
TECHNICAL APPENDIX

**LEVEL OF SERVICE
METHODS AND CRITERIA**

**Unsignalized Intersection
Level of Service Criteria**

Level of Service	Delay Range (sec)	Expected Delay to Minor Street Traffic
A	≤ 10	Little to No Delay
B	> 10 and ≤ 15	Short Traffic Delays
C	>15 and ≤ 25	Average Traffic Delays
D	>25 and ≤ 35	Long Traffic Delays
E	> 35 and ≤ 50	Very Long Traffic Delays
F	> 50	Stop-and-Go Condition Delays Generally Longer than Acceptable

**Unsignalized Intersections
Level of Service Descriptions**

LOS	General Description
A	<ul style="list-style-type: none"> • Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in the queue.
B	<ul style="list-style-type: none"> • Some drivers begin to consider the delay an inconvenience • Occasionally there is more than one vehicle in the queue.
C	<ul style="list-style-type: none"> • Many times there is more than one vehicle in the queue. • Most drivers feel restricted, but not objectionably so.
D	<ul style="list-style-type: none"> • Often there is more than one vehicle in the queue. • Drivers feel quite restricted.
E	<ul style="list-style-type: none"> • Represents conditions in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. • There is almost always more than one vehicle in the queue. • Drivers find the delays approaching intolerable levels.
F	<ul style="list-style-type: none"> • Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection

**Signalized Intersection
Level of Service Criteria**

Level of Service	Delay Range (sec)
A	≤ 10
B	> 10 and ≤ 20
C	>20 and ≤ 35
D	>35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

**Signalized Intersections
Level of Service Descriptions**

LOS	General Description
A	<ul style="list-style-type: none"> • Very low delay at intersection. • All signal cycles clear. • No vehicles wait through more than one signal cycle.
B	<ul style="list-style-type: none"> • Operating speeds beginning to be affected by other traffic. • Short traffic delays at intersections. • Higher average intersections delays resulting from more vehicles stopping.
C	<ul style="list-style-type: none"> • Operating speeds and maneuverability closely controlled by other traffic. • Higher delays at intersections than for LOS B due to a significant number of vehicles stopping. • Not all signal cycles clear the waiting vehicles.
D	<ul style="list-style-type: none"> • Tolerable operating speeds, but long traffic delays occur at intersections • The influence of congestion is noticeable. • Many vehicles stop and the proportion of vehicles not stopping declines. • The number of signal cycle failures, for which vehicles must wait through more than one signal cycle are noticeable.
E	<ul style="list-style-type: none"> • Speeds are restricted, very long traffic delays are experienced and traffic volumes are near capacity. • Traffic flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate. • Traffic signal cycle failures are frequent occurrences.
F	<ul style="list-style-type: none"> • Extreme delays resulting in long queues which may interfere with other traffic movements • Stoppages of long duration and speeds may drop to zero. • There may be frequent signal failures. • Vehicle arrival rates are greater than capacity. • Considered unacceptable by most drivers.

ACCIDENT DATA

PRIMARY TRAFFICWAY	INTERSECTING TRAFFICWAY	DATE	MOST SEVERE SOBRIETY TYPE	FIRST COLLISION TYPE	FIRST OBJECT STRUCK	TOTAL # INJURIES	ROADWAY SURFACE CONDITIONS
E 16TH AVE	S PINES RD	5/5/2013	Had NOT Been Drinking	Entering at angle		3	Dry
E 16TH AVE	S PINES RD	12/31/2012	Had NOT Been Drinking	Entering at angle		0	Dry
E 16TH AVE	S PINES RD	6/5/2012	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
E 16TH AVE	S PINES RD	4/10/2012	Had NOT Been Drinking	Entering at angle		1	Dry
E 16TH AVE	S PINES RD	11/21/2011	Had NOT Been Drinking	Entering at angle		0	Wet
E 16TH AVE	S PINES RD	3/7/2011	Had NOT Been Drinking	Entering at angle		0	Dry
E 16TH AVE	S PINES RD	2/22/2011	Had NOT Been Drinking	Entering at angle		0	Wet
E 32ND AVE	S BOWDISH RD	2/14/2012	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Wet
E 32ND AVE	S BOWDISH RD	12/9/2011	Had NOT Been Drinking	From same direction - both going straight - both moving - rear-end		0	Unknown
E 32ND AVE	S BOWDISH RD	10/19/2011	Had NOT Been Drinking	From opposite direction - one left turn - one straight		0	Dry
E 32ND AVE	S BOWDISH RD	2/24/2011	Had NOT Been Drinking	From opposite direction - one stopped - head-on		1	Ice
E 32ND AVE	S PINES RD	11/26/2013	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
E 32ND AVE	S PINES RD	5/24/2013	Had NOT Been Drinking	From opposite direction - one left turn - one straight		0	Dry
E 32ND AVE	S PINES RD	11/10/2012	HBD - Ability Impaired	From opposite direction - one left turn - one straight		0	Dry
E 32ND AVE	S PINES RD	11/9/2012	Had NOT Been Drinking	From opposite direction - one left turn - one straight		0	Wet
E 32ND AVE	S PINES RD	5/24/2012	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		2	Dry
E 32ND AVE	S PINES RD	1/1/2011	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Ice
E 32ND AVE	S UNIVERSITY RD	5/8/2012	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
E 32ND AVE	S UNIVERSITY RD	11/7/2011	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
E 32ND AVE	SR 27	12/23/2011	Had NOT Been Drinking	Entering at angle		0	Dry
S BOWDISH RD	E 32ND AVE	6/28/2012	Had NOT Been Drinking	From opposite direction - one left turn - one straight		0	Dry
S BOWDISH RD	E 32ND AVE	8/21/2011	Had NOT Been Drinking	Entering at angle		2	Dry
S BOWDISH RD	E 32ND AVE	4/22/2011	Had NOT Been Drinking	Entering at angle		0	Dry
S BOWDISH RD	S DISHMAN MICA RD	10/7/2013	Had NOT Been Drinking	Entering at angle		0	Dry
S BOWDISH RD	S DISHMAN MICA RD	9/11/2013	Had NOT Been Drinking	From opposite direction - one left turn - one straight		1	Dry
S DISHMAN MICA RD	E THORPE RD	9/25/2011	Had NOT Been Drinking	From same direction - both going straight - both moving - rear-end		0	Dry
S DISHMAN MICA RD	S BOWDISH RD	12/23/2011	HBD - Ability Impaired	From same direction - both going straight - one stopped - rear-end		2	Dry
S DISHMAN MICA RD	S SCHAFER RD	3/22/2013	Had NOT Been Drinking	Entering at angle		1	Dry
S DISHMAN MICA RD	S SCHAFER RD	8/12/2012	HBD - Ability Impaired	Entering at angle		0	Dry
S DISHMAN MICA RD	S SCHAFER RD	7/13/2012	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end	Signal Pole	0	Dry
S DISHMAN MICA RD	S UNIVERSITY RD	11/28/2013	Had NOT Been Drinking	Entering at angle		2	Dry
S MADISON RD	S PINES RD	12/9/2012	Unknown	Fixed object	Fence	0	Dry
S MADISON RD	S PINES RD	7/13/2011	Unknown	Fixed object	Fence	0	Dry
S PINES RD	E 16TH AVE	8/13/2013	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
S PINES RD	E 16TH AVE	4/5/2013	Had NOT Been Drinking	Entering at angle		0	Dry
S PINES RD	E 16TH AVE	12/15/2012	HBD - Ability Impaired	Fixed object	Retaining Wall (concrete, rock, brick, etc.)	0	Wet
S PINES RD	E 16TH AVE	7/3/2012	Had NOT Been Drinking	Vehicle turning right hits pedestrian		1	Dry
S PINES RD	E 16TH AVE	3/25/2012	Had NOT Been Drinking	Entering at angle		1	Dry
S PINES RD	E 16TH AVE	8/28/2011	Had NOT Been Drinking	Entering at angle		0	Dry
S PINES RD	E 16TH AVE	11/21/2013	Had NOT Been Drinking	Entering at angle		0	Dry
SR 27	S SCHAFER RD	6/1/2013	HBD - Ability Impaired	Entering at angle		1	Dry
SR 27	S SCHAFER RD	7/6/2012	Had NOT Been Drinking	Entering at angle		1	Dry
SR 27	S SCHAFER RD	5/16/2012	Had NOT Been Drinking	Entering at angle		0	Wet
SR 27	S SCHAFER RD	2/7/2012	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
SR 27	S SCHAFER RD	10/4/2011	HBD - Ability Impaired	From same direction - both going straight - one stopped - rear-end		0	Dry
SR 27	S SCHAFER RD	10/3/2011	Had NOT Been Drinking	Entering at angle		1	Dry
SR 27	S SCHAFER RD	6/28/2011	Had NOT Been Drinking	From same direction - both going straight - one stopped - rear-end		0	Dry
SR 27	S SCHAFER RD	5/18/2011	Had NOT Been Drinking	Entering at angle		0	Dry

MV DRIVER MISC ACTION 1 (UNIT 1)

MV DRIVER MISC ACTION 2 (UNIT 1)

MV DRIVER MISC ACTION 1 (UNIT 2)

MV DRIVER MISC ACTION 1 (UNIT 3)

Proceeded after stopping for flashing red light or stop sign
Turn after stopping at red flashing light or stop sign

Forced/pushed off road by other vehicle (contact must be made)

Stopped in line of traffic

Stopped in line of traffic

Proceeded after stopping for flashing red light or stop sign
Proceeded after stopping for flashing red light or stop sign
Turn after stopping at red flashing light or stop sign
Proceeded after stopping for flashing red light or stop sign

Out of control (ice, turned to fast, etc.) or sliding (not skidding)

Stopped in line of traffic

Out of control (ice, turned to fast, etc.) or sliding (not skidding)

Stopped for another vehicle
Stopped for pedestrian / pedalcyclist

Turn after stopping at red flashing light or stop sign

Hit and run

Out of control (ice, turned to fast, etc.) or sliding (not skidding)

Hit and run
Hit and run

Turn after stopping at red flashing light or stop sign
Proceeded after stopping for flashing red light or stop sign
Proceeded after stopping for flashing red light or stop sign

View obstructed by other vehicle or object

Stopped for another vehicle

Proceeded after stopping for flashing red light or stop sign

LIGHTING CONDITIONS		VEHICLE 1 TYPE	VEHICLE 2 TYPE	MV DRIVER CONT CIRC 1 (UNIT 1)	MV DRIVER CONT CIRC 2 (UNIT 1)
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Driver Interacting with Passengers, Anim		Did Not Grant RW to Vehicle
Dark-Street Lights On	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Follow Too Closely		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Passenger Car	Did Not Grant RW to Vehicle		
Dark-No Street Lights	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Bus or Motor Stage	Did Not Grant RW to Vehicle		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Exceeding Reas. Safe Speed		Apparently Fatigued
Dark-Street Lights On	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Did Not Grant RW to Vehicle		
Dark-Street Lights On	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Exceeding Reas. Safe Speed		
Dark-Street Lights On	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Driver Eating or Drinking		Follow Too Closely
Dark-Street Lights On	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Dark-Street Lights On	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Under Influence of Alcohol		Did Not Grant RW to Vehicle
Dark-Street Lights On	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Dark-Street Lights On	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Driver Adjusting Audio or Entertainment		Follow Too Closely
Dark-Street Lights On	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Exceeding Reas. Safe Speed		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Follow Too Closely		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Follow Too Closely		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Disregard Stop and Go Light		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Disregard Stop and Go Light		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Did Not Grant RW to Vehicle		
Dark-No Street Lights	Passenger Car	Not Stated	Did Not Grant RW to Vehicle		Inattention
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	None		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Dark-Street Lights On	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Daylight	Passenger Car	Passenger Car	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Passenger Car	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Passenger Car	Fail to Yield Row to Pedestrian		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		Exceeding Reas. Safe Speed
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Inattention		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Over Center Line		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Over Center Line		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Follow Too Closely		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Exceeding Reas. Safe Speed		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Disregard Stop and Go Light		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Pickup, Panel Truck or Vanette under 10,000 lb	Under Influence of Alcohol		
Daylight	Pickup, Panel Truck or Vanette under 10,000 lb	Passenger Car	Disregard Stop and Go Light		
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Follow Too Closely		Follow Too Closely
Daylight	Passenger Car	Pickup, Panel Truck or Vanette under 10,000 lb	Did Not Grant RW to Vehicle		

RAW TRAFFIC COUNTS

PROJECT: Painted Hills GC
JOB NO. 13-1166

Whipple Consulting Engineers, Inc
TRAFFIC COUNT REDUCTION WORKSHEET

INTERSECTION: 32nd & University

DATE OF COUNT: 1/21/2015
Counter Analyst
JDK BNG

AM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @																				
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15									
Eastbound	Left			1	1	1	1	1														
	Through			34	31	25	21	14	13	26	22	3										
	Right			0	0	2	1	2	3	1	2											
	App. Total	0	0	34	32	27	24	15	16	28	24	3	0	0	0							
Pct Trucks				0.029	0	0	0	0.04	0	0	0.034	0.111										
Westbound	Left			4	3	1	9	17	6	12	2	17	3									
	Through			81	85	121	101	68	48	50	1	44										
	Right			11	1	37	1	21	8	11	2	10	1									
	App. Total	0	0	96	2	114	6	106	62	73	5	71	4	0	0							
Pct Trucks				0.02	0.05	0.006	0.007	0.009	0.016	0.064	0.053											
Northbound	Left			6	6	3	5	1	4	5	2	1										
	Through			7	19	24	18	11	11	14	1	18										
	Right			16	2	16	9	11	6	12	18	1										
	App. Total	0	0	29	2	39	1	23	21	31	31	38	2	0	0							
Pct Trucks				0.065	0.025	0	0	0	0	0.031	0.05											
Southbound	Left			17	3	1	17	7	8	9	1	3	1									
	Through			6	5	4	1	8	3	13	13											
	Right			23	1	1	1	15	11	2	1	2	1									
	App. Total	0	0	23	3	29	2	15	22	24	24	1	17	1	0	0						
Pct Trucks				0.115	0.065	0.12	0.111	0.063	0	0.04	0.056											
Total Intersection Volume		0	0	182	8	214	9	259	4	210	4	159	2	110	1	156	8	150	10	0	0	0
Intersection Pct Trucks				4.2%	4.0%	1.5%	1.9%	1.2%	0.9%	4.9%	6.3%											

Notes:

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	413
6:45 AM	676
7:00 AM	890
7:15 AM	861
7:30 AM	749
7:45 AM	650

Intersection Total	Pct
One Hour Volumes	Trucks
8:00 AM	596
8:15 AM	435
8:30 AM	324

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & University
 Date Transfer Intersection No. 1

DATE OF COUNT: 1/21/2015
 Counter Analyst: Whipple Consulting Engineers, Inc
 BNG Analyst: AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left			1					1	2	0.50	0%
	Through		34	31		25		21		112	0.80	1%
	Right					2		2	1	5	0.42	20%
	App. Total		34	32	0	27	0	24	1	119	0.85	
	Pct Trucks		0.028571	0	0	0	0	0	0.04			
Westbound	Left		4	3	1	9		9		26	0.72	4%
	Through		81	85	1	121		101	1	391	0.81	1%
	Right		11	26	4	37	1	28		108	0.71	6%
	App. Total		96	114	6	167	1	138	1	525	0.78	
	Pct Trucks		0.020408	0.05	0.005952	0.007194						
Northbound	Left		6	6		3		5		20	0.83	0%
	Through		7	19		24		18		68	0.71	0%
	Right		16	2	14	16		9		58	0.81	5%
	App. Total		29	2	39	43	0	32	0	146	0.85	
	Pct Trucks		0.064516	0.025	0	0	0	0	0			
Southbound	Left		17	3	23	17		6	2	70	0.73	10%
	Through		6	5		4		9		25	0.69	4%
	Right			1	1	1		1		4	0.50	25%
	App. Total		23	3	29	22	2	16	2	99	0.80	
	Pct Trucks		0.115385	0.064516	0.083333	0.111111						
Total Intersection Volume			182	8	214	9	259	3	210	4	889	0.85
Intersection Pct Trucks			4.2%	4.0%	1.1%	1.9%						

Pedestrian Calls

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through			1				1		2
Southbound	Through									0
	App. Total	0	0	1	0	0	0	1	0	2

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & University

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/21/2015
 Counter Analyst

PM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @																
		3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM					
		pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	
Eastbound	Left																	
	Through			72	1	81		73		78		80		87		91		
	Right			3		4		5		4		2		2		0		
	App. Total	0	0	0	75	1	84	0	106	0	84	0	82	0	91	0	62	0
Pct Trucks				0.013		0		0		0		0		0		0		
Westbound	Left			10		15		11		17		14		7		9		
	Through			31		47		42		33		33		35		25		
	Right			11		13		12		15		13		13		14		
	App. Total	0	0	0	52	1	75	1	65	1	69	2	60	1	60	1	48	1
Pct Trucks				0.019		0.013		0.015		0		0.028		0		0.016		
Northbound	Left			1		3		1		5		2		1		2		
	Through			13		11		13		14		15		8		16		
	Right			13		7		16		13		20		12		9		
	App. Total	0	0	0	27	1	21	1	30	0	32	0	37	0	21	0	22	0
Pct Trucks				0.036		0.045		0		0		0		0		0		
Southbound	Left			17		15		25		17		21		23		20		
	Through			17		20		15		20		27		21		38		
	Right					1		2				2						
	App. Total	0	0	0	34	1	36	0	42	1	37	0	50	1	44	0	59	1
Pct Trucks				0.029		0	0.023		0		0.02		0		0.017		0	
Total Intersection Volume			0	0	0	188	4	216	2	2	240	0	240	3	211	0	227	2
Intersection Pct Trucks						2.1%		0.9%		0.0%	1.2%		0.0%		0.9%		0.5%	

Notes:

Intersection Total	Pct Trucks
One Hour Volumes	
5:00 PM	879 0.7%
5:15 PM	636 0.5%
5:30 PM	425 0.7%

Intersection Total	Pct Trucks
One Hour Volumes	
3:30 PM	410 1.5%
3:45 PM	
4:00 PM	
4:15 PM	
4:30 PM	
4:45 PM	923 0.5%

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & University
 Date Transfer Intersection No. 1

DATE OF COUNT: 1/21/2015
 Counter Analyst
 BNG Whipple Consulting Engineers, Inc
 PM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	4:15		4:30		4:45		5:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left							2		2	0.25	0%
	Through	81		73		101		78		333	0.82	0%
	Right	3		4		5		4		16	0.80	0%
	App. Total	84		77		106		84		351	0.83	
	Pct Trucks	0		0		0		0		0		
Westbound	Left	15		11		17		17		60	0.88	0%
	Through	47		42		33		39		163	0.85	1%
	Right	13		12		15		13		55	0.92	4%
	App. Total	75		65		65		69		278	0.91	
	Pct Trucks	0.013158		0.015152		0		0		0.028169		
Northbound	Left	3		1		5		2		12	0.60	8%
	Through	11		13		14		15		53	0.88	0%
	Right	7		16		13		20		56	0.70	0%
	App. Total	21		30		32		37		121	0.82	
	Pct Trucks	0.045455		0		0		0		0		
Southbound	Left	15		25		17		21		80	0.77	3%
	Through	20		15		20		27		82	0.76	0%
	Right	1		2				2		5	0.63	0%
	App. Total	36		42		37		50		167	0.82	
	Pct Trucks	0		0.023256		0		0		0.019608		
Total Intersection Volume		216		214		240		240		917	0.94	
Intersection Pct Trucks		0.9%		0.9%		0.0%		0.0%		1.2%		

Pedestrian Calls

APPROACH	MOVEMENT	4:15		4:30		4:45		5:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through			1				2		3
Southbound	Through					1				1
	App. Total	0		1		1		2		4

DATE OF COUNT: 1/21/2015
 Counter Analyst

		15 Minute Period Beginning @																					
		6:45		7:00		7:15		7:30		7:45		8:00		8:15		8:30		8:45		9:00		9:15	
APPROACH	MOVEMENT	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk
Eastbound	Left																						
	Through			14	1	21	3	16	3	21	3	18	3	21	3	30	4	27	1				
	Right			8	3			13	1	9		12		17		12		18					
	App. Total	0	0	0	0	22	1	26	0	36	4	26	0	30	3	43	4	45	1	0	0	0	0
	Pct Trucks			0.043	0			0	0.1			0	0.091	0.073	0.085	0.022							
Westbound	Left			2		2		1		5		5		3		4		4					
	Through			84		89	1	89	2	97		63	1	68	2	45	2	46	3				
	Right			3		4		10		8		3		5		6		5					
	App. Total	0	0	0	0	89	0	76	1	100	2	110	0	71	1	76	2	55	2	55	3	0	0
	Pct Trucks					0.043	0	0.013	0.02			0	0.014	0.026	0.035	0.052							
Northbound	Left			43		55		60	1	46		40		29		40		31					
	Through			18	1	24		29		16	1	17		10		18		35	3				
	Right			7		5		9		10		3		9		1		3					
	App. Total	0	0	0	0	68	1	84	0	98	1	72	1	57	0	59	0	69	3	0	0	0	0
	Pct Trucks			0.014	0			0	0.01	0.014		0	0.014	0	0	0	0	0.042					
Southbound	Left			4		2		2		3		2		2		2		3					
	Through			6		4	1	11	1	13		20		11		17	1	31	1				
	Right			7		4		6		3		2		2		1		1					
	App. Total	0	0	0	0	17	0	10	1	19	1	19	0	24	0	19	1	35	1	0	0	0	0
	Pct Trucks					0	0.091		0.05		0		0	0	0.05	0.028							
Total Intersection Volume		0	0	0	0	196	2	196	2	253	8	227	1	182	4	166	5	176	7	204	8	0	0
Intersection Pct Trucks						1.0%		1.0%		3.1%	0.4%	0.4%		2.2%	2.9%	3.8%		3.8%		3.8%			

Intersection Total	Pct Trucks
One Hour Volumes	Trucks
6:30 AM	396 1.0%
6:45 AM	657 1.8%
7:00 AM	885 1.5%
7:15 AM	873 1.7%
7:30 AM	846 2.1%
7:45 AM	768 2.2%

Intersection Total	Pct Trucks
One Hour Volumes	Trucks
8:00 AM	752 3.2%
8:15 AM	566 3.5%
8:30 AM	395 3.8%

Notes:

PROJECT: Painted Hills GC
 JOB NO: 13-1166
 INTERSECTION: Dishman-Mica & University/Schafer

DATE OF COUNT: 1/21/2015
 Counter Analyst
 BNG

Data Transfer
 Intersection No. 1

Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left			3		2			1	6	0.50	0%
	Through	14	1	20		21	3	16		75	0.78	5%
	Right	8		3		13	1	9		34	0.61	3%
	App. Total	22	1	26	0	36	4	26	0	115	0.72	
	Pct Trucks	0.043478		0		0		0.1		0		
Westbound	Left	2		2		1			5	10	0.50	0%
	Through	84		70	1	89	2	97		343	0.88	1%
	Right	3		4		10		8		25	0.63	0%
	App. Total	89	0	76	1	100	2	110	0	378	0.86	
	Pct Trucks	0		0.012987		0.019608		0		0		
Northbound	Left	43		55		60	1	46		205	0.84	0%
	Through	18	1	24		29		16	1	89	0.77	2%
	Right	7		5		9		10		31	0.78	0%
	App. Total	68	1	84	0	98	1	72	1	325	0.82	
	Pct Trucks	0.014493		0		0.010101		0.013699		0		
Southbound	Left	4		2		2		3		11	0.69	0%
	Through	6		4	1	11	1	13		36	0.69	6%
	Right	7		4		6		3		20	0.71	0%
	App. Total	17	0	10	1	19	1	19	0	67	0.84	
	Pct Trucks	0		0.090909		0.05		0		0		
Total Intersection Volume		196	2	196	2	253	8	227	1	885	0.85	
Intersection Pct Trucks		1.0%		1.0%		3.1%		0.4%				

Pedestrian Calls

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through			2						2
Southbound	Through									0
	App. Total	0	0	2	0	0	0	0	0	2

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: Dishman-Mica & University/Schafer

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/21/2015
 Counter Analyst
 BNG

APPROACH	MOVEMENT	15 Minute Period Beginning @												Total Intersection Volume		Intersection Pct Trucks		
		3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM	pass	lrk	pass	lrk	
Eastbound	Left			2	1	9	2	7	4	1	4	4	4	4	3	4	3	
	Through			60	65	65	70	72	82	74	83	74	83	74	83	74	83	
	Right			28	25	1	34	34	29	50	45	50	45	50	45	50	45	
	App. Total	0	0	90	92	2	100	0	106	0	128	0	131	0	0	0	0	0
Pct Trucks			0.043	0.021	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Westbound	Left			5	3	7	7	8	4	3	2	4	2	3	4	2	4	
	Through			38	32	3	19	1	32	32	16	32	16	32	16	32	16	
	Right			3	4	3	7	8	1	3	4	1	4	3	4	1	4	
	App. Total	0	0	46	2	39	3	44	0	33	1	35	1	37	0	22	0	0
Pct Trucks			0.042	0.071	0	0.029	0	0.028	0	0	0	0	0	0	0	0	0	0
Northbound	Left			24	18	1	19	22	11	27	19	15	8	27	19	15	8	
	Through			26	14	19	21	22	7	15	8	15	8	15	8	15	8	
	Right			8	2	3	2	2	2	2	1	4	1	2	1	4	1	
	App. Total	0	0	58	34	1	41	45	1	46	1	20	0	43	0	31	0	0
Pct Trucks			0	0	0.029	0	0.022	0.021	0	0	0	0	0	0	0	0	0	0
Southbound	Left			9	7	3	8	1	4	10	9	10	9	10	9	10	9	
	Through			13	20	27	23	23	14	42	26	42	26	42	26	42	26	
	Right			3	1	1	2	3	1	1	1	1	1	1	1	1	1	
	App. Total	0	0	25	0	31	0	33	2	35	0	19	0	52	0	35	0	0
Pct Trucks			0	0	0	0	0.057	0	0	0	0	0	0	0	0	0	0	0
Total Intersection Volume			0	0	219	6	192	4	223	2	191	0	261	0	219	0	0	0
Intersection Pct Trucks			2.7%	3.0%	0.0%	1.8%	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Intersection Total	Pct
One Hour Volumes	Trucks
5:00 PM	896
5:15 PM	671
5:30 PM	480

