Technical Memorandum

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To: Mark Handris, Icon Construction & Development

From: Daniel Stumpf, EI
Todd Mobley, PE

Date: March 27, 2018

Subject: Park Place Annexation:
Transportation Impact Study Addendum #1

Introduction

This memorandum is written as an addendum to the original *Park Place Annexation Transportation Impact Study* (TIS), dated August 2nd, 2017. Oregon Department of Transportation (ODOT) staff have requested that trip generation assumptions within the TIS be revised. Accordingly, this addendum re-assesses site trip generation and includes capacity analyses for year 2035 build-out conditions reflecting this change in projected trips generated.

A draft version of this memorandum was distributed to ODOT and City of Oregon City staff in mid-March. This final version of the memo incorporates revisions made by public agency review of the draft report. This includes:

1. Explanation of the assumed number of homes on the site,
2. Additional discussion of pass-by trips and the use of internal trip reduction,
3. Explanation of ODOT's recent interpretation regarding the application of intersection performance standards,
4. A proposal to establish a trip cap for the subject site.

Trip Generation

Reasonable Worst-Case Development Scenarios

The subject site consists of 34.57 acres currently zoned RRFF-5 and 57.43 acres currently zoned Future-Use 10-acre minimum (FU-10) under Clackamas County. Upon annexation of the site into the Oregon City, the area will be rezoned for 87.5 acres of residential use under R-5 zoning with a minimum lot size of 5,000 square-feet and 4.5 acres of Neighborhood Commercial (NC) zoning.

Under the existing Clackamas County zoning, the site can be developed with up to 11 lots with properties zoned RRFF-5 requiring a minimum lot size of 5 acres and properties zoned FU-10 having a minimum lot size of 10 acres. Each lot may be developed with a single-family home.

Under the proposed zoning, the project site can be developed with up to 533 residential lots in the area zoned R-5[1], as well as the 4.5 acres of neighborhood commercial space. The lots zoned R-5 could each hold a single-family dwelling, and the area zoned NC can accommodate up to 42,000 square-feet of gross floor area for neighborhood commercial uses.

Based on the comparison between the "reasonable worst-case" development scenarios for the existing and proposed zonings, annexation of the subject properties could result in a net increase of up to 522 new homes, as well as 42,000 square-feet of commercial uses.

Trip Generation Methodology

To estimate the number of trips that could be generated under the existing and proposed zones, data from the *TRIP GENERATION MANUAL*[2] was used. The trip projections for the residential uses was determined using data from land-use code 210, *Single-Family Detached Housing*, and is based on the number of dwelling units. Based on correspondence with ODOT and Oregon City staff, trip generation for the NC zone was determined utilizing the following land-use codes:

- 850 – *Supermarket*, 25,000 square-feet;
- 851 – *Convenience Market (Open 24 Hours)*, 2,000 square-feet;
- 881 – *Pharmacy/Drugstore with Drive-Through Window*, 8,000 square-feet;
- 932 – *High-Turnover (Sit-Down) Restaurant*, 5,000 square-feet; and
- 934 – *Fast-Food Restaurant with Drive-Through Window*, 2,000 square-feet.

Given the variety of land-uses that could be developed within the project site (including residential, retail, and restaurant land-uses), some trips generated will be shared or internally captured by other future developed uses and will not impact the nearby transportation system. Using the NCHRP Report 684, internal capture rates for the "reasonable worst-case" development scenario under the proposed zoning were calculated for each land-use during the morning and evening peak hours.

The retail and restaurant land-uses of the "reasonable worst-case" development scenario under the proposed zoning are expected to attract pass-by and diverted trips to the site. Pass-by trips are trips that leave the adjacent roadway to patronize a land-use and then continue in their original direction of travel. Similar to

[1] See attached calculation of residential density from Rick Givens, Planning Consultant, dated March 21, 2018
[2] Institute of Transportation Engineers (ITE), *TRIP GENERATION MANUAL*, 9th Edition, 2012.

pass-by trips, diverted trips are trips that divert from a nearby roadway not adjacent to the site to patronize a land-use before continuing to their original destination. Pass-by trips do not add additional vehicles to the surrounding transportation system; however, they do add additional turning movements at site access intersections. Diverted trips may add turning movements at both site accesses and other nearby intersections.

For the purposes of this analysis, diverted trips were treated as primary trips while pass-by trip rates were determined using data provided in the *TRIP GENERATION HANDBOOK*[3]. Data from land-use codes 850, 851, 881, 932, and 934 were used to determine pass-by rates for the retail and restaurant portions of the "reasonable worst-case" development scenario under the proposed zone. It is assumed that the weekday pass-by rates would approximately match the evening peak hour rates. If no data was provided for a specific land-use during the morning peak hour, it was assumed the morning rate would similarly match the evening peak hour rate.

The calculations indicate that the proposed annexation and zone change could result in up to 538 additional trips during the morning peak hour, with 184 entering and 534 exiting the site. During the evening peak hour, 679 additional trips could be expected, with 412 entering and 267 exiting the site. A daily increase of 7,406 trips is projected, with half entering and half exiting the site.

A summary of the potential trip generation under the proposed zoning is provided in Table 1 on the following page. Table 2 provides a comparison between the trip generation potential under the existing and proposed zones. Detailed trip generation worksheets are included in the attached technical appendix.

ODOT staff has disagreed with the use of both pass-by and internal trips. Regarding this practice, the *TRIP GENERATION HANDBOOK* states on page 63:

> *The application of pass-by trip reductions presented in Chapter 10 should likewise be applicable to mixed-use sites. However, none of the internal trips can be of a pass-by nature because they do not travel on the adjacent (external) street system.* ***Pass-by trip percentages are applicable only to trips that enter or exit the adjacent street system.*** *(emphasis not added, bold text is included in the document referenced)*

The trip generation calculations in the original TIS and in this addendum were prepared in strict compliance with common industry practice and with the guidance from the handbook.

[3] Institute of Transportation Engineers (ITE), *TRIP GENERATION HANDBOOK*, 3rd Edition, 2014.

Table 1 – Trip Generation Summary (Proposed Zoning)

	ITE Code	Size & Rate	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Single-Family Homes	210	533 units	100	300	400	299	175	474	4,896
Internal Trips		*12% (13%)*	*24*	*24*	*48*	*31*	*31*	*62*	*636*
External Trips			76	276	352	268	144	412	4,260
Supermarket	850	25 ksf	53	32	85	121	116	237	2,556
Internal Trips		*12% (13%)*	*5*	*5*	*10*	*15*	*15*	*30*	*332*
External Trips			48	27	75	106	101	207	2,224
Pass-by Trips		*36% (36%)*	*14*	*14*	*28*	*37*	*37*	*74*	*800*
Primary Trips			34	13	47	69	64	133	1,424
Convenience Market (24 Hr)	851	2 ksf	67	67	134	54	51	105	1,476
Internal Trips		*12% (13%)*	*8*	*8*	*16*	*7*	*7*	*14*	*192*
External Trips			59	59	118	47	44	91	1,284
Pass-by Trips		*51% (51%)*	*30*	*30*	*60*	*23*	*23*	*46*	*654*
Primary Trips			29	29	58	24	21	45	630
Pharmacy w/ Drive-Thru	881	8 ksf	15	13	28	40	39	79	776
Internal Trips		*12% (13%)*	*2*	*2*	*4*	*5*	*5*	*10*	*100*
External Trips			13	11	24	35	34	69	676
Pass-by Trips		*49% (49%)*	*6*	*6*	*12*	*17*	*17*	*34*	*332*
Primary Trips			7	5	12	18	17	35	344
High-Turnover Restaurant	932	5 ksf	30	24	54	29	20	49	636
Internal Trips		*12% (13%)*	*3*	*3*	*6*	*3*	*3*	*6*	*82*
External Trips			27	21	48	26	17	43	554
Pass-by Trips		*43% (43%)*	*10*	*10*	*20*	*9*	*9*	*18*	*238*
Primary Trips			17	11	28	17	8	25	316
Fast-Food Rest w/ Drive-Thru	934	2 ksf	46	45	91	34	31	65	992
Internal Trips		*12% (13%)*	*5*	*5*	*10*	*4*	*4*	*8*	*128*
External Trips			41	40	81	30	27	57	864
Pass-by Trips		*49% (50%)*	*20*	*20*	*40*	*14*	*14*	*28*	*432*
Primary Trips			21	20	41	16	13	29	432
Total Vehicular Trips			**311**	**481**	**792**	**577**	**432**	**1,009**	**11,332**
Total Internal Trips			***47***	***47***	***94***	***65***	***65***	***130***	***1,470***
Total External Trips			**264**	**434**	**698**	**512**	**367**	**879**	**9,862**
Total Pass-by Trips			***80***	***80***	***160***	***100***	***100***	***200***	***2,456***
Net New Site Trips			**184**	**354**	**538**	**412**	**267**	**679**	**7,406**

Note: AM (PM and ADT).

Table 2 – Trip Generation Comparison (Existing and Proposed Zoning)

	Morning Peak Hour			Evening Peak Hour			Weekday Total
	Enter	Exit	Total	Enter	Exit	Total	
Existing Zoning Trips	2	6	8	7	4	11	104
Proposed Zoning Trips	184	354	538	412	267	679	7,406
Net Increase in Site Trips	**182**	**348**	**530**	**405**	**263**	**668**	**7,302**

Operational Analysis

To reflect the change in projected site trip generation, the TIS capacity analysis was revised for the 2035 build-out scenarios during the morning and evening peak hours. The analysis was conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *HIGHWAY CAPACITY MANUAL* (HCM)[4]. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Oregon City Capacity Standards

Per Section 12.04.205 of the *Oregon City Municipal Code*, the following minimum acceptable operation standards apply when evaluating traffic impacts associated with the proposed annexation. This language is quoted directly from the City's code:

- For intersections within the Regional Center (Downtown Community Plan), a maximum v/c ratio of 1.10 is permissible during the peak hour, provided that during the second hour the v/c ratio is 0.99 or less. For signalized intersections, these standards apply to the intersection as a whole. For unsignalized intersections, these standards apply to the major-street approaches only. There is no performance standard for unsignalized minor-street approaches.
- For intersections outside the Regional Center but designated on the Arterial and Throughway Network, a maximum v/c ratio of 0.99 shall be maintained. This standard applies to signalized

[4] Transportation Research Board, *HIGHWAY CAPACITY MANUAL 2000* and *2010*.

intersections as a whole, and to the major-street approaches at unsignalized intersections. There is no performance standard for unsignalized minor-street approaches.

- Signalized intersections located outside the Regional Center boundaries and not designated on the Arterial and Throughway Network shall operate at LOS D or better for the intersection as a whole, no approach shall operate worse than LOS E, and the intersection shall operate with a v/c ratio no higher than 1.0 for the sum of critical movements.
- Unsignalized intersections located outside the Regional Center boundaries and not designated on the Arterial and Throughway Network shall operate at LOS E or better for all approaches serving more than 20 peak hour vehicles. LOS F will be tolerated at movements serving no more than 20 vehicles during the peak hour.
- Until the city adopts new performance measures that identify alternative mobility targets, the city exempts proposed developments that are permitted, either conditionally, outright, or through a detailed development master plan approval from compliance with the above mobility standards for identified intersections, including the intersections of OR-99E at the I-205 northbound and southbound ramp terminals, and the intersection of Beavercreek Road at OR-213.

According to Oregon City's Downtown Community Plan, the Regional Center encompasses all of the study intersections except Beavercreek Road at OR-213, the future Holly Lane at S Holcomb Boulevard, and Holly Lane at S Redland Road.

ODOT staff has recently made the interpretation that trips generated outside of a Regional Center, which impact intersections within a Regional Center, are subject to a maximum v/c ratio of 0.99 and not 1.10 during the peak hour. It has not been made clear by ODOT how a state highway intersection within the Regional Center could be analyzed with a mix of vehicles that carry separate applicable performance standards. However, this issue does not change the findings or recommendations contained within the original TIS or this addendum.

The future intersection of Holly Lane at S Holcomb Boulevard will be an unsignalized intersection currently not designated on the Arterial and Throughway Network whereas Holly Lane at S Redland Road is designated on the Arterial and Throughway Network.

Clackamas County Capacity Standards

The roadways of Abernethy Road and S Redland Road operate under the jurisdiction of Clackamas County; therefore, intersections along these roadways must operate acceptably per County standards. According to the *Clackamas County Comprehensive Plan, Chapter 5 – Transportation System Plan*, the following operational standards apply to study intersections along these roadways:

- Urban intersections within Town Centers (Incorporated Cities) are required to operate with a v/c ratio of 1.10 or less during the first hour of the evening peak of traffic and with a v/c ratio of 0.99 or less during the second hour.
- Rural intersections inside a City's Urban Growth Boundary are required to operate with a v/c ratio between 0.80 to 0.95 during the evening peak hour.

Intersection Capacity Analysis

The v/c, delay, and LOS results of the capacity analysis are shown in Table 3 and Table 4 for the morning and evening peak hours. The v/c ratio for two-way stop-controlled intersections represent that highest reported v/c for the major-street approach while LOS and delay are representative of the minor-street approach lane experiencing the highest delay. The reported results are generally based on the analysis methodologies provided in the 2010 HCM; however, for intersections where the 2010 methodology fails to report major-street v/c ratio or does not provide a v/c ratio for a signalized intersection, v/c ratios were evaluated using the HCM 2000 methodologies.

Additionally, the I-205 southbound ramps intersection at OR-213 was analyzed as two separate intersections due to its unique configuration that includes two distinct stop bars for southbound vehicles. Based on the capacity analysis, the highest average control delay experienced for any intersection approach was determined to be the eastbound left-turn from the I-205 off-ramp. The highest projected v/c ratio was for the northbound approach.

Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

Table 3 – Capacity Analysis Summary (Intersections 1 – 8)

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
1. I-205 SB Ramps at OR-99E						
2035 Planning Horizon (w/o Annexation Trips)	F	> 80	**1.21**	E	71	**1.13**
2035 Planning Horizon (w/ Annexation Trips)	F	> 80	**1.21**	E	71	**1.13**
2. I-205 NB Ramps at OR-99E						
2035 Planning Horizon (w/o Annexation Trips)	F	> 80	**1.33**	E	57	**1.17**
2035 Planning Horizon (w/ Annexation Trips)	F	> 80	**1.33**	E	57	**1.17**
3. 15th St at OR-99E						
2035 Planning Horizon (w/o Annexation Trips)	F	54	0.92	E	43	0.78
2035 Planning Horizon (w/ Annexation Trips)	F	70	0.92	F	52	0.78
4. 14th St at OR-99E						
2035 Planning Horizon (w/o Annexation Trips)	E	62	**1.14**	C	27	0.94
2035 Planning Horizon (w/ Annexation Trips)	E	60	**1.14**	C	32	0.96
5. Abernethy Rd/S Holcomb Blvd at Redland Rd						
2035 Planning Horizon (w/o Annexation Trips)	C	30	0.79	D	41	0.91
2035 Planning Horizon (w/ Annexation Trips)	D	44	0.90	F	84	**1.14**
6. Abernethy Rd at Washington St						
2035 Planning Horizon (w/o Annexation Trips)	C	21	0.85	A	9	0.61
2035 Planning Horizon (w/ Annexation Trips)	C	28	0.93	B	11	0.68
7. 15th St at Washington St						
2035 Planning Horizon (w/o Annexation Trips)	B	19	0.81	B	18	0.73
2035 Planning Horizon (w/ Annexation Trips)	C	25	0.88	C	22	0.78
8. 14th St at Washington St						
2035 Planning Horizon (w/o Annexation Trips)	E	56	1.06	E	70	**1.17**
2035 Planning Horizon (w/ Annexation Trips)	E	68	**1.12**	F	> 80	**1.27**

BOLDED results exceed Oregon City and Clackamas County operational standards.

Table 4 – Capacity Analysis Summary (Intersections 9 - 16)

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
9. 14th St at Main St						
2035 Planning Horizon (w/o Annexation Trips)	F	> 80	0.25	F	106	0.35
2035 Planning Horizon (w/ Annexation Trips)	F	> 80	0.26	F	131	0.37
10. I-205 SB Ramps at OR-213						
2035 Planning Horizon (w/o Annexation Trips)	F	> 80	0.68	E	43	0.92
2035 Planning Horizon (w/ Annexation Trips)	F	> 80	0.71	F	51	0.95
12. Prairie Schooner/Clackamas River Dr at OR-213						
2035 Planning Horizon (w/o Annexation Trips)	B	13	0.87	B	14	0.92
2035 Planning Horizon (w/ Annexation Trips)	B	14	0.90	B	16	0.96
13. Redland Rd at OR-213						
2035 Planning Horizon (w/o Annexation Trips)	C	33	1.01	E	77	**1.19**
2035 Planning Horizon (w/ Annexation Trips)	D	42	1.06	F	> 80	**1.24**
Mitigated Conditions (Add 1 NB & SB Th Lane)	C	24	0.81	C	28	0.96
14. Beavercreek Rd at OR-213						
2035 Planning Horizon (w/o Annexation Trips)	E	61	1.01	E	64	1.04
2035 Planning Horizon (w/ Annexation Trips)	E	62	1.01	E	65	1.04
15. Holly Ln at S Holcomb Blvd (Future)						
2035 Planning Horizon (w/o Annexation Trips)	B	11	0.07	B	12	0.16
2035 Planning Horizon (w/ Annexation Trips)	B	13	0.10	C	15	0.21
16. Holly Ln at S Redland Rd*						
2035 Planning Horizon (w/o Annexation Trips)	C	21	0.07	C	22	0.03
2035 Planning Horizon (w/ Annexation Trips)	F	> 80	0.13	F	> 80	0.22

* Intersection converted from three-legged to four-legged under year 2035 conditions.

BOLDED results exceed Oregon City and Clackamas County operational standards.

At the intersection of OR-213 at Redland Road, it was assumed that an additional through lane in each direction on OR-213 will be constructed prior to the planning horizon. This is allowed per the Transportation Planning Rule via OAR 660-12-0060(4)(b)(C) since the highway project is identified in the Financially Constrained project list in the Regional Transportation Plan.

