

From: [Zenk, Jessica](#)
To: [Downtown West Project](#)
Subject: Fw: Autumn Corridor Intersection Level of Service Assessment
Date: Wednesday, March 3, 2021 10:09:10 AM
Attachments: [Autumn Assessment rev 2-26-21 \(10599769xD701E\).pdf](#)

From: Zenk, Jessica <Jessica.Zenk@sanjoseca.gov>
Sent: Wednesday, March 3, 2021 9:46 AM
To: Jim Goddard <JGoddard@sapcenter.com>
Cc: Jonathan Becher <jbecher@sjsharks.com>; Jon Gustafson <jgustafson@sharksice.com>; Lucy Lofrumento (lal@LMALLP.com) <lal@lmallp.com>; Morley, Sean <sean@morleybros.com>; paul pkrupkaconsulting.com <paul@pkrupkaconsulting.com>; Klein, Nanci <Nanci.Klein@sanjoseca.gov>
Subject: Re: Autumn Corridor Intersection Level of Service Assessment

Thank you very much, Jim - appreciate this and look forward to discussing it with you as well.

Best,
Jess

Jessica Zenk
Deputy Director
Department of Transportation, Planning & Project Delivery
408-535-3543
jessica.zenk@sanjoseca.gov

From: Jim Goddard <JGoddard@sapcenter.com>
Sent: Wednesday, March 3, 2021 9:04 AM
To: Zenk, Jessica <Jessica.Zenk@sanjoseca.gov>
Cc: Jonathan Becher <jbecher@sjsharks.com>; Jon Gustafson <jgustafson@sharksice.com>; Lucy Lofrumento (lal@LMALLP.com) <lal@lmallp.com>; Morley, Sean <sean@morleybros.com>; paul pkrupkaconsulting.com <paul@pkrupkaconsulting.com>; Klein, Nanci <Nanci.Klein@sanjoseca.gov>; Jim Goddard <JGoddard@sapcenter.com>
Subject: Autumn Corridor Intersection Level of Service Assessment

[External Email]

Attached is an Autumn Corridor Intersection Level of Service (LOS) Assessment prepared by Krupka Consulting in collaboration with Jim Benshoof. This Assessment addresses 4 of the 21 intersections we identified in our letter dated August 28, 2020, requesting that the City and SSE jointly commission a Supplemental Circulation and Access Analysis for Downtown West Project. We asked Krupka Consulting to do an LOS assessment of four intersections along the Autumn ingress corridor during the 6 to 7pm hour, including trips to a Sharks game at SAP Center, because these are key intersections along one of the two most important routes to and

from the arena.

As stated in the August 28 letter, we feel strongly that this analysis is needed for two purposes: a) to compare and contrast the changes proposed by the Project with changes recommended by SSE and b) to correlate these two post-development scenarios with existing LOS conditions during the 6 to 7pm hour in this Autumn ingress corridor. These two purposes are consistent with the following provision in the AMA Section 21.2.3:

The Parties shall work together in “good faith with the goal of achieving the best overall function of the streets and intersections for the benefit of both the Arena and all other development in the Diridon Area”.

The assessment results indicate that the Downtown West Project and other development in the DSAP area will have a major negative impact on the LOS for guests attending arena events. The results also indicate that the lane configuration recommended by SSE will substantially reduce severe delays that will be experienced by arena guests. **Consistent with the goal under the AMA, we ask that the project be modified to retain two through lanes and a left turn lane in each direction between Santa Clara Street and Park Avenue in accordance with prior City plans for Autumn Street.**

The City has suggested, without providing any specifics, that negative LOS impacts can be mitigated by additional TPMP measures. We disagree with this suggestion/assumption. SSE, in coordination with DOT and SJPD, is already utilizing the most readily available and impactful management measures. Incremental measures are likely to have marginal/diminishing effectiveness on improving LOS, and it is the opinion of our consultants that the potential impact on the LOS delays would be minimal. While TPMP measures can enhance system performance, no amount of traffic management can offset inadequate/deficient street capacity.

It has also been suggested that capacity deficiencies may be mitigated by use of “dynamic lanes” for portions of the north-south route and/or by temporarily converting street segments from two-way to one-way operation. As described in our comment letter to the Project DEIR, we do not believe that dynamic lanes as proposed can be used safely or efficiently for arena traffic flow even under temporary conditions. In addition, temporary conversion of streets to one-way operation would be very expensive (based on intensive use of traffic management personnel and control equipment) and would cause significant disruption for non-event traffic and safety issues. We believe it is important to effectively accommodate SAP Center traffic without temporary conversion of one or more streets to one-way operation. We look forward to meeting with you to review the details of the assessment.

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MEMORANDUM

February 26, 2021

by email

TO: Jim Goddard, Sharks Sports & Entertainment LLC (SSE)
CC: Jim Benshoof
FROM: Paul Krupka
Subject: Autumn Corridor Intersection Assessment

This memorandum documents the assessment of cumulative traffic conditions on the Autumn Street corridor during the 6:00 to 7:00 p.m. hour. The assessment was done for SSE by Krupka Consulting in close collaboration with Jim Benshoof, former Traffic Engineer for SSE, who provided advice, guidance and reviews to Krupka Consulting in all aspects of the work.

Background

The proposed Downtown West (Google) Project (Project) was defined and evaluated in the Downtown West Mixed-Use Plan Draft Environmental Impact Report (Project DEIR) (ESA, October 2020). However, the intersection Level of Service (LOS) analysis for the Project DEIR did not include the segment of Autumn Street between San Carlos Street and Santa Clara Street, which is of utmost importance to SSE for SAP Center access.

Fundamentally, this meant the results of the Project DEIR could not be compared with findings of the most recent traffic evaluation of this key street, the 2014 Diridon Station Area Plan (DSAP) Traffic Impact Analysis (TIA), which is considered by SSE to be an important benchmark regarding traffic conditions.¹ Another important distinction of the DSAP TIA was it addressed the critical 6:00 to 7:00 p.m. hour, when substantial inbound SAP Center event traffic occurs.

Evaluation of intersection LOS during this critical period is essential to this assessment of implications of potential changes to streets and circulation patterns of particular concern to SSE and, in turn, the City of San Jose staff and City Council, who are obligated to coordinate with SSE on such matters. This stimulated SSE to engage Krupka Consulting to develop and undertake an independent assessment to provide relevant comparable information for the corridor intersections during the 6:00 to 7:00 p.m. hour.

Purpose

The purpose of the assessment was to approximate intersection operations along the critical Autumn Street corridor during the typical access hour for Sharks events, 6:00 to 7:00 p.m., under cumulative conditions evaluated in the Project DEIR. An important element of the assessment was the inclusion of SAP Center (Sharks game) traffic.

¹ Diridon Station Area Plan (DSAP) Traffic Impact Analysis (TIA) (City of San Jose, Diridon Station Area Plan Integrated Final Program Environmental Impact Report, Appendix B, August 2014)

The following intersections were studied.

- Autumn Street and Santa Clara Street
- Autumn Street and San Fernando Street
- Autumn Street/Montgomery Street and Park Avenue
- Bird Avenue and San Carlos Street

The assessment was based on Year 2040 Cumulative Plus Goal Based Project Conditions defined in the Draft Local Transportation Analysis Report (Draft LTA) for the Project (Fehr & Peers, September 2020, Scenario 3b). The Draft LTA is Appendix J2 of the Project DEIR.