Intersection Total	Pct
One Hour Volumes	Trucks
3:30 PM	423
3:45 PM	639
4:00 PM	860
4:15 PM	860
4:30 PM	853
4:45 PM	898

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: Dishman-Mica & University/Schafer

DATE OF COUNT: 1/21/2015
 Counter Analyst BNG
 Whipple Consulting Engineers, Inc
 PM PEAK HOUR BREAKDOWN

Data Transfer
 Intersection No. 1

APPROACH	MOVEMENT	4:45		5:00		5:15		5:30		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left		2		1		4		4	11	0.69	0%
	Through		70		72		82		74	298	0.91	0%
	Right		34		34		29		50	147	0.74	0%
	App. Total		106		107		115		128	456	0.89	
	Pct Trucks		0		0		0		0			
Westbound	Left		7		8		4		3	22	0.69	0%
	Through		19		19		32		32	104	0.81	2%
	Right		7		8		1		3	19	0.59	0%
	App. Total		33		35		37		38	145	0.95	
	Pct Trucks		0.029412		0.027778		0		0			
Northbound	Left		22		22		11		27	82	0.76	0%
	Through		21		22		7		15	67	0.73	3%
	Right		2		2		2		1	7	0.88	0%
	App. Total		45		46		20		43	156	0.83	
	Pct Trucks		0.021739		0.021277		0		0			
Southbound	Left		8		9		4		10	32	0.80	3%
	Through		23		23		14		42	103	0.61	1%
	Right		2		3		1		6	6	0.50	0%
	App. Total		33		35		19		52	141	0.68	
	Pct Trucks		0.057143		0		0		0			
Total Intersection Volume			217		223		191		261	898	0.86	
Intersection Pct Trucks			1.8%		0.9%		0.0%		0.0%			

Pedestrian Calls

APPROACH	MOVEMENT	4:45		5:00		5:15		5:30		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
	Through									0
	Through							1		1
	Through									0
	App. Total	0	0	0	0	0	0	1	0	1

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Bowdish

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/22/2015
 Counter Analyst
 CEL BNG

AM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @												Total Intersection Volume	Intersection Pct Trucks							
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15									
Eastbound	Left			58	5	4	6	3	1	2	8	1										
	Through			55	1	40	5	60	2	37	1	37	3									
	Right				6	1	2	4	3	2												
	App. Total	0	0	113	1	48	2	73	3	67	2	41	1	45	4	0	0					
	Pct Trucks			0.009	0.04	0.1	0.039	0.029	0.029	0.029	0.024	0.082										
Westbound	Left			6	11	18	12	16	7	8	3											
	Through			67	90	77	1	75	3	72	2	32	1	60	1							
	Right			5	6	4	11	8	10	10	7											
	App. Total	0	0	78	107	99	1	99	3	89	3	50	1	70	1	0	0					
	Pct Trucks			0	0.009	0.01	0.139	0.029	0.033	0.02	0.014											
Northbound	Left			12	23	28	25	17	10	5	5											
	Through			17	31	38	1	30	13	21	11											
	Right			18	16	21	1	16	19	17	16											
	App. Total	0	0	47	70	87	2	90	1	44	1	43	0	32	0	0	0					
	Pct Trucks			0	0	0.022	0.011	0	0.022	0	0	0	0	0	0	0	0					
Southbound	Left			12	8	9	15	2	2	7	1	11										
	Through			5	5	5	9	8	6	4	2	11										
	Right			5	2	3	3	6	3	1	1	2										
	App. Total	0	0	22	15	17	27	2	11	1	12	3	24	0	0	0	0					
	Pct Trucks			0	0	0	0.069	0	0	0.083	0.2	0										
Total Intersection Volume		0	0	260	1	240	3	248	8	283	21	242	5	175	5	146	5	171	5	0	0	0
Intersection Pct Trucks				0.4%	1.2%	3.1%	6.9%	2.0%	2.8%	3.3%	2.8%	3.3%	2.8%	2.8%	3.3%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%	2.8%

Intersection Total		Pct
One Hour Volumes	Trucks	
8:00 AM	754	2.7%
8:15 AM	507	3.0%
8:30 AM	327	3.1%

Intersection Total		Pct
One Hour Volumes	Trucks	
6:30 AM	504	0.8%
6:45 AM	760	1.6%
7:00 AM	1064	3.1%
7:15 AM	1050	3.5%
7:30 AM	987	4.0%
7:45 AM	882	4.1%

Notes:

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Bowditch
 Date Transfer Intersection No. 1

DATE OF COUNT: 1/22/2015
 Counter Analyst: Whipple Consulting Engineers, Inc
 CEL BNG AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:00		7:15		7:30		7:45		TOTAL	P.H.F.	Pct Trucks	
		pass	lrk	pass	lrk	pass	lrk	pass	lrk				
Eastbound	Left	58		5		4		6		73	0.31	0%	
	Through			37		40		65		208	0.76	5%	
	Right	1		6		1		2		9	0.38	0%	
	App. Total	113		48		45		73		290	0.64		
	Pct Trucks	0.008772 0.04 0.1 0.039474											
Westbound	Left	6		11		18		12		47	0.65	0%	
	Through	67		90		77		70		321	0.88	5%	
	Right	5		6		4		11		26	0.59	0%	
	App. Total	78		107		99		93		394	0.91		
	Pct Trucks	0.009259 0.01 0.138889											
Northbound	Left	12		23		28		25		88	0.79	0%	
	Through	17		31		38		30		117	0.75	1%	
	Right	18		16		21		35		92	0.64	2%	
	App. Total	47		70		87		90		297	0.82		
	Pct Trucks	0 0 0.022472 0.010989											
Southbound	Left	12		8		9		15		46	0.68	4%	
	Through	5		5		5		9		24	0.67	0%	
	Right	5		2		3		3		13	0.65	0%	
	App. Total	22		15		17		27		83	0.72		
	Pct Trucks	0 0 0 0.068966											
Total Intersection Volume		260		240		248		283		1064		0.88	
Intersection Pct Trucks		0.4%		1.2%		3.1%		6.9%					

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Bowditch

DATE OF COUNT: 1/22/2015
 Counter Analyst: 0 BNG
 Whipple Consulting Engineers, Inc
 PM PEAK HOUR BREAKDOWN

Data Transfer
 Intersection No. 1

APPROACH	MOVEMENT	4:15 PM		4:30 PM		4:45 PM		5:00 PM		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left	1		5		10		13		29	0.56	0%
	Through	85		79		69		62		298	0.88	1%
	Right	16		9		8		16		49	0.77	0%
	App. Total	102	0	93	0	87	0	91	0	376	0.92	
	Pct Trucks	0		0.010638		0		0.021505				
Westbound	Left	17		25		24		18		84	0.84	0%
	Through	68		62		56		37		226	0.83	1%
	Right	4		15		9		10		38	0.63	0%
	App. Total	89	0	102	0	89	0	65	0	348	0.84	
	Pct Trucks	0		0.009709		0.011111		0.015152				
Northbound	Left	8		10		5		9		32	0.80	0%
	Through	23		14		18		32		87	0.68	0%
	Right	22		18		8		15		63	0.72	0%
	App. Total	53	0	42	0	31	0	56	0	182	0.81	
	Pct Trucks	0		0		0		0				
Southbound	Left	7		13		6		10		36	0.69	0%
	Through	20		24		27		31		102	0.82	0%
	Right	5		6		7		10		28	0.70	0%
	App. Total	32	0	43	0	40	0	51	0	166	0.81	
	Pct Trucks	0		0		0		0				
Total Intersection Volume		276		280		247		263		1072	0.95	
Intersection Pct Trucks				0.0%		0.7%		0.4%		1.1%		

Pedestrian Calls

APPROACH	MOVEMENT	4:15		4:30		4:45		5:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: Dishman-Mica & Bowdish

DATE OF COUNT: 1/20/2015
 Counter Analyst
 BNG

Data Transfer
 Intersection No. 1

Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left					3			3	6	0.50	0%
	Through	16		22		20	1	14	3	76	0.86	5%
	Right	8				5		5		26	0.81	0%
	App. Total	24	0	30	0	28	1	22	3	108	0.90	
	Pct Trucks	0	0	0	0	0.034483			0.12			
Westbound	Left	3		3	1	11		8	1	27	0.61	7%
	Through	51		60	2	54		49	2	218	0.88	2%
	Right	2		3		11		6		22	0.50	0%
	App. Total	56	0	66	3	76	0	63	3	267	0.88	
	Pct Trucks	0	0	0.043478				0.045455				
Northbound	Left	22		30		26		17	1	96	0.80	1%
	Through	29		34		34		25		122	0.90	0%
	Right	9		8		20	2	2		41	0.47	5%
	App. Total	60	0	72	0	80	2	44	1	259	0.79	
	Pct Trucks	0	0	0.02439				0.022222				
Southbound	Left	8		7		4		2		23	0.72	9%
	Through	9		14	1	13		15	1	53	0.83	4%
	Right	2		2	1	1		2		8	0.67	13%
	App. Total	19	0	23	2	18	2	19	1	84	0.84	
	Pct Trucks	0	0	0.08		0.1		0.05				
Total Intersection Volume		159	0	191	5	202	5	148	8	718	0.87	
Intersection Pct Trucks			0.0%		2.6%		2.4%		5.1%			

Pedestrian Calls

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through	1								1
Southbound	Through									0
	App. Total	1	0	0	0	0	0	0	0	1

PROJECT: Barker & Sprague CPA
 JOB NO. 13-1166
 INTERSECTION: Dishman-Mica & Thorpe
 Analyst
 BNG

DATE OF COUNT: 1/20/2015
 Counter
 Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

Data Transfer
 Intersection No.

1

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
Westbound	Pct Trucks											
	Left	2		1				1		4	0.50	0%
	Through									0		
	Right	19		23	1	22		16		81	0.84	1%
Northbound	App. Total	21		24	1	22	0	17	0	85	0.85	
	Pct Trucks			0.04						0		
	Left									0		
	Through	40		45	1	48		40	4	178	0.93	3%
Southbound	Right	3		1		5		1	4	14	0.58	7%
	App. Total	43		46	1	53	1	44	4	192	0.89	
	Pct Trucks			0.021277		0.018519				0.083333		
	Left	10		22	1	11		2	9	56	0.61	7%
Pedestrian Calls	Through	17		17		29		2	12	79	0.64	5%
	Right									0		
	App. Total	27		39	1	40	4	21	3	135	0.77	
	Pct Trucks			0	0.025	0.090909				0.125		
Total Intersection Volume		91	0	109	3	115	5	82	7	412	0.86	
Intersection Pct Trucks			0.0%		2.7%		4.2%		7.9%			

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
	Through									0
	Through									0
	Through									0
App. Total		0	0	0	0	0	0	0	0	0

PROJECT: **Barter & Sprague CPA**
 JOB NO. 13-1166
 INTERSECTION: **Dishman-Mica & Thorpe**

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/20/2015
 Counter Analyst
JDK BNG

PM PEAK HOURS

APPROACH	15 Minute Period Beginning @																																																																																																																																																																																																																																																																																																																																																
	3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM																																																																																																																																																																																																																																																																																																																																					
	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk																																																																																																																																																																																																																																																																																																																																					
Eastbound													Left													Through													Right													App. Total	0	0	0	0	0	0	0	0	0	0	0	0	Pct Trucks													Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0
Left													Through													Right													App. Total	0	0	0	0	0	0	0	0	0	0	0	0	Pct Trucks													Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0													
Through													Right													App. Total	0	0	0	0	0	0	0	0	0	0	0	0	Pct Trucks													Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																										
Right													App. Total	0	0	0	0	0	0	0	0	0	0	0	0	Pct Trucks													Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																							
App. Total	0	0	0	0	0	0	0	0	0	0	0	0	Pct Trucks													Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																				
Pct Trucks													Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																	
Westbound													Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																														
Left			4	5		4	2	3	1	3			Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																											
Through													Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																								
Right			10	4	7	7	23	4	8	4			App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																					
App. Total	0	0	14	9	0	11	0	7	0	9	0	0	Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																		
Pct Trucks				0									Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																															
Northbound													Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																												
Left													Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																									
Through			25	1	28	2	21	1	23	1	21	2	Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																						
Right			4		1	1	1	1	1	1	1	2	App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																			
App. Total	0	0	29	1	28	2	22	1	24	2	22	2	Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																
Pct Trucks			0.033		0.067	0.043	0.04	0.083	0.04	0.083	0.04	0	Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																													
Southbound													Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																										
Left			11	2	13	12	22	10	11	17			Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																							
Through			36	1	49	45	1	51	48	51			Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																																				
Right													App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																																																	
App. Total	0	0	47	3	62	57	61	61	59	68	0	0	Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																																																														
Pct Trucks			0.06		0.06	0.017	0.014	0.014	0.016	0			Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																																																																											
Total Intersection Volume	0	0	90	4	99	2	86	3	92	2	96	0	Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																																																																																								
Intersection Pct Trucks			4.3%		2.0%	2.3%	1.0%	2.5%	2.1%	0.0%	0.0%	0																																																																																																																																																																																																																																																																																																																																					

Intersection Total		Pct
One Hour Volumes	Trucks	
5:00 PM	408	1.2%
5:15 PM	290	0.7%
5:30 PM	196	0.0%

Intersection Total		Pct
One Hour Volumes	Trucks	
3:30 PM	195	3.1%
3:45 PM	283	2.8%
4:00 PM	380	2.4%
4:15 PM	404	2.0%
4:30 PM	397	2.0%
4:45 PM	405	1.5%

Notes:

::

PROJECT: Barker & Sprague CPA
 JOB NO. 13-1166
 INTERSECTION: Dishman-Mica & Thorpe

DATE OF COUNT: 1/20/2015
 Counter: Whipple Consulting Engineers, Inc
 JDK: BNG PM PEAK HOUR BREAKDOWN

Data Transfer
 Intersection No. 1

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
Westbound	Pct Trucks											
	Left	2		3		1		3		9	0.75	0%
	Through							4		4	0.25	0%
	Right	23		4		8				35	0.38	0%
Northbound	App. Total	25	0	7	0	9	0	7	0	48	0.48	
	Pct Trucks			0		0		0		0		
	Left									0		
	Through	21	2	23	1	25		23		95	0.95	3%
Southbound	Right	1		1		3		2		7	0.58	0%
	App. Total	22	2	24	1	28	0	25	0	102	0.91	
	Pct Trucks		0.083333		0.04					0		
	Left	20		10		11		17		58	0.73	0%
Pedestrian Calls	Through	48	1	51	1	48		51		200	0.96	1%
	Right									0		
	App. Total	68	1	61	1	59	0	68	0	258	0.93	
	Pct Trucks		0.014493		0.016129					0		
Total Intersection Volume		115		92		96		100		408		0.86
Intersection Pct Trucks		2.5%		2.1%		0.0%		0.0%				0.0%

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
	Through									0
	Northbound									0
	Southbound									0
App. Total		0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 16th & Pines

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/28/2015
 Counter Analyst BNG
 JDK

AM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @															
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15				
		pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk
Eastbound	Left																
	Through			35	53	56	1	55	3	51	3	41	5	35	1	64	3
	Right			2	19	15	4	4	3	3	6	4	6	4	3	3	3
	App. Total	0	0	37	72	71	1	59	3	54	3	47	5	39	1	67	3
	Pct Trucks			0.026	0.014	0.014		0.048		0.053		0.096		0.025		0.043	
Westbound	Left			5	16	13	11	11	9	9	8	8	1	13			
	Through			29	54	50	3	51	4	34	2	31	29	38			
	Right																
	App. Total	0	0	34	70	63	3	62	4	43	2	39	0	30	0	51	0
	Pct Trucks			0.029	0	0.045		0.061		0.044		0		0			
Northbound	Left			7	6	8	5	5	5	5	2	2	5				
	Through			55	52	53	47	47	43	37	1	37	1	37	3	51	
	Right																
	App. Total	0	0	62	58	61	0	52	0	48	0	39	1	42	3	56	0
	Pct Trucks			0	0.049	0		0				0.025		0.067			
Southbound	Left			1	1	38	1	24	1	28	13	28	2	35	1		
	Through			21	41	1	4	11	1	5	9	1	9	14			
	Right			8	9	4	11	11	5	3	0	22	1	37	2	49	1
	App. Total	0	0	30	50	42	1	35	2	33	0	22	1	37	2	49	1
	Pct Trucks			0.063	0.038	0.023		0.054				0.043		0.051		0.02	
Total Intersection Volume		0	0	163	4	250	6	237	5	208	9	178	5	147	7	148	6
Intersection Pct Trucks				2.4%	2.3%	2.1%	4.1%	2.7%	4.5%	3.9%	1.8%						

Intersection Total		Pct
One Hour Volumes	Trucks	
6:30 AM	423	2.4%
6:45 AM	665	2.3%
7:00 AM	882	2.7%
7:15 AM	898	2.8%
7:30 AM	796	3.3%
7:45 AM	708	3.8%

Intersection Total		Pct
One Hour Volumes	Trucks	
8:00 AM	718	3.1%
8:15 AM	535	3.2%
8:30 AM	381	2.6%

Notes:

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 16th & Pines

DATE OF COUNT: 1/28/2015
 Counter: Analyst
 JDK BNG

Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

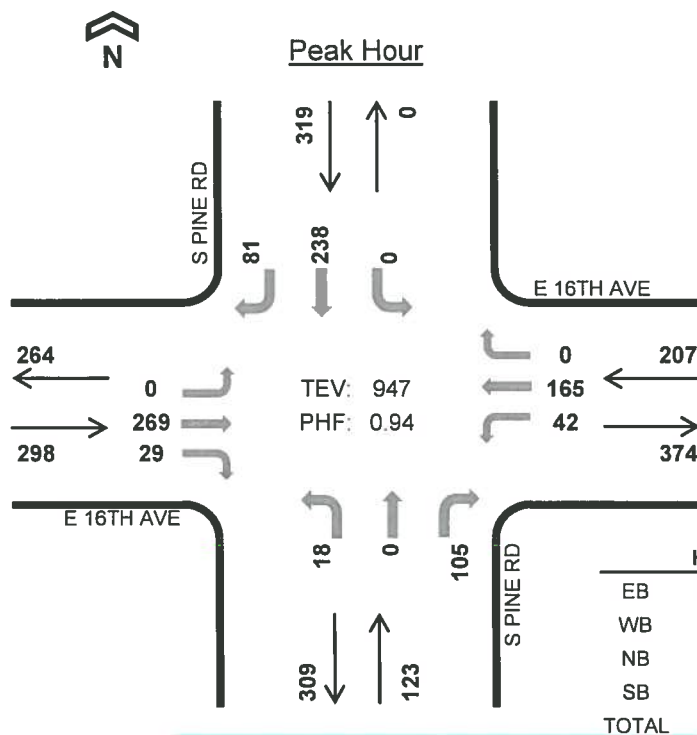
Data Transfer
 Intersection No.

1

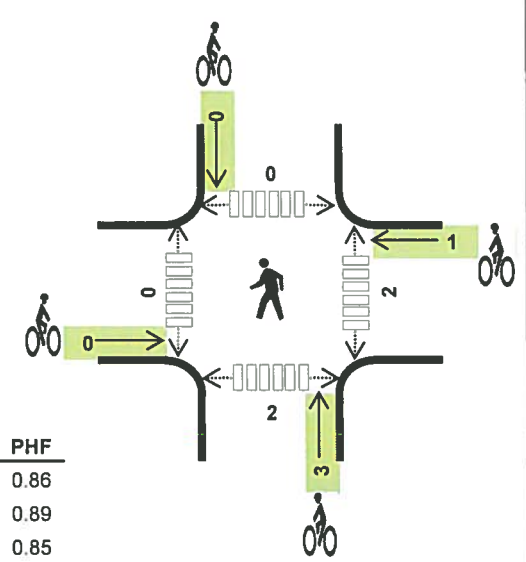
APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left									0		
	Through	53	1	56	1	55	3	51	3	223	0.96	4%
	Right	19		15		4		3		41	0.54	0%
	App. Total	72	1	71	1	59	3	54	3	264	0.90	
	Pct Trucks	0.013699		0.013689		0.048387		0.052632				
Westbound	Left	16		13		11		9		49	0.77	0%
	Through	54		50	3	51	4	34	2	198	0.90	5%
	Right									0		
	App. Total	70	0	63	3	62	4	43	2	247	0.88	
	Pct Trucks	0		0.045455		0.060606		0.044444				
Northbound	Left	6		8		5		5		24	0.75	0%
	Through									0		
	Right	52	3	53		47		43		198	0.90	2%
	App. Total	58	3	61	0	52	0	48	0	222	0.91	
	Pct Trucks	0.04918		0		0		0				
Southbound	Left									0		
	Through	41	1	38	1	24	1	28		134	0.80	2%
	Right	9		4		11		5		31	0.65	6%
	App. Total	50	2	42	1	35	2	33	0	165	0.79	
	Pct Trucks	0.038462		0.023256		0.054054		0				
Total Intersection Volume		250		237		208		178		898		0.88
Intersection Pct Trucks		2.3%		2.1%		4.1%		2.7%				

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through					2				2
Northbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	2	0	0	0	2

S PINE RD E 16TH AVE



Date: Tue, Jul 01, 2014
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	0.7%	0.86
WB	1.0%	0.89
NB	0.8%	0.85
SB	0.6%	0.93
TOTAL	0.7%	0.94

Two-Hour Count Summaries

Interval Start	E 16TH AVE			E 16TH AVE			S PINE RD			S PINE RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	72	8	10	48	0	4	0	29	0	56	26	253	
4:15 PM	0	59	5	6	43	0	5	0	20	0	65	21	224	
4:30 PM	0	62	5	14	42	0	7	0	29	0	57	13	229	
4:45 PM	0	76	11	12	32	0	2	0	27	0	60	21	241	947
5:00 PM	0	87	5	12	31	0	2	0	22	0	32	18	209	903
5:15 PM	0	78	16	13	37	0	2	0	28	0	55	17	246	925
5:30 PM	0	68	9	7	50	0	11	0	25	0	38	15	223	919
5:45 PM	0	80	10	12	27	0	6	0	28	0	39	18	220	898
Count Total	0	582	69	86	310	0	39	0	208	0	402	149	1,845	
Peak Hr	0	269	29	42	165	0	18	0	105	0	238	81	947	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	0	1	0	2	0	0	1	0	1	0	0	0	0	0
4:30 PM	0	1	0	1	2	0	1	0	0	1	2	0	0	2	4
4:45 PM	1	1	0	0	2	0	0	2	0	2	0	0	0	0	0
5:00 PM	0	0	0	2	2	0	0	0	0	0	0	0	0	1	1
5:15 PM	1	0	0	0	1	0	0	0	0	0	1	0	0	2	3
5:30 PM	0	1	0	1	2	0	0	2	0	2	0	0	0	0	0
5:45 PM	1	0	1	1	3	0	0	0	0	0	0	0	0	0	0
Count Total	4	3	2	6	15	0	1	5	0	6	3	0	0	5	8
Peak Hr	2	2	1	2	7	0	1	3	0	4	2	0	0	2	4

PROJECT: Painted Hills GC
JOB NO. 13-1166
INTERSECTION: 16th & SR27
 Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/28/2015
 Counter Analyst
BNG 15 Minute Period Beginning @ **AM PEAK HOURS**

APPROACH	MOVEMENT	15 Minute Period Beginning @																							
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15												
		pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk								
Eastbound	Left			51	2	68	47	55	1	35	1	34	81	1											
	Through			28	41	1	48	41	1	32	24	53	1												
	Right			4	2	6	6	6	7	1	2	5													
	App. Total	0	0	83	0	45	0	122	0	102	2	60	0	139	2	0	0	0							
	Pct Trucks			0	0.022	0	0	0.019	0	0.026	0	0.014	0												
Westbound	Left			2	3	1	1	1	1	2	2	1													
	Through			20	1	51	3	36	1	23	24	44	1												
	Right			10	21	17	16	14	14	14	27	17	1												
	App. Total	0	0	32	1	79	0	70	3	61	0	53	0	62	1	0	0	0							
	Pct Trucks			0.03	0	0.041	0.016	0	0	0	0	0.016	0												
Northbound	Left			17	14	15	12	8	8	7	16	9													
	Through			80	1	100	1	125	1	92	1	48	1	69	4										
	Right			2	7	1	7	3	3	3	1	78	4	0	0	0	0								
	App. Total	0	0	99	1	121	1	141	1	111	0	92	1	84	1	78	4	0							
	Pct Trucks			0.01	0.008	0.007	0	0.011	0	0.012	0.015	0.049													
Southbound	Left			5	8	8	16	7	8	8	8	10													
	Through			11	4	27	21	27	1	16	26	27	3												
	Right																								
	App. Total	0	0	16	4	35	2	28	1	24	0	34	0	37	3	0	0	0							
	Pct Trucks			0.2	0.054	0	0.026	0.028	0	0.075															
Total Intersection Volume		0	0	0	0	230	6	276	4	361	4	314	2	280	4	221	3	211	1	316	10	0	0	0	0
Intersection Pct Trucks				2.5%	1.4%	1.1%	0.6%	1.4%	1.3%	0.5%	3.1%														

