4	10	78	2	76	
Future Vol, veh/h	142	418	7	9	451	126	ო	4	6	78	2	76	
Conflicting Peds, #/hr	0	0	ო	ო	0	0	0	0	2	5	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	'	'	None	1	1	None	1	1	None	1	1	None	
Storage Length	65	1	'	75	'	'	'	1	1	1	1	•	
Veh in Median Storage, #	le, # -	0	'	'	0	'	'	0	1	1	0	•	
Grade, %	•	0	'	'	0	•	1	0	'	1	0	•	
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	10	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	142	418	2	9	451	126	e	4	9	78	2	76	
Major/Minor	Major1		2	Major2		Σ	Minor1		2	Minor2			
Conflicting Flow All	577	0	0	428	0	0	1282	1306	430	1252	1246	514	
Stage 1	•	1	1	1	1	1	209	209	1	534	534	ł	
Stage 2	•	'	•	•	•	•	573	597	•	718	712	•	
Critical Hdwy	4.12	'	1	4.12	1	1	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	•	'	•	•	1	•	6.12	5.52	1	6.12	5.52	•	
Critical Hdwy Stg 2	•	1	1		1	1	6.12	5.52	1	6.12	5.52	ł	
Following How	2 21 R			2 2 1 R			2 518 A 018 2 318 2 518 A 018 2 318	A 018	3 318	3 518	A 018	3 318	

	514	•		6.22	•	•	3.318	560		•		560	•	•											
	1246	534	712	6.52	5.52	5.52	4.018	174	524	436		148	148	519	373										
Minor2	1252	534	718	7.12	6.12	6.12	3.518	149	530	420		126	126	454	349	0	5	64.7	ш						
_	430	1	'	6.22	1	1	3.318	625	'	1		621	1	1	'					SBLn1	203	0.768	64.7	ш	5.3
	1306	209	597	6.52	5.52	5.52	4.018	160	437	491		136	136	374	487					WBR SBLn1	1	1	ľ	'	1
Minor1	1282	209	573	7.12	6.12	6.12	3.518	142	425	505		107	107	363	431			21.8	ပ	WBT	1	1	1	'	1
~	0	1	'	1	'	1	1	1	'	1	'	1	'	1	'					WBL	1128	0.009	8.2	A	0
	0	1	•	1	•	1	1	1	•	1	'	1	•	1	•					EBR	1	1	1	•	1
Maior2	428	1	•	4.12	•	1	- 2.218	1131	•	ł		1128	•	1	•			0.1		EBT	1	•	1	•	1
2	0	1	'	1	•	1	1	1	'	1	'	1	•	1	•					EBL	966	0.143	9.2	4	0.5
	0	1	'	1	1	1	'	1	'	ľ	'	1	1	1	1					NBLn1	231	0.074 0.143	21.8	O	0.2
Maior1	577	1	'	4.12		1	2.218	966	'	1		966		1	'	8	8	2.3							
Maior/Minor N	low All	Stage 1	Stage 2	Critical Hdwy	Critical Hdwy Stg 1	Critical Hdwy Stg 2	Follow-up Hdwy	Pot Cap-1 Maneuver	Stage 1	Stage 2	Platoon blocked, %	Mov Cap-1 Maneuver	Mov Cap-2 Maneuver	Stage 1	Stage 2	Anneoch	Appiloaul	HCM Control Delay, s	HCM LOS	Minor Lane/Major Mvmt	Capacity (veh/h)	HCM Lane V/C Ratio	HCM Control Delay (s)	HCM Lane LOS	HCM 95th %tile Q(veh)

HCM 6th Signalized Intersection Summary 1: Burbank Ave & Sebastopol Rd

1: Burbank Ave & Sebastopol Rd	pastop	ool Rd		aiy							10/0	10/07/2019
	•	Ť	1	1	Ŧ	~	1	+	٠	۶	-	\mathbf{F}
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	~	¢‡		۴	t t			¢				
Traffic Volume (veh/h)	4	550	76	117	593	2	133	-	94	0	0	0
Future Volume (veh/h)	4	550	76	117	593	5	133	-	94	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	0.99	001	0.96	1.00	001	0.97	1.00	001	1.00			
Parking Bus, Adj Mork Zone On Ammach	1.00	1.00 No	1.00	1.00	1.00 No	1.00	1.00	1.00 No	1.00			
Adi Sat Flow. veh/h/ln	1870	1870	1870	1870	1870	1870	1900	1870	1900			
Adj Flow Rate, veh/h	2	550	51	117	593	2	133	-	45			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	2	2	2	2	0	2	0			
Cap, veh/h	543	1128	104	153	2089	7	196	-	99			
Arrive On Green	0.34	0.34	0.34	0.09	0.58	0.58	0.15	0.15	0.15			
Sat Flow, veh/h	818	3277	303	1781	3632	12	1283	9	434			
Grp Volume(v), veh/h	2	298	303	117	290	305	179	0	0			
Grp Sat Flow(s),veh/h/ln	818	1777	1803	1781	1777	1868	1726	0	0			
Q Serve(g_s), s	0.0	3.6	3.7	1.8	2.3	2.3	2.7	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	3.6	3.7	1.8	2.3	2.3	2.7	0.0	0.0			
Prop In Lane	1.00		0.17	1.00		0.01	0.74		0.25			
Lane Grp Cap(c), veh/h	543	612	621	153	1022	1074	264	0	0			
V/C Ratio(X)	0.00	0.49	0.49	0.76	0.28	0.28	0.68	0.00	0.00			
Avail Cap(c_a), veh/h	006	1386	1406	905	2546	2677	2067	0	0 0			
HCM Platoon Katio	0.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Fliter(I) Liniform Dolov (d) stuch	0.4	00.I	00.I	1.00	0.6	0.0	0.1	0.0	0.0			
UIIIUIII Delay (u), Sveri Incr Delay (d2) síveh	0.0		0.6	0.4	0.0	0.0	0.1	0.0	0.0			
Initial O Delav(d3) s/veh	000	0.0	0.0	0.0	0.0	000	100	0.0	0.0			
%ile BackOfQ(50%).veh/In	0.0	0.9	0.9	0.6	0.2	0.2	0.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.9	7.7	7.7	15.3	3.1	3.1	12.2	0.0	0.0			
LnGrp LOS	۷	A	A	в	A	A	в	A	A			
Approach Vol, veh/h		603			712			179				
Approach Delay, síveh		7.7			5.1			12.2				
Approach LOS		A			A			œ				
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		8.2	6.4	13.0				19.4				
Change Period (Y+Rc), s		4.0	4.0	3.5				3.5				
Max Green Setting (Gmax), s		33.0	14.0	21.5				39.5				
Max Q Clear Time (g_c+l1), s		4.7	3.8	5.7				4.3				
Green Ext Time (p_c), s		0.7	0.1	3.3				4.0				
Intersection Summary												
HCM 6th Ctrl Delay			7.0									
HCM 6th LOS			A									

Burbank Avenue Subdivision TIS PM Existing

Synchro 10 Report Page 3

Synchro 10 Report Page 1

Burbank Avenue Subdivision TIS AM Existing

HCM 6th TWSC 2: Burbank Ave & Hughes Ave	HCM 6th TWSC 3: Burbank Ave & Hearn Ave
	Intersection
Int Delay, siveh 2.6	Int Delay, s/veh 7
EBL EBT EBR WBL WBT WBR NBL N	EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL S
13 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	ሪ ት ት
24 15 15 6 13 6 29 177 13 24 45 45 6 42 6 20 477 42	69 361 17 35 534 126 12 12 35 60 13 60 561 17 35 534 126 12 12 35 60 13
Ston Ston Stan Free Free Free Free	+/iii U U Z Z U U U U I I Frae Frae Frae Frae Frae Stan Stan Stan S
red None - None None None	None None None -
	65 - 75
storage,# - 0 0 0 0	storage,# - 0 0 0 0
0 - 0 - 0 -	- 0 0 0 0
r Factor 100 100 100 100 100 100 100 100 100 10	100 100 100 100 100 100 100 100 1
6 2 2 2 2 2 2 2 2 2 2	Jes,% 2 2 2 2 2 2 2 2 2 2 2 2
13 6 29 177 13 18 172	
Major/Minor Minor2 Minor1 Major1 Major2	Major/Minor Major/ Major2 Minor2
Conflicting Flow All 475 472 188 476 477 184 199 0 0 190 0 0	Conflicting Flow All 660 0 0 380 0 0 1218 1240 373 1199 1185 597
224 224 - 242 242	667 667
251 248 -	708 730 -
7.12 6.52 6.22 7.12 (4.12 4.12 7.12 6.52 6.22 7.12
6.12 5.52 - 6.12	6.12 5.52 - 6.12
- 6.12 5.52	•
3.518 4.018 3.318 3.518 4.018 3.318 2.218 -	2.218 2.218 3.518 4.018 3.318 3.518 4.018
leuver 500 490 854 499	neuver 928 1178 157 175 673 162
779 718 - 762	448
•	•
Такили рискеч, // Мих/Стал.Налалиска 770 А60 850 А64 А67 858 1367 - 1384 -	er 0.28 - 1176 - 117 157 671
470 469 - 464 467	
757 704 - 744 688	
716 684 - 728 697	415 - 454 492
•	
Approach EB WB NB SB	Approach EB WB NB SB
12.2 1	trol Delay, s 1.4 0.4 23.3 (
в	
Minor Lane,Major Mvmt NBL NBT NBR EBLn1WBLn1 SBL SBT SBR	MinorLanetMajorMvrnt NBLn1 EBL EBR WBL WBT WBR SBLn1
1367 -	255 928 1176 -
0.021 -	0.231 0.074 0.03 -
lay (s) 7.7 0 - 12.5 12.2 7.6	ay (s) 23.3 9.2 8
A A - B	C A A -
HCM 95th %tile Q(veh) 0.1 0.3 0.1 0	HCM 95th %tile Q(veh) 0.9 0.2 - 0.1 - 4.1

Burbank Avenue Subdivision TIS PM Existing

Synchro 10 Report Page 2

Burbank Avenue Subdivision TIS PM Existing

HCM 6th Signalized Intersection Summary 1: Burbank Ave & Sebastopol Rd	ntersection	on Sum Rd	imary							10/25	10/29/2019	HCM 6th TWSC 2: Burbank Ave & Hughes Ave	TWSC k Ave & I	Hughe	s Ave									10	10/29/2019
		/* †	*	ŧ	~	*	+	٠	۶	-	•														
Movement	EBL E	EBT EBR	R WBL	- WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Intersection													
Lane Configurations		4Þ				-00	¢			•		Int Delay, s/veh	sh 3.2	5											
I raffic Volume (veh/h)	N C	434 100	0 135	442	~ ~	225	- -	234	-	-	0 0	Movement	EBL	3L EBT		EBR WBL \	WBT W	WBR NBL	BL NBT	T NBR	SBL	SBT	SBR		
						077		404	5	5		Lane Configurations		¢			¢								
Ped-Rike Adi(A nhT)	0 00	0.05			0 07	001	0	0 00				Traffic Vol, veh/h		29 17	7 40	32	19	б	25 380		7	302	25		
	1 00 1	1 00 1 00	8.0				001	001				Future Vol, veh/h		29 17						0 14	7		25		
Mork Zone On Annmach				0. V		<u>0</u> .	0. V	00.1				Conflicting Peds, #/hr				0				0			10		
Adi Cot Elour vichihilio	1070 10	Ì			1070	Ì	1070	1000				Sign Control	Stop	p Stop	o Stop	Stop	Stop S		Free Free		Free	Free	Free		
Adj Sat Flow, Vervrun Adi Flow Doto to huk		0/01 0/01	0 10/U	10/01		1300	0/01	141				RT Channelized	pe		- None	•	ź	None		- None	1	'	None		
Book Hour Footor	4 0 1 0				- 5			<u>+</u> 0				Storage Length	ŧ	,		'		,	,		'		,		
							0.1	0.1				Veh in Median Storage, #	Storage, #	•	'	•	0			- 0	1	0			
Percent neavy ven, 70						0 44 0		100				Grade, %				•						0			
Cap, vervn	403 0	01 0 00 0 00 0	010	0//1		0 14 0 00 0		020				Peak Hour Factor	ctor 100	00 100	0 100	100	100	100 10	100 100	0 100	100	100	100		
					ö		0.0	0.30				Heavy Vehicles, %				2						2	2		
Sat Flow, ven/n								003				Mvmt Flow		29 17	7 40	32	19	6	25 380	0 14	7	302	25		
Grp Volume(v), veh/h					227		0	0																	
Grp Sat Flow(s),veh/h/ln	<u> </u>			<u> </u>		1695	0	0						¢											
Q Serve(g_s), s				3 2.5			0.0	0.0				Major/Minor	Z			Minor1		≊I			Ξ				
Cycle Q Clear(g_c), s		4.3 4.4					0.0	0.0				Conflicting Flow All			3 325	794		389 33	337 (0	394	0	0		
Prop In Lane	1.00							0.39				Stage 1	339		-	437	437				1	ł			
Lane Grp Cap(c), veh/h							0	0				Stage 2		53 444	' +	357				· ·		•			
V/C Ratio(X)							0.00	0.00				Critical Hdwy		12 6.52	2 6.22	7.12		6.22 4.12	12	1	4.12	ł			
Avail Cap(c_a), veh/h	770 10	1074 1056					0	0				Critical Hdwy Stg 1		2 5.52		6.12	5.52	,	,		'	•			
HCM Platoon Ratio		.00 1.00					1.00	1.00				Critical Hdwy Stg 2		12 5.52	'		5.52			1	1	ł			
Upstream Filter(I)	1.00		0 1.00	1.00	1.00	1.00	0.00	0.00				Follow-up Hdwy		4	3.318 3.518			318 2.2			- 2.218	•			
Uniform Delay (d), s/veh		`					0.0	0.0				Pot Cap-1 Maneuver		17 32!	5 716	306	323	659 1222		-	- 1165	ł			
Incr Delay (d2), s/veh	0.0	0.8 0.9				0.7	0.0	0.0				Stage 1			· 0	598	579	,		•	'	•			
Initial Q Delay(d3),s/veh							0.0	0.0				Stage 2	586	36 575	-	661	632			1	1	ł			
%ile BackOfQ(50%),veh/ln							0.0	0.0				Platoon blocked, %	ed, %									ł			
Unsig. Movement Delay, s/veh												Mov Cap-1 Maneuver			2 710	270	310 6	658 1212		1	1165	1			
LnGrp Delav(d),s/veh		11.7 11.7		1 5.4			0.0	0.0				Mov Cap-2 Maneuver				270	310	,			1	ł			
LnGrp LOS	A		8		A	8	4	A				Stage 1	653		-	582	564				1	•			
Annroach Vol veh/h		512		578			366					Stage 2		13 560	'		623				'	•			
Approach Delay, s/veh		11.7		8.5			11.8																		
Approach LOS		в		A			B					Annoch	U	8				4	QN		00				
Times Accienced Dhe		c					0					HCM Control Dolory C	ſ			10.4					0				
														ţ c		t. C			0.0		N i				
Phs Duration (G+Y+Kc), s							20.9							د		د									
Change Period (Y+Kc), s							3.5																		
Max Green Setting (Gmax), s			G.I.2 0	~			39.5					Minor Lane/Major Mvmt	ajor Mvmt	NBL	NBT	NBR EBLn1WBLn1	3Ln1WB	Ln1 SBL	BL SBT	T SBR					
Max Q Clear Time (g_c+11), s							4.5					Canacity (veh/h)	(4)	1212		'	400 310	310 1165	65						
Green Ext Time (p_c), s		1.7 0.1					2.8					HCM Lane V/C Ratio	C Ratio	0.021	'	1	0.215 0.194 0.006	194 0.01							
Intersection Summary												HCM Control Delav (s)	Delav (s)	œ		ľ	- 16.4 19.4	3.4							
HCM 6th Ctrl Delav		10.4										HCM Lane LOS	S		A	•	U								
HCM 6th LOS		2	: @									HCM 95th %tile Q(veh)	le Q(veh)	0.1		1		0.7	0						
			2											5											

