Appendix B

Traffic Modeling Data

FEHR PEERS

Appendix X

Date: October 28, 2020

To: Glenn Gebhardt and Mark Meissner, City of Lathrop, CA

From: Albee Wei and Fred Choa, Fehr & Peers

Subject: City of Lathrop Travel Demand Forecasting Model and Vehicle Miles Traveled Technical Memorandum

RS20 -3880

This memorandum documents the methodology for determining Vehicle-Miles Traveled (VMT) from the City of Lathrop Travel Demand Forecasting Model (Travel Demand Model) and presents a glossary of VMT-related terminologies used in the River Islands Phase 2 Project Subsequent Environmental Impact Report (SEIR).

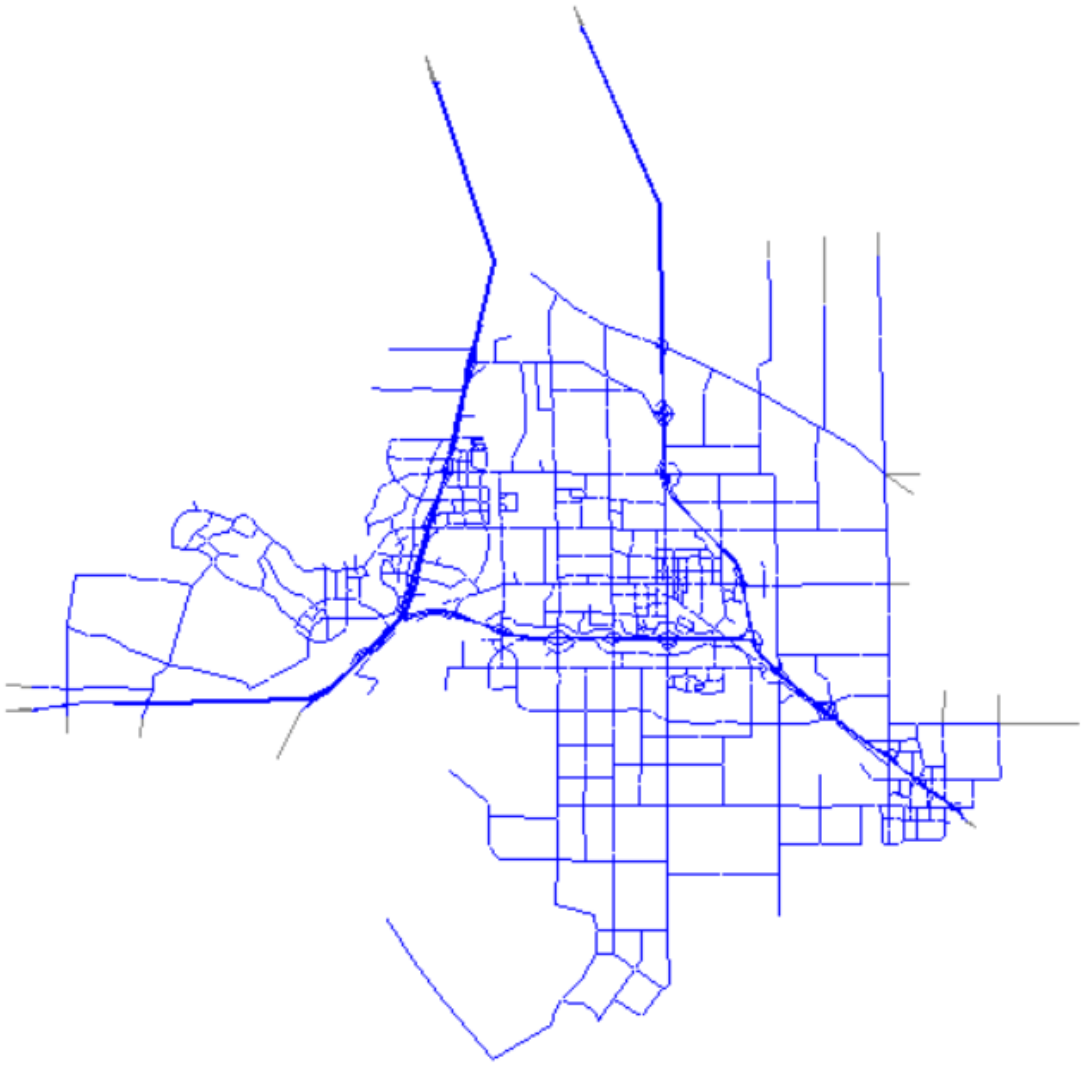
The Travel Demand Model was developed as part of the City of Lathrop's Senate Bill (SB) 743 implementation and will also be used for the City's General Plan 2040 Update. SB 743 eliminates the use of automobile delay and Level of Service (LOS) as a potential significant impact under the California Environmental Quality Act (CEQA), and instead requires all transportation impact analysis to use VMT for the CEQA environmental review process and the determination of CEQA transportation impacts. On September 14, 2020, the City of Lathrop adopted Resolution No. 20-4787, which adopted thresholds of significance and screening criteria for the purpose of analyzing transportation impacts using VMT within the City of Lathrop. Resolution No. 20-4787 also identifies that previous thresholds regarding LOS shall continue for the purpose of reviewing non-CEQA related impacts for discretionary planning approvals in accordance with the general plan.

The shift from automobile delay to VMT changes the focus of transportation impact analysis in CEQA from measuring impacts *to* drivers, to measuring the impact *of* driving. The Travel Demand Model was developed by Fehr & Peers to estimate VMT with consideration of several factors that affect frequency and distance of vehicle travel, including availability and locations of complimentary land use, transportation network, distances traveled to and from areas external to the model area, and availability of high-capacity commuter rail / transit services.

Model Scenarios

The City of Lathrop Travel Demand Model was derived from the San Joaquin Council of Governments (SJCOG) Regional Three County (San Joaquin, Stanislaus, and Merced) Travel Demand Model. As shown in Figure 1, the City of Lathrop Travel Demand Model encompasses the City of Lathrop, the City of Manteca, the City of Ripon, and some unincorporated areas of San Joaquin County. The model area is roughly bounded by French Camp Road in the north, MacArthur Drive in the west, Murphy Road in the east, and Kasson Road and the Stanislaus River in the south. Two model scenarios representing the Base Year Scenario and Cumulative Year Scenario for the City of Lathrop are described below.

Figure 1. City of Lathrop Travel Demand Model Area and Transportation Network



Base Year Scenario

The Base Year Scenario model represents year 2020 "Baseline" conditions in the City of Lathrop. The Base Year Scenario model reflects current local and regional roadways and land use in the Lathrop model area, including those in the River Islands Development area and the Paradise Road Bridge that was recently re-opened to traffic in fall 2020. Land uses in the Base Year Scenario model are placed in 977 Transportation Analysis Zones (TAZs), including 167 TAZs in the City of Lathrop.

The Base Year Scenario model is calibrated to pre COVID-19 traffic counts and reflects data from multiple sources, including: the California Household Travel Survey (CHTS), American Community Survey (ACS), and Caltrans Highway Performance Monitoring System (HPMS) data. The calibration process ensures that the travel demand model reflects existing year 2020 pre COVID-19 local and regional travel conditions. The Base Year Scenario model was used to determine Baseline VMT for residential, office, retail, and industrial land uses.

Cumulative Year Scenario

The Cumulative Year Scenario model represents year 2040 conditions in the City of Lathrop. The Cumulative Year Scenario model reflects local and regional roadway improvements and land use projections consistent with the SJCOG Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), City of Lathrop General Plan, Central Lathrop Specific Plan, City of Manteca General Plan, and City of Ripon General Plan. Land use in the Cumulative Year Scenario model are placed in 1,224 TAZs, including 239 TAZs in the City of Lathrop.

For the River Islands Development project, two Cumulative Year Scenario models were developed. The first model included the River Islands Development Approved Project land use (i.e., land uses as reflected in the 2003 SEIR and subsequent addenda), and the second model included the River Islands Development Proposed Phase 2 Project land use (i.e., the modified Phase 2 Project evaluated in the current SEIR). These Cumulative Year Scenario models were used to evaluate and compare VMT and transportation impact of proposed residential, office, retail, and industrial projects for the Approved River Islands Development Project and the Proposed River Islands Development Project.

Methodology

For each modeling scenario, a model-wide analysis was preformed to obtain daily vehicle trips and travel distance for all TAZs, and the product of daily vehicle trips and travel distance was summed to obtain VMT estimates. Based on the trip origin and destination, vehicle trips were categorized into four trip purpose categories: home-based work, home-based school, home-based other, and non-home-based. Similarly, VMT associated with each vehicle trip is categorized as Residential VMT or Employment VMT. Table 1 provides an overview of vehicle trip purpose and VMT categories.

Table 1. Vehicle Trip Purpose and VMT Categories

Trip Type	Trip Origin	Trip Destination	Example	VMT Category
Home-based Work	Residential zones (single family, multi-family, and other housing types)	Employment/ commercial zones (office, school, government, medical, industrial, food, retail, etc.)	Worker driving between home and work	Residential VMT; Employment VMT
Home-based School	Residential zones (single family, multi-family, and other housing types)	School zones	Parent driving students between home and school	Residential VMT
Home-based Other	Residential zones (single family, multi-family, and other housing types)	Employment/ commercial zones (food, retail, medical, etc.)	Person driving between home and shopping, recreation, social destinations; appointments and errands	Residential VMT; Employment VMT
Non-home-based	Employment/ commercial zones (office, school, government, medical, industrial, food, retail, etc.)	Employment/ commercial zones (office, school, government, medical, industrial, food, retail, etc.)	Worker driving from work to lunch, shopping, errands; business delivery trips	Employment VMT

Source: Fehr & Peers 2020

The primary VMT metric used in the Travel Demand Model is Project-generated VMT. Project-generated VMT is a useful tool in measuring the relative change in VMT when comparing different project alternatives. The primary factors that influence VMT are the availability and locations of complimentary land use (i.e., how far is the desired destination?) and roadway network (i.e., what is the fastest route to reach the destination?).

Per Resolution No. 20-4787, the City of Lathrop has selected the following VMT efficiency metrics that evaluate Project-generated VMT:

- Residential VMT Per Household or Per Resident
- Office VMT Per Employee
- Retail VMT Per Employee
- Industrial VMT Per Employee

To fully account for VMT generated by a project, VMT associated with each vehicle trip is attributed to both trip origin and destination. For example, if a worker travels from their home in Lathrop to their office in Manteca, the entire trip length is counted as home-based work, with Residential VMT generated in Lathrop and home-based work Employment VMT attracted to Manteca. Similarly, if a

worker in Lathrop drives a short distance within the city to have lunch, the entire length of the trip is counted as non-home-based Employment VMT for the office, and non-home-based Employment VMT for the food establishment. For this reason, Project-generated VMT should always be presented as Residential VMT and Employment VMT for each employment category. Summing VMT across land use categories should be avoided, as it would result in double counting VMT.

In general, VMT per Residents and VMT per employee are lower in areas where a well-balanced mix of housing, employment, and commercial uses support short local trips. When a city has more housing than employment and commercial uses, some residents must travel out of the city to work or obtain goods and services. Conversely, an oversupply of employment and commercial uses would attract workers and visitors from outside the city. In either case, the longer inter-city and inter-regional trips contribute to an increase in Residential VMT or Employment VMT. In the City of Lathrop Travel Demand Model, changes in the distribution of jobs and housing within the model area is a main contributor to changes in Project-generated VMT.

The City of Lathrop Travel Demand Model captures vehicle trips that occur partially outside the model area. The Travel Demand Model uses gateways to capture vehicle travel beyond the model area and estimates VMT associated with the entire vehicle trip. Gateways in the City of Lathrop Travel Demand Model include Interstate 5 (I-5), State Route 99 (SR 99), Interstate 205 (I-205), Yosemite Avenue, and other major roads used for regional travel. Vehicle trip distribution to different gateways and average travel distance beyond each gateway is calibrated using CHTS data, ACS data, and the SJCOG Three County Travel Demand Model. For trips produced and attracted at each gateway, the average distance traveled beyond the gateway is added to the vehicle's distance traveled within the model area.

As part of the River Islands project, Fehr & Peers developed a version of the City of Lathrop Travel Demand Model that simulates the benefits of introducing high capacity commuter rail / transit. Based on ridership forecasts published by the Valley Link commuter rail service, the River Islands and North Lathrop Valley Link stations would carry approximately 7,000 daily passengers to and from the San Francisco Bay Area. Therefore, in the River Islands Development Cumulative Plus Proposed Phase 2 Project (With Valley Link) scenario, the Travel Demand Model was modified to reflect the reduction of 7,000 single-occupancy home-based work vehicle trips that travel to and from the San Francisco Bay Area via I-205.

VMT Glossary

Project-generated VMT is the primary VMT metric used in the City of Lathrop Travel Demand Model. Project-generated VMT measures the amount of all vehicle type travel generated by a project (i.e., number of vehicle trips multiplied by their corresponding trip lengths), over a weekday 24-hour time

period. This VMT metric is used to determine transportation impacts for certain land use types such as residential and office uses, as well as provide inputs to a project's air quality, GHG, and energy assessments.

Project's effect on VMT is measured by comparing VMT generated by all land uses within a selected geographic area for scenarios without and with a project or plan. A Project's effect on VMT provides a more complete evaluation of the potential effects of certain land use projects because it captures the combined effect of new VMT, shifting of existing VMT to/from other neighborhoods, and/or shifting of existing VMT to alternate travel routes or travel modes. For example, a new local grocery store has the potential to reduce home-based other (shopping) Residential VMT, as residents can now travel a shorter distance to obtain groceries. A Project's effect on VMT can be evaluated by comparing Project-generated VMT results for all land use categories from without and with a project or plan modeling scenarios.

Baseline VMT represent the existing (Baseline) city-wide VMT for residential, office, retail, and industrial land uses. Baseline VMT is determined using the City of Lathrop Travel Demand Model's Base Year Scenario. When evaluating transportation impacts of future projects, VMT generated by the proposed project is compared to a Baseline city-wide VMT value for a land use type. As VMT assessments are conducted over the coming years, the VMT Baseline values will be updated with the analysis of the Comprehensive General Plan Update and Data from the 2020 Census. It should be noted that this will require transportation improvements and land use developments be added to the Travel Demand Model in order to update the Baseline citywide VMT per land use type.

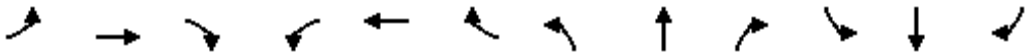
Total Residential Daily VMT is the sum of VMT generated by all residential uses located within a selected area (e.g., project area, city-wide, or model-wide). Vehicle trip types that contribute to Total Residential Daily VMT include home-based work, home-based school, and home-based other trips. Residential Daily VMT reflects how close households are to complimentary destinations (jobs, shopping, schools, etc.), as well as the available transportation options and demographics of the household (i.e. single family, multi-family, or age restricted dwelling units).

VMT Per Household is equal to Total Residential Daily VMT divided by the total number of households located within the selected area. VMT per Household is an efficiency metrics that is used to express change in VMT relative to change in number of households in a selected area.

VMT Per Capita is equal to Total Residential Daily VMT divided by the total number of residents located within the selected area. VMT per Capita is an efficiency metrics that is used to express change in VMT relative to change in number of residents in a selected area.

Total Employee Daily VMT, or Employment VMT is the sum of VMT generated by all employment uses of a single employment category (e.g., office, school, government, medical, industrial, food, retail) located within a selected area (e.g., project area, city-wide, or model-wide). Employee Daily VMT includes VMT generated by both employees who work in the identified area, as well as by customers, visitors, deliveries, and other service-oriented trips. Vehicle trip types that contribute to Total Employee Daily VMT include home-based work, home-based other, and non-home-based trips. Employee Daily VMT reflects how close a workplace or commercial area is to places where employees and customers live.

VMT Per Employee is equal to Total Employee Daily VMT divided by the total number of employees within the identified area. Total Employee Daily VMT and VMT Per Employee should always be presented in single employment category. VMT per Employee is an efficiency metrics that is used to express change in VMT relative to change in number of employees in a selected area.

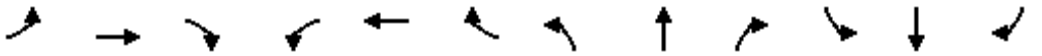


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	550	1500	0	0	1220	810	1420	0	380	0	0	0
Future Volume (vph)	550	1500	0	0	1220	810	1420	0	380	0	0	0
Confl. Peds. (#/hr)						10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	579	1579	0	0	1284	853	1495	0	400	0	0	0
v/c Ratio	1.24	0.83			1.05	1.02	1.30		0.41			
Control Delay	163.7	25.7			84.0	48.0	176.0		26.6			
Queue Delay	0.0	1.6			0.0	0.0	0.0		0.0			
Total Delay	163.7	27.4			84.0	48.0	176.0		26.6			
Queue Length 50th (ft)	~557	497			~397	~302	~764		113			
Queue Length 95th (ft)	#778	606			#493	#550	#901		162			
Internal Link Dist (ft)		670			818			1440			1422	
Turn Bay Length (ft)						400	500		500			
Base Capacity (vph)	466	1908			1220	837	1148		967			
Starvation Cap Reductn	0	174			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.24	0.91			1.05	1.02	1.30		0.41			

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

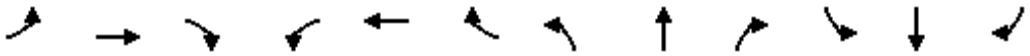
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	550	1500	0	0	1220	810	1420	0	380	0	0	0
Future Volume (veh/h)	550	1500	0	0	1220	810	1420	0	380	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1781	1781	0	0	1781	1781	1781	0	1781			
Adj Flow Rate, veh/h	579	1579	0	0	1284	351	1495	0	362			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	8	8	0	0	8	8	8	0	8			
Cap, veh/h	474	1932	0	0	1236	376	1166	0	941			
Arrive On Green	0.28	0.57	0.00	0.00	0.25	0.25	0.35	0.00	0.35			
Sat Flow, veh/h	1697	3474	0	0	5024	1480	3291	0	2657			
Grp Volume(v), veh/h	579	1579	0	0	1284	351	1495	0	362			
Grp Sat Flow(s),veh/h/ln	1697	1692	0	0	1621	1480	1646	0	1329			
Q Serve(g_s), s	33.5	45.0	0.0	0.0	30.5	27.8	42.5	0.0	12.2			
Cycle Q Clear(g_c), s	33.5	45.0	0.0	0.0	30.5	27.8	42.5	0.0	12.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	474	1932	0	0	1236	376	1166	0	941			
V/C Ratio(X)	1.22	0.82	0.00	0.00	1.04	0.93	1.28	0.00	0.38			
Avail Cap(c_a), veh/h	474	1932	0	0	1236	376	1166	0	941			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.83	0.83	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	43.3	20.7	0.0	0.0	44.8	43.8	38.8	0.0	29.0			
Incr Delay (d2), s/veh	115.2	3.3	0.0	0.0	36.2	32.2	133.8	0.0	0.3			
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/ln	28.7	17.1	0.0	0.0	16.0	13.3	38.3	0.0	3.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	158.4	24.0	0.0	0.0	81.0	76.0	172.5	0.0	29.2			
LnGrp LOS	F	C	A	A	F	E	F	A	C			
Approach Vol, veh/h		2158			1635			1857				
Approach Delay, s/veh		60.1			79.9			144.6				
Approach LOS		E			E			F				

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		73.0			38.0	35.0				
Change Period (Y+Rc), s		4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s		42.5		68.5			33.5	30.5				
Max Q Clear Time (g_c+I1), s		44.5		47.0			35.5	32.5				
Green Ext Time (p_c), s		0.0		12.2			0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			93.6									
HCM 6th LOS			F									

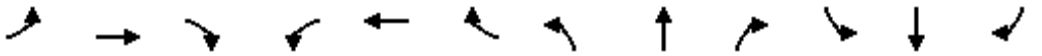


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1520	1540	0	2340	300	0	0	0	530	0	720
Future Volume (vph)	0	1520	1540	0	2340	300	0	0	0	530	0	720
Confl. Peds. (#/hr)			10			10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1600	1621	0	2463	316	0	0	0	558	0	758
v/c Ratio		0.51	1.11		1.12	0.22				0.63		1.00
Control Delay		12.1	66.7		84.5	0.3				45.3		77.7
Queue Delay		0.0	0.0		0.2	0.0				0.0		0.0
Total Delay		12.1	66.7		84.7	0.3				45.3		77.7
Queue Length 50th (ft)		235	~285		~1256	0				213		~347
Queue Length 95th (ft)		269	#552		#1386	0				275		#499
Internal Link Dist (ft)		730			670			1228			1687	
Turn Bay Length (ft)			500							500		500
Base Capacity (vph)		3158	1458		2198	1458				885		755
Starvation Cap Reductn		0	0		174	0				0		0
Spillback Cap Reductn		0	0		0	0				0		0
Storage Cap Reductn		0	0		0	0				0		0
Reduced v/c Ratio		0.51	1.11		1.22	0.22				0.63		1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑	↱				↰↰		↱↱
Traffic Volume (veh/h)	0	1520	1540	0	2340	300	0	0	0	530	0	720
Future Volume (veh/h)	0	1520	1540	0	2340	300	0	0	0	530	0	720
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1781	0	1781	1781				1781	0	1781
Adj Flow Rate, veh/h	0	1600	0	0	2463	0				558	0	720
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	8	8	0	8	8				8	0	8
Cap, veh/h	0	3199		0	2226					899	0	726
Arrive On Green	0.00	0.66	0.00	0.00	0.66	0.00				0.27	0.00	0.27
Sat Flow, veh/h	0	5024	1510	0	3474	1510				3291	0	2657
Grp Volume(v), veh/h	0	1600	0	0	2463	0				558	0	720
Grp Sat Flow(s),veh/h/ln	0	1621	1510	0	1692	1510				1646	0	1329
Q Serve(g_s), s	0.0	21.8	0.0	0.0	85.5	0.0				19.3	0.0	35.1
Cycle Q Clear(g_c), s	0.0	21.8	0.0	0.0	85.5	0.0				19.3	0.0	35.1
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3199		0	2226					899	0	726
V/C Ratio(X)	0.00	0.50		0.00	1.11					0.62	0.00	0.99
Avail Cap(c_a), veh/h	0	3199		0	2226					899	0	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	11.4	0.0	0.0	22.2	0.0				41.4	0.0	47.1
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	48.6	0.0				1.3	0.0	31.4
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/ln	0.0	7.3	0.0	0.0	44.3	0.0				7.9	0.0	14.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.9	0.0	0.0	70.9	0.0				42.7	0.0	78.5
LnGrp LOS	A	B		A	F					D	A	E
Approach Vol, veh/h		1600	A		2463	A					1278	
Approach Delay, s/veh		11.9			70.9						62.9	
Approach LOS		B			E						E	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		90.0		40.0		90.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		85.5		35.5		85.5						
Max Q Clear Time (g_c+I1), s		23.8		37.1		87.5						
Green Ext Time (p_c), s		17.9		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			51.3									
HCM 6th LOS			D									

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	100	60	30	20	30
Future Vol, veh/h	30	100	60	30	20	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	32	105	63	32	21	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	179	21	53	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	804	1048	1534	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	1048	1534	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1534	-	770	1048	-	-
HCM Lane V/C Ratio	0.041	-	0.041	0.1	-	-
HCM Control Delay (s)	7.4	0	9.9	8.8	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.3	-	-

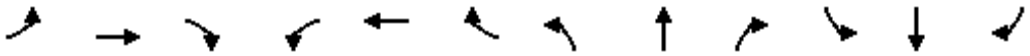
Intersection	
Int Delay, s/veh	7.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	100	10	0	180	0
Future Vol, veh/h	10	100	10	0	180	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	25	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	11	105	11	0	189	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	389	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Critical Hdwy	6.48	6.28	-	-	4.18	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	-	-	2.272	-
Pot Cap-1 Maneuver	603	1053	-	-	1570	-
Stage 1	997	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	531	1053	-	-	1570	-
Mov Cap-2 Maneuver	531	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	598	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	7.6
HCM LOS	A		

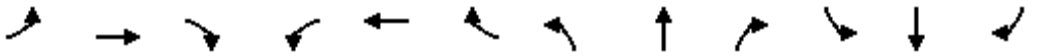
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	531	1053	1570	-
HCM Lane V/C Ratio	-	-	0.02	0.1	0.121	-
HCM Control Delay (s)	-	-	11.9	8.8	7.6	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.3	0.4	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	150	0	90	350	50	0	0	110	20
Future Volume (vph)	0	0	0	150	0	90	350	50	0	0	110	20
Confl. Peds. (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	158	95	368	53	0	0	116	21
v/c Ratio					0.54	0.28	0.99	0.04			0.15	0.03
Control Delay					30.6	7.0	67.6	2.0			14.8	0.1
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					30.6	7.0	67.6	2.0			14.8	0.1
Queue Length 50th (ft)					58	0	149	3			29	0
Queue Length 95th (ft)					101	29	#309	7			67	0
Internal Link Dist (ft)		1133			1101			260			945	
Turn Bay Length (ft)						350						350
Base Capacity (vph)					462	487	372	1293			755	684
Starvation Cap Reductn					0	0	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.34	0.20	0.99	0.04			0.15	0.03

Intersection Summary

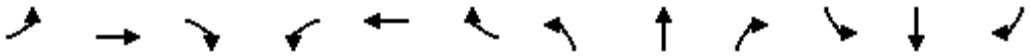
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	0	90	350	50	0	0	110	20
Future Volume (veh/h)	0	0	0	150	0	90	350	50	0	0	110	20
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1781	1781	1781	1781	1781	0	0	1781	1781
Adj Flow Rate, veh/h				158	0	11	368	53	0	0	116	8
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				8	8	8	8	8	0	0	8	8
Cap, veh/h				209	0	186	639	1315	0	0	521	440
Arrive On Green				0.12	0.00	0.12	0.38	0.74	0.00	0.00	0.29	0.29
Sat Flow, veh/h				1697	0	1510	1697	1781	0	0	1781	1505
Grp Volume(v), veh/h				158	0	11	368	53	0	0	116	8
Grp Sat Flow(s),veh/h/ln				1697	0	1510	1697	1781	0	0	1781	1505
Q Serve(g_s), s				5.9	0.0	0.4	11.2	0.5	0.0	0.0	3.2	0.2
Cycle Q Clear(g_c), s				5.9	0.0	0.4	11.2	0.5	0.0	0.0	3.2	0.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				209	0	186	639	1315	0	0	521	440
V/C Ratio(X)				0.76	0.00	0.06	0.58	0.04	0.00	0.00	0.22	0.02
Avail Cap(c_a), veh/h				470	0	418	639	1315	0	0	521	440
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	0.00	1.00	0.99	0.99	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.6	0.0	25.2	16.1	2.3	0.0	0.0	17.4	16.4
Incr Delay (d2), s/veh				5.5	0.0	0.1	1.3	0.1	0.0	0.0	1.0	0.1
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/ln				2.5	0.0	0.1	4.0	0.1	0.0	0.0	1.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	0.0	25.3	17.4	2.3	0.0	0.0	18.4	16.4
LnGrp LOS				C	A	C	B	A	A	A	B	B
Approach Vol, veh/h					169			421			124	
Approach Delay, s/veh					32.5			15.5			18.3	
Approach LOS					C			B			B	

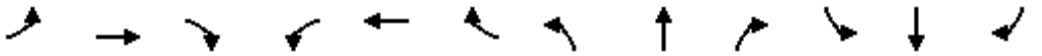
Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	52.5		29.0	23.5		12.5						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	38.0		14.5	19.0		18.0						
Max Q Clear Time (g_c+I1), s	2.5		13.2	5.2		7.9						
Green Ext Time (p_c), s	0.2		0.2	0.4		0.6						

Intersection Summary		
HCM 6th Ctrl Delay		20.0
HCM 6th LOS		C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	40	0	400	0	0	0	0	360	160	80	180	0
Future Volume (vph)	40	0	400	0	0	0	0	360	160	80	180	0
Confl. Peds. (#/hr)									2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	421	0	0	0	0	379	168	84	189	0
v/c Ratio		0.17	0.73					0.21	0.19	0.38	0.15	
Control Delay		23.1	10.5					10.6	3.5	24.5	3.1	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		23.1	10.5					10.6	3.5	24.5	3.1	
Queue Length 50th (ft)		16	0					36	0	17	0	
Queue Length 95th (ft)		33	59					91	36	59	81	
Internal Link Dist (ft)		966			991			741			260	
Turn Bay Length (ft)			400						350			
Base Capacity (vph)		552	776					1816	870	241	1254	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.08	0.54					0.21	0.19	0.35	0.15	

