November 1, 2022

Mr. Don Mason
Tri State General Contractors
288 Distribution Street
San Marcos, CA 92078

Focused Transportation Analysis for the WSS Shoes Development at 13222 San Pablo Avenue

Dear Mr. Mason;

As requested, W-Trans has prepared a focused transportation analysis for the proposed WSS Shoes retail development in the City of San Pablo. The purpose of this letter is to present the results of our evaluation of the project's trip generation, the parking demand and Code requirement compared to the supply, the potential circulation changes at project driveways and the nearby San Pablo Avenue/San Pablo Dam Road intersection, and whether the proposed project would result in a CEQA vehicle miles traveled (VMT) impact.

Existing Conditions

The study area consists of the project site, located at 13222 San Pablo Avenue, the surrounding shopping plaza, and the San Pablo Avenue/San Pablo Dam Road intersection. The existing shopping plaza has 109,712 square feet of retail space on-site, split between two parcels (85,140 square feet on Parcel One, and 25,572 square feet on Parcel Two). Parking for both parcels connects within the site, and thus access to the proposed project area would be provided via the six existing driveways, including two on San Pablo Avenue between Kirk Lane and San Pablo Dam Road, two on Contra Costa Avenue, one on Kirk Lane, and one on San Pablo Dam Road. A site evaluation was conducted on Tuesday, October 4, 2022, to confirm the physical characteristics of the shopping plaza and observe the behavior of all users, including pedestrians and motorists. Specific attention was paid to traffic operations at each of the driveways accessing the shopping plaza.

Project Description

The proposed project would include the construction of a new retail location on Parcel One on a new pad to be located at the southwestern corner of the existing shopping plaza. The proposed building would be adjacent to the San Pablo Avenue/Kirk Lane intersection. It would add 10,000 square feet of retail space to the 109,712 square feet of retail already on-site.

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*, 11th Edition, 2021 for "Shopping Plaza (40-150 ksf)" (ITE LU #821). Because the proposed project would add retail space to an existing shopping plaza, the trip generation of the existing plaza was considered, also with "Shopping Plaza" (ITE LU#821) rates. As trip generation rates for shopping plazas decrease logarithmically with size (larger shopping plazas generate fewer trips per square foot than smaller shopping plazas), the fitted curve equation was applied for the existing and proposed retail square footages to reflect the decreased rates as the size increases. However, an a.m. peak hour fitted curve equation is not provided by ITE and thus the average rates were used to calculate a.m. peak hour trips.

Pass-by Trips

Some portion of traffic associated with retail uses is drawn from existing traffic on nearby streets. These vehicle trips are not considered "new," but are instead comprised of drivers who are already driving on the adjacent street system and choose to make an interim stop; they are referred to as "pass-by." The percentage of these pass-by

trips was developed based on information provided in the *Trip Generation Manual*. This reference includes pass-by data collected at numerous locations for many land uses, such as the retail use applied in this traffic analysis. It is noted that larger shopping centers tend to have lower pass-by rates as they act more as primary destinations. Therefore, only data points with areas between 45,000 square feet and 147,000 square feet were used, resulting in an average p.m. pass-by rate of 40 percent for the shopping center. While it is likely that some pass-by trips would occur during the a.m. peak hour, a pass-by deduction was conservatively omitted as the only a.m. pass-by generator within the lot would be the fitness center. A pass-by value between the a.m. peak hour and p.m. peak hour was assigned to each daily rate to account for the overall average pass-by across a typical weekday.

Total Project Trip Generation

The expected trip generation potential for the proposed project is indicated in Table 1, with deductions taken for pass-by trips. The proposed project would be expected to generate 616 new trips on a daily basis, including 36 during the morning peak hour and 46 during the evening peak hour; these new trips represent the increase in traffic associated with the project compared to existing volumes. The shopping plaza as a whole, after construction of the proposed project, would be expected to generate 8,501 trips daily, with 423 trips during the a.m. peak hour and 622 trips during the p.m. peak hour.