Synchro 10 Report Page 1

Synchro 10 Report Page 2

Burbank Avenue Subdivision TIS AM Background

Burbank Avenue Subdivision TIS AM Background

M 6th TWSC	Burbank Ave & Hearn Ave
HCM (3: Burl

			SBR		86	86	0	Stop	None	•	ł	•	100	2	86		
			SBT	¢	3	13	0	Stop	ł	•	0	0	100	2	13		
			SBL		100	100	2	Stop	ł	•	1	1	100	2	100	Minor2	0001
			NBR		9	9	2	Stop	None	•	1	•	100	2	9	2	
			NBT	¢	17	17	0	Stop	ł	•	0	0	100	2	17		
			NBL		e	ო	0	Stop	ł	•	1	1	100	2	e	Minor1	
			WBR		5	154	0	Free	None	•	1	1	10	2	<u>5</u>	2	•
			WBT	÷	451	451	0	Free	1	•	0	0	100	2	451		•
			WBL	۴	9	9	m	Free	1	75	1	1	100	2	9	Major2	
			EBR		2	7	e	Free	None	•	1	1	100	2	7	2	•
			EBT	æ,	418	418	0	Free	ľ	•	0	0	100	2	418		•
		28.1	EBL	۴	155	155	0	Free	ľ	65	' #	1	100	2	155	Major1	
	L	s/veh		ane Configurations	, veh/h	, veh/h	Conflicting Peds, #/hr	0	elized	ength	Veh in Median Storage, #		· Factor	nicles, %	_		:
	Intersection	Int Delay, s/veh	Movement	Lane Conf	Traffic Vol, veh/h	Future Vol, veh/h	Conflicting	Sign Control	RT Channelized	Storage Length	Veh in Met	Grade, %	Peak Hour Factor	Heavy Vehicles, %	Mvmt Flow	Major/Minor	

Int Delay, s/veh	28.1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	۴	æ		F	÷			¢			¢		
Traffic Vol, veh/h	155	418	7	9	451	154	e	17	9	100	9	86	
Future Vol, veh/h	155	418	7	9	451	154	ო	17	9	100	9	86	
Conflicting Peds, #/hr	0	0	e	e	0	0	0	0	2	S	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	1	ľ	None	ł	ł	None	1	1	None	1	1	None	
Storage Length	65	1	•	75	•	•	•	•	•	•	•		
Veh in Median Storage,	' #	0	1	1	0	1	1	0	ł	1	0		
Grade, %	1	0	1	1	0	1	•	0	•	1	0		
Peak Hour Factor	100	100	100	100	100	100	100	100	10	100	10	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	155	418	7	10	451	154	ი	17	10	100	13	86	
Major/Minor N	Major1		2	Major2		2	Minor1		Σ	Minor2			
Conflicting Flow All	605	0	0	428	0	0	1333	1360	430	1298	1286	528	
Stage 1	ľ	1	1	ł	ł	ł	735	735	ł	548	548		
Stage 2	'	'	'	'	'	•	598	625	•	750	738		
Critical Hdwy	4.12	ľ	1	4.12	1	1	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	1	•	•	1	•	1	6.12	5.52	•	6.12	5.52		
Critical Hdwy Stg 2	1	1	1	1	1	1	6.12	5.52	ł	6.12	5.52		
Follow-up Hdwy	2.218	1	•	2.218	•	1	3.518				4.018	3.318	
Pot Cap-1 Maneuver	973	1	1	1131	1	1	131	148	625	139	<u>16</u>	550	
Stage 1	'	'	'	'	'	'	411	425	'	521	517		
Stage 2	1	ľ	1	ł	ł	1	489	477	ł	403	424		
Platoon blocked, %		'	1		1	1							
Mov Cap-1 Maneuver	973	1	1	1128	1	1	89	123	621	106	136	550	
Mov Cap-2 Maneuver	1	1	•	1	•	1	89	123	•	106	136		
Stage 1	1	1	1	1	ł	1	345	357	ł	438	512		
Stage 2	1	1	1	1	1	1	398	473	÷	316	356		
Approach	EB			WB			NB			SB			
HCM Control Delay, s	2.5			0.1			32.6			188.5			
HCM LOS										ш			
Minor Lane/Major Mvmt		NBLn1	EBL	EBT	EBR	WBL	WBT	WBR SBLn1	BLn1				
Capacity (veh/h)			973	1	ł	1128	1	1	166				
HCM Lane V/C Ratio			0.159	'	'	0.009	'	'	1.199				
HCM Control Delay (s)		32.6	9.4	1	ł	8.2	1	1	188.5				
HCM Lane LOS		۵	A	'	•	A	•	1	ш				
HCM 95th %tile Q(veh)		0.7	0.6	1	1	0	1	1	10.9				

-								
		SBLn1	166	1.199	188.5	ш	10.9	
		WBR ('	1	1	'	ľ	
د		EBR WBL WBT WBR SBLn1	1	1	1	'	1	
		WBL	1128	0.009	8.2	4	0	
		EBR	1	1	1	'	1	
		EBT	1	1	1	'	1	
		EBL	973	0.159	9.4	A	0.6	
		NBLn1	160		32.6		0.7	
LCC C		Lane/Major Mvmt	city (veh/h)	Lane V/C Ratio	Control Delay (s)	Lane LOS	95th %tile Q(veh)	

Burbank Avenue Subdivision TIS AM Background

Synchro 10 Report Page 3

10/29/2019

HCM 6th Signalized Intersection Summary 1: Burbank Ave & Sebastopol Rd	nterse pastop	ed Intersection 5 Sebastopol Rd	Summa	ary							10/29	10/29/2019
	•	1	1	\$	ŧ	~	•	-	٠	۶	-	\mathbf{F}
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	¢,		*	₹ ₩			¢				
Traffic Volume (veh/h)	4	601	89	134	643	2	147	~	110	0	0	0
Future Volume (veh/h)	4	601	89	134	643	0	147	(110	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pb1)	1.00	1 00	0.96	1.00	1 00	1.00	00.1	1 00	00.1			
Work Zone On Annroach	0.1	0. N	00.1	00.1	o N	00.1	00.1	p v	00.1			
Adi Sat Flow. veh/h/ln	1870	1870	1870	1870	1870	1870	1900	1870	1900			
Adi Flow Rate, veh/h	2	601	64	134	643	2	147	-	61			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	2	2	2	2	2	2	0	2	0			
Cap, veh/h	508	1128	120	173	2096	7	215	-	89			
Arrive On Green	0.35	0.35	0.35	0.10	0.58	0.58	0.18	0.18	0.18			
Sat Flow, veh/h	782	3228	343	1781	3633	1	1208	∞	501			
Grp Volume(v), veh/h	2	330	335	134	314	331	209	0	0			
Grp Sat Flow(s),veh/h/ln	782	1777	1794	1781	1777	1868 2.2	1718	0	0			
Q Serve(g_s), s	0.1	4.5	4.6	2.2	5 0 0 0	0 i 0 i 0	3.5	0.0	0.0			
uycie u ulear(g_c), s Dron in i ano	- 0	C.4	4.0	7.7	7.Q	2.0 0.01	0.5	0.0	0.0			
l ane Gm Can(c) veh/h	805	621	607	173	1025	10.0	306	0	0770			
V/C Ratio(X)	0.00	0.53	0.53	0.78	0.31	0.31	0.68	0.00	0.00			
Avail Cap(c_a), veh/h	784	1248	1260	815	2294	2411	1852	0	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	6.5	8.0	8.0	13.5	3.3	3.3	11.8	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.7	0.7	2.8	0.2	0.2	1.0	0.0	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/In	0.0	1.2	1.2	0.8	0.3	0.3		0.0	0.0			
Unsig. Moverment Delay, si ven I nGrn Delay/d) s/veh	9	8.7	8.7	16.3	3.5	35	12.8	00	00			
Lugrp LOS	A	A	A	B	A	A	B	A	A			
Approach Vol, veh/h		667			677			209				
Approach Delay, s/veh		8.7			5.7			12.8				
Approach LOS		A			A			в				
Timer - Assigned Phs		2	ę	4				œ				
Phs Duration (G+Y+Rc), s		9.4	7.0	14.2				21.2				
Change Period (Y+Rc), s		4.0	4.0	3.5				3.5				
Max Green Setting (Gmax), s		33.0	14.0	21.5				39.5				
Max Q Clear Time (g_c+l1), s		5.5	4.2	9.9				4.8				
Green Ext Time (p_c), s		0.9	0.1	3.7				4.4				
Intersection Summary												
HCM 6th Ctrl Delay			7.8									
HCM 6th LOS			A									

Burbank Avenue Subdivision TIS PM Background

th TWSC	ank Ave & Hughes Ave
HCM 6th TWSC	2: Burbank Ave

ersection													
Delay, síveh	2.5												
vement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
ne Configurations		¢			¢			¢			¢		
iffic Vol, veh/h	24	15	15	9	13	9	29	207	13	18	202	22	
ture Vol, veh/h	24	15	15	9	13	9	29	207	13	18	202	22	
nflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	5	
In Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
Channelized	1	1	None										
orage Length	•	•	•	•	•	•	•	•	•	•	•	•	
h in Median Storage, #	' #	0	1	1	0	1	1	0	1	1	0	•	
ade, %	1	0	•	1	0	•	1	0	•	1	0	•	
ak Hour Factor	100	100	100	10	100	100	100	100	100	100	10	100	
avy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
mt Flow	24	15	15	9	13	9	29	207	13	9	202	22	
jor/Minor N	Minor2		2	Minor1		N	Major1		2	Major2			
nflicting Flow All	535	532	218	536	537	214	229	0	0	220	0	0	
Stage 1	254	254	1	272	272	1	1	1	1	1	1	•	
Stane 2	281	278	•	264	265	•	'	'	'	•	'		

eh hhhr arrations eh hhr eds. #hhr eds. #hhr eds. #hhr ads. 8 Stad eds. #hhr in Storage. # actor is % is % i	ntersection													
EBL EBT EBL WBT WBT NBT NBT NBT SBL SBL <td>nt Delay, s/veh</td> <td>2.5</td> <td></td>	nt Delay, s/veh	2.5												
	Aovement	EBL	EBT		WBL		WBR	NBL	NBT	NBR	SBL	SBT	SBR	
	-ane Configurations		¢			¢			¢			¢		
	Fraffic Vol, veh/h	24	15	15	9	13	9	29	207	13	18	202	22	
	Future Vol, veh/h	24	15	15	9	13	9	29	207	1 3	18	202	22	
Sibp Sibp <t< td=""><td>Conflicting Peds, #/hr</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>S</td><td>0</td><td>0</td><td>0</td><td>0</td><td>5</td><td></td></t<>	Conflicting Peds, #/hr	0	0	0	0	0	0	S	0	0	0	0	5	
e. H None $-$ None $ -$	Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
e, \pm · · </td <td>RT Channelized</td> <td>1</td> <td>1</td> <td>None</td> <td>1</td> <td>1</td> <td>None</td> <td>1</td> <td>1</td> <td>None</td> <td>1</td> <td>1</td> <td>None</td> <td></td>	RT Channelized	1	1	None	1	1	None	1	1	None	1	1	None	
e, # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 100	Storage Length	'	'	•	•	'	1	'	•	•	1	'	•	
	/eh in Median Storage,	' #`	0	'	1	0	'	1	0	1	'	0	•	
	Grade, %	1	0	'	'	0	1	1	0	1	1	0	•	
	^b eak Hour Factor	100	10	100	10	100	100	100	100	100	100	100	100	
24 15 15 6 13 6 29 207 13 18 202 2 Minori Minori Minori Minori Majori Majori Majori Majori 0 200 0 200 0 200 0 200 0 200 0 200 0 200 0 0 200 0 200 0 200 0 0 200 0 0 201 201 501 10 301 316 216 2 41 20 0 0 20 0 0 0 0 0 0 10 316 316 318 218 2 412 41 41 2 5	Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Minoriz Minori Majori Major	Avmt Flow	24	15	15	9	13	9	29	207	13	9	202	22	
535 532 218 536 537 214 229 0 0 220 0 264 256 -2 272 272 272 27 $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$ $$		Minor2		2	linor1		2	Aajor1		2	Major2			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Conflicting Flow All	535	532	218	536	537	214	229	0	0	220	0	0	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Stage 1	254	254	1	272	272	1	1	1	1	1	1	•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Stage 2	281	278	'	264	265	'	'	'	•	1	'	•	
	Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	1	1	4.12	1	1	
	Critical Hdwy Stg 1	6.12	5.52	1	6.12	5.52	'	1	1	1	1	1	•	
3518 4018 3318 3518 4018 3318 2218 - 2218 - 2218 - 2516 453 825 139 - 1349 - 1526 885 - 2141 689 - 2141 689 - 2141 689 - 2141 689 - 2141 689 - 2141 689 - 2141 689 - 2141 681 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 - 2141 614 614 - 2141 614 614 614 614 614 614 614 614 614	Critical Hdwy Stg 2							'	1	1	'	'	•	
	ollow-up Hdwy							2.218	1	1	2.218	'	,	
	ot Cap-1 Maneuver	456	453	822	455	450	826	1339	1	1	1349	1	1	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Stage 1	750	697	•	734	685	•	•	•	1	•	•	•	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Stage 2	726	680	1	741	689	1	1	1	1	1	1	•	
427 434 819 422 431 826 133 - - 1349 - 427 434 - 76 688 -	latoon blocked, %								1	1		1	•	
427 434 - 422 431 -	flov Cap-1 Maneuver	427	434	819	422	431	826	1333	1	1	1349	1	•	
728 684 - 719 668 - 10 101 <th101< th=""> <th101< th=""> <th101< th=""></th101<></th101<></th101<>	flov Cap-2 Maneuver	427	434	•	422	431	•	•	•	1	1	1	•	
689 663 - 701 676 -	Stage 1	128	684	1	/16	808	•	1	1	1	1	•	•	
EB WB NB NB 13.2 12.8 0.9 - 13.2 12.8 0.9 - m NBT NBT SBT m NB1 NBT SBT m 1333 - - - 1333 - - - - - 00222 - - 0.109 0.052 0.013 - - 1333 - - 1349 -	Stage 2	689	663	•	701	676	•	•	•	•	1	•	•	
13.2 12.8 0.9 B B 0.9 m NBT NBT NBT m NB1 NBT NB1 m NB1 NBT SB1 1333 - - 495 494 1349 - 1333 - - 0.109 0.052 0.013 - - 0 7.8 0 - 132 12.8 7.7 0 - 1 0.1 - 0.4 0.2 0.13 - - -	voroach	B			WB			NB			SB			
B B mt NBL NBT NBREBLn1WBLn1 SBL SBT 1333 - 495 484 1349 - 0222 - - 0.109 0.022 0.013 - 7.8 0 - 13.2 12.8 7.0 0 - 0.022 - - 0.109 0.013 - - - 0 - - 0 0 - - 0 0 - - 0 0 - - 0 - - 0 0 - - 0 - - 0 0 - - 0 0 - - 0 - - 0 - - 0 - 0 - - - - 0 - 0 - - 13.2 13.4 13.4 0 - 0 0 13.4 0 - <td>ICM Control Delay, s</td> <td>13.2</td> <td></td> <td></td> <td>12.8</td> <td></td> <td></td> <td>0.9</td> <td></td> <td></td> <td>0.6</td> <td></td> <td></td> <td></td>	ICM Control Delay, s	13.2			12.8			0.9			0.6			
Int NBT NBT NBT NBT SBL SBL <td>HCM LOS</td> <td>8</td> <td></td> <td></td> <td>œ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	HCM LOS	8			œ									
1333 - - 495 484 1349 0.022 - - 0.019 0.052 0.113) 7.8 0 - 13.2 7.7) 7.8 0 - 13.2 7.7) 0.1 - - 0.4 0.2 0) 0.1 - 12.8 7.7 0 13.4 13.4	Ainor Lane/Major Mvm	÷	NBL	NBT	NBR E	EBLn1W	/BLn1	SBL	SBT	SBR				
0.022 0.109 0.052 0.013 7 8 0 - 132 128 7.7 A A 0.4 0.2 0 0 0.1 0.4 0.2 0	Capacity (veh/h)		1333	'	'	495	484	1349	'	1				
7.8 0 - 13.2 12.8 7.7 A A - B B A) 0.1 0.4 0.2 0	ICM Lane V/C Ratio		0.022	ľ	1	0.109		0.013	ľ	ľ				
A A - B B A Q(veh) 0.1 0.4 0.2 0	HCM Control Delay (s)		7.8	0	1	13.2	12.8	7.7	0	1				
0.1 0.4 0.2	HCM Lane LOS		4	A	•	ш	ш	A	A	•				
	HCM 95th %tile Q(veh)		0.1	1	1	0.4	0.2	0	1	1				