The assessment was necessarily an approximation of intersection LOS during the 6:00 to 7:00 p.m. hour at the above intersections, given the Draft LTA addressed neither this time period nor three of the four intersections. The assessment provided estimates of intersection turning movement volumes and LOS based on average delay, which formed the foundation for credible planning level findings regarding traffic operations during the 6:00 to 7:00 p.m. hour under Project cumulative conditions with Sharks game traffic.

Procedures

The following points summarize the assessment procedures.

- Intersection Volumes
 - Project intersection turning movement volumes at Bird Avenue and San Carlos Street, for the p.m. peak hour (5:00 p.m. to 6:00 p.m.) Project cumulative condition (Scenario 3b), were extracted from the Draft LTA. Intersection turning movement volumes at the other intersections *were not included* in the Draft LTA, so referenced data were extracted from the DSAP TIA.
 - Intersection data for the p.m. peak hour and the 6:00 to 7:00 p.m. hour were extracted from the DSAP TIA for the cumulative condition scenario (Scenario 5). Given the p.m. peak hour forecasts included trips generated by the proposed ballpark, which is no longer planned, the data were adjusted to subtract ballpark trips. It is also important to note that the 6:00 to 7:00 p.m. data included SAP Center (Sharks game) traffic. By inspection, it was determined that 6:00 to 7:00 p.m. traffic volumes were in aggregate approximately 80% of the p.m. peak hour volumes. This factor was applied to the total intersection volume at Bird Avenue and San Carlos Street to approximate 6:00 to 7:00 p.m. traffic for the Project condition.
 - Intersection turning movement volumes at the other intersections were derived for the Project case based on the assumption that the relative traffic conditions presented in the DSAP TIA were similar and transferable to the Project condition. Project turning movement volumes were derived as follows.
 - Calculate Project total intersection volumes for three intersections based on relative shares of DSAP TIA volumes at these junctions compared to total intersection volumes at Bird Avenue and San Carlos Street.
 - Calculate Project turning movement volumes by approach and turn (right, through, left) based on relative DSAP TIA volumes.

- Intersection Layouts
 - Two intersection layout cases were defined, one for the Project and one reflecting the SSE recommendation.
 - The Project intends to reduce auto dependence. It follows that, with exception of the segment of Autumn Street between Park Avenue and San Carlos Street, the layout has one through lane in each direction, and left turn lanes at intersections. The noted southern block segment has additional through lanes. All Project layouts were based upon information and data contained in the Draft LTA and the Downtown West Design Standards and Guidelines (Appendix M in the Project DEIR).
 - In view of this obvious reduction in street capacity, SSE engaged Jim Benshoof, Traffic Engineer, to recommend street layouts to serve peak traffic conditions based on past experience. The resulting recommendations developed by Jim Benshoof were documented in a memorandum and used to define specific lane layouts for the intersections under study (“SAP Center Recommendations for Diridon Area Street Network,” Wenck, May 21, 2020). Finally, Krupka Consulting conferred with Jim Benshoof to review the layout assumptions for this assessment.
- LOS
 - LOS is a quantitative measure that represents quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler’s perspective and LOS F the worst. The chart below provides general descriptions for the letter designations.

Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/vehicle)	General Description
A	≤10	Free Flow
B	>10 – 20	Stable Flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F ¹	>80	Forced flow (congested and queues fail to clear)

Source: *Highway Capacity Manual 2010*, Transportation Research Board, 2010.

1. If the volume-to-capacity (v/c) ratio for a lane group exceeds 1.0 LOS F is assigned to the individual lane group. LOS for overall approach or intersection is determined solely by the control delay.

- Intersection LOS conditions were calculated for Project and SSE Recommended layout cases and, for reference, the DSAP TIA existing case, using Highway Capacity Manual procedures.
- Results were interpreted and summarized.
- This memorandum was prepared to document the assessment.

Assessment

Intersection Volumes

Table 1 summarizes intersection traffic data developed. The top two lines at each intersection show 6:00 to 7:00 p.m. volumes for DSAP TIA and Project conditions. The bottom two lines show respective p.m. peak hour volumes. Columns show turning movement volumes by approach, turn and total.

Generally, Project volumes are higher than DSAP TIA volumes. This makes sense given the Project cumulative condition includes substantially higher planned development than the DSAP TIA cumulative condition.

LOS

Table 2 summarizes LOS results for the Project and SSE Recommended layout cases. Results for the DSAP TIA existing case are shown for reference and were extracted directly from Table 14 in the DSAP TIA (op. cit., pp. 70-71). The table illustrates intersection layouts in white on black diagrams, and analysis results. Intersection delay is shown in seconds per vehicle. The Attachment contains intersection LOS reports developed using Highway Capacity Manual procedures implemented using Highway Capacity Software (HCS) (University of Florida, HCS Streets Version 7.9).

Cumulative intersection LOS conditions were found to be consistently poor - LOS E and F - at all locations under both layout cases. This compares to LOS D or better in the DSAP TIA Existing case.

Cumulative conditions under the Project case were found to be substantially worse than under the SSE Recommended case at the intersections of Autumn Street with Santa Clara Street and San Fernando Street, as indicated by much higher delay values. For reference, the values under "Change Compared to Project" on Table 2 are calculated decreases in delay in absolute and percentage terms.

These results are not surprising, given that the Project layout would provide just one through lane in each direction along Autumn Street through these two intersections. Also, the Project layout at Santa Clara Street includes one left turn lane eastbound and westbound, whereas the SSE Recommended layout includes two left turn lanes in both directions to complement two receiving through lanes on Autumn Street and thereby better serve the respective high left turn volumes.

These findings provide compelling evidence supporting two through lanes and a left turn lane in each direction along Autumn Street between Santa Clara Street and Park Avenue.

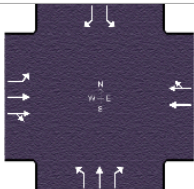
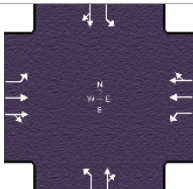
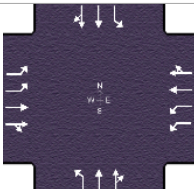
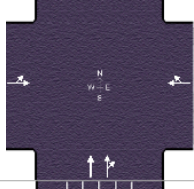
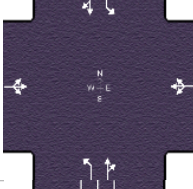
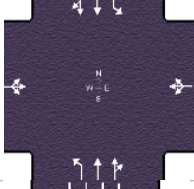
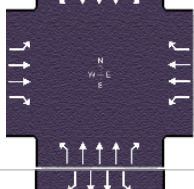
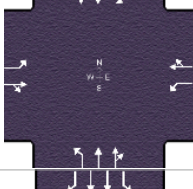
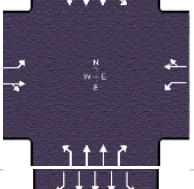
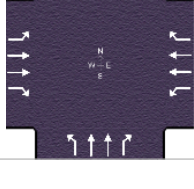
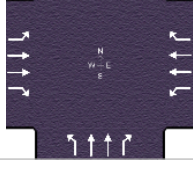
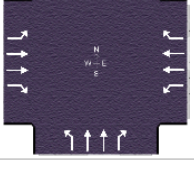
In summary, this assessment provided reasonable data and results related to potential intersection LOS conditions during the 6:00 to 7:00 p.m. hour under Project cumulative conditions with Sharks game traffic, which gives SSE meaningful additional information to supplement the Draft LTA.