Table 1 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
	(ksf)	Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Existing											
Shopping Plaza	109.712	89.84	9,856	3.53	387	240	147	8.75	960	461	499
Pass-by		*-20%*	*-1,971*	*0%*				*-40%*	*-384*	*-184*	*-200*
Total Existing			7,885		387	240	147		576	277	299
Proposed											
Shopping Plaza	119.712	94.49	10,626	3.53	423	262	161	8.66	1,037	498	539
Pass-by		*-20%*	*-2,125*	*0%*				*-40%*	*-415*	*-199*	*-216*
Total Proposed			8,501		423	262	161		622	299	323
Total Net-New			**616**		**36**	**22**	**14**		**46**	**22**	**24**

Note: ksf = 1,000 square feet

Trip Distribution

The pattern used to allocate new project trips to the street network was based on a review of turning movements at the study intersection, observations made during the site visit, and knowledge of local circulation patterns. The applied distribution assumptions and resulting net new trips are shown in Table 2.

Table 2 – Trip Distribution Assumptions

Route	Percent	Daily	AM Trips	PM Trips
To/From the north via San Pablo Ave	25%	154	9	12
To/From the south via San Pablo Ave	50%	308	18	23
To/From the east via San Pablo Dam Rd	25%	154	9	11
TOTAL	**100%**	**616**	**36**	**46**

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rate 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 intersection was analyzed using the signalized methodology published in the *Highway Capacity Manual 5th Edition* (HCM), Transportation Research Board, 2010. 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 signalized 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.

Traffic Operation Standards

The City of San Pablo has adopted the following standard for Level of Service at signalized intersections per Chapter 5: Circulation of the *San Pablo General Plan 2030*.

Policy C-1-7: Apply traffic Level of Service (LOS) standards to signalized intersections on Regional Routes of Significance to be consistent with the Contra Costa Transportation Authority's West County Action Plan.

In the *West County Action Plan for Routes of Regional Significance*, the CCTA has adopted a standard of LOS E along San Pablo Avenue and San Pablo Dam Road. CCTA and the City of San Pablo do not provide information regarding what constitutes as a significant effect on traffic operations for facilities currently functioning at an unacceptable level (i.e., LOS F). Therefore, for the basis of this analysis a significant effect would occur on a facility functioning at an unacceptable level when the increase in average vehicle delay is greater than five seconds.

Short-Term Conditions

The Existing Conditions scenario provides an evaluation of current intersection operation based on existing traffic volumes during the weekday a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Traffic volume data for the San Pablo Avenue/San Pablo Dam Road intersection was collected on May 1, 2019, and on December 5, 2018, for the a.m. and p.m. peak periods, respectively. These counts were converted to 2022 volumes by applying a one percent annual growth rate, which is consistent with the regional 0.4 percent annual population growth rate and 1.8 percent annual job growth rate contained in the *San Pablo General Plan 2030*. Therefore, an overall growth rate of three percent was applied to the a.m. counts obtained in 2019, and an overall growth rate of four percent was applied to the p.m. counts obtained in 2018. Further, trips from the expansion of the nearby Lytton Casino which occurred after the counts were obtained were added to the volumes at the study intersection per the distribution contained in the *Focused Traffic Study for the Lytton Casino Parking Project*, W-Trans, 2019.

The applied volumes, after accounting for regional growth and the addition of the nearby casino development, indicate that the study intersection is operating at an overall LOS C during the a.m. peak hour. During the p.m. peak hour, the intersection operates at an unacceptable LOS F.

Upon the addition of project-related traffic to the existing volumes, the study intersection is expected to continue operating at the same service levels as without the project. The effect on traffic operations due to the addition of project-generated trips would be imperceptible as the average delay added by the project is 0.1 seconds in the a.m. peak hour and 0 seconds in the p.m. peak hour. Therefore, since there would be no change in LOS and the

average delay increases would be less than five seconds the effect on traffic operations would be considered acceptable. These results are summarized in Table 3. Copies of the Level of Service calculations are enclosed.