Burbank Avenue Subdivision TIS PM Background

Synchro 10 Report Page 2

HCM 6th TWSC 3: Burbank Ave & Hearn Ave

10/29/2019

10/29/2019

		SBR		76	76	0	Stop	None				100	2	76		605	,	,	6.22			3.318	498		
		SBT	¢	20	20	0	Stop	ľ	•	0	0	100	2	20		1205	675	530	6.52	5.52	5.52	4.018	184	453	
		SBL		12	12	-	Stop	ľ	•	1	'	100	2	12	Minor2	1222	675	547	7.12	6.12	6.12	3.518	156	444	
		NBR		35	35	-	Stop	None	•	1	'	100	2	35	~	373	1	'	6.22	•	1	3.318	673	1	
		NBT	¢	9	9	0	Stop	ľ	•	0	0	100	2	9		1268	522	746	6.52	5.52	5.52	4.018	168	531	
		NBL		12	12	0	Stop	ľ	•	1	'	100	2	12	Minor1	1245	522	723	7.12	6.12	6.12	3.518	151	538	
		WBR		142	142	0	Free	None	•	1	'	100	2	142	2	0	1	'	1	•	1	1	1	'	
		WBT	æ,	534	534	0	Free	ľ	•	0	0	100	2	534		0	1	'	1	•	1	1	1	1	
		WBL	۴	35	35	2	Free	1	75	1	'	100	2	35	Major2	380	1	'	4.12	•	1	- 2.218	1178	'	
		EBR		17	17	2	Free	None	•	1	'	100	2	17	~	0	1	'	1	•	1	1	1	1	
		EBT	÷	361	361	0	Free	1	•	0	0	100	2	361		0	1	'	1	•	1	1	1	'	
	13.2	EBL	۴	75	75	0	Free	ľ	65	' #.	1	100	2	22	Major1	676	1	'	4.12	'	1	2.218	915	'	
Intersection	Int Delay, s/veh	Movement	Lane Configurations	Traffic Vol, veh/h	Future Vol, veh/h	Conflicting Peds, #/hr	Sign Control	RT Channelized	Storage Length	Veh in Median Storage, #	Grade, %	Peak Hour Factor	Heavy Vehicles, %	Mvmt Flow	Major/Minor N	Conflicting Flow All	Stage 1	Stage 2	Critical Hdwy	Critical Hdwy Stg 1	Critical Hdwy Stg 2	Follow-up Hdwy	Pot Cap-1 Maneuver	Stage 1	

	605			6.22			18	498				498												
	1205 6	675	530	6.52 6.	5.52	5.52	4.018 3.318	184 4	453	527		164 4	164	439	483									
Minor2	1222	675	547	7.12	6.12	6.12		156	444	521		123	123	408	436	SB	91.5	ш						
~	373	1	'	6.22	'	1	3.318 3.518	673	'	ľ		671	'	1	'				SBLn1	192	0.901	91.5	ш	7
	1268	522	746	6.52	5.52	5.52	4.018	168		421		149	149	486	408				WBT WBR SBLn1	'	1	1	'	1
Minor1	1245	522	723	7.12	6.12	6.12	3.518	151	538	417		106	106	493	327	B	27.1			'		1	'	1
	0	1	'	'	'	'			'	'		'		1	'				WBL	1176	0.03	8.2	A	0.1
	0	ľ	Ċ	ľ	ľ		Ċ	ľ	Ċ	ľ	Ċ		Ċ	ľ	Ċ				EBR		Ċ			ľ
Major2	380	Ċ	'	4.12	'		2.218	1178		1		1176		Ċ		WB	0.4		EBT	'	1			1
	0	ľ	'	1	1			1		ľ	'			ľ					EBL	227 915	0.082	9.3		0.3
	0	ľ	'	1	ľ			1		1	'			ľ					NBLn1	227	0.286	27.1		
Major1	676	1	'	4.12	'	'	2.218	915	'	1		915		1	'	8	1.5		t			_		-
Major/Minor	Conflicting Flow All	Stage 1	Stage 2	Critical Hdwy	Critical Hdwy Stg 1	Critical Hdwy Stg 2	Follow-up Hdwy	Pot Cap-1 Maneuver	Stage 1	Stage 2	Platoon blocked, %	Mov Cap-1 Maneuver	Mov Cap-2 Maneuver	Stage 1	Stage 2	Approach	HCM Control Delay, s	HCM LOS	Minor Lane/Major Mvmt	Capacity (veh/h)	HCM Lane V/C Ratio	HCM Control Delay (s)	HCM Lane LOS	HCM 95th %tile Q(veh)

Burbank Avenue Subdivision TIS PM Background

HCM 6th Signalized Intersection Summary 1: Burbank Ave & Sebastopol Rd	tersecti astopol	on Surr. Rd	imary							10/07/2019	611	HCM 6th TWSC 2: Burbank Ave & Hughes Ave	s Hug	ghes A	ve									10/07/2019
-	•	/>	*	ŧ	~	¥	+	*	٠	• •	~													
Movement	EBL E	EBT EBR	R WBL	L WBT	· WBR	NBL	NBT	NBR	SBL	SBT (SBR	Intersection												
Lane Configurations	F						¢					Int Delay, s/veh	3.2											
Traffic Volume (veh/h)		389 79	79 116	5 397		220	0	232	0 0	0 0	0	Movement	EBL	EBT	EBR WBL	WBT	WBR	NBL	NBT NBR	SR SBL	. SBT	SBR		
Future Volume (ven/n)	2 4					770	-	727	5	5		Lane Configurations		¢		¢			¢		¢			
	0 9						0					Traffic Vol, veh/h	29						373 1	14 7	262			
(100	0.99		00.F					0.99				Future Vol, veh/h	29		40 32	2 19	თ			14 7	7 262	25		
		1.00 1.00		_	<u>N.</u>	00.1	0.1	00.1				Conflicting Peds, #/hr	2	0				10	0	0 0				
gcu							ON OF OF	0001				Sign Control		Stop S	S	p Stop	Stop		Free Free	se Free	e Free			
_			U 18/U	10/01 0	0/01	0061	0/01	0061				RT Channelized		- None				•	- None			- None		
uv.							0 0	139				Storage Length	1		,		1	•				1		
		00'L 00'L	0.1	00-1 0	<u>0.1</u>	00.1	00.1	00.1				Veh in Median Storage, #	e,# _	0		- 0	1	ł	0		0	1		
avy Veh, %							.7	0				Grade. %		C		-		•	c		-			
	478 8	823 115	5 148				0	198				Peak Hour Factor	100			0 100				100 100		÷		
_					э.		0.00	0.30				Heavy Vehicles. %	2	2	2 2			2	2		2			
Sat Flow, veh/h							0	656				Mvmt Flow	50				σ			14 7	7 262			
Grp Volume(v), veh/h							0	0					3	:			>			-	101			
Grp Sat Flow(s),veh/h/ln	-					-	0	0																
							0.0	0.0				Major/Minor	Minor2		Minor1	1	Σ	Major1		Major2	~			
c), S				1 2.1			0.0	0.0				Conflicting Flow All	745	736	285 747	7 741	382	297	0	0 387	0	0		
			5 1.00					0.39				Stage 1	299				1	•						
o(c), veh/h							0	0				Stade 2	446	437	- 317		1	•				1		
							000	000				Critical Hdwv	7 12	6.52 6	22 71	2 6.52	6.22	4 12		- 412				
a). veh/h		1165 1158		0 2140		Ì	0	C				Critical Hdwv Sta 1	6.12	5.52	- 6.1	2 5.52	'							
HCM Platoon Ratio	1.00						1.00	1.00				Critical Hdwv Sta 2	6.12	5.52	- 6.1	2 5.52	1	•						
Upstream Filter(I)			0 1.00		1.00	1.00	0.00	0.00				Follow-up Hdwv	3.518 4	3.518 4.018 3.318 3.518 4.018 3.318 2.218	318 3.51	8 4.018	3.318	2.218		- 2.218	'			
Uniform Delav (d). s/veh	8.9	10.1 10.1		7 5.2			0.0	0.0				Pot Cap-1 Maneuver	330	346	754 32	9 344	665	1264		- 1171	1	1		
Incr Delav (d2), s/veh							0.0	0.0				Stage 1	710	666	- 603	3 583	1	•						
Initial Q Delav(d3).s/veh	0.0	0.0 0.0	0.0	0.0		0.0	0.0	0.0				Stage 2	591					•						
%ile BackOfO(50%) veh/ln							0.0	0.0				Platoon blocked. %							,	,	1	1		
Unsia. Movement Delav. s/veh												Mov Cap-1 Maneuver			748 29		664	1253		- 1171				
I nGm Delav(d) s/veh		10.9 10.9	9 18.1	53			00	00				Mov Can-2 Maneuver		332		2 330		•				1		
	0.0 0	а а			0.0	2 0	Q. \\	0.0				Stare 1	687	656	- 588									
Annior to the features of the							260					Stana 2	548	565				ŀ				ľ		
Approach Delay styleh	Ŧ	10.0					8 OL					4 06800	2	8										
		2		4 <			2																	
Appload FOO		2		C			2					Approach	EB		WB	m		NB		SB	~			
Timer - Assigned Phs		2	3				œ					HCM Control Delay, s	15.5		18.2	2		0.5		0.2	~			
Phs Duration (G+Y+Rc), s	-	13.9 6.7		2			18.9					HCM LOS	ပ			0								
Change Period (Y+Rc), s		4.0 4.0		10			3.5																	
Max Green Setting (Gmax), s	ĉ	33.0 14.0	0 21.5	10			39.5					Minor Lane/Maior M/umt	t.	NRI N	NRT NR	NRP FRI n1///RI n1	VRI n1	S IS	CRT CRP	a				
Max Q Clear Time (g c+11). s							4.1						_											
Green Ext Time (p. c). s							2.5					Capacity (veh/h)		1253		- 428	332	1171						
							ì					HCM Lane V/C Ratio		0.02		- 0.201 0.181 0.006	0.181	0.006						
Intersection Summary												HCM Control Delay (s)	_	7.9		- 15.5	₩	8.1	0					
HCM 6th Ctrl Delay		9.8	8									HCM Lane LOS		A	A	ں י		A	A					
HCM 6th LOS		-	A									HCM 95th %tile Q(veh)	-	0.1		- 0.7	0.6	0						
											1													
																							•	