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	516
6:45 AM	881
7:00 AM	1197
7:15 AM	1245
7:30 AM	1189
7:45 AM	1036

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	1.7%
6:45 AM	1.8%
7:00 AM	2.0%
7:15 AM	2.0%
7:30 AM	2.0%
7:45 AM	2.0%

Notes:

--

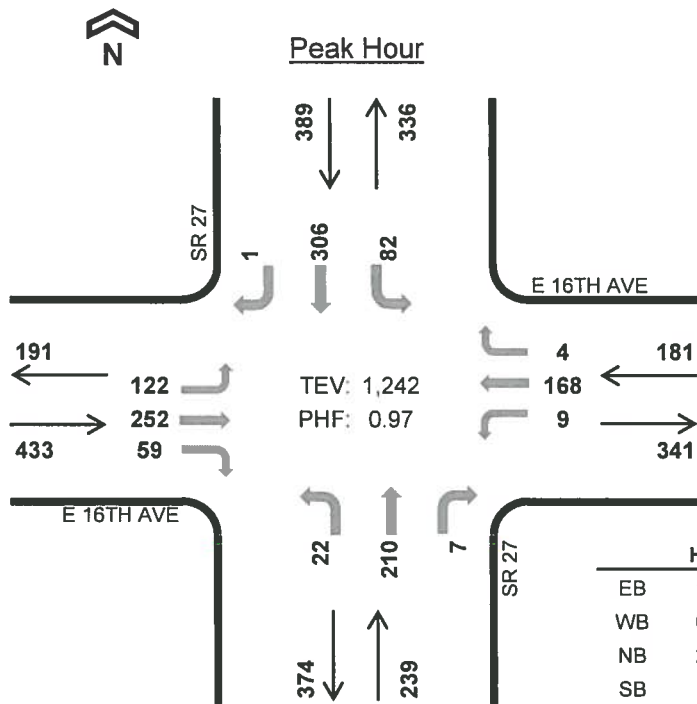
PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 16th & SR27
 Date Transfer Intersection No. 1

DATE OF COUNT: 1/28/2015
 Counter Analyst
 BNG BNG
 Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

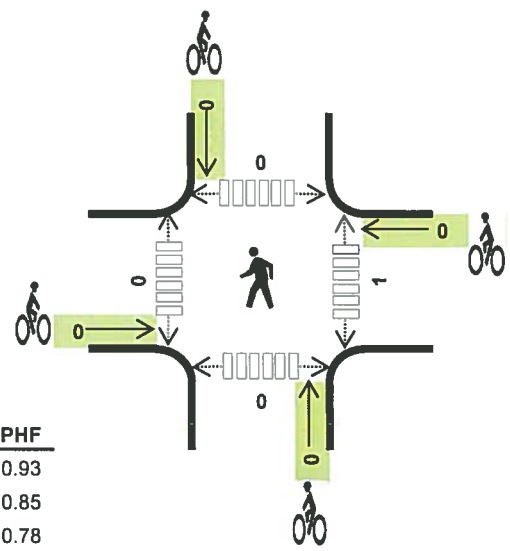
APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left			68		47		55	1	173	0.64	1%
	Through	41	1	48		52		41	1	184	0.88	1%
	Right	2		6		6		6		20	0.83	0%
	App. Total	45	1	122	0	105	0	102	2	377	0.77	
	Pct Trucks	0.021739		0		0		0.019231				
Westbound	Left	3		1				1		5	0.42	0%
	Through	51		52	3	45	1	36		188	0.85	2%
	Right	21		17		16		14		68	0.81	0%
	App. Total	75	0	70	3	61	1	51	0	261	0.87	
	Pct Trucks	0		0.041096		0.016129		0				
Northbound	Left	14		15		12		8		49	0.82	0%
	Through	100	1	125	1	92		81	1	401	0.80	1%
	Right	7		1		7		3		18	0.64	0%
	App. Total	121	1	141	1	111	0	92	1	468	0.82	
	Pct Trucks	0.008197		0.007042		0		0.010753				
Southbound	Left	8		8		16		7		39	0.61	0%
	Through	27	2	20		21	1	27	1	99	0.85	4%
	Right							1		1	0.25	0%
	App. Total	35	2	28	0	37	1	35	1	139	0.91	
	Pct Trucks	0.054054		0		0.026316		0.027778				
Total Intersection Volume		276	4	361	4	314	2	280	4	1245	0.85	
Intersection Pct Trucks		1.4%		1.1%		0.6%		1.4%				

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									3
	Through					3				0
	Through									0
	Through									0
	App. Total	0	0	0	0	3	0	0	0	3

SR 27 E 16TH AVE



Date: Tue, Jul 01, 2014
 Count Period: 4:00 PM to 6:00 PM
 Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	1.4%	0.93
WB	0.6%	0.85
NB	2.5%	0.78
SB	1.0%	0.94
TOTAL	1.4%	0.97

Two-Hour Count Summaries

Interval Start	E 16TH AVE			E 16TH AVE			SR 27			SR 27			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	29	42	9	1	39	4	3	51	5	15	46	1	245	
4:15 PM	37	51	10	1	55	0	4	60	6	13	53	0	290	
4:30 PM	29	49	11	1	49	0	5	68	4	14	75	0	305	
4:45 PM	26	56	11	0	36	1	5	71	1	18	73	1	299	1,139
5:00 PM	37	61	15	3	46	0	4	44	2	23	81	0	316	1,210
5:15 PM	28	64	19	2	38	2	6	53	2	22	70	0	306	1,226
5:30 PM	31	71	14	4	48	1	7	42	2	19	82	0	321	1,242
5:45 PM	28	59	11	4	43	1	6	58	1	16	53	0	280	1,223
Count Total	245	453	100	16	354	9	40	447	23	140	533	2	2,362	
Peak Hr	122	252	59	9	168	4	22	210	7	82	306	1	1,242	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	1	1	1	4	0	0	0	0	0	0	0	0	0	0
4:30 PM	3	2	1	0	6	0	1	0	0	1	2	0	0	0	2
4:45 PM	3	1	1	3	8	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	1	1	3	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
5:30 PM	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0
Count Total	12	4	12	5	33	0	1	0	0	1	3	0	0	0	3
Peak Hr	6	1	6	4	17	0	0	0	0	0	1	0	0	0	1

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Pines

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/22/2015
 Counter: JDK
 Analyst: BNG

AM PEAK HOURS

APPROACH	15 Minute Period Beginning @																																																																																																																																																																																																																																																																																																																																																
	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15																																																																																																																																																																																																																																																																																																																																					
MOVEMENT	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk	pass	trk																																																																																																																																																																																																																																																																																																																																					
Eastbound													Left			2	5	5	1	6	6	10	9	9		Through			92	59	76	4	106	39	52	2	52	1	Right				5	2	1	6	4	7	1	7	3	App. Total	0	0	94	69	83	6	114	49	69	3	68	4	Pct Trucks			0.011	0.028	0.067	0.047	0.017	0	0.042	0.056		0	Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0
Left			2	5	5	1	6	6	10	9	9		Through			92	59	76	4	106	39	52	2	52	1	Right				5	2	1	6	4	7	1	7	3	App. Total	0	0	94	69	83	6	114	49	69	3	68	4	Pct Trucks			0.011	0.028	0.067	0.047	0.017	0	0.042	0.056		0	Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0													
Through			92	59	76	4	106	39	52	2	52	1	Right				5	2	1	6	4	7	1	7	3	App. Total	0	0	94	69	83	6	114	49	69	3	68	4	Pct Trucks			0.011	0.028	0.067	0.047	0.017	0	0.042	0.056		0	Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																										
Right				5	2	1	6	4	7	1	7	3	App. Total	0	0	94	69	83	6	114	49	69	3	68	4	Pct Trucks			0.011	0.028	0.067	0.047	0.017	0	0.042	0.056		0	Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																							
App. Total	0	0	94	69	83	6	114	49	69	3	68	4	Pct Trucks			0.011	0.028	0.067	0.047	0.017	0	0.042	0.056		0	Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																				
Pct Trucks			0.011	0.028	0.067	0.047	0.017	0	0.042	0.056		0	Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																	
Westbound													Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																														
Left			6	10	8	7	15	11	9	9	2		Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																											
Through			62	84	90	1	97	78	43	49	1		Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																								
Right			3	6	7	1	12	4	6	6			App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																					
App. Total	0	0	71	100	105	1	124	93	52	64	3	0	Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																		
Pct Trucks			0	0.02	0.009	0.121	0.016	0	0	0.045		0	Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																															
Northbound													Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																												
Left			4	4	6	7	3	14	9	24	2		Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																									
Through			10	15	10	8	9	8	8	11			Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																						
Right			14	13	20	2	30	13	9	20	1		App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																			
App. Total	0	0	28	32	36	2	42	35	26	55	3	0	Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																
Pct Trucks			0	0.03	0.053	0.023	0.023	0	0	0.052		0	Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																													
Southbound													Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																										
Left			14	30	15	4	82	14	8	11			Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																							
Through			3	8	7	5	5	4	14	14	1		Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																																				
Right			8	9	7	7	3	5	4	4			App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																																																	
App. Total	0	0	25	47	29	4	90	23	26	29	1	0	Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																																																														
Pct Trucks			0	0.021	0.121	0.047	0	0	0	0.033		0	Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																																																																											
Total Intersection Volume	0	0	218	248	253	13	329	200	173	3	216	11	Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																																																																																								
Intersection Pct Trucks			0.5%	2.4%	4.9%	6.8%	1.3%	0.0%	1.7%	4.8%		0																																																																																																																																																																																																																																																																																																																																					

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	473 1.5%
6:45 AM	739 2.7%
7:00 AM	1092 4.0%
7:15 AM	1248 3.8%
7:30 AM	1194 3.5%
7:45 AM	1104 2.9%

Intersection Total	Pct
One Hour Volumes	Trucks
8:00 AM	978 1.9%
8:15 AM	603 2.3%
8:30 AM	403 3.5%

Notes:

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Pines

Data Transfer
 Intersection No. 1

DATE OF COUNT: 1/22/2015
 Counter Analyst
 JDK BNG

Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT		7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks									
	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk												
Eastbound	Left	5	5	1	11	6	28	0.64	4%													
	Through	59	2	76	4	111	6	106	1	365	0.78	4%										
	Right	5	1	2	1	1	12	0.60	17%	12	0.60	17%										
	App. Total	69	2	83	6	123	6	114	2	405	0.78											
Pct Trucks	0.028169																					
Westbound	Left	10	8	8	7	1	42	0.66	5%													
	Through	84	2	90	1	84	12	97	1	371	0.95	4%										
	Right	6	7	7	11	1	37	0.77	3%	37	0.77	3%										
	App. Total	100	2	105	1	102	14	124	2	450	0.89											
Pct Trucks	0.019608																					
Northbound	Left	4	6	6	7	3	20	0.71	0%													
	Through	15	10	20	2	28	1	30	1	96	0.77	5%										
	Right	13	1	36	2	43	1	42	1	158	0.90											
	App. Total	32	1	36	2	43	1	42	1	158	0.90											
Pct Trucks	0.030303																					
Southbound	Left	30	15	15	4	49	2	82	3%	182	0.55	3%										
	Through	8	7	7	5	5	25	0.78	0%	25	0.78	0%										
	Right	9	1	7	7	1	28	0.70	7%	28	0.70	7%										
	App. Total	47	1	29	4	61	3	90	0	235	0.65											
Pct Trucks	0.020833																					
Total Intersection Volume	248		6		253		13		329		24		370		5		1248		0.83			
Intersection Pct Trucks	2.4%												4.9%		6.8%		1.3%					

APPROACH	MOVEMENT		7:15		7:30		7:45		8:00		TOTAL
	ped	bike	ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	6	4	4	4	20	7	37				37
Westbound	4	4	4	4	5	8					8
Northbound	6	6	3	5	11	11					11
Southbound	4	3	3	3	16	8					31
App. Total	20	0	11	0	41	0					87

PROJECT: Painted Hills GC
 JOB NO: 13-1166
 INTERSECTION: 32nd & Pines

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/21/2015
 Counter Analyst: BNG

PM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @												Total Intersection Volume	Intersection Pct Trucks		
		3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM				
		pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk
Eastbound	Left			6	18					3	84	10	6	5			
	Through			65	88			81	1	63	2	103	75	1	72		
	Right			8	6			2		4			4		7		
	App. Total	0	0	0	0	79	2	112	0	99	1	91	0	75	2	110	1
Pct Trucks			0.025	0			0	0.025	0	0.026	0	0.009	0.012	0			0
Westbound	Left			10	23			15	14	18		12		22		9	
	Through			66	72			74	84	1	61	65	70	2	53	1	
	Right			2	7			6	2	6		6	8		4		
	App. Total	0	0	0	0	78	0	102	2	95	0	100	1	85	0	100	2
Pct Trucks			0	0	0.019	0	0.019	0	0.01	0	0	0	0.02	0.015			0
Northbound	Left			18	6			9	7	12		4		2		4	
	Through			11	8			8	3	6		2	3		3		
	Right			9	15			15	11	11		9	14		7		
	App. Total	0	0	0	0	38	0	29	1	32	0	29	0	19	0	14	0
Pct Trucks			0	0	0.033	0	0.033	0	0	0	0	0	0	0	0	0	0
Southbound	Left			9	11			8	8	11		8		8		8	
	Through			13	17			16	8	10		13	8	1	6		
	Right			13	10			8	15	10		5	12		6		
	App. Total	0	0	0	0	35	0	38	0	32	0	31	1	26	0	28	1
Pct Trucks			0	0			0	0	0.031	0	0.031	0	0.034	0			0
Total Intersection Volume			0	0	0	0	230	2	281	3	258	1	243	1	220	3	234
Intersection Pct Trucks					0.9%			1.1%	0.4%	0.4%	1.3%	0.4%	1.7%	0.4%	1.3%	0.4%	0.5%

Intersection Total	Pct
One Hour Volumes	Trucks
3:30 PM	516 1.0%
3:45 PM	775 0.8%
4:00 PM	1019 0.7%
4:15 PM	1010 0.8%
4:30 PM	961 0.6%
4:45 PM	937 1.0%

Intersection Total	Pct
One Hour Volumes	Trucks
5:00 PM	879 1.0%
5:15 PM	656 0.9%
5:30 PM	421 1.2%

Notes:

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Pines

DATE OF COUNT: 1/21/2015
 Counter Analyst BNG
 Whipple Consulting Engineers, Inc
 PM PEAK HOUR BREAKDOWN

Data Transfer
 Intersection No. 1

APPROACH	MOVEMENT	4:00 PM		4:15 PM		4:30 PM		4:45 PM		TOTAL	P.H.F.	Pct Trucks
		pass	trk	pass	trk	pass	trk	pass	trk			
Eastbound	Left		6	18		16		3		43	0.60	0%
	Through		65	88		81		84		321	0.91	1%
	Right		8	6		2		4		20	0.63	0%
	App. Total		79	112		99		91		384	0.86	
	Pct Trucks		0.024691		0		0.01		0			
Westbound	Left		10	23		15		14		63	0.66	2%
	Through		66	72		74		84		298	0.88	1%
	Right		2	7		6		2		17	0.61	0%
	App. Total		78	102		95		100		378	0.91	
	Pct Trucks		0	0.019231		0		0		0.009901		
Northbound	Left		18	6		9		7		40	0.56	0%
	Through		11	8		8		3		30	0.68	0%
	Right		9	15		15		11		51	0.80	2%
	App. Total		38	29		32		21		121	0.80	
	Pct Trucks		0	0.033333		0		0				
Southbound	Left		9	11		8		8		36	0.82	0%
	Through		13	17		16		8		54	0.79	0%
	Right		13	10		8		15		46	0.77	0%
	App. Total		35	38		32		31		136	0.89	
	Pct Trucks		0	0		0		0				
Total Intersection Volume			230	281		258		243		1019		0.90
Intersection Pct Trucks			0.9%	1.1%		0.4%		0.4%				0.4%

Pedestrian Calls

APPROACH	MOVEMENT	4:15		4:30		4:45		5:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through									0
Southbound	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills PRD
 JOB NO. 13-1166
 INTERSECTION: Madison & Thorpe
 Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 3/11/2015
 Counter Analyst
 RMA

AM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @														
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15			
Eastbound	Left				19	21	24	3	8							
	Through															
	Right				3	3	3	1								
	App. Total	0	0	0	22	24	27	3	9	0	0	0	0	0	0	
Pct Trucks		0														
Westbound	Left							0								
	Through															
	Right															
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pct Trucks		0														
Northbound	Left				15	15	1	10	8							
	Through				15	18	19	9								
	Right															
	App. Total	0	0	0	30	33	1	29	17	0	0	0	0	0	0	
Pct Trucks		0.029														
Southbound	Left															
	Through				3	9	6	6								
	Right				8	13	17	13								
	App. Total	0	0	0	11	22	23	19	19	0	0	0	0	0	0	
Pct Trucks		0														
Total Intersection Volume		0	0	0	63	79	1	79	3	45	0	0	0	0	0	
Intersection Pct Trucks		0.0%														

Intersection Total	Pct
One Hour Volumes	Trucks
8:00 AM	45
8:15 AM	0
8:30 AM	0

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	63
6:45 AM	143
7:00 AM	225
7:15 AM	270
7:30 AM	207
7:45 AM	127

Notes:

PROJECT: Painted Hills PRD
 JOB NO. 13-1166
 INTERSECTION: Madison & Thorpe

Data Transfer
 Intersection No. 1

DATE OF COUNT: 3/11/2015
 Counter Analyst
 RMA RMA
 Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left	19		21		24	3	8		75	0.69	4%
	Through									0	0	
	Right	3		3		3		1		10	0.83	0%
	App. Total	22	0	24	0	27	3	9	0	85	0.71	
	Pct Trucks	0	0	0	0	0.1	0	0	0	0		
Westbound	Left									0		
	Through									0		
	Right									0		
	App. Total	0	0	0	0	0	0	0	0	0		
	Pct Trucks											
Northbound	Left	15		15	1	10		8		49	0.77	2%
	Through	15		18		19		9		61	0.80	0%
	Right									0		
	App. Total	30	0	33	1	29	0	17	0	110	0.81	
	Pct Trucks	0	0	0.029412	0	0	0	0	0	0		
Southbound	Left									0		
	Through	3		9		6		6		24	0.67	0%
	Right	8		13		17		13		51	0.75	0%
	App. Total	11	0	22	0	23	0	19	0	75	0.82	
	Pct Trucks	0	0	0	0	0	0	0	0	0		
Total Intersection Volume		63	0	79	1	79	3	45	0	270	0.82	
Intersection Pct Trucks			0.0%		1.3%		3.7%		0.0%			

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through									0
Southbound	Through									0
App. Total		0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills PRD
 JOB NO. 13-1166
 INTERSECTION: Madison & Thorpe

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 3/11/2015
 Counter Analyst

PM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @																
		3:30 PM	3:45 PM	4:00 PM	4:15 PM	4:30 PM	4:45 PM	5:00 PM	5:15 PM	5:30 PM	5:45 PM	6:00 PM	6:15 PM					
		pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk					
Eastbound	Left							8	1	5	3							
	Through																	
	Right							10	11	9								
	App. Total	0	0	0	0	0	0	18	1	16	0	12	0	17	0	0	0	0
	Pct Trucks							0.053			0			0				0
Westbound	Left																	
	Through																	
	Right																	
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pct Trucks																	
Northbound	Left							3		7	8							
	Through																	
	Right							5	12	11								
	App. Total	0	0	0	0	0	0	8	0	19	0	19	0	11	0	0	0	0
	Pct Trucks																	
Southbound	Left																	
	Through																	
	Right							24	17	18								
	App. Total	0	0	0	0	0	0	37	0	23	0	20	0	18	0	0	0	0
	Pct Trucks																	
Total Intersection Volume		0	0	0	0	0	0	63	1	58	0	51	0	46	0	0	0	0
Intersection Pct Trucks								1.6%		0.0%		0.0%		0.0%				

Notes:

Intersection Total	Pct
One Hour Volumes	Trucks
5:00 PM	219
5:15 PM	155
5:30 PM	97
	0.5%
	0.0%
	0.0%

Intersection Total	Pct
One Hour Volumes	Trucks
3:30 PM	0
3:45 PM	0
4:00 PM	0
4:15 PM	64
4:30 PM	122
4:45 PM	173
	1.6%
	0.8%
	0.6%

::

PROJECT: Painted Hills PRD
 JOB NO. 13-1166
 INTERSECTION: Madison & Thorpe

DATE OF COUNT: 3/11/2015
 Counter Analyst
 RMA

Whipple Consulting Engineers, Inc
 PM PEAK HOUR BREAKDOWN

Data Transfer
 Intersection No. 1

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left		8	1	5		3		4	21	0.58	5%
	Through											
	Right		10		11		9		13	43	0.83	0%
	App. Total		18	1	16	0	12	0	17	64	0.84	
	Pct Trucks		0.052632									
Westbound	Left									0		
	Through											
	Right									0		
	App. Total		0	0	0	0	0	0	0	0		
	Pct Trucks											
Northbound	Left		3		7		8		6	24	0.75	0%
	Through		5		12		11		5	33	0.69	0%
	Right											
	App. Total		8	0	19	0	19	0	11	57	0.75	
	Pct Trucks											
Southbound	Left									0		
	Through		24		17		18		14	73	0.76	0%
	Right		13		6		2		4	25	0.48	0%
	App. Total		37	0	23	0	20	0	18	98	0.66	
	Pct Trucks											
Total Intersection Volume			63	1	58	0	51	0	46	219	0.86	
Intersection Pct Trucks				1.6%		0.0%		0.0%				0.0%

Pedestrian Calls

APPROACH	MOVEMENT	5:00 PM		5:15 PM		5:30 PM		5:45 PM		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
Westbound	Through									0
Northbound	Through									0
Southbound	Through									0
App. Total		0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & HWY 27

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/22/2015
 Counter BNG

AM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @															
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15				
Eastbound	Left			15	27	1	20	37	35	1	20	13	1	12			
	Through			42	31	58	2	68	3	57	1	29	39	2	51	1	
	Right			21	13	1	10	24	13	1	11	1	17	14			
	App. Total	0	0	0	78	2	71	2	86	2	129	3	105	3	60	1	77
Pct Trucks				0.025	0.027	0.022	0.023	0.028	0.016	0.042	0.013						
Westbound	Left			11	7	1	11	19	1	10	1	6	2	9	1	9	3
	Through			45	46	2	47	48	3	61	1	31	1	28	1	31	1
	Right			8	12	13	13	19	9	10	10	9	4	1			
	App. Total	0	0	64	65	2	71	86	4	80	1	47	3	46	1	44	5
Pct Trucks				0	0.03	0.014	0.044	0.012	0.06	0.021	0.102						
Northbound	Left			33	37	1	15	21	37	20	18	20	1				
	Through			36	1	65	80	62	51	44	1	38	37	1			
	Right			23	16	25	31	31	30	18	24	24	1				
	App. Total	0	0	92	118	1	120	114	1	118	0	82	2	80	0	81	3
Pct Trucks				0.011	0.008	0	0.009	0	0.024	0	0.036						
Southbound	Left			2	4	5	5	5	4	8	3	2					
	Through			19	19	15	1	20	23	1	21	2	15	1	27		
	Right			4	7	14	2	23	2	23	4	5	1	13			
	App. Total	0	0	25	30	0	34	3	48	2	50	1	33	2	42	0	0
Pct Trucks				0.038	0	0.081	0.04	0.057	0.08	0							
Total Intersection Volume		0	0	259	4	284	5	313	6	377	10	353	5	222	8	218	6
Intersection Pct Trucks				1.5%	1.7%	1.9%	2.6%	2.7%	3.5%	3.6%							

Notes:

Intersection Total	Pct
One Hour Volumes	Trucks
8:00 AM	1065
8:15 AM	707
8:30 AM	477

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	552
6:45 AM	871
7:00 AM	1258
7:15 AM	1353
7:30 AM	1294
7:45 AM	1199

::