Table 3 – Existing and Existing plus Project Peak Hour Intersection Levels of Service

Study Intersection	Existing Conditions				Existing plus Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
San Pablo Ave/San Pablo Dam Rd	25.6	C	**100.8**	**F**	25.7	C	**100.8**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation

Finding – The study intersection is expected to continue operating at the same Levels of Service upon the addition of project-generated traffic to Existing Conditions as without it. While the study intersection operates at LOS F without or with the addition of project traffic, the project would not increase delay by more than five seconds and therefore the impact on traffic operations is considered acceptable.

Parking Analysis

The project site was analyzed to determine whether the post-construction parking supply would be enough to satisfy the City of San Pablo Code requirements for retail developments. The *San Pablo Municipal Code, Article 17.54.030 Nonresidential off-street parking requirements* states that one space shall be provided for every 300 square feet of local-serving retail and one space shall be provided for every 400 square feet of regional-serving retail. As defined by the California Governor's Office of Planning and Research (OPR), generally stores under 50,000 square feet can be considered local-serving retail. On-site, there is 25,572 square feet of local-serving retail on Parcel Two. On Parcel One, there is 84,140 square feet of regional-serving retail, with an additional 10,000 square feet of local-serving retail proposed. Therefore, the parking lot should have a minimum of 331 parking spaces to satisfy City Code requirements. Table 4 summarizes the City's parking requirements as they apply to the project site.

Table 4 – City Parking Requirement Summary

Land Use	Parking Requirement	Size (square feet)	Required Number of Parking Spaces
Retail Sales, Local			
Parcel Two	1 space per 300 square feet	25,572	86
Proposed	1 space per 300 square feet	10,000	34
Retail Sales, Regional	1 space per 400 square feet	84,140	211
TOTAL			**331**

Note: Parking Requirements per *San Pablo Municipal Code, Article 17.54.030 Nonresidential off-street parking requirements*

The existing site has a total of 706 parking spaces available, of which 513 are on Parcel One and 193 are on Parcel Two. The proposed project would result in a net loss of 73 spaces on Parcel One, leaving the parcel with 440 spaces and the parking lot with a total of 633 spaces. In both the existing and proposed conditions, the number of parking spaces provided in the parking lot exceeds what is required by the *San Pablo Municipal Code*.

When analyzing each parcel independently, Parcel One would require 211 parking spaces under existing conditions. With the addition of the project, it would require 245 spaces. Since 513 spaces and 440 spaces are provided in the existing and proposed conditions, respectively, the parking supply in Parcel One would satisfy the Code requirements. Similarly, Parcel Two currently requires 86 parking spaces and would continue to do so

without or with the addition of the project. Since 193 spaces are currently provided on Parcel Two, the Code requirements are met.

The *San Pablo Avenue Specific Plan,* Dyett & Bhatia, 2011, includes less-restrictive parking requirements for developments adjacent to San Pablo Avenue with the goals of promoting transit and reducing parking demand. The Specific Plan suggests that one parking space per 400 square feet be provided for all types of retail. This would result in a parking requirement of 300 spaces, which is also met.

The projected parking demand was estimated using standard rates published by ITE in *Parking Generation*, 5th Edition, 2019, for "Shopping Center" (ITE LU #820). According to the ITE estimates, 234 parking spaces would be required to accommodate the expected demand of the shopping plaza after construction of the proposed project. Since the post-construction parking supply would be 633 spaces, the anticipated parking demand is expected to be accommodated.

Finding – The proposed parking supply of 633 spaces within the parking lot would satisfy the City's Code requirement of 331 spaces and the *San Pablo Avenue Specific Plan* parking requirement of 300 spaces. It would also exceed the anticipated parking demand of 234 spaces per the ITE *Parking Generation Manual*.