Burbank Avenue Subdivision TIS AM Existing Plus Project

Synchro 10 Report Page 2

Synchro 10 Report Page 1

Burbank Avenue Subdivision TIS AM Existing Plus Project

SEL SBT SBR SEL SBT SBR 93 2 85 5 0 0 5 0 5 1 0 5 1 0 10 1 0 10 2 2 2 93 2 85 1 0 - 1 0 - 1 0 - 1 0 0 2 2 2 93 2 85 1 25 517 1 251 125 517 1 251 125 517 1 251 125 517 1 281 125 126 125 125 125 125 125 125 125 125 125 125	Movement EBL Lane Configurations EBL Lane Configurations EBL Traffic Volume (veh/h) 4 Future Volume (veh/h) 4 Initial O (Da), veh minial O (Da), veh Mor Zone On Approach Mor Zone On Approach Mor Zone On Approach Mor Zone On Approach Mor Zone On Approach Adj Stel Ravie, veh/h Adj Stel Ravie, veh/h Adj Stel Ravie, veh/h Zen Veh, weh/h Stel Flow, veh/h Stel Rowie, veh/h Stel Rowie, veh/h Bit O Servel(2, s), s, 0,0 Prop In Lane Prop In Lane For Di Lane For Di Lane	550 550 550 550 550 550 1.00 1.00 1.00 1		WBT +	WBR NB WBR 14 2 14 2 14 0 0.97 1.0 1.00 1.00
3.8 BL EBT EBR WBL WBT NBL NBT SBL SBT SDT SD		EBT E EBT E 550 550 550 550 550 550 550 100 1100 1	-		
3.8 BL EBT EBL NBL NBT NBT NBT NBT NBT NBT NBT NBT NBT SBL SBT SBR 44 418 7 10 451 131 3 4 10 33 2 85 16 0 3 3 0 0 0 5 5 0 0 ref Free Free Stop		100 100 <th></th> <th></th> <th></th>			
BL EBT WBL WBL NBL		550 550 550 1.00 1.00 1.00 1.00 1.00 1.0			
Na Na <th< td=""><td>, the second sec</td><td>550 1.00 1 1.00 1 1.00 1 550 1 550 1 1.00 1 1.00 1 1.00 1 1.00 1 1.00 1 1.00 1 1.01 1</td><td>,</td><td></td><td></td></th<>	, the second sec	550 1.00 1 1.00 1 1.00 1 550 1 550 1 1.00 1 1.00 1 1.00 1 1.00 1 1.00 1 1.00 1 1.01 1	,		
45 418 7 10 451 131 3 4 10 93 2 85 46 418 7 10 451 131 3 4 10 93 2 85 66 7 10 451 131 3 4 10 93 2 85 66 7 70 451 131 3 4 10 93 2 85 65 7 75 7	te o e e	100 100 100 100 100 100 100 100 100 100	~		
41 7 10 451 13 3 4 10 33 2 85 10 0 3 3 0 0 0 5 5 0 0 10 3 3 0 0 0 5 5 0 0 10 3 3 0 0 0 5 5 0 0 10 10 100	te y te te	1.00 No 1.00 550 550 1.00 1.00 1.07 1.02 1.07 1.03 1.03 1.03 1.03 1.03 1.00 1.777 4.1	· ·		
0 0 3 3 0 0 0 5 5 0 0 00 0 3 3 0 0 0 5 5 0 0 65 - None - None - None - None 65 - 0 - - 0 - - 0 - 66 - - 0 - - 0 - - None 67 - - 0 - - 0 - - None 67 - 0 0 0 100	er se er	1.00 1.00 550 550 1.00 1.07 1.07 1.07 1.07 1.07 1.177 4.1 4.1	~		
Re Free F	년 · · · · · · · · · · · · · · · · · · ·	No 1870 550 1001 1071 0.34 0.34 3169 3169 4.1 4.1 4.1			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	~ E 4	1870 550 550 1001 2 1071 0.34 0.34 3169 3169 4.1 4.1 4.1			
	् म् र	550 1.00 1.07 1071 0.34 0.34 3169 308 1777 4.1 4.1			1870 190
0 - 0 0	् म् र	1.00 2 1071 0.34 0.34 3169 308 1777 4.1 4.1			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$. E 4	2 1071 0.34 3169 3169 4.1 4.1 4.1			1.00 1.0
100 1	ų, s	1071 0.34 3169 308 4.1 4.1 4.1			2
2 2	u a	0.34 3169 308 4.1 4.1 4.1	32 182		7 21
145 418 7 10 451 131 3 4 10 93 2 85 Major1 Major2 Minor1 Minor1 Minor1 Minor1 Minor1 655 517 55 51 517 55 51 51 51 51 51 51 51 51 51 51 51 51 51 51 51 51 51 51 51 52 51 52 52	ų s	308 308 4.1 4.1 4.1			1.0 1.0.1
Major Minori Minori </td <td>ų s</td> <td>1771 1777 1.4 1.4</td> <td></td> <td></td> <td></td>	ų s	1771 1777 1.4 1.4			
Majort Major2 Minor1 Minor2 582 0 0 428 0 0 1256 517 55 57 - - - - - 715 755 517 55 517 - - - - 715 755 517 55 517 - - - - - 715 555 517 55 517 55 - - - - 712 652 6.22 7.12 652 5.22 512 552 - 512 552 - 522 - 126 522 - 126 522 - 522 - 123 536 513 536 518 536 518 536 518 536 518 536 518 536 518 518 518 518 518 518 518 518 518 518	<u>م</u> ا	4.1	83 1781	1777	JAGR 171
582 0 4.28 0 1.25 517 4.30 1.25 517 536 6.12 5.52 5.23 5.23 5.	2	4.1			
- - - 715 715 537 537 - - 15 537 537 - - 15 - - 16 - - 16 - - 17 552 521 537 537 537 537 537 537 537 537 537 537 537 537 537 537 532 532 532 532 532 532 532 532 532 532 532 532 532 532 533 538 173 558 173 558 173 133 18 101 3318 101 3318 101 3318 101 3318 101 3318 101 3318 101 3318 113 111 <td>2</td> <td>- 103</td> <td></td> <td>2.5</td> <td></td>	2	- 103		2.5	
4.12 - - 580 602 - 724 718 - 4.12 - - 7.12 6.52 6.22 - 7.12 6.52 6.22 - 1 - - - - - - 1.12 - - 7.12 6.52 6.12 5.52 - 1 1 - 1 1 - 1	olo) vich/h	504			
4.12 - - 4.12 - - 7.12 6.52 6.22 7.12 6.52 6.22 -<		1.09			
- - - - 6.12 5.52 - </td <td></td> <td>0.51</td> <td>0.52 0.77</td> <td></td> <td></td>		0.51	0.52 0.77		
2218 - - - 6.12 5.52 - - 1 x 992 - - 1318 3.18 3.18 3.18 3.18 1 <t< td=""><td>Avail Cap(c_a), veh/h 833</td><td>1284</td><td></td><td></td><td></td></t<>	Avail Cap(c_a), veh/h 833	1284			
2218 - - 2218 - - 3.518 4.018 3.318 Lver 992 - - 139 157 6.25 147 172 558 - - - - - 4.22 4.34 - 558 16 . - - - - 4.22 4.34 - 558 16 . - - - - 4.22 4.34 - 553 - . - - - - - 500 489 - 417 433 - % - - - - 103 133 621 124 145 568 Liver - - - - 103 133 621 124 145 Liver - - - - - - - 10	j	1.00			
992 - - 139 157 625 147 172 558 - - - - 422 434 - 558 - - - - 422 434 - 558 - - - - 422 434 - 558 - - - - 500 489 - 417 433 - - - - - 500 489 - 417 433 - - - - - - 103 133 621 124 145 558 - - - - 103 133 621 124 145 - - - - - - - - 124 145 -		1.00		1.00	1.00 1.0
422 434 - 528 523 - 500 489 - 417 433 - 992 1128 103 133 621 124 145 558 360 313 - 124 145 - 	eh	7.9		3.2	3.2 1
	ncr Delay (d2), s/veh 0.0	0.7	0.7 2.7	0.2	0.1
992 - - 103 133 621 124 145 558 . - - - 103 133 - 124 145 . - - - 103 133 - 124 145 . - - - - 03 333 - 124 145	nitial Q Delay(d3),s/ven 0.0	0.0	0.0 1 1 0.0	0.0	0.0
	helv	-			2.2
360 370 - 451 518 -		8.6		3.4	3.4 12.
	nGrp LOS A	A	A	A	A
485 - 345 369 -	Approach Vol, veh/h	620		736	
Appros	Approach Delay, s/veh	8.6		5.7	
	Approach LOS	A		A	
rol Delay, s 2.4 0.1 22.2 94	imer - Assigned Phs	2	3 4		
L	² hs Duration (G+Y+Rc), s	9.2 7			
Change	Change Period (Y+Rc), s		4.0 3.5		
VinortaneMajorMvnnt NBLn1 EBL EBT EBR WBL WBT WBRSBLn1 	Aax Green Setting (Gmax), s	33.0 14			
196	viax u clear lime (g_c+l1), s				
0.075 0.146 0.009 0.918	Green Ext lime (p_c), s		0.1 3.4		
lay (s) 22.2 9.2 8.2 94	ntersection Summary				
C A F	HCM 6th Ctrl Delay	2	7.		
HCM 95th %tile Q(veh) 0.2 0.5 0 7.3	HCM 6th LOS		A		

HCM 6th TWSC 3: Burbank Ave &

Synchro 10 Report Page 3

HCM 6th Signalized Intersection Summary

Movement EBL Larne Configurations EBL Larne Configurations (verhh) 4 Future Volume (verhh) 4 Future Volume (verhh) 4 Initial Q (DD), verh 2009 Perking Bus, Adj Vork Zone On Approach 100 Work Zone On Approach 1100 Peak Hour Factor 100 Peak Hour Factor 100 Percent Heavy Verh, % 2 Cap, verh 0.34	EBT EBT 550 100 1870 550 550 550 550 550 550 550 5	۴	\mathbf{Y}	Ŧ	~	4	+	*	۶	-	\mathbf{i}
5	EBT 550 550 550 1870 1870 550					-		•			
5	550 550 0 1.00 1870 550 550	EBK	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
5	550 550 0 1.00 No 1870 550		۴	4 4			¢				
5	550 0 1.00 1870 550	93	141	593	2	143	-	108	0	0	0
5	0 1.00 No 1870 550	93	141	593	2	143	-	108	0	0	0
5	1.00 No 1870 550	0	0	0	0	0	0	0			
5	1.00 No 1870 550	0.96	1.00		0.97	1.00		1.00			
5	No 1870 550	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
	1870 550			٩			٩ ۷				
	550	1870	1870	1870	1870	1900	1870	1900			
		68	141	593	2	143	-	59			
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
	2	2	2	2	2	0	2	0			
	1071	132	182	2087	2	210	-	87			
	0.34	0.34	0.10	0.57	0.57	0.17	0.17	0.17			
	3169	390	1781	3632	12	1210	œ	499			
Grp Volume(v), veh/h 2	308	310	141	290	305	203	0	0			
,veh/h/In	1777	1783	1781	1777	1868	1718	0	0			
	4.1	4.2	2.3	2.5	2.5	3.3	0.0	0.0			
Cycle Q Clear(g_c), s 0.0	4.1	4.2	2.3	2.5	2.5	3.3	0.0	0.0			
		0.22	1.00		0.01	0.70		0.29			
Lane Grp Cap(c), veh/h 519	601	603	182	1021	1073	298	0	0			
	0.51	0.52	0.77	0.28	0.28	0.68	00.0	0.00			
Avail Cap(c_a), veh/h 833	1284	1288	838	2359	2480	1905	0	0			
j	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
	1.00	1.00	1.00	1.00	1.00	1.00	00.0	00.0			
eh	7.9	7.9	13.0	3.2	3.2	11.5	0.0	0.0			
Incr Delay (d2), s/veh 0.0	0.7	0.7	2.7	0.2	0.1	1.0	0.0	0.0			
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln 0.0			0.8	0.3	0.3	1.0	0.0	0.0			
ay, s/veh											
LnGrp Delay(d),s/veh 6.5	8.6	8.6	15.7	3.4	3.4	12.6	0.0	0.0			
	A	A	m	A	A	m	A	A			
Approach Vol, veh/h	620 8 0			736			203				
Approach Delay, s/veh	8.6			5.7			12.6				
Approach LOS	A			A			р				
Timer - Assigned Phs	2	3	4				80				
Phs Duration (G+Y+Rc), s	9.2	7.0	13.6				20.6				
Change Period (Y+Rc), s	4.0	4.0	3.5				3.5				
Max Green Setting (Gmax), s	33.0	14.0	21.5				39.5				
Max Q Clear Time (g_c+l1), s	5.3	4.3	6.2				4.5				
Green Ext Time (p_c), s	0.9	0.1	3.4				4.0				
Intersection Summary											
		~ ~									
		1.1									
HCM 6th LOS		A									

Synchro 10 Report Page 1

Burbank Avenue Subdivision TIS PM Existing Plus Project

Burbank Avenue Subdivision TIS AM Existing Plus Project

HCM 6th TVSC Burbank Ave & Hughes Ave 33: 1	HCM 6th TWSC 3: Burbank Ave & Hearn Ave	learn Ave				0	10/17/2019
Intersection 2.4 Int Delay, siveh 2.4	Intersection Int Delay, s/veh 9.5	2					
Movement EBL EBT EBR WBL WBT WBL NBT NBR SBL SBT SBR	Movement EBL	. EBT EBR	WBL WBT	WBR NBL NBT	BT NBR SBL SBT	BT SBR	
ns ቆ ቆ ቆ	su	¢					
24 15 15 6 13 6 29 201 13 18 213 22		361 261	35 534		35 70	13 75 10 75	
		105		2	5,		
	Conflicting Peds, #/hr 0	0 Z 0	2 0 Emo Emo		Cton Cton	Chr Cton	
and sup sup sup sup reterret reterret reterret and sup		LIEU LIEU		doic	None -		
			1	- AION			
· · · · · · · · · · · · · · · · · · ·	Storage Length 00		· 0				
	Crado %		- -			- -	
Feature 100 100 100 100 100 100 100 100 100 10	Deak Hour Factor 100	001	100 100	100	100 100		
				000	001 0	00 00	ľ
24 15 15 6 13 6 29 201 13 18 213 22		361	5	Ì	35 70		
							Ĺ
MaiorMinor Minor? Minori Maiori Maior? Maior	Maior/Minor Major1		Maior2	Minor1	Minor		
	In All	6	380	0 1050 1077	272	11 BOB	
240 231 22 240 240 240 0 240 0 214 0 0 264 265 266 266 240 1 214 0 0					0771 C/C		
203 203 - 200 276 379 - 276	Stare 2				- 662	538 -	
	Critical Hduny 19		1 1 2 -		6 20 7 10	6.9	
	Sta 1		 	- 6.12 5.52	- 6.12	5.52 -	
6.12 5.52 - 6.12 5.52	Critical Hdwv Sta 2		•	- 6.12 5.5			
3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218	Follow-up Hdwy 2.218		2.218 -	- 3.518 4.01	3.518 4.018 3.318 3.518 4.01	ŝ	Ĺ
uver 453 450 810 452 447 832 1327 1356	Pot Cap-1 Maneuver 915		- 1178 -	- 150 16		182 497	
740 689 - 739 689		•	•		- 443	453 -	
731 685 - 731 682	Stage 2	•	1	- 419 42	420 - 518 52	522 -	
		•	•				
424 431 807 419 428 832 1321 1356	Nov Cap-1 Maneuver 915	•	1176 -	- 109 14	671 126	161 497	
neuver 424 431 - 419 428	Jeuver		•		- 126		1
	Stage 1		•	- 486 48	405	439 - 435	
034 000 - 031					- 40/	- 0	
	- CD		O/M	Q	5		Ì
tri Dalav s 13.2 19.9 0.0 0.0	trul Delavis		04	24.6	67.8		
		•		0	, LL		Ĺ
Miror LaneMajor Mvmt NBL NBT NBR EBL/11/WBLr/1 SBL SBR	Minor Lane/Major Mvmt	NBLn1 EBL	EBT EBR WBL	WBT	WBR SBLn1		
1321 491 482 1356	Capacity (veh/h)			- 1176 -	- 201		
0.022 - 0.11 0.052 0.013	HCM Lane V/C Ratio	Ö		0.03 -	- 0.786		
lay (s) 7.8 0 - 13.2 12.9 7.7 0 -	HCM Control Delay (s)	റ	1	8.2 -	- 67.8		
A A ' B B A A '	HCM Lane LOS		•		ш,		1
	HCM 95th %tile Q(veh)	0.9 0.3	•	0.1 -	- 5.5		