Based on the capacity analysis, the following six study intersections that are not projected to meet the applicable minimum intersection performance standards:

1. I-205 southbound ramps at OR-99E;
2. I-205 northbound ramps at OR-99E;
3. 14th Street at OR-99E;
4. 14th Street at Washington Street;
5. Abernethy Road/S Holcomb Boulevard at Redland Road; and
6. Beavercreek Road at OR-213.

The above listed intersections were reported as not meeting operational standards or exceeding capacity within the original TIS and therefore, mitigation was suggested. All mitigations previously recommended within the TIS are still applicable and are expected to address any additional intersection impacts projected with the increased site trip generation.

Proposed Trip Cap

It is recognized that there is continued discussion with ODOT regarding the trip generation calculations relative to pass-by trips and internal trip capture. To simplify the analysis and come to a consensus, it is recommended that a trip cap be established as part of the annexation process. This will ensure that future development on the site does not generate external trips beyond what is analyzed in this addendum. It is recommended that the trip cap be established as follows:

The total number of external primary trips generated by development on the site shall not exceed the following:

AM Peak Hour:	538 trips
PM Peak Hour:	679 trips
Weekday:	7,406 trips

Rick Givens
Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045

March 21, 2018

Todd Mobley
Lancaster Engineering, Inc.
321 SW 4th Avenue, Suite 400
Portland, OR 97204

RE: Park Place Annexation Density

Dear Todd:

The estimate of a maximum residential density of 533 units for the 91 acre Park Place annexation and zone change is based upon the following:

Total Area: 91 Acres
Less MUC Area: 4.5 Acres
Gross Residential Area: 86.5 Acres

Low Density Residential/R-10 Area: 9.5 Acres
Less Unbuildable Stream Corridor: 3.55 Acres
Buildable Site Area: 5.95 Acres
Net Site Area (Less 20% Streets): 4.76 Acres or 207,345 sq. ft.
Maximum Density @ 1 Unit per 10,000 sq. ft.: 21 Units

Medium Density Residential/R-5 Area: 78 Acres
Less Unbuildable Stream Corridor: 4.65 Acres
Buildable Site Area: 73.35 Acres
Net Site Area (Less 20% Streets): 58.68 Acres or 2,560,659 sq. ft.
Maximum Density @ 1 Unit per 5,000 sq. ft.: 512 Units

Total Maximum Density: 533 Units

Note that the actual density achieved would likely be significantly less than this due to the steepness of certain areas of the site.

Please let me know if you have any questions or need further information.

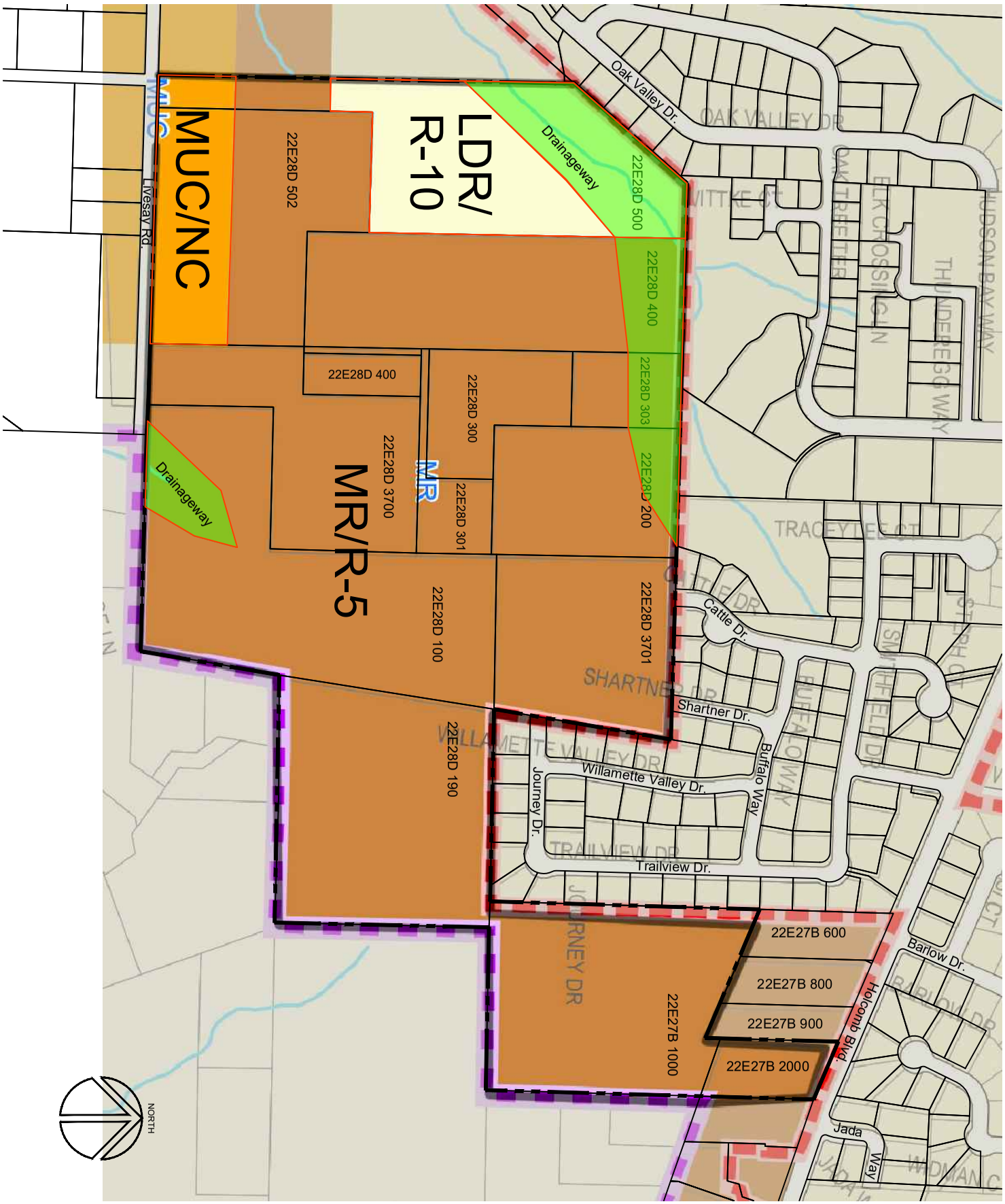
Sincerely yours,

Rick Givens

Rick Givens

Cc: Mike Robinson, Mark Handris

phone: 503-479-0097 | fax: 503-479-0097 | e-mail: rickgivens@gmail.com



Richard E. Givens, Planning Consultant
18680 Sunblaze Dr.
Oregon City, Oregon 97045
PH: (503) 479-02097

SCALE 1" = 400'