Site Access and Circulation

The project parking lot is accessible via six driveways, including two on San Pablo Avenue between Kirk Lane and San Pablo Dam Road, two on Contra Costa Avenue, one on Kirk Lane, and one on San Pablo Dam Road. The driveways on Contra Costa Avenue and Kirk Lane are full access driveways. The southern San Pablo Avenue driveway serves as an approach leg to a signalized intersection, with separate lanes for left and right turns. The northern San Pablo Avenue driveway is a right-turn in, right-turn out restricted driveway and outbound left-turns are not allowed at the driveway on San Pablo Dam Road. A left-turn pocket and break in the median help facilitate left turns in. During the site visit, 15-minute driveway spot surveys were taken during the p.m. peak period to capture the relative proportion of vehicles that use each driveway. The results of the spot surveys are summarized in Table 5.

Table 5 – Driveway Survey Summary

Driveway	Trips	In	Out	Percent
San Pablo Dam Rd	36	19	17	22%
San Pablo Ave North	16	0	16	10%
San Pablo Ave South (signalized)	88	46	42	54%
Kirk Ln	16	13	3	10%
Contra Costa Ave North	3	1	2	2%
Contra Costa Ave South	3	1	2	2%

Notes: Percent listed is the percent of trips at each driveway compared to total observed trips into or out of the parking lot

The driveway distribution assumptions for the project-generated trips are provided in Table 6. These assumptions are based on the observed driveway distribution, accounting for the location of the project site at the southwest corner of the parking lot.

Table 6 – Driveway Trip Distribution of Project-Generated Trips				
Driveway	**Percent**	**Daily**	**AM**	**PM**
San Pablo Dam Rd	15%	92	5	7
San Pablo Ave North	5%	31	2	2
San Pablo Ave South (signalized)	65%	401	24	30
Kirk Ln	15%	92	5	7
Contra Costa Ave North	0%	0	0	0
Contra Costa Ave South	0%	0	0	0
TOTAL	**100%**	**616**	**36**	**46**

Vehicle Miles Traveled (VMT) Evaluation

Senate Bill (SB) 743 established the change in vehicle-miles-travelled (VMT) as a result of a project as the basis for determining environmental impacts. Because the City of San Pablo has not yet adopted a standard of significance for evaluating VMT, guidance provided by the Contra Costa County Transportation Authority (CCTA) in the technical memorandum *VMT Analysis Methodology for Land Use Projects in Contra Costa*, 2020, was used. These guidelines are based on the OPR publication *Transportation Impacts (SB 743) CEQA Guidelines Update and Technical Advisory*, 2018.

CCTA provides screening criteria for small projects (i.e., projects 10,000 square feet or less) and for local-serving projects. Local-serving retail may generally be presumed to have a less-than-significant VMT impact and be screened from further VMT analysis since adding local-serving retail uses typically improves destination accessibility to customers, often reducing trip distances (i.e., the "miles" in vehicle miles traveled) since customers need to travel shorter distances for the same products or services than they previously did. The total demand for retail in a region also tends to hold steady; adding new local-serving retail typically shifts trips away from another use rather than adding entirely new shopping trips to the region. While CCTA does not explicitly state a size cutoff between local-serving and regional-serving retail, OPR cites a size of 50,000 square feet or greater as being a potential indicator when a retail development becomes regional-serving.

The proposed project includes 10,000 square feet of retail. Given the size of the development, the retail can be assumed to be local-serving. Based on CCTA VMT guidelines, the project would screen out of further VMT analysis as it fits the criteria for small and local-serving projects. Therefore, the project is presumed to have a less-than-significant VMT impact.

Finding – The project is presumed to have a less-than-significant VMT impact.

Conclusions

- The proposed project would be expected to generate an additional 616 new trips daily, with 36 occurring during the a.m. peak hour and 46 occurring during the p.m. peak hour.