Burbank Avenue Subdivision TIS PM Existing Plus Project

Synchro 10 Report Page 2

Burbank Avenue Subdivision TIS PM Existing Plus Project

EBL EBT EBR WBL WBT V 2 434 105 143 442 2 434 105 143 442 0 0 0 10 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1100 100 100 100 100 100 2 434 81 143 442 2 <th>NBL N 241 241 241 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.</th> <th>NB 252 262 262 110 110 110 110 110 100 00 00 00 00 00</th> <th>SBL SBT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</th> <th>Intersection Electron Int Delay, s/veh 3.2 Movement EBL Lane Configurations 29 Future Vol, veh/h 29 Future Vol, veh/h 29 Conflicting Peets, #Inr 2 Sign Control Stop Sign Control Stop Reade Vehicles, % - Peak Hour, Factor 100 Heavy Vehicles, % 2 Mont Flow 29 Major/Mint Flow 29 Conflicting Flow Min 24 343</th> <th>EBT EBR WBL WBT WBR NIN </th> <th>NBT NBR SBL SBT 5 44 44 7 315 44 5 418 14 7 315 6 418 14 7 315 7 6 418 14 7 315 6 10 0 0 0 0 0 7 Free Free Free Free Free Free Free 7 7 0 0 100 14 7 315 15 15 16 16 16 16 16 16 16 16 16 16</th> <th>RB 25 56 60 10 25 25 25 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2</th>	NBL N 241 241 241 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	NB 252 262 262 110 110 110 110 110 100 00 00 00 00 00	SBL SBT 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Intersection Electron Int Delay, s/veh 3.2 Movement EBL Lane Configurations 29 Future Vol, veh/h 29 Future Vol, veh/h 29 Conflicting Peets, #Inr 2 Sign Control Stop Sign Control Stop Reade Vehicles, % - Peak Hour, Factor 100 Heavy Vehicles, % 2 Mont Flow 29 Major/Mint Flow 29 Conflicting Flow Min 24 343	EBT EBR WBL WBT WBR NIN	NBT NBR SBL SBT 5 44 44 7 315 44 5 418 14 7 315 6 418 14 7 315 7 6 418 14 7 315 6 10 0 0 0 0 0 7 Free Free Free Free Free Free Free 7 7 0 0 100 14 7 315 15 15 16 16 16 16 16 16 16 16 16 16	RB 25 56 60 10 25 25 25 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
Iors 1	241 241 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.				EBT EBR WBL WBT WBR WBR WBT WBR WBT	NBT NBR SBL SBT 4 18 14 7 315 5 418 14 7 315 6 18 14 7 315 6 18 14 7 315 9 16 0 0 0 0 9 Free Free Free Free Free 10 100 100 100 100 100 2	
veh(h) 2 434 105 143 442 pbT) 0.99 0.95 1.00 0 0 pbT 0.99 0.95 1.00 100 100 pbT 0.97 1870 1870 1870 1870 1870 pbPnoach 1370 1870 1870 1870 1870 1870 pbPnoach 100 1.00 1.00 1.00 1.00 1.00 pbPnoach 1870 1870 1870 1870 1870 1870 pbPnoach 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 pbPnoach 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 <td< td=""><td>241 241 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.</td><td></td><td></td><td>W subscription with the second s</td><td>EBT EBR WBI WBT WBT WBT 17 40 32 19 9 17 40 32 19 9 17 40 32 19 9 17 40 32 19 9 180 Stop Stop Stop Stop 10 19 0 0 0 0 2 10 0 0 0 0 - 10 10 100 100 100 100 11 40 32 19 9 9 117 40 32 19 9 9 117 40 32 19 9 9 1352 - 366 394 427 - 655 6.12 6.12 6.22 - -</td><td>NBT NBR SBL SBT 4 1 7 315 5 418 14 7 315 6 418 14 7 315 7 10 0 0 0 0 8 418 14 7 315 14 8 10 0</td><td>м</td></td<>	241 241 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.			W subscription with the second s	EBT EBR WBI WBT WBT WBT 17 40 32 19 9 17 40 32 19 9 17 40 32 19 9 17 40 32 19 9 180 Stop Stop Stop Stop 10 19 0 0 0 0 2 10 0 0 0 0 - 10 10 100 100 100 100 11 40 32 19 9 9 117 40 32 19 9 9 117 40 32 19 9 9 1352 - 366 394 427 - 655 6.12 6.12 6.22 - -	NBT NBR SBL SBT 4 1 7 315 5 418 14 7 315 6 418 14 7 315 7 10 0 0 0 0 8 418 14 7 315 14 8 10 0	м
vehich) 2 434 105 133 442 nh 0 0 0 0 0 0 pb1) 1.00 1.00 1.00 1.00 1.00 1.00 hybroach No 0.95 1.00 1.00 1.00 1.00 hhinn 1870 1870 1870 1870 1870 1870 ehh 2 434 81 1.43 442 2.2 2	241 241 1.00 1.00 180 1.00 1.00 1.00 1.00 1.00			W su	4 4 4 4 4 4 4 5 4 9 10 <t< td=""><td>45 14 7 315 6 418 14 7 315 6 418 14 7 315 7 316 14 7 315 8 418 14 7 315 9 Free Free Free Free 1 None - - - 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1100 100 100 100 100 110 0 0 418 14 7 111 7 315 2 2 2 110 100 100 100 10 10 111 7 315 2 2 2 2 111 114 7 315 1 2 2</td><td></td></t<>	45 14 7 315 6 418 14 7 315 6 418 14 7 315 7 316 14 7 315 8 418 14 7 315 9 Free Free Free Free 1 None - - - 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1100 100 100 100 100 110 0 0 418 14 7 111 7 315 2 2 2 110 100 100 100 10 10 111 7 315 2 2 2 2 111 114 7 315 1 2 2	
m 0	$\begin{array}{c} 1.00\\ 1.00\\ 1.00\\ 1.00\\ 1.00\\ 1.00\\ 1.00\\ 1.00\\ 1.00\\ 2.25\\ 0.25\\ 0.32\\ 0.32\\ 0.32\\ 0.1009\\ 1.009\\ 1.009\\ 1.009\\ 1.009\\ 1.009\\ 1.009\\ 1.009\\ 1.009\\ 1.009\\ 1.000\\ 1$			W wade,	17 40 32 19 9 17 40 32 19 9 17 40 32 19 9 17 40 32 19 9 19 10 10 10 10 10 10 100 100 100 100 100 10 100 100 100 100 100 17 40 32 19 9 3 834 38 845 83 427 3 352 370 364 - - - 652 6.22 7.12 6.52 - - 655 - 6.12 5.52 - - -	418 14 7 315 316 316 316 316 316 316 316 316 311	
pb1) 0.99 0.95 1.00 Qpnoach 1.00 1.00 1.00 1.00 Qpnoach No No 1.00 1.00 1.00 Aphnach 1870 1870 1870 1870 1870 Anklin 1870 1870 1870 1870 1870 Ark 12 2.434 81 1.43 442 Ark 2 2.43 81 1.43 442 Ark 2.2 2	1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00			W wrage,	17 40 32 19 9 10 0 0 0 2 9 10 Stop Stop Stop Stop Stop Stop Stop 19 9 10 Stop Stop Stop Stop Stop 10 2 10 10 10 100 100 100 100 10	5 418 14 7 315 0 0 0 0 0 0 Free Free Free Free 1 None - - - - 1 None - - - - - 1 0 0 - - 0 - - - - - - - - - - - - 0 0 100 114 7 315 115 116 116 116 116 116 116 116 116 116 116 116 116 116 116 116 116 116 116 116	90 0 0 ' ' ' O N 0 O ' ' '
I 1.00 1.	1,00 1 1900 11 241 1 1.00 1 1.00 1 325 0 0.32 0 10.32 0 10.32 0 10.32 0 10.32 0 10.32 0 1692 8 1 8 1 8 3 1 8 1 1470 0 1470 0			#/hr	0 0 0 0 2 Slop Slop Slop Slop Slop Slop I - - - - - None - - - - - - None - - - - - - - 0 - - 0 - - - - 0 - - 0 10 100	0 0	
Oppoach No No Mhlin 1870 1870 1870 1870 Mhlin 1870 1870 1870 1870 Mhlin 1870 1870 1870 1870 Min 1.00 1.00 1.00 1.00 1.00 Min 1.00 1.00 1.00 1.00 1.00 1.00 Min 2.2 2 2 2 2 2 2 Min 4.4 8.5 1.9 1.60 1.00 1.00 Min 0.27 0.27 0.27 0.10 0.48 Min 0.27 0.27 0.27 0.10 0.48 Min 0.27 0.27 0.10 0.48 3637 Weihlin 2 268 2549 1771 174 1771 Weihlin 9.3 2777 14.3 716 1771 1771	1900 18 241 241 1.00 1 325 0 325 0 325 0 1009 1009 1009 1009 1009 1009 1009 1009 1009 1009 1009 1009 1000 1000			s age	Stop Stop Stop Stop Stop Stop Stop Stop Ione - None - - None - - None - </td <td>Free Free <th< td=""><td></td></th<></td>	Free Free <th< td=""><td></td></th<>	
Inhula 1870 1771 1741 1771 <	1900 1 241 2 325 0 325 0 325 0 1009 1 1892 8 1 8.1 8 8.1 8 8.1 8 8.1 8 1470 0 74 (W uade	- None - None - - - 0 - - 0 - - 0 - 100 100 100 100 100 100 17 40 32 19 9 834 38 845 839 427 652 - 370 364 - 655 - 370 364 - 655 - 612 552 -	Mone None - 0 0 - 100 100 100 100 100 100 101	
Hih 2 434 81 143 442 or 1.00 1.00 1.00 1.00 1.00 /eh/% 2 2 2 2 2 2 /eh/% 444 805 149 186 1749 0 0.27 0.27 0.27 0.38 0.48 0 0.28 549 1781 3637 veh/hin 939 1777 144 1781 1777 0.1 0.1 4.7 4.8 3.0 2.7	241 1.00 0.32 0.32 0.32 1009 1009 1692 8.1 8.1 8.1 8.1 8.1 1470 0.74 (1470			Wit.	Minori Minori Ma 652 6.22 7.12 6.52 - 100 100 100 100 100 100 117 40 32 19 9 9 117 40 32 19 9 9 117 40 32 19 9 427 117 40 32 19 9 427 1252 - 370 364 - - 1352 - 3712 652 622 - 1352 - 3712 652 -<	- - - 0 - 0 - - 0 0 100 100 100 100 2 2 2 2 2 418 14 7 315 0 0 0 432 0 0 0 0 432 0 - - - - - - - - - - - -	
m 1.00 1.	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00			Vehini Median Storage, # - Vehini Median Storage, # - Feak Hour Factor 100 Heavy Vehides, % 29 Mvmt Flow 29 Conflicting Flow 10 843 Conflicting Flow 10 843 Staae 1 322	0 - 0 - 0 - 0 - 0 - 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100	0 - - 0 0 - - 0 100 100 100 100 2 2 2 2 418 14 7 315 1 0 0 432 0 0 0 0 432 0 0 0 0 4422 0 15 - - - - 16 - - - - -	
(eh, % 2 2 2 2 2 2 2 2 2 2 2 2 14 36 37 36 36 36 36 36 36 36 36 36 36 36 36 36 37 36 36 36 37 36 37 36 37 36 37 36 37 36 37 36 37 36 37 36 37 37 37 37 37 37 37 37 37 37 37 36 37	0 325 0.32 (1009 1009 404 1692 8.1 8.1 8.1 8.1 8.1 1470 0.74 (1470			Grade, % Grade, % Peak Hour Factor 100 Heavy Vehides, % 29 Munti Flow 29 Major/Minor Minor Conflicting Flow All 843 Stade 1 322	0 - - 0 - 100 100 100 100 100 100 17 40 32 19 9 9 834 3845 839 427 - - 835 - 475 475 - - 652 - 370 364 - - 652 - 370 364 - - 655 - 371 552 - - -	0 - - 0 0 100 100 100 2 2 2 2 418 14 7 315 Major2 0 432 0 0 0 0 432 0 1 - - - - 1 - - - - 1 - - - - - 1 - - - - - -	
444 805 149 186 1749 0 0.27 0.27 0.27 0.48 333 2968 549 1781 3537 vehhh 2 258 557 143 216 vehhlin 939 1777 1741 1781 1777 vehhlin 939 1777 143 1777 216 vehhlin 939 1777 143 1777 216 vehhlin 939 1777 143 216 217	325 0.32 (0.32 (1009 1692 8.1 8.1 8.1 8.1 8.1 8.1 0.60 544 (0.74 (1470			Mir	100 100 <td>100 100 100 100 2 2 2 2 2 5 418 14 7 315 Major2 0 0 432 0 0 0 432 0 - - - - - - - - - - - - - - - - - - - - - - - -</td> <td></td>	100 100 100 100 2 2 2 2 2 5 418 14 7 315 Major2 0 0 432 0 0 0 432 0 - - - - - - - - - - - - - - - - - - - - - - - -	
0.27 0.27 0.27 0.28 0.48 939 2968 549 1781 3637 vehlh 2 258 257 143 3637 vehlh 93 2368 549 1781 3637 vehlh 93 236 257 143 276 vehlhin 93 1777 144 1781 1776 0.1 4.7 4.8 3.0 2.7	0.32 (0 1009 (1009			Mir	Ninor1 Ninor Ninor Ninor <td>No No No No 5 418 14 7 315 6 418 14 7 315 0 0 0 432 0 0 0 0 432 0 1 - - - - 2 - - - - 2 - - - - - 2 - - - - - - 2 - - - - - - - - 2 -</td> <td></td>	No No No No 5 418 14 7 315 6 418 14 7 315 0 0 0 432 0 0 0 0 432 0 1 - - - - 2 - - - - 2 - - - - - 2 - - - - - - 2 - - - - - - - - 2 -	
939 2968 549 1781 3637 veh/h 2 258 257 143 216 veh/h/ln 939 1777 1741 1781 1777 0.1 4.7 4.8 3.0 2.7	1009 404 1692 8.1 8.1 8.1 0.60 544 0.74 1470			Wi	1 2 2 2 2 1 1 4 3 2 2 3 1 1 3 2 1 9 3 1 40 3 2 4 3	2 2 2 2 6 418 14 7 315 1 Malor2 0 0 0 0 0 0 432 0 - - - - - 0 - 432 0 - - - - - - - - - - - - - - - - - - - - - - - -	
velvln 2 258 257 143 216 velvlnln 939 1777 1741 1781 1777 0.1 4.7 4.8 3.0 2.7	404 1692 8.1 8.1 8.1 0.60 544 0.74 1470			Wi	11 40 32 19 9 11 40 32 19 9 11 815 839 427 33 12 352 - 475 475 - 1352 - 475 475 475 - 1352 - 472 364 - - 1482 - 370 364 - - 1552 - 612 652 2.22 - 1552 - 612 5.52 - -	410 14 7 515 Major2 0 0 0 0 432 0 4.12	
939 1777 1741 1781 1777 0.1 4.7 4.8 3.0 2.7	1692 8.1 8.1 8.1 8.1 6.0 544 0.74 1470			W	Minori Minori Minori Minori Minori 332 a 845 839 427 33 3352 - 475 475 482 - 370 364 - 652 6.22 7.12 6.52 6.22 4. 5552 - 6.12 5.52 -	Major2 0 0 0 432 2 - 4,12	
0.1 4.7 4.8 3.0 2.7	8.1 8.1 544 0.74 (1470			M	Minori Minori 834 338 445 839 447 33 352 347 475 475 47 3 482 370 364 - - - 652 6.22 712 6.52 6.22 4 652 - 6.12 5.52 - 6.12 5.52 - 652 - 6.12 5.52 - 6.12 5.52 -	Major2 0 0 0 432 2 - 4,12	
	8.1 0.60 544 0.74 (338 845 839 427 3 - 475 476 - - 370 364 - - 370 364 - 6.22 7.12 6.52 6.22 4. - 6.12 5.52 - - - 6.12 5.52 - -	0 0 432 4.12 	0
4.7 4.8 3.0 2.7	0.60 544 0.74 (1470				- 475 475 - - 370 364 - 6.22 7.12 6.52 6.22 4. - 6.12 5.52 - - 6.12 5.52 -		
1.00 0.32 1.00	544 0.74 1470				- 370 364 - 6.22 7.12 6.52 6.22 4. - 6.12 5.52 - - 6.12 5.52 -		
o(c), veh/h 444 482 472 186 854	0.74 1470				6.22 7.12 6.52 6.22 4. - 6.12 5.52 - - 6.12 5.52 -	4.12 	
0.00 0.54 0.54 0.77 0.25	1470			Critical Hdwy 7.12	- 6.12 5.52 - - 6.12 5.52 -		
/h 721 1006 985 657 1848					- 6.12 5.52 -		
io 1.00 1.00 1.00 1.00 1.00	1.00			g 2		•	
1.00 1.00	00 1.00 0.00	<u> </u>			4.018 3.318 3.518 4.018 3.318	•	
eh 10.1 11.8 11.8 16.6 5.8	11.5			neuver	304 704 283	99 1128 -	
0.0 0.9	0.8	0.0 0.0		Stage 1 665	632 - 570		
0.0 0.0 0.0 0.0 0.0	0.0) 553 - 650 624 -		
0.0 1.6 1.6 1.2 0.7	2.5	0.0 0.0				•	
ay, s/veh				Mov Cap-1 Maneuver 256	291 698 248	99 1128 -	
y(d),s/veh 10.1 12.7 12.8 19.1 6	12.2	0.0 0.0		neuver	291 - 248	• • • •	
B B B B A	в	A A		Stage 1 642	6222 - 555 542 -	•	
	40	404		Stage 2 516	538 - 591 614 -	•	
r, s/veh 12.8	12	12.2					
Approach LOS B A		в		Approach EB	WB	NB SB	
imer - Assianed Phs 2 3 4		8		HCM Control Delay. s 17.4	20.8	0.4 0.2	
	21	8		HCM LOS C			
40 40	3.5	i re					
v) s 33.0 v	2 Q						
101	~	2.		Minor Lane/Major Mvmt	NBT NBR EE	BL SBT SBR	
10.0	t c	-:+ 0 C		Capacity (veh/h)	•	28	
1.9 0.1	7	0		HCM Lane V/C Ratio	0.229 0.209 0		
ntersection Summary				HCM Control Delay (s)	- 17.4	.2 0 -	
				HCM Lane LOS	ပ	A A -	
HCM 6th LOS B				HCM 95th %tile Q(veh)	0.1 0.9 0.8	0	