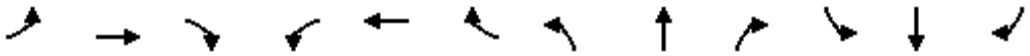
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	400	0	0	0	0	360	160	80	180	0
Future Volume (veh/h)	40	0	400	0	0	0	0	360	160	80	180	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781				0	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	42	0	44				0	379	85	84	189	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	8	8	8				0	8	8	8	8	0
Cap, veh/h	103	0	92				0	2266	1009	105	1427	0
Arrive On Green	0.06	0.00	0.06				0.00	0.67	0.67	0.12	1.00	0.00
Sat Flow, veh/h	1697	0	1510				0	3474	1507	1697	1781	0
Grp Volume(v), veh/h	42	0	44				0	379	85	84	189	0
Grp Sat Flow(s),veh/h/ln	1697	0	1510				0	1692	1507	1697	1781	0
Q Serve(g_s), s	1.5	0.0	1.8				0.0	2.7	1.3	3.1	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	1.8				0.0	2.7	1.3	3.1	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	103	0	92				0	2266	1009	105	1427	0
V/C Ratio(X)	0.41	0.00	0.48				0.00	0.17	0.08	0.80	0.13	0.00
Avail Cap(c_a), veh/h	561	0	499				0	2266	1009	222	1427	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	29.4	0.0	29.5				0.0	4.0	3.8	28.1	0.0	0.0
Incr Delay (d2), s/veh	2.6	0.0	3.9				0.0	0.2	0.2	12.6	0.2	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/ln	0.7	0.0	0.7				0.0	0.6	0.3	1.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	33.4				0.0	4.2	3.9	40.7	0.2	0.0
LnGrp LOS	C	A	C				A	A	A	D	A	A
Approach Vol, veh/h		86						464			273	
Approach Delay, s/veh		32.7						4.1			12.6	
Approach LOS		C						A			B	

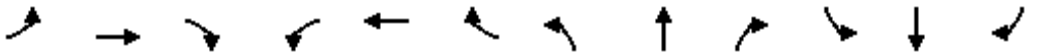
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.5	48.0		8.4		56.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	8.5	21.5		21.5		34.5
Max Q Clear Time (g_c+I1), s	5.1	4.7		3.8		2.0
Green Ext Time (p_c), s	0.0	2.3		0.2		1.0

Intersection Summary			
HCM 6th Ctrl Delay			9.9
HCM 6th LOS			A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	500	0	750	0	690	510	0	700	470
Future Volume (vph)	0	0	0	500	0	750	0	690	510	0	700	470
Confl. Peds. (#/hr)									2			2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	263	263	789	0	726	537	0	737	495
v/c Ratio				0.40	0.40	0.64		0.31	0.40		0.32	0.51
Control Delay				18.1	18.1	14.5		4.2	11.3		12.7	3.3
Queue Delay				0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay				18.1	18.1	14.5		4.2	11.3		12.7	3.3
Queue Length 50th (ft)				88	88	107		13	269		73	0
Queue Length 95th (ft)				150	150	171		21	363		99	47
Internal Link Dist (ft)		1812			1566			1047			868	
Turn Bay Length (ft)						450			300			450
Base Capacity (vph)				657	657	1240		2316	1331		2316	971
Starvation Cap Reductn				0	0	0		0	0		0	0
Spillback Cap Reductn				0	0	0		0	0		0	0
Storage Cap Reductn				0	0	0		0	0		0	0
Reduced v/c Ratio				0.40	0.40	0.64		0.31	0.40		0.32	0.51

Intersection Summary



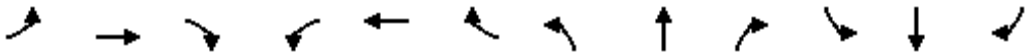
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	500	0	750	0	690	510	0	700	470
Future Volume (veh/h)	0	0	0	500	0	750	0	690	510	0	700	470
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1811	1811	1811	0	1811	1811	0	1811	1811
Adj Flow Rate, veh/h				526	0	631	0	726	537	0	737	220
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				6	6	6	0	6	6	0	6	6
Cap, veh/h				937	0	834	0	3008	1349	0	3008	933
Arrive On Green				0.27	0.00	0.27	0.00	0.61	0.61	0.00	0.61	0.61
Sat Flow, veh/h				3450	0	3070	0	5107	1532	0	5107	1533
Grp Volume(v), veh/h				526	0	631	0	726	537	0	737	220
Grp Sat Flow(s),veh/h/ln				1725	0	1535	0	1648	1532	0	1648	1533
Q Serve(g_s), s				9.8	0.0	14.1	0.0	5.1	4.9	0.0	5.1	4.9
Cycle Q Clear(g_c), s				9.8	0.0	14.1	0.0	5.1	4.9	0.0	5.1	4.9
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				937	0	834	0	3008	1349	0	3008	933
V/C Ratio(X)				0.56	0.00	0.76	0.00	0.24	0.40	0.00	0.25	0.24
Avail Cap(c_a), veh/h				1403	0	1248	0	3008	1349	0	3008	933
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	0.00	1.00	0.00	0.87	0.87	0.00	1.00	1.00
Uniform Delay (d), s/veh				23.5	0.0	25.0	0.0	6.7	0.8	0.0	6.8	6.7
Incr Delay (d2), s/veh				0.5	0.0	1.5	0.0	0.2	0.8	0.0	0.2	0.6
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/ln				3.8	0.0	5.0	0.0	1.4	0.3	0.0	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.0	0.0	26.5	0.0	6.9	1.6	0.0	7.0	7.3
LnGrp LOS				C	A	C	A	A	A	A	A	A
Approach Vol, veh/h					1157			1263			957	
Approach Delay, s/veh					25.4			4.6			7.0	
Approach LOS					C			A			A	

Timer - Assigned Phs	2			6		8					
Phs Duration (G+Y+Rc), s	50.1			50.1		24.9					
Change Period (Y+Rc), s	4.5			4.5		4.5					
Max Green Setting (Gmax), s	35.5			35.5		30.5					
Max Q Clear Time (g_c+I1), s	7.1			7.1		16.1					
Green Ext Time (p_c), s	7.7			6.1		4.2					

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

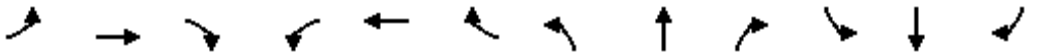
Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	530	0	510	0	0	0	0	670	430	570	630	0
Future Volume (vph)	530	0	510	0	0	0	0	670	430	570	630	0
Confl. Peds. (#/hr)			2						2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)	20%		21%									
Lane Group Flow (vph)	446	225	424	0	0	0	0	705	453	600	663	0
v/c Ratio	0.60	0.60	0.43					0.42	0.38	0.77	0.30	
Control Delay	28.4	21.6	4.0					20.9	3.3	21.3	5.1	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	28.4	21.6	4.0					20.9	3.3	21.3	5.1	
Queue Length 50th (ft)	97	65	0					96	0	128	56	
Queue Length 95th (ft)	142	148	33					134	34	173	80	
Internal Link Dist (ft)		1475			1882			773			1047	
Turn Bay Length (ft)	600		600						700	550		
Base Capacity (vph)	847	418	1055					1684	1198	858	2178	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.53	0.54	0.40					0.42	0.38	0.70	0.30	

Intersection Summary



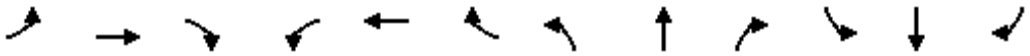
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	530	0	510	0	0	0	0	670	430	570	630	0
Future Volume (veh/h)	530	0	510	0	0	0	0	670	430	570	630	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811				0	1811	1811	1811	1811	0
Adj Flow Rate, veh/h	582	0	103				0	705	140	600	663	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6				0	6	6	6	6	0
Cap, veh/h	831	0	491				0	2219	1210	704	2475	0
Arrive On Green	0.16	0.00	0.16				0.00	0.45	0.45	0.28	0.96	0.00
Sat Flow, veh/h	5175	0	3058				0	5107	2695	3346	3532	0
Grp Volume(v), veh/h	582	0	103				0	705	140	600	663	0
Grp Sat Flow(s),veh/h/ln	1725	0	1529				0	1648	1348	1673	1721	0
Q Serve(g_s), s	8.0	0.0	2.2				0.0	6.9	2.3	12.7	0.8	0.0
Cycle Q Clear(g_c), s	8.0	0.0	2.2				0.0	6.9	2.3	12.7	0.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	831	0	491				0	2219	1210	704	2475	0
V/C Ratio(X)	0.70	0.00	0.21				0.00	0.32	0.12	0.85	0.27	0.00
Avail Cap(c_a), veh/h	1414	0	836				0	2219	1210	870	2475	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.95	0.95	0.00
Uniform Delay (d), s/veh	29.8	0.0	27.3				0.0	13.3	12.0	25.9	0.5	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.2				0.0	0.4	0.2	6.5	0.3	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/ln	3.2	0.0	0.8				0.0	2.3	0.6	4.9	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	0.0	27.5				0.0	13.7	12.2	32.4	0.7	0.0
LnGrp LOS	C	A	C				A	B	B	C	A	A
Approach Vol, veh/h		685						845			1263	
Approach Delay, s/veh		30.4						13.4			15.8	
Approach LOS		C						B			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	20.3	38.2		16.6		58.4
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	19.5	21.5		20.5		45.5
Max Q Clear Time (g_c+I1), s	14.7	8.9		10.0		2.8
Green Ext Time (p_c), s	1.1	4.2		2.1		4.8

Intersection Summary	
HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.



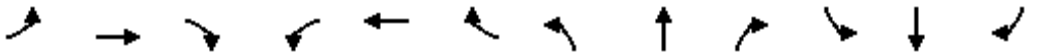
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	510	2370	0	0	1610	960	1180	0	530	0	0	0
Future Volume (vph)	510	2370	0	0	1610	960	1180	0	530	0	0	0
Confl. Peds. (#/hr)						10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	537	2495	0	0	1695	1011	1242	0	558	0	0	0
v/c Ratio	1.14	1.20			1.14	1.17	1.21		0.65			
Control Delay	136.3	120.9			117.5	108.2	147.5		44.5			
Queue Delay	0.0	0.0			1.4	0.0	0.0		0.0			
Total Delay	136.3	120.9			118.9	108.2	147.5		44.5			
Queue Length 50th (ft)	~625	~1537			~706	~737	~761		247			
Queue Length 95th (ft)	m#755	#1663			#802	#1002	#898		320			
Internal Link Dist (ft)		670			818			1440			1422	
Turn Bay Length (ft)						400	500		500			
Base Capacity (vph)	473	2083			1488	862	1026		863			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			435	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.14	1.20			1.61	1.17	1.21		0.65			

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	510	2370	0	0	1610	960	1180	0	530	0	0	0
Future Volume (veh/h)	510	2370	0	0	1610	960	1180	0	530	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1781	1781	0	0	1781	1781	1781	0	1781			
Adj Flow Rate, veh/h	537	2495	0	0	1695	563	1242	0	526			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	8	8	0	0	8	8	8	0	8			
Cap, veh/h	481	2110	0	0	1508	460	1042	0	841			
Arrive On Green	0.38	0.83	0.00	0.00	0.31	0.31	0.32	0.00	0.32			
Sat Flow, veh/h	1697	3474	0	0	5024	1485	3291	0	2657			
Grp Volume(v), veh/h	537	2495	0	0	1695	563	1242	0	526			
Grp Sat Flow(s),veh/h/ln	1697	1692	0	0	1621	1485	1646	0	1329			
Q Serve(g_s), s	42.5	93.5	0.0	0.0	46.5	46.5	47.5	0.0	25.3			
Cycle Q Clear(g_c), s	42.5	93.5	0.0	0.0	46.5	46.5	47.5	0.0	25.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	481	2110	0	0	1508	460	1042	0	841			
V/C Ratio(X)	1.12	1.18	0.00	0.00	1.12	1.22	1.19	0.00	0.63			
Avail Cap(c_a), veh/h	481	2110	0	0	1508	460	1042	0	841			
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.44	0.44	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	46.7	12.8	0.0	0.0	51.8	51.7	51.2	0.0	43.7			
Incr Delay (d2), s/veh	65.4	84.5	0.0	0.0	65.2	118.4	95.9	0.0	1.5			
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/ln	25.3	41.4	0.0	0.0	27.6	32.1	33.2	0.0	8.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	112.1	97.3	0.0	0.0	116.9	170.1	147.1	0.0	45.1			
LnGrp LOS	F	F	A	A	F	F	F	A	D			
Approach Vol, veh/h		3032			2258			1768				
Approach Delay, s/veh		100.0			130.2			116.8				
Approach LOS		F			F			F				

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		52.0		98.0			47.0	51.0				
Change Period (Y+Rc), s		4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s		47.5		93.5			42.5	46.5				
Max Q Clear Time (g_c+I1), s		49.5		95.5			44.5	48.5				
Green Ext Time (p_c), s		0.0		0.0			0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			113.8									
HCM 6th LOS			F									

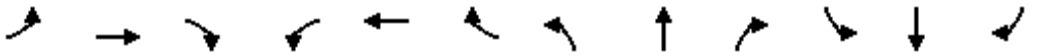
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	2550	2020	0	2730	60	0	0	0	330	0	1000
Future Volume (vph)	0	2550	2020	0	2730	60	0	0	0	330	0	1000
Confl. Peds. (#/hr)			10			10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2684	2126	0	2874	63	0	0	0	347	0	1053
v/c Ratio		0.90	1.46		1.38	0.04				0.34		1.25
Control Delay		29.3	223.0		191.2	0.0				40.4		165.7
Queue Delay		0.7	0.0		0.2	0.0				6.8		0.0
Total Delay		30.0	223.0		191.4	0.0				47.2		165.7
Queue Length 50th (ft)		782	~1355		~1955	0				134		~727
Queue Length 95th (ft)		857	#1602		m#1510	m0				178		#880
Internal Link Dist (ft)		730			670			1228			1687	
Turn Bay Length (ft)			500							500		500
Base Capacity (vph)		2993	1458		2083	1458				1026		840
Starvation Cap Reductn		0	0		123	0				0		0
Spillback Cap Reductn		100	0		0	0				620		0
Storage Cap Reductn		0	0		0	0				0		0
Reduced v/c Ratio		0.93	1.46		1.47	0.04				0.85		1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑	↱				↰↰		↱↱
Traffic Volume (veh/h)	0	2550	2020	0	2730	60	0	0	0	330	0	1000
Future Volume (veh/h)	0	2550	2020	0	2730	60	0	0	0	330	0	1000
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1781	0	1781	1781				1781	0	1781
Adj Flow Rate, veh/h	0	2684	0	0	2874	0				347	0	1045
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	8	8	0	8	8				8	0	8
Cap, veh/h	0	3031		0	2110					1042	0	841
Arrive On Green	0.00	0.62	0.00	0.00	1.00	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	5024	1510	0	3474	1510				3291	0	2657
Grp Volume(v), veh/h	0	2684	0	0	2874	0				347	0	1045
Grp Sat Flow(s),veh/h/ln	0	1621	1510	0	1692	1510				1646	0	1329
Q Serve(g_s), s	0.0	69.6	0.0	0.0	0.0	0.0				12.1	0.0	47.5
Cycle Q Clear(g_c), s	0.0	69.6	0.0	0.0	0.0	0.0				12.1	0.0	47.5
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3031		0	2110					1042	0	841
V/C Ratio(X)	0.00	0.89		0.00	1.36					0.33	0.00	1.24
Avail Cap(c_a), veh/h	0	3031		0	2110					1042	0	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	23.7	0.0	0.0	0.0	0.0				39.1	0.0	51.3
Incr Delay (d2), s/veh	0.0	4.2	0.0	0.0	163.3	0.0				0.9	0.0	118.9
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/ln	0.0	25.9	0.0	0.0	47.8	0.0				5.0	0.0	29.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.0	0.0	0.0	163.3	0.0				40.0	0.0	170.2
LnGrp LOS	A	C		A	F					D	A	F
Approach Vol, veh/h		2684	A		2874	A					1392	
Approach Delay, s/veh		28.0			163.3						137.7	
Approach LOS		C			F						F	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		98.0		52.0		98.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		93.5		47.5		93.5						
Max Q Clear Time (g_c+I1), s		71.6		49.5		2.0						
Green Ext Time (p_c), s		19.2		0.0		73.5						

Intersection Summary	
HCM 6th Ctrl Delay	105.9
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	220	40	20	30	50
Future Vol, veh/h	70	220	40	20	30	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	74	232	42	21	32	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	32	85	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	849	1033	1493	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	825	1033	1493	-	-	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1493	-	825	1033	-	-
HCM Lane V/C Ratio	0.028	-	0.089	0.224	-	-
HCM Control Delay (s)	7.5	0	9.8	9.5	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.9	-	-

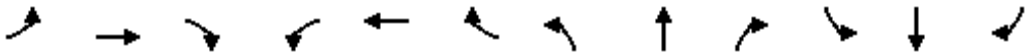
Intersection	
Int Delay, s/veh	7.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	10	0	160	0
Future Vol, veh/h	0	0	10	0	160	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	25	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	0	0	11	0	168	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	347	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Critical Hdwy	6.48	6.28	-	-	4.18	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	-	-	2.272	-
Pot Cap-1 Maneuver	638	1053	-	-	1570	-
Stage 1	997	-	-	-	-	-
Stage 2	711	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	570	1053	-	-	1570	-
Mov Cap-2 Maneuver	570	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	635	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	7.6
HCM LOS	A		

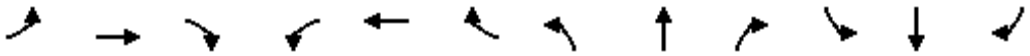
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	-	1570	-
HCM Lane V/C Ratio	-	-	-	-	0.107	-
HCM Control Delay (s)	-	-	0	0	7.6	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	-	0.4	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	150	0	70	430	140	0	0	120	30
Future Volume (vph)	0	0	0	150	0	70	430	140	0	0	120	30
Confl. Peds. (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	158	74	453	147	0	0	126	32
v/c Ratio					0.56	0.22	0.97	0.12			0.20	0.05
Control Delay					33.7	5.6	68.3	1.2			18.0	0.2
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					33.7	5.6	68.3	1.2			18.0	0.2
Queue Length 50th (ft)					63	0	220	1			37	0
Queue Length 95th (ft)					109	22	#391	7			81	0
Internal Link Dist (ft)		1133			1101			260			945	
Turn Bay Length (ft)						350						350
Base Capacity (vph)					429	454	465	1235			632	584
Starvation Cap Reductn					0	0	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.37	0.16	0.97	0.12			0.20	0.05

Intersection Summary

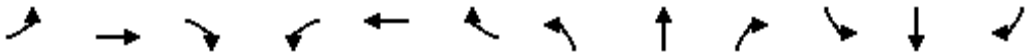
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	0	70	430	140	0	0	120	30
Future Volume (veh/h)	0	0	0	150	0	70	430	140	0	0	120	30
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1781	1781	1781	1781	1781	0	0	1781	1781
Adj Flow Rate, veh/h				158	0	9	453	147	0	0	126	11
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				8	8	8	8	8	0	0	8	8
Cap, veh/h				206	0	183	703	1336	0	0	484	408
Arrive On Green				0.12	0.00	0.12	0.14	0.25	0.00	0.00	0.27	0.27
Sat Flow, veh/h				1697	0	1510	1697	1781	0	0	1781	1504
Grp Volume(v), veh/h				158	0	9	453	147	0	0	126	11
Grp Sat Flow(s),veh/h/ln				1697	0	1510	1697	1781	0	0	1781	1504
Q Serve(g_s), s				6.3	0.0	0.4	17.7	4.5	0.0	0.0	3.9	0.4
Cycle Q Clear(g_c), s				6.3	0.0	0.4	17.7	4.5	0.0	0.0	3.9	0.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				206	0	183	703	1336	0	0	484	408
V/C Ratio(X)				0.77	0.00	0.05	0.64	0.11	0.00	0.00	0.26	0.03
Avail Cap(c_a), veh/h				436	0	388	703	1336	0	0	484	408
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.97	0.97	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.8	0.0	27.2	25.3	8.3	0.0	0.0	20.0	18.7
Incr Delay (d2), s/veh				5.9	0.0	0.1	2.0	0.2	0.0	0.0	1.3	0.1
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/ln				2.8	0.0	0.1	8.2	1.0	0.0	0.0	1.6	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				35.7	0.0	27.3	27.3	8.4	0.0	0.0	21.3	18.8
LnGrp LOS				D	A	C	C	A	A	A	C	B
Approach Vol, veh/h					167			600			137	
Approach Delay, s/veh					35.2			22.7			21.1	
Approach LOS					D			C			C	

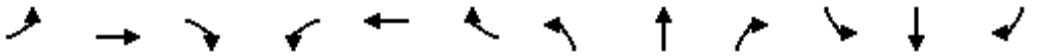
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		57.0			33.5	23.5		13.0				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		43.0			19.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s		6.5			19.7	5.9		8.3				
Green Ext Time (p_c), s		0.8			0.0	0.5		0.5				

Intersection Summary		
HCM 6th Ctrl Delay	24.8	
HCM 6th LOS	C	



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	80	0	390	0	0	0	0	490	110	70	200	0
Future Volume (vph)	80	0	390	0	0	0	0	490	110	70	200	0
Confl. Peds. (#/hr)									2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	84	411	0	0	0	0	516	116	74	211	0
v/c Ratio		0.34	0.72					0.27	0.13	0.37	0.17	
Control Delay		28.5	10.6					10.6	3.5	43.4	0.6	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		28.5	10.6					10.6	3.5	43.4	0.6	
Queue Length 50th (ft)		34	0					55	0	35	2	
Queue Length 95th (ft)		60	62					124	29	73	3	
Internal Link Dist (ft)		966			991			741			260	
Turn Bay Length (ft)			400						350			
Base Capacity (vph)		584	790					1895	877	213	1271	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					112	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.14	0.52					0.29	0.13	0.35	0.17	

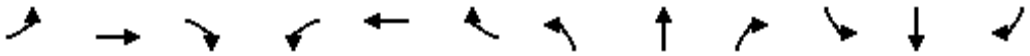
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	0	390	0	0	0	0	490	110	70	200	0
Future Volume (veh/h)	80	0	390	0	0	0	0	490	110	70	200	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781				0	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	84	0	43				0	516	61	74	211	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	8	8	8				0	8	8	8	8	0
Cap, veh/h	130	0	115				0	2289	1019	93	1416	0
Arrive On Green	0.08	0.00	0.08				0.00	0.68	0.68	0.11	1.00	0.00
Sat Flow, veh/h	1697	0	1510				0	3474	1507	1697	1781	0
Grp Volume(v), veh/h	84	0	43				0	516	61	74	211	0
Grp Sat Flow(s),veh/h/ln	1697	0	1510				0	1692	1507	1697	1781	0
Q Serve(g_s), s	3.4	0.0	1.9				0.0	4.1	1.0	3.0	0.0	0.0
Cycle Q Clear(g_c), s	3.4	0.0	1.9				0.0	4.1	1.0	3.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	130	0	115				0	2289	1019	93	1416	0
V/C Ratio(X)	0.65	0.00	0.37				0.00	0.23	0.06	0.80	0.15	0.00
Avail Cap(c_a), veh/h	594	0	528				0	2289	1019	182	1416	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	31.4	0.0	30.7				0.0	4.3	3.8	30.8	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.0	2.0				0.0	0.2	0.1	14.3	0.2	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/ln	1.5	0.0	0.7				0.0	1.0	0.2	1.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	0.0	32.7				0.0	4.6	3.9	45.1	0.2	0.0
LnGrp LOS	D	A	C				A	A	A	D	A	A
Approach Vol, veh/h		127						577			285	
Approach Delay, s/veh		35.4						4.5			11.9	
Approach LOS		D						A			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.3	51.8		9.8		60.2
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	7.5	24.5		24.5		36.5
Max Q Clear Time (g_c+I1), s	5.0	6.1		5.4		2.0
Green Ext Time (p_c), s	0.0	3.2		0.5		1.2

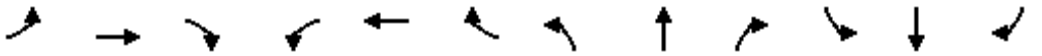
Intersection Summary	
HCM 6th Ctrl Delay	10.6
HCM 6th LOS	B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	650	0	1200	0	940	650	0	1410	760
Future Volume (vph)	0	0	0	650	0	1200	0	940	650	0	1410	760
Confl. Peds. (#/hr)									2			2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	342	342	1263	0	989	684	0	1484	800
v/c Ratio				0.42	0.42	0.91		0.50	0.50		0.75	0.74
Control Delay				17.5	17.5	32.5		3.3	17.7		28.3	6.4
Queue Delay				0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay				17.5	17.5	32.5		3.3	17.7		28.3	6.4
Queue Length 50th (ft)				137	137	383		46	370		290	0
Queue Length 95th (ft)				212	212	#561		m35	497		347	87
Internal Link Dist (ft)		1812			1566			1047			868	
Turn Bay Length (ft)						450			300			450
Base Capacity (vph)				817	817	1389		1981	1378		1981	1083
Starvation Cap Reductn				0	0	0		0	0		0	0
Spillback Cap Reductn				0	0	0		0	0		0	0
Storage Cap Reductn				0	0	0		0	0		0	0
Reduced v/c Ratio				0.42	0.42	0.91		0.50	0.50		0.75	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



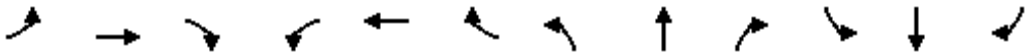
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	650	0	1200	0	940	650	0	1410	760
Future Volume (veh/h)	0	0	0	650	0	1200	0	940	650	0	1410	760
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1811	1811	1811	0	1811	1811	0	1811	1811
Adj Flow Rate, veh/h				684	0	1226	0	989	684	0	1484	299
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				6	6	6	0	6	6	0	6	6
Cap, veh/h				1560	0	1388	0	2263	1395	0	2263	702
Arrive On Green				0.45	0.00	0.45	0.00	0.46	0.46	0.00	0.46	0.46
Sat Flow, veh/h				3450	0	3070	0	5107	1531	0	5107	1533
Grp Volume(v), veh/h				684	0	1226	0	989	684	0	1484	299
Grp Sat Flow(s),veh/h/ln				1725	0	1535	0	1648	1531	0	1648	1533
Q Serve(g_s), s				13.5	0.0	36.4	0.0	13.6	7.3	0.0	23.3	13.1
Cycle Q Clear(g_c), s				13.5	0.0	36.4	0.0	13.6	7.3	0.0	23.3	13.1
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1560	0	1388	0	2263	1395	0	2263	702
V/C Ratio(X)				0.44	0.00	0.88	0.00	0.44	0.49	0.00	0.66	0.43
Avail Cap(c_a), veh/h				1742	0	1550	0	2263	1395	0	2263	702
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	0.00	1.00	0.00	0.42	0.42	0.00	1.00	1.00
Uniform Delay (d), s/veh				18.7	0.0	25.0	0.0	18.4	0.7	0.0	21.0	18.3
Incr Delay (d2), s/veh				0.2	0.0	5.9	0.0	0.3	0.5	0.0	1.5	1.9
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/ln				5.2	0.0	13.5	0.0	4.9	0.2	0.0	8.6	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.9	0.0	30.9	0.0	18.6	1.3	0.0	22.5	20.2
LnGrp LOS				B	A	C	A	B	A	A	C	C
Approach Vol, veh/h					1910			1673			1783	
Approach Delay, s/veh					26.6			11.5			22.1	
Approach LOS					C			B			C	

Timer - Assigned Phs	2		6		8							
Phs Duration (G+Y+Rc), s	50.3		50.3		49.7							
Change Period (Y+Rc), s	4.5		4.5		4.5							
Max Green Setting (Gmax), s	40.5		40.5		50.5							
Max Q Clear Time (g_c+I1), s	15.6		25.3		38.4							
Green Ext Time (p_c), s	10.8		9.6		6.8							

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	690	0	650	0	0	0	0	900	600	1150	910	0
Future Volume (vph)	690	0	650	0	0	0	0	900	600	1150	910	0
Confl. Peds. (#/hr)			2						2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)	21%		20%									
Lane Group Flow (vph)	574	289	547	0	0	0	0	947	632	1211	958	0
v/c Ratio	0.95	0.94	0.68					0.78	0.58	0.87	0.39	
Control Delay	67.0	71.5	18.2					41.3	6.2	8.4	3.9	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	67.0	71.5	18.2					41.3	6.2	8.4	3.9	
Queue Length 50th (ft)	200	179	62					210	9	56	60	
Queue Length 95th (ft)	#312	#382	126					#293	60	51	73	
Internal Link Dist (ft)		1475			1882			773			1047	
Turn Bay Length (ft)	600		600						700	550		
Base Capacity (vph)	604	306	808					1215	1099	1502	2435	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.95	0.94	0.68					0.78	0.58	0.81	0.39	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	690	0	650	0	0	0	0	900	600	1150	910	0
Future Volume (veh/h)	690	0	650	0	0	0	0	900	600	1150	910	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811				0	1811	1811	1811	1811	0
Adj Flow Rate, veh/h	789	0	271				0	947	158	1211	958	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6				0	6	6	6	6	0
Cap, veh/h	933	0	552				0	1479	806	1290	2511	0
Arrive On Green	0.18	0.00	0.18				0.00	0.30	0.30	0.64	1.00	0.00
Sat Flow, veh/h	5175	0	3059				0	5107	2692	3346	3532	0
Grp Volume(v), veh/h	789	0	271				0	947	158	1211	958	0
Grp Sat Flow(s),veh/h/ln	1725	0	1530				0	1648	1346	1673	1721	0
Q Serve(g_s), s	14.7	0.0	8.0				0.0	16.6	4.4	32.6	0.0	0.0
Cycle Q Clear(g_c), s	14.7	0.0	8.0				0.0	16.6	4.4	32.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	933	0	552				0	1479	806	1290	2511	0
V/C Ratio(X)	0.85	0.00	0.49				0.00	0.64	0.20	0.94	0.38	0.00
Avail Cap(c_a), veh/h	1009	0	597				0	1479	806	1523	2511	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.67	0.67	0.00
Uniform Delay (d), s/veh	39.6	0.0	36.9				0.0	30.4	26.1	16.8	0.0	0.0
Incr Delay (d2), s/veh	6.4	0.0	0.7				0.0	2.1	0.5	7.7	0.3	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/ln	6.6	0.0	3.0				0.0	6.6	1.4	8.0	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.0	0.0	37.5				0.0	32.5	26.6	24.4	0.3	0.0
LnGrp LOS	D	A	D				A	C	C	C	A	A
Approach Vol, veh/h		1060						1105			2169	
Approach Delay, s/veh		43.8						31.7			13.8	
Approach LOS		D						C			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	43.0	34.4		22.5		77.5
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	45.5	21.5		19.5		71.5
Max Q Clear Time (g_c+I1), s	34.6	18.6		16.7		2.0
Green Ext Time (p_c), s	3.9	1.8		1.3		8.1

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

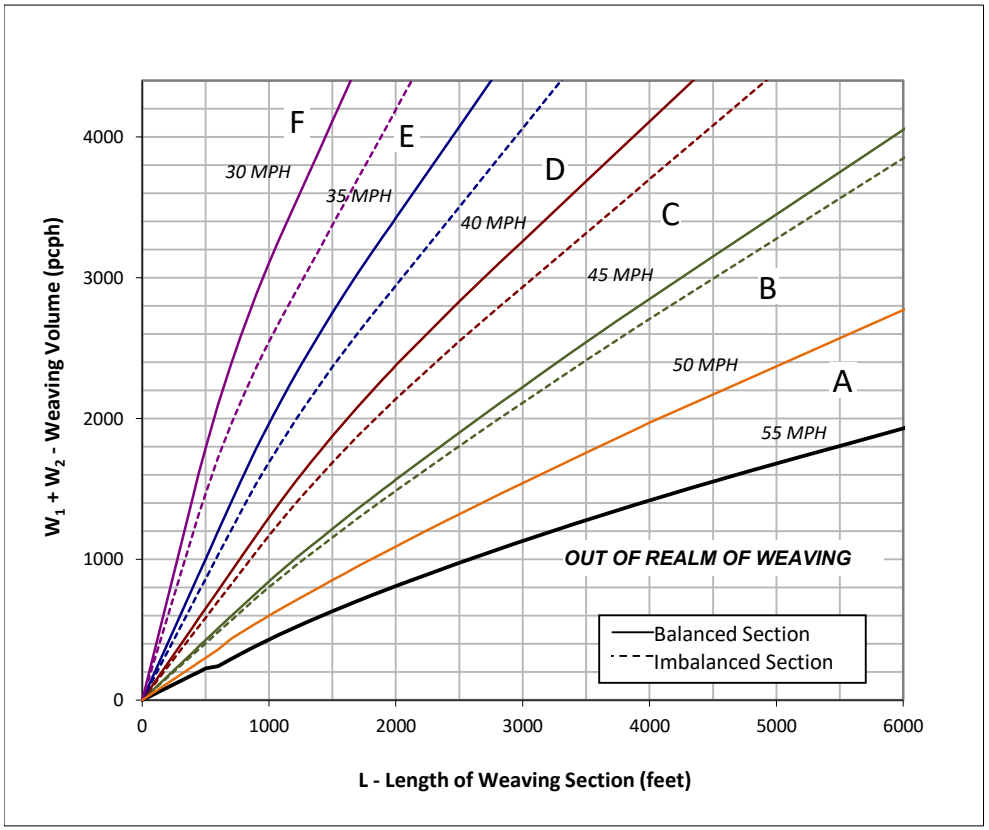
User approved volume balancing among the lanes for turning movement.