DATE: 3-21-2018

PROJECT 15-ICN-105

Park Place Annexation

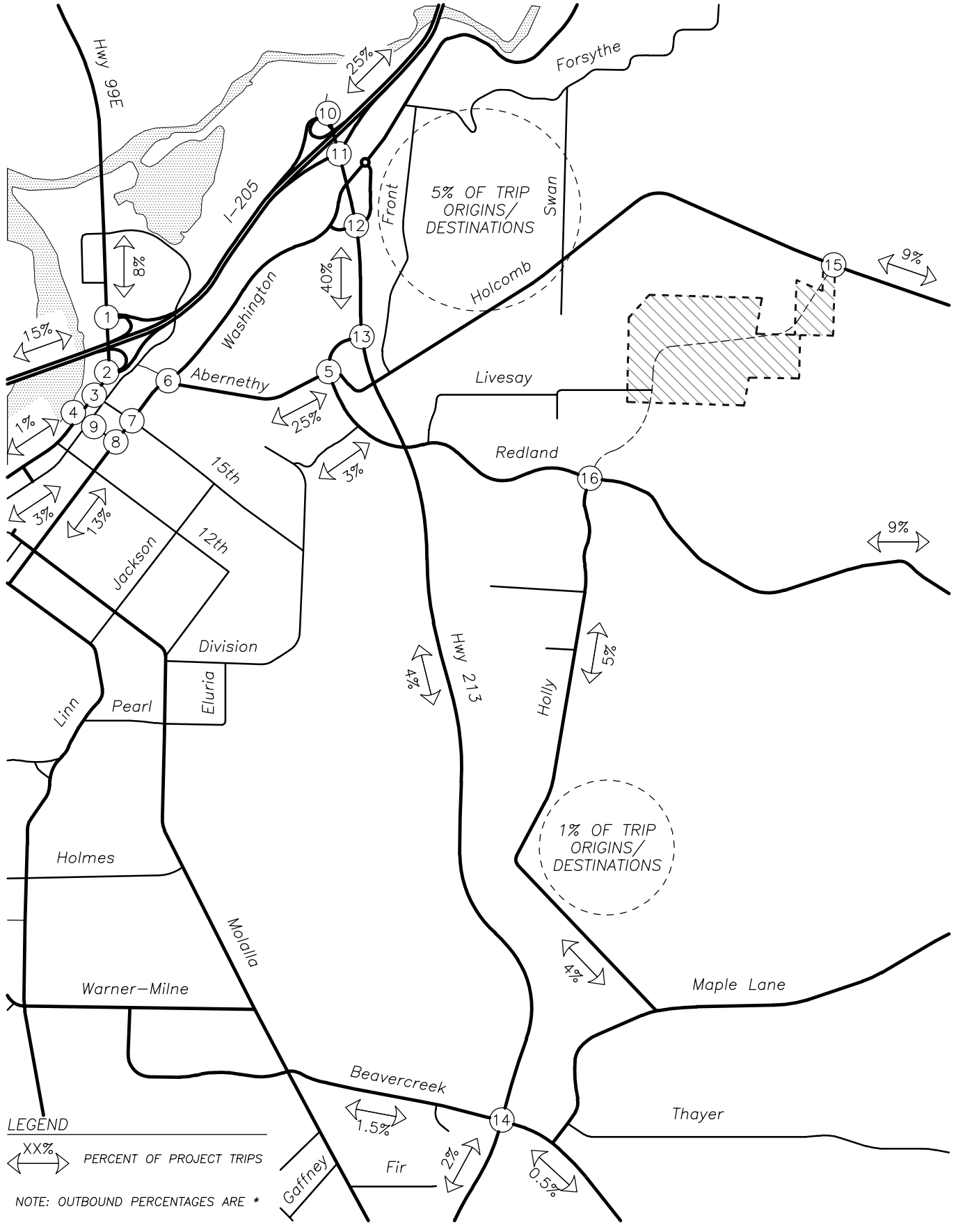
Oregon City, Oregon

Proposed Zoning

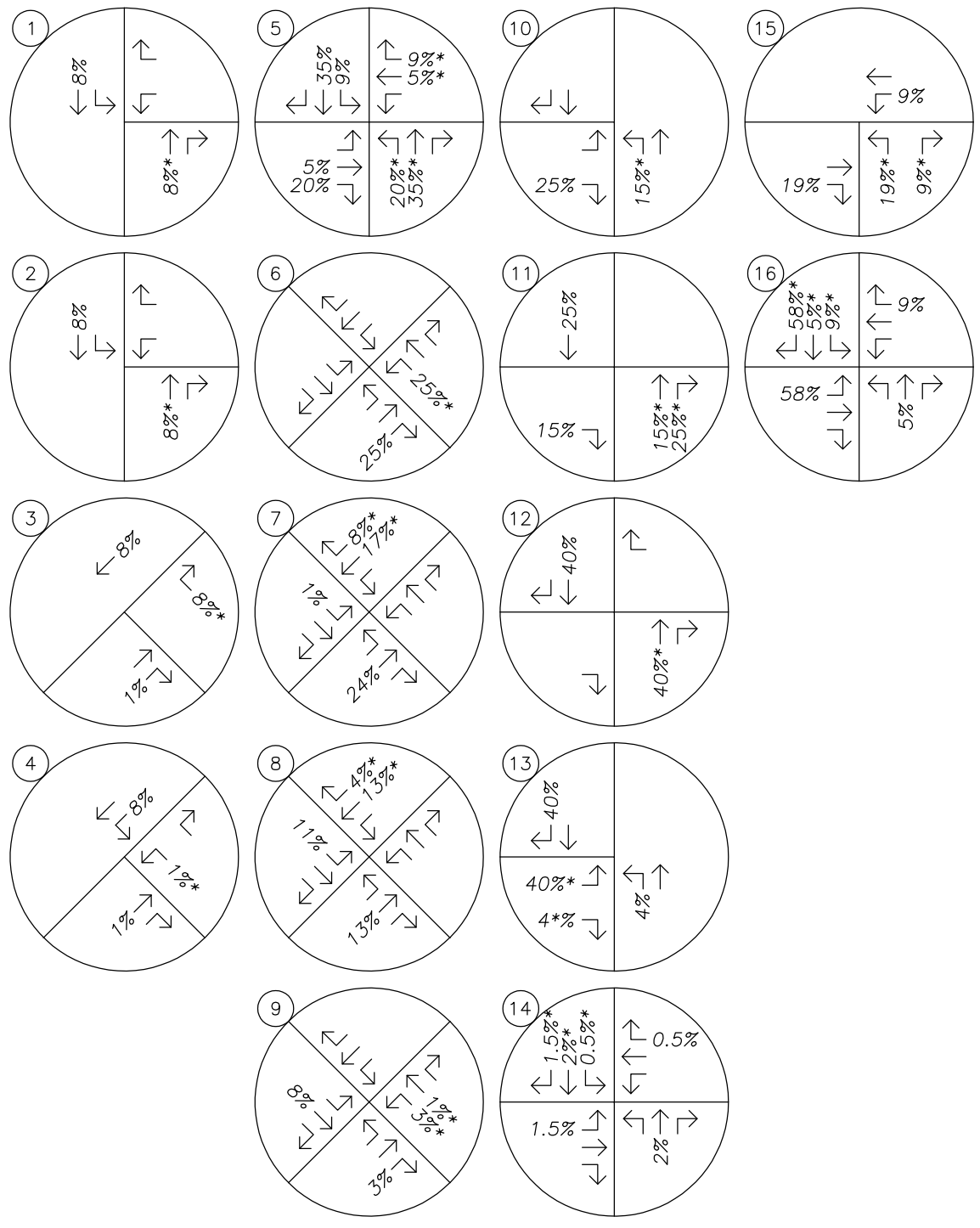
SITE TRIP DISTRIBUTION

Inbound & Outbound Percentages – Site Trips
AM & PM Peak Hours

FIGURE 1



*Matches the alignment in the City's TSP



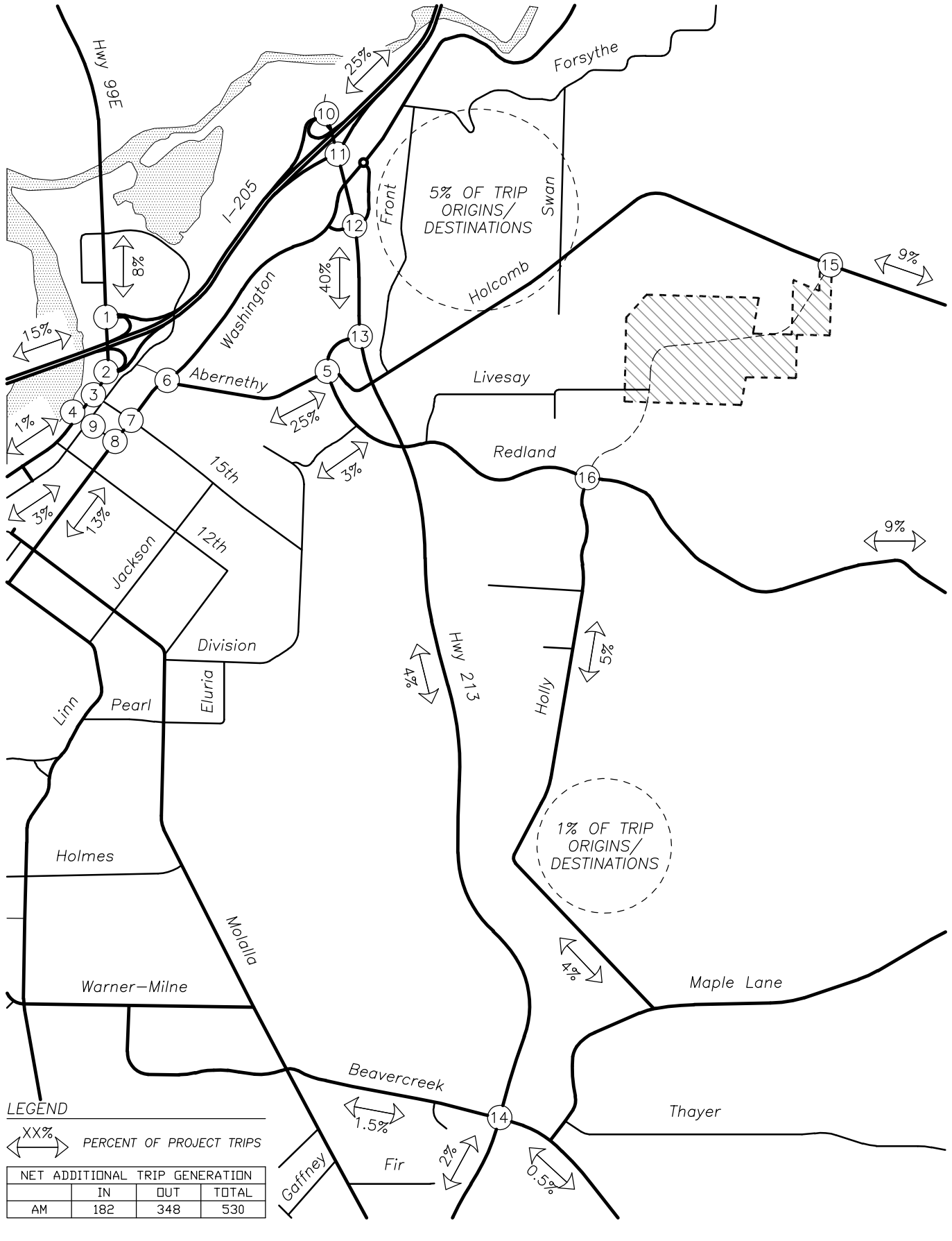
No Scale

SITE TRIP ASSIGNMENT

Proposed Zone Change – Net Additional Site Trips

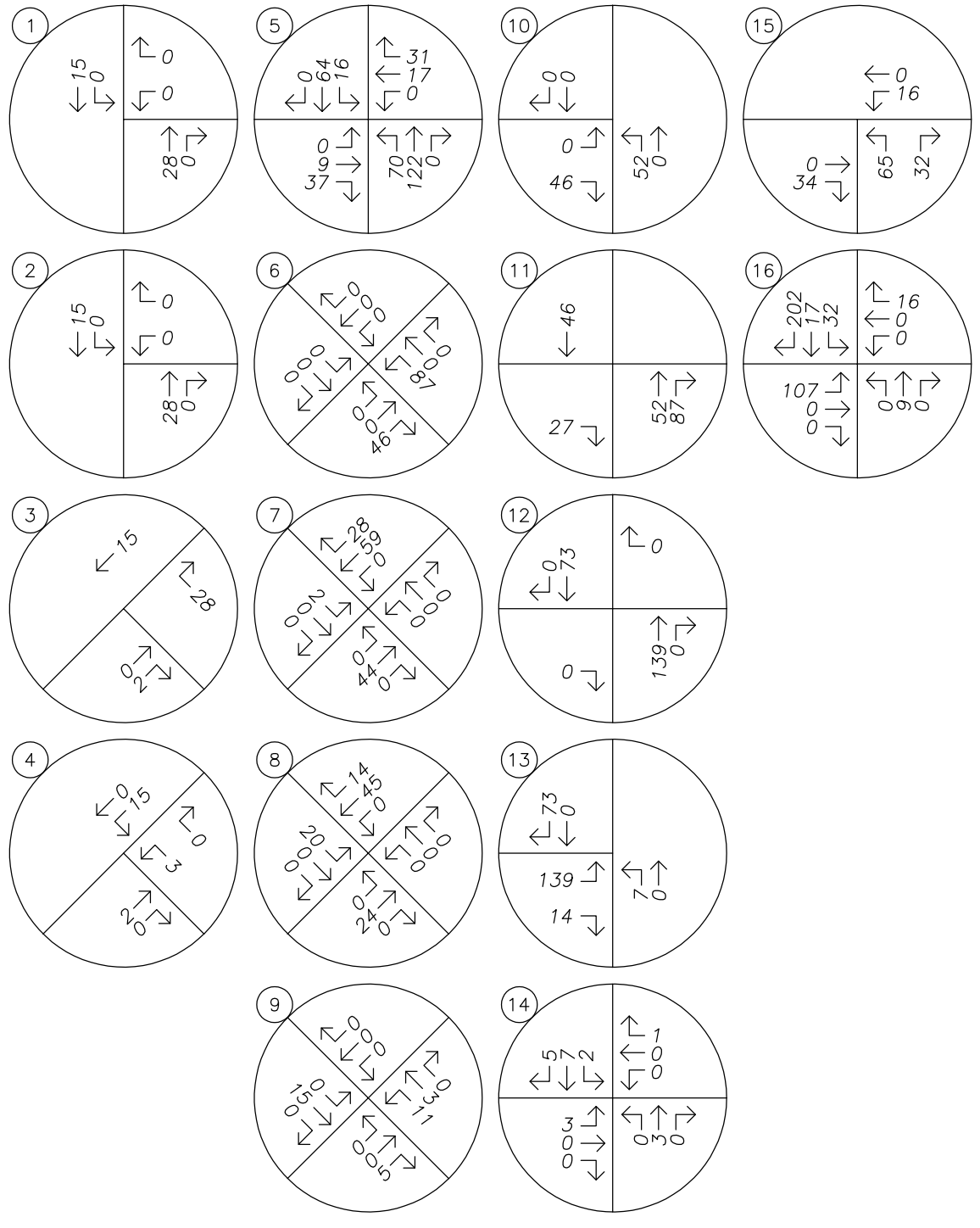
AM Peak Hour

FIGURE 2



NET ADDITIONAL TRIP GENERATION			
	IN	OUT	TOTAL
AM	182	348	530

*Matches the alignment in the City's TSP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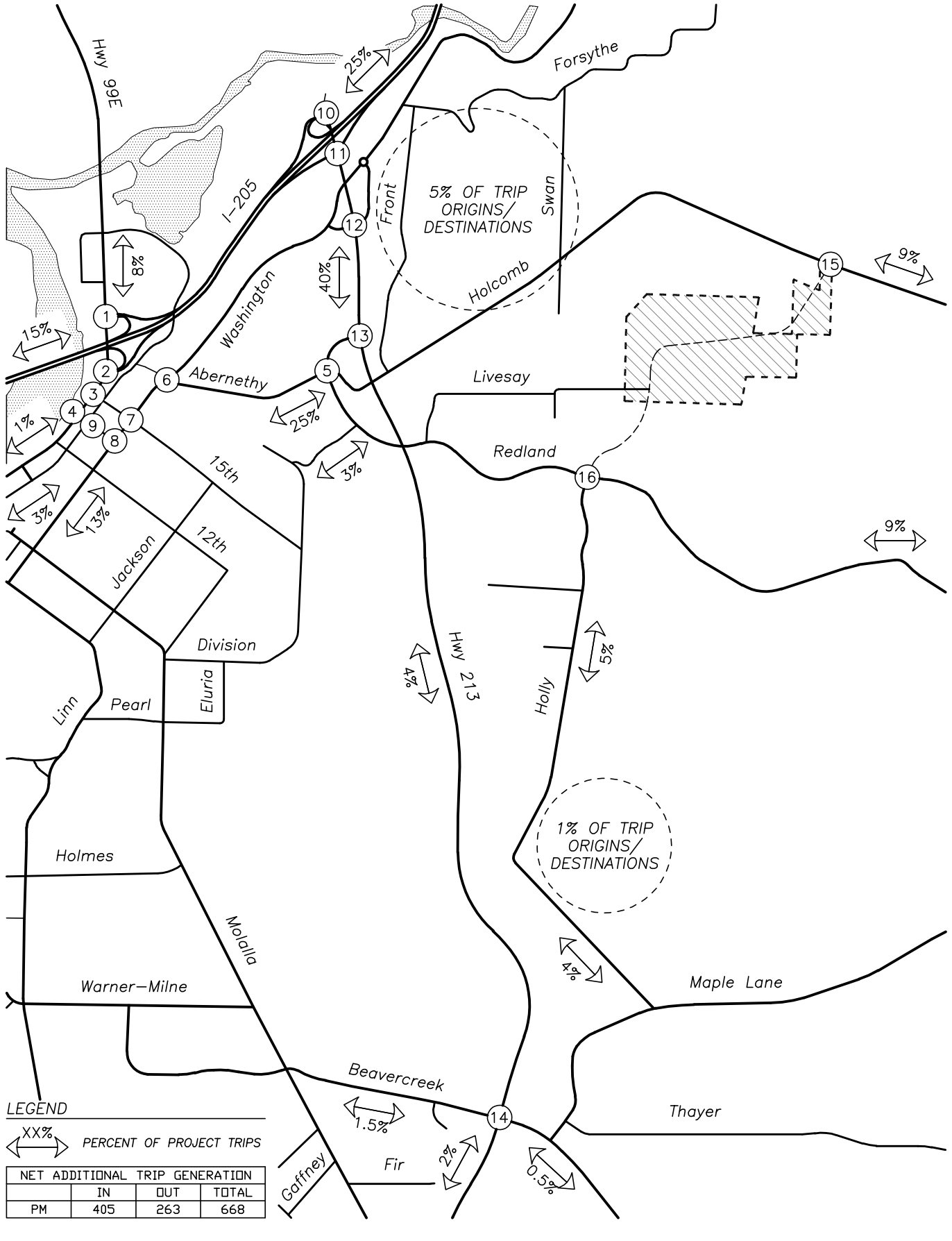
SITE TRIP ASSIGNMENT

Proposed Zone Change – Net Additional Site Trips

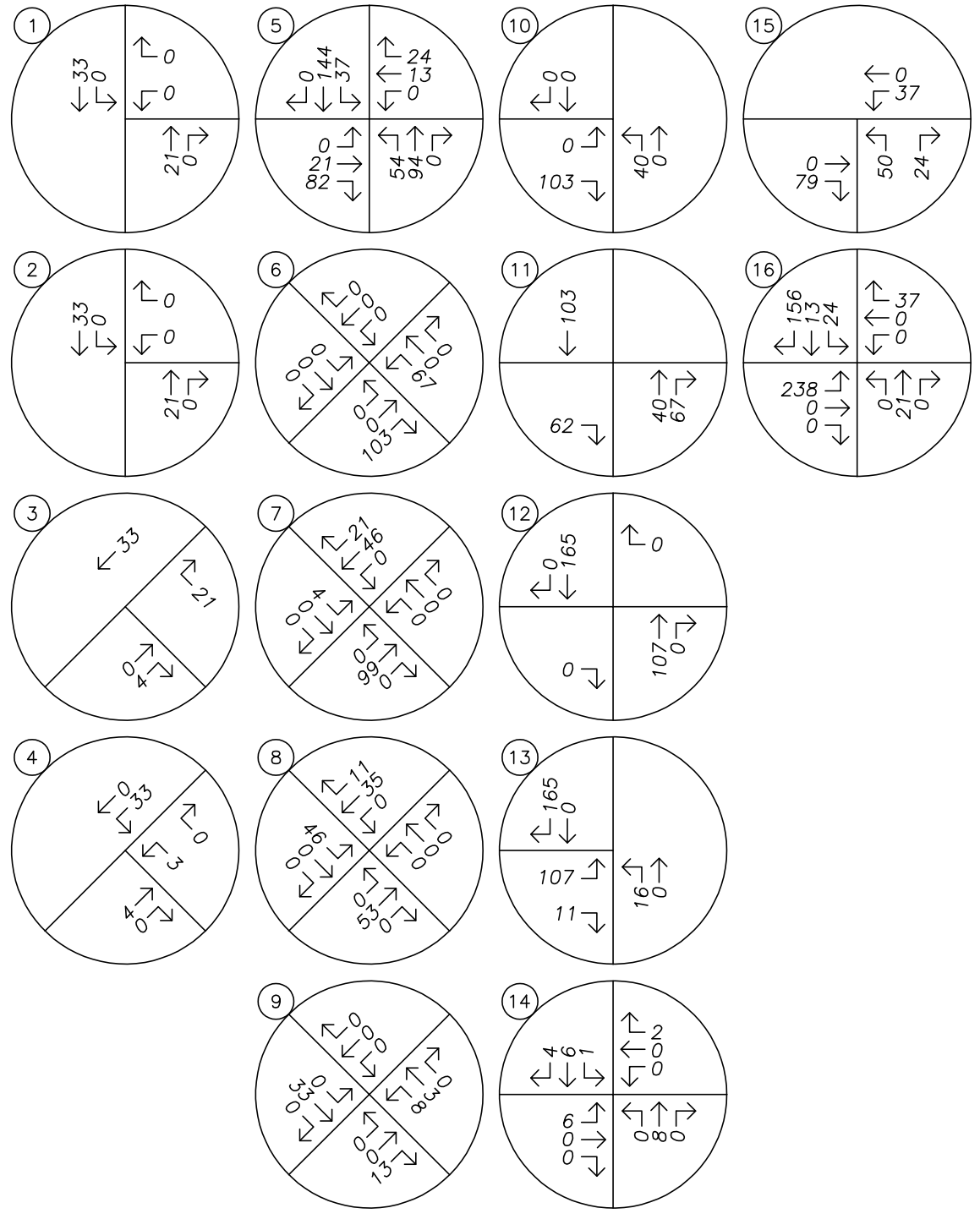
PM Peak Hour

FIGURE 3



NET ADDITIONAL TRIP GENERATION			
	IN	OUT	TOTAL
PM	405	263	668

*Matches the alignment in the City's TSP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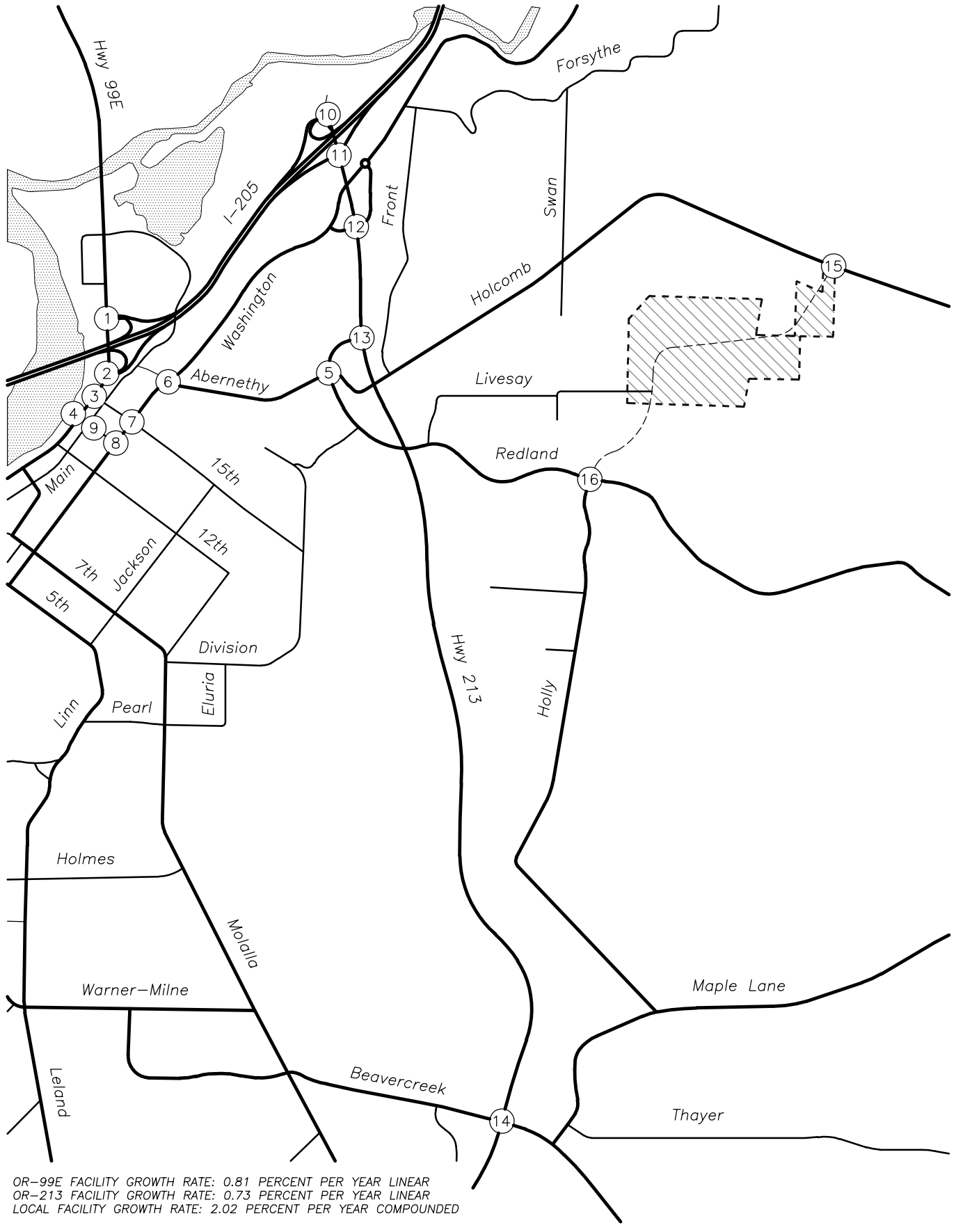
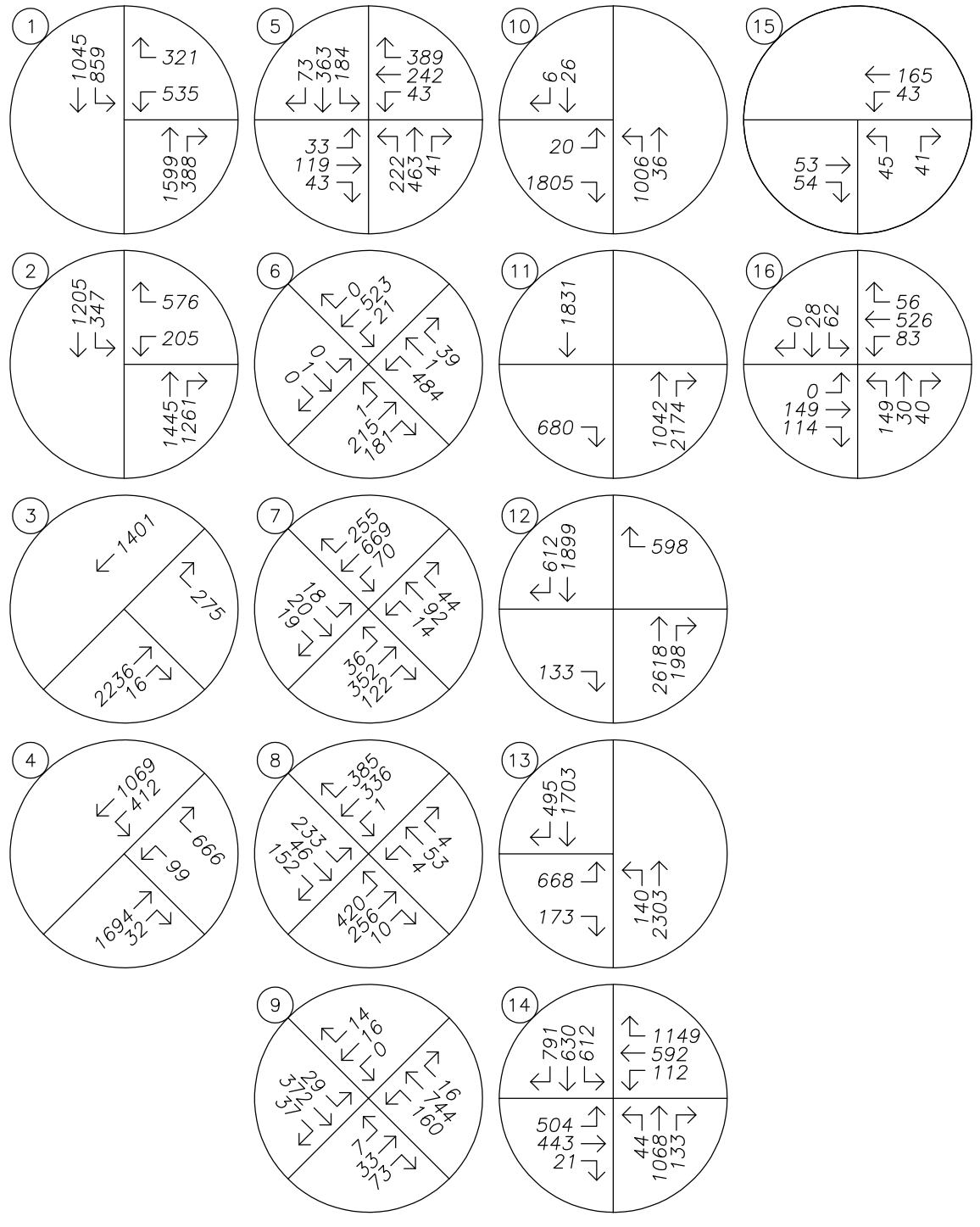
TRAFFIC VOLUMES
Year 2035 Planning Horizon – w/ Holly Extension
AM Peak Hour