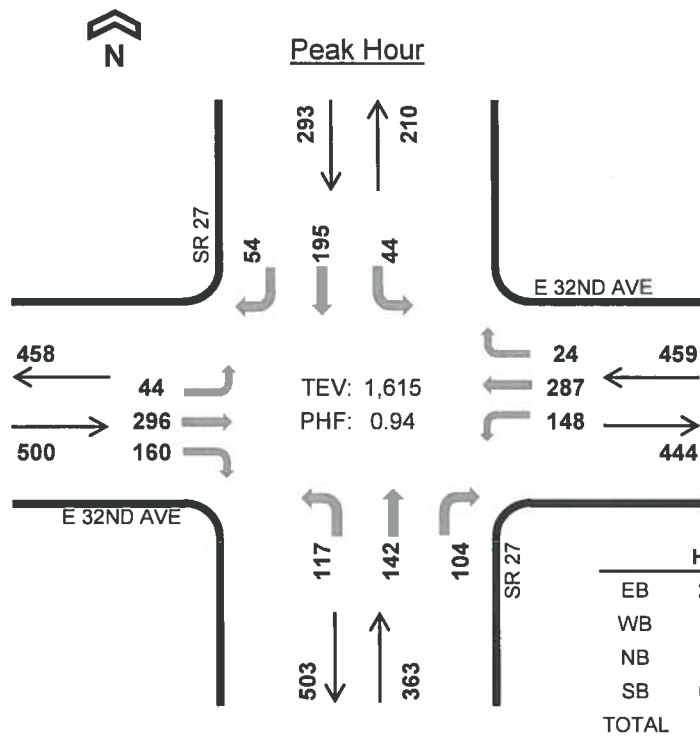
PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & HWY 27
 Data Transfer Intersection No. 1

DATE OF COUNT: 1/22/2015
 Counter Analyst
 BNG Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

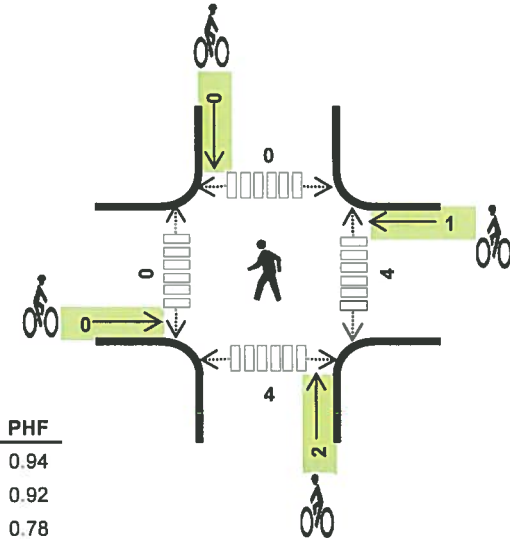
APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left	27	1	20	37	35	1	121	0.82	2%		
	Through	31	2	58	68	3	1	220	0.77	3%		
	Right	13	1	10	24	13	1	62	0.65	3%		
	App. Total	71	2	88	129	51	3	403	0.76			
	Pct Trucks	0.027397		0.022222		0.022727		0.027778				
Westbound	Left	7	1	11	19	1	1	50	0.63	6%		
	Through	46	2	47	48	3	61	207	0.85	2%		
	Right	12	1	13	19	9	9	53	0.70	0%		
	App. Total	65	2	71	86	4	80	310	0.86			
	Pct Trucks	0.029851		0.013889		0.044444		0.012346				
Northbound	Left	37	1	15	21	37	1	111	0.73	1%		
	Through	65	80	80	62	51	51	258	0.81	0%		
	Right	16	25	31	31	1	30	103	0.80	1%		
	App. Total	118	1	120	114	1	118	472	0.98			
	Pct Trucks	0.008403		0		0.008696		0				
Southbound	Left	4	5	5	5	4	4	18	0.90	0%		
	Through	19	15	1	20	23	1	79	0.82	3%		
	Right	7	14	2	23	2	23	71	0.71	6%		
	App. Total	30	0	34	48	2	50	168	0.82			
	Pct Trucks	0		0.081081		0.04		0.019608				
Total Intersection Volume		284	5	313	6	377	10	353		1353	0.87	
Intersection Pct Trucks		1.7%		1.9%		2.6%		1.4%				

APPROACH	MOVEMENT	7:15		7:30		7:45		8:00		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through	1	1	1	1	1	1	1	1	3
Westbound	Through									0
Northbound	Through	1								1
Southbound	Through									0
	App. Total	2	0	1	0	1	0	0	0	4

SR 27 E 32ND AVE



Date: Wed, Jul 02, 2014
 Count Period: 4:00 PM to 6:00 PM
 Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	2.0%	0.94
WB	1.5%	0.92
NB	1.4%	0.78
SB	0.3%	0.85
TOTAL	1.4%	0.94

Two-Hour Count Summaries

Interval Start	E 32ND AVE			E 32ND AVE			SR 27			SR 27			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	16	75	35	31	67	4	35	53	29	16	42	14	417	
4:15 PM	14	76	43	41	75	9	32	26	26	11	58	17	428	
4:30 PM	8	85	40	37	83	3	25	37	24	13	60	13	428	
4:45 PM	6	60	42	39	62	8	25	26	25	4	35	10	342	1,615
5:00 PM	14	47	21	26	52	11	28	30	31	6	40	13	319	1,517
5:15 PM	9	52	17	25	79	9	24	50	21	10	48	15	359	1,448
5:30 PM	5	49	23	19	41	42	21	43	27	12	55	24	361	1,381
5:45 PM	12	66	21	37	84	2	25	37	16	10	39	10	359	1,398
Count Total	84	510	242	255	543	88	215	302	199	82	377	116	3,013	
Peak Hr	44	296	160	148	287	24	117	142	104	44	195	54	1,615	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	1	0	0	5	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	2	0	0	2	0	0	2	0	2	0	0	0	0	0
4:30 PM	2	1	4	0	7	0	1	0	0	1	0	0	0	0	0
4:45 PM	4	3	1	1	9	0	0	0	0	0	4	0	0	4	8
5:00 PM	1	4	4	0	9	0	1	0	0	1	0	0	0	1	1
5:15 PM	2	3	3	0	8	1	0	0	0	1	0	0	0	1	1
5:30 PM	1	6	3	0	10	0	0	1	0	1	0	0	0	0	0
5:45 PM	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0
Count Total	14	21	17	1	53	1	2	3	0	6	4	0	0	6	10
Peak Hr	10	7	5	1	23	0	1	2	0	3	4	0	0	4	8

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Evergreen

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/27/2015
 Counter Analyst
 BNG

AM PEAK HOURS

APPROACH	15 Minute Period Beginning @											
	6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15
MOVEMENT	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk
Eastbound			19	35	50	3	55	44	39	32	1	29
Through			33	34	46	2	43	48	45	35	1	49
Right									2			
App. Total	0	0	52	69	96	5	98	92	86	67	2	78
Pct Trucks			0.037		0	0.05	0.01	0.011	0	0.029		0.013
Westbound			46	40	52	2	44	47	40	4		44
Through			8	7	6	3	3	8	4	2		2
Right												
App. Total	0	0	54	47	58	2	47	55	44	4	0	46
Pct Trucks					0	0.033	0	0.052	0.083	0		0
Northbound												
Through												
Right												
App. Total	0	0	0	0	0	0	0	0	0	0	0	0
Pct Trucks												
Southbound			1		2	1		2		1		
Through												
Right			21	13	3	30	24	1	25	13	1	25
App. Total	0	0	22	13	3	32	25	1	27	3	2	25
Pct Trucks				0.188	0		0.038		0.167	0.125		0.038
Total Intersection Volume	0	0	128	2	186	7	170	2	174	4	145	7
Intersection Pct Trucks			1.5%	2.3%	3.6%	1.2%	1.2%	2.2%	4.6%	3.4%	1.3%	1.3%

Intersection Total	Pct
One Hour Volumes	Trucks
8:00 AM	598
8:15 AM	420
8:30 AM	268

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	262
6:45 AM	455
7:00 AM	627
7:15 AM	675
7:30 AM	695
7:45 AM	619

Notes:

PROJECT: Painted Hills GC
 JOB NO. 13-1166
 INTERSECTION: 32nd & Evergreen
 Data Transfer
 Intersection No. 1

DATE OF COUNT: 1/27/2015
 Counter Analyst
 BNG Whipple Consulting Engineers, Inc
 AM PEAK HOUR BREAKDOWN

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left	50	3	55	44	44	1	39	192	0.87	2%	
	Through	46	2	43	1	48		45	185	0.96	2%	
	Right							2	2	0.25	0%	
	App. Total	96	5	98	1	92	1	86	379	0.94		
	Pct Trucks	0.049505		0.010101		0.010753		0				
Westbound	Left								0			
	Through	52	2	44	47	47	3	40	192	0.89	5%	
	Right	6	3	3	8	8	4	4	21	0.66	0%	
	App. Total	58	2	47	0	55	3	44	213	0.89		
	Pct Trucks	0.033333		0		0.051724		0.063333				
Northbound	Left								0			
	Through								0			
	Right								0			
	App. Total	0	0	0	0	0	0	0	0			
	Pct Trucks											
Southbound	Left	2		1	2	2			5	0.63	0%	
	Through	30		24	1	25		15	98	0.82	4%	
	Right	32	0	25	1	27	0	15	103	0.80		
	App. Total	64	0	50	3	54	0	30	206			
	Pct Trucks	0		0.038462		0.051724		0.166667				
Total Intersection Volume		186	7	170	2	174	4	145	695	0.90		
Intersection Pct Trucks			3.6%		1.2%		2.2%		4.6%			

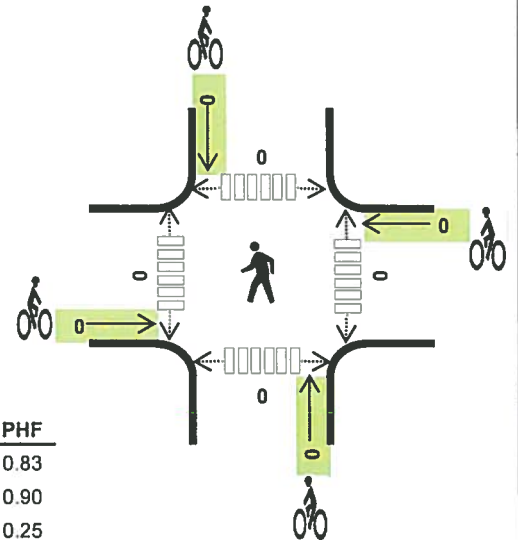
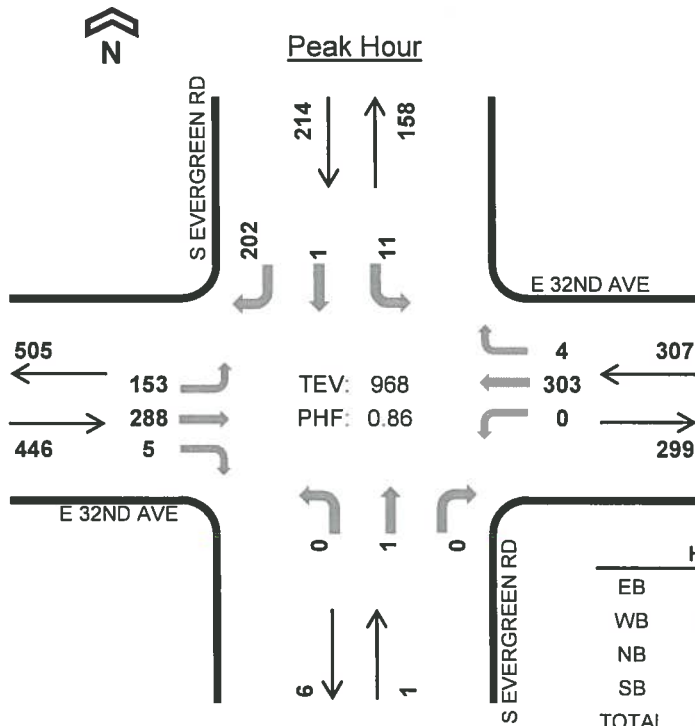
Pedestrian Calls

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
	Through									0
	Through									0
	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

S EVERGREEN RD E 32ND AVE



Date: Wed, Jul 02, 2014
 Count Period: 4:00 PM to 6:00 PM
 Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	1.3%	0.83
WB	0.3%	0.90
NB	0.0%	0.25
SB	2.3%	0.76
TOTAL	1.2%	0.86

Two-Hour Count Summaries

Interval Start	E 32ND AVE Eastbound			E 32ND AVE Westbound			S EVERGREEN RD Northbound			S EVERGREEN RD Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	28	47	0	0	50	3	0	0	0	3	0	33	164	
4:15 PM	23	48	3	0	79	2	0	0	0	3	0	49	207	
4:30 PM	40	50	0	0	75	0	0	1	0	1	0	57	224	
4:45 PM	39	47	1	0	81	4	0	0	0	3	0	40	215	810
5:00 PM	44	73	1	0	68	0	0	1	0	1	0	44	232	878
5:15 PM	28	76	2	0	77	0	0	0	0	3	1	52	239	910
5:30 PM	42	92	1	0	77	0	0	0	0	4	0	66	282	968
5:45 PM	23	67	0	0	66	4	0	0	0	5	1	44	210	963
Count Total	267	500	8	0	573	13	0	2	0	23	2	385	1,773	
Peak Hr	153	288	5	0	303	4	0	1	0	11	1	202	968	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	4	2	0	0	6	0	0	0	0	0	0	0	0	0	0
4:15 PM	1	1	0	1	3	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0
5:00 PM	3	1	0	2	6	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0
Count Total	13	4	0	7	24	0	0	0	0	0	0	0	0	0	0
Peak Hr	6	1	0	5	12	0	0	0	0	0	0	0	0	0	0

PROJECT: Painted Hills GC
 JOB NO: 13-1166
 INTERSECTION: 32nd & Sullivan

Whipple Consulting Engineers, Inc
 TRAFFIC COUNT REDUCTION WORKSHEET

DATE OF COUNT: 1/27/2015
 Counter

AM PEAK HOURS

APPROACH	MOVEMENT	15 Minute Period Beginning @																					
		6:30	6:45	7:00	7:15	7:30	7:45	8:00	8:15	8:30	8:45	9:00	9:15										
		pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk	pass	lrk										
Eastbound	Left			33	1	26	2	56	1	38	1	46	1	45	1								
	Through									4													
	Right			1								3											
	App. Total	0	0	0	34	1	26	2	57	1	42	1	49	0	27	1							
	Pct Trucks			0.029		0.071		0.017		0.025		0.023		0.036									
Westbound	Left																						
	Through																						
	Right																						
	App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
	Pct Trucks																						
Northbound	Left			4		5	4	4		2	4	4		6									
	Through			13		19	26	21		12	15	15		26	14								
	Right																						
	App. Total	0	0	0	17	0	24	0	30	0	14	0	19	0	33	0							
	Pct Trucks			0		0		0		0		0		0									
Southbound	Left																						
	Through			2		8	5	6		5	6	6		13	1								
	Right			33	1	30	44	3	27	1	36	4	23	4	28	27							
	App. Total	0	0	0	35	1	38	0	49	3	41	4	29	4	32	0							
	Pct Trucks			0.028		0		0.058		0.029		0.089		0.121									
Total Intersection Volume		0	0	0	86	2	88	2	136	4	97	2	97	5	97	4	92	1	106	6	0	0	0
Intersection Pct Trucks				2.3%		2.2%		2.9%		2.0%		4.9%		4.0%		5.4%		1.1%		5.4%			

Intersection Total	Pct
One Hour Volumes	Trucks
6:30 AM	178 2.2%
6:45 AM	318 3.6%
7:00 AM	417 4.7%
7:15 AM	431 4.9%
7:30 AM	442 5.0%
7:45 AM	395 4.5%

Intersection Total	Pct
One Hour Volumes	Trucks
8:00 AM	408 4.7%
8:15 AM	306 3.5%
8:30 AM	205 2.4%

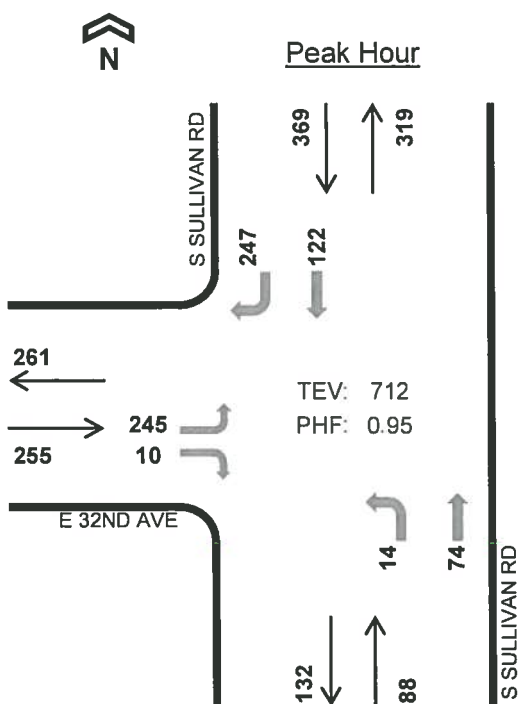
Notes:

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		TOTAL	P.H.F.	Pct Trucks
		pass	lrk	pass	lrk	pass	lrk	pass	lrk			
Eastbound	Left	56	1	38	1	38	1	46	181	0.79	2%	
	Through			1		4			5	0.31	0%	
	Right	1						3	4	0.33	0%	
	App. Total	57	1	39	1	42	1	49	190	0.82		
	Pct Trucks	0.017241		0.025		0.023256		0				
Westbound	Left								0			
	Through								0			
	Right								0			
	App. Total	0	0	0	0	0	0	0	0			
	Pct Trucks	0		0		0		0				
Northbound	Left	4		4		2		4	14	0.88	0%	
	Through	26		21		12		15	74	0.71	0%	
	Right								0			
	App. Total	30	0	25	0	14	0	19	88	0.73		
	Pct Trucks	0		0		0		0				
Southbound	Left								0			
	Through	5		6		5		6	22	0.92	0%	
	Right	44	3	27	1	36	4	23	142	0.76	8%	
	App. Total	49	3	33	1	41	4	29	164	0.79		
	Pct Trucks	0.057692		0.029412		0.088889		0.121212				
Total Intersection Volume		136	4	97	2	97	5	97	442	0.79		
Intersection Pct Trucks		2.9%		2.0%		4.9%		4.0%				

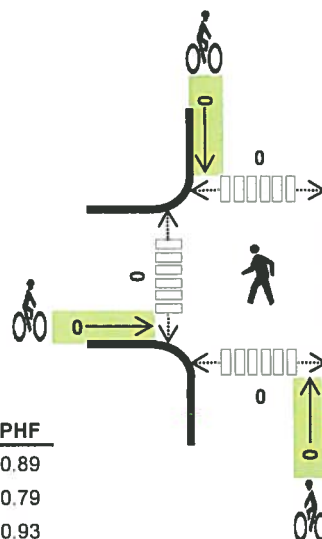
Pedestrian Calls

APPROACH	MOVEMENT	7:30		7:45		8:00		8:15		TOTAL
		ped	bike	ped	bike	ped	bike	ped	bike	
Eastbound	Through									0
	Through									0
	Through									0
	Through									0
	App. Total	0	0	0	0	0	0	0	0	0

S SULLIVAN RD E 32ND AVE



Date: Wed, Jul 02, 2014
 Count Period: 4:00 PM to 6:00 PM
 Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	1.6%	0.89
NB	0.0%	0.79
SB	0.3%	0.93
TOTAL	0.7%	0.95

Two-Hour Count Summaries

Interval Start	E 32ND AVE			E 32ND AVE			S SULLIVAN RD			S SULLIVAN RD			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	54	0	4	0	0	0	1	14	0	0	37	59	169	
4:15 PM	69	0	3	0	0	0	5	23	0	0	29	59	188	
4:30 PM	67	0	1	0	0	0	2	15	0	0	29	70	184	
4:45 PM	55	0	2	0	0	0	6	22	0	0	27	59	171	712
5:00 PM	46	0	3	0	0	0	5	9	0	0	20	50	133	676
5:15 PM	51	0	2	0	0	0	2	7	0	0	24	76	162	650
5:30 PM	41	0	4	0	0	0	2	15	0	0	29	59	150	616
5:45 PM	45	0	4	0	0	0	3	8	0	0	27	71	158	603
Count Total	428	0	23	0	0	0	26	113	0	0	222	503	1,315	
Peak Hr	245	0	10	0	0	0	14	74	0	0	122	247	712	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	1	1	0	1	0	0	1	0	0	0	0	0
4:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0
5:00 PM	3	0	0	1	4	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
Count Total	8	0	0	2	10	1	1	0	0	2	0	0	0	0	0
Peak Hr	4	0	0	1	5	0	1	0	0	1	0	0	0	0	0

BACKGROUND PROJECTS

Painted Hills PRD
Background projects

Status

Elk Ridge Heights
Pine Valley Ranch
Paxton Addition
The Creek at Chester

78 lots Remaining
132 lots Remaining
13 lots Remaining
44 lots Remaining

Elk Ridge Heights

119 single family residential lots platted
41 lots built out
 78 single family residential lots

Trip Generation

Table 3 - Trip Generation Rates for LUC # 210 – Single Family Residential Detached Housing

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. @ 0.76 trips per Unit	Directional Distribution		Vol. @ 1.01 trips per Unit	Directional Distribution	
		26% In	74% Out		65% In	35% Out
78	59	15	44	79	51	28
Average Daily Trip Ends (ADT)						
Units	Rate	ADT				
78	11.66	909				

Trip Distribution

95% north on State Route 27 towards 32nd Avenue
 55% north on State Route 27
 23% west on 32nd Avenue
 17% east on 32nd Avenue

5% south on State Route 27

Pine Valley Ranch

132 single family residential lots platted

0 lots built out

132 single family residential lots

Trip Generation

Table 4 - Trip Generation Rates for LUC # 220 – Apartments

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. per * equation	Directional Distribution		Vol. per ** equation	Directional Distribution	
		20% In	80% Out		65% In	35% Out
132	69	14	55	90	59	31
Average Daily Trip Ends (ADT)				*AM Vol. eqn: $T=0.49(X)+3.73$		
Units	Rate	ADT		**PM Vol. eqn: $T=0.55(X)+17.65$		
132	6.65	878				

Trip Distribution

- 15% west on 32nd Avenue towards Dishman-Mica Road
- 35% north on State Route 27
- 20% east on 32nd Avenue, then north on Sullivan Road
- 15% east on 32nd Avenue, then north on Evergreen Road
- 5% north on State Route 27, then west on 16th Avenue
- 5% south on State Route 27
- 5% internal

Paxton Addition

14 single family residential lots platted
1 lots built out
 13 single family residential lots remain

Trip Generation

Table 1 - Trip Generation Rates for LUC # 210 – Single Family Residential Detached Housing

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. @ 0.76 trips per Unit	Directional Distribution		Vol. @ 1.01 trips per Unit	Directional Distribution	
		26% In	74% Out		65% In	35% Out
13	10	3	7	13	8	5
Average Daily Trip Ends (ADT)						
Units	Rate	ADT				
13	11.66	152				

Trip Distribution

60% north on Madison Road towards 32nd Avenue
 34% east on 32nd Avenue
 17% north on Pines Road
 9% west on 32nd Avenue

40% west on Thorpe Road towards Dishman-Mica Road
 36% north on Dishman-Mica Road
 4% south on Dishman-Mica Road

The Creek at Chester

49 single family residential lots platted
5 lots built out
 44 single family residential lots remain

Trip Generation

Table 2 - Trip Generation Rates for LUC # 210 – Single Family Residential Detached Housing

Dwelling Units	AM Peak Hour			PM Peak Hour		
	Vol. @ 0.76 trips per Unit	Directional Distribution		Vol. @ 1.01 trips per Unit	Directional Distribution	
		26% In	74% Out		65% In	35% Out
44	33	9	24	44	29	15
Average Daily Trip Ends (ADT)						
Units	Rate	ADT				
44	11.66	513				

Trip Distribution



















60% north on Madison Road towards 32nd Avenue
 34% east on 32nd Avenue
 17% north on Pines Road
 9% west on 32nd Avenue

40% west on Thorpe Road towards Dishman-Mica Road
 36% north on Dishman-Mica Road
 4% south on Dishman-Mica Road

**LEVEL OF SERVICE
CALCULATIONS
EXISTING CONDITIONS**

HCM Signalized Intersection Capacity Analysis
 1: University Rd & 32nd Ave

2015 AM Existing
 6/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	112	5	26	391	108	20	68	58	70	25	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Fr _t		0.99			0.97		1.00	0.93		1.00	0.98	
Fl _t Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3514			3422		1770	3295		1770	3461	
Fl _t Permitted		0.95			0.94		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3334			3213		1770	3295		1770	3461	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	132	6	31	460	127	24	80	68	82	29	5
RTOR Reduction (vph)	0	3	0	0	21	0	0	53	0	0	4	0
Lane Group Flow (vph)	0	137	0	0	597	0	24	95	0	82	30	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		20.4			20.4		1.2	10.9		5.1	14.8	
Effective Green, g (s)		20.4			20.4		1.2	10.9		5.1	14.8	
Actuated g/C Ratio		0.40			0.40		0.02	0.22		0.10	0.29	
Clearance Time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Grp Cap (vph)		1349			1300		42	712		179	1016	
v/s Ratio Prot							0.01	c0.03		c0.05	c0.01	
v/s Ratio Perm		0.04			c0.19							
v/c Ratio		0.10			0.46		0.57	0.13		0.46	0.03	
Uniform Delay, d ₁		9.3			11.0		24.3	15.9		21.3	12.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d ₂		0.1			0.5		20.6	0.2		2.5	0.0	
Delay (s)		9.4			11.5		44.9	16.1		23.9	12.7	
Level of Service		A			B		D	B		C	B	
Approach Delay (s)		9.4			11.5			20.1			20.6	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			13.6				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			50.4				Sum of lost time (s)			14.0		
Intersection Capacity Utilization			37.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2: Schafer Rd/University Rd & Dishman-Mica Rd