Leisch Method for Weaving Analysis

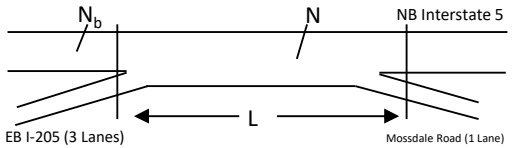
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	2,000

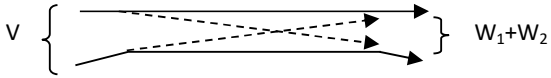
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - AM
Freeway	NB Interstate 5
On-ramp	EB I-205 (3 Lanes)
Off-ramp	Mossdale Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	8,700	6,400	30
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,362	7,168	31



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	23.8
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,571
6. Level of Service (LOS)	D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

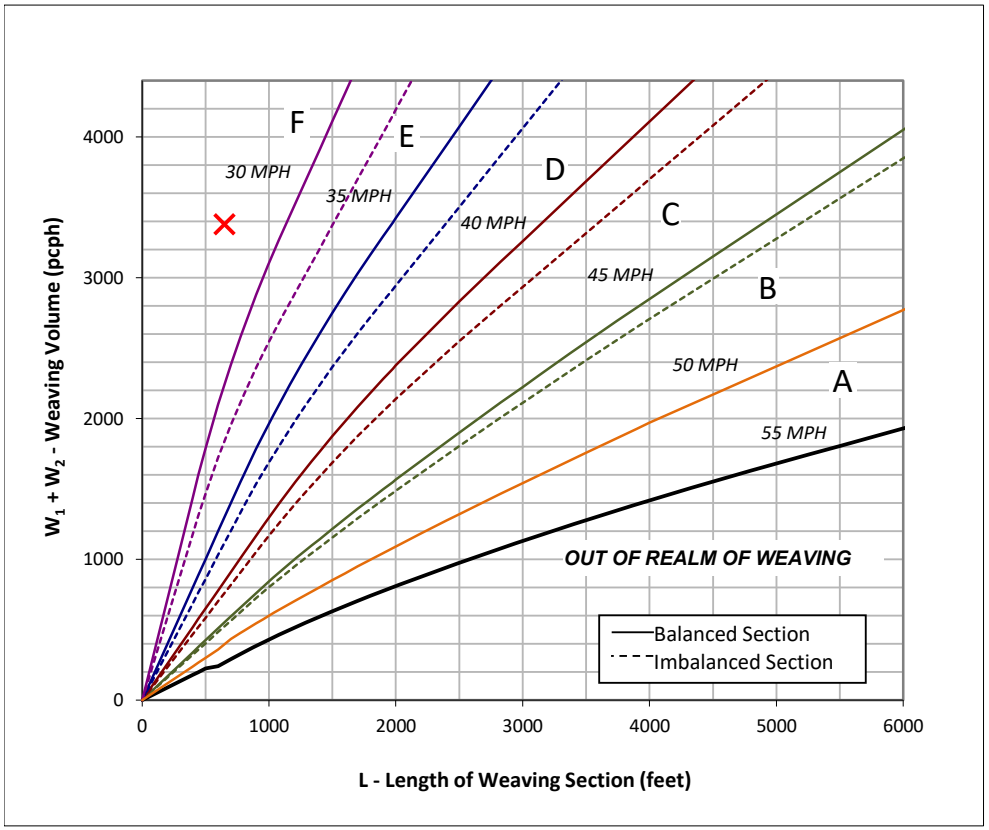
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

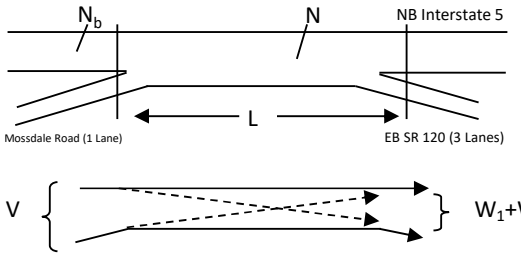
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	650

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - AM
Freeway	NB Interstate 5
On-ramp	Mossdale Road (1 Lane)
Off-ramp	EB SR 120 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	8,660	63	2,961
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,327	65	3,316



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **24.0**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,576**
6. Level of Service (LOS) **D**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

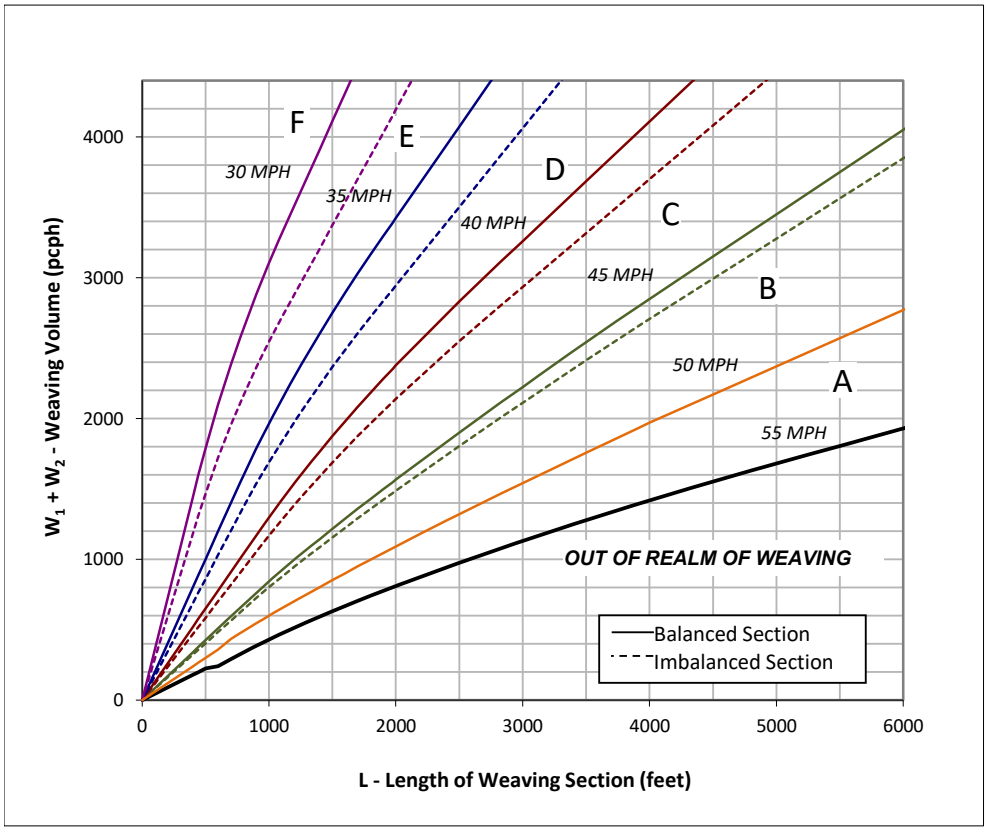
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

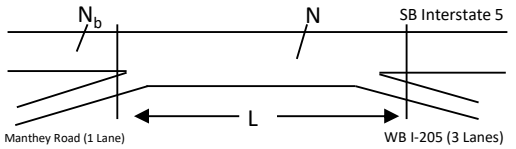
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	3,200

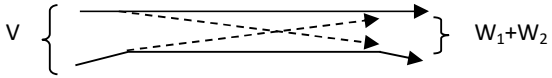
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - AM
Freeway	SB Interstate 5
On-ramp	Manthey Road (1 Lane)
Off-ramp	WB I-205 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	10,165	18	8,487
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.4	2.0	2.0
Volume (pcph)	10,652	19	9,505



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	26.0
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,781
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

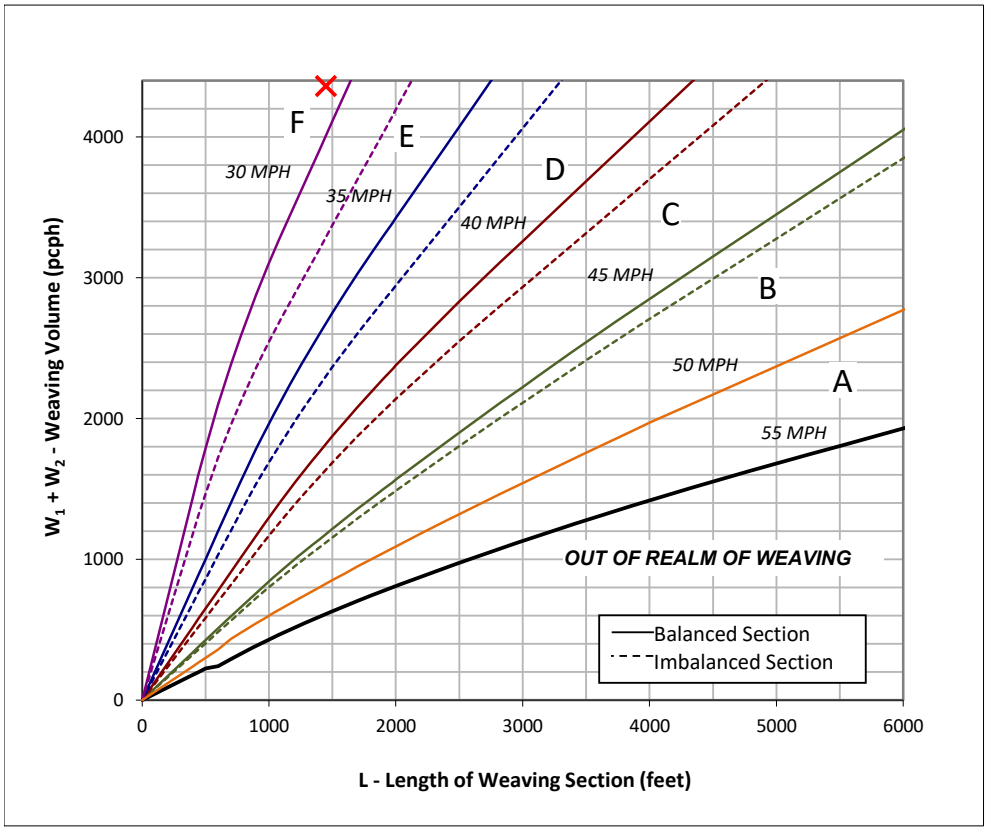
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

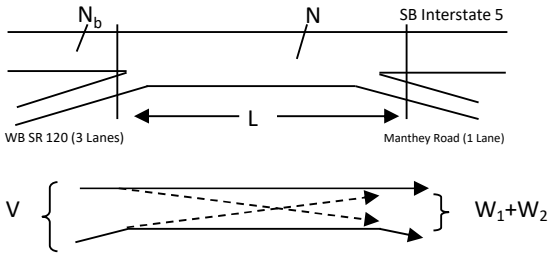
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	1,450

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - AM
Freeway	SB Interstate 5
On-ramp	WB SR 120 (3 Lanes)
Off-ramp	Manthey Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	10,085	3,840	60
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.4	2.0	2.0
Volume (pcph)	10,581	4,301	62



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	28.7
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,784
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

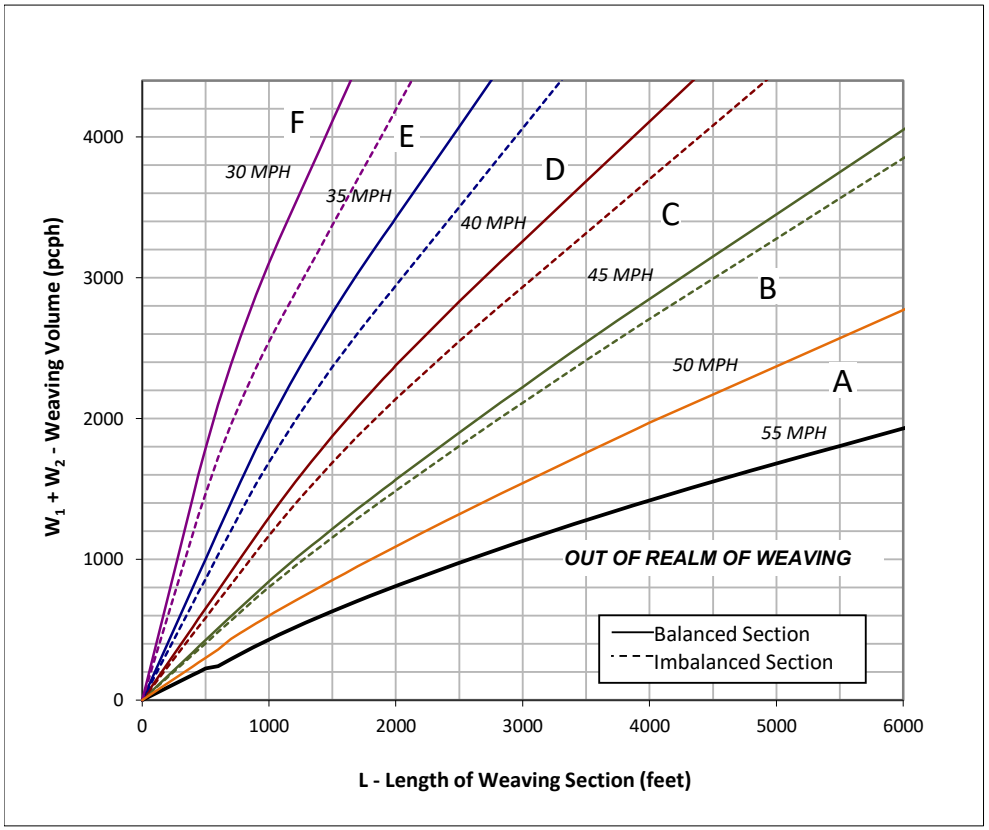
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

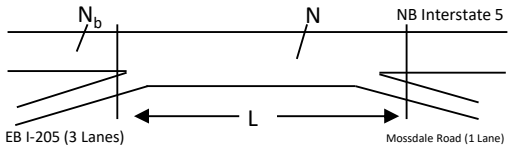
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	2,000

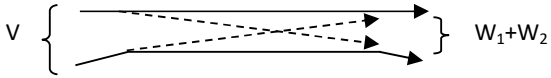
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - PM
Freeway	NB Interstate 5
On-ramp	EB I-205 (3 Lanes)
Off-ramp	Mossdale Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	11,702	8,130	50
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.2	2.0	2.0
Volume (pcph)	12,004	9,106	52



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	18.0
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	2,018
6. Level of Service (LOS)	F

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

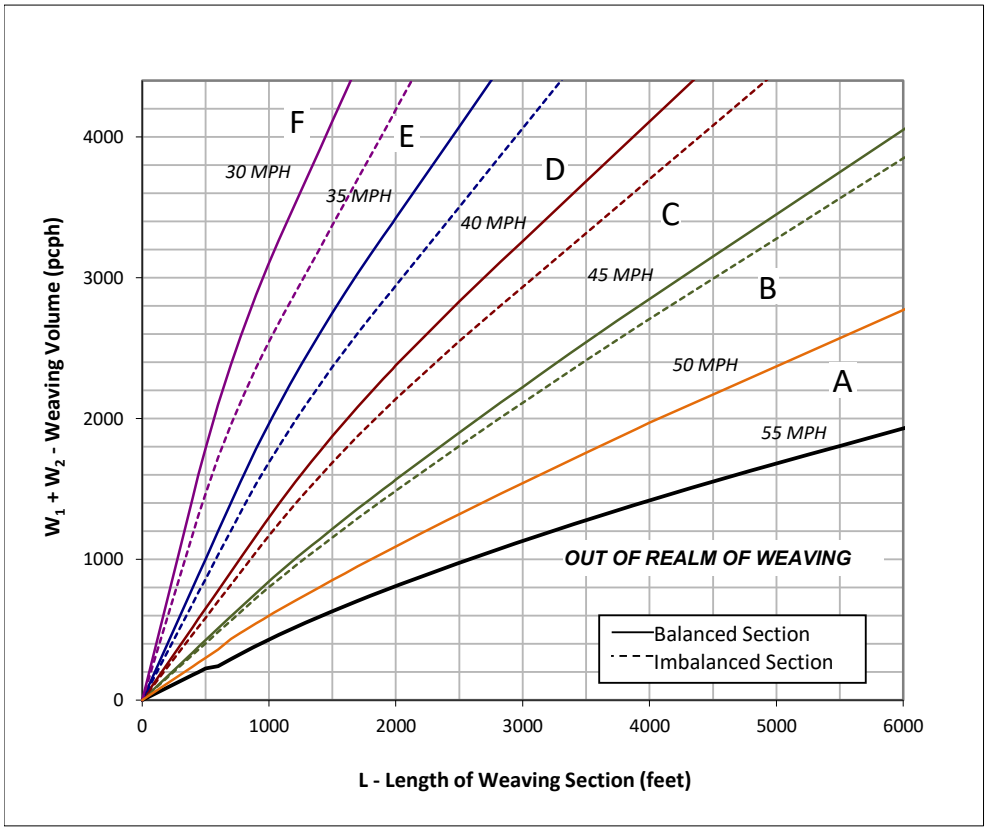
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

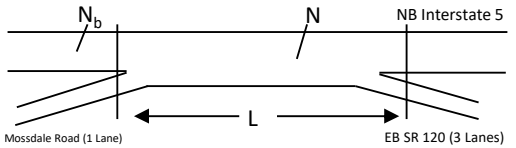
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	650

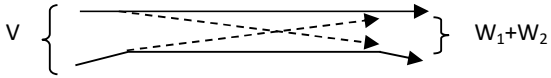
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - PM
Freeway	NB Interstate 5
On-ramp	Mossdale Road (1 Lane)
Off-ramp	EB SR 120 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	11,452	56	5,388
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.2	2.0	2.0
Volume (pcph)	11,784	58	6,035



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **9.6**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   SV = (1/N)*[V + (k - 1)*min(W_1, W_2)] **1,983**
6. Level of Service (LOS) **F**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

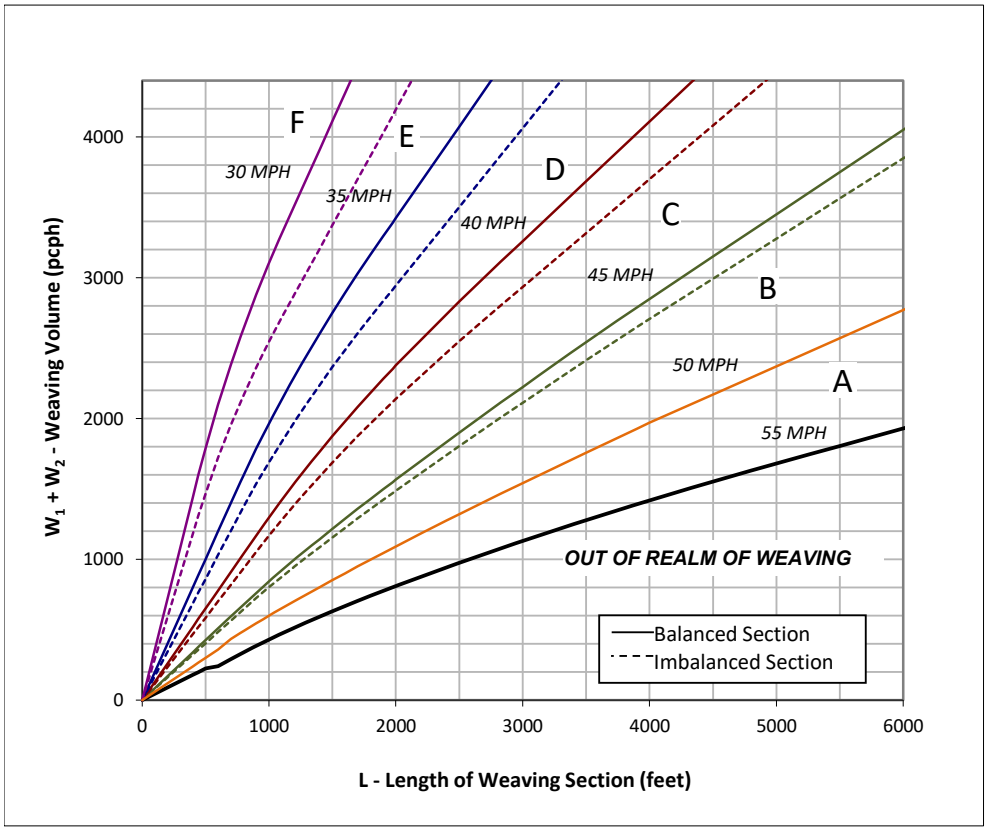
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

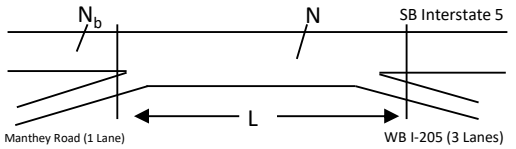
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	3,200

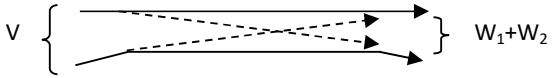
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - PM
Freeway	SB Interstate 5
On-ramp	Manthey Road (1 Lane)
Off-ramp	WB I-205 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,353	19	6,782
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.5	2.0	2.0
Volume (pcph)	9,937	20	7,596



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	29.8
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,663
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

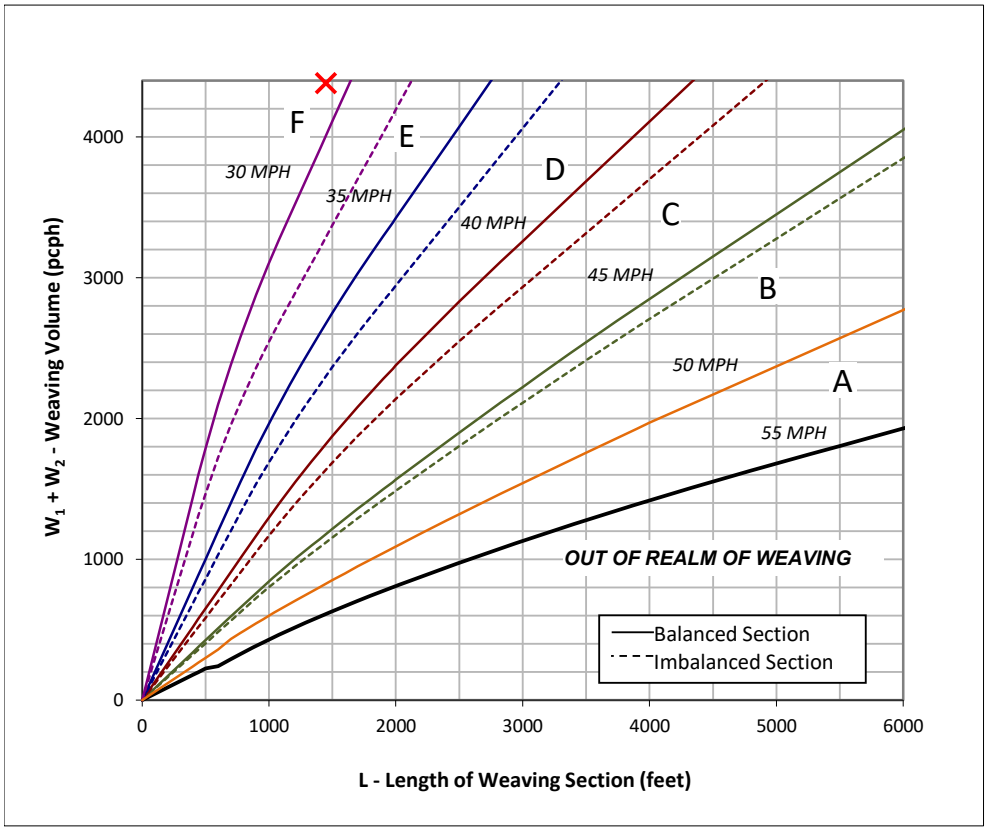
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

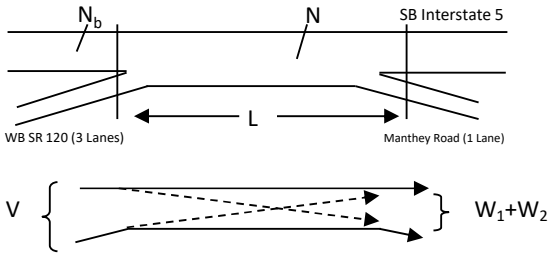
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	1,450

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Approved - PM
Freeway	SB Interstate 5
On-ramp	WB SR 120 (3 Lanes)
Off-ramp	Manthey Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,163	3,913	0
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,770	4,383	0



Figure



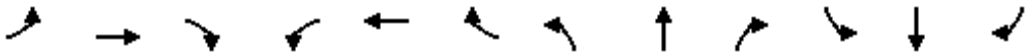
Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	28.6
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,628
6. Level of Service (LOS)	D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

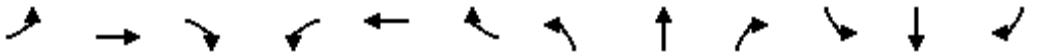


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Future Volume (vph)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Confl. Peds. (#/hr)						10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	653	1684	0	0	1326	853	1600	0	400	0	0	0
v/c Ratio	1.40	0.88			1.09	1.03	1.39		0.41			
Control Delay	227.5	29.2			95.1	50.5	214.7		26.6			
Queue Delay	0.0	4.1			0.0	0.0	0.0		0.0			
Total Delay	227.5	33.3			95.1	50.5	214.7		26.6			
Queue Length 50th (ft)	~677	564			~422	~313	~852		113			
Queue Length 95th (ft)	#905	688			#518	#561	#988		162			
Internal Link Dist (ft)		670			818			1440			1422	
Turn Bay Length (ft)						400	500		500			
Base Capacity (vph)	466	1908			1220	831	1148		967			
Starvation Cap Reductn	0	163			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.40	0.97			1.09	1.03	1.39		0.41			