FIGURE 4



OR–99E FACILITY GROWTH RATE: 0.81 PERCENT PER YEAR LINEAR
OR–213 FACILITY GROWTH RATE: 0.73 PERCENT PER YEAR LINEAR
LOCAL FACILITY GROWTH RATE: 2.02 PERCENT PER YEAR COMPOUNDED

*Matches the alignment in the City's TSP



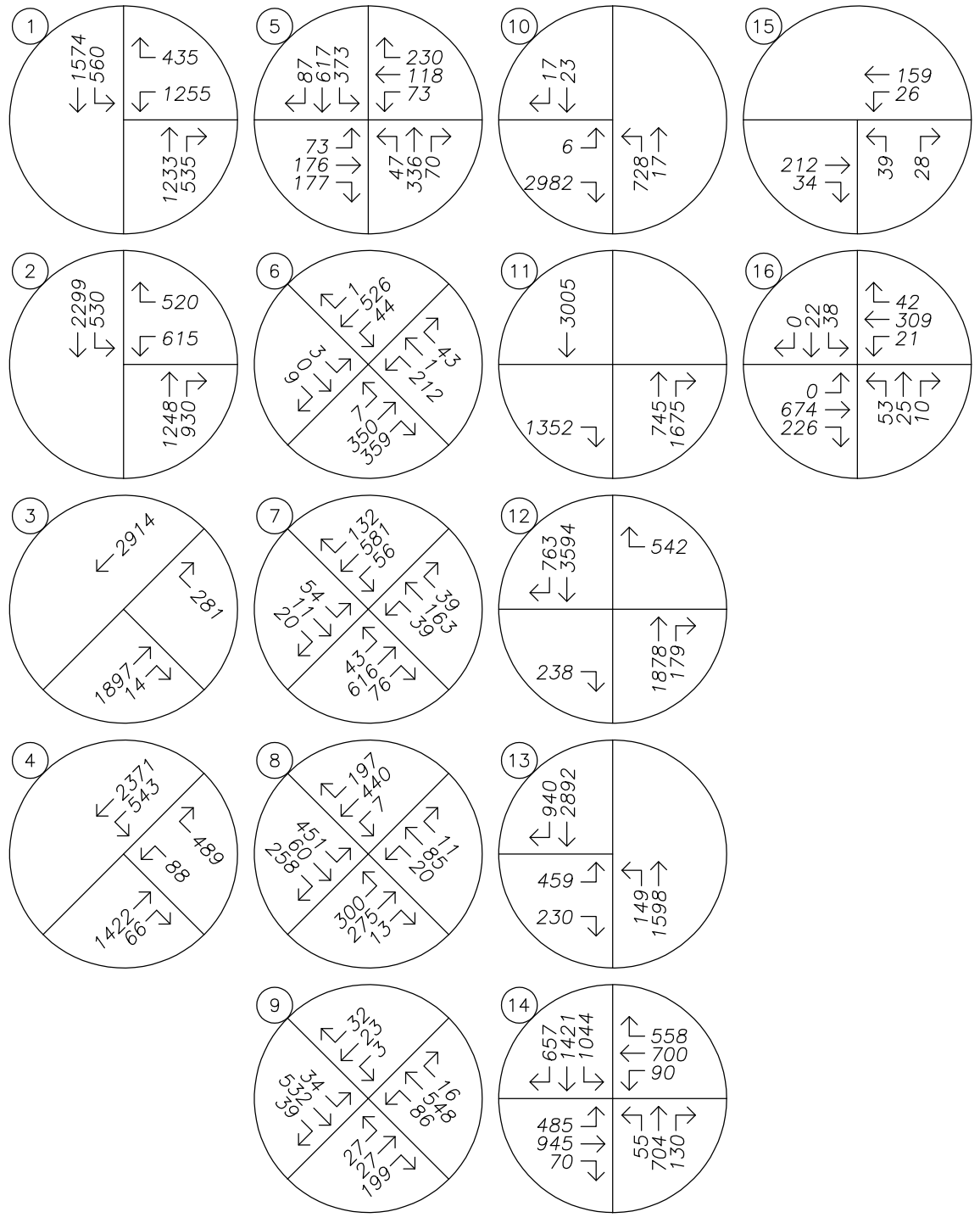
No Scale

TRAFFIC VOLUMES
Year 2035 Planning Horizon – w/ Holly Extension
PM Peak Hour

FIGURE 5

OR–99E FACILITY GROWTH RATE: 0.81 PERCENT PER YEAR LINEAR
OR–213 FACILITY GROWTH RATE: 0.73 PERCENT PER YEAR LINEAR
LOCAL FACILITY GROWTH RATE: 2.02 PERCENT PER YEAR COMPOUNDED

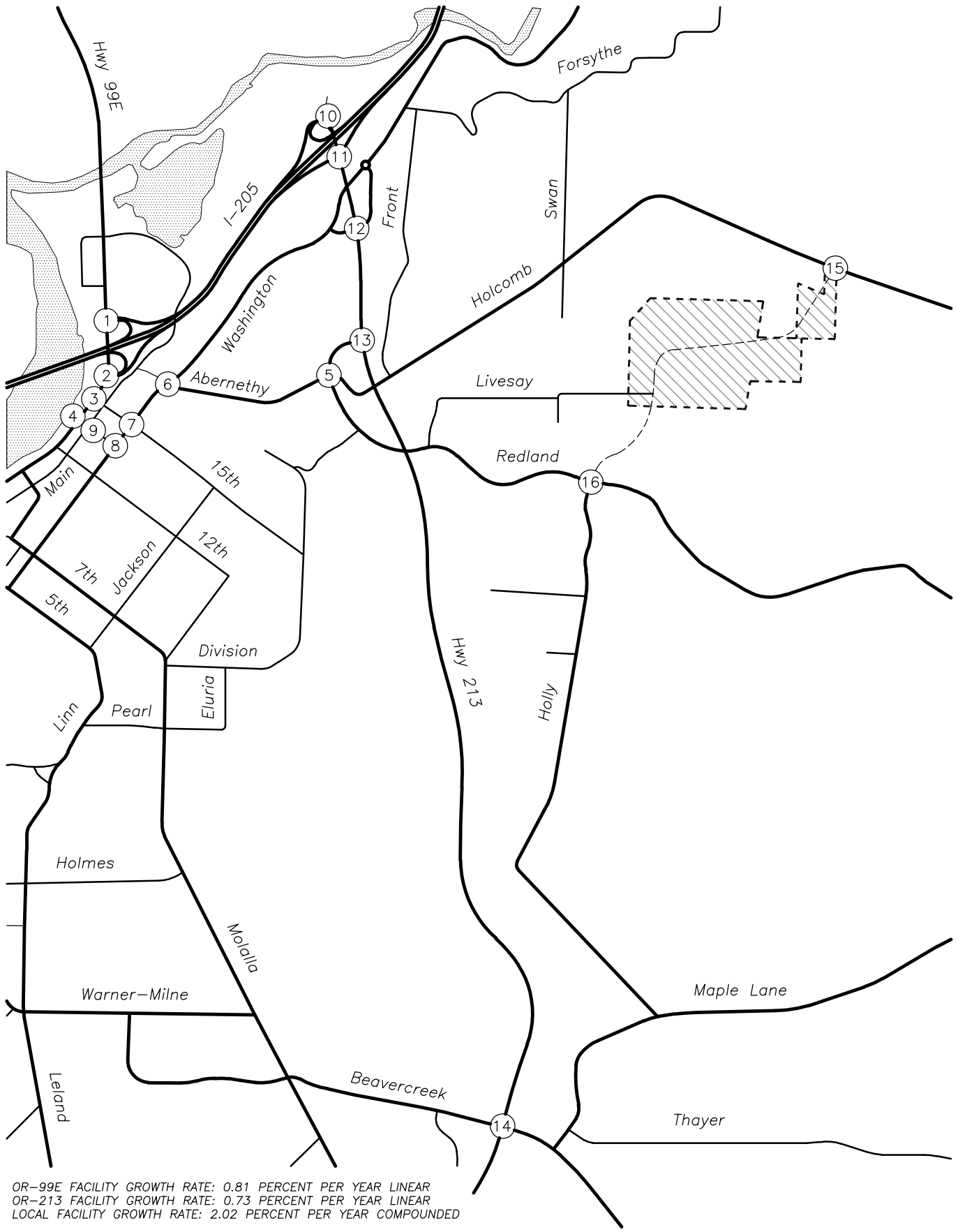
*Matches the alignment in the City's TSP



No Scale

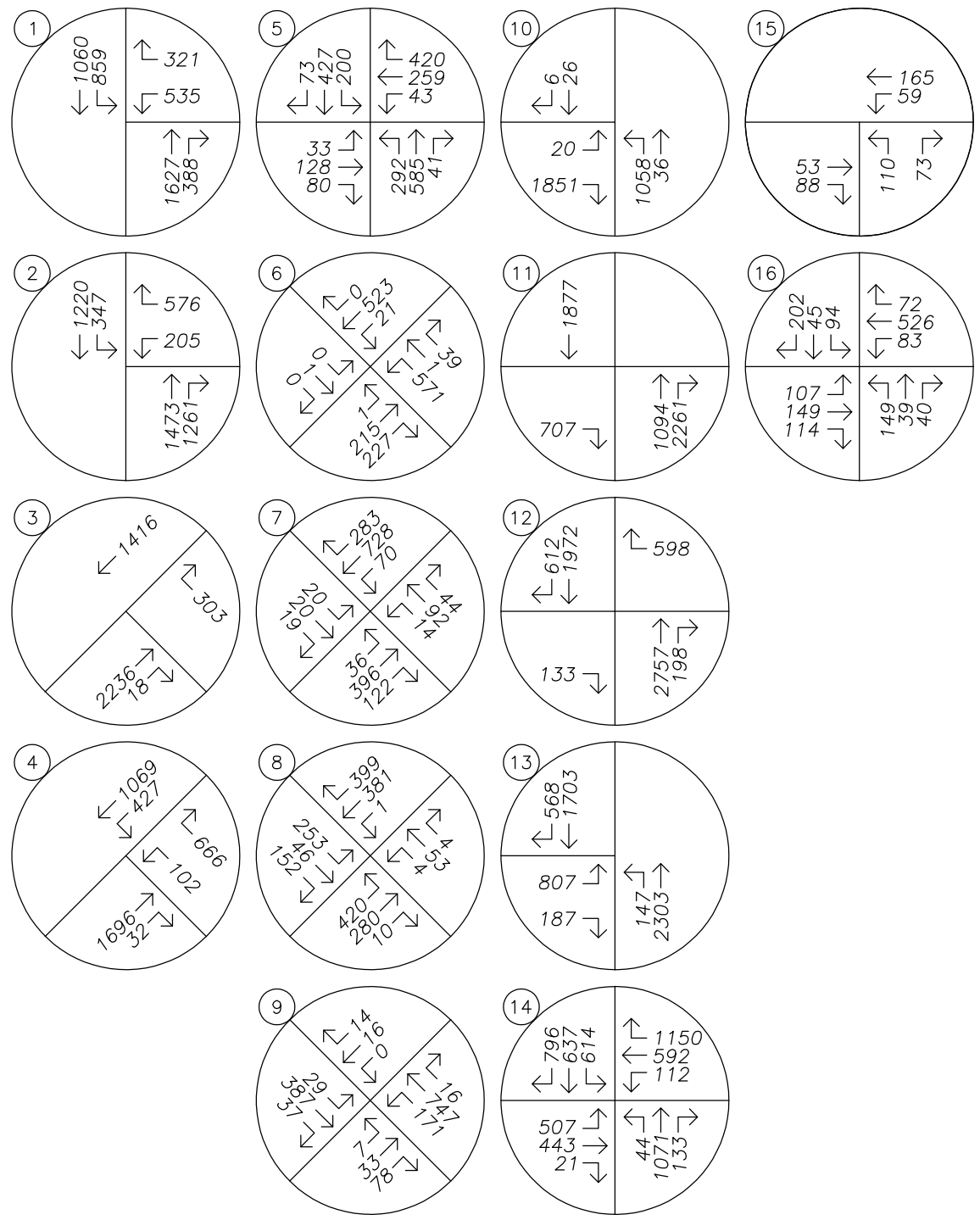
FIGURE 6

TRAFFIC VOLUMES
Year 2035 Planning Horizon plus Annexation
AM Peak Hour



OR-99E FACILITY GROWTH RATE: 0.81 PERCENT PER YEAR LINEAR
OR-213 FACILITY GROWTH RATE: 0.73 PERCENT PER YEAR LINEAR
LOCAL FACILITY GROWTH RATE: 2.02 PERCENT PER YEAR COMPOUNDED

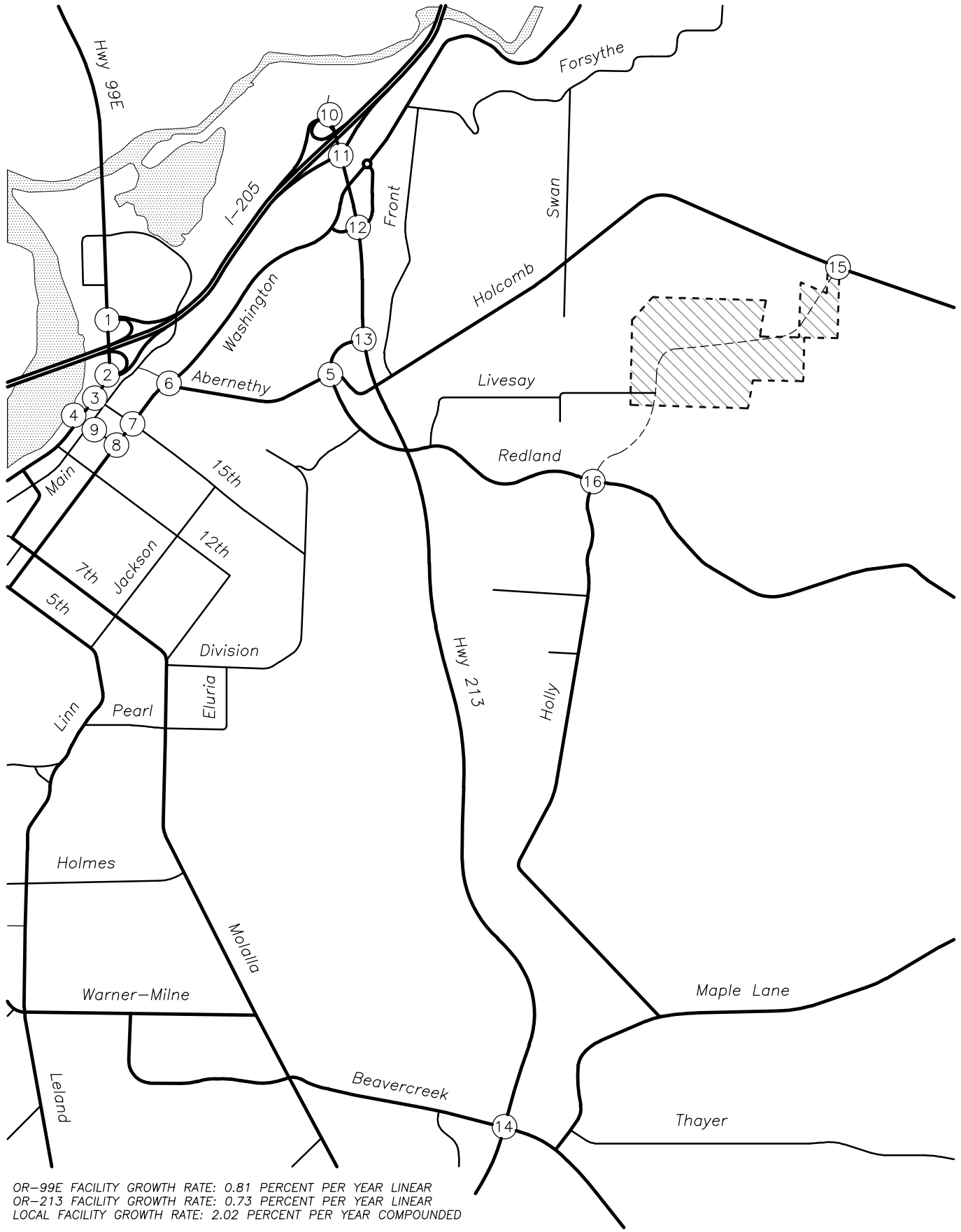
*Matches the alignment in the City's TSP