Attachment - Intersection LOS Reports

Table 1

Autumn Street Intersection Assessment > 6:00 - 7:00 PM																	
Prepared for:		SSE		SCENARIO		DEFINITION		NOTES:		2/3/21 Project volumes adjusted to remove ballpark trips.							
Prepared by:		Krupka Consulting		DSAP		DSAP Cumulative											
February 16, 2021						Scenario: 5 Cumulative Conditions											
				Project		Downtown West Cumulative Plus Goal-Based Project											
						Scenario: 3b Year 2040 Cumulative Plus Goal-Based Project Conditions											
INTERSECTIONS/CONDITIONS	North Approach				East Approach				South Approach				West Approach				Total
	RT	TH	LT	Total	RT	TH	LT	Total	RT	TH	LT	Total	RT	TH	LT	Total	
Autumn/Santa Clara																	
6:00 to 7:00 PM DSAP	222	442	310	974	242	629	810	1681	184	117	187	488	698	719	291	1708	4851
6:00 to 7:00 PM Project (estimated)	292	330	287	1283	319	828	747	2214	231	136	246	643	771	799	381	2249	6388
PM Peak Hour DSAP	380	384	343	1107	365	1352	870	2587	247	160	390	797	837	877	420	2134	6625
PM Peak Hour Project (estimated)	458	463	413	1334	440	1630	1049	3118	298	193	470	961	1009	1057	506	2572	7985
Autumn/San Fernando																	
6:00 to 7:00 PM DSAP	92	1067	467	1626	109	20	52	181	176	630	220	1026	452	71	79	602	3435
6:00 to 7:00 PM Project (estimated)	124	1347	316	2197	56	27	70	245	238	578	297	1386	611	96	107	813	4640
PM Peak Hour DSAP	132	1402	315	1849	272	100	272	644	335	755	345	1435	646	101	113	860	4788
PM Peak Hour Project (estimated)	160	1698	382	2240	330	121	330	780	406	915	418	1738	783	122	137	1042	5800
Autumn-Montgomery/Park																	
6:00 to 7:00 PM DSAP	170	1495	46	1711	107	114	238	459	70	1405	168	1643	250	383	120	753	4566
6:00 to 7:00 PM Project (estimated)	182	1547	50	1874	100	125	261	503	77	1300	184	1800	274	272	114	825	5002
PM Peak Hour DSAP	222	2048	45	2315	76	251	376	703	89	1262	208	1559	296	216	99	611	5188
PM Peak Hour Project (estimated)	268	2468	54	2790	92	302	453	847	107	1521	251	1879	357	260	119	736	6252
Bird/San Carlos																	
6:00 to 7:00 PM DSAP	278	1182	139	1599	71	347	218	636	241	1245	211	1697	295	976	255	1526	5458
6:00 to 7:00 PM Project (estimated)	300	1221	153	1766	78	383	241	702	207	1170	233	1874	326	781	248	1685	6026
PM Peak Hour DSAP	379	1785	167	2331	44	613	346	1003	244	888	216	1348	454	885	225	1564	6246
PM Peak Hour Project	289	1090	121	1500	42	1020	788	1850	326	890	540	1756	423	1635	369	2427	7533

Table 2

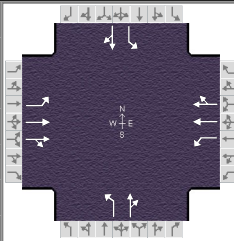
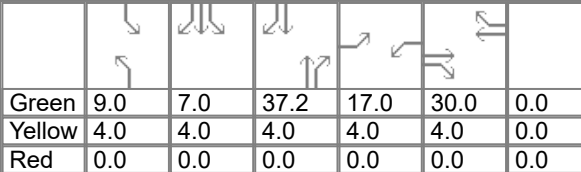
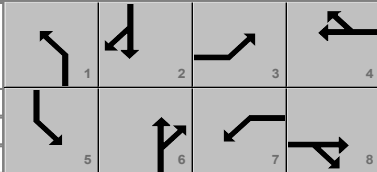
INTERSECTION LAYOUTS AND LEVELS OF SERVICE Autumn Corridor Intersection Assessment							
INTERSECTION	2013 DSAP EXISTING - INCLUDING SAP CENTER TRAFFIC 6:00 - 7:00 PM		DOWNTOWN WEST SCENARIO 3b INCLUDING SAP CENTER TRAFFIC 6:00 - 7:00 PM				
	2013 DSAP Existing		Project		SSE Recommended		
	Layout	Delay/LOS	Layout	Delay/LOS	Layout	Delay/LOS	Change Compared to Project (seconds, %)
Autumn/Santa Clara		25.2/C		410.4/F		237.2/F	-173, -42%
Autumn/San Fernando		8.5/A		275.3/F		118.1/F	-157, -57%
Autumn-Montgomery/Park		34.7/C		71.1/E		65.9/E	-5, -7%
Bird/San Carlos		35.5/D		58.9/E		58.0/E	-1, -2%

Source: Krupka Consulting, February 26, 2021

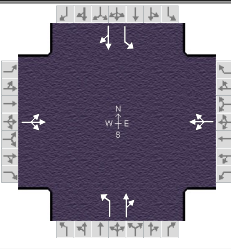
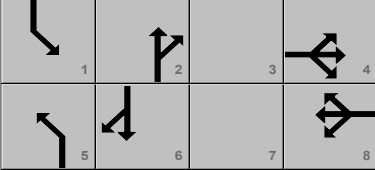
Attachment