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

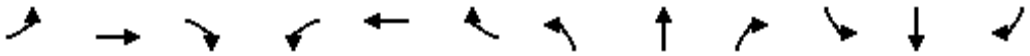
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Future Volume (veh/h)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1781	1781	0	0	1781	1781	1781	0	1781			
Adj Flow Rate, veh/h	653	1684	0	0	1326	357	1600	0	362			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	8	8	0	0	8	8	8	0	8			
Cap, veh/h	474	1932	0	0	1236	376	1166	0	941			
Arrive On Green	0.28	0.57	0.00	0.00	0.25	0.25	0.35	0.00	0.35			
Sat Flow, veh/h	1697	3474	0	0	5024	1480	3291	0	2657			
Grp Volume(v), veh/h	653	1684	0	0	1326	357	1600	0	362			
Grp Sat Flow(s),veh/h/ln	1697	1692	0	0	1621	1480	1646	0	1329			
Q Serve(g_s), s	33.5	51.0	0.0	0.0	30.5	28.5	42.5	0.0	12.2			
Cycle Q Clear(g_c), s	33.5	51.0	0.0	0.0	30.5	28.5	42.5	0.0	12.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	474	1932	0	0	1236	376	1166	0	941			
V/C Ratio(X)	1.38	0.87	0.00	0.00	1.07	0.95	1.37	0.00	0.38			
Avail Cap(c_a), veh/h	474	1932	0	0	1236	376	1166	0	941			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.79	0.79	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	43.3	22.0	0.0	0.0	44.8	44.0	38.8	0.0	29.0			
Incr Delay (d2), s/veh	180.7	4.6	0.0	0.0	47.5	35.2	173.2	0.0	0.3			
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/ln	37.4	19.6	0.0	0.0	17.3	13.8	44.6	0.0	3.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	224.0	26.6	0.0	0.0	92.3	79.2	211.9	0.0	29.2			
LnGrp LOS	F	C	A	A	F	E	F	A	C			
Approach Vol, veh/h		2337			1683			1962				
Approach Delay, s/veh		81.8			89.5			178.2				
Approach LOS		F			F			F				

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		73.0			38.0	35.0				
Change Period (Y+Rc), s		4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s		42.5		68.5			33.5	30.5				
Max Q Clear Time (g_c+I1), s		44.5		53.0			35.5	32.5				
Green Ext Time (p_c), s		0.0		10.5			0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			115.6									
HCM 6th LOS			F									

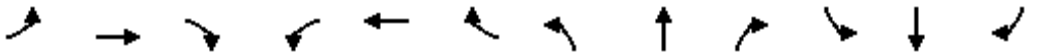


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Future Volume (vph)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Confl. Peds. (#/hr)			10			10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1779	1705	0	2611	316	0	0	0	558	0	832
v/c Ratio		0.56	1.17		1.19	0.22				0.63		1.10
Control Delay		13.0	91.6		113.2	0.3				45.3		105.6
Queue Delay		0.0	0.0		0.2	0.0				0.0		0.0
Total Delay		13.0	91.6		113.4	0.3				45.3		105.6
Queue Length 50th (ft)		276	~432		~1392	0				213		~434
Queue Length 95th (ft)		315	#697		#1518	0				275		#577
Internal Link Dist (ft)		730			670			1228			1687	
Turn Bay Length (ft)			500							500		500
Base Capacity (vph)		3158	1458		2198	1458				885		755
Starvation Cap Reductn		0	0		140	0				0		0
Spillback Cap Reductn		0	0		0	0				0		0
Storage Cap Reductn		0	0		0	0				0		0
Reduced v/c Ratio		0.56	1.17		1.27	0.22				0.63		1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑	↱				↰↰		↱↱
Traffic Volume (veh/h)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Future Volume (veh/h)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1781	0	1781	1781				1781	0	1781
Adj Flow Rate, veh/h	0	1779	0	0	2611	0				558	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	8	8	0	8	8				8	0	8
Cap, veh/h	0	3199		0	2226					899	0	726
Arrive On Green	0.00	0.66	0.00	0.00	0.66	0.00				0.27	0.00	0.27
Sat Flow, veh/h	0	5024	1510	0	3474	1510				3291	0	2657
Grp Volume(v), veh/h	0	1779	0	0	2611	0				558	0	794
Grp Sat Flow(s),veh/h/ln	0	1621	1510	0	1692	1510				1646	0	1329
Q Serve(g_s), s	0.0	25.7	0.0	0.0	85.5	0.0				19.3	0.0	35.5
Cycle Q Clear(g_c), s	0.0	25.7	0.0	0.0	85.5	0.0				19.3	0.0	35.5
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3199		0	2226					899	0	726
V/C Ratio(X)	0.00	0.56		0.00	1.17					0.62	0.00	1.09
Avail Cap(c_a), veh/h	0	3199		0	2226					899	0	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.0	0.0	0.0	22.2	0.0				41.4	0.0	47.3
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	78.3	0.0				1.3	0.0	62.1
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/ln	0.0	8.6	0.0	0.0	53.5	0.0				7.9	0.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.7	0.0	0.0	100.5	0.0				42.7	0.0	109.4
LnGrp LOS	A	B		A	F					D	A	F
Approach Vol, veh/h		1779	A		2611	A					1352	
Approach Delay, s/veh		12.7			100.5						81.8	
Approach LOS		B			F						F	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		90.0		40.0		90.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		85.5		35.5		85.5						
Max Q Clear Time (g_c+I1), s		27.7		37.5		87.5						
Green Ext Time (p_c), s		21.4		0.0		0.0						

Intersection Summary		
HCM 6th Ctrl Delay		68.9
HCM 6th LOS		E

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	120	60	30	20	30
Future Vol, veh/h	30	120	60	30	20	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	32	126	63	32	21	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	179	21	53	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	804	1048	1534	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	1048	1534	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1534	-	770	1048	-	-
HCM Lane V/C Ratio	0.041	-	0.041	0.121	-	-
HCM Control Delay (s)	7.4	0	9.9	8.9	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	0.4	-	-

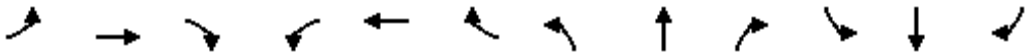
Intersection	
Int Delay, s/veh	7.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	100	10	0	190	0
Future Vol, veh/h	10	100	10	0	190	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	25	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	11	105	11	0	200	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	411	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.48	6.28	-	-	4.18	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	-	-	2.272	-
Pot Cap-1 Maneuver	586	1053	-	-	1570	-
Stage 1	997	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	512	1053	-	-	1570	-
Mov Cap-2 Maneuver	512	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	7.6
HCM LOS	A		

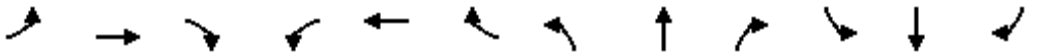
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	512	1053	1570	-
HCM Lane V/C Ratio	-	-	0.021	0.1	0.127	-
HCM Control Delay (s)	-	-	12.2	8.8	7.6	0
HCM Lane LOS	-	-	B	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.3	0.4	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	150	0	100	350	50	0	0	110	20
Future Volume (vph)	0	0	0	150	0	100	350	50	0	0	110	20
Confl. Peds. (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	158	105	368	53	0	0	116	21
v/c Ratio					0.54	0.30	0.99	0.04			0.17	0.03
Control Delay					30.6	7.6	68.4	2.1			15.0	0.1
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					30.6	7.6	68.4	2.1			15.0	0.1
Queue Length 50th (ft)					58	0	149	3			29	0
Queue Length 95th (ft)					101	33	#309	7			67	0
Internal Link Dist (ft)		1133			1101			260			945	
Turn Bay Length (ft)						350						350
Base Capacity (vph)					462	489	372	1207			693	636
Starvation Cap Reductn					0	0	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.34	0.21	0.99	0.04			0.17	0.03

Intersection Summary

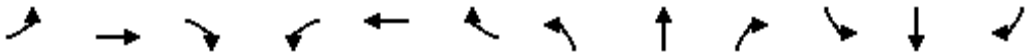
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	0	100	350	50	0	0	110	20
Future Volume (veh/h)	0	0	0	150	0	100	350	50	0	0	110	20
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1781	1781	1781	1781	1781	0	0	1781	1781
Adj Flow Rate, veh/h				158	0	13	368	53	0	0	116	7
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				8	8	8	8	8	0	0	8	8
Cap, veh/h				209	0	186	639	1315	0	0	521	440
Arrive On Green				0.12	0.00	0.12	0.38	0.74	0.00	0.00	0.29	0.29
Sat Flow, veh/h				1697	0	1510	1697	1781	0	0	1781	1505
Grp Volume(v), veh/h				158	0	13	368	53	0	0	116	7
Grp Sat Flow(s),veh/h/ln				1697	0	1510	1697	1781	0	0	1781	1505
Q Serve(g_s), s				5.9	0.0	0.5	11.2	0.5	0.0	0.0	3.2	0.2
Cycle Q Clear(g_c), s				5.9	0.0	0.5	11.2	0.5	0.0	0.0	3.2	0.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				209	0	186	639	1315	0	0	521	440
V/C Ratio(X)				0.75	0.00	0.07	0.58	0.04	0.00	0.00	0.22	0.02
Avail Cap(c_a), veh/h				470	0	418	639	1315	0	0	521	440
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	0.00	1.00	0.99	0.99	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.5	0.0	25.2	16.1	2.3	0.0	0.0	17.4	16.4
Incr Delay (d2), s/veh				5.4	0.0	0.2	1.3	0.1	0.0	0.0	1.0	0.1
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/ln				2.5	0.0	0.2	4.0	0.1	0.0	0.0	1.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				33.0	0.0	25.3	17.4	2.4	0.0	0.0	18.4	16.4
LnGrp LOS				C	A	C	B	A	A	A	B	B
Approach Vol, veh/h					171			421			123	
Approach Delay, s/veh					32.4			15.5			18.3	
Approach LOS					C			B			B	

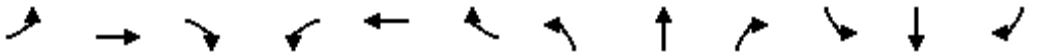
Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	52.5		29.0	23.5		12.5						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	38.0		14.5	19.0		18.0						
Max Q Clear Time (g_c+I1), s	2.5		13.2	5.2		7.9						
Green Ext Time (p_c), s	0.2		0.2	0.4		0.6						

Intersection Summary		
HCM 6th Ctrl Delay		20.0
HCM 6th LOS		C



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	40	0	400	0	0	0	0	360	160	70	190	0
Future Volume (vph)	40	0	400	0	0	0	0	360	160	70	190	0
Confl. Peds. (#/hr)									2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	421	0	0	0	0	379	168	74	200	0
v/c Ratio		0.17	0.73					0.19	0.18	0.35	0.16	
Control Delay		23.1	10.5					9.8	3.4	24.1	3.2	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		23.1	10.5					9.8	3.4	24.1	3.2	
Queue Length 50th (ft)		16	0					35	0	15	0	
Queue Length 95th (ft)		33	59					91	36	55	86	
Internal Link Dist (ft)		966			991			741			260	
Turn Bay Length (ft)			400						350			
Base Capacity (vph)		552	776					1947	920	237	1254	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.08	0.54					0.19	0.18	0.31	0.16	

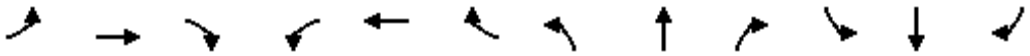
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	400	0	0	0	0	360	160	70	190	0
Future Volume (veh/h)	40	0	400	0	0	0	0	360	160	70	190	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781				0	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	42	0	44				0	379	89	74	200	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	8	8	8				0	8	8	8	8	0
Cap, veh/h	103	0	92				0	2285	1017	96	1427	0
Arrive On Green	0.06	0.00	0.06				0.00	0.67	0.67	0.11	1.00	0.00
Sat Flow, veh/h	1697	0	1510				0	3474	1507	1697	1781	0
Grp Volume(v), veh/h	42	0	44				0	379	89	74	200	0
Grp Sat Flow(s),veh/h/ln	1697	0	1510				0	1692	1507	1697	1781	0
Q Serve(g_s), s	1.5	0.0	1.8				0.0	2.7	1.3	2.8	0.0	0.0
Cycle Q Clear(g_c), s	1.5	0.0	1.8				0.0	2.7	1.3	2.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	103	0	92				0	2285	1017	96	1427	0
V/C Ratio(X)	0.41	0.00	0.48				0.00	0.17	0.09	0.77	0.14	0.00
Avail Cap(c_a), veh/h	561	0	499				0	2285	1017	222	1427	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	29.4	0.0	29.5				0.0	3.9	3.6	28.4	0.0	0.0
Incr Delay (d2), s/veh	2.6	0.0	3.9				0.0	0.2	0.2	12.0	0.2	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/ln	0.7	0.0	0.7				0.0	0.6	0.3	1.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	33.4				0.0	4.0	3.8	40.4	0.2	0.0
LnGrp LOS	C	A	C				A	A	A	D	A	A
Approach Vol, veh/h		86						468			274	
Approach Delay, s/veh		32.7						4.0			11.0	
Approach LOS		C						A			B	

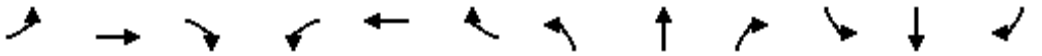
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.2	48.4		8.4		56.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	8.5	21.5		21.5		34.5
Max Q Clear Time (g_c+I1), s	4.8	4.7		3.8		2.0
Green Ext Time (p_c), s	0.0	2.4		0.2		1.1

Intersection Summary		
HCM 6th Ctrl Delay		9.3
HCM 6th LOS		A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	500	0	930	0	620	510	0	990	590
Future Volume (vph)	0	0	0	500	0	930	0	620	510	0	990	590
Confl. Peds. (#/hr)									2			2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	263	263	979	0	653	537	0	1042	621
v/c Ratio				0.40	0.40	0.77		0.28	0.40		0.45	0.60
Control Delay				18.1	18.1	17.6		3.1	12.0		14.0	3.9
Queue Delay				0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay				18.1	18.1	17.6		3.1	12.0		14.0	3.9
Queue Length 50th (ft)				88	88	148		9	276		112	0
Queue Length 95th (ft)				150	150	231		13	366		146	52
Internal Link Dist (ft)		1812			1566			1047			868	
Turn Bay Length (ft)						450			300			450
Base Capacity (vph)				657	657	1275		2316	1331		2316	1038
Starvation Cap Reductn				0	0	0		0	0		0	0
Spillback Cap Reductn				0	0	0		0	0		0	0
Storage Cap Reductn				0	0	0		0	0		0	0
Reduced v/c Ratio				0.40	0.40	0.77		0.28	0.40		0.45	0.60

Intersection Summary



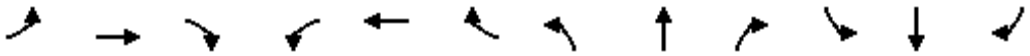
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	500	0	930	0	620	510	0	990	590
Future Volume (veh/h)	0	0	0	500	0	930	0	620	510	0	990	590
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1811	1811	1811	0	1811	1811	0	1811	1811
Adj Flow Rate, veh/h				526	0	784	0	653	537	0	1042	277
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				6	6	6	0	6	6	0	6	6
Cap, veh/h				1097	0	976	0	2778	1349	0	2778	862
Arrive On Green				0.32	0.00	0.32	0.00	0.56	0.56	0.00	0.56	0.56
Sat Flow, veh/h				3450	0	3070	0	5107	1532	0	5107	1533
Grp Volume(v), veh/h				526	0	784	0	653	537	0	1042	277
Grp Sat Flow(s),veh/h/ln				1725	0	1535	0	1648	1532	0	1648	1533
Q Serve(g_s), s				9.2	0.0	17.5	0.0	5.0	4.9	0.0	8.8	7.2
Cycle Q Clear(g_c), s				9.2	0.0	17.5	0.0	5.0	4.9	0.0	8.8	7.2
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1097	0	976	0	2778	1349	0	2778	862
V/C Ratio(X)				0.48	0.00	0.80	0.00	0.24	0.40	0.00	0.38	0.32
Avail Cap(c_a), veh/h				1403	0	1248	0	2778	1349	0	2778	862
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	0.00	1.00	0.00	0.84	0.84	0.00	1.00	1.00
Uniform Delay (d), s/veh				20.6	0.0	23.4	0.0	8.3	0.8	0.0	9.1	8.8
Incr Delay (d2), s/veh				0.3	0.0	3.0	0.0	0.2	0.7	0.0	0.4	1.0
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/ln				3.5	0.0	6.3	0.0	1.5	0.3	0.0	2.6	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.9	0.0	26.5	0.0	8.5	1.6	0.0	9.5	9.8
LnGrp LOS				C	A	C	A	A	A	A	A	A
Approach Vol, veh/h					1310			1190			1319	
Approach Delay, s/veh					24.2			5.3			9.6	
Approach LOS					C			A			A	

Timer - Assigned Phs	2		6		8							
Phs Duration (G+Y+Rc), s	46.6		46.6		28.4							
Change Period (Y+Rc), s	4.5		4.5		4.5							
Max Green Setting (Gmax), s	35.5		35.5		30.5							
Max Q Clear Time (g_c+I1), s	7.0		10.8		19.5							
Green Ext Time (p_c), s	7.1		8.8		4.3							

Intersection Summary		
HCM 6th Ctrl Delay	13.3	
HCM 6th LOS	B	

Notes

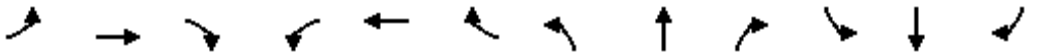
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	450	0	520	0	0	0	0	680	450	810	680	0
Future Volume (vph)	450	0	520	0	0	0	0	680	450	810	680	0
Confl. Peds. (#/hr)			2						2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)	13%		27%									
Lane Group Flow (vph)	412	210	399	0	0	0	0	716	474	853	716	0
v/c Ratio	0.58	0.52	0.43					0.49	0.43	0.89	0.32	
Control Delay	28.5	13.0	4.1					23.3	3.6	26.9	4.7	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	28.5	13.0	4.1					23.3	3.6	26.9	4.7	
Queue Length 50th (ft)	91	28	0					101	0	191	47	
Queue Length 95th (ft)	131	97	32					136	35	#309	77	
Internal Link Dist (ft)		1475			1882			773			1047	
Turn Bay Length (ft)	600		600						700	550		
Base Capacity (vph)	847	453	1037					1462	1114	959	2211	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.49	0.46	0.38					0.49	0.43	0.89	0.32	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



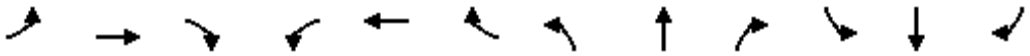
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	450	0	520	0	0	0	0	680	450	810	680	0
Future Volume (veh/h)	450	0	520	0	0	0	0	680	450	810	680	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811				0	1811	1811	1811	1811	0
Adj Flow Rate, veh/h	493	0	83				0	716	125	853	716	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6				0	6	6	6	6	0
Cap, veh/h	730	0	431				0	2071	1129	870	2543	0
Arrive On Green	0.14	0.00	0.14				0.00	0.42	0.42	0.35	0.98	0.00
Sat Flow, veh/h	5175	0	3057				0	5107	2695	3346	3532	0
Grp Volume(v), veh/h	493	0	83				0	716	125	853	716	0
Grp Sat Flow(s),veh/h/ln	1725	0	1528				0	1648	1347	1673	1721	0
Q Serve(g_s), s	6.8	0.0	1.8				0.0	7.4	2.1	18.9	0.4	0.0
Cycle Q Clear(g_c), s	6.8	0.0	1.8				0.0	7.4	2.1	18.9	0.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	730	0	431				0	2071	1129	870	2543	0
V/C Ratio(X)	0.68	0.00	0.19				0.00	0.35	0.11	0.98	0.28	0.00
Avail Cap(c_a), veh/h	1414	0	835				0	2071	1129	870	2543	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh	30.6	0.0	28.4				0.0	14.8	13.3	24.3	0.2	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.2				0.0	0.5	0.2	24.2	0.2	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/ln	2.8	0.0	0.6				0.0	2.5	0.6	8.8	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	28.7				0.0	15.3	13.5	48.5	0.4	0.0
LnGrp LOS	C	A	C				A	B	B	D	A	A
Approach Vol, veh/h		576						841			1569	
Approach Delay, s/veh		31.2						15.0			26.6	
Approach LOS		C						B			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.0	35.9		15.1		59.9
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	19.5	21.5		20.5		45.5
Max Q Clear Time (g_c+I1), s	20.9	9.4		8.8		2.4
Green Ext Time (p_c), s	0.0	4.1		1.8		5.3

Intersection Summary	
HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



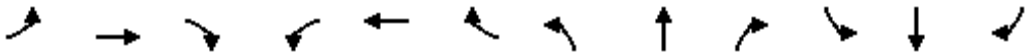
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Future Volume (vph)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Confl. Peds. (#/hr)						10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	621	2579	0	0	1853	1011	1253	0	558	0	0	0
v/c Ratio	1.31	1.24			1.25	1.19	1.22		0.65			
Control Delay	199.5	138.6			159.1	114.4	151.7		44.5			
Queue Delay	0.0	0.0			1.5	0.0	0.0		0.0			
Total Delay	199.5	138.6			160.6	114.4	151.7		44.5			
Queue Length 50th (ft)	~801	~1631			~823	~757	~773		247			
Queue Length 95th (ft)	m#865	#1753			#917	#1022	#910		320			
Internal Link Dist (ft)		670			818			1440			1422	
Turn Bay Length (ft)						400	500		500			
Base Capacity (vph)	473	2083			1488	852	1026		863			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			467	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.31	1.24			1.81	1.19	1.22		0.65			

Intersection Summary

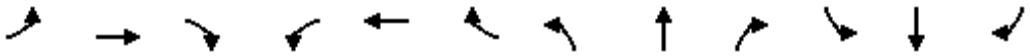
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Future Volume (veh/h)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1781	1781	0	0	1781	1781	1781	0	1781			
Adj Flow Rate, veh/h	621	2579	0	0	1853	573	1253	0	526			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	8	8	0	0	8	8	8	0	8			
Cap, veh/h	481	2110	0	0	1508	460	1042	0	841			
Arrive On Green	0.28	0.62	0.00	0.00	0.31	0.31	0.32	0.00	0.32			
Sat Flow, veh/h	1697	3474	0	0	5024	1485	3291	0	2657			
Grp Volume(v), veh/h	621	2579	0	0	1853	573	1253	0	526			
Grp Sat Flow(s),veh/h/ln	1697	1692	0	0	1621	1485	1646	0	1329			
Q Serve(g_s), s	42.5	93.5	0.0	0.0	46.5	46.5	47.5	0.0	25.3			
Cycle Q Clear(g_c), s	42.5	93.5	0.0	0.0	46.5	46.5	47.5	0.0	25.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	481	2110	0	0	1508	460	1042	0	841			
V/C Ratio(X)	1.29	1.22	0.00	0.00	1.23	1.24	1.20	0.00	0.63			
Avail Cap(c_a), veh/h	481	2110	0	0	1508	460	1042	0	841			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.34	0.34	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	53.8	28.2	0.0	0.0	51.8	51.7	51.2	0.0	43.7			
Incr Delay (d2), s/veh	136.7	101.6	0.0	0.0	109.1	127.2	100.3	0.0	1.5			
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/ln	36.0	64.4	0.0	0.0	33.7	33.2	33.9	0.0	8.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	190.5	129.9	0.0	0.0	160.9	178.9	151.5	0.0	45.1			
LnGrp LOS	F	F	A	A	F	F	F	A	D			
Approach Vol, veh/h		3200			2426			1779				
Approach Delay, s/veh		141.7			165.2			120.1				
Approach LOS		F			F			F				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		52.0		98.0			47.0	51.0				
Change Period (Y+Rc), s		4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s		47.5		93.5			42.5	46.5				
Max Q Clear Time (g_c+I1), s		49.5		95.5			44.5	48.5				
Green Ext Time (p_c), s		0.0		0.0			0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			144.2									
HCM 6th LOS			F									



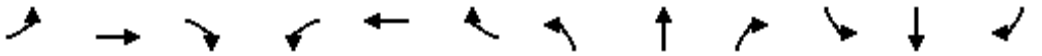
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Future Volume (vph)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Confl. Peds. (#/hr)			10			10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2853	2137	0	3042	63	0	0	0	347	0	1147
v/c Ratio		0.95	1.47		1.46	0.04				0.34		1.37
Control Delay		35.2	226.4		227.3	0.0				40.4		211.0
Queue Delay		4.0	0.0		0.2	0.0				19.4		0.0
Total Delay		39.2	226.4		227.5	0.0				59.8		211.0
Queue Length 50th (ft)		903	~1377		~2138	0				134		~837
Queue Length 95th (ft)		987	#1625		m#1516	m0				178		#990
Internal Link Dist (ft)		730			670			1228			1687	
Turn Bay Length (ft)			500							500		500
Base Capacity (vph)		2993	1458		2083	1458				1026		840
Starvation Cap Reductn		0	0		124	0				0		0
Spillback Cap Reductn		112	0		0	0				668		0
Storage Cap Reductn		0	0		0	0				0		0
Reduced v/c Ratio		0.99	1.47		1.55	0.04				0.97		1.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑	↱				↰↰		↱↱
Traffic Volume (veh/h)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Future Volume (veh/h)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1781	0	1781	1781				1781	0	1781
Adj Flow Rate, veh/h	0	2853	0	0	3042	0				347	0	1139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	8	8	0	8	8				8	0	8
Cap, veh/h	0	3031		0	2110					1042	0	841
Arrive On Green	0.00	0.62	0.00	0.00	0.83	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	5024	1510	0	3474	1510				3291	0	2657
Grp Volume(v), veh/h	0	2853	0	0	3042	0				347	0	1139
Grp Sat Flow(s),veh/h/ln	0	1621	1510	0	1692	1510				1646	0	1329
Q Serve(g_s), s	0.0	80.2	0.0	0.0	93.5	0.0				12.1	0.0	47.5
Cycle Q Clear(g_c), s	0.0	80.2	0.0	0.0	93.5	0.0				12.1	0.0	47.5
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3031		0	2110					1042	0	841
V/C Ratio(X)	0.00	0.94		0.00	1.44					0.33	0.00	1.35
Avail Cap(c_a), veh/h	0	3031		0	2110					1042	0	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.7	0.0	0.0	12.8	0.0				39.1	0.0	51.3
Incr Delay (d2), s/veh	0.0	7.4	0.0	0.0	199.1	0.0				0.9	0.0	167.0
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/ln	0.0	30.5	0.0	0.0	74.9	0.0				5.0	0.0	35.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.2	0.0	0.0	211.9	0.0				40.0	0.0	218.2
LnGrp LOS	A	C		A	F					D	A	F
Approach Vol, veh/h		2853	A		3042	A					1486	
Approach Delay, s/veh		33.2			211.9						176.6	
Approach LOS		C			F						F	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		98.0		52.0		98.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		93.5		47.5		93.5						
Max Q Clear Time (g_c+I1), s		82.2		49.5		95.5						
Green Ext Time (p_c), s		10.7		0.0		0.0						

Intersection Summary												
HCM 6th Ctrl Delay			135.7									
HCM 6th LOS			F									

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	250	40	20	30	50
Future Vol, veh/h	70	250	40	20	30	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	74	263	42	21	32	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	137	32	85	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	849	1033	1493	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	825	1033	1493	-	-	-
Mov Cap-2 Maneuver	825	-	-	-	-	-
Stage 1	955	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1493	-	825	1033	-	-
HCM Lane V/C Ratio	0.028	-	0.089	0.255	-	-
HCM Control Delay (s)	7.5	0	9.8	9.7	-	-
HCM Lane LOS	A	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	1	-	-

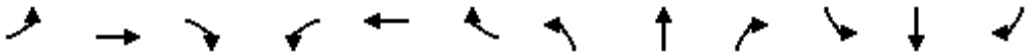
Intersection	
Int Delay, s/veh	7.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	10	0	190	0
Future Vol, veh/h	0	0	10	0	190	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	25	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	0	0	11	0	200	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	411	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	400	-	-	-	-	-
Critical Hdwy	6.48	6.28	-	-	4.18	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	-	-	2.272	-
Pot Cap-1 Maneuver	586	1053	-	-	1570	-
Stage 1	997	-	-	-	-	-
Stage 2	664	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	512	1053	-	-	1570	-
Mov Cap-2 Maneuver	512	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	580	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	7.6
HCM LOS	A		

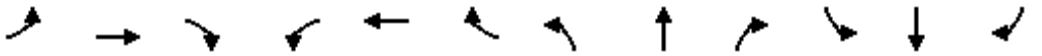
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	-	1570	-
HCM Lane V/C Ratio	-	-	-	-	0.127	-
HCM Control Delay (s)	-	-	0	0	7.6	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	-	0.4	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	150	0	80	430	380	0	0	120	110
Future Volume (vph)	0	0	0	150	0	80	430	380	0	0	120	110
Confl. Peds. (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	158	84	453	400	0	0	126	116
v/c Ratio					0.56	0.25	0.97	0.32			0.20	0.19
Control Delay					33.7	7.0	64.2	4.6			18.0	5.1
Queue Delay					0.0	0.0	0.0	0.3			0.0	0.0
Total Delay					33.7	7.0	64.2	4.8			18.0	5.1
Queue Length 50th (ft)					63	0	215	18			37	0
Queue Length 95th (ft)					109	28	#361	94			81	34
Internal Link Dist (ft)		1133			1101			260			945	
Turn Bay Length (ft)						350						350
Base Capacity (vph)					429	454	465	1235			632	599
Starvation Cap Reductn					0	0	0	327			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.37	0.19	0.97	0.44			0.20	0.19