No Scale

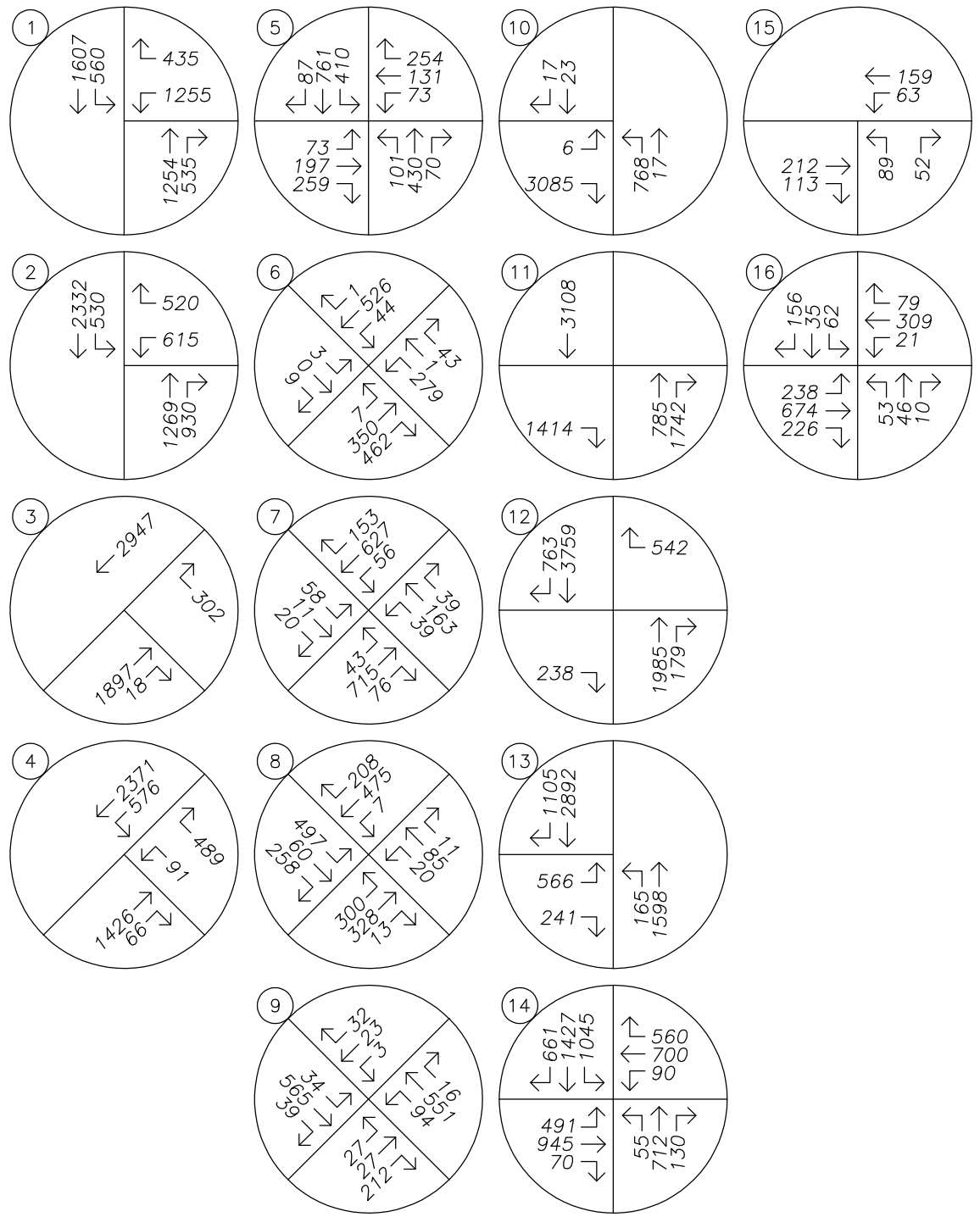
TRAFFIC VOLUMES
Year 2035 Planning Horizon plus Annexation
PM Peak Hour

FIGURE 7



OR-99E FACILITY GROWTH RATE: 0.81 PERCENT PER YEAR LINEAR
OR-213 FACILITY GROWTH RATE: 0.73 PERCENT PER YEAR LINEAR
LOCAL FACILITY GROWTH RATE: 2.02 PERCENT PER YEAR COMPOUNDED

*Matches the alignment in the City's TSP



No Scale

TRIP GENERATION CALCULATIONS

Land Use: Supermarket
Land Use Code: 850
Variable: 1000 Sq Ft Gross Floor Area
Variable Value: 25

AM PEAK HOUR

Trip Rate: 3.40

	Enter	Exit	Total
Directional Distribution	62%	38%	
Trip Ends	**53**	**32**	**85**

PM PEAK HOUR

Trip Rate: 9.48

	Enter	Exit	Total
Directional Distribution	51%	49%	
Trip Ends	**121**	**116**	**237**

WEEKDAY

Trip Rate: 102.24

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,278**	**1,278**	**2,556**

SATURDAY

Trip Rate: 177.59

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**2,220**	**2,220**	**4,440**

Source: TRIP GENERATION, Ninth Edition

TRIP GENERATION CALCULATIONS

Land Use: Convenience Market (Open 24 Hours)
Land Use Code: 851
Variable: 1,000 Sq Ft Gross Floor Area
Variable Value: 2.0

AM PEAK HOUR

Trip Rate: 67.03

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**67**	**67**	**134**

PM PEAK HOUR

Trip Rate: 52.41

	Enter	Exit	Total
Directional Distribution	51%	49%	
Trip Ends	**54**	**51**	**105**

WEEKDAY

Trip Rate: 737.99

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**738**	**738**	**1,476**

SATURDAY

Trip Rate: 863.10

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**863**	**863**	**1,726**

Source: TRIP GENERATION, Ninth Edition

TRIP GENERATION CALCULATIONS

Land Use: Pharmacy/Drugstore with Drive-Through Window
Land Use Code: 881
Variable: 1,000 Sq Ft Gross Floor Area
Variable Value: 8.0

AM PEAK HOUR

Trip Rate: 3.45

	Enter	Exit	Total
Directional Distribution	52%	48%	
Trip Ends	**15**	**13**	**28**

PM PEAK HOUR

Trip Rate: 9.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**40**	**40**	**79**

WEEKDAY

Trip Rate: 96.91

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**388**	**388**	**776**

SATURDAY PEAK HOUR

Trip Rate: 8.20

	Enter	Exit	Total
Directional Distribution	49%	51%	
Trip Ends	**32**	**34**	**66**

Source: TRIP GENERATION, Ninth Edition

TRIP GENERATION CALCULATIONS

Land Use: High-Turnover (Sit-Down) Restaurant
Land Use Code: 932
Variable: 1000 Sq Ft Gross Floor Area
Variable Quantity: 5

AM PEAK HOUR

Trip Rate: 10.81

	Enter	Exit	Total
Directional Distribution	55%	45%	
Trip Ends	**30**	**24**	**54**

PM PEAK HOUR

Trip Rate: 9.85

	Enter	Exit	Total
Directional Distribution	60%	40%	
Trip Ends	**29**	**20**	**49**

WEEKDAY

Trip Rate: 127.15

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**318**	**318**	**636**

SATURDAY

Trip Rate: 158.37

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**396**	**396**	**792**

Source: TRIP GENERATION, Ninth Edition

TRIP GENERATION CALCULATIONS

Land Use: Fast Food Restaurant with Drive-Through Window
Land Use Code: 934
Variable: 1000 Sq Ft Gross Floor Area
Variable Quantity: 2

AM PEAK HOUR

Trip Rate: 45.42

	Enter	Exit	Total
Directional Distribution	51%	49%	
Trip Ends	**46**	**45**	**91**

PM PEAK HOUR

Trip Rate: 32.65

	Enter	Exit	Total
Directional Distribution	52%	48%	
Trip Ends	**34**	**31**	**65**

WEEKDAY

Trip Rate: 496.12

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**496**	**496**	**992**

SATURDAY

Trip Rate: 722.03

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**722**	**722**	**1,444**

Source: TRIP GENERATION, Ninth Edition

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Park Place	**Organization:**	Lancaster Engineering
Project Location:	Oregon City, OR	**Performed By:**	Daniel Stumpf, EI
Scenario Description:	Background + Site Trips	**Date:**	
Analysis Year:	2035	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	850, 851, 881	35,000	Sq. Ft.	247	135	112
Restaurant	932, 934	7,000	Sq. Ft.	145	76	69
Cinema/Entertainment				0		
Residential	210	533	Dwelling Units	400	100	300
Hotel				0		
All Other Land Uses[2]				0		
Total				792	311	481

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.25	0%	0%	1.25	0%	0%
Restaurant	1.25	0%	0%	1.25	0%	0%
Cinema/Entertainment						
Residential	1.25	0%	0%	1.25	0%	0%
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		18	0	3	0
Restaurant	0	12		0	3	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	4	19	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	990	389	601
Internal Capture Percentage	12%	15%	10%
External Vehicle-Trips[3]	697	263	434
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	9%	15%
Restaurant	39%	17%
Cinema/Entertainment	N/A	N/A
Residential	5%	6%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Park Place
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.25	135	169	1.25	112	140
Restaurant	1.25	76	95	1.25	69	86
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.25	100	125	1.25	300	375
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	41		18	0	20	0
Restaurant	27	12		0	3	3
Cinema/Entertainment	0	0	0		0	0
Residential	8	4	75	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		54	22	0	0	0
Retail	0		48	0	3	0
Restaurant	0	14		0	6	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	29	19	0		0
Hotel	0	7	6	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	16	153	169	122	0	0
Restaurant	37	58	95	46	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	6	119	125	95	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	21	119	140	95	0	0
Restaurant	15	71	86	57	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	23	352	375	282	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Park Place	**Organization:**	Lancaster Engineering
Project Location:	Oregon City, OR	**Performed By:**	Daniel Stumpf, EI
Scenario Description:	Background + Site Trips	**Date:**	
Analysis Year:	2035	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	850, 851, 881	35,000	Sq. Ft.	421	215	206
Restaurant	932, 934	7,000	Sq. Ft.	114	63	51
Cinema/Entertainment				0		
Residential	210	533	Dwelling Units	474	299	175
Hotel				0		
All Other Land Uses[2]				0		
Total				1009	577	432

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.25	0%	0%	1.25	0%	0%
Restaurant	1.25	0%	0%	1.25	0%	0%
Cinema/Entertainment						
Residential	1.25	0%	0%	1.25	0%	0%
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail					3000	
Restaurant					3000	
Cinema/Entertainment						
Residential		3000	3000			
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		23	0	22	0
Restaurant	0	26		0	4	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	3	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	1,263	722	541
Internal Capture Percentage	13%	11%	15%
External Vehicle-Trips[3]	883	514	369
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	11%	17%
Restaurant	30%	47%
Cinema/Entertainment	N/A	N/A
Residential	7%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Park Place
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.25	215	269	1.25	206	258
Restaurant	1.25	63	79	1.25	51	64
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.25	299	374	1.25	175	219
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	5		75	10	22	13
Restaurant	2	26		5	4	4
Cinema/Entertainment	0	0	0		0	0
Residential	9	9	5	0		7
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		22	2	0	15	0
Retail	0		23	0	172	0
Restaurant	0	135		0	60	0
Cinema/Entertainment	0	11	2		15	0
Residential	0	3	1	0		0
Hotel	0	5	4	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	29	240	269	192	0	0
Restaurant	24	55	79	44	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	26	348	374	278	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	45	213	258	170	0	0
Restaurant	30	34	64	27	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	4	215	219	172	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Table 7.1a Adjusted Internal Trip Capture Rates for Trip Origins within a Multi-Use Development			
Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
From OFFICE	To Office	0.0%	0.0%
	To Retail	28.0%	20.0%
	To Restaurant	63.0%	4.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	1.0%	2.0%
	To Hotel	0.0%	0.0%
From RETAIL	To Office	29.0%	2.0%
	To Retail	0.0%	0.0%
	To Restaurant	13.0%	29.0%
	To Cinema/Entertainment	0.0%	4.0%
	To Residential	14.0%	8.6%
	To Hotel	0.0%	5.0%
From RESTAURANT	To Office	31.0%	3.0%
	To Retail	14.0%	41.0%
	To Restaurant	0.0%	0.0%
	To Cinema/Entertainment	0.0%	8.0%
	To Residential	4.0%	5.9%
	To Hotel	3.0%	7.0%
From CINEMA/ENTERTAINMENT	To Office	0.0%	2.0%
	To Retail	0.0%	21.0%
	To Restaurant	0.0%	31.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	8.0%
	To Hotel	0.0%	2.0%
From RESIDENTIAL	To Office	2.0%	4.0%
	To Retail	1.0%	4.2%
	To Restaurant	20.0%	2.1%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	0.0%
	To Hotel	0.0%	3.0%
From HOTEL	To Office	75.0%	0.0%
	To Retail	14.0%	16.0%
	To Restaurant	9.0%	68.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	2.0%
	To Hotel	0.0%	0.0%

Table 7.2a Adjusted Internal Trip Capture Rates for Trip Destinations within a Multi-Use Development			
Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
To OFFICE	From Office	0.0%	0.0%
	From Retail	4.0%	31.0%
	From Restaurant	14.0%	30.0%
	From Cinema/Entertainment	0.0%	6.0%
	From Residential	3.0%	57.0%
	From Hotel	3.0%	0.0%
To RETAIL	From Office	32.0%	8.0%
	From Retail	0.0%	0.0%
	From Restaurant	8.0%	50.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	17.0%	1.0%
	From Hotel	4.0%	2.0%
To RESTAURANT	From Office	23.0%	2.0%
	From Retail	50.0%	29.0%
	From Restaurant	0.0%	0.0%
	From Cinema/Entertainment	0.0%	3.0%
	From Residential	20.0%	1.4%
	From Hotel	6.0%	5.0%
To CINEMA/ENTERTAINMENT	From Office	0.0%	1.0%
	From Retail	0.0%	26.0%
	From Restaurant	0.0%	32.0%
	From Cinema/Entertainment	0.0%	0.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To RESIDENTIAL	From Office	0.0%	4.0%
	From Retail	2.0%	46.0%
	From Restaurant	5.0%	16.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To HOTEL	From Office	0.0%	0.0%
	From Retail	0.0%	17.0%
	From Restaurant	4.0%	71.0%
	From Cinema/Entertainment	0.0%	1.0%
	From Residential	0.0%	12.0%
	From Hotel	0.0%	0.0%

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	535	321	1627	388	859	1060
Future Volume (vph)	535	321	1627	388	859	1060
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3273	1509	4988	1510	1752	5036
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3273	1509	4988	1510	1752	5036
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	563	338	1713	408	904	1116
RTOR Reduction (vph)	0	0	0	287	0	0
Lane Group Flow (vph)	563	338	1713	121	904	1116
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	7%	7%	4%	4%	3%	3%
Turn Type	Prot	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	17.6	50.5	26.0	26.0	32.9	63.4
Effective Green, g (s)	17.6	50.5	26.0	26.0	32.9	63.4
Actuated g/C Ratio	0.20	0.56	0.29	0.29	0.37	0.70
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	640	922	1440	436	640	3547
v/s Ratio Prot	c0.17	0.13	c0.34		c0.52	0.22
v/s Ratio Perm		0.09		0.08		
v/c Ratio	0.88	0.37	1.19	0.28	1.41	0.31
Uniform Delay, d1	35.2	10.9	32.0	24.7	28.6	5.1
Progression Factor	1.00	1.00	1.09	2.70	1.00	1.00
Incremental Delay, d2	13.1	0.2	89.8	1.0	194.8	0.2
Delay (s)	48.3	11.2	124.6	67.9	223.4	5.3
Level of Service	D	B	F	E	F	A
Approach Delay (s)	34.4		113.7			102.9
Approach LOS	C		F			F

Intersection Summary			
HCM 2000 Control Delay	95.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	205	576	1473	1261	347	1220
Future Volume (vph)	205	576	1473	1261	347	1220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1719	1538	4940	1496	1719	4940
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1719	1538	4940	1496	1719	4940
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	606	1551	1327	365	1284
RTOR Reduction (vph)	0	225	0	328	0	0
Lane Group Flow (vph)	216	381	1551	999	365	1284
Confl. Peds. (#/hr)				3	3	
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	18.5	18.5	43.5	43.5	14.5	62.5
Effective Green, g (s)	18.5	18.5	43.5	43.5	14.5	62.5
Actuated g/C Ratio	0.21	0.21	0.48	0.48	0.16	0.69
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	353	316	2387	723	276	3430
v/s Ratio Prot	0.13		0.31		c0.21	0.26
v/s Ratio Perm		c0.25		c0.67		
v/c Ratio	0.61	1.21	0.65	1.38	1.32	0.37
Uniform Delay, d1	32.5	35.8	17.5	23.2	37.8	5.7
Progression Factor	1.00	1.00	1.00	1.00	0.80	1.82
Incremental Delay, d2	3.1	118.8	1.4	180.6	165.7	0.3
Delay (s)	35.6	154.6	18.9	203.9	195.9	10.6
Level of Service	D	F	B	F	F	B
Approach Delay (s)	123.3		104.2			51.6
Approach LOS	F		F			D

Intersection Summary			
HCM 2000 Control Delay	90.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	2236	18	0	1416	0	303
Future Volume (Veh/h)	2236	18	0	1416	0	303
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	2354	19	0	1491	0	319
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	335			372		
pX, platoon unblocked			0.54		0.59	0.54
vC, conflicting volume			2373		2860	1186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1832		1718	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		100	45
cM capacity (veh/h)			168		47	582

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	NW 1
Volume Total	1569	804	497	497	497	319
Volume Left	0	0	0	0	0	0
Volume Right	0	19	0	0	0	319
cSH	1700	1700	1700	1700	1700	582
Volume to Capacity	0.92	0.47	0.29	0.29	0.29	0.55
Queue Length 95th (ft)	0	0	0	0	0	83
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	18.4
Lane LOS						C
Approach Delay (s)	0.0		0.0			18.4
Approach LOS						C

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	87.8%	ICU Level of Service		E
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	5.3

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Vol, veh/h	2236	18	0	1416	0	303
Future Vol, veh/h	2236	18	0	1416	0	303
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	6	6	2	2
Mvmt Flow	2354	19	0	1491	0	319

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1186
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	2
Pot Cap-1 Maneuver	-	-	0	-	0	340
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	340
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

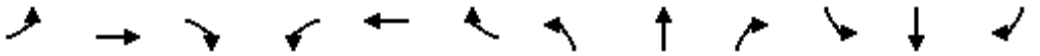
Approach	NB	SB	NW
HCM Control Delay, s	0	0	69.9
HCM LOS			F

Minor Lane/Major Mvmt	NBT	NBR	NWLn1	SBT
Capacity (veh/h)	-	-	340	-
HCM Lane V/C Ratio	-	-	0.938	-
HCM Control Delay (s)	-	-	69.9	-
HCM Lane LOS	-	-	F	-
HCM 95th %tile Q(veh)	-	-	9.7	-