Synchro 10 Report Page 2

Burbank Avenue Subdivision TIS AM Background Plus Project

Burbank Avenue Subdivision TIS AM Background Plus Project

Synchro 10 Report Page 1

	Ave
	Hearn
с	8
TWSC	nk Ave
1 6th -	bai
HCM	3: Bur

tersection													
t Delay, síveh	41.1												
ovement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
ane Configurations	*	÷		*	÷			¢			¢		
affic Vol, veh/h	158	418	2	9	451	159	ო	17	9	115	33	95	
uture Vol, veh/h	158	418	7	9	451	159	ო	17	9	115	13	95	
onflicting Peds, #/hr	0	0	ო	ო	0	0	0	0	2	2	0	0	
gn Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
T Channelized	1	1	None	1	1	None	1	1	None	1	1	None	
torage Length	65	'	•	75	•	'	'	'	•	'	'	•	
eh in Median Storage,	· # "	0	'	1	0	1	'	0	'	1	0	•	
rade, %	'	0	'	1	0	'	'	0	1	'	0	•	
eak Hour Factor	100	100	100	10	100	100	100	100	100	100	100	100	
eavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
vmt Flow	158	418	7	9	451	159	ო	17	9	115	13	95	
ajor/Minor N	Major1		2	Major2		2	Minor1		2	Minor2			
onflicting Flow All	610	0	0	428	0	0	0 1346	1371	430	430 1307	1295	531	
Stage 1	1	1	1	1	1	1	741	741	1	551	551	•	
Stage 2	'	'	'	•	'	•	605	630	'	756	744	•	
ritical Hdwy	4.12	1	1	4.12	1	1	7.12	6.52	6.22	7.12	6.52	6.22	
ritical How Sto 1	'	'	•	'	•	'	612	5.52	•	612	5.52		

Intersection													
Int Delay, s/veh	41.1												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	۴	÷		*	æ			¢			¢		
Traffic Vol, veh/h	158	418	2	9	451	159	e	17	9	115	9	95	
Future Vol, veh/h	158	418	7	9	451	159	ო	17	6	115	13	95	
Conflicting Peds, #/hr	0	0	ო	ო	0	0	0	0	2	5	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	1	1	None	1	1	None	1	1	None	1	1	None	
Storage Length	65	'	'	75	1	•	'	'	•	•	'		
Veh in Median Storage,	' #``	0	'	'	0	1	'	0	1	1	0	•	
Grade, %	1	0	1	'	0	1	'	0	1	'	0		
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	158	418	2	9	451	159	e	17	9	115	13	95	
Major/Minor N	Major1			Major2		-	Minor1		Z	Minor2			
Conflicting Flow All	610	0	0	428	0	0	1346	1371	430	1307	1295	531	
Stage 1	1	1	1	1	1	1	741	741	1	551	551		
Stage 2	'	'	'	'	'	'	605	630	'	756	744		
Critical Hdwy	4.12	1	1	4.12	1	1	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	'	'	'	'	'	'	6.12	5.52	'	6.12	5.52	,	
Critical Hdwy Stg 2	1	1	1	1	1	1	6.12				5.52		
Follow-up Hdwy	2.218	1	1	2.218	1	1	3.518				4.018	3.318	
Pot Cap-1 Maneuver	696	1	1	1131	1	1	128	146	625	137	162	548	
Stage 1	1	1		•	•		408	423	•	519	515		
Stage 2	1	1	1	1	1	1	485	475	1	400	421		
Platoon blocked, %		1	1		1	1							
Mov Cap-1 Maneuver	696	'	1	1128	'	1	85	121	621	~ 104	134	548	
Mov Cap-2 Maneuver	1	1	1	1	1	1	85	121	•	~ 104	₽	•	
Stage 1	1	1	1	1	1	1	341	353	ł	434	510		
Stage 2	1	1	1	'	1	1	387	471	•	312	352	•	
Approach	B			WB			NB			SB			
HCM Control Delay, s	2.6			0.1			33.5			256.7			
HCM LOS										ш			
Minor Lane/Major Mvmt		NBLn1	EBL	EBT	EBR	WBL	WBT	WBR SBLn1	SBLn1				
Capacity (veh/h)		156	696	1	1	1128	1	1	162				
HCM Lane V/C Ratio		0.192	o.	1	1	0.009	1	1	1.377				
HCM Control Delay (s)		33.5	9.4	1	1	8.2	1	1	- 256.7				
			<			<			ц				

				ed *: All major volume in platoon
- 256.7	ш	13.7		fined
1	•	1		Not De
÷	•	÷		tation I
8.2	A	0		+: Computation Not Defined
÷	'	÷		+ s
ł	•	ł		\$: Delay exceeds 300s
9.4	∢	0.6		y exce
33.5 9.4		0.7		\$: Dela
HCM Control Delay (s)	HCM Lane LOS	HCM 95th %tile Q(veh)	Notes	~: Volume exceeds capacity

Burbank Avenue Subdivision TIS AM Background Plus Project

Synchro 10 Report Page 3

10/29/2019

Movement EBL Lane Configurations EBL Lane Configurations 4 Future Volume (veh/h) 4 Future Volume (veh/h) 4 Initial O (Db), veh (h) 0 Ped-Bike Adj Apr) 1,00 Parking Bus, Adj Work Zone On Approach 1,00 Adj Flow Rate, veh/h 120 Adj Flow Rate, veh/h 220	1	t	-	\$	Ļ	~	•	•	•	۶	-	\mathbf{F}
5		EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
		4		۴	414			Ą				
ch th		601	106	158	643	2	157	-	124	0	0	0
ach		01	106	158	643	2	157	-	124	0	0	0
ach	~	0	0	0	0	0	0	0	0			
ach 1			0.96	1.00		0.97	1.00		1.00			
ach 1	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
		S S	010	0101	ON OF C	0101	0001	ON OF	0001			
		18/0	18/0	18/0	18/0	18/0	1900	18/0	1900			
		109	81	158	643	2 00 7	15/	- 00	G/			
Percent Heavy Veh % 2		00.1	0.1	00.1	00.1	00.1	0. 0	00.1	0.0			
		1071	144	206	2099	1 -	227	1 ←	108 108			
Green (0.34	0.34	0.12	0.58	0.58	0.20	0.20	0.20			
		3132	421	1781	3633		1153	7	551			
veh/h		340	342	158	314	331	233	0	0			
veh/h/ln		1777	1776	1781	1777	1868	1712	0	0			
		5.2	5.2	2.9	3.0	3.0	4.2	0.0	0.0			
rr(g_c), s		5.2	5.2	2.9	3.0	3.0	4.2	0.0	0.0			
			0.24	1.00		0.01	0.67		0.32			
Lane Grp Cap(c), veh/h 484		608	607	206	1027	10/9	336	0 0	0 0			
		0.56	0.56	0.//	0.31	0.31	0.69	0.00	0.00			
Avall Cap(c_a), vervri 123 UCM Platear Datia 100			140	10/		1 222						
I Instream Filter(I) 1 00			00.1	0. I	00.1	001	00.1	000	000			
Uniform Delay (d), s/veh 7.2		8.9	8.9	14.3	3.6	3.6	12.4	0.0	0.0			
		0.8	0.8	2.3	0.2	0.2	1.0	0.0	0.0			
he		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%), veh/ln 0.0		1.5	1.5	1.0	0.4	0.5	1.4	0.0	0.0			
ay, s/veh												
y(d),s/veh 7.		9.7	9.7	16.5	3.8	3.8	13.4	0.0	0.0			
LINGED LOS		A	A	m	A	A	m	A	A			
		004 0 1			000			007				
Approach Delay, siven Approach LOS		- A			0. A			2 2 4				
			¢									
Timer - Assigned Phs		2	m	4				×				
Phs Duration (G+Y+Rc), s	7	10.5	7.8	14.9				22.7				
Change Period (Y+Rc), s		4.0	4.0	3.5				3.5				
Max Green Setting (Gmax), s	τ, τ	33.0 î î	14.0	21.5				39.5				
Max & Clear Time (g_c+I1), s		2.0	4.9	7.2				5.0				
Green Ext lime (p_c), s		1.0	0.1	3.7				4.4				
Intersection Summary												
HCM 6th Ctrl Delav			8.6									
HCM 6th LOS			A									

Burbank Avenue Subdivision TIS PM Background Plus Project

TWSC	ink Ave & Hughes Ave	
HCM 6th TM	2: Burbank A	

ntersection													
nt Delay, síveh	2.3												
Aovement	EBL	EBT	EBR	EBR WBL WBT WBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
ane Configurations.		¢			¢			¢			¢		
raffic Vol, veh/h	24	15	15	9	3	9	29	231	13	9	243	22	
⁻ uture Vol, veh/h	24	15	15	9	13	9	29	231	13	9	243	22	
Conflicting Peds, #/hr	0	0	0	0	0	0	5	0	0	0	0	2	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	1	1	None	1	1	None	1	1	None	1	1	None	
storage Length	•	•	1	•	•	•	•	•	•	•	•	•	
/eh in Median Storage, #	' #	0	1	1	0	•	1	0	1	1	0	1	
Srade, %	1	0	•	1	0	1	•	0	•	1	0	•	
beak Hour Factor	100	10	100	100	100	10	100	100	100	100	10	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Avmt Flow	24	15	15	9	13	9	29	231	13	40	243	22	

2.3 EBL 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4 2.4	EBR 15 15 15 15 15 15 15 15 15 15 15 15 15	WBL V 6 6 6 0 100 100 100 6 110 6 12 5 6 12 6 12 6 12 6 6 12 6 6 6		WBR 66 66 66 66 66 66 66 00 00 00 00 00 00	NBL 1 29 29 5 29 29 20 2 29 20 29 270 270 270	NBT 233 233 4 100 0 0 1 1 100 2 2 2 2 2 2 2 2 2 2 2 2	NBR 13 13 13 13 13 13 13 13 13 13 13 13	SBL 18 18 18 18 7 10 10 10 10 10 244 244 244		SBR 22 22 22 22 5 5 5 6 7 100 100 22 22 22 22	
EBL s 24 bhr 24 24 24 36p - 24 36p - 24 24 24 24 24 24 24 23 24 23 25 260 295 295 212 305 23513 4	EBR 15 15 15 15 15 15 15 15 15 15 15 15 15						NBR 13 13 13 100 100 13 13 13 13	SBL 18 18 18 18 18 10 100 100 100 2 18 244 244		SBR 22 22 5 5 5 5 7 6 0 0 0 0	
s 24 24 24 24 80p 80p 24 24 24 24 235 600 800 800 805 805 805 805 805 805 805 8	15 15 2 0 2 Stop 2 2 2 2 2 2 59 259 259 2 55 15 15 15 15 15 15 15 15 15 15 15 15						13 13 13 13 100 100 13 13 13 13	18 18 Free 100 100 244 244		22 22 5 5 5 7 6 7 100 2 22 22 22 0	
24 bhr 24 Stop 24 	15 15 15 15 15 15 100 100 100 15 15 15 15 15 15 15 15 15 15 15 15 15						13 13 13 100 100 13 13 13 13	18 18 Free 18 100 100 100 12 244 1		22 22 22 22 10, , , , , , , , , , , , , , , , , , ,	
24 br 0 Stop Stop - - - - - - - - - - - - - - - - - - -	15 8top None 100 100 15 15 15 15 15 15 15 15 15 15 15 15 15						13 13 100 100 100 100 100 100 100 100	18 6 7 7 7 100 100 100 100 2 11 100 244 1		22 5 5 100 100 2 2 2 2 2 2 2 2 2 2 2 2 2 2	
hr 0 Stop age, # 102 24 24 24 260 295 205 5.12 261 261 261 265 305 5.35	0 Stop None 100 100 15 15 2 259 259 6.22						0 None 100 13 13 13	0 Free - 100 2 24 244 		5 Free 100 22 22 0	
Stop 100 24 24 24 24 24 24 24 24 24 25 24 26 20 205 205 212 212 212 212 212 212 212 21	Stop None 100 15 15 15 15 15 15 15 15 15 15 15 15 15			5			Free None 100 100 100 100 100 100 100 100 100 10	Free		Pree None 100 22 22 0	
	None 100 15 15 259 259 6.22			one			None 100 100 130 130 130 130 130 130 130 130			None 100 22 22 0	
					2 2 29 2300-1	0 0 0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 100 243 243	0 22 0	
age, #	100 100 150 259 159 6.22				2 - 29 - 210 - 210	0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			0 100 243 243	0 22 0 0	
100 2 24 24 000 600 7.12 6.12 6.12 6.12 6.12 8.18	100 100 15 15 15 15 6.22		Ű	100 2 6 238 238 3.22 -	- 100 2 29 270 270 	0 100 2 31 2 33 2 33 2 31		- 100 2 18 18 244 244	0 100 243 243	100 2 22 0	
100 2 24 000 600 7.12 6.12 6.12 6.12 8.18	100 15 15 259 259 6.22 6.22		Ű,	100 6 0 238 238 .238 .22	100 2 29 29 270 4.12	100 2 231 0		100 2 18 18 244 244	100 2 243	100 22 0	
2 24 000 600 6.12 6.12 6.12 6.12 3.518	2 15 259 259 6.22			2 6 <u>Mi</u> 238 .238 .22	2 29 270 270 	231		2 18 244 244	243	0 22 0	ш
24 Minor2 600 600 7.12 6.12 6.12 6.12 3.518	15 259 - 6.22 -		Ű	6 <u>Ma</u> 238 . 2 3.22 	29 270 4.12	0		18 13 244 -	243	0 23	
Minor2 600 295 7.12 6.12 6.12 6.12 3.518	259 - 6.22		Ű	Mi 238 . 2 3.22	ajor1 270 4.12	0 ' ' '	≥ '	lajor2 244 -		0	
600 295 305 7.12 6.12 6.12 6.12 3.518			<u> </u>	238 5.22 	270 - 4.12	0 ' ' '	0''	244	ŀ	0	
295 305 7.12 6.12 6.12 8.12 3.518					4.12	• • •	• •	ł	0		
305 7.12 6.12 6.12 3.518				3.22	4.12	• •	1		1	•	
7.12 6.12 6.12 3.518				3.22	4.12	ł.		•	'	•	
6.12 6.12 3.518	1		5.52	• •			1	4.12	ł	•	
6.12 3.518				•	•	•	•	•	•		
3.518	1				ł	ł	1	1	ł	•	
	3.318				2.218	1	,	2.218	1	,	
neuver 413	780	412		801	1293	ł	1	1322	1	•	
713	•	712	668	•	•	•	•	'	•	•	
Stage 2 705 664	1	705	662	ł	ł	ł	1	1	1	•	
						1	1		1		
385	117	380		801	1288	•	1	1322	1	•	
neuver 385	'	380	395		,	1	1	1	1	,	
692	1	693	651	ł	•	ł	1	1	1	•	
Stage 2 668 647	'	665	649	÷	÷	÷	•	1	1		
Approach EB		WB			NB			SB			
HCM Control Delay, s 14		13.6			0.8			0.5			
HCM LOS B		ш									
Minor Lane/Major Mvmt NBL	NBT	NBR EE	NBR EBLn1WBLn1	Ln1	SBL	SBT	SBR				
Capacity (veh/h) 1288	1	•		445	1322	•	1				
HCM Lane V/C Ratio 0.023	•	•	0.119 0.		0.014	÷	•				
HCM Control Delay (s) 7.9	0	•	4	13.6	7.8	0	1				
	A	•	ш	ш	4	∢	•				
HCM 95th %tile Q(veh) 0.1	1	ł	0.4	0.2	0	ł	1				