Intersection Summary

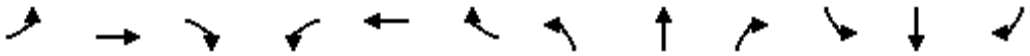
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	0	80	430	380	0	0	120	110
Future Volume (veh/h)	0	0	0	150	0	80	430	380	0	0	120	110
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1781	1781	1781	1781	1781	0	0	1781	1781
Adj Flow Rate, veh/h				158	0	10	453	400	0	0	126	38
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				8	8	8	8	8	0	0	8	8
Cap, veh/h				206	0	184	703	1336	0	0	484	408
Arrive On Green				0.12	0.00	0.12	0.55	1.00	0.00	0.00	0.27	0.27
Sat Flow, veh/h				1697	0	1510	1697	1781	0	0	1781	1504
Grp Volume(v), veh/h				158	0	10	453	400	0	0	126	38
Grp Sat Flow(s),veh/h/ln				1697	0	1510	1697	1781	0	0	1781	1504
Q Serve(g_s), s				6.3	0.0	0.4	13.0	0.1	0.0	0.0	3.9	1.3
Cycle Q Clear(g_c), s				6.3	0.0	0.4	13.0	0.1	0.0	0.0	3.9	1.3
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				206	0	184	703	1336	0	0	484	408
V/C Ratio(X)				0.77	0.00	0.05	0.64	0.30	0.00	0.00	0.26	0.09
Avail Cap(c_a), veh/h				436	0	388	703	1336	0	0	484	408
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.94	0.94	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				29.8	0.0	27.2	12.1	0.0	0.0	0.0	20.0	19.1
Incr Delay (d2), s/veh				5.9	0.0	0.1	1.9	0.5	0.0	0.0	1.3	0.5
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/ln				2.8	0.0	0.1	3.9	0.2	0.0	0.0	1.6	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				35.6	0.0	27.3	14.0	0.6	0.0	0.0	21.3	19.5
LnGrp LOS				D	A	C	B	A	A	A	C	B
Approach Vol, veh/h					168			853			164	
Approach Delay, s/veh					35.1			7.7			20.9	
Approach LOS					D			A			C	

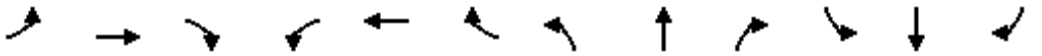
Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	57.0		33.5	23.5		13.0						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	43.0		19.5	19.0		18.0						
Max Q Clear Time (g_c+I1), s	2.1		15.0	5.9		8.3						
Green Ext Time (p_c), s	2.5		0.7	0.5		0.5						

Intersection Summary		
HCM 6th Ctrl Delay		13.4
HCM 6th LOS		B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	300	0	390	0	0	0	0	510	110	70	200	0
Future Volume (vph)	300	0	390	0	0	0	0	510	110	70	200	0
Confl. Peds. (#/hr)									2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	316	411	0	0	0	0	537	116	74	211	0
v/c Ratio		0.69	0.58					0.35	0.16	0.42	0.20	
Control Delay		30.2	5.7					15.5	4.3	54.3	1.1	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		30.2	5.7					15.5	4.3	54.3	1.1	
Queue Length 50th (ft)		119	0					84	0	35	2	
Queue Length 95th (ft)		181	54					134	30	73	3	
Internal Link Dist (ft)		966			991			741			260	
Turn Bay Length (ft)			400						350			
Base Capacity (vph)		584	790					1521	727	189	1050	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					93	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.54	0.52					0.38	0.16	0.39	0.20	

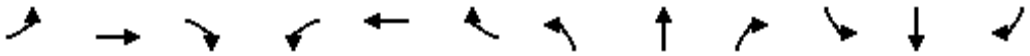
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	0	390	0	0	0	0	510	110	70	200	0
Future Volume (veh/h)	300	0	390	0	0	0	0	510	110	70	200	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781				0	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	316	0	97				0	537	48	74	211	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	8	8	8				0	8	8	8	8	0
Cap, veh/h	386	0	344				0	1776	791	93	1147	0
Arrive On Green	0.23	0.00	0.23				0.00	0.52	0.52	0.11	1.00	0.00
Sat Flow, veh/h	1697	0	1510				0	3474	1507	1697	1781	0
Grp Volume(v), veh/h	316	0	97				0	537	48	74	211	0
Grp Sat Flow(s),veh/h/ln	1697	0	1510				0	1692	1507	1697	1781	0
Q Serve(g_s), s	12.4	0.0	3.7				0.0	6.3	1.1	3.0	0.0	0.0
Cycle Q Clear(g_c), s	12.4	0.0	3.7				0.0	6.3	1.1	3.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	386	0	344				0	1776	791	93	1147	0
V/C Ratio(X)	0.82	0.00	0.28				0.00	0.30	0.06	0.80	0.18	0.00
Avail Cap(c_a), veh/h	594	0	528				0	1776	791	182	1147	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	25.7	0.0	22.3				0.0	9.4	8.2	30.8	0.0	0.0
Incr Delay (d2), s/veh	5.2	0.0	0.4				0.0	0.4	0.1	14.3	0.4	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/ln	5.2	0.0	1.3				0.0	2.0	0.3	1.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.9	0.0	22.8				0.0	9.8	8.3	45.1	0.4	0.0
LnGrp LOS	C	A	C				A	A	A	D	A	A
Approach Vol, veh/h		413						585			285	
Approach Delay, s/veh		29.0						9.7			12.0	
Approach LOS		C						A			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.3	41.2		20.4		49.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	7.5	24.5		24.5		36.5
Max Q Clear Time (g_c+I1), s	5.0	8.3		14.4		2.0
Green Ext Time (p_c), s	0.0	3.2		1.6		1.2

Intersection Summary		
HCM 6th Ctrl Delay		16.4
HCM 6th LOS		B



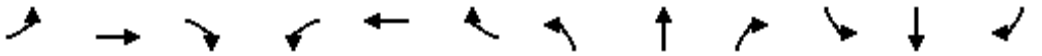
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	650	0	1560	0	840	650	0	1700	640
Future Volume (vph)	0	0	0	650	0	1560	0	840	650	0	1700	640
Confl. Peds. (#/hr)									2			2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	342	342	1642	0	884	684	0	1789	674
v/c Ratio				0.42	0.42	1.17		0.45	0.50		0.90	0.67
Control Delay				17.5	17.5	108.6		3.1	18.0		35.7	5.4
Queue Delay				0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay				17.5	17.5	108.6		3.1	18.0		35.7	5.4
Queue Length 50th (ft)				137	137	~696		41	396		383	0
Queue Length 95th (ft)				212	212	#847		m45	m418		#456	74
Internal Link Dist (ft)		1812			1566			1047			868	
Turn Bay Length (ft)						450			300			450
Base Capacity (vph)				817	817	1404		1981	1378		1981	1008
Starvation Cap Reductn				0	0	0		0	0		0	0
Spillback Cap Reductn				0	0	0		0	0		0	0
Storage Cap Reductn				0	0	0		0	0		0	0
Reduced v/c Ratio				0.42	0.42	1.17		0.45	0.50		0.90	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



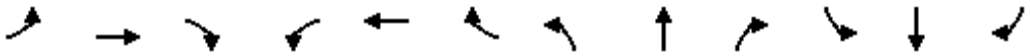
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	650	0	1560	0	840	650	0	1700	640
Future Volume (veh/h)	0	0	0	650	0	1560	0	840	650	0	1700	640
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1811	1811	1811	0	1811	1811	0	1811	1811
Adj Flow Rate, veh/h				684	0	1589	0	884	684	0	1789	252
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				6	6	6	0	6	6	0	6	6
Cap, veh/h				1742	0	1550	0	2002	1395	0	2002	621
Arrive On Green				0.50	0.00	0.50	0.00	0.41	0.41	0.00	0.41	0.41
Sat Flow, veh/h				3450	0	3070	0	5107	1531	0	5107	1533
Grp Volume(v), veh/h				684	0	1589	0	884	684	0	1789	252
Grp Sat Flow(s),veh/h/ln				1725	0	1535	0	1648	1531	0	1648	1533
Q Serve(g_s), s				12.2	0.0	50.5	0.0	13.0	7.3	0.0	33.7	11.7
Cycle Q Clear(g_c), s				12.2	0.0	50.5	0.0	13.0	7.3	0.0	33.7	11.7
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1742	0	1550	0	2002	1395	0	2002	621
V/C Ratio(X)				0.39	0.00	1.03	0.00	0.44	0.49	0.00	0.89	0.41
Avail Cap(c_a), veh/h				1742	0	1550	0	2002	1395	0	2002	621
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	0.00	1.00	0.00	0.28	0.28	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.3	0.0	24.8	0.0	21.6	0.7	0.0	27.7	21.2
Incr Delay (d2), s/veh				0.1	0.0	29.5	0.0	0.2	0.3	0.0	6.6	2.0
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/ln				4.6	0.0	23.0	0.0	4.8	0.1	0.0	13.5	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				15.4	0.0	54.2	0.0	21.8	1.1	0.0	34.4	23.2
LnGrp LOS				B	A	F	A	C	A	A	C	C
Approach Vol, veh/h					2273			1568			2041	
Approach Delay, s/veh					42.5			12.7			33.0	
Approach LOS					D			B			C	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	45.0		45.0		55.0			
Change Period (Y+Rc), s	4.5		4.5		4.5			
Max Green Setting (Gmax), s	40.5		40.5		50.5			
Max Q Clear Time (g_c+I1), s	15.0		35.7		52.5			
Green Ext Time (p_c), s	9.9		4.1		0.0			

Intersection Summary		
HCM 6th Ctrl Delay	31.3	
HCM 6th LOS	C	

Notes

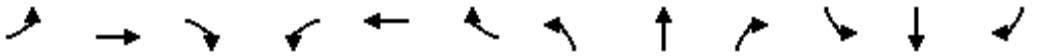
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	540	0	650	0	0	0	0	950	600	1420	930	0
Future Volume (vph)	540	0	650	0	0	0	0	950	600	1420	930	0
Confl. Peds. (#/hr)			2						2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)	12%		27%									
Lane Group Flow (vph)	500	253	499	0	0	0	0	1000	632	1495	979	0
v/c Ratio	0.84	0.74	0.63					0.95	0.62	0.99	0.40	
Control Delay	52.9	33.9	16.1					57.7	7.6	18.8	3.7	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	52.9	33.9	16.1					57.7	7.6	18.8	3.7	
Queue Length 50th (ft)	169	96	51					231	16	106	60	
Queue Length 95th (ft)	#254	#240	108					#320	69	m#618	m71	
Internal Link Dist (ft)		1475			1882			773			1047	
Turn Bay Length (ft)	600		600						700	550		
Base Capacity (vph)	604	344	798					1051	1014	1511	2444	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.83	0.74	0.63					0.95	0.62	0.99	0.40	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	540	0	650	0	0	0	0	950	600	1420	930	0
Future Volume (veh/h)	540	0	650	0	0	0	0	950	600	1420	930	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811				0	1811	1811	1811	1811	0
Adj Flow Rate, veh/h	624	0	239				0	1000	156	1495	979	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6				0	6	6	6	6	0
Cap, veh/h	802	0	474				0	1271	692	1516	2598	0
Arrive On Green	0.15	0.00	0.15				0.00	0.26	0.26	0.76	1.00	0.00
Sat Flow, veh/h	5175	0	3058				0	5107	2691	3346	3532	0
Grp Volume(v), veh/h	624	0	239				0	1000	156	1495	979	0
Grp Sat Flow(s),veh/h/ln	1725	0	1529				0	1648	1345	1673	1721	0
Q Serve(g_s), s	11.6	0.0	7.2				0.0	18.8	4.6	42.8	0.0	0.0
Cycle Q Clear(g_c), s	11.6	0.0	7.2				0.0	18.8	4.6	42.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	802	0	474				0	1271	692	1516	2598	0
V/C Ratio(X)	0.78	0.00	0.50				0.00	0.79	0.23	0.99	0.38	0.00
Avail Cap(c_a), veh/h	1009	0	596				0	1271	692	1523	2598	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.46	0.46	0.00
Uniform Delay (d), s/veh	40.6	0.0	38.7				0.0	34.6	29.3	11.9	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.8				0.0	5.0	0.8	12.6	0.2	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/ln	5.0	0.0	2.7				0.0	7.8	1.5	7.6	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	0.0	39.6				0.0	39.6	30.1	24.4	0.2	0.0
LnGrp LOS	D	A	D				A	D	C	C	A	A
Approach Vol, veh/h		863						1156			2474	
Approach Delay, s/veh		42.5						38.3			14.8	
Approach LOS		D						D			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	49.8	30.2		20.0		80.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	45.5	21.5		19.5		71.5
Max Q Clear Time (g_c+I1), s	44.8	20.8		13.6		2.0
Green Ext Time (p_c), s	0.5	0.5		1.9		8.4

Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Notes

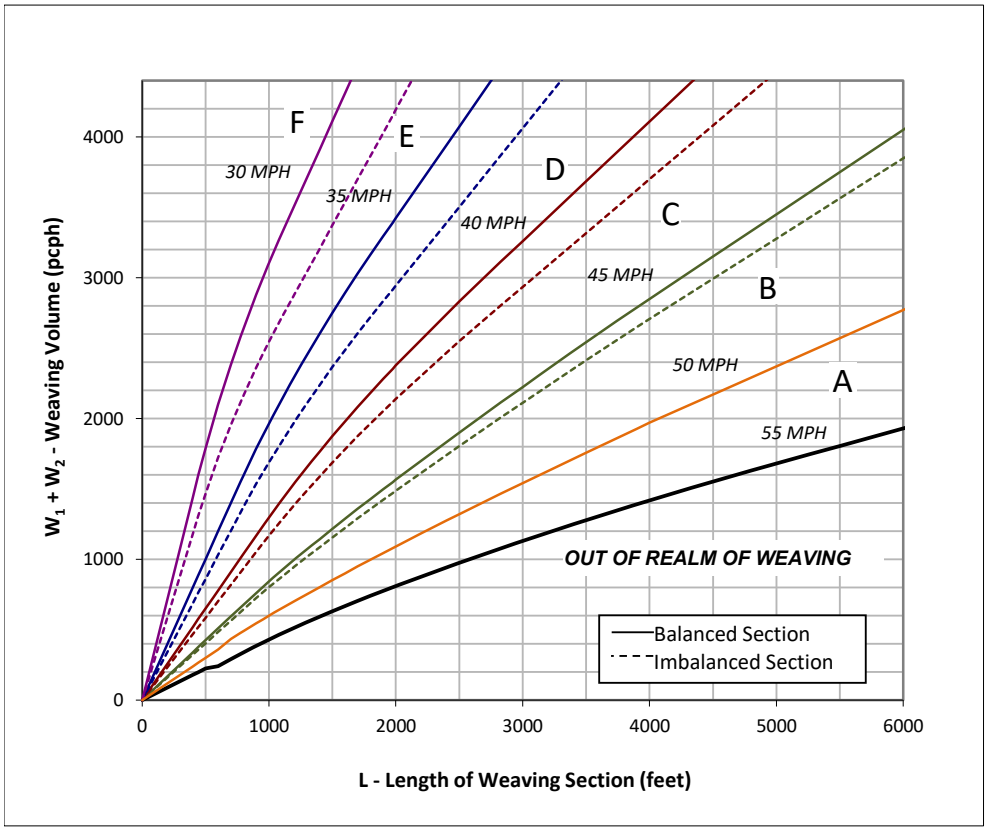
User approved volume balancing among the lanes for turning movement.

Leisch Method for Weaving Analysis

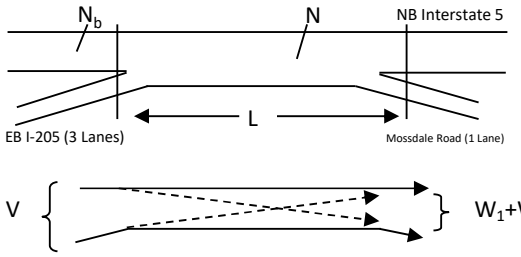
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	2,000

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed (NVL) - AM
Freeway	NB Interstate 5
On-ramp	EB I-205 (3 Lanes)
Off-ramp	Mossdale Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,007	6,572	35
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,633	7,361	36



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **23.2**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,617**
6. Level of Service (LOS) **D**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

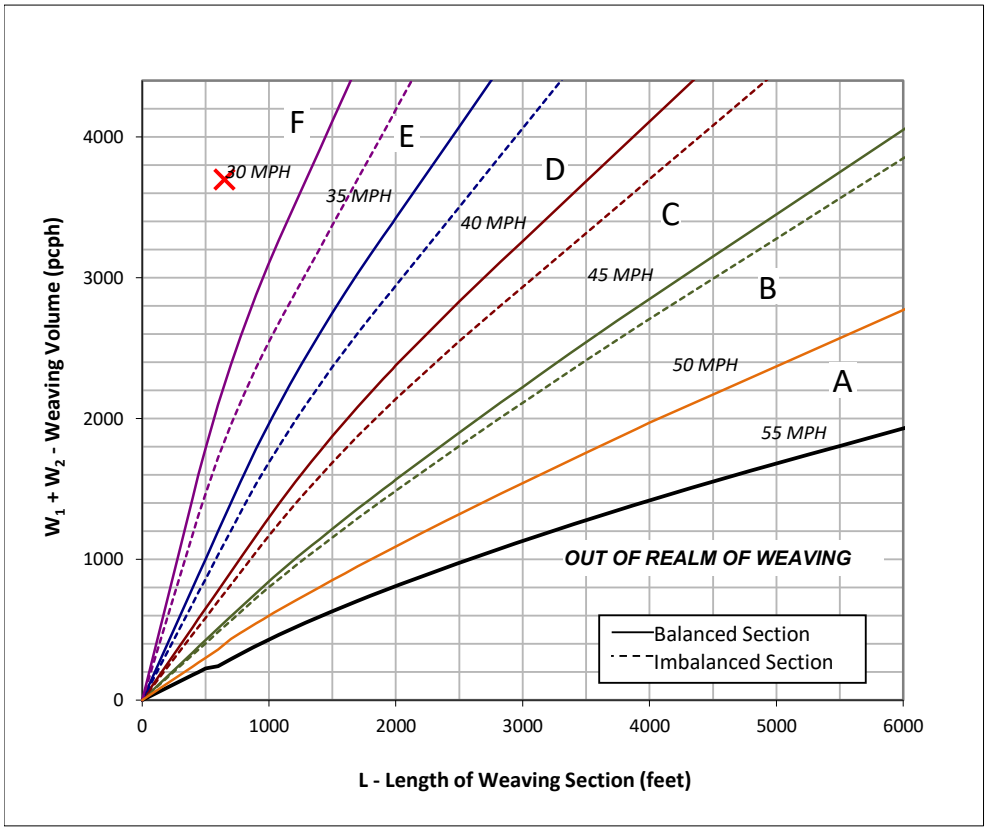
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

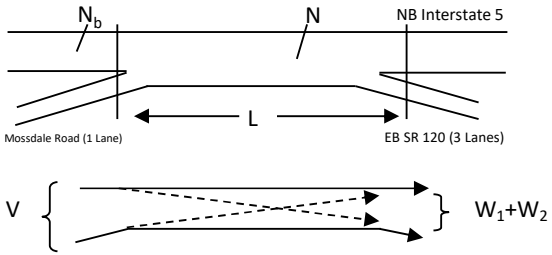
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	650

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed (NVL) - AM
Freeway	NB Interstate 5
On-ramp	Mossdale Road (1 Lane)
Off-ramp	EB SR 120 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	8,977	66	3,242
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,606	68	3,631



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **22.3**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,624**
6. Level of Service (LOS) **D**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

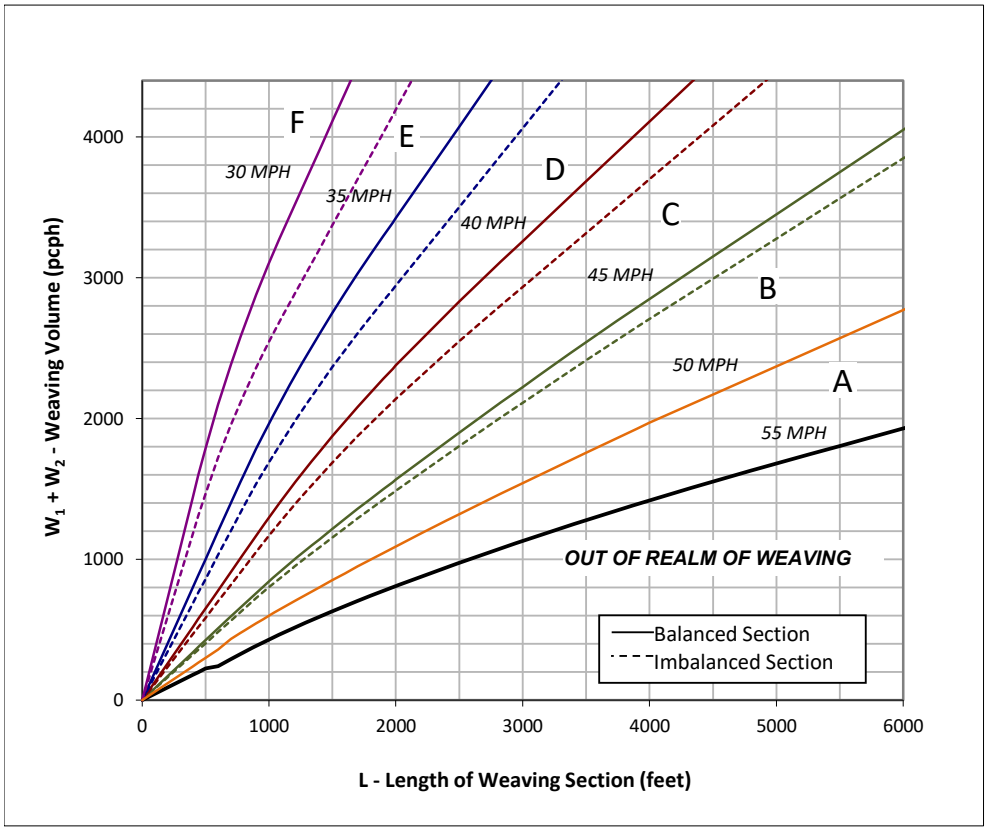
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

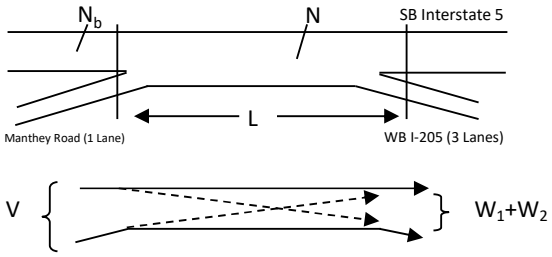
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	3,200

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed(NVL) - AM
Freeway	SB Interstate 5
On-ramp	Manthey Road (1 Lane)
Off-ramp	WB I-205 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,994	19	8,364
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.4	2.0	2.0
Volume (pcph)	10,501	20	9,368



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	26.3
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,757
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

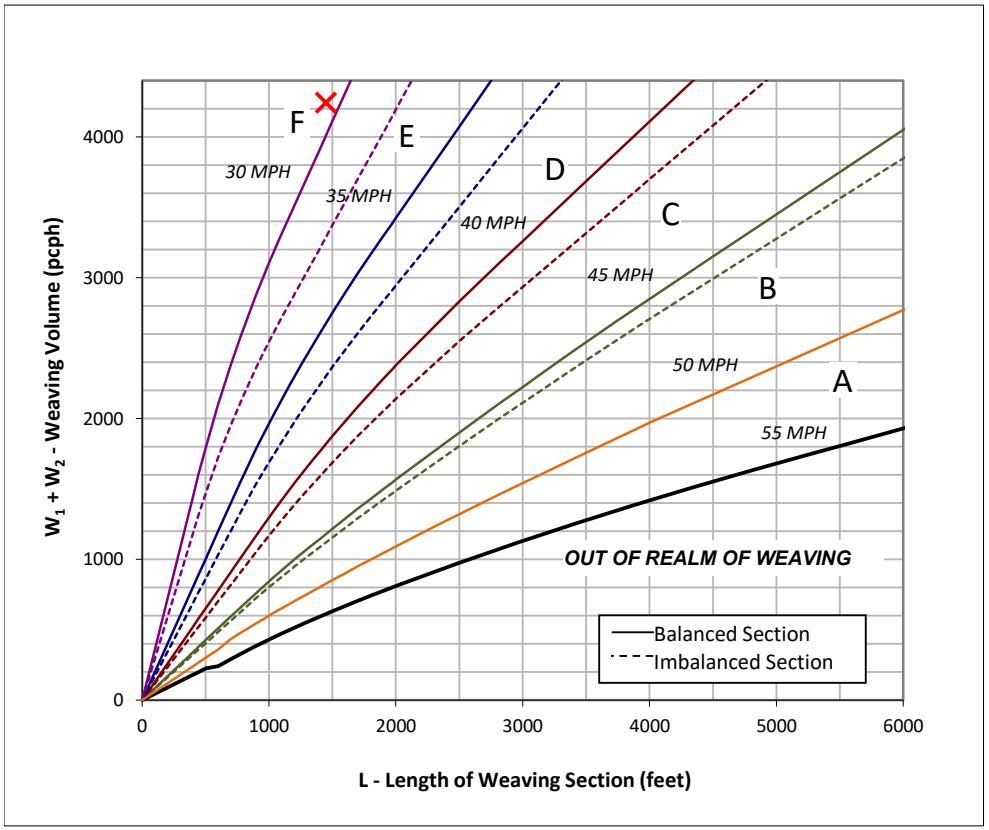
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

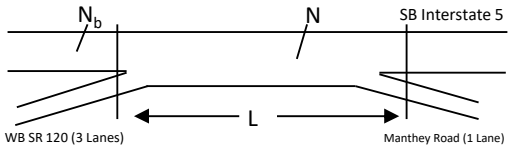
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	1,450

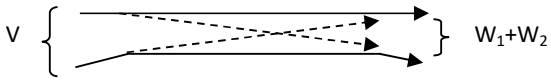
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed (NVL)- AM
Freeway	SB Interstate 5
On-ramp	WB SR 120 (3 Lanes)
Off-ramp	Manthey Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	10,053	3,647	156
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.4	2.0	2.0
Volume (pcph)	10,553	4,085	161



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	29.1
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,812
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

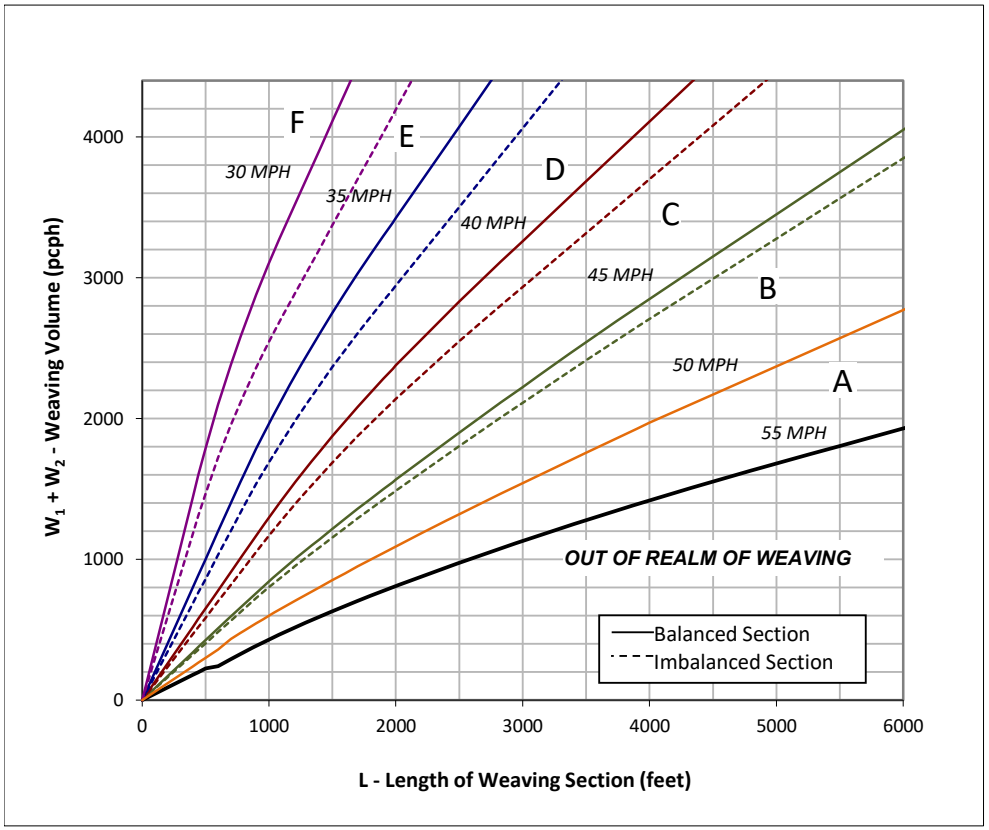
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