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1696	32	427	1069	102	666
Future Volume (vph)	1696	32	427	1069	102	666
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	4.5
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3395		1703	3406	1736	1553
Flt Permitted	1.00		0.08	1.00	0.95	1.00
Satd. Flow (perm)	3395		139	3406	1736	1553
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1785	34	449	1125	107	701
RTOR Reduction (vph)	2	0	0	0	0	4
Lane Group Flow (vph)	1817	0	449	1125	107	697
Confl. Peds. (#/hr)		1	1		3	
Heavy Vehicles (%)	6%	6%	6%	6%	4%	4%
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	4	1
Permitted Phases			6			4
Actuated Green, G (s)	47.0		79.5	79.5	11.5	39.5
Effective Green, g (s)	47.0		79.5	79.5	11.5	39.5
Actuated g/C Ratio	0.47		0.80	0.80	0.12	0.40
Clearance Time (s)	4.5		4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1595		548	2707	199	683
v/s Ratio Prot	c0.54		0.23	0.33	0.06	c0.29
v/s Ratio Perm			0.42			0.16
v/c Ratio	1.14		0.82	0.42	0.54	1.02
Uniform Delay, d1	26.5		27.9	3.1	41.7	30.2
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	70.9		9.3	0.1	2.8	39.9
Delay (s)	97.4		37.3	3.2	44.5	70.1
Level of Service	F		D	A	D	E
Approach Delay (s)	97.4			12.9	66.7	
Approach LOS	F			B	E	

Intersection Summary			
HCM 2000 Control Delay	59.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	128	80	43	259	420	292	585	41	200	427	73
Future Volume (vph)	33	128	80	43	259	420	292	585	41	200	427	73
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	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1656	1629		1752	1845	1568	1752	1827		1736	1827	1553
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1656	1629		1752	1845	1568	1752	1827		1736	1827	1553
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)	35	135	84	45	273	442	307	616	43	211	449	77
RTOR Reduction (vph)	0	30	0	0	0	119	0	3	0	0	0	51
Lane Group Flow (vph)	35	189	0	45	273	323	307	656	0	211	449	26
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	9%	9%	9%	3%	3%	3%	3%	3%	3%	4%	4%	4%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases						8						6
Actuated Green, G (s)	3.8	16.5		2.8	15.5	24.9	13.9	25.0		9.4	20.5	24.3
Effective Green, g (s)	3.8	16.5		2.8	15.5	24.9	13.9	25.0		9.4	20.5	24.3
Actuated g/C Ratio	0.05	0.23		0.04	0.22	0.35	0.19	0.35		0.13	0.29	0.34
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	87	374		68	398	642	339	637		227	522	623
v/s Ratio Prot	0.02	0.12		c0.03	c0.15	0.07	c0.18	c0.36		0.12	0.25	0.00
v/s Ratio Perm						0.14						0.01
v/c Ratio	0.40	0.51		0.66	0.69	0.50	0.91	1.03		0.93	0.86	0.04
Uniform Delay, d1	32.9	24.0		34.0	25.9	18.5	28.3	23.4		30.8	24.2	15.9
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	3.0	1.1		21.6	4.9	0.6	26.4	43.4		40.2	13.5	0.0
Delay (s)	35.9	25.1		55.6	30.7	19.1	54.7	66.8		71.0	37.8	15.9
Level of Service	D	C		E	C	B	D	E		E	D	B
Approach Delay (s)		26.6			25.4			62.9			45.0	
Approach LOS		C			C			E			D	

Intersection Summary					
HCM 2000 Control Delay	44.2	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	71.7	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	77.2%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

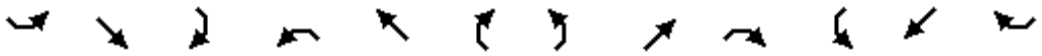
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	1	0	571	1	39	1	215	227	21	523	0
Future Volume (vph)	0	1	0	571	1	39	1	215	227	21	523	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1900		1716	1544		1701	1792	1491	1734	1827	
Flt Permitted		1.00		0.76	1.00		0.20	1.00	1.00	0.57	1.00	
Satd. Flow (perm)		1900		1368	1544		360	1792	1491	1041	1827	
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)	0	1	0	634	1	43	1	239	252	23	581	0
RTOR Reduction (vph)	0	0	0	0	22	0	0	0	165	0	0	0
Lane Group Flow (vph)	0	1	0	634	22	0	1	239	87	23	581	0
Confl. Peds. (#/hr)			1	1			3		1	1		3
Heavy Vehicles (%)	0%	0%	0%	5%	5%	5%	6%	6%	6%	4%	4%	4%
Turn Type		NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)		28.8		28.8	28.8		19.9	19.9	19.9	19.9	19.9	
Effective Green, g (s)		28.8		28.8	28.8		19.9	19.9	19.9	19.9	19.9	
Actuated g/C Ratio		0.50		0.50	0.50		0.34	0.34	0.34	0.34	0.34	
Clearance Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		948		682	770		124	618	514	359	630	
v/s Ratio Prot		0.00			0.01			0.13			c0.32	
v/s Ratio Perm				c0.46			0.00		0.06	0.02		
v/c Ratio		0.00		0.93	0.03		0.01	0.39	0.17	0.06	0.92	
Uniform Delay, d1		7.2		13.5	7.3		12.4	14.3	13.1	12.7	18.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		19.0	0.0		0.0	0.4	0.2	0.1	19.1	
Delay (s)		7.2		32.5	7.4		12.4	14.7	13.3	12.7	37.3	
Level of Service		A		C	A		B	B	B	B	D	
Approach Delay (s)		7.2			30.9			14.0			36.3	
Approach LOS		A			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	20	20	19	14	92	44	36	396	122	70	728	283
Future Volume (vph)	20	20	19	14	92	44	36	396	122	70	728	283
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		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.96		1.00	0.96		1.00	0.96	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1478			1669		1703	1720		1735	1739	
Flt Permitted		0.81			0.97		0.07	1.00		0.36	1.00	
Satd. Flow (perm)		1221			1624		130	1720		656	1739	
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)	22	22	21	16	102	49	40	440	136	78	809	314
RTOR Reduction (vph)	0	18	0	0	18	0	0	11	0	0	13	0
Lane Group Flow (vph)	0	47	0	0	149	0	40	565	0	78	1110	0
Confl. Peds. (#/hr)	1		1	1		1	1		1	1		1
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	20%	20%	20%	8%	8%	8%	6%	6%	6%	4%	4%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.6			12.6		58.1	55.2		60.9	56.6	
Effective Green, g (s)		12.6			12.6		58.1	55.2		60.9	56.6	
Actuated g/C Ratio		0.15			0.15		0.68	0.64		0.71	0.66	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		179			239		141	1109		520	1149	
v/s Ratio Prot							c0.01	0.33		0.01	c0.64	
v/s Ratio Perm		0.04			c0.09		0.18			0.10		
v/c Ratio		0.26			0.62		0.28	0.51		0.15	0.97	
Uniform Delay, d1		32.4			34.3		15.7	8.0		4.5	13.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			5.0		1.1	0.4		0.1	18.8	
Delay (s)		33.2			39.3		16.8	8.4		4.7	32.4	
Level of Service		C			D		B	A		A	C	
Approach Delay (s)		33.2			39.3			9.0			30.6	
Approach LOS		C			D			A			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	253	46	152	4	53	4	420	280	10	1	381	399
Future Volume (vph)	253	46	152	4	53	4	420	280	10	1	381	399
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	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.97		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.99		1.00	0.92	
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1749	1506		1838		1752	1833		1716	1646	
Flt Permitted		0.76	1.00		0.97		0.08	1.00		0.57	1.00	
Satd. Flow (perm)		1391	1506		1782		154	1833		1036	1646	
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)	266	48	160	4	56	4	442	295	11	1	401	420
RTOR Reduction (vph)	0	0	127	0	2	0	0	1	0	0	40	0
Lane Group Flow (vph)	0	314	33	0	62	0	442	305	0	1	781	0
Confl. Peds. (#/hr)	1		4	4		1	3		2	2		3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		19.1	19.1		19.1		65.5	60.0		44.4	43.4	
Effective Green, g (s)		19.1	19.1		19.1		65.5	60.0		44.4	43.4	
Actuated g/C Ratio		0.20	0.20		0.20		0.70	0.64		0.47	0.46	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		283	307		363		408	1175		498	763	
v/s Ratio Prot							c0.20	0.17		0.00	0.47	
v/s Ratio Perm		c0.23	0.02		0.03		c0.55			0.00		
v/c Ratio		1.11	0.11		0.17		1.08	0.26		0.00	1.02	
Uniform Delay, d1		37.2	30.3		30.7		30.3	7.2		12.9	25.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		86.2	0.2		0.2		68.8	0.1		0.0	38.6	
Delay (s)		123.4	30.5		30.9		99.1	7.4		12.9	63.7	
Level of Service		F	C		C		F	A		B	E	
Approach Delay (s)		92.0			30.9			61.6			63.7	
Approach LOS		F			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	68.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	93.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	102.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	29	387	37	171	747	16	7	33	78	0	16	14
Future Volume (Veh/h)	29	387	37	171	747	16	7	33	78	0	16	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	31	407	39	180	786	17	7	35	82	0	17	15
Pedestrians		2			10			4				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		0			1			0				
Right turn flare (veh)									5			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		187			537							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	803			450			1672	1656	440	1692	1666	796
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	712			450			1695	1676	440	1717	1688	705
tC, single (s)	4.1			4.1			7.2	6.6	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.3
p0 queue free %	96			84			83	46	86	100	75	96
cM capacity (veh/h)	777			1101			41	65	594	27	67	388

Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1
Volume Total	31	446	983	124	32
Volume Left	31	0	180	7	0
Volume Right	0	39	17	82	15
cSH	777	1700	1101	180	109
Volume to Capacity	0.04	0.26	0.16	0.69	0.29
Queue Length 95th (ft)	3	0	15	104	28
Control Delay (s)	9.8	0.0	3.9	57.6	51.0
Lane LOS	A		A	F	F
Approach Delay (s)	0.6		3.9	57.6	51.0
Approach LOS				F	F

Intersection Summary				
Average Delay	8.0			
Intersection Capacity Utilization	91.7%	ICU Level of Service		F
Analysis Period (min)	15			

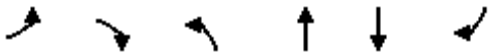
Intersection	
Int Delay, s/veh	7

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	29	387	37	171	747	16	7	33	78	0	16	14
Future Vol, veh/h	29	387	37	171	747	16	7	33	78	0	16	14
Conflicting Peds, #/hr	0	0	4	4	0	0	2	0	10	10	0	2
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	130	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	4	4	4	3	3	3	9	9	9	0	0	0
Mvmt Flow	31	407	39	180	786	17	7	35	82	0	17	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	803	0	0	450	0	0	1665	1655	441	1670	1666	797
Stage 1	-	-	-	-	-	-	492	492	-	1155	1155	-
Stage 2	-	-	-	-	-	-	1173	1163	-	515	511	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.19	6.59	6.29	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.19	5.59	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.19	5.59	-	6.1	5.5	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.581	4.081	3.381	3.5	4	3.3
Pot Cap-1 Maneuver	812	-	-	1105	-	-	74	94	602	77	98	390
Stage 1	-	-	-	-	-	-	546	536	-	242	274	-
Stage 2	-	-	-	-	-	-	227	261	-	546	540	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	810	-	-	1094	-	-	43	63	594	29	66	389
Mov Cap-2 Maneuver	-	-	-	-	-	-	43	63	-	29	66	-
Stage 1	-	-	-	-	-	-	523	514	-	233	192	-
Stage 2	-	-	-	-	-	-	140	183	-	418	517	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.6	1.6	62.4	51.6
HCM LOS			F	F

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SER	SWLn1
Capacity (veh/h)	58	594	1094	-	-	810	-	-	108
HCM Lane V/C Ratio	0.726	0.138	0.165	-	-	0.038	-	-	0.292
HCM Control Delay (s)	160.6	12	8.9	0	-	9.6	-	-	51.6
HCM Lane LOS	F	B	A	A	-	A	-	-	F
HCM 95th %tile Q(veh)	3.1	0.5	0.6	-	-	0.1	-	-	1.1



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	0	1058	36	26	6
Future Volume (Veh/h)	20	0	1058	36	26	6
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)	21	0	1114	38	27	6
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	2293	27	27			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2293	27	27			
tC, single (s)	*6.0	6.3	4.1			
tC, 2 stage (s)						
tF (s)	*2.0	3.4	2.2			
p0 queue free %	0	100	29			
cM capacity (veh/h)	20	1037	1568			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	1114	38	27	6
Volume Left	21	1114	0	0	0
Volume Right	0	0	0	0	6
cSH	20	1568	1700	1700	1700
Volume to Capacity	1.04	0.71	0.02	0.02	0.00
Queue Length 95th (ft)	71	165	0	0	0
Control Delay (s)	482.3	12.7	0.0	0.0	0.0
Lane LOS	F	B			
Approach Delay (s)	482.3	12.3		0.0	
Approach LOS	F				

Intersection Summary			
Average Delay	20.1		
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

* User Entered Value

Intersection	
Int Delay, s/veh	20.4

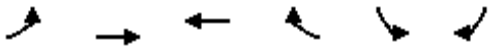
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	0	1058	36	26	6
Future Vol, veh/h	20	0	1058	36	26	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	0	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	5	5	18	18
Mvmt Flow	21	0	1114	38	27	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2292	-	27	0	-	0
Stage 1	27	-	-	-	-	-
Stage 2	2265	-	-	-	-	-
Critical Hdwy	6	-	4.15	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	2	-	2.245	-	-	-
Pot Cap-1 Maneuver	70	0	1568	-	-	0
Stage 1	1741	0	-	-	-	0
Stage 2	102	0	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	~ 20	-	1568	-	-	-
Mov Cap-2 Maneuver	~ 20	-	-	-	-	-
Stage 1	1741	-	-	-	-	-
Stage 2	30	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 489.1	12.3	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT
Capacity (veh/h)	1568	-	20	-
HCM Lane V/C Ratio	0.71	-	1.053	-
HCM Control Delay (s)	12.7	-	$ 489.1	-
HCM Lane LOS	B	-	F	-
HCM 95th %tile Q(veh)	6.6	-	2.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1851	0	1094	26	0
Future Volume (Veh/h)	0	1851	0	1094	26	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1948	0	1152	27	0
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	1152				974	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1152				974	0
tC, single (s)	4.2				7.2	7.3
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.5
p0 queue free %	100				88	100
cM capacity (veh/h)	580				223	1034

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	974	974	576	576	27
Volume Left	0	0	0	0	27
Volume Right	0	0	576	576	0
cSH	1700	1700	1700	1700	223
Volume to Capacity	0.57	0.57	0.34	0.34	0.12
Queue Length 95th (ft)	0	0	0	0	10
Control Delay (s)	0.0	0.0	0.0	0.0	23.4
Lane LOS					C
Approach Delay (s)	0.0		0.0		23.4
Approach LOS					C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

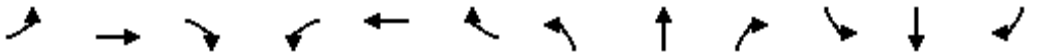
Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1851	0	1094	26	0
Future Vol, veh/h	0	1851	0	1094	26	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	5	5	18	18
Mvmt Flow	0	1948	0	1152	27	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	-	974	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	974	-
Critical Hdwy	-	-	-	-	7.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	6.16	-
Follow-up Hdwy	-	-	-	-	3.68	-
Pot Cap-1 Maneuver	0	-	0	-	223	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	292	0
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver	-	-	-	-	223	-
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	292	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	23.4
HCM LOS			C

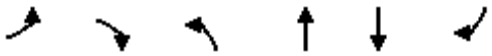
Minor Lane/Major Mvmt	EBT	WBR	SBLn1
Capacity (veh/h)	-	-	223
HCM Lane V/C Ratio	-	-	0.123
HCM Control Delay (s)	-	-	23.4
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	0.4



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	133	0	0	598	0	2757	198	0	1972	612
Future Volume (vph)	0	0	133	0	0	598	0	2757	198	0	1972	612
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		4.5	4.5
Lane Util. Factor			0.88			0.88		0.91	1.00		0.91	1.00
Frpb, ped/bikes			1.00			1.00		1.00	0.98		1.00	1.00
Flpb, ped/bikes			1.00			1.00		1.00	1.00		1.00	1.00
Frt			0.85			0.85		1.00	0.85		1.00	0.85
Flt Protected			1.00			1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)			2760			2538		4988	1521		4893	1524
Flt Permitted			1.00			1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)			2760			2538		4988	1521		4893	1524
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)	0	0	137	0	0	616	0	2842	204	0	2033	631
RTOR Reduction (vph)	0	0	67	0	0	13	0	0	74	0	0	118
Lane Group Flow (vph)	0	0	70	0	0	603	0	2842	130	0	2033	513
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	3%	3%	3%	12%	12%	12%	4%	4%	4%	6%	6%	6%
Turn Type			Perm			Perm		NA	Perm		NA	Perm
Protected Phases								2			6	
Permitted Phases			5			1			2			6
Actuated Green, G (s)			7.7			23.5		56.5	56.5		72.3	72.3
Effective Green, g (s)			7.7			23.5		56.5	56.5		72.3	72.3
Actuated g/C Ratio			0.09			0.26		0.63	0.63		0.81	0.81
Clearance Time (s)			4.5			4.5		4.5	4.5		4.5	4.5
Vehicle Extension (s)			3.0			3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)			238			670		3166	965		3974	1238
v/s Ratio Prot								c0.57			0.42	
v/s Ratio Perm			0.03			c0.24			0.09			0.34
v/c Ratio			0.30			0.90		0.90	0.13		0.51	0.41
Uniform Delay, d1			38.1			31.6		13.8	6.5		2.7	2.4
Progression Factor			1.00			1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2			0.7			14.9		3.8	0.1		0.1	0.2
Delay (s)			38.8			46.5		17.6	6.6		2.8	2.6
Level of Service			D			D		B	A		A	A
Approach Delay (s)		38.8			46.5			16.9			2.7	
Approach LOS		D			D			B			A	