INTERSECTION LOS RESULTS

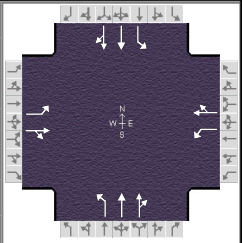
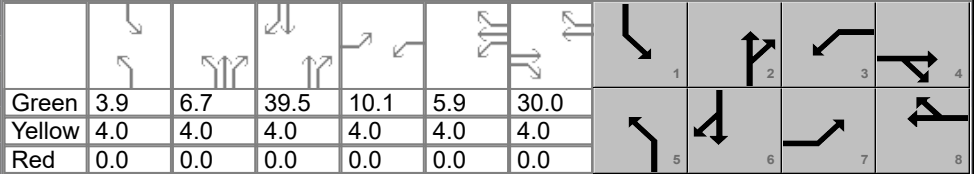
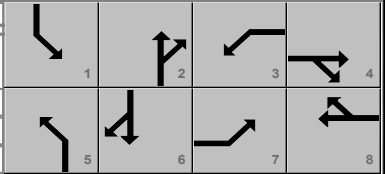
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information										
Agency		Krupka Consulting				Duration, h		0.250								
Analyst		PK		Analysis Date		Feb 23, 2021		Area Type		Other						
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF		0.92						
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period		1> 6:00						
Intersection		Santa Clara		File Name		DW C 1 mod 1 022321.xus										
Project Description		DW C+G-B P 6-7 for Autumn Assessment														
Demand Information				EB			WB			NB			SB			
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R	
Demand (ν), veh/h				381	799	771	747	828	319	246	136	231	287	330	292	
Signal Information																
Cycle, s	120.2	Reference Phase	2													
Offset, s	0	Reference Point	End													
Uncoordinated	Yes	Simult. Gap E/W	On													
Force Mode	Fixed	Simult. Gap N/S	On													
Green	9.0	7.0	37.2	17.0	30.0	0.0										
Yellow	4.0	4.0	4.0	4.0	4.0	0.0										
Red	0.0	0.0	0.0	0.0	0.0	0.0										
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT					
Assigned Phase				3	8	7	4	1	6	5	2					
Case Number				2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0					
Phase Duration, s				21.0	34.0	21.0	34.0	13.0	41.2	24.0	52.2					
Change Period, ($Y+R_c$), s				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0					
Max Allow Headway (MAH), s				3.1	3.2	3.1	3.2	3.1	3.2	3.1	3.2					
Queue Clearance Time (g_s), s				19.0	32.0	19.0	32.0	11.0	39.2	22.0	47.2					
Green Extension Time (g_e), s				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9					
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Max Out Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00					
Movement Group Results				EB			WB			NB			SB			
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R	
Assigned Movement				3	8	18	7	4	14	1	6	16	5	2	12	
Adjusted Flow Rate (ν), veh/h				414	868	838	812	652	595	357	532		312	676		
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1900	1610	1810	1900	1720	1810	1707		1810	1752		
Queue Service Time (g_s), s				17.0	30.0	30.0	17.0	30.0	30.0	9.0	37.2		20.0	45.2		
Cycle Queue Clearance Time (g_c), s				17.0	30.0	30.0	17.0	30.0	30.0	9.0	37.2		20.0	45.2		
Green Ratio (g/C)				0.39	0.25	0.25	0.39	0.25	0.25	0.41	0.31		0.17	0.40		
Capacity (c), veh/h				256	474	402	256	474	429	136	528		301	702		
Volume-to-Capacity Ratio (X)				1.618	1.831	2.085	3.172	1.375	1.385	2.632	1.008		1.036	0.963		
Back of Queue (Q), ft/ln (50 th percentile)				715.5	1605.3	1680.1	1945.9	944.8	872	794.7	431.9		351.7	580.5		
Back of Queue (Q), veh/ln (50 th percentile)				28.6	64.2	67.2	77.8	37.8	34.9	31.8	17.3		14.1	23.2		
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00		
Uniform Delay (d_1), s/veh				51.6	45.1	45.1	51.6	45.1	45.1	55.6	41.5		50.1	35.1		
Incremental Delay (d_2), s/veh				295.4	382.2	496.7	987.6	181.6	187.3	736.5	13.7		61.5	23.7		
Initial Queue Delay (d_3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		
Control Delay (d), s/veh				347.0	427.3	541.8	1039.2	226.7	232.4	792.1	55.2		111.6	58.8		
Level of Service (LOS)				F	F	F	F	F	F	F	F		F	E		
Approach Delay, s/veh / LOS				456.9	F		548.8	F		350.9	F		75.5	E		
Intersection Delay, s/veh / LOS				410.4						F						
Multimodal Results				EB			WB			NB			SB			
Pedestrian LOS Score / LOS				1.94	B		1.94	B		2.29	B		2.28	B		
Bicycle LOS Score / LOS				2.24	B		2.19	B		1.59	B		2.12	B		

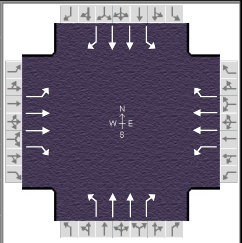
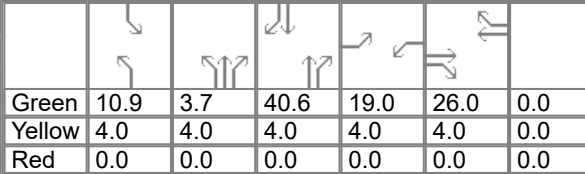
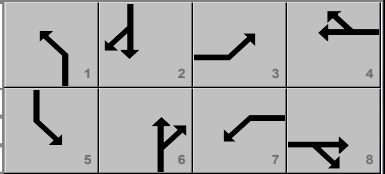
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information																
Agency		Krupka Consulting				Duration, h		0.250														
Analyst		PK		Analysis Date		Feb 23, 2021		Area Type		Other												
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF		0.92												
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period		1> 6:00												
Intersection		San Fernando		File Name		DW C 1 mod 1 022321.xus																
Project Description		DW C+G-B P 6-7 for Autumn Assessment																				
Demand Information						EB			WB			NB			SB							
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R					
Demand (v), veh/h						107	96	611	70	27	56	297	578	238	316	1347	124					
Signal Information																						
Cycle, s	120.0	Reference Phase	2																			
Offset, s	0	Reference Point	End																			
Uncoordinated	Yes	Simult. Gap E/W	On	Green	10.0													70.0	28.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0													4.0	4.0	0.0	0.0	0.0
						Red	0.0	0.0	0.0	0.0	0.0	0.0										
Timer Results						EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT		
Assigned Phase								4				8		5		2		1		6		
Case Number								8.0				8.0		2.0		4.0		2.0		4.0		
Phase Duration, s								32.0				32.0		14.0		74.0		14.0		74.0		
Change Period, (Y+R c), s								4.0				4.0		4.0		4.0		4.0		4.0		
Max Allow Headway (MAH), s								3.4				3.4		3.1		3.1		3.1		3.1		
Queue Clearance Time (g s), s								30.0				26.2		12.0		72.0		12.0		42.4		
Green Extension Time (g e), s								0.0				0.0		0.0		0.0		0.0		6.7		
Phase Call Probability								1.00				1.00		1.00		1.00		1.00		1.00		
Max Out Probability								1.00				1.00		1.00		1.00		1.00		0.01		
Movement Group Results						EB			WB			NB			SB							
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R					
Assigned Movement						7	4	14	3	8	18	5	2	12	1	6	16					
Adjusted Flow Rate (v), veh/h							885			166		423	1163		180	836						
Adjusted Saturation Flow Rate (s), veh/h/ln							1646			784		1810	1805		1810	1872						
Queue Service Time (g s), s							3.8			0.0		10.0	70.0		10.0	40.4						
Cycle Queue Clearance Time (g c), s							28.0			24.2		10.0	70.0		10.0	40.4						
Green Ratio (g/C)							0.23			0.23		0.08	0.58		0.08	0.58						
Capacity (c), veh/h							418			227		151	1053		151	1092						
Volume-to-Capacity Ratio (X)							2.117			0.734		2.808	1.105		1.191	0.766						
Back of Queue (Q), ft/ln (50 th percentile)							1796.6			133.7		971.8	1069.4		209.6	408.1						
Back of Queue (Q), veh/ln (50 th percentile)							71.9			5.3		38.9	42.8		8.4	16.3						
Queue Storage Ratio (RQ) (50 th percentile)							0.00			0.00		0.00	0.00		0.00	0.00						
Uniform Delay (d 1), s/veh							47.1			43.1		55.0	25.0		55.0	18.8						
Incremental Delay (d 2), s/veh							510.5			10.3		820.3	52.9		92.4	0.1						
Initial Queue Delay (d 3), s/veh							0.0			0.0		0.0	0.0		0.0	0.0						
Control Delay (d), s/veh							557.5			53.4		875.3	77.9		147.4	19.0						
Level of Service (LOS)							F			D		F	F		F	B						
Approach Delay, s/veh / LOS						557.5	F		53.4	D		290.7	F		41.7	D						
Intersection Delay, s/veh / LOS						275.3						F										
Multimodal Results						EB			WB			NB			SB							
Pedestrian LOS Score / LOS						1.94	B		1.94	B		1.67	B		1.67	B						
Bicycle LOS Score / LOS						1.95	B		0.76	A		2.48	B		3.69	D						