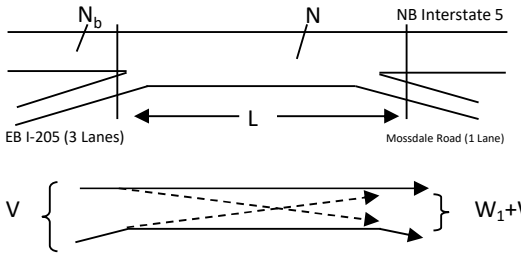
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	2,000

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed(NVL) - PM
Freeway	NB Interstate 5
On-ramp	EB I-205 (3 Lanes)
Off-ramp	Mossdale Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	11,440	8,056	58
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.2	2.0	2.0
Volume (pcph)	11,774	9,023	60



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **18.2**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,982**
6. Level of Service (LOS) **E**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

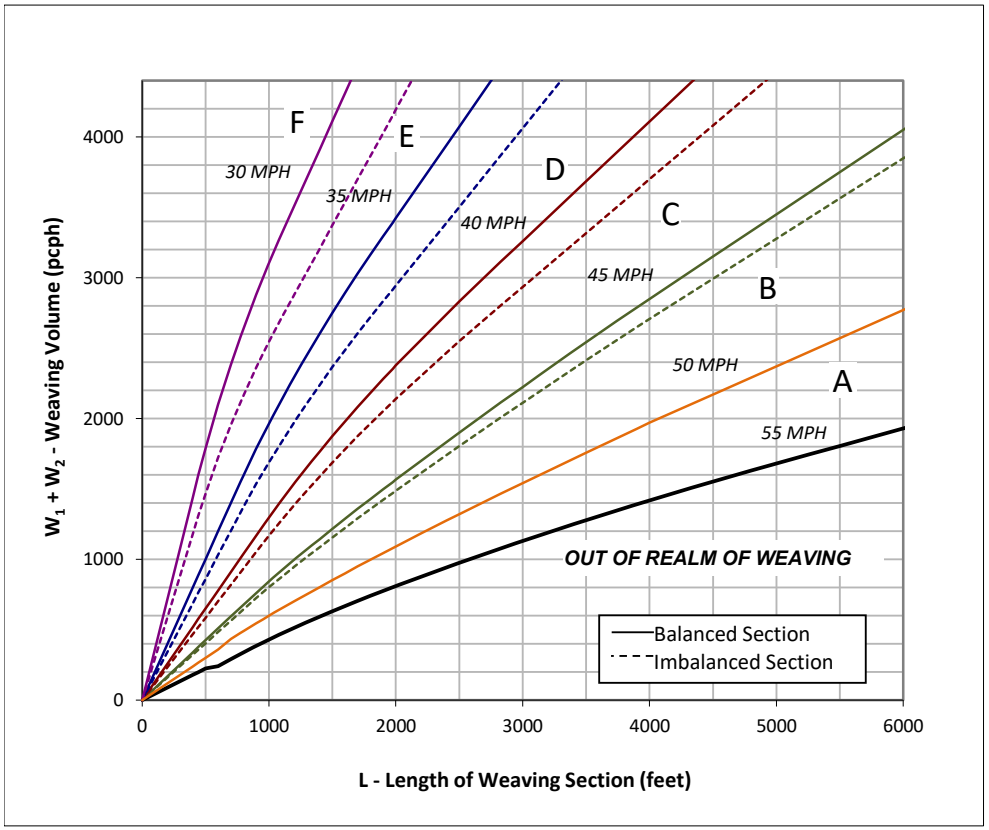
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

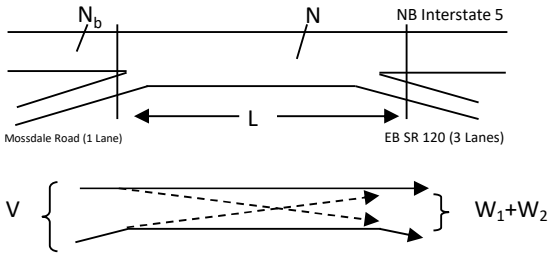
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	650

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed(NVL) - PM
Freeway	NB Interstate 5
On-ramp	Mossdale Road (1 Lane)
Off-ramp	EB SR 120 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	11,452	58	5,388
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.2	2.0	2.0
Volume (pcph)	11,784	60	6,035



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **9.6**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   SV = (1/N)*[V + (k - 1)*min(W_1, W_2)] **1,984**
6. Level of Service (LOS) **E**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

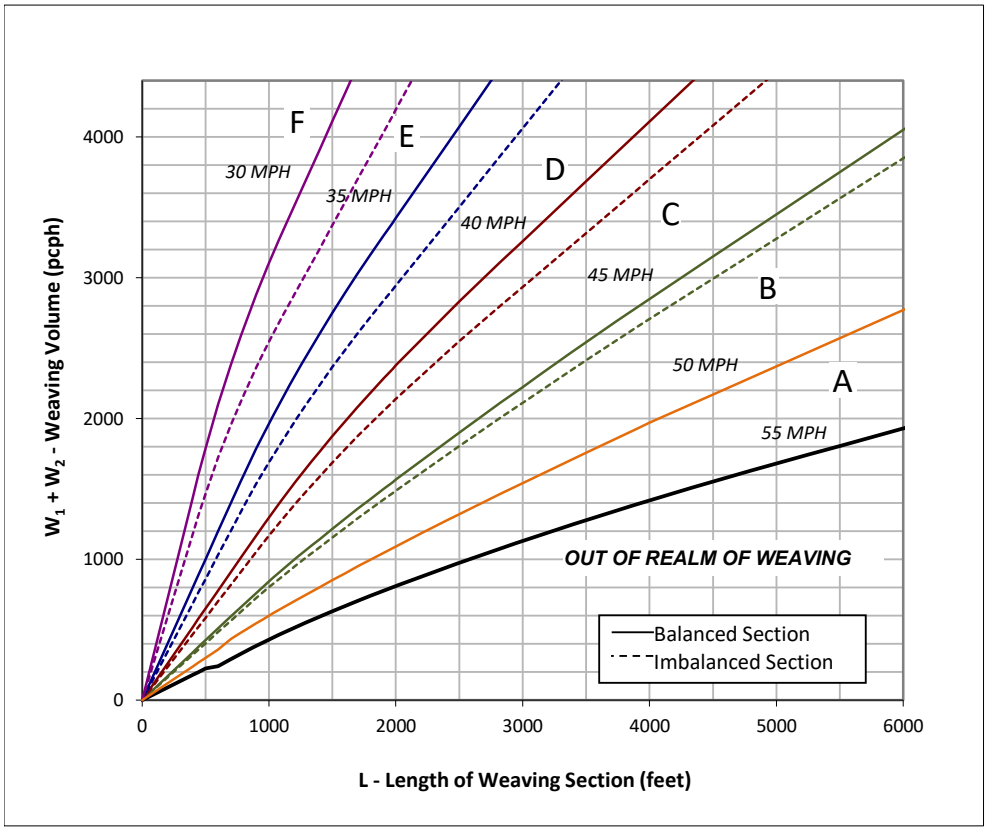
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

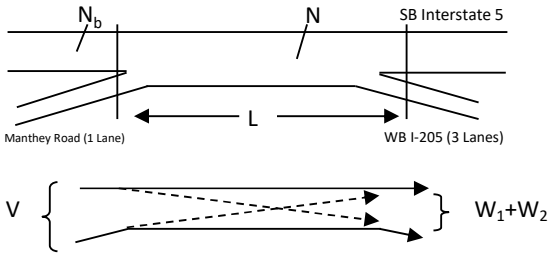
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	3,200

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed(NVL) - PM
Freeway	SB Interstate 5
On-ramp	Manthey Road (1 Lane)
Off-ramp	WB I-205 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,453	19	6,874
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.5	2.0	2.0
Volume (pcph)	10,025	20	7,699



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	29.6
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,677
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

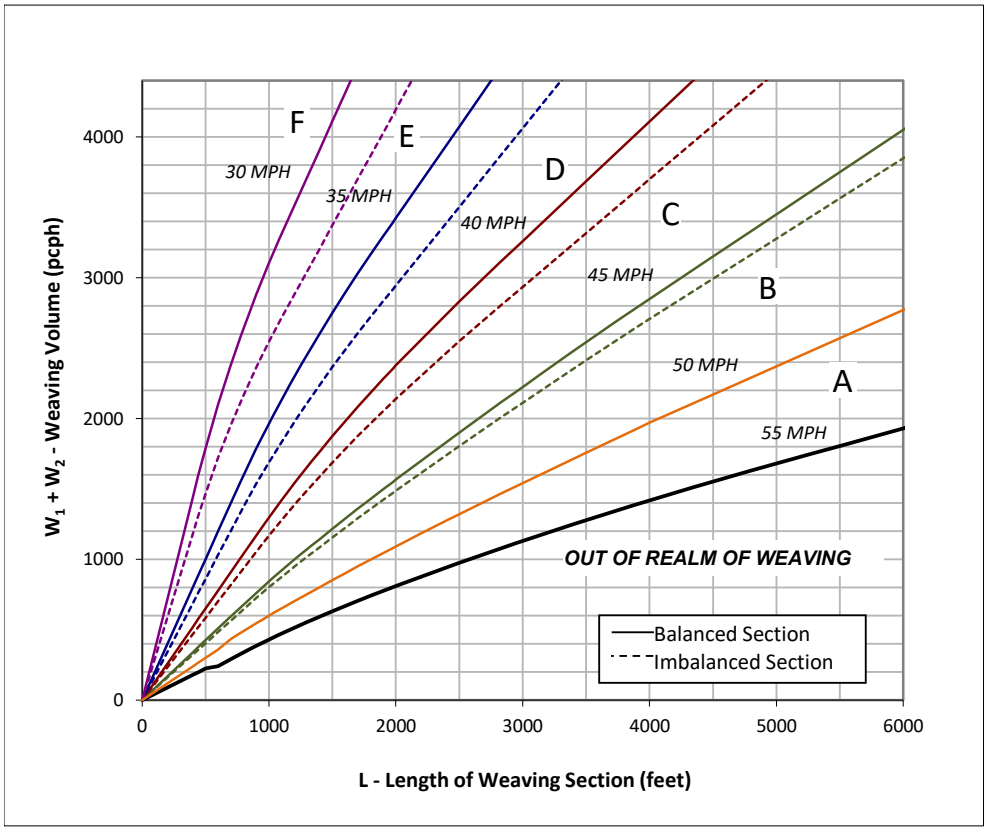
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

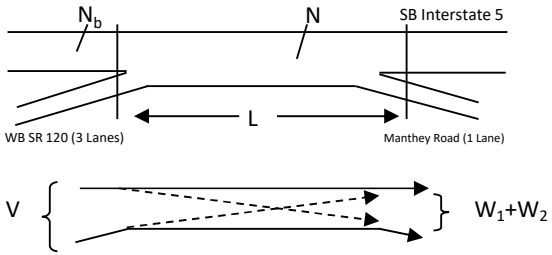
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	1,450

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed(NVL) - PM
Freeway	SB Interstate 5
On-ramp	WB SR 120 (3 Lanes)
Off-ramp	Manthey Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,307	3,932	0
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.5	2.0	2.0
Volume (pcph)	9,897	4,404	0



Figure



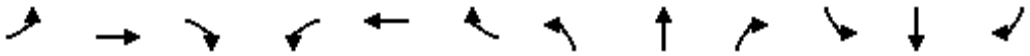
Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	28.5
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,649
6. Level of Service (LOS)	D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

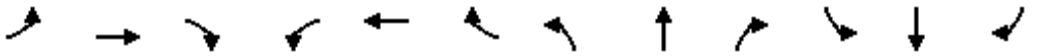


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Future Volume (vph)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Confl. Peds. (#/hr)						10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	653	1684	0	0	1326	853	1600	0	400	0	0	0
v/c Ratio	1.40	0.88			1.09	1.03	1.39		0.41			
Control Delay	227.5	29.2			95.1	50.5	214.7		26.6			
Queue Delay	0.0	4.1			0.0	0.0	0.0		0.0			
Total Delay	227.5	33.3			95.1	50.5	214.7		26.6			
Queue Length 50th (ft)	~677	564			~422	~313	~852		113			
Queue Length 95th (ft)	#905	688			#518	#561	#988		162			
Internal Link Dist (ft)		670			818			1440			1422	
Turn Bay Length (ft)						400	500		500			
Base Capacity (vph)	466	1908			1220	831	1148		967			
Starvation Cap Reductn	0	163			0	0	0		0			
Spillback Cap Reductn	0	0			0	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.40	0.97			1.09	1.03	1.39		0.41			

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

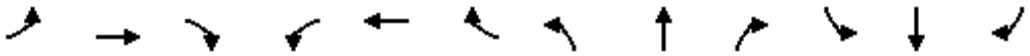
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Future Volume (veh/h)	620	1600	0	0	1260	810	1520	0	380	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1781	1781	0	0	1781	1781	1781	0	1781			
Adj Flow Rate, veh/h	653	1684	0	0	1326	357	1600	0	362			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	8	8	0	0	8	8	8	0	8			
Cap, veh/h	474	1932	0	0	1236	376	1166	0	941			
Arrive On Green	0.28	0.57	0.00	0.00	0.25	0.25	0.35	0.00	0.35			
Sat Flow, veh/h	1697	3474	0	0	5024	1480	3291	0	2657			
Grp Volume(v), veh/h	653	1684	0	0	1326	357	1600	0	362			
Grp Sat Flow(s),veh/h/ln	1697	1692	0	0	1621	1480	1646	0	1329			
Q Serve(g_s), s	33.5	51.0	0.0	0.0	30.5	28.5	42.5	0.0	12.2			
Cycle Q Clear(g_c), s	33.5	51.0	0.0	0.0	30.5	28.5	42.5	0.0	12.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	474	1932	0	0	1236	376	1166	0	941			
V/C Ratio(X)	1.38	0.87	0.00	0.00	1.07	0.95	1.37	0.00	0.38			
Avail Cap(c_a), veh/h	474	1932	0	0	1236	376	1166	0	941			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.79	0.79	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	43.3	22.0	0.0	0.0	44.8	44.0	38.8	0.0	29.0			
Incr Delay (d2), s/veh	180.7	4.6	0.0	0.0	47.5	35.2	173.2	0.0	0.3			
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/ln	37.4	19.6	0.0	0.0	17.3	13.8	44.6	0.0	3.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	224.0	26.6	0.0	0.0	92.3	79.2	211.9	0.0	29.2			
LnGrp LOS	F	C	A	A	F	E	F	A	C			
Approach Vol, veh/h		2337			1683			1962				
Approach Delay, s/veh		81.8			89.5			178.2				
Approach LOS		F			F			F				

Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		47.0		73.0			38.0	35.0				
Change Period (Y+Rc), s		4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s		42.5		68.5			33.5	30.5				
Max Q Clear Time (g_c+I1), s		44.5		53.0			35.5	32.5				
Green Ext Time (p_c), s		0.0		10.5			0.0	0.0				

Intersection Summary												
HCM 6th Ctrl Delay			115.6									
HCM 6th LOS			F									

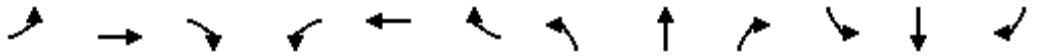


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Future Volume (vph)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Confl. Peds. (#/hr)			10			10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1779	1705	0	2611	316	0	0	0	558	0	832
v/c Ratio		0.56	1.17		1.19	0.22				0.63		1.10
Control Delay		13.0	91.6		113.2	0.3				45.3		105.6
Queue Delay		0.0	0.0		0.2	0.0				0.0		0.0
Total Delay		13.0	91.6		113.4	0.3				45.3		105.6
Queue Length 50th (ft)		276	~432		~1392	0				213		~434
Queue Length 95th (ft)		315	#697		#1518	0				275		#577
Internal Link Dist (ft)		730			670			1228			1687	
Turn Bay Length (ft)			500							500		500
Base Capacity (vph)		3158	1458		2198	1458				885		755
Starvation Cap Reductn		0	0		140	0				0		0
Spillback Cap Reductn		0	0		0	0				0		0
Storage Cap Reductn		0	0		0	0				0		0
Reduced v/c Ratio		0.56	1.17		1.27	0.22				0.63		1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Future Volume (veh/h)	0	1690	1620	0	2480	300	0	0	0	530	0	790
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1781	0	1781	1781				1781	0	1781
Adj Flow Rate, veh/h	0	1779	0	0	2611	0				558	0	794
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	8	8	0	8	8				8	0	8
Cap, veh/h	0	3199		0	2226					899	0	726
Arrive On Green	0.00	0.66	0.00	0.00	0.66	0.00				0.27	0.00	0.27
Sat Flow, veh/h	0	5024	1510	0	3474	1510				3291	0	2657
Grp Volume(v), veh/h	0	1779	0	0	2611	0				558	0	794
Grp Sat Flow(s),veh/h/ln	0	1621	1510	0	1692	1510				1646	0	1329
Q Serve(g_s), s	0.0	25.7	0.0	0.0	85.5	0.0				19.3	0.0	35.5
Cycle Q Clear(g_c), s	0.0	25.7	0.0	0.0	85.5	0.0				19.3	0.0	35.5
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3199		0	2226					899	0	726
V/C Ratio(X)	0.00	0.56		0.00	1.17					0.62	0.00	1.09
Avail Cap(c_a), veh/h	0	3199		0	2226					899	0	726
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	12.0	0.0	0.0	22.2	0.0				41.4	0.0	47.3
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	78.3	0.0				1.3	0.0	62.1
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/ln	0.0	8.6	0.0	0.0	53.5	0.0				7.9	0.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.7	0.0	0.0	100.5	0.0				42.7	0.0	109.4
LnGrp LOS	A	B		A	F					D	A	F
Approach Vol, veh/h		1779	A		2611	A					1352	
Approach Delay, s/veh		12.7			100.5						81.8	
Approach LOS		B			F						F	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		90.0		40.0		90.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		85.5		35.5		85.5						
Max Q Clear Time (g_c+I1), s		27.7		37.5		87.5						
Green Ext Time (p_c), s		21.4		0.0		0.0						

Intersection Summary		
HCM 6th Ctrl Delay		68.9
HCM 6th LOS		E

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	195	76	30	20	30
Future Vol, veh/h	30	195	76	30	20	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	32	205	80	32	21	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	213	21	53	0	-	0
Stage 1	21	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	769	1048	1534	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	728	1048	1534	-	-	-
Mov Cap-2 Maneuver	728	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	833	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	5.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1534	-	728	1048	-	-
HCM Lane V/C Ratio	0.052	-	0.043	0.196	-	-
HCM Control Delay (s)	7.5	0	10.2	9.3	-	-
HCM Lane LOS	A	A	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.7	-	-

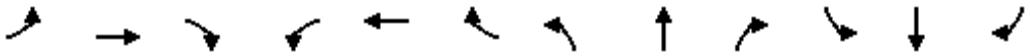
Intersection	
Int Delay, s/veh	9.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	383	10	0	204	0
Future Vol, veh/h	10	383	10	0	204	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	25	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	11	403	11	0	215	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	441	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Critical Hdwy	6.48	6.28	-	-	4.18	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	-	-	2.272	-
Pot Cap-1 Maneuver	563	1053	-	-	1570	-
Stage 1	997	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	486	1053	-	-	1570	-
Mov Cap-2 Maneuver	486	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	555	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	7.7
HCM LOS	B		

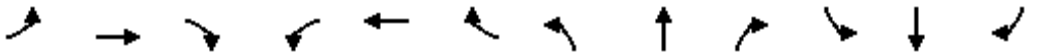
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	486	1053	1570	-
HCM Lane V/C Ratio	-	-	0.022	0.383	0.137	-
HCM Control Delay (s)	-	-	12.6	10.5	7.7	0
HCM Lane LOS	-	-	B	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	1.8	0.5	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	155	0	100	322	50	0	0	110	20
Future Volume (vph)	0	0	0	155	0	100	322	50	0	0	110	20
Confl. Peds. (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	163	105	339	53	0	0	116	21
v/c Ratio					0.55	0.30	0.91	0.04			0.17	0.03
Control Delay					30.7	7.5	52.0	2.2			15.2	0.1
Queue Delay					0.0	0.0	0.0	0.0			0.0	0.0
Total Delay					30.7	7.5	52.0	2.2			15.2	0.1
Queue Length 50th (ft)					60	0	135	3			29	0
Queue Length 95th (ft)					103	33	#277	7			68	0
Internal Link Dist (ft)		1133			1101			260			945	
Turn Bay Length (ft)						350						350
Base Capacity (vph)					462	489	372	1202			687	632
Starvation Cap Reductn					0	0	0	0			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.35	0.21	0.91	0.04			0.17	0.03

Intersection Summary

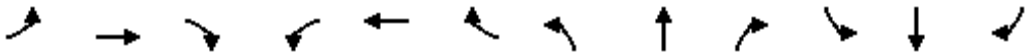
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	155	0	100	322	50	0	0	110	20
Future Volume (veh/h)	0	0	0	155	0	100	322	50	0	0	110	20
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1781	1781	1781	1781	1781	0	0	1781	1781
Adj Flow Rate, veh/h				163	0	14	339	53	0	0	116	7
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				8	8	8	8	8	0	0	8	8
Cap, veh/h				215	0	192	633	1309	0	0	521	440
Arrive On Green				0.13	0.00	0.13	0.37	0.73	0.00	0.00	0.29	0.29
Sat Flow, veh/h				1697	0	1510	1697	1781	0	0	1781	1505
Grp Volume(v), veh/h				163	0	14	339	53	0	0	116	7
Grp Sat Flow(s),veh/h/ln				1697	0	1510	1697	1781	0	0	1781	1505
Q Serve(g_s), s				6.0	0.0	0.5	10.2	0.5	0.0	0.0	3.2	0.2
Cycle Q Clear(g_c), s				6.0	0.0	0.5	10.2	0.5	0.0	0.0	3.2	0.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				215	0	192	633	1309	0	0	521	440
V/C Ratio(X)				0.76	0.00	0.07	0.54	0.04	0.00	0.00	0.22	0.02
Avail Cap(c_a), veh/h				470	0	418	633	1309	0	0	521	440
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	0.00	1.00	0.99	0.99	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				27.4	0.0	25.0	16.0	2.4	0.0	0.0	17.4	16.4
Incr Delay (d2), s/veh				5.3	0.0	0.2	0.9	0.1	0.0	0.0	1.0	0.1
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/ln				2.6	0.0	0.2	3.5	0.1	0.0	0.0	1.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.8	0.0	25.2	16.8	2.4	0.0	0.0	18.4	16.4
LnGrp LOS				C	A	C	B	A	A	A	B	B
Approach Vol, veh/h					177			392			123	
Approach Delay, s/veh					32.2			14.9			18.3	
Approach LOS					C			B			B	

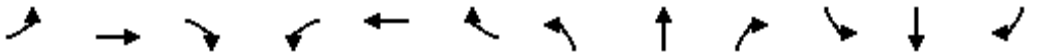
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		52.2			28.7	23.5		12.8				
Change Period (Y+Rc), s		4.5			4.5	4.5		4.5				
Max Green Setting (Gmax), s		38.0			14.5	19.0		18.0				
Max Q Clear Time (g_c+I1), s		2.5			12.2	5.2		8.0				
Green Ext Time (p_c), s		0.2			0.3	0.4		0.6				

Intersection Summary												
HCM 6th Ctrl Delay			19.9									
HCM 6th LOS			B									



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	40	0	395	0	0	0	0	332	188	70	195	0
Future Volume (vph)	40	0	395	0	0	0	0	332	188	70	195	0
Confl. Peds. (#/hr)									2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	42	416	0	0	0	0	349	198	74	205	0
v/c Ratio		0.17	0.72					0.18	0.21	0.35	0.16	
Control Delay		23.1	10.5					9.7	3.2	24.0	3.2	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		23.1	10.5					9.7	3.2	24.0	3.2	
Queue Length 50th (ft)		16	0					32	0	15	0	
Queue Length 95th (ft)		33	59					83	38	56	88	
Internal Link Dist (ft)		966			991			741			260	
Turn Bay Length (ft)			400						350			
Base Capacity (vph)		552	772					1949	933	237	1255	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					0	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.08	0.54					0.18	0.21	0.31	0.16	

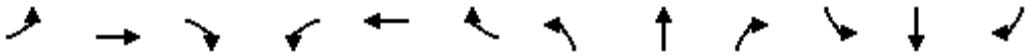
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	395	0	0	0	0	332	188	70	195	0
Future Volume (veh/h)	40	0	395	0	0	0	0	332	188	70	195	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781				0	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	42	0	42				0	349	105	74	205	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	8	8	8				0	8	8	8	8	0
Cap, veh/h	102	0	91				0	2287	1018	96	1428	0
Arrive On Green	0.06	0.00	0.06				0.00	0.68	0.68	0.11	1.00	0.00
Sat Flow, veh/h	1697	0	1510				0	3474	1507	1697	1781	0
Grp Volume(v), veh/h	42	0	42				0	349	105	74	205	0
Grp Sat Flow(s),veh/h/ln	1697	0	1510				0	1692	1507	1697	1781	0
Q Serve(g_s), s	1.6	0.0	1.7				0.0	2.4	1.6	2.8	0.0	0.0
Cycle Q Clear(g_c), s	1.6	0.0	1.7				0.0	2.4	1.6	2.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	102	0	91				0	2287	1018	96	1428	0
V/C Ratio(X)	0.41	0.00	0.46				0.00	0.15	0.10	0.77	0.14	0.00
Avail Cap(c_a), veh/h	561	0	499				0	2287	1018	222	1428	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	29.4	0.0	29.5				0.0	3.8	3.7	28.4	0.0	0.0
Incr Delay (d2), s/veh	2.7	0.0	3.6				0.0	0.1	0.2	12.0	0.2	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/ln	0.7	0.0	0.7				0.0	0.5	0.3	1.3	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	0.0	33.2				0.0	4.0	3.9	40.4	0.2	0.0
LnGrp LOS	C	A	C				A	A	A	D	A	A
Approach Vol, veh/h		84						454			279	
Approach Delay, s/veh		32.6						3.9			10.9	
Approach LOS		C						A			B	

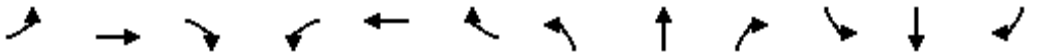
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.2	48.4		8.4		56.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	8.5	21.5		21.5		34.5
Max Q Clear Time (g_c+I1), s	4.8	4.4		3.7		2.0
Green Ext Time (p_c), s	0.0	2.2		0.2		1.1

Intersection Summary			
HCM 6th Ctrl Delay			9.3
HCM 6th LOS			A



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	508	0	930	0	573	510	0	990	590
Future Volume (vph)	0	0	0	508	0	930	0	573	510	0	990	590
Confl. Peds. (#/hr)									2			2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	267	268	979	0	603	537	0	1042	621
v/c Ratio				0.41	0.41	0.75		0.26	0.40		0.45	0.60
Control Delay				18.2	18.2	16.0		3.1	12.2		14.0	3.9
Queue Delay				0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay				18.2	18.2	16.0		3.1	12.2		14.0	3.9
Queue Length 50th (ft)				89	90	135		9	274		112	0
Queue Length 95th (ft)				153	154	217		14	361		146	52
Internal Link Dist (ft)		1812			1566			1047			868	
Turn Bay Length (ft)						450			300			450
Base Capacity (vph)				657	657	1303		2316	1331		2316	1038
Starvation Cap Reductn				0	0	0		0	0		0	0
Spillback Cap Reductn				0	0	0		0	0		0	0
Storage Cap Reductn				0	0	0		0	0		0	0
Reduced v/c Ratio				0.41	0.41	0.75		0.26	0.40		0.45	0.60

Intersection Summary



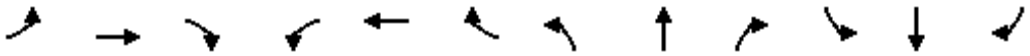
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	508	0	930	0	573	510	0	990	590
Future Volume (veh/h)	0	0	0	508	0	930	0	573	510	0	990	590
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1811	1811	1811	0	1811	1811	0	1811	1811
Adj Flow Rate, veh/h				535	0	755	0	603	537	0	1042	277
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				6	6	6	0	6	6	0	6	6
Cap, veh/h				1069	0	951	0	2819	1349	0	2819	874
Arrive On Green				0.31	0.00	0.31	0.00	0.57	0.57	0.00	0.57	0.57
Sat Flow, veh/h				3450	0	3070	0	5107	1532	0	5107	1533
Grp Volume(v), veh/h				535	0	755	0	603	537	0	1042	277
Grp Sat Flow(s),veh/h/ln				1725	0	1535	0	1648	1532	0	1648	1533
Q Serve(g_s), s				9.5	0.0	16.9	0.0	4.5	4.9	0.0	8.6	7.1
Cycle Q Clear(g_c), s				9.5	0.0	16.9	0.0	4.5	4.9	0.0	8.6	7.1
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1069	0	951	0	2819	1349	0	2819	874
V/C Ratio(X)				0.50	0.00	0.79	0.00	0.21	0.40	0.00	0.37	0.32
Avail Cap(c_a), veh/h				1403	0	1248	0	2819	1349	0	2819	874
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	0.00	1.00	0.00	0.86	0.86	0.00	1.00	1.00
Uniform Delay (d), s/veh				21.1	0.0	23.7	0.0	7.9	0.8	0.0	8.8	8.5
Incr Delay (d2), s/veh				0.4	0.0	2.7	0.0	0.1	0.8	0.0	0.4	1.0
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/ln				3.6	0.0	6.0	0.0	1.3	0.3	0.0	2.6	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				21.5	0.0	26.4	0.0	8.0	1.6	0.0	9.2	9.4
LnGrp LOS				C	A	C	A	A	A	A	A	A
Approach Vol, veh/h					1290			1140			1319	
Approach Delay, s/veh					24.4			5.0			9.2	
Approach LOS					C			A			A	