- The proposed parking supply of 633 spaces exceeds the parking requirements contained in the *San Pablo Municipal Code* and the *San Pablo Avenue Specific Plan*. It also exceeds the anticipated parking demand estimated using rates contained in the ITE *Parking Generation Manual*.

- Upon the addition of project-generated traffic to Existing Conditions, the study intersection of San Pablo Avenue/San Pablo Dam Road is expected to continue operating at LOS C and LOS F during the a.m. and p.m.

peak hours, respectively. The project would not increase delay by more than five seconds in either scenario and therefore the effect on traffic operation is considered acceptable.

- The proposed project is expected to generate 24 and 30 additional trips at the signalized San Pablo Avenue southern driveway during the a.m. and p.m. peak hours, respectively, and fewer trips at each of the other site driveways.

- The project is considered a local-serving retail use, thus screening out from further VMT analysis and presumed to have a less-than-significant impact on VMT.

We hope this information adequately addresses the project's potential traffic impact. Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Nicholas Brunetto, PE
Associate Engineer

Mark Spencer, PE
Senior Principal

MES/ngb/SPA016.L1

Enclosures: Level of Service Calculations

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	35	46	622	169	257	80	314	281	439	774	10
Future Volume (veh/h)	8	35	46	622	169	257	80	314	281	439	774	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	2	2	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	8	35	45	628	171	0	81	317	0	443	782	10
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	101	104	789	416	0	105	633	283	491	1393	18
Arrive On Green	0.07	0.07	0.07	0.22	0.22	0.00	0.06	0.18	0.00	0.28	0.39	0.39
Sat Flow, veh/h	343	1502	1549	3548	1863	0	1774	3539	1583	1774	3578	46
Grp Volume(v), veh/h	43	0	45	628	171	0	81	317	0	443	387	405
Grp Sat Flow(s),veh/h/ln	1846	0	1549	1774	1863	0	1774	1770	1583	1774	1770	1854
Q Serve(g_s), s	1.6	0.0	2.0	12.1	5.7	0.0	3.3	5.8	0.0	17.4	12.3	12.4
Cycle Q Clear(g_c), s	1.6	0.0	2.0	12.1	5.7	0.0	3.3	5.8	0.0	17.4	12.3	12.4
Prop In Lane	0.19		1.00	1.00		0.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	124	0	104	789	416	0	105	633	283	491	689	722
V/C Ratio(X)	0.35	0.00	0.43	0.80	0.41	0.00	0.77	0.50	0.00	0.90	0.56	0.56
Avail Cap(c_a), veh/h	663	0	556	2500	1312	0	613	2103	941	870	1051	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	0.0	32.7	26.8	24.4	0.0	33.9	27.1	0.0	25.5	17.5	17.5
Incr Delay (d2), s/veh	0.6	0.0	1.0	0.7	0.2	0.0	4.4	1.3	0.0	3.1	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.9	6.2	3.3	0.0	1.7	3.0	0.0	9.0	6.4	6.7
LnGrp Delay(d),s/veh	33.1	0.0	33.8	27.8	24.9	0.0	38.3	28.4	0.0	28.6	19.0	18.9
LnGrp LOS	C		C	C	C		D	C		C	B	B
Approach Vol, veh/h		88			799			398			1235	
Approach Delay, s/veh		33.5			27.1			30.4			22.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.5	18.0		8.9	9.3	33.2		21.0
Change Period (Y+Rc), s	4.5	5.0		4.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	35.5	43.0		26.0	25.0	43.0		51.0
Max Q Clear Time (g_c+I1), s	19.4	7.8		4.0	5.3	14.4		14.1
Green Ext Time (p_c), s	0.6	4.1		0.2	0.1	10.2		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	25.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	35	46	627	169	257	80	317	285	439	780	10
Future Volume (veh/h)	8	35	46	627	169	257	80	317	285	439	780	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	2	2	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	8	35	45	633	171	0	81	320	0	443	788	10
Adj No. of Lanes	0	2	0	2	1	0	1	2	1	1	2	0