	SBR	•	•	ł	•	ł	
	SBT	1	•	0	A	1	
		1322	0.014	7.8	A	0	
	VBLn1	452 445 1322	0.119 0.056 0.014	13.6	ш	0.2	
	NBR EBLn1WBLn1	452	0.119	14	ш	0.4	
œ	NBR I	'	1	1	•	1	
	NBT	1	1	0	4	1	
	NBL	1288	0.023	7.9	4	0.1	
m							
M LOS	or Lane/Major Mvmt	pacity (veh/h)	M Lane V/C Ratio	M Control Delay (s):	M Lane LOS	:M 95th %tile Q(veh)	

T EBR WBL WBT WBR SBLn1 - 1176 - 181 - 0.03 - 1.044 - 82 - 132 - 2 A - 132 - 2 - 0.1 - 89

NBLn1 EBL EBT E 214 902 -0.304 0.094 -29 9.4 -D A -1.2 0.3 -. . .

Minor Lane/Major Mwmt Capacity (veh/h)) HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS HCM S5th %cite Q(veh)

.

S
도고
visic roje
3urbank Avenue Subdivision PM Background Plus Project
e Si d Plu
/enu
k A Kgr
ban Ba
PM

Synchro 10 Report Page 2

HCM 6th TWSC 3: Burbank Ave & Hearn Ave

10/29/2019

10/29/2019

Intersection													
Int Delay, s/veh	19.3												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	۶	÷		۴	æ			¢			¢		
Traffic Vol, veh/h	85	361	17	35	534	159	12	18	35	87	20	82	
Future Vol, veh/h	85	361	17	35	534	159	12	9	35	87	20	82	
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	-	~	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	1	1	None	1	1	None	1	ł	None	1	1	None	
Storage Length	65	•	•	75	•	•	•	'	•	1	1	•	
Veh in Median Storage, #	je,# -	0	1	1	0	1	1	0	1	1	0	•	
Grade, %	1	0	1	1	0	1	1	0	1	1	0	•	
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	85	361	17	35	534	159	12	9	35	87	20	82	
Major/Minor	Major1		~	Major2		~	Minor1		2	Minor2			
Conflicting Flow All	693	0	0	380	0	0	1277	1305	373	1251	1234	614	
Stage 1	1	1	1	1	1	1	542	542	1	684	684	ł	
Stage 2	'	•	•	•	•	•	735	763	•	567	550	'	
Critical Hdwy	4.12	1	ľ	4.12	ľ	1	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	1	•	•	•	•	•	6.12	5.52	•	6.12	5.52	•	
Critical Hdwy Stg 2	1	1	1	1	1	1	6.12	5.52		6.12	5.52	1	
Follow-up Hdwy	2.218	1	1	2.218	1	1	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	902	1	1	1178	1	1	143	160	673	149	177	492	
Stage 1		1	1	1	1	1	525	520	•	439	449	•	
Stage 2	1	1	1	1	1	1	411	413	ł	508	516	1	
Platoon blocked, %		1	1		1	•							
Mov Cap-1 Maneuver	r 902	1	1	1176	1	1	98	140	671	116	155	492	
Mov Cap-2 Maneuver	' _	1	1	1	1	1	98	140	'	116	155	'	
Stage 1	1	1	1	1	1	1	475	470	1	398	436	ł	
Stage 2		1	1	1	1	1	317	401	•	419	466	•	
Approach	8			WB			۳			SB			
HCM Control Delav. s	1.7			0.4			29			132			
HCM LOS										ш			

Burbank Avenue Subdivision TIS PM Background Plus Project

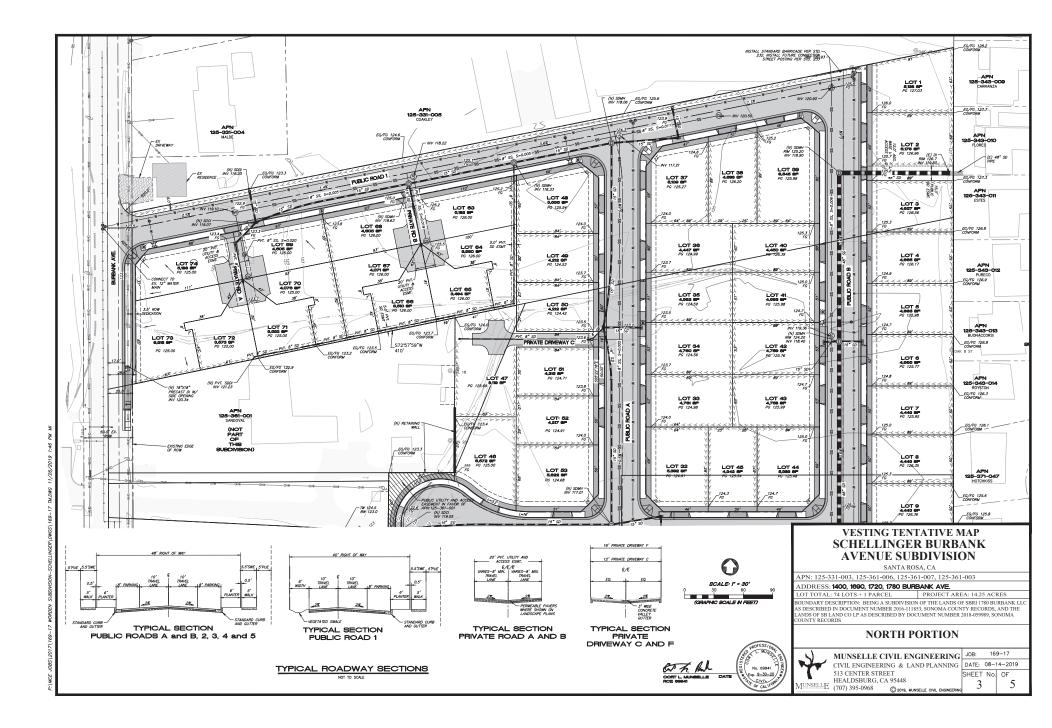
Appendix C

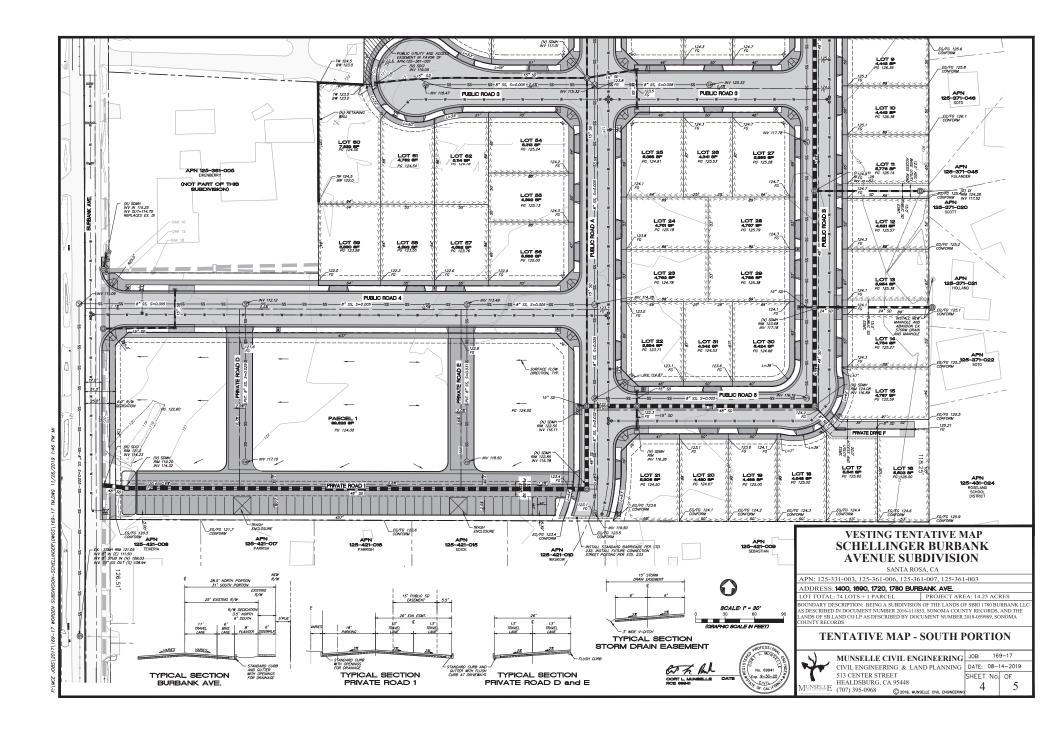
Proposed Street Cross-Sections





This page intentionally left blank





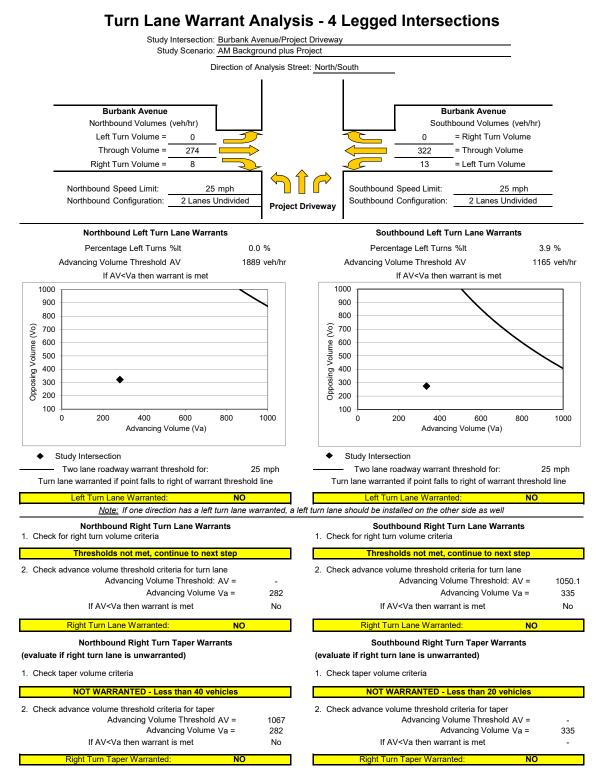
Appendix D

Warrant Analyses

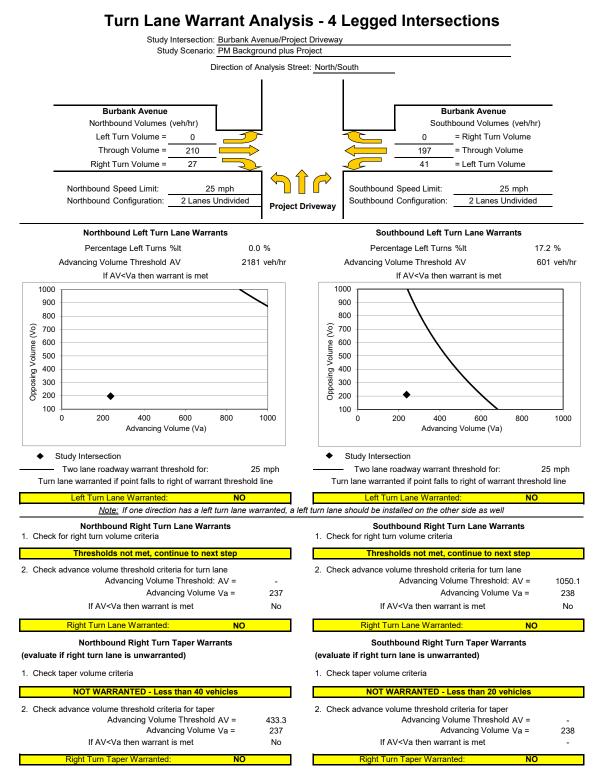




This page intentionally left blank

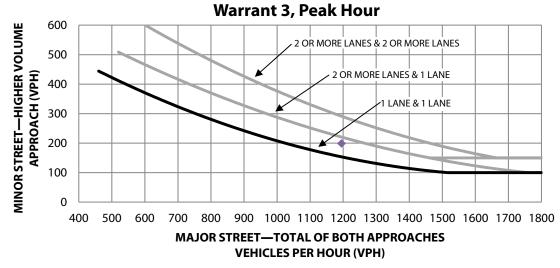


Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, Jan. 1997. The right turn lane and taper analysis is based on work conducted by Cottrell in 1981. The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.



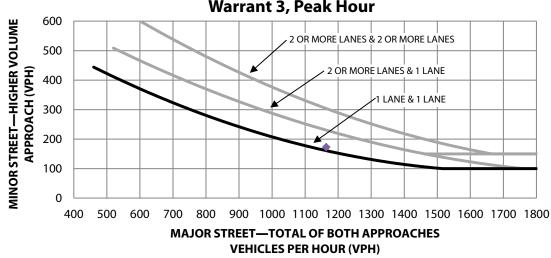
Methodology based on Washington State Transportation Center Research Report Method For Prioritizing Intersection Improvements, Jan. 1997. The right turn lane and taper analysis is based on work conducted by Cottrell in 1981. The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991.