Timer - Assigned Phs	2			6		8						
Phs Duration (G+Y+Rc), s	47.3			47.3		27.7						
Change Period (Y+Rc), s	4.5			4.5		4.5						
Max Green Setting (Gmax), s	35.5			35.5		30.5						
Max Q Clear Time (g_c+I1), s	6.9			10.6		18.9						
Green Ext Time (p_c), s	6.6			8.8		4.4						

Intersection Summary		
HCM 6th Ctrl Delay	13.1	
HCM 6th LOS	B	

Notes

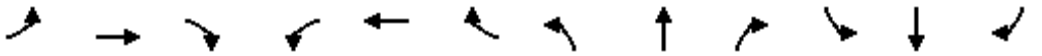
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	450	0	512	0	0	0	0	633	497	810	688	0
Future Volume (vph)	450	0	512	0	0	0	0	633	497	810	688	0
Confl. Peds. (#/hr)			2						2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)	14%		26%									
Lane Group Flow (vph)	408	206	399	0	0	0	0	666	523	853	724	0
v/c Ratio	0.57	0.52	0.43					0.46	0.46	0.89	0.33	
Control Delay	28.4	13.5	4.1					22.9	3.6	26.7	4.8	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	28.4	13.5	4.1					22.9	3.6	26.7	4.8	
Queue Length 50th (ft)	90	30	0					93	0	191	47	
Queue Length 95th (ft)	130	98	32					126	36	#310	81	
Internal Link Dist (ft)		1475			1882			773			1047	
Turn Bay Length (ft)	600		600						700	550		
Base Capacity (vph)	847	449	1037					1462	1149	959	2212	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.48	0.46	0.38					0.46	0.46	0.89	0.33	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



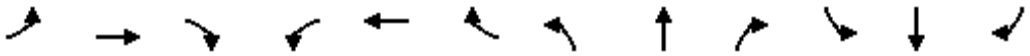
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	450	0	512	0	0	0	0	633	497	810	688	0
Future Volume (veh/h)	450	0	512	0	0	0	0	633	497	810	688	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811				0	1811	1811	1811	1811	0
Adj Flow Rate, veh/h	493	0	82				0	666	137	853	724	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6				0	6	6	6	6	0
Cap, veh/h	730	0	431				0	2072	1129	870	2543	0
Arrive On Green	0.14	0.00	0.14				0.00	0.42	0.42	0.35	0.98	0.00
Sat Flow, veh/h	5175	0	3057				0	5107	2695	3346	3532	0
Grp Volume(v), veh/h	493	0	82				0	666	137	853	724	0
Grp Sat Flow(s),veh/h/ln	1725	0	1528				0	1648	1347	1673	1721	0
Q Serve(g_s), s	6.8	0.0	1.8				0.0	6.8	2.3	18.9	0.4	0.0
Cycle Q Clear(g_c), s	6.8	0.0	1.8				0.0	6.8	2.3	18.9	0.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	730	0	431				0	2072	1129	870	2543	0
V/C Ratio(X)	0.68	0.00	0.19				0.00	0.32	0.12	0.98	0.28	0.00
Avail Cap(c_a), veh/h	1414	0	835				0	2072	1129	870	2543	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.90	0.90	0.00
Uniform Delay (d), s/veh	30.6	0.0	28.4				0.0	14.6	13.3	24.3	0.2	0.0
Incr Delay (d2), s/veh	1.1	0.0	0.2				0.0	0.4	0.2	24.2	0.3	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/ln	2.8	0.0	0.6				0.0	2.3	0.7	8.8	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	0.0	28.6				0.0	15.0	13.6	48.5	0.4	0.0
LnGrp LOS	C	A	C				A	B	B	D	A	A
Approach Vol, veh/h		575						803			1577	
Approach Delay, s/veh		31.3						14.8			26.4	
Approach LOS		C						B			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	24.0	35.9		15.1		59.9
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	19.5	21.5		20.5		45.5
Max Q Clear Time (g_c+I1), s	20.9	8.8		8.8		2.4
Green Ext Time (p_c), s	0.0	3.9		1.8		5.4

Intersection Summary	
HCM 6th Ctrl Delay	24.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



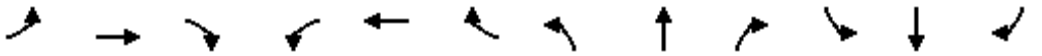
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Future Volume (vph)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Confl. Peds. (#/hr)						10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	621	2579	0	0	1853	1011	1253	0	558	0	0	0
v/c Ratio	1.31	1.24			1.25	1.19	1.22		0.65			
Control Delay	199.5	138.6			159.1	114.4	151.7		44.5			
Queue Delay	0.0	0.0			1.5	0.0	0.0		0.0			
Total Delay	199.5	138.6			160.6	114.4	151.7		44.5			
Queue Length 50th (ft)	~801	~1631			~823	~757	~773		247			
Queue Length 95th (ft)	m#865	#1753			#917	#1022	#910		320			
Internal Link Dist (ft)		670			818			1440			1422	
Turn Bay Length (ft)						400	500		500			
Base Capacity (vph)	473	2083			1488	852	1026		863			
Starvation Cap Reductn	0	0			0	0	0		0			
Spillback Cap Reductn	0	0			467	0	0		0			
Storage Cap Reductn	0	0			0	0	0		0			
Reduced v/c Ratio	1.31	1.24			1.81	1.19	1.22		0.65			

Intersection Summary

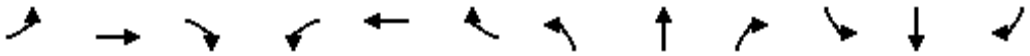
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Future Volume (veh/h)	590	2450	0	0	1760	960	1190	0	530	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1781	1781	0	0	1781	1781	1781	0	1781			
Adj Flow Rate, veh/h	621	2579	0	0	1853	573	1253	0	526			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	8	8	0	0	8	8	8	0	8			
Cap, veh/h	481	2110	0	0	1508	460	1042	0	841			
Arrive On Green	0.28	0.62	0.00	0.00	0.31	0.31	0.32	0.00	0.32			
Sat Flow, veh/h	1697	3474	0	0	5024	1485	3291	0	2657			
Grp Volume(v), veh/h	621	2579	0	0	1853	573	1253	0	526			
Grp Sat Flow(s),veh/h/ln	1697	1692	0	0	1621	1485	1646	0	1329			
Q Serve(g_s), s	42.5	93.5	0.0	0.0	46.5	46.5	47.5	0.0	25.3			
Cycle Q Clear(g_c), s	42.5	93.5	0.0	0.0	46.5	46.5	47.5	0.0	25.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	481	2110	0	0	1508	460	1042	0	841			
V/C Ratio(X)	1.29	1.22	0.00	0.00	1.23	1.24	1.20	0.00	0.63			
Avail Cap(c_a), veh/h	481	2110	0	0	1508	460	1042	0	841			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.34	0.34	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	53.8	28.2	0.0	0.0	51.8	51.7	51.2	0.0	43.7			
Incr Delay (d2), s/veh	136.7	101.6	0.0	0.0	109.1	127.2	100.3	0.0	1.5			
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/ln	36.0	64.4	0.0	0.0	33.7	33.2	33.9	0.0	8.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	190.5	129.9	0.0	0.0	160.9	178.9	151.5	0.0	45.1			
LnGrp LOS	F	F	A	A	F	F	F	A	D			
Approach Vol, veh/h		3200			2426			1779				
Approach Delay, s/veh		141.7			165.2			120.1				
Approach LOS		F			F			F				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		52.0		98.0			47.0	51.0				
Change Period (Y+Rc), s		4.5		4.5			4.5	4.5				
Max Green Setting (Gmax), s		47.5		93.5			42.5	46.5				
Max Q Clear Time (g_c+I1), s		49.5		95.5			44.5	48.5				
Green Ext Time (p_c), s		0.0		0.0			0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			144.2									
HCM 6th LOS			F									



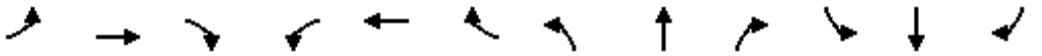
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Future Volume (vph)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Confl. Peds. (#/hr)			10			10						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2853	2137	0	3042	63	0	0	0	347	0	1147
v/c Ratio		0.95	1.47		1.46	0.04				0.34		1.37
Control Delay		35.2	226.4		227.3	0.0				40.4		211.0
Queue Delay		4.0	0.0		0.2	0.0				19.4		0.0
Total Delay		39.2	226.4		227.5	0.0				59.8		211.0
Queue Length 50th (ft)		903	~1377		~2138	0				134		~837
Queue Length 95th (ft)		987	#1625		m#1516	m0				178		#990
Internal Link Dist (ft)		730			670			1228			1687	
Turn Bay Length (ft)			500							500		500
Base Capacity (vph)		2993	1458		2083	1458				1026		840
Starvation Cap Reductn		0	0		124	0				0		0
Spillback Cap Reductn		112	0		0	0				668		0
Storage Cap Reductn		0	0		0	0				0		0
Reduced v/c Ratio		0.99	1.47		1.55	0.04				0.97		1.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↱		↑↑	↱				↰↰		↱↱
Traffic Volume (veh/h)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Future Volume (veh/h)	0	2710	2030	0	2890	60	0	0	0	330	0	1090
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1781	1781	0	1781	1781				1781	0	1781
Adj Flow Rate, veh/h	0	2853	0	0	3042	0				347	0	1139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	8	8	0	8	8				8	0	8
Cap, veh/h	0	3031		0	2110					1042	0	841
Arrive On Green	0.00	0.62	0.00	0.00	0.83	0.00				0.32	0.00	0.32
Sat Flow, veh/h	0	5024	1510	0	3474	1510				3291	0	2657
Grp Volume(v), veh/h	0	2853	0	0	3042	0				347	0	1139
Grp Sat Flow(s),veh/h/ln	0	1621	1510	0	1692	1510				1646	0	1329
Q Serve(g_s), s	0.0	80.2	0.0	0.0	93.5	0.0				12.1	0.0	47.5
Cycle Q Clear(g_c), s	0.0	80.2	0.0	0.0	93.5	0.0				12.1	0.0	47.5
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	3031		0	2110					1042	0	841
V/C Ratio(X)	0.00	0.94		0.00	1.44					0.33	0.00	1.35
Avail Cap(c_a), veh/h	0	3031		0	2110					1042	0	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	25.7	0.0	0.0	12.8	0.0				39.1	0.0	51.3
Incr Delay (d2), s/veh	0.0	7.4	0.0	0.0	199.1	0.0				0.9	0.0	167.0
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/ln	0.0	30.5	0.0	0.0	74.9	0.0				5.0	0.0	35.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.2	0.0	0.0	211.9	0.0				40.0	0.0	218.2
LnGrp LOS	A	C		A	F					D	A	F
Approach Vol, veh/h		2853	A		3042	A					1486	
Approach Delay, s/veh		33.2			211.9						176.6	
Approach LOS		C			F						F	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		98.0		52.0		98.0						
Change Period (Y+Rc), s		4.5		4.5		4.5						
Max Green Setting (Gmax), s		93.5		47.5		93.5						
Max Q Clear Time (g_c+I1), s		82.2		49.5		95.5						
Green Ext Time (p_c), s		10.7		0.0		0.0						

Intersection Summary	
HCM 6th Ctrl Delay	135.7
HCM 6th LOS	F

Notes

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	266	336	20	30	50
Future Vol, veh/h	70	266	336	20	30	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	-	-	25
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	74	280	354	21	32	53

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	761	32	85	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	729	-	-	-	-	-
Critical Hdwy	6.45	6.25	4.15	-	-	-
Critical Hdwy Stg 1	5.45	-	-	-	-	-
Critical Hdwy Stg 2	5.45	-	-	-	-	-
Follow-up Hdwy	3.545	3.345	2.245	-	-	-
Pot Cap-1 Maneuver	369	1033	1493	-	-	-
Stage 1	983	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	280	1033	1493	-	-	-
Mov Cap-2 Maneuver	280	-	-	-	-	-
Stage 1	747	-	-	-	-	-
Stage 2	472	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	7.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1493	-	280	1033	-	-
HCM Lane V/C Ratio	0.237	-	0.263	0.271	-	-
HCM Control Delay (s)	8.2	0	22.4	9.8	-	-
HCM Lane LOS	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.9	-	1	1.1	-	-

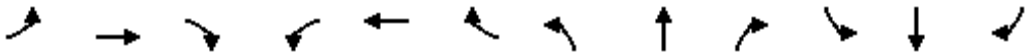
Intersection	
Int Delay, s/veh	7.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	22	10	0	285	0
Future Vol, veh/h	0	22	10	0	285	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	25	-	25	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	8	8	8	8	8	8
Mvmt Flow	0	23	11	0	300	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	611	11	0	0	11	0
Stage 1	11	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Critical Hdwy	6.48	6.28	-	-	4.18	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	-	-	2.272	-
Pot Cap-1 Maneuver	447	1053	-	-	1570	-
Stage 1	997	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	362	1053	-	-	1570	-
Mov Cap-2 Maneuver	362	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	434	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	7.8
HCM LOS	A		

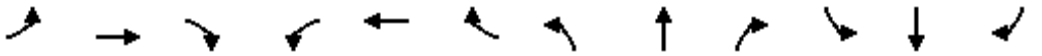
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	1053	1570	-
HCM Lane V/C Ratio	-	-	-	0.022	0.191	-
HCM Control Delay (s)	-	-	0	8.5	7.8	0
HCM Lane LOS	-	-	A	A	A	A
HCM 95th %tile Q(veh)	-	-	-	0.1	0.7	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	186	0	80	424	380	0	0	120	110
Future Volume (vph)	0	0	0	186	0	80	424	380	0	0	120	110
Confl. Peds. (#/hr)												2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	196	84	446	400	0	0	126	116
v/c Ratio					0.62	0.23	0.96	0.33			0.21	0.20
Control Delay					34.2	6.4	60.8	4.9			19.2	5.4
Queue Delay					0.0	0.0	0.0	0.3			0.0	0.0
Total Delay					34.2	6.4	60.8	5.2			19.2	5.4
Queue Length 50th (ft)					78	0	212	18			38	0
Queue Length 95th (ft)					129	27	#354	94			84	35
Internal Link Dist (ft)		1133			1101			260			945	
Turn Bay Length (ft)						350						350
Base Capacity (vph)					429	454	465	1199			596	571
Starvation Cap Reductn					0	0	0	300			0	0
Spillback Cap Reductn					0	0	0	0			0	0
Storage Cap Reductn					0	0	0	0			0	0
Reduced v/c Ratio					0.46	0.19	0.96	0.44			0.21	0.20

Intersection Summary

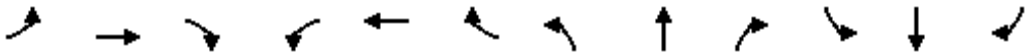
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	186	0	80	424	380	0	0	120	110
Future Volume (veh/h)	0	0	0	186	0	80	424	380	0	0	120	110
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1781	1781	1781	1781	1781	0	0	1781	1781
Adj Flow Rate, veh/h				196	0	12	446	400	0	0	126	35
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				8	8	8	8	8	0	0	8	8
Cap, veh/h				249	0	221	660	1291	0	0	484	408
Arrive On Green				0.15	0.00	0.15	0.52	0.96	0.00	0.00	0.27	0.27
Sat Flow, veh/h				1697	0	1510	1697	1781	0	0	1781	1504
Grp Volume(v), veh/h				196	0	12	446	400	0	0	126	35
Grp Sat Flow(s),veh/h/ln				1697	0	1510	1697	1781	0	0	1781	1504
Q Serve(g_s), s				7.8	0.0	0.5	13.6	0.8	0.0	0.0	3.9	1.2
Cycle Q Clear(g_c), s				7.8	0.0	0.5	13.6	0.8	0.0	0.0	3.9	1.2
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				249	0	221	660	1291	0	0	484	408
V/C Ratio(X)				0.79	0.00	0.05	0.68	0.31	0.00	0.00	0.26	0.09
Avail Cap(c_a), veh/h				436	0	388	660	1291	0	0	484	408
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.95	0.95	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				28.8	0.0	25.7	13.6	0.4	0.0	0.0	20.0	19.0
Incr Delay (d2), s/veh				5.5	0.0	0.1	2.6	0.6	0.0	0.0	1.3	0.4
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/ln				3.4	0.0	0.2	4.3	0.3	0.0	0.0	1.6	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				34.3	0.0	25.8	16.2	1.0	0.0	0.0	21.3	19.4
LnGrp LOS				C	A	C	B	A	A	A	C	B
Approach Vol, veh/h					208			846			161	
Approach Delay, s/veh					33.9			9.0			20.9	
Approach LOS					C			A			C	

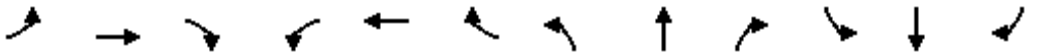
Timer - Assigned Phs	2		5	6		8						
Phs Duration (G+Y+Rc), s	55.2		31.7	23.5		14.8						
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5						
Max Green Setting (Gmax), s	43.0		19.5	19.0		18.0						
Max Q Clear Time (g_c+I1), s	2.8		15.6	5.9		9.8						
Green Ext Time (p_c), s	2.5		0.6	0.5		0.6						

Intersection Summary		
HCM 6th Ctrl Delay		14.8
HCM 6th LOS		B



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	300	0	354	0	0	0	0	504	116	70	236	0
Future Volume (vph)	300	0	354	0	0	0	0	504	116	70	236	0
Confl. Peds. (#/hr)									2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	316	373	0	0	0	0	531	122	74	248	0
v/c Ratio		0.70	0.55					0.35	0.17	0.41	0.24	
Control Delay		30.6	5.5					15.5	4.2	52.6	1.0	
Queue Delay		0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay		30.6	5.5					15.5	4.2	52.6	1.0	
Queue Length 50th (ft)		119	0					83	0	36	1	
Queue Length 95th (ft)		181	52					133	31	77	2	
Internal Link Dist (ft)		966			991			741			260	
Turn Bay Length (ft)			400						350			
Base Capacity (vph)		584	765					1521	731	192	1053	
Starvation Cap Reductn		0	0					0	0	0	0	
Spillback Cap Reductn		0	0					93	0	0	0	
Storage Cap Reductn		0	0					0	0	0	0	
Reduced v/c Ratio		0.54	0.49					0.37	0.17	0.39	0.24	

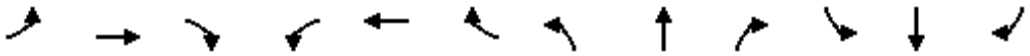
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	0	354	0	0	0	0	504	116	70	236	0
Future Volume (veh/h)	300	0	354	0	0	0	0	504	116	70	236	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1781	1781	1781				0	1781	1781	1781	1781	0
Adj Flow Rate, veh/h	316	0	88				0	531	50	74	248	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	8	8	8				0	8	8	8	8	0
Cap, veh/h	386	0	343				0	1778	791	93	1147	0
Arrive On Green	0.23	0.00	0.23				0.00	0.53	0.53	0.11	1.00	0.00
Sat Flow, veh/h	1697	0	1510				0	3474	1507	1697	1781	0
Grp Volume(v), veh/h	316	0	88				0	531	50	74	248	0
Grp Sat Flow(s),veh/h/ln	1697	0	1510				0	1692	1507	1697	1781	0
Q Serve(g_s), s	12.4	0.0	3.3				0.0	6.2	1.1	3.0	0.0	0.0
Cycle Q Clear(g_c), s	12.4	0.0	3.3				0.0	6.2	1.1	3.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	386	0	343				0	1778	791	93	1147	0
V/C Ratio(X)	0.82	0.00	0.26				0.00	0.30	0.06	0.80	0.22	0.00
Avail Cap(c_a), veh/h	594	0	528				0	1778	791	182	1147	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.99	0.99	0.00
Uniform Delay (d), s/veh	25.7	0.0	22.2				0.0	9.4	8.2	30.8	0.0	0.0
Incr Delay (d2), s/veh	5.3	0.0	0.4				0.0	0.4	0.2	14.3	0.4	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/ln	5.2	0.0	1.1				0.0	2.0	0.3	1.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	0.0	22.6				0.0	9.8	8.3	45.1	0.4	0.0
LnGrp LOS	C	A	C				A	A	A	D	A	A
Approach Vol, veh/h		404						581			322	
Approach Delay, s/veh		29.1						9.7			10.7	
Approach LOS		C						A			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	8.3	41.3		20.4		49.6
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	7.5	24.5		24.5		36.5
Max Q Clear Time (g_c+I1), s	5.0	8.2		14.4		2.0
Green Ext Time (p_c), s	0.0	3.2		1.5		1.4

Intersection Summary			
HCM 6th Ctrl Delay			15.9
HCM 6th LOS			B



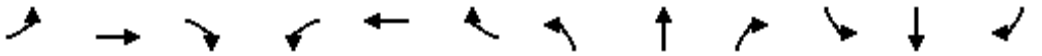
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	0	0	709	0	1560	0	840	640	0	1700	640
Future Volume (vph)	0	0	0	709	0	1560	0	840	640	0	1700	640
Confl. Peds. (#/hr)									2			2
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)				50%								
Lane Group Flow (vph)	0	0	0	373	373	1642	0	884	674	0	1789	674
v/c Ratio				0.46	0.46	1.17		0.45	0.49		0.90	0.67
Control Delay				18.2	18.2	108.6		3.1	17.7		35.7	5.4
Queue Delay				0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay				18.2	18.2	108.6		3.1	17.7		35.7	5.4
Queue Length 50th (ft)				153	153	~696		41	389		383	0
Queue Length 95th (ft)				235	235	#847		m45	m417		#456	74
Internal Link Dist (ft)		1812			1566			1047			868	
Turn Bay Length (ft)						450			300			450
Base Capacity (vph)				817	817	1404		1981	1378		1981	1008
Starvation Cap Reductn				0	0	0		0	0		0	0
Spillback Cap Reductn				0	0	0		0	0		0	0
Storage Cap Reductn				0	0	0		0	0		0	0
Reduced v/c Ratio				0.46	0.46	1.17		0.45	0.49		0.90	0.67

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



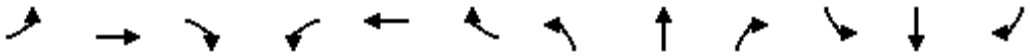
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	709	0	1560	0	840	640	0	1700	640
Future Volume (veh/h)	0	0	0	709	0	1560	0	840	640	0	1700	640
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1811	1811	1811	0	1811	1811	0	1811	1811
Adj Flow Rate, veh/h				746	0	1589	0	884	674	0	1789	252
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				6	6	6	0	6	6	0	6	6
Cap, veh/h				1742	0	1550	0	2002	1395	0	2002	621
Arrive On Green				0.50	0.00	0.50	0.00	0.41	0.41	0.00	0.41	0.41
Sat Flow, veh/h				3450	0	3070	0	5107	1531	0	5107	1533
Grp Volume(v), veh/h				746	0	1589	0	884	674	0	1789	252
Grp Sat Flow(s),veh/h/ln				1725	0	1535	0	1648	1531	0	1648	1533
Q Serve(g_s), s				13.7	0.0	50.5	0.0	13.0	7.1	0.0	33.7	11.7
Cycle Q Clear(g_c), s				13.7	0.0	50.5	0.0	13.0	7.1	0.0	33.7	11.7
Prop In Lane				1.00		1.00	0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h				1742	0	1550	0	2002	1395	0	2002	621
V/C Ratio(X)				0.43	0.00	1.03	0.00	0.44	0.48	0.00	0.89	0.41
Avail Cap(c_a), veh/h				1742	0	1550	0	2002	1395	0	2002	621
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	0.00	1.00	0.00	0.31	0.31	0.00	1.00	1.00
Uniform Delay (d), s/veh				15.6	0.0	24.8	0.0	21.6	0.7	0.0	27.7	21.2
Incr Delay (d2), s/veh				0.2	0.0	29.5	0.0	0.2	0.4	0.0	6.6	2.0
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/ln				5.1	0.0	23.0	0.0	4.8	0.1	0.0	13.5	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				15.8	0.0	54.2	0.0	21.8	1.1	0.0	34.4	23.2
LnGrp LOS				B	A	F	A	C	A	A	C	C
Approach Vol, veh/h					2335			1558			2041	
Approach Delay, s/veh					41.9			12.8			33.0	
Approach LOS					D			B			C	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	45.0		45.0		55.0			
Change Period (Y+Rc), s	4.5		4.5		4.5			
Max Green Setting (Gmax), s	40.5		40.5		50.5			
Max Q Clear Time (g_c+I1), s	15.0		35.7		52.5			
Green Ext Time (p_c), s	9.9		4.1		0.0			

Intersection Summary		
HCM 6th Ctrl Delay	31.2	
HCM 6th LOS	C	

Notes

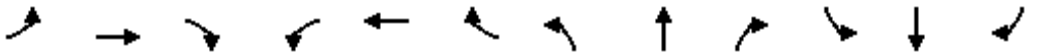
User approved volume balancing among the lanes for turning movement.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	540	0	591	0	0	0	0	940	610	1420	989	0
Future Volume (vph)	540	0	591	0	0	0	0	940	610	1420	989	0
Confl. Peds. (#/hr)			2						2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
Shared Lane Traffic (%)	15%		25%									
Lane Group Flow (vph)	483	241	466	0	0	0	0	989	642	1495	1041	0
v/c Ratio	0.82	0.78	0.61					0.94	0.63	0.99	0.43	
Control Delay	51.1	43.6	17.1					56.0	8.0	18.3	3.8	
Queue Delay	0.0	0.0	0.0					0.0	0.0	0.0	0.0	
Total Delay	51.1	43.6	17.1					56.0	8.0	18.3	3.8	
Queue Length 50th (ft)	162	119	52					228	19	105	66	
Queue Length 95th (ft)	#240	#270	107					#314	74	m#614	m77	
Internal Link Dist (ft)		1475			1882			773			1047	
Turn Bay Length (ft)	600		600						700	550		
Base Capacity (vph)	604	314	768					1051	1014	1515	2449	
Starvation Cap Reductn	0	0	0					0	0	0	0	
Spillback Cap Reductn	0	0	0					0	0	0	0	
Storage Cap Reductn	0	0	0					0	0	0	0	
Reduced v/c Ratio	0.80	0.77	0.61					0.94	0.63	0.99	0.43	

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	540	0	591	0	0	0	0	940	610	1420	989	0
Future Volume (veh/h)	540	0	591	0	0	0	0	940	610	1420	989	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811				0	1811	1811	1811	1811	0
Adj Flow Rate, veh/h	625	0	242				0	989	166	1495	1041	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	6	6				0	6	6	6	6	0
Cap, veh/h	803	0	474				0	1270	691	1516	2597	0
Arrive On Green	0.16	0.00	0.16				0.00	0.26	0.26	0.76	1.00	0.00
Sat Flow, veh/h	5175	0	3058				0	5107	2691	3346	3532	0
Grp Volume(v), veh/h	625	0	242				0	989	166	1495	1041	0
Grp Sat Flow(s),veh/h/ln	1725	0	1529				0	1648	1345	1673	1721	0
Q Serve(g_s), s	11.6	0.0	7.3				0.0	18.6	4.9	42.8	0.0	0.0
Cycle Q Clear(g_c), s	11.6	0.0	7.3				0.0	18.6	4.9	42.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	803	0	474				0	1270	691	1516	2597	0
V/C Ratio(X)	0.78	0.00	0.51				0.00	0.78	0.24	0.99	0.40	0.00
Avail Cap(c_a), veh/h	1009	0	596				0	1270	691	1523	2597	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.67	1.67	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	1.00	0.45	0.45	0.00
Uniform Delay (d), s/veh	40.6	0.0	38.8				0.0	34.5	29.4	11.9	0.0	0.0
Incr Delay (d2), s/veh	3.1	0.0	0.8				0.0	4.8	0.8	12.4	0.2	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/ln	5.0	0.0	2.7				0.0	7.7	1.6	7.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	0.0	39.6				0.0	39.3	30.3	24.3	0.2	0.0
LnGrp LOS	D	A	D				A	D	C	C	A	A
Approach Vol, veh/h		867						1155			2536	
Approach Delay, s/veh		42.5						38.0			14.4	
Approach LOS		D						D			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	49.8	30.2		20.0		80.0
Change Period (Y+Rc), s	4.5	4.5		4.5		4.5
Max Green Setting (Gmax), s	45.5	21.5		19.5		71.5
Max Q Clear Time (g_c+I1), s	44.8	20.6		13.6		2.0
Green Ext Time (p_c), s	0.5	0.6		1.9		9.2

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

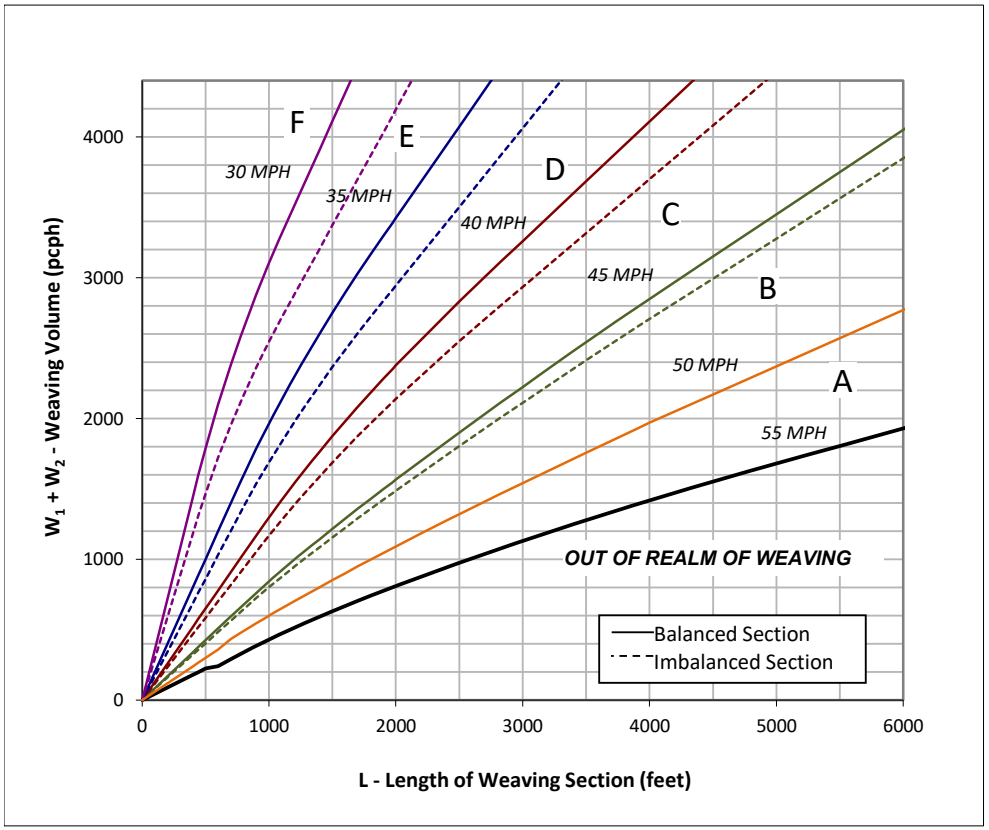
User approved volume balancing among the lanes for turning movement.