2015 AM Existing
 6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↕		↖	↗		↖	↑	↗
Volume (vph)	6	75	34	10	343	25	205	89	31	11	36	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3504		1770	1791		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3504		1770	1791		1770	1863	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	7	88	40	12	404	29	241	105	36	13	42	24
RTOR Reduction (vph)	0	0	30	0	4	0	0	9	0	0	0	22
Lane Group Flow (vph)	7	88	10	12	429	0	241	132	0	13	42	2
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3		
Permitted Phases			6								8	8
Actuated Green, G (s)	1.0	14.5	14.5	1.0	14.5		15.5	18.7		1.1	4.3	4.3
Effective Green, g (s)	1.0	14.5	14.5	1.0	14.5		15.5	18.7		1.1	4.3	4.3
Actuated g/C Ratio	0.02	0.26	0.26	0.02	0.26		0.28	0.34		0.02	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	32	488	415	32	918		496	605		35	144	123
v/s Ratio Prot	0.00	0.05		c0.01	c0.12		c0.14	c0.07		0.01		
v/s Ratio Perm			0.01								0.02	0.00
v/c Ratio	0.22	0.18	0.03	0.38	0.47		0.49	0.22		0.37	0.29	0.02
Uniform Delay, d1	26.8	15.8	15.2	26.8	17.2		16.6	13.1		26.8	24.1	23.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.7	0.2	0.0	9.8	0.5		1.0	0.2		8.8	1.5	0.1
Delay (s)	31.4	16.0	15.2	36.6	17.7		17.6	13.3		35.6	25.6	23.6
Level of Service	C	B	B	D	B		B	B		D	C	C
Approach Delay (s)		16.6			18.2			16.0			26.6	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	55.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	38.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bowdish Rd & 32nd Ave

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	73	208	9	47	321	26	88	117	92	46	24	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	1851		1770	1842			1759			1774	
Flt Permitted	0.35	1.00		0.61	1.00			0.87			0.74	
Satd. Flow (perm)	651	1851		1129	1842			1556			1354	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	83	236	10	53	365	30	100	133	105	52	27	15
RTOR Reduction (vph)	0	2	0	0	3	0	0	20	0	0	8	0
Lane Group Flow (vph)	83	244	0	53	392	0	0	318	0	0	86	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	26.3	21.0		22.9	19.3			17.8			17.8	
Effective Green, g (s)	26.3	21.0		22.9	19.3			17.8			17.8	
Actuated g/C Ratio	0.47	0.37		0.41	0.34			0.32			0.32	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	408	689		499	630			491			427	
v/s Ratio Prot	c0.02	0.13		0.01	c0.21							
v/s Ratio Perm	0.08			0.04				c0.20			0.06	
v/c Ratio	0.20	0.35		0.11	0.62			0.65			0.20	
Uniform Delay, d1	8.9	12.8		10.3	15.5			16.6			14.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.4		0.1	2.2			3.3			0.3	
Delay (s)	9.2	13.2		10.4	17.7			19.9			14.4	
Level of Service	A	B		B	B			B			B	
Approach Delay (s)		12.2			16.8			19.9			14.4	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	14.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Bowdish Rd & Dishman-Mica Rd

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	76	26	27	218	22	96	122	41	23	53	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Fr _t	1.00	0.96		1.00	0.99			0.98			1.00	0.85
Fl _t Protected	0.95	1.00		0.95	1.00			0.98			0.99	1.00
Satd. Flow (prot)	1770	1791		1770	1837			1790			1835	1583
Fl _t Permitted	0.95	1.00		0.95	1.00			0.85			0.86	1.00
Satd. Flow (perm)	1770	1791		1770	1837			1546			1610	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	7	87	30	31	251	25	110	140	47	26	61	9
RTOR Reduction (vph)	0	16	0	0	6	0	0	6	0	0	0	6
Lane Group Flow (vph)	7	101	0	31	270	0	0	291	0	0	87	3
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4
Actuated Green, G (s)	1.1	12.2		1.3	12.4			16.0			16.0	16.0
Effective Green, g (s)	1.1	12.2		1.3	12.4			16.0			16.0	16.0
Actuated g/C Ratio	0.03	0.28		0.03	0.28			0.36			0.36	0.36
Clearance Time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Grp Cap (vph)	44	496		52	517			562			585	575
v/s Ratio Prot	0.00	0.06		c0.02	c0.15							
v/s Ratio Perm								c0.19			0.05	0.00
v/c Ratio	0.16	0.20		0.60	0.52			0.52			0.15	0.01
Uniform Delay, d ₁	21.0	12.2		21.1	13.3			11.0			9.4	8.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d ₂	2.3	0.3		19.6	1.2			1.1			0.2	0.0
Delay (s)	23.3	12.5		40.7	14.6			12.0			9.6	8.9
Level of Service	C	B		D	B			B			A	A
Approach Delay (s)		13.1			17.2			12.0			9.5	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
6: Dishman-Mica Rd & Thorpe Rd

2015 AM Existing
6/11/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	4	81	178	14	56	79
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	5	94	207	16	65	92
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	437	215			223	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	437	215			223	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	89			95	
cM capacity (veh/h)	549	825			1346	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	99	223	157
Volume Left	5	0	65
Volume Right	94	16	0
cSH	806	1700	1346
Volume to Capacity	0.12	0.13	0.05
Queue Length 95th (ft)	10	0	4
Control Delay (s)	10.1	0.0	3.5
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	3.5
Approach LOS	B		

Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		32.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Pines Rd & 16th Ave

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	0	223	41	49	198	0	24	0	198	0	134	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	253	47	56	225	0	27	0	225	0	152	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					129							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	225			300			724	613	277	838	636	225
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			300			628	503	277	756	529	67
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			88	100	70	100	61	96
cM capacity (veh/h)	1365			1261			227	400	762	197	387	887

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	300	281	252	188
Volume Left	0	56	27	0
Volume Right	47	0	225	35
cSH	1700	1261	607	433
Volume to Capacity	0.18	0.04	0.42	0.43
Queue Length 95th (ft)	0	3	51	54
Control Delay (s)	0.0	1.9	15.1	19.5
Lane LOS		A	C	C
Approach Delay (s)	0.0	1.9	15.1	19.5
Approach LOS			C	C

Intersection Summary			
Average Delay		7.8	
Intersection Capacity Utilization		63.2%	ICU Level of Service B
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
8: Hwy 27 & 16th Ave

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Volume (vph)	173	184	20	5	188	68	49	401	18	39	99	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1819	1583		1860	1583	1770	3517		1770	3535	
Flt Permitted		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1819	1583		1860	1583	1770	3517		1770	3535	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	204	216	24	6	221	80	58	472	21	46	116	1
RTOR Reduction (vph)	0	0	16	0	0	80	0	2	0	0	0	0
Lane Group Flow (vph)	0	420	8	0	227	0	58	491	0	46	117	0
Turn Type	Split	NA	Perm	Split	NA	NA	Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		30.6	30.6		19.3	0.0	7.4	20.7		6.8	20.1	
Effective Green, g (s)		30.6	30.6		19.3	0.0	7.4	20.7		6.8	20.1	
Actuated g/C Ratio		0.31	0.31		0.20	0.00	0.08	0.21		0.07	0.21	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	2.5		3.0	1.9	
Lane Grp Cap (vph)		571	497		368	0	134	747		123	729	
v/s Ratio Prot		c0.23			c0.12		c0.03	c0.14		0.03	0.03	
v/s Ratio Perm			0.00									
v/c Ratio		0.74	0.02		0.62	0.00	0.43	0.66		0.37	0.16	
Uniform Delay, d1		29.8	23.0		35.7	48.7	43.0	35.1		43.3	31.7	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.9	0.0		3.1	0.0	2.2	1.9		1.9	0.0	
Delay (s)		34.7	23.0		38.7	48.7	45.2	37.0		45.2	31.8	
Level of Service		C	C		D	D	D	D		D	C	
Approach Delay (s)		34.1			41.3			37.9			35.5	
Approach LOS		C			D			D			D	

Intersection Summary		
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.66	
Actuated Cycle Length (s)	97.4	Sum of lost time (s) 20.0
Intersection Capacity Utilization	61.9%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
9: Pines Rd & 32nd Ave

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	365	12	42	371	37	20	42	96	182	25	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	0.99		1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1854		1770	1837		1770	1669		1770	1714	
Flt Permitted	0.36	1.00		0.35	1.00		0.72	1.00		0.35	1.00	
Satd. Flow (perm)	666	1854		644	1837		1332	1669		644	1714	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	34	440	14	51	447	45	24	51	116	219	30	34
RTOR Reduction (vph)	0	1	0	0	2	0	0	60	0	0	25	0
Lane Group Flow (vph)	34	453	0	51	490	0	24	107	0	219	39	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	50.5	46.6		54.7	48.7		15.9	13.3		32.8	25.7	
Effective Green, g (s)	50.5	46.6		54.7	48.7		15.9	13.3		32.8	25.7	
Actuated g/C Ratio	0.51	0.47		0.55	0.49		0.16	0.13		0.33	0.26	
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	379	864		420	895		223	222		380	440	
v/s Ratio Prot	0.00	0.24		c0.01	c0.27		0.00	0.06		c0.09	0.02	
v/s Ratio Perm	0.04			0.06			0.01			c0.10		
v/c Ratio	0.09	0.52		0.12	0.55		0.11	0.48		0.58	0.09	
Uniform Delay, d1	13.2	18.8		11.7	17.9		35.8	40.1		26.1	28.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	2.3		0.1	2.4		0.2	3.4		2.1	0.2	
Delay (s)	13.3	21.1		11.9	20.3		36.0	43.5		28.3	28.4	
Level of Service	B	C		B	C		D	D		C	C	
Approach Delay (s)		20.6			19.5			42.6			28.3	
Approach LOS		C			B			D			C	

Intersection Summary

HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	19.0
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

Description: Plan 2

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
14: Madison Rd & Thorpe Rd

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	75	0	10	0	0	0	49	61	0	0	24	51
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.92	0.82	0.92	0.92	0.92	0.82	0.82	0.92	0.92	0.82	0.82
Hourly flow rate (vph)	91	0	12	0	0	0	60	74	0	0	29	62
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	254	254	60	266	285	74	91			74		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	254	254	60	266	285	74	91			74		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	99	100	100	100	96			100		
cM capacity (veh/h)	678	624	1005	657	599	987	1503			1525		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	104	0	134	91
Volume Left	91	0	60	0
Volume Right	12	0	0	62
cSH	705	1700	1503	1525
Volume to Capacity	0.15	0.00	0.04	0.00
Queue Length 95th (ft)	13	0	3	0
Control Delay (s)	11.0	0.0	3.5	0.0
Lane LOS	B	A	A	
Approach Delay (s)	11.0	0.0	3.5	0.0
Approach LOS	B	A		

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
15: Hwy 27 & 32nd Ave

2015 AM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	121	220	62	50	207	53	111	258	103	18	79	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.96		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3423		1770	1806		1770	3388		1770	3288	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3423		1770	1806		1770	3388		1770	3288	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	139	253	71	57	238	61	128	297	118	21	91	82
RTOR Reduction (vph)	0	15	0	0	6	0	0	27	0	0	69	0
Lane Group Flow (vph)	139	309	0	57	293	0	128	388	0	21	104	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.3	25.1		6.9	19.7		11.8	21.6		2.6	12.4	
Effective Green, g (s)	12.3	25.1		6.9	19.7		11.8	21.6		2.6	12.4	
Actuated g/C Ratio	0.16	0.33		0.09	0.26		0.15	0.28		0.03	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.0	2.7	
Lane Grp Cap (vph)	285	1127		160	466		274	960		60	535	
v/s Ratio Prot	c0.08	0.09		0.03	c0.16		c0.07	c0.11		0.01	0.03	
v/s Ratio Perm												
v/c Ratio	0.49	0.27		0.36	0.63		0.47	0.40		0.35	0.20	
Uniform Delay, d1	29.1	18.8		32.6	25.0		29.3	22.1		36.0	27.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.1		1.4	2.7		1.3	0.2		3.5	0.1	
Delay (s)	30.4	19.0		33.9	27.7		30.6	22.3		39.5	27.7	
Level of Service	C	B		C	C		C	C		D	C	
Approach Delay (s)		22.4			28.7			24.3			29.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	76.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
16: 32nd Ave & Evergreen Rd

2015 AM Existing
6/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	192	185	2	0	192	21	0	0	0	5	0	98
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	213	206	2	0	213	23	0	0	0	6	0	109
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	237			208			967	870	207	857	859	225
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	237			208			967	870	207	857	859	225
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			100			100	100	100	98	100	87
cM capacity (veh/h)	1330			1363			177	243	834	243	247	814

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	213	208	237	0	6	109
Volume Left	213	0	0	0	6	0
Volume Right	0	2	23	0	0	109
cSH	1330	1700	1363	1700	243	814
Volume to Capacity	0.16	0.12	0.00	0.00	0.02	0.13
Queue Length 95th (ft)	14	0	0	0	2	12
Control Delay (s)	8.2	0.0	0.0	0.0	20.1	10.1
Lane LOS	A			A	C	B
Approach Delay (s)	4.2		0.0	0.0	10.6	
Approach LOS				A	B	

Intersection Summary		
Average Delay		3.8
Intersection Capacity Utilization	38.1%	ICU Level of Service A
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis
 17: Sullivan Rd & 32nd Ave

2015 AM Existing
 6/11/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	LT			TH	TH	LT
Volume (veh/h)	181	4	14	74	22	142
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	229	5	18	94	28	180
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	157	28	208			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	157	28	208			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	100	99			
cM capacity (veh/h)	823	1047	1363			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	234	111	28	180
Volume Left	229	18	0	0
Volume Right	5	0	0	180
cSH	827	1363	1700	1700
Volume to Capacity	0.28	0.01	0.02	0.11
Queue Length 95th (ft)	29	1	0	0
Control Delay (s)	11.1	1.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.1	1.3	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization		28.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: University Rd & 32nd Ave

2015 PM Existing
 6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕		↗	↕↕	
Volume (vph)	2	333	16	60	163	55	12	53	56	80	82	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frt		0.99			0.97		1.00	0.92		1.00	0.99	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3514			3397		1770	3265		1770	3510	
Flt Permitted		0.95			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3351			2789		1770	3265		1770	3510	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2	354	17	64	173	59	13	56	60	85	87	5
RTOR Reduction (vph)	0	3	0	0	22	0	0	46	0	0	3	0
Lane Group Flow (vph)	0	370	0	0	274	0	13	70	0	85	89	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		15.7			15.7		1.1	10.4		5.0	14.3	
Effective Green, g (s)		15.7			15.7		1.1	10.4		5.0	14.3	
Actuated g/C Ratio		0.35			0.35		0.02	0.23		0.11	0.32	
Clearance Time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Grp Cap (vph)		1166			970		43	752		196	1112	
v/s Ratio Prot							0.01	0.02		c0.05	c0.03	
v/s Ratio Perm		c0.11			0.10							
v/c Ratio		0.32			0.28		0.30	0.09		0.43	0.08	
Uniform Delay, d1		10.8			10.6		21.6	13.6		18.7	10.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.3		5.4	0.1		2.1	0.1	
Delay (s)		11.1			11.0		27.0	13.8		20.8	10.9	
Level of Service		B			B		C	B		C	B	
Approach Delay (s)		11.1			11.0			15.1			15.6	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	41.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 2: Schafer Rd/University Rd & Dishman-Mica Rd

2015 PM Existing
 6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↕		↖	↗		↖	↑	↗
Volume (vph)	11	298	147	22	104	19	82	67	7	32	103	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3458		1770	1837		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3458		1770	1837		1770	1863	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	13	347	171	26	121	22	95	78	8	37	120	7
RTOR Reduction (vph)	0	0	104	0	9	0	0	3	0	0	0	6
Lane Group Flow (vph)	13	347	67	26	134	0	95	83	0	37	120	1
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3		
Permitted Phases			6								8	8
Actuated Green, G (s)	1.2	25.5	25.5	2.6	26.9		8.1	12.3		4.5	8.7	8.7
Effective Green, g (s)	1.2	25.5	25.5	2.6	26.9		8.1	12.3		4.5	8.7	8.7
Actuated g/C Ratio	0.02	0.39	0.39	0.04	0.41		0.12	0.19		0.07	0.13	0.13
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	32	731	621	70	1433		220	348		122	249	212
v/s Ratio Prot	0.01	c0.19		c0.01	0.04		c0.05	c0.05		0.02		
v/s Ratio Perm			0.04								c0.06	0.00
v/c Ratio	0.41	0.47	0.11	0.37	0.09		0.43	0.24		0.30	0.48	0.00
Uniform Delay, d1	31.5	14.7	12.5	30.4	11.6		26.3	22.3		28.7	26.0	24.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.1	0.7	0.1	4.5	0.0		1.9	0.5		1.9	2.0	0.0
Delay (s)	42.6	15.4	12.6	34.8	11.6		28.1	22.8		30.6	28.0	24.4
Level of Service	D	B	B	C	B		C	C		C	C	C
Approach Delay (s)		15.1			15.2			25.6			28.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: Bowdish Rd & 32nd Ave

2015 PM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	298	49	84	226	38	32	87	63	36	102	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.95			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	1823		1770	1823			1761			1801	
Flt Permitted	0.59	1.00		0.45	1.00			0.92			0.89	
Satd. Flow (perm)	1097	1823		832	1823			1642			1626	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	314	52	88	238	40	34	92	66	38	107	29
RTOR Reduction (vph)	0	6	0	0	6	0	0	27	0	0	10	0
Lane Group Flow (vph)	31	360	0	88	272	0	0	165	0	0	164	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	22.7	20.8		26.9	22.9			9.3			9.3	
Effective Green, g (s)	22.7	20.8		26.9	22.9			9.3			9.3	
Actuated g/C Ratio	0.47	0.43		0.56	0.48			0.19			0.19	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	544	788		543	867			317			314	
v/s Ratio Prot	0.00	c0.20		c0.01	0.15							
v/s Ratio Perm	0.02			0.08				c0.10			0.10	
v/c Ratio	0.06	0.46		0.16	0.31			0.52			0.52	
Uniform Delay, d1	6.8	9.7		5.1	7.8			17.4			17.4	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.6		0.1	0.3			2.0			2.0	
Delay (s)	6.9	10.2		5.2	8.0			19.4			19.4	
Level of Service	A	B		A	A			B			B	
Approach Delay (s)		10.0			7.4			19.4			19.4	
Approach LOS		A			A			B			B	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	48.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Bowdish Rd & Dishman-Mica Rd

2015 PM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	220	106	18	99	21	39	80	10	13	100	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.95		1.00	0.97			0.99			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	1772		1770	1814			1816			1852	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.87			0.95	1.00
Satd. Flow (perm)	1770	1772		1770	1814			1602			1778	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	239	115	20	108	23	42	87	11	14	109	7
RTOR Reduction (vph)	0	19	0	0	10	0	0	4	0	0	0	5
Lane Group Flow (vph)	11	335	0	20	121	0	0	136	0	0	123	2
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4
Actuated Green, G (s)	1.0	16.8		1.1	16.9			10.6			10.6	10.6
Effective Green, g (s)	1.0	16.8		1.1	16.9			10.6			10.6	10.6
Actuated g/C Ratio	0.02	0.39		0.03	0.39			0.25			0.25	0.25
Clearance Time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Grp Cap (vph)	41	692		45	712			394			438	390
v/s Ratio Prot	0.01	c0.19		c0.01	0.07							
v/s Ratio Perm								c0.09			0.07	0.00
v/c Ratio	0.27	0.48		0.44	0.17			0.35			0.28	0.00
Uniform Delay, d1	20.6	9.8		20.6	8.5			13.3			13.1	12.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	4.8	0.7		9.3	0.2			0.7			0.5	0.0
Delay (s)	25.4	10.6		29.9	8.6			14.1			13.6	12.2
Level of Service	C	B		C	A			B			B	B
Approach Delay (s)		11.0			11.5			14.1			13.5	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	43.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
6: Dishman-Mica Rd & Thorpe Rd

2015 PM Existing
6/11/2015




















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Volume (veh/h)	9	35	95	7	58	200
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	10	41	110	8	67	233
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	482	115			119	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	482	115			119	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			95	
cM capacity (veh/h)	518	938			1469	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	51	119	300
Volume Left	10	0	67
Volume Right	41	8	0
cSH	805	1700	1469
Volume to Capacity	0.06	0.07	0.05
Queue Length 95th (ft)	5	0	4
Control Delay (s)	9.8	0.0	2.0
Lane LOS	A		A
Approach Delay (s)	9.8	0.0	2.0
Approach LOS	A		

Intersection Summary			
Average Delay		2.4	
Intersection Capacity Utilization		30.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Pines Rd & 16th Ave

2015 PM Existing
6/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	269	29	42	165	0	18	0	105	0	238	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	286	31	45	176	0	19	0	112	0	253	86
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					129							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	176			317			779	566	302	678	582	176
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	51			317			711	479	302	601	496	51
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			87	100	85	100	40	91
cM capacity (veh/h)	1422			1243			146	428	738	311	419	930
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	317	220	131	339								
Volume Left	0	45	19	0								
Volume Right	31	0	112	86								
cSH	1700	1243	463	487								
Volume to Capacity	0.19	0.04	0.28	0.70								
Queue Length 95th (ft)	0	3	29	134								
Control Delay (s)	0.0	1.9	15.8	27.7								
Lane LOS		A	C	D								
Approach Delay (s)	0.0	1.9	15.8	27.7								
Approach LOS			C	D								
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			60.8%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
8: Hwy 27 & 16th Ave

2015 PM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗		↖	↗	
Volume (vph)	122	252	59	9	168	4	22	210	7	82	306	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1833	1583		1858	1583	1770	3523		1770	3538	
Flt Permitted		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1833	1583		1858	1583	1770	3523		1770	3538	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	126	260	61	9	173	4	23	216	7	85	315	1
RTOR Reduction (vph)	0	0	43	0	0	4	0	2	0	0	0	0
Lane Group Flow (vph)	0	386	18	0	182	0	23	221	0	85	316	0
Turn Type	Split	NA	Perm	Split	NA	NA	Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		24.9	24.9		15.2	0.0	2.6	13.8		8.3	19.5	
Effective Green, g (s)		24.9	24.9		15.2	0.0	2.6	13.8		8.3	19.5	
Actuated g/C Ratio		0.30	0.30		0.18	0.00	0.03	0.17		0.10	0.24	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	2.5		3.0	1.9	
Lane Grp Cap (vph)		555	479		343	0	55	591		178	839	
v/s Ratio Prot		c0.21			c0.10		0.01	0.06		c0.05	c0.09	
v/s Ratio Perm			0.01									
v/c Ratio		0.70	0.04		0.53	0.00	0.42	0.37		0.48	0.38	
Uniform Delay, d1		25.3	20.2		30.3	41.1	39.1	30.4		34.9	26.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.8	0.0		1.6	0.0	5.1	0.3		2.0	0.1	
Delay (s)		29.1	20.2		31.9	41.1	44.1	30.7		36.9	26.4	
Level of Service		C	C		C	D	D	C		D	C	
Approach Delay (s)		27.9			32.1			31.9			28.6	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 9: Pines Rd & 32nd Ave

2015 PM Existing
 6/11/2015



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	43	321	20	63	298	17	40	30	51	36	54	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.99		1.00	0.99		1.00	0.91		1.00	0.93	
Fl _t Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1847		1770	1848		1770	1686		1770	1734	
Fl _t Permitted	0.50	1.00		0.47	1.00		0.67	1.00		0.70	1.00	
Satd. Flow (perm)	938	1847		871	1848		1246	1686		1301	1734	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	357	22	70	331	19	44	33	57	40	60	51
RTOR Reduction (vph)	0	1	0	0	1	0	0	50	0	0	30	0
Lane Group Flow (vph)	48	378	0	70	349	0	44	40	0	40	81	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	39.0	35.4		39.6	35.7		12.2	8.2		11.8	8.0	
Effective Green, g (s)	39.0	35.4		39.6	35.7		12.2	8.2		11.8	8.0	
Actuated g/C Ratio	0.55	0.50		0.56	0.51		0.17	0.12		0.17	0.11	
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	562	930		540	938		246	196		243	197	
v/s Ratio Prot	0.00	c0.20		c0.01	0.19		c0.01	0.02		0.01	c0.05	
v/s Ratio Perm	0.04			0.07			0.02			0.02		
v/c Ratio	0.09	0.41		0.13	0.37		0.18	0.20		0.16	0.41	
Uniform Delay, d ₁	7.2	10.9		7.1	10.5		24.6	28.1		24.9	29.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d ₂	0.1	1.3		0.1	1.1		0.4	0.7		0.3	1.9	
Delay (s)	7.3	12.2		7.3	11.6		25.0	28.8		25.2	30.9	
Level of Service	A	B		A	B		C	C		C	C	
Approach Delay (s)		11.7			10.9			27.5			29.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	19.0
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Plan 1			
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 14: Madison Rd & Thorpe Rd