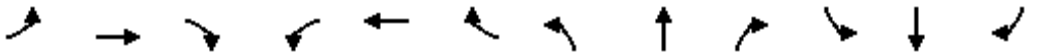
Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	807	187	147	2303	1703	568
Future Volume (vph)	807	187	147	2303	1703	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3400	1568	1736	3471	3471	1553
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3400	1568	1736	3471	3471	1553
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	841	195	153	2399	1774	592
RTOR Reduction (vph)	0	9	0	0	0	27
Lane Group Flow (vph)	841	186	153	2399	1774	565
Heavy Vehicles (%)	3%	3%	4%	4%	4%	4%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	28.5	39.9	11.4	82.5	66.6	95.1
Effective Green, g (s)	28.5	39.9	11.4	82.5	66.6	95.1
Actuated g/C Ratio	0.24	0.33	0.10	0.69	0.55	0.79
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	807	580	164	2386	1926	1288
v/s Ratio Prot	c0.25	0.03	0.09	c0.69	0.51	0.10
v/s Ratio Perm		0.09				0.26
v/c Ratio	1.04	0.32	0.93	1.01	0.92	0.44
Uniform Delay, d1	45.8	29.9	53.9	18.8	24.3	4.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	43.2	0.3	50.6	19.7	8.8	0.2
Delay (s)	88.9	30.2	104.6	38.5	33.1	4.2
Level of Service	F	C	F	D	C	A
Approach Delay (s)	77.9			42.5	25.8	
Approach LOS	E			D	C	

Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	507	443	21	112	592	0	44	1071	133	614	637	796
Future Volume (vph)	507	443	21	112	592	0	44	1071	133	614	637	796
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		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		0.97	0.95		1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	3348		3400	3505		1719	3438	1538	3335	3438	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3273	3348		3400	3505		1719	3438	1538	3335	3438	1538
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)	534	466	22	118	623	0	46	1127	140	646	671	838
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	93	0	0	218
Lane Group Flow (vph)	534	485	0	118	623	0	46	1127	47	646	671	620
Confl. Peds. (#/hr)			4	4								
Heavy Vehicles (%)	7%	7%	7%	3%	3%	3%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	18.6	30.9		8.2	20.5		4.2	40.4	40.4	22.5	58.7	58.7
Effective Green, g (s)	18.6	30.9		8.2	20.5		4.2	40.4	40.4	22.5	58.7	58.7
Actuated g/C Ratio	0.16	0.26		0.07	0.17		0.04	0.34	0.34	0.19	0.49	0.49
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	507	862		232	598		60	1157	517	625	1681	752
v/s Ratio Prot	c0.16	0.14		0.03	c0.18		0.03	c0.33		c0.19	0.20	
v/s Ratio Perm									0.03			0.40
v/c Ratio	1.05	0.56		0.51	1.04		0.77	0.97	0.09	1.03	0.40	0.82
Uniform Delay, d1	50.7	38.7		54.0	49.8		57.4	39.3	27.2	48.8	19.5	26.3
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	54.7	0.8		1.8	48.1		43.5	20.9	0.3	44.9	0.7	10.0
Delay (s)	105.4	39.5		55.7	97.9		100.9	60.2	27.6	93.7	20.2	36.3
Level of Service	F	D		E	F		F	E	C	F	C	D
Approach Delay (s)		74.0			91.2			58.2			48.5	
Approach LOS		E			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	61.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	53	88	59	165	110	73
Future Volume (Veh/h)	53	88	59	165	110	73
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	62	104	69	194	129	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)						
pX, platoon unblocked						
vC, conflicting volume			166		446	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		446	114
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		76	91
cM capacity (veh/h)			1394		542	939

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	166	263	215
Volume Left	0	69	129
Volume Right	104	0	86
cSH	1700	1394	652
Volume to Capacity	0.10	0.05	0.33
Queue Length 95th (ft)	0	4	36
Control Delay (s)	0.0	2.3	13.2
Lane LOS		A	B
Approach Delay (s)	0.0	2.3	13.2
Approach LOS			B

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

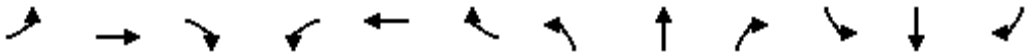
Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	53	88	59	165	110	73
Future Vol, veh/h	53	88	59	165	110	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	5	5	5	5	2	2
Mvmt Flow	62	104	69	194	129	86

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	166	0	447	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	-	-	4.15	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.245	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1394	-	569	939
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1394	-	538	939
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	686	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	648	-	-	1394	-
HCM Lane V/C Ratio	0.332	-	-	0.05	-
HCM Control Delay (s)	13.3	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	149	114	83	526	72	149	39	40	94	45	202
Future Volume (Veh/h)	107	149	114	83	526	72	149	39	40	94	45	202
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	113	157	120	87	554	76	157	41	42	99	47	213
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	630			277			1446	1247	217	1272	1269	592
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	630			277			1446	1247	217	1272	1269	592
tC, single (s)	4.2			4.2			*6.0	*6.0	*6.0	*6.0	*6.0	*6.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			*2.0	*2.0	*2.0	*2.0	*2.0	*2.0
p0 queue free %	87			93			0	84	97	55	81	73
cM capacity (veh/h)	897			1258			126	254	1331	220	246	787

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	390	717	240	359
Volume Left	113	87	157	99
Volume Right	120	76	42	213
cSH	897	1258	167	394
Volume to Capacity	0.13	0.07	1.44	0.91
Queue Length 95th (ft)	11	6	377	240
Control Delay (s)	3.8	1.8	278.7	58.5
Lane LOS	A	A	F	F
Approach Delay (s)	3.8	1.8	278.7	58.5
Approach LOS			F	F

Intersection Summary				
Average Delay	53.1			
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			

* User Entered Value

Intersection	
Int Delay, s/veh	48

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	107	149	114	83	526	72	149	39	40	94	45	202
Future Vol, veh/h	107	149	114	83	526	72	149	39	40	94	45	202
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	14	14	14	7	7	7	4	4	4	2	2	2
Mvmt Flow	113	157	120	87	554	76	157	41	42	99	47	213

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	629	0	0	277	0	0	1338	1246	217	1250	1268	592
Stage 1	-	-	-	-	-	-	442	442	-	766	766	-
Stage 2	-	-	-	-	-	-	896	804	-	484	502	-
Critical Hdwy	4.24	-	-	4.17	-	-	6	6	6	6	6	6
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Follow-up Hdwy	2.326	-	-	2.263	-	-	2	2	2	2	2	2
Pot Cap-1 Maneuver	898	-	-	1258	-	-	274	313	1331	311	303	787
Stage 1	-	-	-	-	-	-	955	1028	-	601	683	-
Stage 2	-	-	-	-	-	-	496	648	-	902	955	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	898	-	-	1258	-	-	~ 138	237	1331	214	229	787
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 138	237	-	214	229	-
Stage 1	-	-	-	-	-	-	811	873	-	510	609	-
Stage 2	-	-	-	-	-	-	298	578	-	707	811	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	1	236	65.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	179	898	-	-	1258	-	-	382
HCM Lane V/C Ratio	1.341	0.125	-	-	0.069	-	-	0.94
HCM Control Delay (s)	236	9.6	0	-	8.1	0	-	65.4
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	14	0.4	-	-	0.2	-	-	10.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	1255	435	1254	535	560	1607
Future Volume (vph)	1255	435	1254	535	560	1607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	0.91	1.00	1.00	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.96	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	1568	5085	1526	1770	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	1568	5085	1526	1770	5085
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1294	448	1293	552	577	1657
RTOR Reduction (vph)	0	0	0	414	0	0
Lane Group Flow (vph)	1294	448	1293	138	577	1657
Confl. Peds. (#/hr)				6	6	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%
Turn Type	Prot	pm+ov	NA	Perm	Prot	NA
Protected Phases	8	1	2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	29.5	54.0	22.5	22.5	24.5	51.5
Effective Green, g (s)	29.5	54.0	22.5	22.5	24.5	51.5
Actuated g/C Ratio	0.33	0.60	0.25	0.25	0.27	0.57
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1114	1019	1271	381	481	2909
v/s Ratio Prot	c0.38	0.12	c0.25		c0.33	0.33
v/s Ratio Perm		0.17		0.09		
v/c Ratio	1.16	0.44	1.02	0.36	1.20	0.57
Uniform Delay, d1	30.2	9.8	33.8	27.8	32.8	12.2
Progression Factor	1.00	1.00	1.25	4.87	1.00	1.00
Incremental Delay, d2	82.9	0.3	23.5	1.5	108.4	0.8
Delay (s)	113.1	10.1	65.7	137.2	141.2	13.0
Level of Service	F	B	E	F	F	B
Approach Delay (s)	86.6		87.1			46.1
Approach LOS	F		F			D

Intersection Summary			
HCM 2000 Control Delay	71.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	102.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	615	520	1269	930	530	2332
Future Volume (vph)	615	520	1269	930	530	2332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	0.91	1.00	1.00	0.91
Frpb, ped/bikes	1.00	1.00	1.00	0.96	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	5036	1510	1770	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1583	5036	1510	1770	5085
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	628	531	1295	949	541	2380
RTOR Reduction (vph)	0	331	0	442	0	0
Lane Group Flow (vph)	628	200	1295	507	541	2380
Confl. Peds. (#/hr)				7	7	
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	27.5	27.5	26.5	26.5	22.5	53.5
Effective Green, g (s)	27.5	27.5	26.5	26.5	22.5	53.5
Actuated g/C Ratio	0.31	0.31	0.29	0.29	0.25	0.59
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	540	483	1482	444	442	3022
v/s Ratio Prot	c0.35		0.26		c0.31	0.47
v/s Ratio Perm		0.13		c0.34		
v/c Ratio	1.16	0.41	0.87	1.14	1.22	0.79
Uniform Delay, d1	31.2	24.8	30.2	31.8	33.8	13.9
Progression Factor	1.00	1.00	1.00	1.00	0.89	0.92
Incremental Delay, d2	92.2	0.6	7.4	87.3	111.5	1.2
Delay (s)	123.5	25.4	37.6	119.1	141.6	14.0
Level of Service	F	C	D	F	F	B
Approach Delay (s)	78.6		72.0			37.7
Approach LOS	E		E			D

Intersection Summary			
HCM 2000 Control Delay	57.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.17		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1897	18	0	2947	0	302
Future Volume (Veh/h)	1897	18	0	2947	0	302
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1997	19	0	3102	0	318
Pedestrians					3	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	335			372		
pX, platoon unblocked			0.59		0.77	0.59
vC, conflicting volume			2019		3044	1011
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1332		183	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	50
cM capacity (veh/h)			298		608	636

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3	NW 1
Volume Total	1331	685	1034	1034	1034	318
Volume Left	0	0	0	0	0	0
Volume Right	0	19	0	0	0	318
cSH	1700	1700	1700	1700	1700	636
Volume to Capacity	0.78	0.40	0.61	0.61	0.61	0.50
Queue Length 95th (ft)	0	0	0	0	0	70
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	16.2
Lane LOS						C
Approach Delay (s)	0.0		0.0			16.2
Approach LOS						C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Vol, veh/h	1897	18	0	2947	0	302
Future Vol, veh/h	1897	18	0	2947	0	302
Conflicting Peds, #/hr	0	3	3	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	2	2
Mvmt Flow	1997	19	0	3102	0	318

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1011
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	2.5
Pot Cap-1 Maneuver	-	-	0	-	0	372
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	371
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

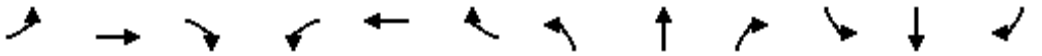
Approach	NB	SB	NW
HCM Control Delay, s	0	0	51.6
HCM LOS			F

Minor Lane/Major Mvmt	NBT	NBR	NWLn1	SBT
Capacity (veh/h)	-	-	371	-
HCM Lane V/C Ratio	-	-	0.857	-
HCM Control Delay (s)	-	-	51.6	-
HCM Lane LOS	-	-	F	-
HCM 95th %tile Q(veh)	-	-	8.1	-

Movement	NBT	NBR	SBL	SBT	NWL	NWR
Lane Configurations						
Traffic Volume (vph)	1426	66	576	2371	91	489
Future Volume (vph)	1426	66	576	2371	91	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5		4.5	4.5	4.5	4.5
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3446		1770	3539	1787	1599
Flt Permitted	1.00		0.09	1.00	0.95	1.00
Satd. Flow (perm)	3446		161	3539	1787	1599
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	1470	68	594	2444	94	504
RTOR Reduction (vph)	3	0	0	0	0	4
Lane Group Flow (vph)	1535	0	594	2444	94	500
Confl. Peds. (#/hr)		2	2			
Heavy Vehicles (%)	4%	4%	2%	2%	1%	1%
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	4	1
Permitted Phases			6			4
Actuated Green, G (s)	41.8		81.7	81.7	9.3	44.7
Effective Green, g (s)	41.8		81.7	81.7	9.3	44.7
Actuated g/C Ratio	0.42		0.82	0.82	0.09	0.45
Clearance Time (s)	4.5		4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1440		701	2891	166	786
v/s Ratio Prot	c0.45		0.30	c0.69	0.05	c0.22
v/s Ratio Perm			0.39			0.09
v/c Ratio	1.07		0.85	0.85	0.57	0.64
Uniform Delay, d1	29.1		25.2	5.4	43.4	21.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	43.4		9.3	2.4	4.4	1.7
Delay (s)	72.5		34.5	7.9	47.8	23.1
Level of Service	E		C	A	D	C
Approach Delay (s)	72.5			13.1	26.9	
Approach LOS	E			B	C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	197	259	73	131	254	101	430	70	410	761	87
Future Volume (vph)	73	197	259	73	131	254	101	430	70	410	761	87
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	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1675		1787	1881	1599	1770	1824		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1675		1787	1881	1599	1770	1824		1770	1863	1583
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)	77	207	273	77	138	267	106	453	74	432	801	92
RTOR Reduction (vph)	0	63	0	0	0	76	0	8	0	0	0	51
Lane Group Flow (vph)	77	417	0	77	138	191	106	519	0	432	801	41
Confl. Peds. (#/hr)			4	4								
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8	1	5	2		1	6	7
Permitted Phases						8						6
Actuated Green, G (s)	3.9	18.1		3.9	18.1	32.6	5.0	19.6		14.5	29.1	33.0
Effective Green, g (s)	3.9	18.1		3.9	18.1	32.6	5.0	19.6		14.5	29.1	33.0
Actuated g/C Ratio	0.05	0.24		0.05	0.24	0.44	0.07	0.26		0.20	0.39	0.45
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	93	409		94	459	800	119	482		346	731	801
v/s Ratio Prot	c0.04	c0.25		0.04	0.07	0.05	0.06	0.28		c0.24	c0.43	0.00
v/s Ratio Perm						0.07						0.02
v/c Ratio	0.83	1.02		0.82	0.30	0.24	0.89	1.08		1.25	1.10	0.05
Uniform Delay, d1	34.8	28.0		34.8	22.8	13.0	34.3	27.2		29.8	22.5	11.7
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	42.7	49.7		40.4	0.4	0.2	50.3	63.1		133.7	62.5	0.0
Delay (s)	77.5	77.7		75.1	23.2	13.1	84.5	90.4		163.5	85.0	11.7
Level of Service	E	E		E	C	B	F	F		F	F	B
Approach Delay (s)		77.7			25.9			89.4			105.5	
Approach LOS		E			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	84.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	74.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	3	0	9	279	1	43	7	350	462	44	526	1
Future Volume (vph)	3	0	9	279	1	43	7	350	462	44	526	1
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	4.5	4.5	4.5	4.5	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		0.98		1.00	0.98		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.90		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1655		1733	1526		1785	1881	1561	1749	1844	
Flt Permitted		0.96		0.75	1.00		0.30	1.00	1.00	0.48	1.00	
Satd. Flow (perm)		1612		1367	1526		555	1881	1561	878	1844	
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)	3	0	10	310	1	48	8	389	513	49	584	1
RTOR Reduction (vph)	0	9	0	0	32	0	0	0	271	0	0	0
Lane Group Flow (vph)	0	4	0	310	17	0	8	389	242	49	585	0
Confl. Peds. (#/hr)	1		1	1		1	3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	4%	4%	4%	1%	1%	1%	3%	3%	3%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6			2			4			8	
Permitted Phases	6			2			4		4	8		
Actuated Green, G (s)		15.5		15.5	15.5		21.8	21.8	21.8	21.8	21.8	
Effective Green, g (s)		15.5		15.5	15.5		21.8	21.8	21.8	21.8	21.8	
Actuated g/C Ratio		0.33		0.33	0.33		0.47	0.47	0.47	0.47	0.47	
Clearance Time (s)		4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		539		457	510		261	885	734	413	868	
v/s Ratio Prot					0.01			0.21			c0.32	
v/s Ratio Perm		0.00		c0.23			0.01		0.15	0.06		
v/c Ratio		0.01		0.68	0.03		0.03	0.44	0.33	0.12	0.67	
Uniform Delay, d1		10.3		13.3	10.4		6.6	8.2	7.7	6.9	9.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		4.0	0.0		0.0	0.4	0.3	0.1	2.1	
Delay (s)		10.3		17.2	10.4		6.6	8.5	7.9	7.0	11.6	
Level of Service		B		B	B		A	A	A	A	B	
Approach Delay (s)		10.3			16.3			8.2			11.2	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	9.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	58	11	20	39	163	39	43	715	76	56	627	153
Future Volume (vph)	58	11	20	39	163	39	43	715	76	56	627	153
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		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.97			0.98		1.00	0.99		1.00	0.97	
Flt Protected		0.97			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1610			1799		1787	1850		1770	1797	
Flt Permitted		0.61			0.94		0.13	1.00		0.13	1.00	
Satd. Flow (perm)		1011			1696		242	1850		240	1797	
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)	61	12	21	41	172	41	45	753	80	59	660	161
RTOR Reduction (vph)	0	16	0	0	12	0	0	5	0	0	12	0
Lane Group Flow (vph)	0	78	0	0	242	0	45	828	0	59	809	0
Confl. Peds. (#/hr)	3		4	4		3	6		3	3		6
Heavy Vehicles (%)	10%	10%	10%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.1			13.1		34.0	31.1		34.0	31.1	
Effective Green, g (s)		13.1			13.1		34.0	31.1		34.0	31.1	
Actuated g/C Ratio		0.22			0.22		0.56	0.51		0.56	0.51	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		218			366		209	949		207	922	
v/s Ratio Prot							0.01	0.45		c0.01	c0.45	
v/s Ratio Perm		0.08			c0.14		0.11			0.15		
v/c Ratio		0.36			0.66		0.22	0.87		0.29	0.88	
Uniform Delay, d1		20.2			21.7		9.6	13.0		10.0	13.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.0			4.5		0.5	8.9		0.8	9.5	
Delay (s)		21.2			26.2		10.1	21.9		10.7	22.5	
Level of Service		C			C		B	C		B	C	
Approach Delay (s)		21.2			26.2			21.3			21.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	497	60	258	20	85	11	300	328	13	7	475	208
Future Volume (vph)	497	60	258	20	85	11	300	328	13	7	475	208
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	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00	0.96		1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.99		1.00	0.99		1.00	0.95	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1795	1534		1800		1787	1868		1746	1744	
Flt Permitted		0.68	1.00		0.64		0.11	1.00		0.55	1.00	
Satd. Flow (perm)		1277	1534		1159		206	1868		1005	1744	
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)	523	63	272	21	89	12	316	345	14	7	500	219
RTOR Reduction (vph)	0	0	176	0	5	0	0	2	0	0	19	0
Lane Group Flow (vph)	0	586	96	0	117	0	316	357	0	7	700	0
Confl. Peds. (#/hr)	2		9	9		2	5		5	5		5
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	3%	3%	3%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)		29.5	29.5		29.5		45.1	39.6		33.1	32.1	
Effective Green, g (s)		29.5	29.5		29.5		45.1	39.6		33.1	32.1	
Actuated g/C Ratio		0.35	0.35		0.35		0.54	0.47		0.40	0.38	
Clearance Time (s)		4.5	4.5		4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		450	541		408		271	884		406	669	
v/s Ratio Prot							c0.12	0.19		0.00	0.40	
v/s Ratio Perm		c0.46	0.06		0.10		c0.51			0.01		
v/c Ratio		1.30	0.18		0.29		1.17	0.40		0.02	1.05	
Uniform Delay, d1		27.0	18.7		19.5		22.7	14.3		15.3	25.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		151.5	0.2		0.4		107.2	0.3		0.0	47.5	
Delay (s)		178.5	18.8		19.9		129.9	14.6		15.3	73.2	
Level of Service		F	B		B		F	B		B	E	
Approach Delay (s)		127.9			19.9			68.6			72.7	
Approach LOS		F			B			E			E	