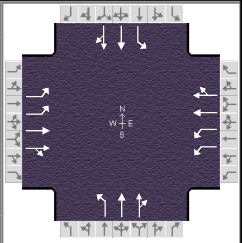
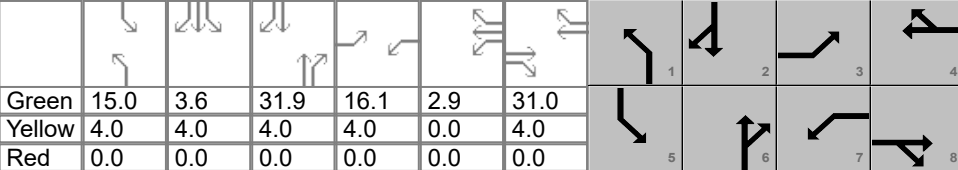
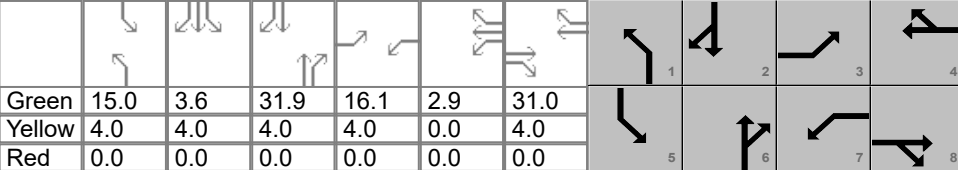
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information															
Agency		Krupka Consulting				Duration, h		0.250													
Analyst		PK		Analysis Date		Feb 23, 2021		Area Type		Other											
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF		0.92											
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period		1> 6:00											
Intersection		Park		File Name		DW C 1 mod 1 022321.xus															
Project Description		DW C+G-B P 6-7 for Autumn Assessment																			
Demand Information				EB			WB			NB			SB								
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R						
Demand (v), veh/h				114	272	274	261	125	100	184	1300	77	50	1547	182						
Signal Information																					
Cycle, s	120.1	Reference Phase	2																		
Offset, s	0	Reference Point	End																		
Uncoordinated	Yes	Simult. Gap E/W	On																		
Force Mode	Fixed	Simult. Gap N/S	On																		
				Green	3.9	6.7	39.5	10.1	5.9	30.0											
				Yellow	4.0	4.0	4.0	4.0	4.0	4.0											
				Red	0.0	0.0	0.0	0.0	0.0	0.0											
Timer Results				EBL		EBT		WBL		WBT		NBL				NBT		SBL		SBT	
Assigned Phase				7		4		3		8		5				2		1		6	
Case Number				2.0		4.0		2.0		4.0		2.0				4.0		2.0		4.0	
Phase Duration, s				14.1		34.0		24.0		43.9		18.6				54.2		7.9		43.5	
Change Period, (Y+R c), s				4.0		4.0		4.0		4.0		4.0				4.0		4.0		4.0	
Max Allow Headway (MAH), s				3.1		3.2		3.1		3.2		3.1				3.1		3.1		3.1	
Queue Clearance Time (g s), s				10.1		32.0		20.6		14.9		14.5				45.2		4.1		35.7	
Green Extension Time (g e), s				0.1		0.0		0.0		1.7		0.2				2.4		0.0		3.8	
Phase Call Probability				0.98		1.00		1.00		1.00		1.00				1.00		0.65		1.00	
Max Out Probability				0.00		1.00		1.00		0.01		0.09		0.94		0.00		0.39			
Movement Group Results				EB			WB			NB			SB								
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R						
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16						
Adjusted Flow Rate (v), veh/h				124	593		284	245		192	723	712	32	559	539						
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1743		1810	1759		1810	1900	1862	1810	1900	1829						
Queue Service Time (g s), s				8.1	30.0		18.6	12.9		12.5	42.9	43.2	2.1	33.6	33.7						
Cycle Queue Clearance Time (g c), s				8.1	30.0		18.6	12.9		12.5	42.9	43.2	2.1	33.6	33.7						
Green Ratio (g/C)				0.08	0.25		0.17	0.33		0.12	0.42	0.42	0.03	0.33	0.33						
Capacity (c), veh/h				151	435		301	585		220	794	778	59	624	601						
Volume-to-Capacity Ratio (X)				0.818	1.363		0.941	0.418		0.869	0.911	0.915	0.538	0.896	0.897						
Back of Queue (Q), ft/ln (50 th percentile)				95.6	855.1		283.2	136.8		150	512.1	507.3	23.7	387.3	373.3						
Back of Queue (Q), veh/ln (50 th percentile)				3.8	34.2		11.3	5.5		6.0	20.5	20.3	0.9	15.5	14.9						
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00						
Uniform Delay (d 1), s/veh				54.1	45.0		49.5	31.1		51.8	32.9	32.9	57.2	38.4	38.4						
Incremental Delay (d 2), s/veh				4.1	177.8		36.1	0.2		6.3	6.5	6.9	0.3	1.1	1.1						
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0						
Control Delay (d), s/veh				58.2	222.8		85.6	31.2		58.1	39.3	39.9	57.4	39.4	39.5						
Level of Service (LOS)				E	F		F	C		E	D	D	E	D	D						
Approach Delay, s/veh / LOS				194.4		F		60.4		E		41.8		D		40.0		D			
Intersection Delay, s/veh / LOS				71.1									E								
Multimodal Results				EB			WB			NB			SB								
Pedestrian LOS Score / LOS				2.30		B		2.29		B		1.92		B		1.93		B			
Bicycle LOS Score / LOS				1.67		B		1.36		A		1.89		B		2.08		B			