Leisch Method for Weaving Analysis

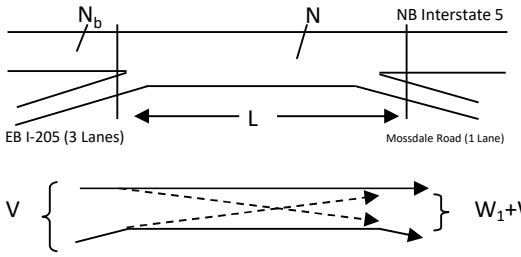
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	2,000

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - AM
Freeway	NB Interstate 5
On-ramp	EB I-205 (3 Lanes)
Off-ramp	Mossdale Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,082	6,743	39
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,699	7,552	40



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **22.7**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,630**
6. Level of Service (LOS) **D**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

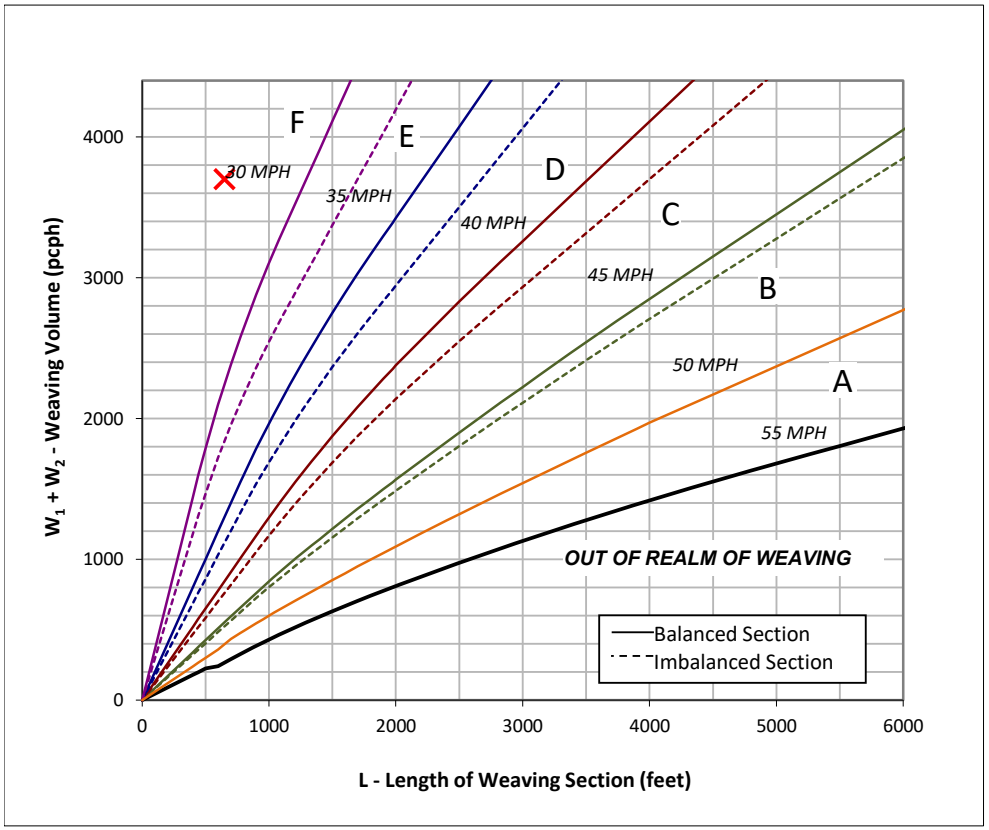
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

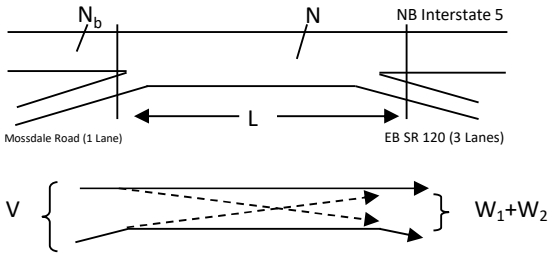
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	650

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - AM
Freeway	NB Interstate 5
On-ramp	Mossdale Road (1 Lane)
Off-ramp	EB SR 120 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	8,983	68	3,242
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.6	2.0	2.0
Volume (pcph)	9,611	70	3,631



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **22.3**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,625**
6. Level of Service (LOS) **D**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

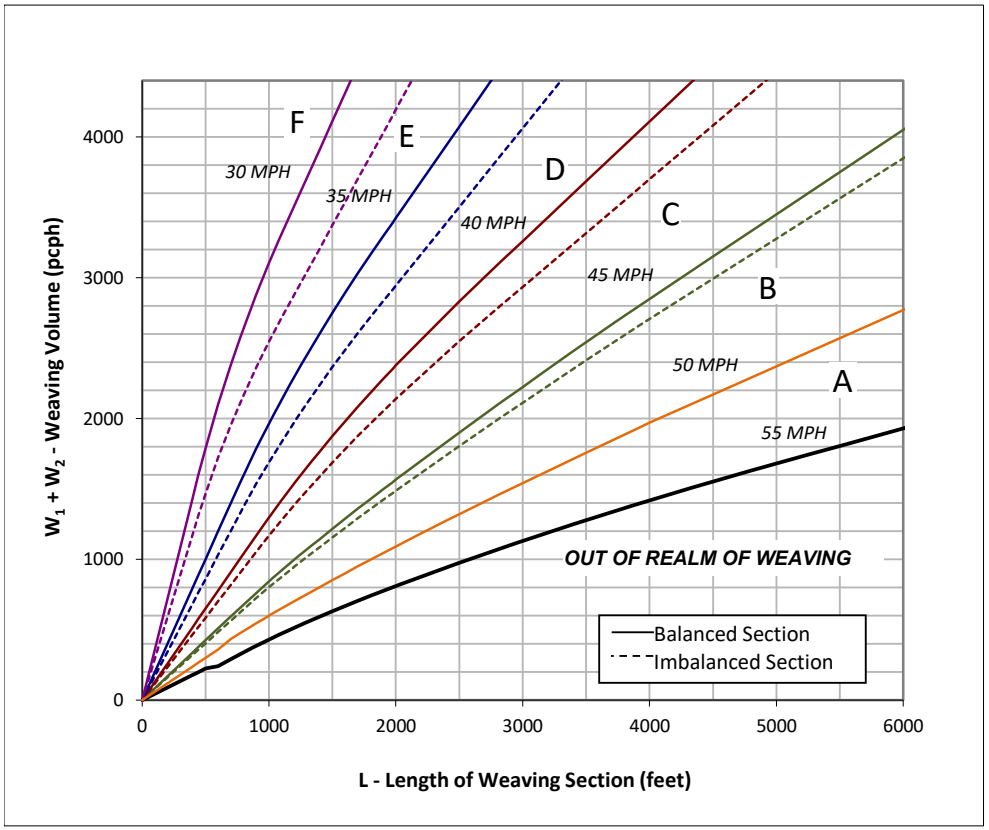
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

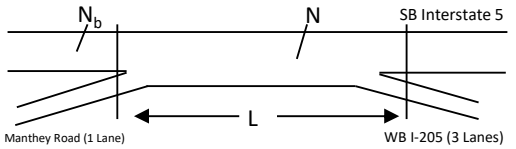
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	3,200

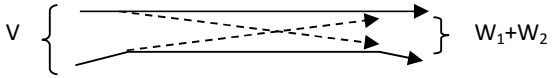
Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - AM
Freeway	SB Interstate 5
On-ramp	Manthey Road (1 Lane)
Off-ramp	WB I-205 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,823	19	8,240
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.4	2.0	2.0
Volume (pcph)	10,351	20	9,229



Figure





Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	26.6
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,732
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

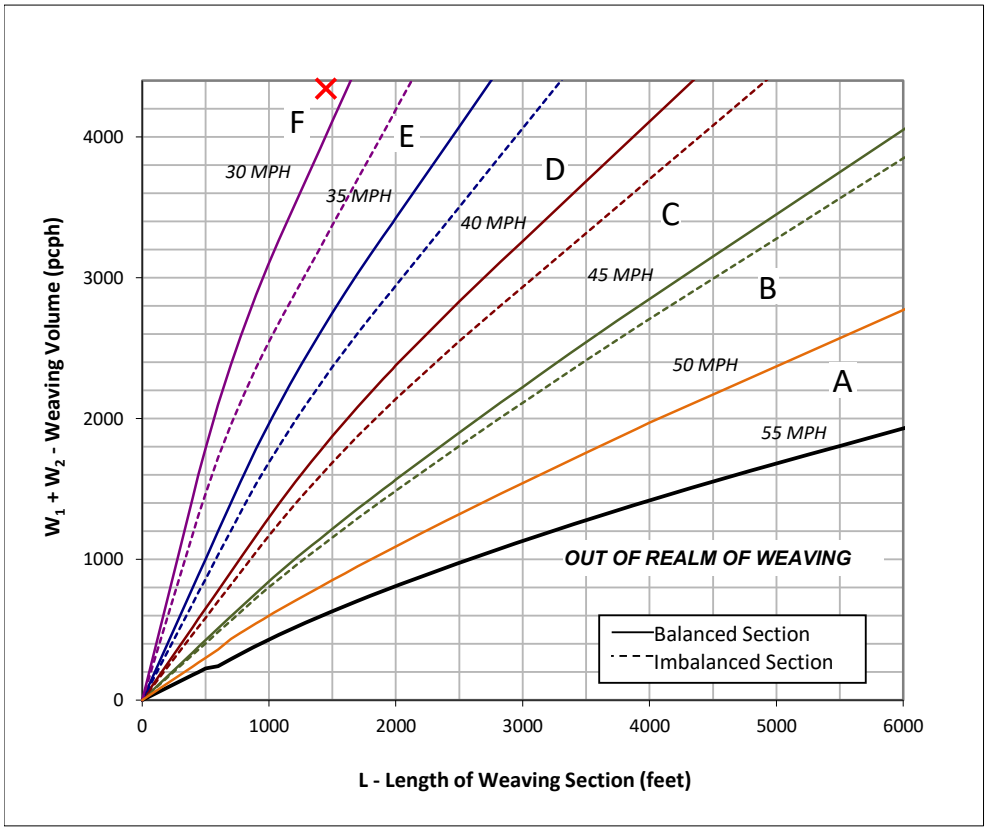
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

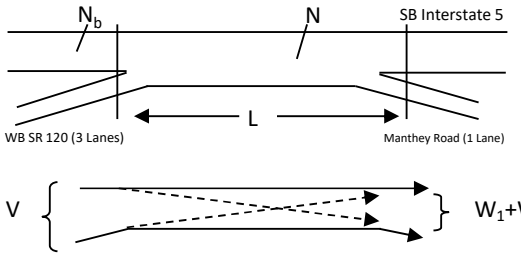
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	1,450

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - AM
Freeway	SB Interstate 5
On-ramp	WB SR 120 (3 Lanes)
Off-ramp	Manthey Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	10,053	3,647	252
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.4	2.0	2.0
Volume (pcph)	10,553	4,085	260



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	28.8
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,845
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

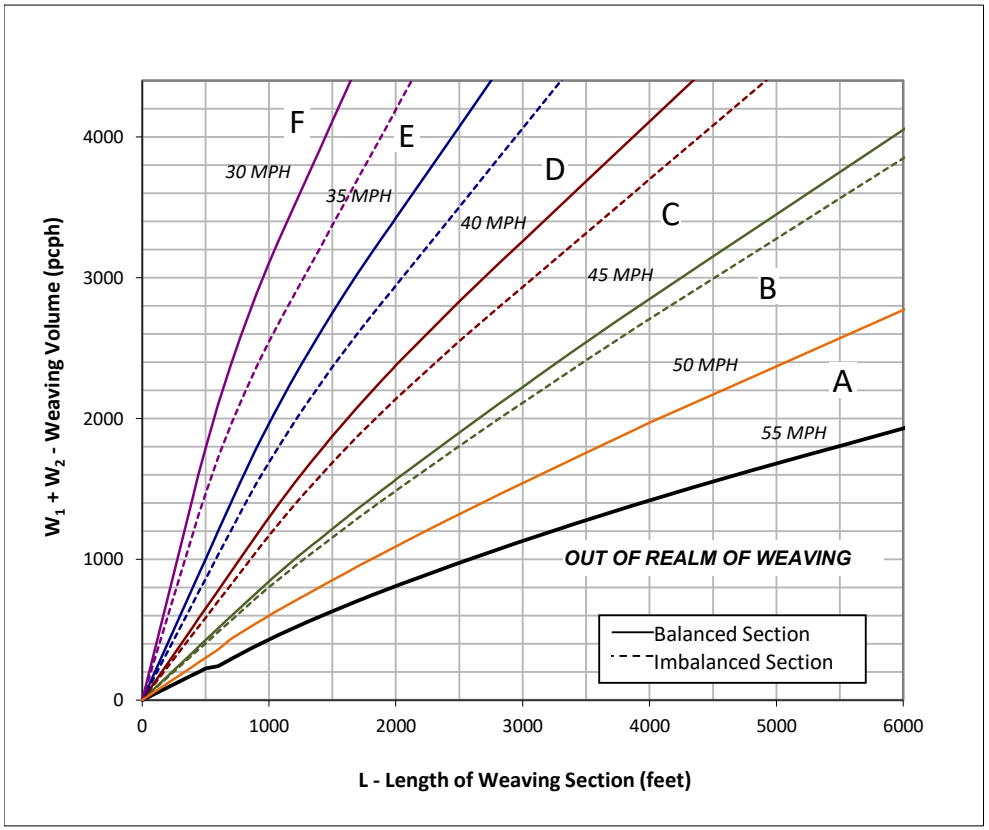
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

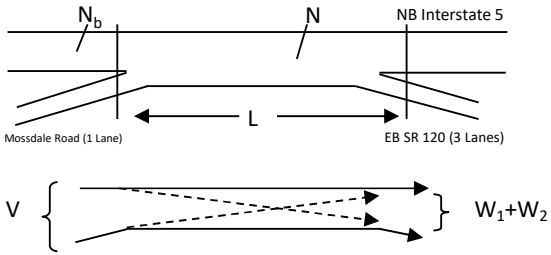
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	650

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - PM
Freeway	NB Interstate 5
On-ramp	Mossdale Road (1 Lane)
Off-ramp	EB SR 120 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	11,596	349	5,332
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.2	2.0	2.0
Volume (pcph)	11,911	359	5,972



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **8.4**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **2,105**
6. Level of Service (LOS) **F**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

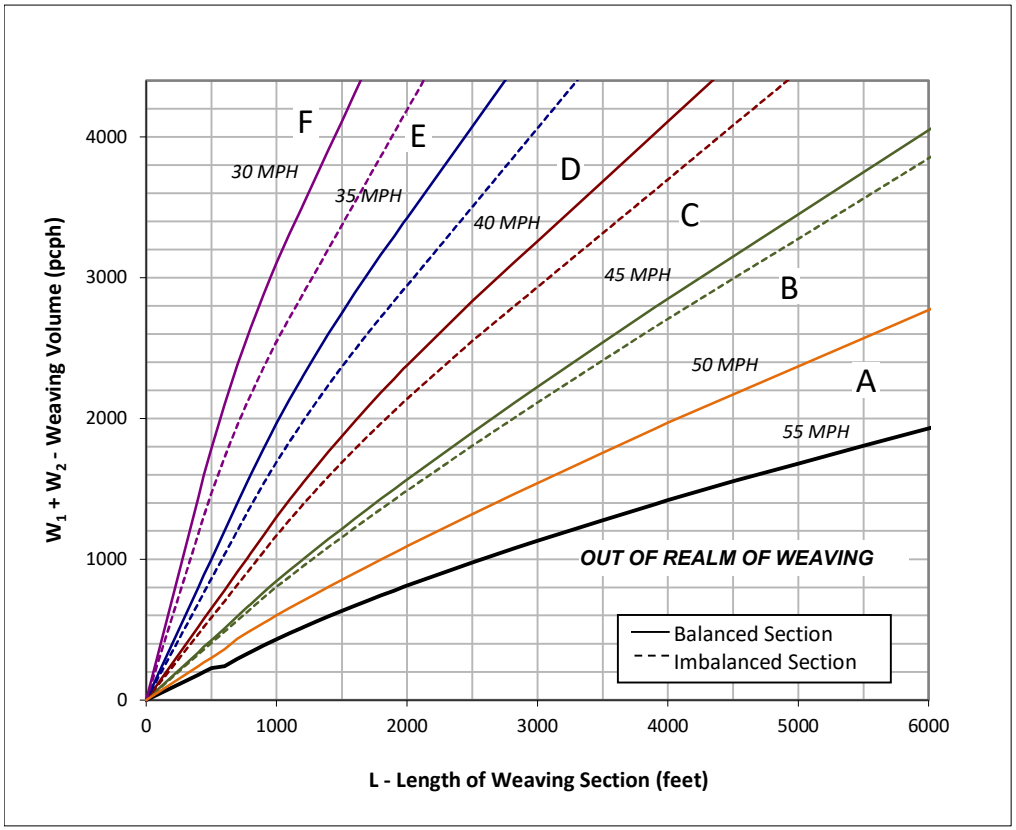
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

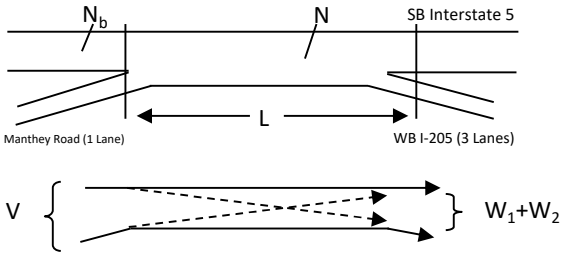
Data Input		
Number of Entering Mainline Lanes	N_b	5
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	3,200

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - PM
Freeway	SB Interstate 5
On-ramp	Manthey Road (1 Lane)
Off-ramp	WB I-205 (3 Lanes)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,553	20	6,965
Truck Percentage	12.0%	3.0%	12.0%
PCE for Trucks	1.5	2.0	2.0
Volume (pcph)	10,113	21	7,801



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	29.4
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,692
6. Level of Service (LOS)	E

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

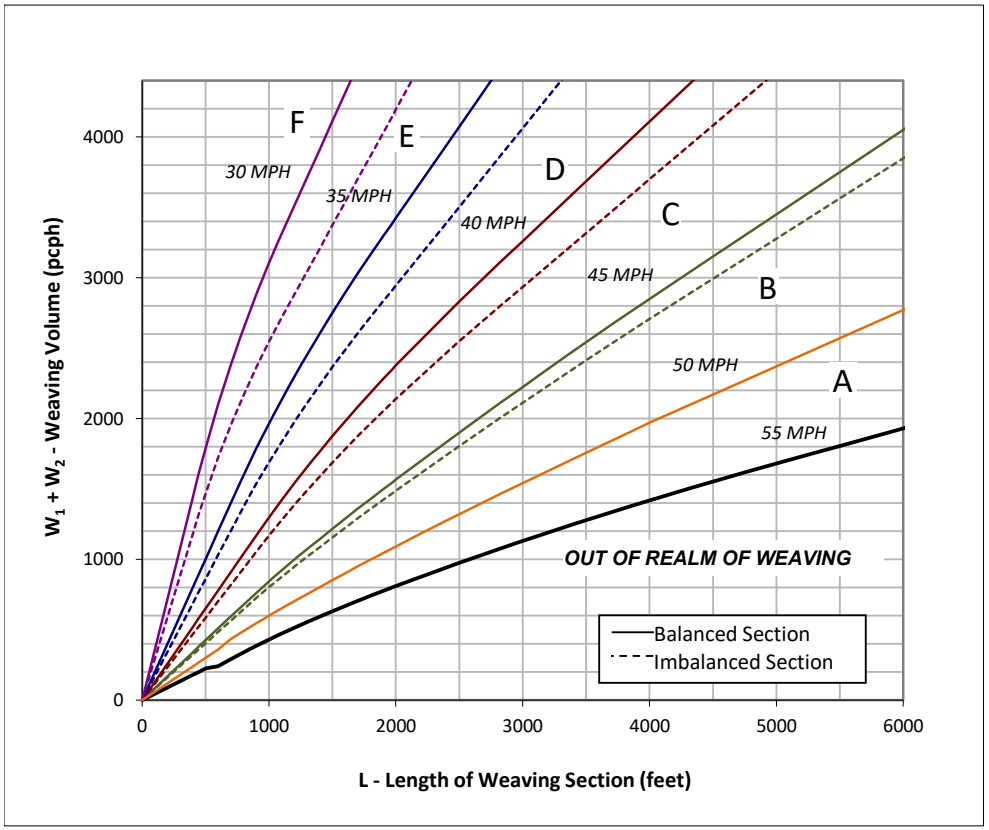
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

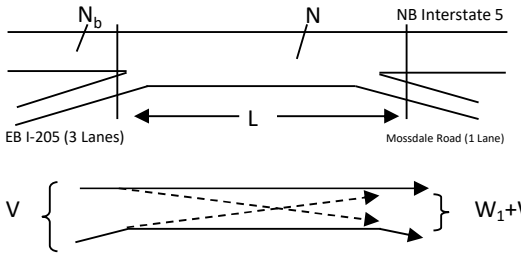
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	2,000

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - PM
Freeway	NB Interstate 5
On-ramp	EB I-205 (3 Lanes)
Off-ramp	Mossdale Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	11,440	7,982	66
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.2	2.0	2.0
Volume (pcph)	11,774	8,940	68



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)? **Y**

   If optional exit lane, then "Y". Otherwise "N".

2. In the chart to the left, which two speed curves is the red "x" between?

   30 MPH and **35 MPH**

   If left of the 30 MPH curve, LOS is F. Select "-".

   If below the 55 MPH curve, out of the realm of weaving.

3. Interpolated Weaving Speed (S_w, mph) **18.5**
4. Weaving Intensity Factor (k) **3.00**
5. Service Volume (SV, pcph)

   $SV = (1/N)*[V + (k - 1)*\min(W_1, W_2)]$ **1,985**
6. Level of Service (LOS) **E**

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

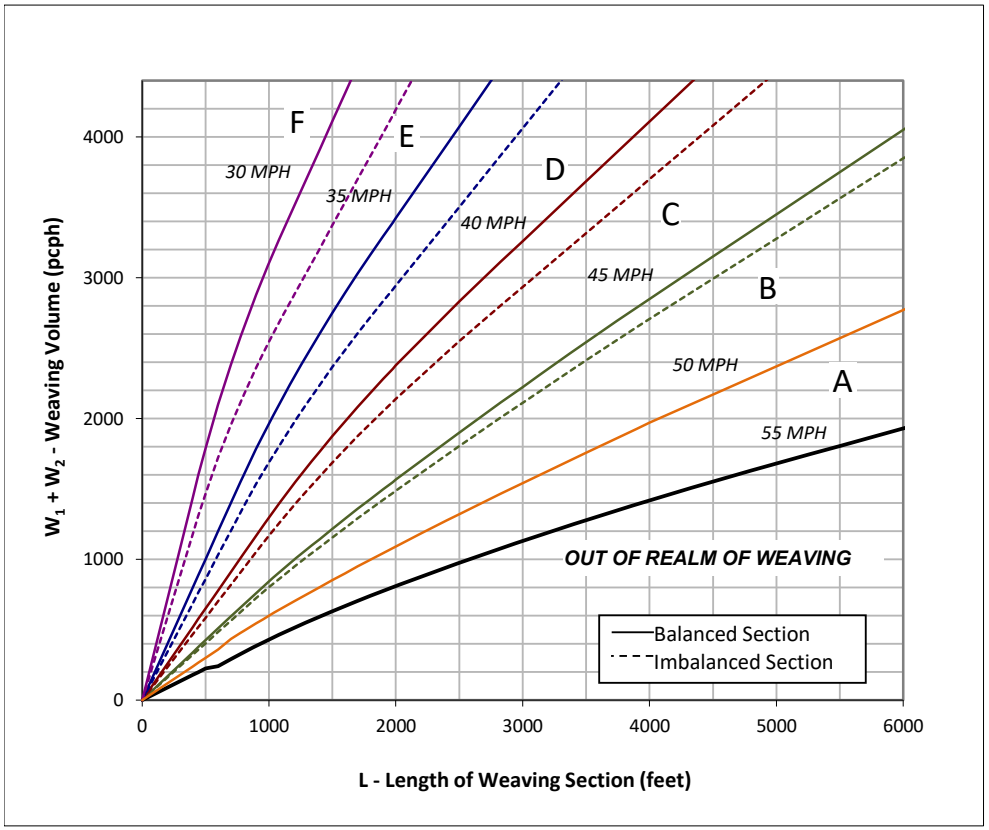
Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014

Leisch Method for Weaving Analysis

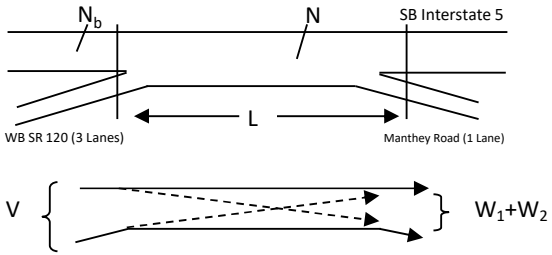
Data Input		
Number of Entering Mainline Lanes	N_b	3
Number of Lanes in Weaving Section	N	6
Length of Weaving Section (feet)	L	1,450

Project Information	
Project	River Islands SEIR
Scenario	Cumulative + Proposed - PM
Freeway	SB Interstate 5
On-ramp	WB SR 120 (3 Lanes)
Off-ramp	Manthey Road (1 Lane)

	Total Weaving Section (V)	On-ramp to Mainline (W_1)	Mainline to Off-ramp (W_2)
Volume (vph)*	9,307	3,951	6
Truck Percentage	12.0%	12.0%	3.0%
PCE for Trucks	1.5	2.0	2.0
Volume (pcph)	9,897	4,425	6



Figure



Capacity Analysis

1. Is the weaving section balanced (Y / N)?	Y
If optional exit lane, then "Y". Otherwise "N".	
2. In the chart to the left, which two speed curves is the red "x" between?	**30 MPH** and **35 MPH**
If left of the 30 MPH curve, LOS is F. Select "-".	
If below the 55 MPH curve, out of the realm of weaving.	
3. Interpolated Weaving Speed (S_w, mph)	28.4
4. Weaving Intensity Factor (k)	3.00
5. Service Volume (SV, pcph)	
SV = (1/N)*[V + (k - 1)*min(W_1, W_2)]	1,651
6. Level of Service (LOS)	D

The LOS in the chart above refers to the capacity of weaving traffic only; through and ramp to ramp traffic is not included.

* Note: **Do not adjust by a Peak Hour Factor (PHF).** The methodology incorporates the PHF in the Service Volume tables.

Sources: *Completion of Procedures for Analysis and Design of Traffic Weaving Sections* , Jack E. Leisch & Associates, September 1983 and *Highway Design Manual* , California Department of Transportation, 2014