2015 PM Existing
 6/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	21	0	43	0	0	0	24	33	0	0	73	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.92	0.86	0.92	0.92	0.92	0.86	0.86	0.92	0.92	0.86	0.86
Hourly flow rate (vph)	24	0	50	0	0	0	28	38	0	0	85	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	194	194	99	244	208	38	114			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	194	194	99	244	208	38	114			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	95	100	100	100	98			100		
cM capacity (veh/h)	755	688	956	663	676	1033	1475			1572		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	74	0	66	114								
Volume Left	24	0	28	0								
Volume Right	50	0	0	29								
cSH	879	1700	1475	1572								
Volume to Capacity	0.08	0.00	0.02	0.00								
Queue Length 95th (ft)	7	0	1	0								
Control Delay (s)	9.5	0.0	3.2	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.5	0.0	3.2	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			20.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
15: Hwy 27 & 32nd Ave

2015 PM Existing
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	
Volume (vph)	44	296	160	148	287	24	117	142	104	44	195	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.99		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3353		1770	1841		1770	3314		1770	3425	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3353		1770	1841		1770	3314		1770	3425	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	47	315	170	157	305	26	124	151	111	47	207	57
RTOR Reduction (vph)	0	48	0	0	2	0	0	81	0	0	18	0
Lane Group Flow (vph)	47	437	0	157	329	0	124	181	0	47	246	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	4.9	18.8		13.0	26.9		11.6	21.0		4.9	14.3	
Effective Green, g (s)	4.9	18.8		13.0	26.9		11.6	21.0		4.9	14.3	
Actuated g/C Ratio	0.06	0.24		0.17	0.35		0.15	0.27		0.06	0.18	
Clearance Time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.0	2.7	
Lane Grp Cap (vph)	111	811		296	637		264	895		111	630	
v/s Ratio Prot	0.03	0.13		c0.09	c0.18		c0.07	0.05		0.03	c0.07	
v/s Ratio Perm												
v/c Ratio	0.42	0.54		0.53	0.52		0.47	0.20		0.42	0.39	
Uniform Delay, d1	35.0	25.7		29.6	20.2		30.2	21.9		35.0	27.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.6	0.7		1.8	0.7		1.3	0.1		2.6	0.3	
Delay (s)	37.6	26.4		31.4	20.9		31.6	22.0		37.6	28.2	
Level of Service	D	C		C	C		C	C		D	C	
Approach Delay (s)		27.4			24.3			25.0			29.6	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
16: 32nd Ave & Evergreen Rd

2015 PM Existing
6/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	153	288	5	0	303	4	0	1	0	11	1	202
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	178	335	6	0	352	5	0	1	0	13	1	235
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1052										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	357			341			1284	1051	338	1046	1051	355
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	357			289			1274	1030	286	1026	1031	355
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	85			100			100	99	100	93	99	66
cM capacity (veh/h)	1202			1219			80	190	721	180	190	689

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	178	341	357	1	13	236
Volume Left	178	0	0	0	13	0
Volume Right	0	6	5	0	0	235
cSH	1202	1700	1219	190	180	680
Volume to Capacity	0.15	0.20	0.00	0.01	0.07	0.35
Queue Length 95th (ft)	13	0	0	0	6	39
Control Delay (s)	8.5	0.0	0.0	24.0	26.5	13.1
Lane LOS	A			C	D	B
Approach Delay (s)	2.9		0.0	24.0	13.8	
Approach LOS				C	B	

Intersection Summary		
Average Delay		4.4
Intersection Capacity Utilization	54.2%	ICU Level of Service
Analysis Period (min)		15
		A

HCM Unsignalized Intersection Capacity Analysis
 17: Sullivan Rd & 32nd Ave

2015 PM Existing
 6/11/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘			↖	↑	↗
Volume (veh/h)	245	10	14	74	122	247
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	258	11	15	78	128	260
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	236	128	388			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	236	128	388			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	99	99			
cM capacity (veh/h)	743	922	1170			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	268	93	128	260
Volume Left	258	15	0	0
Volume Right	11	0	0	260
cSH	749	1170	1700	1700
Volume to Capacity	0.36	0.01	0.08	0.15
Queue Length 95th (ft)	41	1	0	0
Control Delay (s)	12.5	1.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.5	1.4	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		4.6	
Intersection Capacity Utilization		35.3%	ICU Level of Service A
Analysis Period (min)		15	

**LEVEL OF SERVICE
CALCULATIONS
YEAR 2020
WITHOUT PROJECT**

HCM Signalized Intersection Capacity Analysis
1: University Rd & 32nd Ave

2020 AM W-O Proj.
6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕			↕↕		↗	↕↕		↗	↕↕	
Volume (vph)	2	119	5	26	413	112	20	70	59	71	25	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frt		0.99			0.97		1.00	0.93		1.00	0.98	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3515			3423		1770	3297		1770	3461	
Flt Permitted		0.95			0.94		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3335			3214		1770	3297		1770	3461	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	140	6	31	486	132	24	82	69	84	29	5
RTOR Reduction (vph)	0	3	0	0	21	0	0	54	0	0	3	0
Lane Group Flow (vph)	0	145	0	0	628	0	24	97	0	84	31	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		21.0			21.0		1.3	11.7		7.1	17.5	
Effective Green, g (s)		21.0			21.0		1.3	11.7		7.1	17.5	
Actuated g/C Ratio		0.39			0.39		0.02	0.22		0.13	0.33	
Clearance Time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Grp Cap (vph)		1301			1254		42	717		233	1125	
v/s Ratio Prot							0.01	c0.03		c0.05	0.01	
v/s Ratio Perm		0.04			c0.20							
v/c Ratio		0.11			0.50		0.57	0.14		0.36	0.03	
Uniform Delay, d1		10.5			12.4		26.0	17.0		21.3	12.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.7		20.6	0.2		1.3	0.0	
Delay (s)		10.5			13.1		46.5	17.2		22.6	12.4	
Level of Service		B			B		D	B		C	B	
Approach Delay (s)		10.5			13.1			21.2			19.6	
Approach LOS		B			B			C			B	

Intersection Summary		
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.37	
Actuated Cycle Length (s)	53.8	Sum of lost time (s) 14.0
Intersection Capacity Utilization	42.8%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 2: Schafer Rd/University Rd & Dishman-Mica Rd

2020 AM W-O Proj.
 6/11/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	79	34	11	355	26	207	90	31	11	36	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Fr _t	1.00	1.00	0.85	1.00	0.99		1.00	0.96		1.00	1.00	0.85
Fl _t Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3503		1770	1792		1770	1863	1583
Fl _t Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3503		1770	1792		1770	1863	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	7	93	40	13	418	31	244	106	36	13	42	24
RTOR Reduction (vph)	0	0	29	0	4	0	0	9	0	0	0	22
Lane Group Flow (vph)	7	93	11	13	445	0	244	133	0	13	42	2
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3		
Permitted Phases			6								8	8
Actuated Green, G (s)	1.0	14.7	14.7	1.1	14.8		15.8	19.0		1.1	4.3	4.3
Effective Green, g (s)	1.0	14.7	14.7	1.1	14.8		15.8	19.0		1.1	4.3	4.3
Actuated g/C Ratio	0.02	0.26	0.26	0.02	0.26		0.28	0.34		0.02	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	31	489	416	34	927		500	609		34	143	121
v/s Ratio Prot	0.00	0.05		c0.01	c0.13		c0.14	c0.07		0.01		
v/s Ratio Perm			0.01								0.02	0.00
v/c Ratio	0.23	0.19	0.03	0.38	0.48		0.49	0.22		0.38	0.29	0.02
Uniform Delay, d ₁	27.1	16.0	15.3	27.1	17.3		16.7	13.2		27.1	24.4	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d ₂	5.0	0.3	0.0	9.5	0.5		1.0	0.2		9.5	1.6	0.1
Delay (s)	32.1	16.2	15.3	36.6	17.8		17.7	13.4		36.6	25.9	23.9
Level of Service	C	B	B	D	B		B	B		D	C	C
Approach Delay (s)		16.8			18.4			16.1			27.1	
Approach LOS		B			B			B			C	

Intersection Summary		
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio	0.46	
Actuated Cycle Length (s)	55.9	Sum of lost time (s) 20.0
Intersection Capacity Utilization	38.8%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis
 3: Bowdish Rd & 32nd Ave

2020 AM W-O Proj.
 6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	216	9	49	346	27	89	119	94	47	25	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.99		1.00	0.99			0.96			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	1852		1770	1842			1758			1774	
Flt Permitted	0.32	1.00		0.60	1.00			0.87			0.73	
Satd. Flow (perm)	595	1852		1120	1842			1555			1339	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	84	245	10	56	393	31	101	135	107	53	28	15
RTOR Reduction (vph)	0	2	0	0	3	0	0	20	0	0	8	0
Lane Group Flow (vph)	84	253	0	56	421	0	0	323	0	0	88	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	27.5	22.1		23.9	20.3			18.2			18.2	
Effective Green, g (s)	27.5	22.1		23.9	20.3			18.2			18.2	
Actuated g/C Ratio	0.47	0.38		0.41	0.35			0.31			0.31	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	392	706		502	645			488			420	
v/s Ratio Prot	c0.02	0.14		0.01	c0.23							
v/s Ratio Perm	0.08			0.04				c0.21			0.07	
v/c Ratio	0.21	0.36		0.11	0.65			0.66			0.21	
Uniform Delay, d1	9.0	12.8		10.3	15.8			17.2			14.6	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	0.4		0.1	2.6			3.7			0.3	
Delay (s)	9.3	13.2		10.4	18.5			20.9			14.9	
Level of Service	A	B		B	B			C			B	
Approach Delay (s)		12.3			17.5			20.9			14.9	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Bowdish Rd & Dishman-Mica Rd

2020 AM W-O Proj.
6/11/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	80	26	28	231	23	97	124	42	24	55	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Fr _t	1.00	0.96		1.00	0.99			0.98			1.00	0.85
Fl _t Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1770	1794		1770	1838			1790			1835	1583
Fl _t Permitted	0.95	1.00		0.95	1.00			0.85			0.86	1.00
Satd. Flow (perm)	1770	1794		1770	1838			1545			1598	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	7	92	30	32	266	26	111	143	48	28	63	9
RTOR Reduction (vph)	0	15	0	0	6	0	0	7	0	0	0	6
Lane Group Flow (vph)	7	107	0	32	286	0	0	295	0	0	91	3
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4
Actuated Green, G (s)	1.1	12.5		1.3	12.7			16.3			16.3	16.3
Effective Green, g (s)	1.1	12.5		1.3	12.7			16.3			16.3	16.3
Actuated g/C Ratio	0.02	0.28		0.03	0.28			0.37			0.37	0.37
Clearance Time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Grp Cap (vph)	43	502		51	523			564			584	578
v/s Ratio Prot	0.00	0.06		c0.02	c0.16							
v/s Ratio Perm								c0.19			0.06	0.00
v/c Ratio	0.16	0.21		0.63	0.55			0.52			0.16	0.01
Uniform Delay, d ₁	21.3	12.3		21.4	13.5			11.1			9.5	9.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d ₂	2.4	0.3		24.3	1.5			1.1			0.2	0.0
Delay (s)	23.7	12.6		45.7	15.0			12.2			9.7	9.0
Level of Service	C	B		D	B			B			A	A
Approach Delay (s)		13.2			18.0			12.2			9.6	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			14.3	HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			44.6	Sum of lost time (s)				14.5				
Intersection Capacity Utilization			44.3%	ICU Level of Service				A				
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
6: Dishman-Mica Rd & Thorpe Rd

2020 AM W-O Proj.
6/11/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Volume (veh/h)	7	94	180	15	62	80
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	8	109	209	17	72	93
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	455	218			227	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	455	218			227	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	87			95	
cM capacity (veh/h)	533	822			1342	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	117	227	165			
Volume Left	8	0	72			
Volume Right	109	17	0			
cSH	792	1700	1342			
Volume to Capacity	0.15	0.13	0.05			
Queue Length 95th (ft)	13	0	4			
Control Delay (s)	10.3	0.0	3.7			
Lane LOS	B		A			
Approach Delay (s)	10.3	0.0	3.7			
Approach LOS	B					
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			34.2%		ICU Level of Service	A
Analysis Period (min)			15			





















HCM Unsignalized Intersection Capacity Analysis
7: Pines Rd & 16th Ave

2020 AM W-O Proj.
6/11/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	228	41	50	207	0	25	0	204	0	140	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	259	47	57	235	0	28	0	232	0	159	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					129							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	235			306			746	631	282	863	655	235
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			306			651	521	282	782	547	75
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			87	100	69	100	58	96
cM capacity (veh/h)	1353			1255			211	390	757	185	376	876
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	306	292	260	194								
Volume Left	0	57	28	0								
Volume Right	47	0	232	35								
cSH	1700	1255	590	420								
Volume to Capacity	0.18	0.05	0.44	0.46								
Queue Length 95th (ft)	0	4	56	60								
Control Delay (s)	0.0	1.9	15.8	20.7								
Lane LOS		A	C	C								
Approach Delay (s)	0.0	1.9	15.8	20.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			8.3									
Intersection Capacity Utilization			64.7%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
8: Hwy 27 & 16th Ave

2020 AM W-O Proj.
6/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	176	189	23	5	190	69	58	456	18	39	112	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1819	1583		1860	1583	1770	3519		1770	3535	
Flt Permitted		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1819	1583		1860	1583	1770	3519		1770	3535	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	207	222	27	6	224	81	68	536	21	46	132	1
RTOR Reduction (vph)	0	0	19	0	0	81	0	2	0	0	0	0
Lane Group Flow (vph)	0	429	8	0	230	0	68	555	0	46	133	0
Turn Type	Split	NA	Perm	Split	NA	NA	Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		31.9	31.9		19.9	0.0	8.1	23.4		6.8	22.1	
Effective Green, g (s)		31.9	31.9		19.9	0.0	8.1	23.4		6.8	22.1	
Actuated g/C Ratio		0.31	0.31		0.20	0.00	0.08	0.23		0.07	0.22	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	2.5		3.0	1.9	
Lane Grp Cap (vph)		568	495		362	0	140	807		118	765	
v/s Ratio Prot		c0.24			c0.12		c0.04	c0.16		0.03	0.04	
v/s Ratio Perm			0.01									
v/c Ratio		0.76	0.02		0.64	0.00	0.49	0.69		0.39	0.17	
Uniform Delay, d1		31.5	24.2		37.7	51.0	45.0	36.0		45.6	32.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.7	0.0		3.6	0.0	2.6	2.2		2.1	0.0	
Delay (s)		37.2	24.2		41.3	51.0	47.6	38.2		47.7	32.6	
Level of Service		D	C		D	D	D	D		D	C	
Approach Delay (s)		36.4			43.9			39.2			36.5	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			39.0				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			102.0				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			64.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 9: Pines Rd & 32nd Ave

2020 AM W-O Proj.
 6/11/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↖		↙	↖		↙	↖		↙	↖	
Volume (vph)	28	375	13	50	395	37	23	48	108	186	27	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.92	
Fl _t Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1853		1770	1839		1770	1670		1770	1721	
Fl _t Permitted	0.33	1.00		0.32	1.00		0.71	1.00		0.32	1.00	
Satd. Flow (perm)	613	1853		604	1839		1329	1670		590	1721	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	34	452	16	60	476	45	28	58	130	224	33	34
RTOR Reduction (vph)	0	1	0	0	2	0	0	58	0	0	25	0
Lane Group Flow (vph)	34	467	0	60	519	0	28	130	0	224	42	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	50.6	46.7		55.6	49.2		18.7	14.7		34.5	26.0	
Effective Green, g (s)	50.6	46.7		55.6	49.2		18.7	14.7		34.5	26.0	
Actuated g/C Ratio	0.50	0.46		0.54	0.48		0.18	0.14		0.34	0.25	
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	347	847		402	886		260	240		376	438	
v/s Ratio Prot	0.00	0.25		c0.01	c0.28		0.00	0.08		c0.09	0.02	
v/s Ratio Perm	0.04			0.07			0.02			c0.11		
v/c Ratio	0.10	0.55		0.15	0.59		0.11	0.54		0.60	0.10	
Uniform Delay, d ₁	14.2	20.1		12.5	19.1		34.6	40.6		26.2	29.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d ₂	0.1	2.6		0.2	2.8		0.2	4.3		2.5	0.2	
Delay (s)	14.4	22.7		12.6	21.9		34.8	44.9		28.7	29.3	
Level of Service	B	C		B	C		C	D		C	C	
Approach Delay (s)		22.1			21.0			43.6			28.9	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	102.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Plan 2			
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 14: Madison Rd & Thorpe Rd

2020 AM W-O Proj.
 6/11/2015























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	81	0	11	0	0	0	51	62	0	0	25	66
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.92	0.82	0.92	0.92	0.92	0.82	0.82	0.92	0.92	0.82	0.82
Hourly flow rate (vph)	99	0	13	0	0	0	62	76	0	0	30	80
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	271	271	71	284	311	76	111			76		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271	271	71	284	311	76	111			76		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	100	99	100	100	100	96			100		
cM capacity (veh/h)	660	609	992	638	578	986	1479			1523		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	112	0	138	111
Volume Left	99	0	62	0
Volume Right	13	0	0	80
cSH	687	1700	1479	1523
Volume to Capacity	0.16	0.00	0.04	0.00
Queue Length 95th (ft)	15	0	3	0
Control Delay (s)	11.3	0.0	3.6	0.0
Lane LOS	B	A	A	
Approach Delay (s)	11.3	0.0	3.6	0.0
Approach LOS	B	A		

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
15: Hwy 27 & 32nd Ave

2020 AM W-O Proj.
6/11/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations												
Volume (vph)	125	229	72	57	217	65	131	305	117	21	92	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.96		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3412		1770	1798		1770	3393		1770	3306	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3412		1770	1798		1770	3393		1770	3306	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	144	263	83	66	249	75	151	351	134	24	106	83
RTOR Reduction (vph)	0	17	0	0	7	0	0	25	0	0	69	0
Lane Group Flow (vph)	144	329	0	66	317	0	151	460	0	24	120	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	13.1	27.5		7.5	21.9		13.4	24.1		2.6	13.3	
Effective Green, g (s)	13.1	27.5		7.5	21.9		13.4	24.1		2.6	13.3	
Actuated g/C Ratio	0.16	0.34		0.09	0.27		0.16	0.29		0.03	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.0	2.7	
Lane Grp Cap (vph)	283	1148		162	481		290	1000		56	538	
v/s Ratio Prot	c0.08	0.10		0.04	c0.18		c0.09	c0.14		0.01	0.04	
v/s Ratio Perm												
v/c Ratio	0.51	0.29		0.41	0.66		0.52	0.46		0.43	0.22	
Uniform Delay, d1	31.4	19.9		35.0	26.6		31.2	23.5		38.8	29.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.1		1.7	3.3		1.7	0.2		5.2	0.2	
Delay (s)	32.8	20.0		36.7	29.9		32.9	23.7		44.0	29.9	
Level of Service	C	C		D	C		C	C		D	C	
Approach Delay (s)		23.8			31.0			25.9			31.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	81.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
16: 32nd Ave & Evergreen Rd

2020 AM W-O Proj.
6/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	212	207	2	0	205	21	0	0	0	5	0	103
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	236	230	2	0	228	23	0	0	0	6	0	114
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	251			232			1056	953	231	941	943	239
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	251			232			1056	953	231	941	943	239
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	82			100			100	100	100	97	100	86
cM capacity (veh/h)	1314			1335			150	213	808	210	216	799

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	236	232	251	0	6	114
Volume Left	236	0	0	0	6	0
Volume Right	0	2	23	0	0	114
cSH	1314	1700	1335	1700	210	799
Volume to Capacity	0.18	0.14	0.00	0.00	0.03	0.14
Queue Length 95th (ft)	16	0	0	0	2	12
Control Delay (s)	8.3	0.0	0.0	0.0	22.6	10.3
Lane LOS	A			A	C	B
Approach Delay (s)	4.2		0.0	0.0	10.8	
Approach LOS				A	B	

Intersection Summary		
Average Delay		3.9
Intersection Capacity Utilization	40.2%	ICU Level of Service A
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis
 17: Sullivan Rd & 32nd Ave

2020 AM W-O Proj.
 6/11/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			L	T	R
Volume (veh/h)	203	4	14	75	22	155
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	257	5	18	95	28	196
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	158	28	224			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	158	28	224			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	100	99			
cM capacity (veh/h)	822	1047	1345			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	262	113	28	196
Volume Left	257	18	0	0
Volume Right	5	0	0	196
cSH	825	1345	1700	1700
Volume to Capacity	0.32	0.01	0.02	0.12
Queue Length 95th (ft)	34	1	0	0
Control Delay (s)	11.4	1.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.4	1.3	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		5.2	
Intersection Capacity Utilization		29.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
1: University Rd & 32nd Ave

2020 PM W-O Proj.
6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕		↗	↕	
Volume (vph)	2	353	16	61	172	58	12	54	57	83	84	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frt		0.99			0.97		1.00	0.92		1.00	0.99	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3515			3397		1770	3265		1770	3511	
Flt Permitted		0.95			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3352			2784		1770	3265		1770	3511	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2	376	17	65	183	62	13	57	61	88	89	5
RTOR Reduction (vph)	0	3	0	0	22	0	0	47	0	0	3	0
Lane Group Flow (vph)	0	392	0	0	288	0	13	71	0	88	91	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		16.6			16.6		1.1	10.5		5.1	14.5	
Effective Green, g (s)		16.6			16.6		1.1	10.5		5.1	14.5	
Actuated g/C Ratio		0.36			0.36		0.02	0.23		0.11	0.31	
Clearance Time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Grp Cap (vph)		1204			1000		42	742		195	1101	
v/s Ratio Prot							0.01	0.02		c0.05	c0.03	
v/s Ratio Perm		c0.12			0.10							
v/c Ratio		0.33			0.29		0.31	0.10		0.45	0.08	
Uniform Delay, d1		10.7			10.6		22.2	14.1		19.2	11.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.3		5.7	0.1		2.3	0.1	
Delay (s)		11.1			10.9		27.8	14.2		21.5	11.2	
Level of Service		B			B		C	B		C	B	
Approach Delay (s)		11.1			10.9			15.6			16.2	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	46.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 2: Schafer Rd/University Rd & Dishman-Mica Rd

2020 PM W-O Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↕		↙	↗		↙	↑	↗
Volume (vph)	11	312	149	22	110	19	83	68	7	33	104	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3461		1770	1837		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3461		1770	1837		1770	1863	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	13	363	173	26	128	22	97	79	8	38	121	7
RTOR Reduction (vph)	0	0	104	0	9	0	0	3	0	0	0	6
Lane Group Flow (vph)	13	363	69	26	141	0	97	84	0	38	121	1
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3		
Permitted Phases			6								8	8
Actuated Green, G (s)	1.2	26.1	26.1	2.6	27.5		8.2	12.5		4.5	8.8	8.8
Effective Green, g (s)	1.2	26.1	26.1	2.6	27.5		8.2	12.5		4.5	8.8	8.8
Actuated g/C Ratio	0.02	0.40	0.40	0.04	0.42		0.12	0.19		0.07	0.13	0.13
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	32	740	628	70	1448		220	349		121	249	212
v/s Ratio Prot	0.01	c0.19		c0.01	0.04		c0.05	c0.05		0.02		
v/s Ratio Perm			0.04								c0.06	0.00
v/c Ratio	0.41	0.49	0.11	0.37	0.10		0.44	0.24		0.31	0.49	0.00
Uniform Delay, d1	31.9	14.8	12.5	30.8	11.6		26.6	22.6		29.1	26.4	24.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.1	0.7	0.1	4.5	0.0		1.9	0.5		2.0	2.0	0.0
Delay (s)	43.0	15.5	12.6	35.2	11.6		28.5	23.1		31.2	28.4	24.7
Level of Service	D	B	B	D	B		C	C		C	C	C
Approach Delay (s)		15.2			15.1			26.0			28.9	
Approach LOS		B			B			C			C	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: Bowdish Rd & 32nd Ave

2020 PM W-O Proj.
 6/12/2015






















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Volume (vph)	29	319	50	88	238	39	32	89	67	37	104	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.95			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	1825		1770	1824			1758			1802	
Flt Permitted	0.58	1.00		0.40	1.00			0.92			0.87	
Satd. Flow (perm)	1083	1825		739	1824			1627			1576	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	336	53	93	251	41	34	94	71	39	109	29
RTOR Reduction (vph)	0	6	0	0	5	0	0	29	0	0	10	0
Lane Group Flow (vph)	31	383	0	93	287	0	0	170	0	0	167	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	24.4	22.3		31.6	25.9			9.2			9.2	
Effective Green, g (s)	24.4	22.3		31.6	25.9			9.2			9.2	
Actuated g/C Ratio	0.48	0.44		0.62	0.51			0.18			0.18	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	544	794		570	922			292			283	
v/s Ratio Prot	0.00	c0.21		c0.02	0.16							
v/s Ratio Perm	0.02			0.08				0.10			c0.11	
v/c Ratio	0.06	0.48		0.16	0.31			0.58			0.59	
Uniform Delay, d1	7.1	10.3		4.4	7.4			19.2			19.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.6		0.1	0.3			3.5			3.8	
Delay (s)	7.2	11.0		4.6	7.7			22.7			23.1	
Level of Service	A	B		A	A			C			C	
Approach Delay (s)		10.7			6.9			22.7			23.1	
Approach LOS		B			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	51.2	Sum of lost time (s)	14.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Bowdish Rd & Dishman-Mica Rd