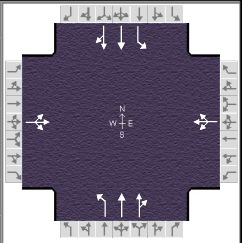
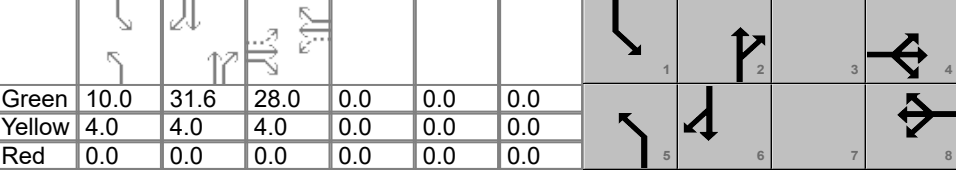
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information																
Agency		Krupka Consulting				Duration, h		0.250														
Analyst		PK		Analysis Date		Feb 23, 2021		Area Type						Other								
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF						0.92								
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period						1> 6:00								
Intersection		San Carlos		File Name		DW C 1 mod 1 022321.xus																
Project Description		DW C+G-B P 6-7 for Autumn Assessment																				
Demand Information				EB			WB			NB			SB									
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R							
Demand (v), veh/h				248	781	326	241	383	78	233	1170	207	153	1221	300							
Signal Information																						
Cycle, s	120.2	Reference Phase	2																			
Offset, s	0	Reference Point	End																			
Uncoordinated	Yes	Simult. Gap E/W	On																			
Force Mode	Fixed	Simult. Gap N/S	On	Green	10.9	3.7	40.6	19.0	26.0	0.0	Yellow	4.0	4.0	4.0	4.0	4.0	0.0	Red	0.0	0.0	0.0	0.0
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT				
Assigned Phase				3		8		7		4		1		6		5		2				
Case Number				2.0		3.0		2.0		3.0		2.0		3.0		2.0		3.0				
Phase Duration, s				23.0		30.0		23.0		30.0		22.6		52.3		14.9		44.6				
Change Period, (Y+R c), s				4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0				
Max Allow Headway (MAH), s				3.1		3.1		3.1		3.1		3.1		3.1		3.1		3.1				
Queue Clearance Time (g s), s				19.7		28.0		19.1		14.2		18.5		41.0		10.9		36.0				
Green Extension Time (g e), s				0.0		0.0		0.0		3.8		0.1		4.2		0.1		4.5				
Phase Call Probability				1.00		1.00		1.00		1.00		1.00		1.00		0.99		1.00				
Max Out Probability				1.00		1.00		1.00		0.18		1.00		0.80		0.00		0.59				
Movement Group Results				EB			WB			NB			SB									
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R							
Assigned Movement				3	8	18	7	4	14	1	6	16	5	2	12							
Adjusted Flow Rate (v), veh/h				270	849	354	262	416	85	253	1272	225	136	1083	266							
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1809	1610	1810	1809	1610	1810	1809	1610	1810	1809	1610							
Queue Service Time (g s), s				17.7	26.0	26.0	17.1	12.2	5.2	16.5	39.0	11.7	8.9	34.0	15.8							
Cycle Queue Clearance Time (g c), s				17.7	26.0	26.0	17.1	12.2	5.2	16.5	39.0	11.7	8.9	34.0	15.8							
Green Ratio (g/C)				0.16	0.22	0.22	0.16	0.22	0.22	0.15	0.40	0.40	0.09	0.34	0.34							
Capacity (c), veh/h				286	783	348	286	783	348	280	1454	647	164	1221	544							
Volume-to-Capacity Ratio (X)				0.942	1.085	1.017	0.916	0.532	0.243	0.904	0.875	0.348	0.828	0.887	0.490							
Back of Queue (Q), ft/ln (50 th percentile)				272.5	444.3	383.5	254	136.4	51.9	236.5	443.7	110.7	100.4	370.6	151.5							
Back of Queue (Q), veh/ln (50 th percentile)				10.9	17.8	15.3	10.2	5.5	2.1	9.5	17.7	4.4	4.0	14.8	6.1							
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
Uniform Delay (d 1), s/veh				50.0	47.1	47.1	49.8	41.7	39.0	49.9	33.2	25.0	53.7	37.6	31.6							
Incremental Delay (d 2), s/veh				37.5	57.6	52.7	31.5	0.4	0.1	26.5	6.0	0.1	0.4	0.7	0.0							
Initial Queue Delay (d 3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
Control Delay (d), s/veh				87.6	104.7	99.8	81.3	42.1	39.1	76.4	39.2	25.1	54.2	38.4	31.6							
Level of Service (LOS)				F	F	F	F	D	D	E	D	C	D	D	C							
Approach Delay, s/veh / LOS				100.4		F		55.2		E		42.8		D		38.6		D				
Intersection Delay, s/veh / LOS				58.9						E												
Multimodal Results				EB			WB			NB			SB									
Pedestrian LOS Score / LOS				2.45		B		2.45		B		2.43		B		2.44		B				
Bicycle LOS Score / LOS				1.70		B		1.12		A		1.93		B		1.99		B				

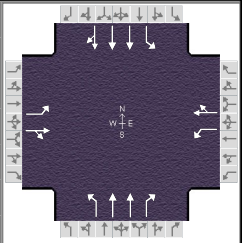
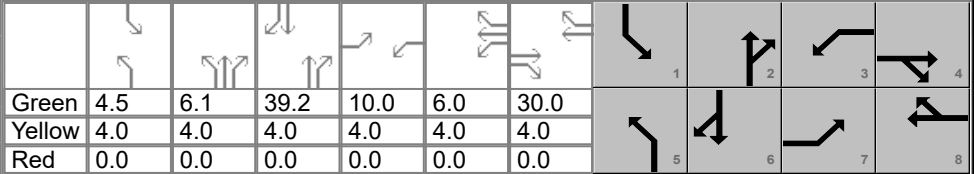
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information									
Agency		Krupka Consulting				Duration, h		0.250							
Analyst		PK		Analysis Date		1/29/2021		Area Type		Other					
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF		0.92					
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period		1> 6:00					
Intersection		Santa Clara		File Name		DW C 2 mod 1 022321.xus									
Project Description		DW C+G-B P 6-7 Autumn_SSE Layout													
Demand Information				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h				381	799	771	747	828	319	246	136	231	287	330	292
Signal Information															
Cycle, s	120.4	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	15.0	3.6	31.9	16.1	2.9	31.0	5	6	7	8	
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	4.0	0.0	4.0	5	6	7	8	
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0	0.0	0.0	0.0	0.0	5	6	7	8	
Timer Results				EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT				
Assigned Phase				3	8	7	4	1	6	5	2				
Case Number				2.0	4.0	2.0	4.0	2.0	4.0	2.0	4.0				
Phase Duration, s				20.1	35.0	23.0	37.9	19.0	35.9	26.6	43.4				
Change Period, (Y+R c), s				4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Allow Headway (MAH), s				3.1	3.2	3.1	3.2	3.1	3.2	3.1	3.2				
Queue Clearance Time (g s), s				15.9	33.0	21.0	35.9	17.0	29.1	22.4	21.9				
Green Extension Time (g e), s				0.1	0.0	0.0	0.0	0.0	2.8	0.2	2.8				
Phase Call Probability				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Max Out Probability				1.00	1.00	1.00	1.00	1.00	0.01	1.00	0.00				
Movement Group Results				EB			WB			NB			SB		
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement				3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (v), veh/h				414	868	838	812	652	595	402	222	377	312	359	317
Adjusted Saturation Flow Rate (s), veh/h/ln				1757	1900	1610	1757	1900	1720	1810	1900	1610	1810	1900	1610
Queue Service Time (g s), s				13.9	31.0	31.0	19.0	33.9	33.9	15.0	11.7	27.1	20.4	18.9	19.9
Cycle Queue Clearance Time (g c), s				13.9	31.0	31.0	19.0	33.9	33.9	15.0	11.7	27.1	20.4	18.9	19.9
Green Ratio (g/C)				0.13	0.26	0.26	0.16	0.28	0.28	0.12	0.26	0.26	0.19	0.33	0.33
Capacity (c), veh/h				469	489	414	554	535	484	225	503	426	339	622	527
Volume-to-Capacity Ratio (X)				0.882	1.776	2.022	1.465	1.219	1.228	1.783	0.442	0.885	0.920	0.576	0.602
Back of Queue (Q), ft/ln (50 th percentile)				177.1	1571.7	1651.5	627.7	815.6	755.6	732.2	135.5	272.7	285.3	215.6	193
Back of Queue (Q), veh/ln (50 th percentile)				7.1	62.9	66.1	25.1	32.6	30.2	29.3	5.4	10.9	11.4	8.6	7.7
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d 1), s/veh				51.3	44.7	44.7	50.7	43.3	43.3	52.7	36.9	42.5	48.1	33.6	33.9
Incremental Delay (d 2), s/veh				15.5	357.4	468.4	218.9	114.6	119.8	360.2	0.1	2.7	24.9	0.3	0.4
Initial Queue Delay (d 3), s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh				66.8	402.2	513.2	269.7	157.9	163.1	412.9	37.0	45.2	72.9	33.9	34.3
Level of Service (LOS)				E	F	F	F	F	F	F	D	D	E	C	C
Approach Delay, s/veh / LOS				380.5		F	203.5		F	191.0		F	46.4		D
Intersection Delay, s/veh / LOS				237.2						F					
Multimodal Results				EB			WB			NB			SB		
Pedestrian LOS Score / LOS				2.30		B	2.29		B	2.45		B	2.44		B
Bicycle LOS Score / LOS				2.24		B	2.19		B	1.04		A	1.30		A