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	23	101	104	794	418	0	105	635	284	490	1395	18
Arrive On Green	0.07	0.07	0.07	0.22	0.22	0.00	0.06	0.18	0.00	0.28	0.39	0.39
Sat Flow, veh/h	343	1502	1549	3548	1863	0	1774	3539	1583	1774	3578	45
Grp Volume(v), veh/h	43	0	45	633	171	0	81	320	0	443	390	408
Grp Sat Flow(s),veh/h/ln	1846	0	1549	1774	1863	0	1774	1770	1583	1774	1770	1854
Q Serve(g_s), s	1.6	0.0	2.0	12.3	5.7	0.0	3.3	5.9	0.0	17.5	12.5	12.5
Cycle Q Clear(g_c), s	1.6	0.0	2.0	12.3	5.7	0.0	3.3	5.9	0.0	17.5	12.5	12.5
Prop In Lane	0.19		1.00	1.00		0.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	124	0	104	794	418	0	105	635	284	490	690	723
V/C Ratio(X)	0.35	0.00	0.43	0.80	0.41	0.00	0.77	0.50	0.00	0.90	0.56	0.57
Avail Cap(c_a), veh/h	659	0	553	2486	1305	0	609	2091	935	865	1045	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	0.0	32.9	26.9	24.5	0.0	34.1	27.2	0.0	25.6	17.6	17.6
Incr Delay (d2), s/veh	0.6	0.0	1.1	0.7	0.2	0.0	4.4	1.3	0.0	3.3	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.9	6.3	3.3	0.0	1.7	3.0	0.0	9.0	6.4	6.7
LnGrp Delay(d),s/veh	33.3	0.0	34.0	27.9	25.0	0.0	38.5	28.5	0.0	28.9	19.1	19.0
LnGrp LOS	C		C	C	C		D	C		C	B	B
Approach Vol, veh/h		88			804			401			1241	
Approach Delay, s/veh		33.7			27.3			30.5			22.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	24.6	18.1		8.9	9.3	33.4		21.2
Change Period (Y+Rc), s	4.5	5.0		4.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	35.5	43.0		26.0	25.0	43.0		51.0
Max Q Clear Time (g_c+I1), s	19.5	7.9		4.0	5.3	14.5		14.3
Green Ext Time (p_c), s	0.6	4.1		0.2	0.1	10.3		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	55	55	436	325	157	164	850	300	607	478	26
Future Volume (veh/h)	15	55	55	436	325	157	164	850	300	607	478	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	2	2	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	15	57	56	261	598	0	169	876	0	626	493	27
Adj No. of Lanes	0	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	25	96	92	351	731	0	195	1034	463	403	1518	83
Arrive On Green	0.06	0.06	0.06	0.19	0.19	0.00	0.11	0.30	0.00	0.29	0.48	0.48
Sat Flow, veh/h	404	1533	1468	1774	3725	0	1774	3539	1583	1774	3409	186
Grp Volume(v), veh/h	68	0	60	261	598	0	169	876	0	626	255	265
Grp Sat Flow(s),veh/h/ln	1843	0	1562	1774	1863	0	1774	1770	1583	1774	1770	1826
Q Serve(g_s), s	4.5	0.0	4.6	17.2	19.0	0.0	11.6	28.3	0.0	35.5	10.9	11.0
Cycle Q Clear(g_c), s	4.5	0.0	4.6	17.2	19.0	0.0	11.6	28.3	0.0	35.5	10.9	11.0
Prop In Lane	0.22		0.94	1.00		0.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	115	0	97	351	731	0	195	1034	463	403	788	813
V/C Ratio(X)	0.60	0.00	0.61	0.74	0.82	0.00	0.87	0.85	0.00	1.55	0.32	0.33
Avail Cap(c_a), veh/h	388	0	329	732	1538	0	359	1232	551	510	844	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.6	0.0	61.7	47.1	47.8	0.0	59.1	45.2	0.0	60.4	24.9	24.9
Incr Delay (d2), s/veh	1.8	0.0	2.3	1.2	0.9	0.0	4.6	6.1	0.0	261.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	2.2	9.0	10.1	0.0	6.5	16.2	0.0	46.6	6.3	6.6
LnGrp Delay(d),s/veh	63.4	0.0	64.0	49.2	49.0	0.0	63.7	51.3	0.0	321.5	25.4	25.4
LnGrp LOS	E		E	D	D		E	D		F	C	C
Approach Vol, veh/h		128			859			1045			1146	
Approach Delay, s/veh		63.7			49.1			53.3			187.1	
Approach LOS		E			D			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	40.0	42.6		11.9	18.7	63.9		29.0
Change Period (Y+Rc), s	4.5	5.0		4.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	35.5	43.0		26.0	25.0	43.0		51.0
Max Q Clear Time (g_c+I1), s	37.5	30.3		6.6	13.6	13.0		21.0
Green Ext Time (p_c), s	0.0	7.4		0.4	0.2	6.3		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	100.8
HCM 2010 LOS	F