2020 PM W-O Proj.
6/12/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	235	107	21	105	22	39	84	18	14	104	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Fr _t	1.00	0.95		1.00	0.97			0.98			1.00	0.85
Fl _t Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	1775		1770	1814			1805			1852	1583
Fl _t Permitted	0.95	1.00		0.95	1.00			0.88			0.95	1.00
Satd. Flow (perm)	1770	1775		1770	1814			1607			1772	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	255	116	23	114	24	42	91	20	15	113	7
RTOR Reduction (vph)	0	18	0	0	10	0	0	6	0	0	0	5
Lane Group Flow (vph)	11	353	0	23	128	0	0	147	0	0	128	2
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4
Actuated Green, G (s)	1.0	17.4		1.1	17.5			10.8			10.8	10.8
Effective Green, g (s)	1.0	17.4		1.1	17.5			10.8			10.8	10.8
Actuated g/C Ratio	0.02	0.40		0.03	0.40			0.25			0.25	0.25
Clearance Time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Grp Cap (vph)	40	705		44	724			396			436	390
v/s Ratio Prot	0.01	c0.20		c0.01	0.07							
v/s Ratio Perm								c0.09			0.07	0.00
v/c Ratio	0.28	0.50		0.52	0.18			0.37			0.29	0.00
Uniform Delay, d ₁	21.0	9.9		21.1	8.5			13.7			13.4	12.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d ₂	5.0	0.8		13.8	0.2			0.8			0.5	0.0
Delay (s)	26.1	10.7		34.9	8.7			14.5			13.9	12.5
Level of Service	C	B		C	A			B			B	B
Approach Delay (s)		11.1			12.4			14.5			13.8	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.4			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			43.8			Sum of lost time (s)		14.5				
Intersection Capacity Utilization			42.0%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
 6: Dishman-Mica Rd & Thorpe Rd

2020 PM W-O Proj.
 6/12/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	R
Volume (veh/h)	10	44	96	9	80	202
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	12	51	112	10	93	235
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	538	117			122	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	538	117			122	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	95			94	
cM capacity (veh/h)	472	935			1465	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	63	122	328
Volume Left	12	0	93
Volume Right	51	10	0
cSH	792	1700	1465
Volume to Capacity	0.08	0.07	0.06
Queue Length 95th (ft)	6	0	5
Control Delay (s)	9.9	0.0	2.6
Lane LOS	A		A
Approach Delay (s)	9.9	0.0	2.6
Approach LOS	A		

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		31.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Pines Rd & 16th Ave

2020 PM W-O Proj.
6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↑			↕			↕	
Volume (veh/h)	0	280	30	44	171	0	18	0	110	0	251	82
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	298	32	47	182	0	19	0	117	0	267	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					129							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	182			330			810	589	314	706	605	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			330			744	501	314	630	519	55
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			85	100	84	100	34	91
cM capacity (veh/h)	1414			1230			125	414	726	293	405	923
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	330	229	136	354								
Volume Left	0	47	19	0								
Volume Right	32	0	117	87								
cSH	1700	1230	433	469								
Volume to Capacity	0.19	0.04	0.31	0.75								
Queue Length 95th (ft)	0	3	33	160								
Control Delay (s)	0.0	1.9	17.1	32.6								
Lane LOS		A	C	D								
Approach Delay (s)	0.0	1.9	17.1	32.6								
Approach LOS			C	D								
Intersection Summary												
Average Delay			13.7									
Intersection Capacity Utilization			62.2%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
8: Hwy 27 & 16th Ave





















2020 PM W-O Proj.
6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↗		↗	↕↗	
Volume (vph)	124	258	68	9	172	4	26	237	7	83	354	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1833	1583		1858	1583	1770	3524		1770	3538	
Flt Permitted		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1833	1583		1858	1583	1770	3524		1770	3538	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	128	266	70	9	177	4	27	244	7	86	365	1
RTOR Reduction (vph)	0	0	48	0	0	4	0	2	0	0	0	0
Lane Group Flow (vph)	0	394	22	0	186	0	27	249	0	86	366	0
Turn Type	Split	NA	Perm	Split	NA	NA	Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		25.9	25.9		15.7	0.0	4.2	13.8		8.5	18.1	
Effective Green, g (s)		25.9	25.9		15.7	0.0	4.2	13.8		8.5	18.1	
Actuated g/C Ratio		0.31	0.31		0.19	0.00	0.05	0.16		0.10	0.22	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	2.5		3.0	1.9	
Lane Grp Cap (vph)		565	488		347	0	88	579		179	763	
v/s Ratio Prot		c0.21			c0.10		0.02	0.07		c0.05	c0.10	
v/s Ratio Perm			0.01									
v/c Ratio		0.70	0.04		0.54	0.00	0.31	0.43		0.48	0.48	
Uniform Delay, d1		25.5	20.3		30.8	42.0	38.4	31.5		35.6	28.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.7	0.0		1.6	0.0	2.0	0.4		2.0	0.2	
Delay (s)		29.3	20.4		32.4	42.0	40.4	31.9		37.6	29.0	
Level of Service		C	C		C	D	D	C		D	C	
Approach Delay (s)		27.9			32.6			32.7			30.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	83.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 9: Pines Rd & 32nd Ave

2020 PM W-O Proj.
 6/12/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	345	22	73	313	17	41	35	66	36	68	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Fr _t	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.94	
Fit Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1846		1770	1848		1770	1681		1770	1749	
Fit Permitted	0.50	1.00		0.40	1.00		0.66	1.00		0.68	1.00	
Satd. Flow (perm)	937	1846		742	1848		1222	1681		1276	1749	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	383	24	81	348	19	46	39	73	40	76	52
RTOR Reduction (vph)	0	2	0	0	1	0	0	62	0	0	24	0
Lane Group Flow (vph)	48	405	0	81	366	0	46	50	0	40	104	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	38.2	34.4		42.4	36.5		15.1	10.8		14.5	10.5	
Effective Green, g (s)	38.2	34.4		42.4	36.5		15.1	10.8		14.5	10.5	
Actuated g/C Ratio	0.52	0.46		0.57	0.49		0.20	0.15		0.20	0.14	
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	525	856		506	910		280	245		276	247	
v/s Ratio Prot	0.00	c0.22		c0.01	0.20		c0.01	0.03		0.01	c0.06	
v/s Ratio Perm	0.04			0.08			0.02			0.02		
v/c Ratio	0.09	0.47		0.16	0.40		0.16	0.20		0.14	0.42	
Uniform Delay, d ₁	9.0	13.6		7.7	11.9		24.1	27.9		24.5	29.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d ₂	0.1	1.9		0.1	1.3		0.3	0.6		0.2	1.6	
Delay (s)	9.1	15.5		7.8	13.2		24.4	28.4		24.8	30.6	
Level of Service	A	B		A	B		C	C		C	C	
Approach Delay (s)		14.8			12.2			27.2			29.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	19.0
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		
Description: Plan 1			
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 14: Madison Rd & Thorpe Rd

2020 PM W-O Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	38	0	50	0	0	0	25	33	0	0	74	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.92	0.86	0.92	0.92	0.92	0.86	0.86	0.92	0.92	0.86	0.86
Hourly flow rate (vph)	44	0	58	0	0	0	29	38	0	0	86	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	202	202	106	260	222	38	126			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	202	202	106	260	222	38	126			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	94	100	100	100	98			100		
cM capacity (veh/h)	744	680	948	640	663	1033	1461			1572		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	102	0	67	126
Volume Left	44	0	29	0
Volume Right	58	0	0	40
cSH	848	1700	1461	1572
Volume to Capacity	0.12	0.00	0.02	0.00
Queue Length 95th (ft)	10	0	2	0
Control Delay (s)	9.8	0.0	3.3	0.0
Lane LOS	A	A	A	
Approach Delay (s)	9.8	0.0	3.3	0.0
Approach LOS	A	A		

Intersection Summary			
Average Delay		4.2	
Intersection Capacity Utilization		21.6%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
15: Hwy 27 & 32nd Ave

2020 PM W-O Proj.
6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	44	308	191	183	297	30	133	166	124	56	238	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.99		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3336		1770	1837		1770	3312		1770	3437	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3336		1770	1837		1770	3312		1770	3437	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	47	328	203	195	316	32	141	177	132	60	253	60
RTOR Reduction (vph)	0	63	0	0	2	0	0	89	0	0	15	0
Lane Group Flow (vph)	47	468	0	195	346	0	141	220	0	60	298	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.0	20.9		15.7	31.6		13.1	20.8		7.2	14.9	
Effective Green, g (s)	5.0	20.9		15.7	31.6		13.1	20.8		7.2	14.9	
Actuated g/C Ratio	0.06	0.25		0.19	0.37		0.15	0.25		0.09	0.18	
Clearance Time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.0	2.7	
Lane Grp Cap (vph)	104	824		328	686		274	814		150	605	
v/s Ratio Prot	0.03	c0.14		c0.11	0.19		c0.08	0.07		0.03	c0.09	
v/s Ratio Perm												
v/c Ratio	0.45	0.57		0.59	0.50		0.51	0.27		0.40	0.49	
Uniform Delay, d1	38.5	27.9		31.5	20.5		32.8	25.8		36.7	31.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.9		2.9	0.6		1.6	0.1		1.7	0.5	
Delay (s)	41.6	28.8		34.4	21.0		34.5	25.9		38.4	32.0	
Level of Service	D	C		C	C		C	C		D	C	
Approach Delay (s)		29.8			25.8			28.6			33.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			84.6			Sum of lost time (s)		20.0				
Intersection Capacity Utilization			57.2%			ICU Level of Service				B		
Analysis Period (min)			15									
c	Critical Lane Group											

HCM Unsignalized Intersection Capacity Analysis
16: 32nd Ave & Evergreen Rd

2020 PM W-O Proj.
6/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	164	308	5	0	334	4	0	1	0	11	1	223
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	191	358	6	0	388	5	0	1	0	13	1	259
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		1052										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	393			364			1393	1135	361	1131	1136	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	393			298			1387	1114	295	1109	1115	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	84			100			100	99	100	92	99	61
cM capacity (veh/h)	1166			1194			60	165	703	154	164	658

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	191	364	393	1	13	260
Volume Left	191	0	0	0	13	0
Volume Right	0	6	5	0	0	259
cSH	1166	1700	1194	165	154	649
Volume to Capacity	0.16	0.21	0.00	0.01	0.08	0.40
Queue Length 95th (ft)	15	0	0	1	7	48
Control Delay (s)	8.7	0.0	0.0	27.0	30.6	14.2
Lane LOS	A			D	D	B
Approach Delay (s)	3.0		0.0	27.0	15.0	
Approach LOS				D	B	

Intersection Summary		
Average Delay		4.7
Intersection Capacity Utilization	58.2%	ICU Level of Service B
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis
 17: Sullivan Rd & 32nd Ave

2020 PM W-O Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	W
Volume (veh/h)	265	10	15	75	123	276
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	279	11	16	79	129	291
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	240	129	420			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	240	129	420			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	99	99			
cM capacity (veh/h)	738	920	1139			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	289	95	129	291
Volume Left	279	16	0	0
Volume Right	11	0	0	291
cSH	743	1139	1700	1700
Volume to Capacity	0.39	0.01	0.08	0.17
Queue Length 95th (ft)	46	1	0	0
Control Delay (s)	12.9	1.5	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.9	1.5	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		4.8	
Intersection Capacity Utilization		36.5%	ICU Level of Service A
Analysis Period (min)		15	

**LEVEL OF SERVICE
CALCULATIONS
YEAR 2020
WITH PROJECT**

HCM Signalized Intersection Capacity Analysis
 1: University Rd & 32nd Ave

2020 AM W- Proj.
 6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕		↖	↕	
Volume (vph)	2	122	5	26	419	120	20	80	59	72	31	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Flt		0.99			0.97		1.00	0.94		1.00	0.98	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3516			3419		1770	3314		1770	3474	
Flt Permitted		0.95			0.94		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3336			3211		1770	3314		1770	3474	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	2	144	6	31	493	141	24	94	69	85	36	5
RTOR Reduction (vph)	0	3	0	0	23	0	0	54	0	0	3	0
Lane Group Flow (vph)	0	149	0	0	642	0	24	109	0	85	38	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		21.7			21.7		1.4	12.0		7.2	17.8	
Effective Green, g (s)		21.7			21.7		1.4	12.0		7.2	17.8	
Actuated g/C Ratio		0.40			0.40		0.03	0.22		0.13	0.32	
Clearance Time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Grp Cap (vph)		1318			1269		45	724		232	1126	
v/s Ratio Prot							0.01	c0.03		c0.05	0.01	
v/s Ratio Perm		0.04			c0.20							
v/c Ratio		0.11			0.51		0.53	0.15		0.37	0.03	
Uniform Delay, d1		10.5			12.5		26.4	17.3		21.8	12.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.7		14.6	0.2		1.3	0.0	
Delay (s)		10.6			13.2		41.0	17.5		23.1	12.7	
Level of Service		B			B		D	B		C	B	
Approach Delay (s)		10.6			13.2			20.6			19.7	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			14.8				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			54.9				Sum of lost time (s)			14.0		
Intersection Capacity Utilization			43.7%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 2: Schafer Rd/University Rd & Dishman-Mica Rd

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↕		↖	↗		↖	↑	↗
Volume (vph)	6	109	34	11	467	36	207	90	31	17	36	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3501		1770	1792		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3501		1770	1792		1770	1863	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	7	128	40	13	549	42	244	106	36	20	42	24
RTOR Reduction (vph)	0	0	28	0	4	0	0	9	0	0	0	22
Lane Group Flow (vph)	7	128	12	13	587	0	244	133	0	20	42	2
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3		
Permitted Phases			6								8	8
Actuated Green, G (s)	1.0	18.2	18.2	1.1	18.3		16.3	19.5		1.2	4.4	4.4
Effective Green, g (s)	1.0	18.2	18.2	1.1	18.3		16.3	19.5		1.2	4.4	4.4
Actuated g/C Ratio	0.02	0.30	0.30	0.02	0.31		0.27	0.32		0.02	0.07	0.07
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	29	565	480	32	1067		480	582		35	136	116
v/s Ratio Prot	0.00	0.07		c0.01	c0.17		c0.14	c0.07		0.01		
v/s Ratio Perm			0.01								0.02	0.00
v/c Ratio	0.24	0.23	0.03	0.41	0.55		0.51	0.23		0.57	0.31	0.02
Uniform Delay, d1	29.1	15.6	14.7	29.1	17.4		18.5	14.8		29.1	26.4	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	0.3	0.0	11.1	0.7		1.2	0.3		24.2	1.8	0.1
Delay (s)	35.0	15.9	14.7	40.2	18.1		19.6	15.0		53.4	28.1	25.9
Level of Service	C	B	B	D	B		B	B		D	C	C
Approach Delay (s)		16.4			18.6			17.9			33.4	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 3: Bowdish Rd & 32nd Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Volume (vph)	74	219	10	52	355	31	94	129	101	49	30	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Fr _t	1.00	0.99		1.00	0.99			0.96			0.98	
Fl _t Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1770	1851		1770	1840			1759			1779	
Fl _t Permitted	0.30	1.00		0.60	1.00			0.87			0.72	
Satd. Flow (perm)	565	1851		1115	1840			1551			1317	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	84	249	11	59	403	35	107	147	115	56	34	15
RTOR Reduction (vph)	0	2	0	0	4	0	0	20	0	0	7	0
Lane Group Flow (vph)	84	258	0	59	434	0	0	349	0	0	98	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	28.1	22.7		24.7	21.0			19.3			19.3	
Effective Green, g (s)	28.1	22.7		24.7	21.0			19.3			19.3	
Actuated g/C Ratio	0.47	0.38		0.41	0.35			0.32			0.32	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	374	703		501	647			501			425	
v/s Ratio Prot	c0.02	0.14		0.01	c0.24							
v/s Ratio Perm	0.09			0.04				c0.23			0.07	
v/c Ratio	0.22	0.37		0.12	0.67			0.70			0.23	
Uniform Delay, d ₁	9.5	13.3		10.6	16.4			17.6			14.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d ₂	0.3	0.4		0.1	3.0			4.5			0.4	
Delay (s)	9.9	13.8		10.7	19.4			22.2			15.1	
Level of Service	A	B		B	B			C			B	
Approach Delay (s)		12.8			18.4			22.2			15.1	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	14.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 4: Bowdish Rd & Dishman-Mica Rd

2020 AM W- Proj.
 6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	116	26	57	353	45	97	124	53	32	55	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.97		1.00	0.98			0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.98	1.00
Satd. Flow (prot)	1770	1811		1770	1831			1783			1829	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.85			0.84	1.00
Satd. Flow (perm)	1770	1811		1770	1831			1533			1565	1583
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	7	133	30	66	406	52	111	143	61	37	63	9
RTOR Reduction (vph)	0	11	0	0	6	0	0	9	0	0	0	6
Lane Group Flow (vph)	7	152	0	66	452	0	0	306	0	0	100	3
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4
Actuated Green, G (s)	1.1	15.1		5.0	19.0			16.5			16.5	16.5
Effective Green, g (s)	1.1	15.1		5.0	19.0			16.5			16.5	16.5
Actuated g/C Ratio	0.02	0.30		0.10	0.37			0.32			0.32	0.32
Clearance Time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Grp Cap (vph)	38	535		173	680			495			505	511
v/s Ratio Prot	0.00	0.08		c0.04	c0.25							
v/s Ratio Perm								c0.20			0.06	0.00
v/c Ratio	0.18	0.28		0.38	0.66			0.62			0.20	0.01
Uniform Delay, d1	24.6	13.8		21.6	13.4			14.6			12.5	11.7
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	3.2	0.4		1.9	2.7			2.6			0.3	0.0
Delay (s)	27.7	14.2		23.5	16.1			17.3			12.8	11.7
Level of Service	C	B		C	B			B			B	B
Approach Delay (s)		14.8			17.0			17.3			12.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	51.1	Sum of lost time (s)	14.5
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 5: Dishman-Mica Rd & Sundown Drive

2020 AM W- Proj.
 6/12/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Volume (veh/h)	8	132	313	2	37	160
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	143	340	2	40	174
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						1112
pX, platoon unblocked						
vC, conflicting volume	596	341			342	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	596	341			342	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	80			97	
cM capacity (veh/h)	451	701			1217	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	152	342	214
Volume Left	9	0	40
Volume Right	143	2	0
cSH	680	1700	1217
Volume to Capacity	0.22	0.20	0.03
Queue Length 95th (ft)	21	0	3
Control Delay (s)	11.8	0.0	1.8
Lane LOS	B		A
Approach Delay (s)	11.8	0.0	1.8
Approach LOS	B		

Intersection Summary			
Average Delay		3.1	
Intersection Capacity Utilization		45.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 6: Dishman-Mica Rd & Thorpe Rd

2020 AM W- Proj.
 6/12/2015




















Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	LT		LT			LT
Volume (veh/h)	11	110	182	16	70	89
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	13	128	212	19	81	103
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	487	221			230	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	487	221			230	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	84			94	
cM capacity (veh/h)	507	819			1338	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	141	230	185
Volume Left	13	0	81
Volume Right	128	19	0
cSH	775	1700	1338
Volume to Capacity	0.18	0.14	0.06
Queue Length 95th (ft)	16	0	5
Control Delay (s)	10.7	0.0	3.7
Lane LOS	B		A
Approach Delay (s)	10.7	0.0	3.7
Approach LOS	B		

Intersection Summary			
Average Delay		3.9	
Intersection Capacity Utilization		36.5%	ICU Level of Service A
Analysis Period (min)		15	





















HCM Unsignalized Intersection Capacity Analysis
7: Pines Rd & 16th Ave

2020 AM W- Proj.
6/12/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	228	42	51	207	0	28	0	227	0	145	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	259	48	58	235	0	32	0	258	0	165	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					129							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	235			307			752	634	283	892	658	235
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	73			307			656	523	283	814	550	73
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			84	100	66	100	56	96
cM capacity (veh/h)	1353			1254			204	388	756	167	374	876
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	307	293	290	200								
Volume Left	0	58	32	0								
Volume Right	48	0	258	35								
cSH	1700	1254	583	416								
Volume to Capacity	0.18	0.05	0.50	0.48								
Queue Length 95th (ft)	0	4	69	63								
Control Delay (s)	0.0	1.9	17.1	21.4								
Lane LOS		A	C	C								
Approach Delay (s)	0.0	1.9	17.1	21.4								
Approach LOS			C	C								
Intersection Summary												
Average Delay			9.0									
Intersection Capacity Utilization			66.7%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
8: Hwy 27 & 16th Ave

2020 AM W- Proj.
6/12/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	189	199	23	5	191	69	58	472	18	39	114	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt		1.00	0.85		1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1818	1583		1860	1583	1770	3520		1770	3535	
Flt Permitted		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1818	1583		1860	1583	1770	3520		1770	3535	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	222	234	27	6	225	81	68	555	21	46	134	1
RTOR Reduction (vph)	0	0	18	0	0	81	0	2	0	0	0	0
Lane Group Flow (vph)	0	456	9	0	231	0	68	574	0	46	135	0
Turn Type	Split	NA	Perm	Split	NA	NA	Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		34.4	34.4		20.3	0.0	8.1	24.6		6.9	23.4	
Effective Green, g (s)		34.4	34.4		20.3	0.0	8.1	24.6		6.9	23.4	
Actuated g/C Ratio		0.32	0.32		0.19	0.00	0.08	0.23		0.06	0.22	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	2.5		3.0	1.9	
Lane Grp Cap (vph)		588	512		355	0	135	815		115	778	
v/s Ratio Prot		c0.25			c0.12		c0.04	c0.16		0.03	0.04	
v/s Ratio Perm			0.01									
v/c Ratio		0.78	0.02		0.65	0.00	0.50	0.70		0.40	0.17	
Uniform Delay, d1		32.4	24.4		39.7	53.1	47.1	37.5		47.7	33.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.3	0.0		4.2	0.0	2.9	2.6		2.3	0.0	
Delay (s)		38.8	24.4		43.9	53.1	50.1	40.1		49.9	33.6	
Level of Service		D	C		D	D	D	D		D	C	
Approach Delay (s)		38.0			46.3			41.1			37.8	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.8				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			106.2				Sum of lost time (s)			20.0		
Intersection Capacity Utilization			65.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 9: Pines Rd & 32nd Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	381	18	67	398	37	36	74	164	186	34	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1850		1770	1839		1770	1670		1770	1736	
Flt Permitted	0.31	1.00		0.28	1.00		0.71	1.00		0.22	1.00	
Satd. Flow (perm)	573	1850		517	1839		1319	1670		415	1736	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	34	459	22	81	480	45	43	89	198	224	41	34
RTOR Reduction (vph)	0	1	0	0	2	0	0	54	0	0	19	0
Lane Group Flow (vph)	34	480	0	81	523	0	43	233	0	224	56	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	50.9	46.9		58.1	50.5		27.7	21.9		41.6	31.3	
Effective Green, g (s)	50.9	46.9		58.1	50.5		27.7	21.9		41.6	31.3	
Actuated g/C Ratio	0.46	0.42		0.53	0.46		0.25	0.20		0.38	0.28	
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	306	784		357	839		353	330		342	491	
v/s Ratio Prot	0.00	0.26		c0.02	c0.28		0.01	0.14		c0.09	0.03	
v/s Ratio Perm	0.05			0.10			0.02			c0.16		
v/c Ratio	0.11	0.61		0.23	0.62		0.12	0.71		0.65	0.11	
Uniform Delay, d1	17.7	24.8		15.4	22.8		31.8	41.4		26.2	29.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	3.5		0.3	3.5		0.2	8.4		4.5	0.2	
Delay (s)	17.8	28.3		15.7	26.3		32.0	49.8		30.6	29.6	
Level of Service	B	C		B	C		C	D		C	C	
Approach Delay (s)		27.6			24.9			47.5			30.4	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.6	Sum of lost time (s)	19.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
Description: Plan 2			
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 10: Madison Rd & Painted Hills Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			Y	Y	
Volume (veh/h)	19	0	0	219	116	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	0	0	238	126	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	366	128	126			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	366	128	126			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	633	922	1460			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	21	238	130
Volume Left	21	0	0
Volume Right	0	0	4
cSH	633	1460	1700
Volume to Capacity	0.03	0.00	0.08
Queue Length 95th (ft)	3	0	0
Control Delay (s)	10.9	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.9	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		21.5%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 11: Madison Rd & 41st Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	LT	RT	LT	TH	TH	RT
Volume (veh/h)	29	3	1	190	106	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	3	1	207	115	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	329	121	115			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	329	121	115			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	665	931	1474			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	208	126
Volume Left	32	1	0
Volume Right	3	0	11
cSH	683	1474	1700
Volume to Capacity	0.05	0.00	0.07
Queue Length 95th (ft)	4	0	0
Control Delay (s)	10.6	0.0	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		20.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: Madison Rd & 43rd Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↓	
Volume (veh/h)	34	3	1	157	103	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	3	1	171	112	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	290	117	112			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	290	117	112			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	700	935	1478			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	40	172	123
Volume Left	37	1	0
Volume Right	3	0	11
cSH	714	1478	1700
Volume to Capacity	0.06	0.00	0.07
Queue Length 95th (ft)	4	0	0
Control Delay (s)	10.3	0.1	0.0
Lane LOS	B	A	
Approach Delay (s)	10.3	0.1	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		19.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: Madison Rd & 44th Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↕	↕	
Volume (veh/h)	12	12	4	146	98	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	13	4	159	107	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	276	109	107			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	276	109	107			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	100			
cM capacity (veh/h)	712	945	1484			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	26	163	111
Volume Left	13	4	0
Volume Right	13	0	4
cSH	812	1484	1700
Volume to Capacity	0.03	0.00	0.07
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.6	0.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	0.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		20.9%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 14: Madison Rd & Thorpe Rd