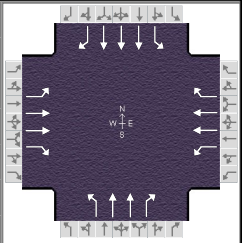
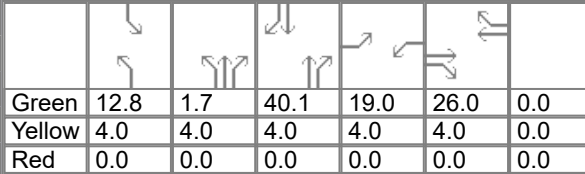
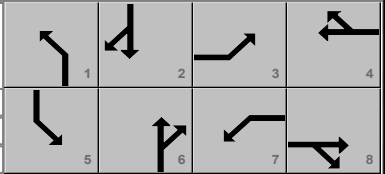
HCS7 Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Krupka Consulting				Duration, h		0.250											
Analyst		PK		Analysis Date		1/29/2021		Area Type						Other					
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF						0.92					
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period						1> 6:00					
Intersection		San Fernando		File Name		DW C 2 mod 1 022321.xus													
Project Description		DW C+G-B P 6-7 Autumn_SSE Layout																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h				107	96	611	70	27	56	297	578	238	316	1347	124				
Signal Information																			
Cycle, s	81.6	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	Yes	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	10.0	31.6	28.0	0.0	0.0	0.0									
				Yellow	4.0	4.0	4.0	0.0	0.0	0.0									
				Red	0.0	0.0	0.0	0.0	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						4				8		5		2		1		6	
Case Number						8.0				8.0		2.0		4.0		2.0		4.0	
Phase Duration, s						32.0				32.0		14.0		35.6		14.0		35.6	
Change Period, (Y+R c), s						4.0				4.0		4.0		4.0		4.0		4.0	
Max Allow Headway (MAH), s						3.4				3.4		3.1		3.1		3.1		3.1	
Queue Clearance Time (g s), s						30.0				14.1		12.0		25.8		12.0		22.6	
Green Extension Time (g e), s						0.0				1.9		0.0		5.8		0.0		5.8	
Phase Call Probability						1.00				1.00		1.00		1.00		1.00		1.00	
Max Out Probability						1.00				0.55		1.00		0.01		1.00		0.00	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16				
Adjusted Flow Rate (v), veh/h					885			166		423	611	552	235	554	538				
Adjusted Saturation Flow Rate (s), veh/h/ln					1651			784		1810	1900	1711	1810	1900	1843				
Queue Service Time (g s), s					15.9			0.0		10.0	23.7	23.8	10.0	20.6	20.6				
Cycle Queue Clearance Time (g c), s					28.0			12.1		10.0	23.7	23.8	10.0	20.6	20.6				
Green Ratio (g/C)					0.34			0.34		0.12	0.39	0.39	0.12	0.39	0.39				
Capacity (c), veh/h					616			333		222	736	663	222	736	714				
Volume-to-Capacity Ratio (X)					1.436			0.499		1.910	0.830	0.833	1.059	0.753	0.753				
Back of Queue (Q), ft/ln (50 th percentile)					1168.1			59.8		746.3	245	222	161.7	210.9	205.1				
Back of Queue (Q), veh/ln (50 th percentile)					46.7			2.4		29.9	9.8	8.9	6.5	8.4	8.2				
Queue Storage Ratio (RQ) (50 th percentile)					0.00			0.00		0.00	0.00	0.00	0.00	0.00	0.00				
Uniform Delay (d 1), s/veh					27.7			20.7		35.8	22.6	22.6	35.8	21.6	21.6				
Incremental Delay (d 2), s/veh					205.4			0.4		416.0	0.4	0.4	36.2	0.1	0.1				
Initial Queue Delay (d 3), s/veh					0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0				
Control Delay (d), s/veh					233.1			21.1		451.8	22.9	23.0	72.0	21.7	21.7				
Level of Service (LOS)					F			C		F	C	C	F	C	C				
Approach Delay, s/veh / LOS				233.1	F		21.1	C		137.4	F		30.6	C					
Intersection Delay, s/veh / LOS				118.1						F									
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.27	B		2.27	B		1.68	B		1.68	B					
Bicycle LOS Score / LOS				1.95	B		0.76	A		1.49	A		2.09	B					