Hearn Avenue & Burbank Avenue City of Santa Rosa	P	-	Burbank Avenue Subdi Project TIS	vision
	Intersection: 1			
	Major Street		Minor Street	
Street Name	Hearn Avenue		Burbank Avenue	
Direction	E-W		N-S	
Number of Lanes	1		1	
Approach Speed	25		25	
Population less than 10,000?	No			
Date of Count:	Wednesday, Septemb	er 11, 2019		
Scenario:	AM Baseline			
	ondition A or Diamot		I	Yes
Warrant 3 Met?: Met when either 0			l	
Condition A: Met when condition			L	Met
Condition A: Met when condition Condition A1	is A1, A2, and A3 are me	et	ا 	
Condition A: Met when condition Condition A1	is A1, A2, and A3 are me need by traffic on one mi in equals or exceeds fou	et inor street appro	l ach (one direction only) or a one lane approach,	Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for	is A1, A2, and A3 are me need by traffic on one mi gn equals or exceeds fou a two-lane approach	et inor street appro	or a one lane approach,	Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for	is A1, A2, and A3 are me need by traffic on one mi gn equals or exceeds fou a two-lane approach	et inor street appro ur vehicle-hours f	or a one lane approach,	Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam	is A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach proach Delay: 10. e minor street approach	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o	or a one lane approach, s only) equals or exceeds	Met Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach proach Delay: 10. e minor street approach lane of traffic of 150 vp	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving	or a one lane approach, s only) equals or exceeds	Met Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach proach Delay: 10. e minor street approach lane of traffic of 150 vp	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o	or a one lane approach, s only) equals or exceeds	Met Met Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach broach Delay: 10. e minor street approach lane of traffic of 150 vp bach Volume: 1	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving 99 vph	or a one lane approach, only) equals or exceeds g lanes	Met Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volur	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach broach Delay: 10. e minor street approach lane of traffic of 150 vp bach Volume: 1 me serviced during the h	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving 99 vph nour equals or ex	or a one lane approach, only) equals or exceeds g lanes ceeds 800 vph for	Met Met Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volur intersections with four o	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach broach Delay: 10. e minor street approach lane of traffic of 150 vp bach Volume: 1 me serviced during the h	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving 99 vph nour equals or ex	or a one lane approach, only) equals or exceeds g lanes ceeds 800 vph for	Met Met Met
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volur intersections with four of approaches	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach broach Delay: 10. e minor street approach lane of traffic of 150 vp bach Volume: 1 me serviced during the h or more appraches or 65	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving 99 vph nour equals or ex 50 vph for interse	or a one lane approach, only) equals or exceeds g lanes ceeds 800 vph for	Met Met Met
Condition A: Met when condition Condition A1 The total delay experier controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volur intersections with four of approaches Total Enter	as A1, A2, and A3 are me need by traffic on one mi on equals or exceeds fou a two-lane approach broach Delay: 10. e minor street approach lane of traffic of 150 vp bach Volume: 1 me serviced during the h or more appraches or 65	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving 99 vph nour equals or ex	or a one lane approach, only) equals or exceeds g lanes ceeds 800 vph for	Met Met Met
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volur intersections with four of approaches	as A1, A2, and A3 are me inced by traffic on one mi on equals or exceeds fou a two-lane approach broach Delay: 10.4 e minor street approach lane of traffic of 150 vp bach Volume: 14 me serviced during the h for more appraches or 65 ering Volume: 14.4	et inor street appro ur vehicle-hours f 42 vehicle-hours n (one direction o oh for two moving 99 vph nour equals or ex 50 vph for interse	or a one lane approach, only) equals or exceeds g lanes ceeds 800 vph for	Met Met Met



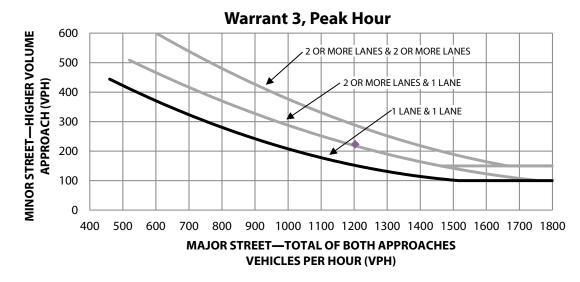


Hearn Avenue & Burbank Avenue City of Santa Rosa	2	Project Nan	ne: Burbank Avenue Subo Project TIS	division
		Intersection: 1		
	Major Str	eet	Minor Street	
Street Name	Hearn Ave	nue	Burbank Avenue	-
Direction	E-W		N-S	
Number of Lanes	1		1	
Approach Speed	25		25	
Population less than 10,000?	No			
Date of Count:	Wednesday, Sep	otember 11, 2019		
Scenario:	PM Baseline			
				Yes
Condition A: Met when condition				Met
Condition A1	ns A1, A2, and A3 a	are met	pproach (one direction only	Met Met
Condition A: Met when condition <i>Condition A1</i> The total delay experien	ns A1, A2, and A3 a	are met one minor street a	pproach (one direction only ours for a one lane approach	Met Met
Condition A: Met when condition <i>Condition A1</i> The total delay experien	ns A1, A2, and A3 a nced by traffic on o gn equals or excee	are met one minor street a eds four vehicle-ho	pproach (one direction only ours for a one lane approach	Met Met
Condition A: Met when condition <i>Condition A1</i> The total delay experien controlled by a STOP sign or five vehicle-hours for	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro	are met one minor street a eds four vehicle-ho ach	burs for a one lane approach	Met Met
Condition A: Met when condition <i>Condition A1</i> The total delay experien controlled by a STOP sign or five vehicle-hours for	ns A1, A2, and A3 a nced by traffic on o gn equals or excee	are met one minor street a eds four vehicle-ho	burs for a one lane approach	Met Met
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sid or five vehicle-hours for Minor Ap Condition A2	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay:	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-h	ours for a one lane approach	Met Met /)
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sid or five vehicle-hours for Minor Ap Condition A2	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: e minor street app	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-ł proach (one direct	ours for a one lane approach nours ion only) equals or exceeds	Met Met /)
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sid or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: e minor street app g lane of traffic of f	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-h proach (one direct 150 vph for two m	ours for a one lane approach nours ion only) equals or exceeds	Met Met /)
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sid or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: e minor street app	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-ł proach (one direct	ours for a one lane approach nours ion only) equals or exceeds	Met Met /)
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor App	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: e minor street app g lane of traffic of f oach Volume:	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-ł proach (one direct 150 vph for two m 173 vph	ours for a one lane approach nours ion only) equals or exceeds oving lanes	Met Met) , Met
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: g lane of traffic of roach Volume: me serviced during	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-h proach (one direct 150 vph for two m 173 vph g the hour equals	ours for a one lane approach nours ion only) equals or exceeds oving lanes or exceeds 800 vph for	Met Met) , Met
Condition A: Met when condition Condition A1 The total delay experien controlled by a STOP sig or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor App Condition A3 The total entering volu	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: g lane of traffic of roach Volume: me serviced during	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-h proach (one direct 150 vph for two m 173 vph g the hour equals	ours for a one lane approach nours ion only) equals or exceeds oving lanes or exceeds 800 vph for	Met Met) , Met
Condition A: Met when condition Condition A1 The total delay experience controlled by a STOP signer or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volume intersections with four approaches	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: g lane of traffic of roach Volume: me serviced during	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-h proach (one direct 150 vph for two m 173 vph g the hour equals	ours for a one lane approach nours ion only) equals or exceeds oving lanes or exceeds 800 vph for	Met Met) , Met
Condition A: Met when condition Condition A1 The total delay experience controlled by a STOP signer or five vehicle-hours for Minor Ap Condition A2 The volume on the sam 100 vph for one moving Minor Appr Condition A3 The total entering volume intersections with four approaches	ns A1, A2, and A3 a nced by traffic on o gn equals or excee r a two-lane appro proach Delay: e minor street app g lane of traffic of roach Volume: me serviced during or more apprache	are met one minor street a eds four vehicle-ho ach 4.4 vehicle-h proach (one direct 150 vph for two m 173 vph g the hour equals s or 650 vph for in	ours for a one lane approach nours ion only) equals or exceeds oving lanes or exceeds 800 vph for	Met Met) , Met



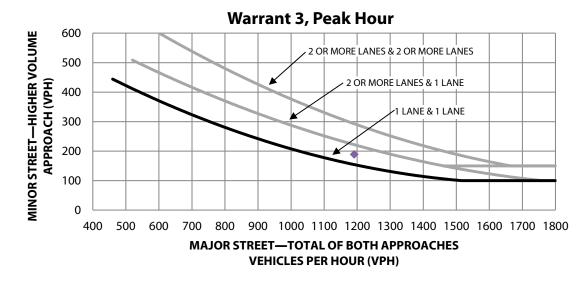


City of Santa Rosa		Project Name	e: Burbank Avenue Subdi Project TIS	vision
,		Intersection	-	
	Major Str	eet	Minor Street	
Street Name	Hearn Ave	nue	Burbank Avenue	
Direction	E-W		N-S	
Number of Lanes	1		1	
Approach Speed	25		25	
Population less than 10,000?	No			
Date of Count:	Wednesday, Sep	otember 11, 2019		
Scenario:	AM Baseline Plu	s Project		
		she minor street up	proach (one direction only)	
or five vehicle-hours for	•	eds four vehicle-hou	proach (one direction only) ırs for a one lane approach,	
or five vehicle-hours for	a two-lane appro	eds four vehicle-hou	irs for a one lane approach,	
or five vehicle-hours for	•	eds four vehicle-hou ach	irs for a one lane approach,	Met
or five vehicle-hours for Minor App Condition A2	a two-lane appro proach Delay: e minor street app	eds four vehicle-hou ach 15.9 vehicle-ho proach (one directio	ours for a one lane approach, ours on only) equals or exceeds	Met
or five vehicle-hours for Minor App <i>Condition A2</i> The volume on the same 100 vph for one moving Minor Appro	a two-lane appro proach Delay: e minor street app	eds four vehicle-hou ach 15.9 vehicle-ho proach (one directio	ours for a one lane approach, ours on only) equals or exceeds	Met
or five vehicle-hours for Minor App Condition A2 The volume on the same 100 vph for one moving Minor Appro Condition A3	a two-lane appro proach Delay: e minor street app lane of traffic of pach Volume:	eds four vehicle-hou ach 15.9 vehicle-ho proach (one directio 150 vph for two mov 223 vph	ours for a one lane approach, ours on only) equals or exceeds ving lanes	Met Met
or five vehicle-hours for Minor App <i>Condition A2</i> The volume on the same 100 vph for one moving Minor Appro	a two-lane appro proach Delay: e minor street app lane of traffic of pach Volume: ne serviced during	eds four vehicle-hou ach 15.9 vehicle-ho proach (one directio 150 vph for two mov 223 vph g the hour equals or	irs for a one lane approach, ours on only) equals or exceeds ving lanes r exceeds 800 vph for	
or five vehicle-hours for Minor App Condition A2 The volume on the same 100 vph for one moving Minor Appro Condition A3 The total entering volum intersections with four co approaches	a two-lane appro proach Delay: e minor street app lane of traffic of pach Volume: ne serviced during	eds four vehicle-hou ach 15.9 vehicle-ho proach (one directio 150 vph for two mov 223 vph g the hour equals or	irs for a one lane approach, ours on only) equals or exceeds ving lanes r exceeds 800 vph for	
or five vehicle-hours for Minor App Condition A2 The volume on the same 100 vph for one moving Minor Appro Condition A3 The total entering volum intersections with four co approaches	a two-lane appro proach Delay: e minor street app lane of traffic of pach Volume: ne serviced during or more apprache	eds four vehicle-hou ach 15.9 vehicle-ho proach (one directio 150 vph for two mov 223 vph g the hour equals or s or 650 vph for inte	irs for a one lane approach, ours on only) equals or exceeds ving lanes r exceeds 800 vph for	





Hearn Avenue & Burbank Avenue City of Santa Rosa	2	Project Nam	e: Burbank Avenue Subdi Project TIS	vision
		Intersectio	•	
	Major Str	eet	Minor Street	
Street Name	Hearn Ave	nue	Burbank Avenue	
Direction	E-W		N-S	
Number of Lanes	1		1	
Approach Speed	25		25	
Population less than 10,000?	No			
Date of Count:	Wednesday, Sej	otember 11, 2019		
Scenario:	PM Baseline Plu	s Project		
· · ·	gn equals or excee	eds four vehicle-ho	oproach (one direction only) urs for a one lane approach,	Met
	proach Delay:	6.93 vehicle-h	ours	
Condition A2	prouch Deluy.	0.99 venicie n		Met
The volume on the sam 100 vph for one moving			on only) equals or exceeds oving lanes	
Minor Appr	oach Volume:	189 vph		
Condition A3			<u>-</u>	Met
Condition A3 The total entering volur intersections with four of approaches			•	Met
The total entering volur intersections with four of approaches			•	Met
The total entering volur intersections with four of approaches	or more apprache	s or 650 vph for int	•	Met Met





7:30

California Manual on Uniform Traffic Control Devices (CaMUTCD) All-Way Stop Control (AWSC) Warrant Worksheet

WARRANT A - Interim Measure

2

Burbank Avenue

Hughes Road

9/11/2019

N/A

Two-Way Stop

CaMUTCD Language

Intersection #:

Existing Control:

Volume Count Date:

Speed Count Date:

Major Street: Minor Street:

Condition A: Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

Are traffic control signals justified at this location? No

WARRANT B - Crash History

CaMUTCD Language

Condition B: Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.

	Crashes	Minimum
Total in a 12-month period	1	-
Total in a 12-month period susceptible to correction by AWSC	1	5

WARRANT C - Eight Hour Volume

CaMUTCD Language

Peak Hour

8:30

Condition C.1: The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and

Condition C.2: The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour.

	Hou	r	C.1 Volume	C.2 Volume
7:00	-	8:00	400	97
8:00	-	9:00	533	122
13:00	-	14:00	440	83
14:00	-	15:00	279	54
15:00	-	16:00	344	69
16:00	-	17:00	367	57
17:00	-	18:00	431	83
18:00	-	19:00	335	67

	Average		
	Volume	Minimum	Satisfied?
C.1	391	300	Yes
C.2	79	200	No
	Peak Hour	N 41:	Cottofic do

	Peak Hour		
	Delay	Minimum	Satisfied?
C.2	14	30	No

No

No

Page 1 of 2

At least one warrant satisfied? No

C.1+C.2 or C.3 Satisfied?

Optional Warrants Satisfied? 0

Satisfied?

Satisfied? No

Calc:



Intersection #:	2
Major Street:	Burbank Avenue
Minor Street:	Hughes Road

CaMUTCD Language

Condition C.3: If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.

	Value	Minimum	Satisfied?
C.1. Major Street Entering Vehicles (Both Approaches)	391	210	Yes
C.2. Minor Street Entering Vehicles, Pedestrians, and Bicycles (Both Approaches)	79	140	No
C.2. Minor Street Peak Hour Vehicle Delay (Seconds)	14	21	No
C.3. Major Street 85th-percentile Speed	N/A	41	No

WARRANT D - Combination of Above

Satisfied? No

CaMUTCD Language

Condition D: Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

	Value	Minimum	Satisfied?
B. Crashes in 12-month period susceptible to correction by AWSC	1	4	No
C.1. Major Street Entering Vehicles (Both Approaches)	391	240	Yes
C.2. Minor Street Entering Vehicles, Pedestrians, and Bicycles (Both Approaches)	79	160	No
C.2. Minor Street Peak Hour Vehicular Delay (Seconds)	14	24	No

0	PTIONAL WARRANTS	0 Optional Warrants Sa	atisfied
А	The need to control left-turn conflicts	Satisfied?	No
В	The need to control vehicle/pedestrian conflicts near locations that generate h pedestrian volumes	nigh Satisfied?	No
С	Locations where a road user, after stopping, cannot see conflicting traffic and able to negotiate the intersection unless conflicting cross traffic is also require stop		No
D	An intersection of two residential neighborhood collector (through) streets of design and operating characteristics where multi-way stop control would import traffic operational characteristics of the intersection		No