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	88	0	11	0	0	0	51	62	0	0	25	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.92	0.82	0.92	0.92	0.92	0.82	0.82	0.92	0.92	0.82	0.82
Hourly flow rate (vph)	107	0	13	0	0	0	62	76	0	0	30	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	282	282	82	296	334	76	134			76		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282	282	82	296	334	76	134			76		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	83	100	99	100	100	100	96			100		
cM capacity (veh/h)	648	600	977	626	561	986	1450			1523		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	121	0	138	134
Volume Left	107	0	62	0
Volume Right	13	0	0	104
cSH	673	1700	1450	1523
Volume to Capacity	0.18	0.00	0.04	0.00
Queue Length 95th (ft)	16	0	3	0
Control Delay (s)	11.5	0.0	3.6	0.0
Lane LOS	B	A	A	
Approach Delay (s)	11.5	0.0	3.6	0.0
Approach LOS	B	A		

Intersection Summary			
Average Delay		4.8	
Intersection Capacity Utilization	25.0%		ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
15: Hwy 27 & 32nd Ave

2020 AM W- Proj.
6/12/2015





















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕		↖	↕		↖	↕	
Volume (vph)	141	267	78	57	232	65	134	305	117	21	92	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.96		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3419		1770	1801		1770	3393		1770	3303	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3419		1770	1801		1770	3393		1770	3303	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	162	307	90	66	267	75	154	351	134	24	106	85
RTOR Reduction (vph)	0	15	0	0	7	0	0	25	0	0	72	0
Lane Group Flow (vph)	162	382	0	66	335	0	154	460	0	24	119	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	14.2	30.0		7.5	23.3		13.8	24.5		2.7	13.4	
Effective Green, g (s)	14.2	30.0		7.5	23.3		13.8	24.5		2.7	13.4	
Actuated g/C Ratio	0.17	0.35		0.09	0.28		0.16	0.29		0.03	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.0	2.7	
Lane Grp Cap (vph)	296	1210		156	495		288	981		56	522	
v/s Ratio Prot	c0.09	0.11		0.04	c0.19		c0.09	c0.14		0.01	0.04	
v/s Ratio Perm												
v/c Ratio	0.55	0.32		0.42	0.68		0.53	0.47		0.43	0.23	
Uniform Delay, d1	32.3	19.9		36.6	27.4		32.5	24.8		40.2	31.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.1	0.2		1.8	3.7		1.9	0.3		5.2	0.2	
Delay (s)	34.4	20.0		38.4	31.0		34.4	25.0		45.4	31.3	
Level of Service	C	C		D	C		C	C		D	C	
Approach Delay (s)		24.2			32.2			27.3			32.9	
Approach LOS		C			C			C			C	

Intersection Summary		
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.59	
Actuated Cycle Length (s)	84.7	Sum of lost time (s) 20.0
Intersection Capacity Utilization	57.0%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

HCM Unsignalized Intersection Capacity Analysis
16: 32nd Ave & Evergreen Rd

2020 AM W- Proj.
6/18/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	231	226	2	0	217	21	0	0	0	5	0	106
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	257	251	2	0	241	23	0	0	0	6	0	118
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	264			253			1136	1030	252	1017	1019	253
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264			253			1136	1030	252	1017	1019	253
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			100			100	100	100	97	100	85
cM capacity (veh/h)	1300			1312			129	187	786	183	190	786
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2						
Volume Total	257	253	264	0	6	118						
Volume Left	257	0	0	0	6	0						
Volume Right	0	2	23	0	0	118						
cSH	1300	1700	1312	1700	183	786						
Volume to Capacity	0.20	0.15	0.00	0.00	0.03	0.15						
Queue Length 95th (ft)	18	0	0	0	2	13						
Control Delay (s)	8.5	0.0	0.0	0.0	25.3	10.4						
Lane LOS	A			A	D	B						
Approach Delay (s)	4.3		0.0	0.0	11.1							
Approach LOS				A	B							
Intersection Summary												
Average Delay				3.9								
Intersection Capacity Utilization			42.1%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 17: Sullivan Rd & 32nd Ave

2020 AM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↕	↕	↗
Volume (veh/h)	223	4	14	75	22	167
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	282	5	18	95	28	211
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	158	28	239			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	158	28	239			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	100	99			
cM capacity (veh/h)	822	1047	1328			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	287	113	28	211
Volume Left	282	18	0	0
Volume Right	5	0	0	211
cSH	825	1328	1700	1700
Volume to Capacity	0.35	0.01	0.02	0.12
Queue Length 95th (ft)	39	1	0	0
Control Delay (s)	11.7	1.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.7	1.3	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		5.5	
Intersection Capacity Utilization		30.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis
 1: University Rd & 32nd Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↗	↕		↖	↕	
Volume (vph)	2	364	16	61	179	62	12	73	57	89	102	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor		0.95			0.95		1.00	0.95		1.00	0.95	
Frt		0.99			0.97		1.00	0.93		1.00	0.99	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3516			3396		1770	3306		1770	3516	
Flt Permitted		0.95			0.81		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3353			2774		1770	3306		1770	3516	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	2	387	17	65	190	66	13	78	61	95	109	5
RTOR Reduction (vph)	0	3	0	0	24	0	0	47	0	0	3	0
Lane Group Flow (vph)	0	403	0	0	297	0	13	92	0	95	111	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			4		5	2		1	6	
Permitted Phases	4			4								
Actuated Green, G (s)		16.9			16.9		1.2	11.7		7.2	17.7	
Effective Green, g (s)		16.9			16.9		1.2	11.7		7.2	17.7	
Actuated g/C Ratio		0.34			0.34		0.02	0.23		0.14	0.36	
Clearance Time (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		5.0			5.0		4.0	5.0		4.0	5.0	
Lane Grp Cap (vph)		1137			941		42	776		255	1249	
v/s Ratio Prot							0.01	c0.03		c0.05	0.03	
v/s Ratio Perm		c0.12			0.11							
v/c Ratio		0.35			0.32		0.31	0.12		0.37	0.09	
Uniform Delay, d1		12.4			12.2		23.9	15.0		19.3	10.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.4		5.7	0.1		1.3	0.1	
Delay (s)		12.8			12.6		29.6	15.1		20.5	10.7	
Level of Service		B			B		C	B		C	B	
Approach Delay (s)		12.8			12.6			16.4			15.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	49.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 2: Schafer Rd/University Rd & Dishman-Mica Rd

2020 PM W- Proj.
 6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↕		↖	↗		↖	↑	↗
Volume (vph)	11	452	149	22	187	38	83	68	7	51	104	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3450		1770	1837		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3450		1770	1837		1770	1863	1583
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	13	526	173	26	217	44	97	79	8	59	121	7
RTOR Reduction (vph)	0	0	84	0	10	0	0	3	0	0	0	6
Lane Group Flow (vph)	13	526	89	26	251	0	97	84	0	59	121	1
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	custom
Protected Phases	1	6		5	2		7	4		3		
Permitted Phases			6								8	8
Actuated Green, G (s)	1.3	31.1	31.1	2.9	32.7		8.4	12.8		5.4	9.8	9.8
Effective Green, g (s)	1.3	31.1	31.1	2.9	32.7		8.4	12.8		5.4	9.8	9.8
Actuated g/C Ratio	0.02	0.43	0.43	0.04	0.45		0.12	0.18		0.07	0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	31	802	681	71	1562		205	325		132	252	214
v/s Ratio Prot	0.01	c0.28		c0.01	0.07		c0.05	c0.05		0.03		
v/s Ratio Perm			0.06								c0.06	0.00
v/c Ratio	0.42	0.66	0.13	0.37	0.16		0.47	0.26		0.45	0.48	0.00
Uniform Delay, d1	35.1	16.3	12.4	33.8	11.7		29.8	25.6		32.0	28.8	27.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.0	2.2	0.1	4.3	0.1		2.3	0.6		3.3	2.0	0.0
Delay (s)	47.1	18.5	12.5	38.1	11.7		32.2	26.2		35.2	30.8	27.0
Level of Service	D	B	B	D	B		C	C		D	C	C
Approach Delay (s)		17.5			14.1			29.3			32.1	
Approach LOS		B			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.56	
Actuated Cycle Length (s)	72.2	Sum of lost time (s) 20.0
Intersection Capacity Utilization	45.1%	ICU Level of Service A
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

3: Bowdish Rd & 32nd Ave

2020 PM W- Proj.
6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Volume (vph)	29	336	50	94	247	42	34	98	71	42	117	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.98		1.00	0.98			0.95			0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	
Satd. Flow (prot)	1770	1826		1770	1822			1760			1805	
Flt Permitted	0.57	1.00		0.33	1.00			0.93			0.90	
Satd. Flow (perm)	1071	1826		622	1822			1647			1644	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	354	53	99	260	44	36	103	75	44	123	29
RTOR Reduction (vph)	0	6	0	0	6	0	0	26	0	0	8	0
Lane Group Flow (vph)	31	401	0	99	298	0	0	188	0	0	188	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			4			8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	21.3	19.2		28.9	23.0			12.7			12.7	
Effective Green, g (s)	21.3	19.2		28.9	23.0			12.7			12.7	
Actuated g/C Ratio	0.41	0.37		0.56	0.44			0.25			0.25	
Clearance Time (s)	4.0	5.0		4.0	5.0			5.0			5.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	468	676		477	808			403			403	
v/s Ratio Prot	0.00	c0.22		c0.02	0.16							
v/s Ratio Perm	0.02			0.09				c0.11			0.11	
v/c Ratio	0.07	0.59		0.21	0.37			0.47			0.47	
Uniform Delay, d1	9.1	13.1		6.1	9.6			16.7			16.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	1.6		0.2	0.4			1.2			1.2	
Delay (s)	9.2	14.8		6.3	10.0			17.8			17.8	
Level of Service	A	B		A	A			B			B	
Approach Delay (s)		14.4			9.1			17.8			17.8	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Bowdish Rd & Dishman-Mica Rd

2020 PM W- Proj.
6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↖	↗
Volume (vph)	10	393	107	24	201	37	39	84	28	33	104	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	0.97		1.00	0.98			0.98			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.99	1.00
Satd. Flow (prot)	1770	1803		1770	1819			1793			1841	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.88			0.91	1.00
Satd. Flow (perm)	1770	1803		1770	1819			1590			1688	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	427	116	26	218	40	42	91	30	36	113	7
RTOR Reduction (vph)	0	9	0	0	8	0	0	10	0	0	0	6
Lane Group Flow (vph)	11	534	0	26	250	0	0	153	0	0	149	2
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	Perm
Protected Phases	1	6		5	2			4			4	
Permitted Phases							4			4		4
Actuated Green, G (s)	1.2	24.9		1.3	25.0			11.1			11.1	11.1
Effective Green, g (s)	1.2	24.9		1.3	25.0			11.1			11.1	11.1
Actuated g/C Ratio	0.02	0.48		0.03	0.48			0.21			0.21	0.21
Clearance Time (s)	4.0	5.5		4.0	5.5			5.0			5.0	5.0
Vehicle Extension (s)	4.0	4.0		4.0	4.0			4.0			4.0	4.0
Lane Grp Cap (vph)	41	866		44	877			340			361	339
v/s Ratio Prot	0.01	c0.30		c0.01	0.14							
v/s Ratio Perm								c0.10			0.09	0.00
v/c Ratio	0.27	0.62		0.59	0.29			0.45			0.41	0.00
Uniform Delay, d1	24.9	9.9		25.0	8.0			17.7			17.5	16.0
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	4.8	1.5		22.4	0.2			1.3			1.0	0.0
Delay (s)	29.6	11.4		47.4	8.3			19.0			18.6	16.0
Level of Service	C	B		D	A			B			B	B
Approach Delay (s)		11.8			11.9			19.0			18.5	
Approach LOS		B			B			B			B	

Intersection Summary

HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	14.5
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 5: Dishman-Mica Rd & Sundown Drive

2020 PM W- Proj.
 6/12/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Volume (veh/h)	3	74	182	6	131	338
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	80	198	7	142	367
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						1112
pX, platoon unblocked	0.86					
vC, conflicting volume	853	201			204	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	750	201			204	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	90			90	
cM capacity (veh/h)	293	840			1367	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	84	204	510
Volume Left	3	0	142
Volume Right	80	7	0
cSH	783	1700	1367
Volume to Capacity	0.11	0.12	0.10
Queue Length 95th (ft)	9	0	9
Control Delay (s)	10.1	0.0	3.0
Lane LOS	B		A
Approach Delay (s)	10.1	0.0	3.0
Approach LOS	B		

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		49.7%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 6: Dishman-Mica Rd & Thorpe Rd

2020 PM W- Proj.
 6/12/2015



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Volume (veh/h)	15	59	103	15	102	206
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	17	69	120	17	119	240
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	605	128			137	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	605	128			137	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	93			92	
cM capacity (veh/h)	423	921			1447	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	86	137	358
Volume Left	17	0	119
Volume Right	69	17	0
cSH	744	1700	1447
Volume to Capacity	0.12	0.08	0.08
Queue Length 95th (ft)	10	0	7
Control Delay (s)	10.5	0.0	3.0
Lane LOS	B		A
Approach Delay (s)	10.5	0.0	3.0
Approach LOS	B		

Intersection Summary			
Average Delay		3.4	
Intersection Capacity Utilization		34.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
7: Pines Rd & 16th Ave

2020 PM W- Proj.
6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Volume (veh/h)	0	280	33	49	171	0	21	0	124	0	275	82
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	298	35	52	182	0	22	0	132	0	293	87
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					129							
pX, platoon unblocked	0.91						0.91	0.91		0.91	0.91	0.91
vC, conflicting volume	182			333			835	602	315	734	619	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			333			769	512	315	657	531	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			78	100	82	100	26	91
cM capacity (veh/h)	1415			1226			101	405	725	272	395	925

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	333	234	154	380
Volume Left	0	52	22	0
Volume Right	35	0	132	87
cSH	1700	1226	382	455
Volume to Capacity	0.20	0.04	0.40	0.83
Queue Length 95th (ft)	0	3	48	203
Control Delay (s)	0.0	2.1	20.7	41.7
Lane LOS		A	C	E
Approach Delay (s)	0.0	2.1	20.7	41.7
Approach LOS			C	E

Intersection Summary			
Average Delay		17.7	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
 8: Hwy 27 & 16th Ave

2020 PM W- Proj.
 6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↕↗		↗	↕↗	
Volume (vph)	130	267	68	9	177	4	26	241	7	83	360	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	4.0	5.0	5.0		5.0	5.0	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Fr't		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1833	1583		1858	1583	1770	3525		1770	3538	
Flt Permitted		0.98	1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1833	1583		1858	1583	1770	3525		1770	3538	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	134	275	70	9	182	4	27	248	7	86	371	1
RTOR Reduction (vph)	0	0	48	0	0	4	0	2	0	0	0	0
Lane Group Flow (vph)	0	409	22	0	191	0	27	253	0	86	372	0
Turn Type	Split	NA	Perm	Split	NA	NA	Prot	NA		Prot	NA	
Protected Phases	8	8		4	4		1	6		5	2	
Permitted Phases			8									
Actuated Green, G (s)		27.0	27.0		16.1	0.0	4.2	14.1		8.5	18.4	
Effective Green, g (s)		27.0	27.0		16.1	0.0	4.2	14.1		8.5	18.4	
Actuated g/C Ratio		0.32	0.32		0.19	0.00	0.05	0.16		0.10	0.21	
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	2.5		3.0	1.9	
Lane Grp Cap (vph)		577	498		349	0	86	579		175	759	
v/s Ratio Prot		c0.22			c0.10		0.02	0.07		c0.05	c0.11	
v/s Ratio Perm			0.01									
v/c Ratio		0.71	0.04		0.55	0.00	0.31	0.44		0.49	0.49	
Uniform Delay, d1		25.9	20.4		31.5	42.9	39.4	32.2		36.6	29.5	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.0	0.0		1.8	0.0	2.1	0.4		2.2	0.2	
Delay (s)		29.9	20.4		33.3	42.9	41.5	32.6		38.7	29.7	
Level of Service		C	C		C	D	D	C		D	C	
Approach Delay (s)		28.5			33.5			33.5			31.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 9: Pines Rd & 32nd Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	43	349	45	119	319	17	54	52	113	36	100	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.90		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1831		1770	1849		1770	1671		1770	1774	
Flt Permitted	0.52	1.00		0.31	1.00		0.50	1.00		0.63	1.00	
Satd. Flow (perm)	970	1831		569	1849		924	1671		1170	1774	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	388	50	132	354	19	60	58	126	40	111	52
RTOR Reduction (vph)	0	4	0	0	1	0	0	71	0	0	16	0
Lane Group Flow (vph)	48	434	0	132	372	0	60	113	0	40	147	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	36.7	32.7		46.2	37.7		21.8	15.6		17.6	13.5	
Effective Green, g (s)	36.7	32.7		46.2	37.7		21.8	15.6		17.6	13.5	
Actuated g/C Ratio	0.46	0.41		0.57	0.47		0.27	0.19		0.22	0.17	
Clearance Time (s)	4.5	5.0		4.5	5.0		4.5	5.0		4.5	5.0	
Vehicle Extension (s)	3.0	5.0		3.0	5.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	482	744		461	867		315	324		286	297	
v/s Ratio Prot	0.00	c0.24		c0.03	c0.20		c0.01	0.07		0.01	c0.08	
v/s Ratio Perm	0.04			0.13			0.04			0.02		
v/c Ratio	0.10	0.58		0.29	0.43		0.19	0.35		0.14	0.50	
Uniform Delay, d1	12.2	18.6		9.5	14.2		22.2	28.0		25.1	30.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.3		0.3	1.6		0.3	0.9		0.2	1.8	
Delay (s)	12.3	21.9		9.8	15.7		22.5	28.9		25.3	32.1	
Level of Service	B	C		A	B		C	C		C	C	
Approach Delay (s)		20.9			14.2			27.3			30.8	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	19.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
Description: Plan 1			
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
 10: Madison Rd & Painted Hills Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Volume (veh/h)	9	0	0	120	190	19
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	0	0	130	207	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	347	217	207			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	347	217	207			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	650	823	1365			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	10	130	227
Volume Left	10	0	0
Volume Right	0	0	21
cSH	650	1365	1700
Volume to Capacity	0.02	0.00	0.13
Queue Length 95th (ft)	1	0	0
Control Delay (s)	10.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	10.6	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		21.2%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 11: Madison Rd & 41st Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Volume (veh/h)	18	2	3	102	159	31
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	2	3	111	173	34
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	307	190	173			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	307	190	173			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	683	852	1404			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	22	114	207
Volume Left	20	3	0
Volume Right	2	0	34
cSH	697	1404	1700
Volume to Capacity	0.03	0.00	0.12
Queue Length 95th (ft)	2	0	0
Control Delay (s)	10.3	0.2	0.0
Lane LOS	B	A	
Approach Delay (s)	10.3	0.2	0.0
Approach LOS	B		

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		20.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 12: Madison Rd & 43rd Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘			↗	↗	
Volume (veh/h)	21	2	3	84	124	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	2	3	91	135	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253	155	135			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253	155	135			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	734	891	1450			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	25	95	175
Volume Left	23	3	0
Volume Right	2	0	40
cSH	746	1450	1700
Volume to Capacity	0.03	0.00	0.10
Queue Length 95th (ft)	3	0	0
Control Delay (s)	10.0	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	10.0	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		18.8%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 13: Madison Rd & 44th Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↙			↕	↘	
Volume (veh/h)	8	8	13	79	113	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	9	14	86	123	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	244	130	123			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	244	130	123			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	99			
cM capacity (veh/h)	737	920	1464			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	100	137
Volume Left	9	14	0
Volume Right	9	0	14
cSH	818	1464	1700
Volume to Capacity	0.02	0.01	0.08
Queue Length 95th (ft)	2	1	0
Control Delay (s)	9.5	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		24.9%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis
 14: Madison Rd & Thorpe Rd

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	58	0	50	0	0	0	25	33	0	0	74	47
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.92	0.86	0.92	0.92	0.92	0.86	0.86	0.92	0.92	0.86	0.86
Hourly flow rate (vph)	67	0	58	0	0	0	29	38	0	0	86	55
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	210	210	113	268	237	38	141			38		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	210	210	113	268	237	38	141			38		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	94	100	100	100	98			100		
cM capacity (veh/h)	736	673	939	632	650	1033	1442			1572		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	126	0	67	141
Volume Left	67	0	29	0
Volume Right	58	0	0	55
cSH	818	1700	1442	1572
Volume to Capacity	0.15	0.00	0.02	0.00
Queue Length 95th (ft)	14	0	2	0
Control Delay (s)	10.2	0.0	3.3	0.0
Lane LOS	B	A	A	
Approach Delay (s)	10.2	0.0	3.3	0.0
Approach LOS	B	A		

Intersection Summary			
Average Delay		4.5	
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
15: Hwy 27 & 32nd Ave

2020 PM W- Proj.
6/12/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↵	↕		↵	↕		↵	↕		↵	↕	
Volume (vph)	48	328	198	183	332	30	144	166	124	56	238	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Lane Util. Factor	1.00	0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.99		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3339		1770	1840		1770	3312		1770	3429	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3339		1770	1840		1770	3312		1770	3429	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	51	349	211	195	353	32	153	177	132	60	253	66
RTOR Reduction (vph)	0	60	0	0	2	0	0	88	0	0	16	0
Lane Group Flow (vph)	51	500	0	195	383	0	153	221	0	60	303	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.9	21.3		16.1	30.5		13.9	22.1		7.3	15.5	
Effective Green, g (s)	6.9	21.3		16.1	30.5		13.9	22.1		7.3	15.5	
Actuated g/C Ratio	0.08	0.25		0.19	0.35		0.16	0.25		0.08	0.18	
Clearance Time (s)	4.5	4.5		4.5	4.5		5.5	5.5		5.5	5.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	2.5		3.0	2.7	
Lane Grp Cap (vph)	140	819		328	646		283	843		148	612	
v/s Ratio Prot	0.03	0.15		c0.11	c0.21		c0.09	0.07		0.03	c0.09	
v/s Ratio Perm												
v/c Ratio	0.36	0.61		0.59	0.59		0.54	0.26		0.41	0.49	
Uniform Delay, d1	37.9	29.1		32.4	23.1		33.5	25.8		37.7	32.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.6	1.4		2.9	1.5		2.1	0.1		1.8	0.5	
Delay (s)	39.5	30.4		35.2	24.5		35.6	26.0		39.5	32.6	
Level of Service	D	C		D	C		D	C		D	C	
Approach Delay (s)		31.2			28.1			29.2			33.7	
Approach LOS		C			C			C			C	

Intersection Summary		
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.58	
Actuated Cycle Length (s)	86.8	Sum of lost time (s) 20.0
Intersection Capacity Utilization	58.8%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

HCM Unsignalized Intersection Capacity Analysis
16: 32nd Ave & Evergreen Rd

2020 PM W- Proj.
6/18/2015



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↕			↕		↖	↗	
Volume (veh/h)	171	320	5	0	354	4	0	1	0	11	1	238
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	199	372	6	0	412	5	0	1	0	13	1	277
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		1052										
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	416			378			1464	1189	375	1184	1190	414
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	416			291			1461	1165	288	1160	1166	414
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	83			100			100	99	100	91	99	57
cM capacity (veh/h)	1143			1179			48	149	697	138	149	638

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1	SB 2
Volume Total	199	378	416	1	13	278
Volume Left	199	0	0	0	13	0
Volume Right	0	6	5	0	0	277
cSH	1143	1700	1179	149	138	630
Volume to Capacity	0.17	0.22	0.00	0.01	0.09	0.44
Queue Length 95th (ft)	16	0	0	1	8	56
Control Delay (s)	8.8	0.0	0.0	29.4	33.7	15.2
Lane LOS	A			D	D	C
Approach Delay (s)	3.0		0.0	29.4	16.0	
Approach LOS				D	C	

Intersection Summary		
Average Delay		5.0
Intersection Capacity Utilization	60.8%	ICU Level of Service B
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis
 17: Sullivan Rd & 32nd Ave

2020 PM W- Proj.
 6/12/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	↑
Volume (veh/h)	277	10	15	75	123	296
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	292	11	16	79	129	312
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	240	129	441			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	240	129	441			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	60	99	99			
cM capacity (veh/h)	738	920	1119			

Direction, Lane #	EB 1	NB 1	SB 1	SB 2
Volume Total	302	95	129	312
Volume Left	292	16	0	0
Volume Right	11	0	0	312
cSH	743	1119	1700	1700
Volume to Capacity	0.41	0.01	0.08	0.18
Queue Length 95th (ft)	50	1	0	0
Control Delay (s)	13.1	1.5	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.1	1.5	0.0	
Approach LOS	B			

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization		37.2%	ICU Level of Service A
Analysis Period (min)		15	

**LEVEL OF SERVICE
CALCULATIONS
YEAR 2040
WITHOUT PROJECT**