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information													
Agency		Krupka Consulting				Duration, h		0.250											
Analyst		PK		Analysis Date		1/29/2021		Area Type		Other									
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF		0.92									
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period		1> 6:00									
Intersection		Park		File Name		DW C 2 mod 1 022321.xus													
Project Description		DW C+G-B P 6-7 Autumn_SSE Layout																	
Demand Information				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h				114	272	274	261	125	100	184	1300	77	50	1547	182				
Signal Information																			
Cycle, s	119.8	Reference Phase	2																
Offset, s	0	Reference Point	End																
Uncoordinated	Yes	Simult. Gap E/W	On																
Force Mode	Fixed	Simult. Gap N/S	On																
				Green	4.5	6.1	39.2	10.0	6.0	30.0									
				Yellow	4.0	4.0	4.0	4.0	4.0	4.0									
				Red	0.0	0.0	0.0	0.0	0.0	0.0									
Timer Results				EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase				7		4		3		8		5		2		1		6	
Case Number				2.0		4.0		2.0		4.0		2.0		3.0		2.0		4.0	
Phase Duration, s				14.0		34.0		24.0		44.0		18.6		53.3		8.5		43.2	
Change Period, (Y+R c), s				4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0	
Max Allow Headway (MAH), s				3.1		3.2		3.1		3.2		3.1		3.1		3.1		3.1	
Queue Clearance Time (g s), s				10.1		32.0		20.6		14.9		14.5		44.2		4.8		30.4	
Green Extension Time (g e), s				0.1		0.0		0.0		1.7		0.2		4.1		0.0		8.8	
Phase Call Probability				0.98		1.00		1.00		1.00		1.00		1.00		0.75		1.00	
Max Out Probability				0.00		1.00		1.00		0.01		0.08		0.81		0.00		0.29	
Movement Group Results				EB			WB			NB			SB						
Approach Movement				L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement				7	4	14	3	8	18	5	2	12	1	6	16				
Adjusted Flow Rate (v), veh/h				124	593		284	245		192	1354	80	42	991	468				
Adjusted Saturation Flow Rate (s), veh/h/ln				1810	1743		1810	1759		1810	1809	1610	1810	1900	1794				
Queue Service Time (g s), s				8.1	30.0		18.6	12.9		12.5	42.2	3.7	2.8	28.4	28.4				
Cycle Queue Clearance Time (g c), s				8.1	30.0		18.6	12.9		12.5	42.2	3.7	2.8	28.4	28.4				
Green Ratio (g/C)				0.08	0.25		0.17	0.33		0.12	0.41	0.41	0.04	0.33	0.33				
Capacity (c), veh/h				151	436		302	587		220	1488	662	68	1243	587				
Volume-to-Capacity Ratio (X)				0.818	1.360		0.939	0.417		0.870	0.910	0.121	0.617	0.797	0.797				
Back of Queue (Q), ft/ln (50 th percentile)				95.3	851.8		281.4	136.1		148.4	462.5	34.8	31.4	323.6	306.2				
Back of Queue (Q), veh/ln (50 th percentile)				3.8	34.1		11.3	5.4		5.9	18.5	1.4	1.3	12.9	12.2				
Queue Storage Ratio (RQ) (50 th percentile)				0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00				
Uniform Delay (d 1), s/veh				54.0	44.9		49.3	30.9		51.7	33.2	21.8	56.8	36.7	36.7				
Incremental Delay (d 2), s/veh				4.1	176.3		35.5	0.2		5.6	3.2	0.0	0.3	0.2	0.3				
Initial Queue Delay (d 3), s/veh				0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0				
Control Delay (d), s/veh				58.1	221.2		84.8	31.1		57.2	36.3	21.9	57.1	36.8	37.0				
Level of Service (LOS)				E	F		F	C		E	D	C	E	D	D				
Approach Delay, s/veh / LOS				193.0		F		59.9		E		38.1		D		37.5		D	
Intersection Delay, s/veh / LOS				65.9									E						
Multimodal Results				EB			WB			NB			SB						
Pedestrian LOS Score / LOS				2.59		C		2.44		B		1.92		B		1.93		B	
Bicycle LOS Score / LOS				1.67		B		1.36		A		1.89		B		1.55		B	

HCS7 Signalized Intersection Results Summary

General Information						Intersection Information															
Agency		Krupka Consulting				Duration, h		0.250													
Analyst		PK		Analysis Date		1/29/2021		Area Type		Other											
Jurisdiction		San Jose		Time Period		6:00 - 7:00 PM		PHF		0.92											
Urban Street		Autumn Street		Analysis Year		2020		Analysis Period		1> 6:00											
Intersection		San Carlos		File Name		DW C 2 mod 1 022321.xus															
Project Description		DW C+G-B P 6-7 Autumn_SSE Layout																			
Demand Information						EB			WB			NB			SB						
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R				
Demand (v), veh/h						248	781	326	241	383	78	233	1170	207	153	1221	300				
Signal Information																					
Cycle, s	119.7	Reference Phase	2																		
Offset, s	0	Reference Point	End																		
Uncoordinated	Yes	Simult. Gap E/W	On																		
Force Mode	Fixed	Simult. Gap N/S	On																		
Green						12.8	1.7	40.1	19.0	26.0	0.0										
Yellow						4.0	4.0	4.0	4.0	4.0	0.0										
Red						0.0	0.0	0.0	0.0	0.0	0.0										
Timer Results						EBL		EBT		WBL		WBT		NBL		NBT		SBL		SBT	
Assigned Phase						3		8		7		4		1		6		5		2	
Case Number						2.0		3.0		2.0		3.0		2.0		3.0		2.0		3.0	
Phase Duration, s						23.0		30.0		23.0		30.0		22.5		49.8		16.8		44.1	
Change Period, (Y+R c), s						4.0		4.0		4.0		4.0		4.0		4.0		4.0		4.0	
Max Allow Headway (MAH), s						3.1		3.1		3.1		3.1		3.1		3.1		3.1		3.1	
Queue Clearance Time (g s), s						19.6		28.0		19.0		14.2		18.5		42.0		12.7		29.2	
Green Extension Time (g e), s						0.0		0.0		0.0		3.8		0.1		3.8		0.2		9.2	
Phase Call Probability						1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00	
Max Out Probability						1.00		1.00		1.00		0.18		1.00		0.89		0.01		0.43	
Movement Group Results						EB			WB			NB			SB						
Approach Movement						L	T	R	L	T	R	L	T	R	L	T	R				
Assigned Movement						3	8	18	7	4	14	1	6	16	5	2	12				
Adjusted Flow Rate (v), veh/h						270	849	354	262	416	85	253	1272	225	165	1319	324				
Adjusted Saturation Flow Rate (s), veh/h/ln						1810	1809	1610	1810	1809	1610	1810	1809	1610	1810	1725	1610				
Queue Service Time (g s), s						17.6	26.0	26.0	17.0	12.2	5.2	16.5	40.0	12.0	10.7	27.2	20.0				
Cycle Queue Clearance Time (g c), s						17.6	26.0	26.0	17.0	12.2	5.2	16.5	40.0	12.0	10.7	27.2	20.0				
Green Ratio (g/C)						0.16	0.22	0.22	0.16	0.22	0.22	0.15	0.38	0.38	0.11	0.34	0.34				
Capacity (c), veh/h						287	786	350	287	786	350	280	1386	617	194	1736	540				
Volume-to-Capacity Ratio (X)						0.938	1.080	1.013	0.912	0.530	0.242	0.904	0.918	0.365	0.851	0.760	0.600				
Back of Queue (Q), ft/ln (50 th percentile)						269.6	440	380.7	251.4	135.7	51.5	235.1	471.6	114.3	124.3	281.5	193.2				
Back of Queue (Q), veh/ln (50 th percentile)						10.8	17.6	15.2	10.1	5.4	2.1	9.4	18.9	4.6	5.0	11.3	7.7				
Queue Storage Ratio (RQ) (50 th percentile)						0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Uniform Delay (d 1), s/veh						49.8	46.8	46.8	49.5	41.4	38.7	49.7	35.1	26.5	52.5	35.5	33.1				
Incremental Delay (d 2), s/veh						36.5	55.9	51.4	30.6	0.3	0.1	26.3	9.4	0.1	2.5	0.4	0.2				
Initial Queue Delay (d 3), s/veh						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
Control Delay (d), s/veh						86.3	102.8	98.3	80.1	41.8	38.8	76.0	44.5	26.6	55.0	35.8	33.3				
Level of Service (LOS)						F	F	F	F	D	D	E	D	C	E	D	C				
Approach Delay, s/veh / LOS						98.7		F		54.6		D		46.7		D		37.1		D	
Intersection Delay, s/veh / LOS						58.0						E									
Multimodal Results						EB			WB			NB			SB						
Pedestrian LOS Score / LOS						2.60		C		2.60		C		2.44		B		2.44		B	
Bicycle LOS Score / LOS						1.70		B		1.12		A		1.93		B		1.49		A	