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	55	55	441	325	157	164	856	306	607	484	26
Future Volume (veh/h)	15	55	55	441	325	157	164	856	306	607	484	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	2	2	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	15	57	56	263	603	0	169	882	0	626	499	27
Adj No. of Lanes	0	2	0	1	2	0	1	2	1	1	2	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	25	96	91	353	736	0	194	1036	463	403	1518	82
Arrive On Green	0.06	0.06	0.06	0.20	0.20	0.00	0.11	0.31	0.00	0.29	0.48	0.48
Sat Flow, veh/h	404	1533	1468	1774	3725	0	1774	3539	1583	1774	3412	184
Grp Volume(v), veh/h	68	0	60	263	603	0	169	882	0	626	258	268
Grp Sat Flow(s),veh/h/ln	1843	0	1562	1774	1863	0	1774	1770	1583	1774	1770	1826
Q Serve(g_s), s	4.5	0.0	4.6	17.4	19.3	0.0	11.6	28.6	0.0	35.5	11.1	11.2
Cycle Q Clear(g_c), s	4.5	0.0	4.6	17.4	19.3	0.0	11.6	28.6	0.0	35.5	11.1	11.2
Prop In Lane	0.22		0.94	1.00		0.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	115	0	97	353	736	0	194	1036	463	403	787	813
V/C Ratio(X)	0.60	0.00	0.61	0.74	0.82	0.00	0.87	0.85	0.00	1.55	0.33	0.33
Avail Cap(c_a), veh/h	386	0	327	729	1531	0	357	1226	549	507	843	870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.8	0.0	61.9	47.2	47.9	0.0	59.3	45.3	0.0	60.5	25.0	25.0
Incr Delay (d2), s/veh	1.8	0.0	2.3	1.2	0.9	0.0	4.6	6.3	0.0	261.7	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	2.2	9.1	10.2	0.0	6.5	16.5	0.0	46.6	6.4	6.6
LnGrp Delay(d),s/veh	63.6	0.0	64.2	49.3	49.1	0.0	63.9	51.7	0.0	322.1	25.5	25.5
LnGrp LOS	E		E	D	D		E	D		F	C	C
Approach Vol, veh/h		128			866			1051			1152	
Approach Delay, s/veh		63.9			49.2			53.7			186.7	
Approach LOS		E			D			D			F	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	40.0	42.9		11.9	18.7	64.1		29.3
Change Period (Y+Rc), s	4.5	5.0		4.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	35.5	43.0		26.0	25.0	43.0		51.0
Max Q Clear Time (g_c+I1), s	37.5	30.6		6.6	13.6	13.2		21.3
Green Ext Time (p_c), s	0.0	7.3		0.4	0.2	6.4		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	100.8
HCM 2010 LOS	F

Notes