Intersection Summary			
HCM 2000 Control Delay	88.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	83.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	103.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (veh/h)	34	565	39	94	551	16	27	27	212	3	23	32
Future Volume (Veh/h)	34	565	39	94	551	16	27	27	212	3	23	32
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	36	595	41	99	580	17	28	28	223	3	24	34
Pedestrians		1			7			9				
Lane Width (ft)		12.0			12.0			12.0				
Walking Speed (ft/s)		3.5			3.5			3.5				
Percent Blockage		0			1			1				
Right turn flare (veh)									5			
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		187			537							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	597			645			1530	1492	632	1586	1504	590
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	496			645			1533	1491	632	1596	1504	488
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 %	96			89			50	70	53	89	74	94
cM capacity (veh/h)	965			932			56	94	470	28	94	525

Direction, Lane #	SE 1	SE 2	NW 1	NE 1	SW 1
Volume Total	36	636	696	279	61
Volume Left	36	0	99	28	3
Volume Right	0	41	17	223	34
cSH	965	1700	932	374	143
Volume to Capacity	0.04	0.37	0.11	0.75	0.43
Queue Length 95th (ft)	3	0	9	147	47
Control Delay (s)	8.9	0.0	2.6	42.6	47.7
Lane LOS	A		A	E	E
Approach Delay (s)	0.5		2.6	42.6	47.7
Approach LOS				E	E

Intersection Summary				
Average Delay	9.9			
Intersection Capacity Utilization	87.7%	ICU Level of Service		E
Analysis Period (min)	15			

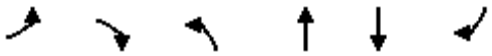
Intersection	
Int Delay, s/veh	9.2

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Vol, veh/h	34	565	39	94	551	16	27	27	212	3	23	32
Future Vol, veh/h	34	565	39	94	551	16	27	27	212	3	23	32
Conflicting Peds, #/hr	0	0	9	9	0	0	1	0	7	7	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-	-	130	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	2	2	2	4	4	4	0	0	0
Mvmt Flow	36	595	41	99	580	17	28	28	223	3	24	34

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	597	0	0	645	0	0	1512	1491	631	1494	1502	589
Stage 1	-	-	-	-	-	-	696	696	-	786	786	-
Stage 2	-	-	-	-	-	-	816	795	-	708	716	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.14	6.54	6.24	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.536	4.036	3.336	3.5	4	3.3
Pot Cap-1 Maneuver	985	-	-	940	-	-	97	122	477	102	123	512
Stage 1	-	-	-	-	-	-	429	440	-	388	406	-
Stage 2	-	-	-	-	-	-	368	397	-	429	437	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	984	-	-	934	-	-	63	98	470	36	99	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	63	98	-	36	99	-
Stage 1	-	-	-	-	-	-	410	420	-	374	341	-
Stage 2	-	-	-	-	-	-	268	334	-	201	417	-

Approach	SE	NW	NE	SW
HCM Control Delay, s	0.5	1.3	42	43.3
HCM LOS			E	E

Minor Lane/Major Mvmt	NELn1	NELn2	NWL	NWT	NWR	SEL	SET	SERSWLn1
Capacity (veh/h)	77	470	934	-	-	984	-	- 153
HCM Lane V/C Ratio	0.738	0.475	0.106	-	-	0.036	-	- 0.399
HCM Control Delay (s)	130.7	19.4	9.3	0	-	8.8	-	- 43.3
HCM Lane LOS	F	C	A	A	-	A	-	- E
HCM 95th %tile Q(veh)	3.5	2.5	0.4	-	-	0.1	-	- 1.7



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	0	768	17	23	17
Future Volume (Veh/h)	6	0	768	17	23	17
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)	6	0	808	18	24	18
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	1658	24	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1658	24	24			
tC, single (s)	*6.0	6.2	4.1			
tC, 2 stage (s)						
tF (s)	*2.0	3.3	2.2			
p0 queue free %	93	100	49			
cM capacity (veh/h)	85	1050	1578			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	6	808	18	24	18
Volume Left	6	808	0	0	0
Volume Right	0	0	0	0	18
cSH	85	1578	1700	1700	1700
Volume to Capacity	0.07	0.51	0.01	0.01	0.01
Queue Length 95th (ft)	6	76	0	0	0
Control Delay (s)	50.7	9.7	0.0	0.0	0.0
Lane LOS	F	A			
Approach Delay (s)	50.7	9.4		0.0	
Approach LOS	F				

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	59.2%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

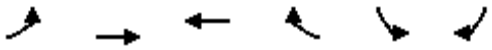
Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	0	768	17	23	17
Future Vol, veh/h	6	0	768	17	23	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	Free
Storage Length	0	-	0	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	4	4	0	0
Mvmt Flow	6	0	808	18	24	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1659	-	24	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	1635	-	-	-	-	-
Critical Hdwy	6	-	4.14	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	2	-	2.236	-	-	-
Pot Cap-1 Maneuver	174	0	1578	-	-	0
Stage 1	1748	0	-	-	-	0
Stage 2	233	0	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	85	-	1578	-	-	-
Mov Cap-2 Maneuver	85	-	-	-	-	-
Stage 1	1748	-	-	-	-	-
Stage 2	114	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	50.7	9.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT
Capacity (veh/h)	1578	-	85	-
HCM Lane V/C Ratio	0.512	-	0.074	-
HCM Control Delay (s)	9.7	-	50.7	-
HCM Lane LOS	A	-	F	-
HCM 95th %tile Q(veh)	3.1	-	0.2	-



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	3085	0	785	23	0
Future Volume (Veh/h)	0	3085	0	785	23	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	3247	0	826	24	0
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	826				1624	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826				1624	0
tC, single (s)	4.2				*6.5	6.9
tC, 2 stage (s)						
tF (s)	2.2				*2.5	3.3
p0 queue free %	100				81	100
cM capacity (veh/h)	794				128	1091

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1624	1624	413	413	24
Volume Left	0	0	0	0	24
Volume Right	0	0	413	413	0
cSH	1700	1700	1700	1700	128
Volume to Capacity	0.95	0.95	0.24	0.24	0.19
Queue Length 95th (ft)	0	0	0	0	16
Control Delay (s)	0.0	0.0	0.0	0.0	39.5
Lane LOS					E
Approach Delay (s)	0.0		0.0		39.5
Approach LOS					E

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

* User Entered Value

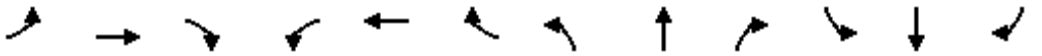
Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑		↱↱	↰	
Traffic Vol, veh/h	0	3085	0	785	23	0
Future Vol, veh/h	0	3085	0	785	23	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	4	4	0	0
Mvmt Flow	0	3247	0	826	24	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	-	1624	-
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	1624	-
Critical Hdwy	-	-	-	-	6.5	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	-	-	2.5	-
Pot Cap-1 Maneuver	0	-	0	-	128	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	175	0
Platoon blocked, %		-		-		
Mov Cap-1 Maneuver	-	-	-	-	128	-
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	175	-

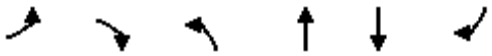
Approach	EB	WB	SB
HCM Control Delay, s	0	0	39.6
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBR	SBLn1
Capacity (veh/h)	-	-	128
HCM Lane V/C Ratio	-	-	0.189
HCM Control Delay (s)	-	-	39.6
HCM Lane LOS	-	-	E
HCM 95th %tile Q(veh)	-	-	0.7



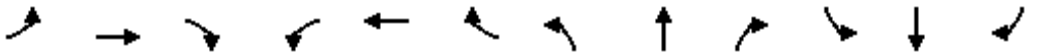
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	238	0	0	542	0	1985	179	0	3759	763
Future Volume (vph)	0	0	238	0	0	542	0	1985	179	0	3759	763
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.5			4.5		4.5	4.5		4.5	4.5
Lane Util. Factor			0.88			0.88		0.91	1.00		0.91	1.00
Frt			0.85			0.85		1.00	0.85		1.00	0.85
Flt Protected			1.00			1.00		1.00	1.00		1.00	1.00
Satd. Flow (prot)			2814			2760		5085	1583		5085	1583
Flt Permitted			1.00			1.00		1.00	1.00		1.00	1.00
Satd. Flow (perm)			2814			2760		5085	1583		5085	1583
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)	0	0	245	0	0	559	0	2046	185	0	3875	787
RTOR Reduction (vph)	0	0	53	0	0	19	0	0	60	0	0	160
Lane Group Flow (vph)	0	0	192	0	0	540	0	2046	125	0	3875	627
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type			Perm			Perm		NA	Perm		NA	Perm
Protected Phases								2			6	
Permitted Phases			5			1			2			6
Actuated Green, G (s)			12.3			24.7		70.9	70.9		83.3	83.3
Effective Green, g (s)			12.3			24.7		70.9	70.9		83.3	83.3
Actuated g/C Ratio			0.12			0.24		0.68	0.68		0.80	0.80
Clearance Time (s)			4.5			4.5		4.5	4.5		4.5	4.5
Vehicle Extension (s)			3.0			3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)			330			651		3446	1072		4049	1260
v/s Ratio Prot								0.40			c0.76	
v/s Ratio Perm			0.07			c0.20			0.08			0.40
v/c Ratio			0.58			0.83		0.59	0.12		0.96	0.50
Uniform Delay, d1			43.7			37.9		9.1	5.9		9.1	3.6
Progression Factor			1.00			1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2			2.6			8.6		0.3	0.0		6.8	0.3
Delay (s)			46.3			46.6		9.4	5.9		15.9	3.9
Level of Service			D			D		A	A		B	A
Approach Delay (s)		46.3			46.6			9.1			13.8	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	104.6	Sum of lost time (s)	9.0
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	566	241	165	1598	2892	1105
Future Volume (vph)	566	241	165	1598	2892	1105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	3433	1583	1752	3505	3539	1583
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	3433	1583	1752	3505	3539	1583
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	578	246	168	1631	2951	1128
RTOR Reduction (vph)	0	2	0	0	0	8
Lane Group Flow (vph)	578	244	168	1631	2951	1120
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Actuated Green, G (s)	18.5	27.0	8.5	92.5	79.5	98.0
Effective Green, g (s)	18.5	27.0	8.5	92.5	79.5	98.0
Actuated g/C Ratio	0.15	0.22	0.07	0.77	0.66	0.82
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	529	415	124	2701	2344	1352
v/s Ratio Prot	c0.17	0.04	c0.10	0.47	c0.83	0.13
v/s Ratio Perm		0.11				0.58
v/c Ratio	1.09	0.59	1.35	0.60	1.26	0.83
Uniform Delay, d1	50.8	41.5	55.8	5.9	20.2	6.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	66.7	2.1	203.2	1.0	120.2	4.3
Delay (s)	117.5	43.7	259.0	6.9	140.4	10.6
Level of Service	F	D	F	A	F	B
Approach Delay (s)	95.5			30.4	104.5	
Approach LOS	F			C	F	

Intersection Summary			
HCM 2000 Control Delay	83.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	116.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	491	945	70	90	700	560	55	712	130	1045	1427	661
Future Volume (vph)	491	945	70	90	700	560	55	712	130	1045	1427	661
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	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3532		3467	3574	1577	1752	3505	1544	3433	3539	1555
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3532		3467	3574	1577	1752	3505	1544	3433	3539	1555
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)	506	974	72	93	722	577	57	734	134	1077	1471	681
RTOR Reduction (vph)	0	4	0	0	0	396	0	0	105	0	0	183
Lane Group Flow (vph)	506	1042	0	93	722	181	57	734	29	1077	1471	498
Confl. Peds. (#/hr)	1		6	6		1	3		1	1		3
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	3%	3%	3%	2%	2%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			6
Actuated Green, G (s)	16.7	35.1		5.1	23.5	23.5	4.0	26.3	26.3	35.5	57.8	57.8
Effective Green, g (s)	16.7	35.1		5.1	23.5	23.5	4.0	26.3	26.3	35.5	57.8	57.8
Actuated g/C Ratio	0.14	0.29		0.04	0.20	0.20	0.03	0.22	0.22	0.30	0.48	0.48
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	482	1033		147	699	308	58	768	338	1015	1704	748
v/s Ratio Prot	c0.15	c0.29		0.03	0.20		0.03	c0.21		c0.31	0.42	
v/s Ratio Perm						0.12			0.02			0.32
v/c Ratio	1.05	1.01		0.63	1.03	0.59	0.98	0.96	0.09	1.06	0.86	0.67
Uniform Delay, d1	51.6	42.5		56.5	48.2	43.9	58.0	46.3	37.3	42.2	27.6	23.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	54.7	30.1		8.6	42.8	2.9	111.4	23.3	0.5	45.9	6.1	4.7
Delay (s)	106.3	72.5		65.1	91.0	46.7	169.4	69.6	37.8	88.2	33.7	28.4
Level of Service	F	E		E	F	D	F	E	D	F	C	C
Approach Delay (s)		83.6			70.9			71.1			50.7	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	64.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	212	113	63	159	89	52
Future Volume (Veh/h)	212	113	63	159	89	52
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	236	126	70	177	99	58
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			362		616	299
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			362		616	299
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		77	92
cM capacity (veh/h)			1186		427	741

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	362	247	157
Volume Left	0	70	99
Volume Right	126	0	58
cSH	1700	1186	506
Volume to Capacity	0.21	0.06	0.31
Queue Length 95th (ft)	0	5	33
Control Delay (s)	0.0	2.7	15.3
Lane LOS		A	C
Approach Delay (s)	0.0	2.7	15.3
Approach LOS			C

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

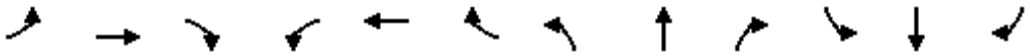
Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	113	63	159	89	52
Future Vol, veh/h	212	113	63	159	89	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	3	3	4	4	2	2
Mvmt Flow	236	126	70	177	99	58

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	361	0	615	298
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	317	-
Critical Hdwy	-	-	4.14	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.236	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1187	-	455	741
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	738	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1187	-	425	741
Mov Cap-2 Maneuver	-	-	-	-	425	-
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	690	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.3	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	504	-	-	1187	-
HCM Lane V/C Ratio	0.311	-	-	0.059	-
HCM Control Delay (s)	15.3	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.2	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	674	226	21	309	79	53	46	10	62	35	156
Future Volume (Veh/h)	238	674	226	21	309	79	53	46	10	62	35	156
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	251	709	238	22	325	83	56	48	11	65	37	164
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	408			947			1923	1782	828	1776	1860	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	408			947			1923	1782	828	1776	1860	366
tC, single (s)	4.1			4.1			*6.0	*6.0	*6.0	*6.0	*6.0	*6.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			*2.0	*2.0	*2.0	*2.0	*2.0	*2.0
p0 queue free %	78			97			5	56	98	17	63	85
cM capacity (veh/h)	1151			721			59	110	565	79	99	1080

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1198	430	115	266
Volume Left	251	22	56	65
Volume Right	238	83	11	164
cSH	1151	721	82	196
Volume to Capacity	0.22	0.03	1.41	1.35
Queue Length 95th (ft)	21	2	224	381
Control Delay (s)	5.4	0.9	330.3	235.2
Lane LOS	A	A	F	F
Approach Delay (s)	5.4	0.9	330.3	235.2
Approach LOS			F	F

Intersection Summary			
Average Delay	53.5		
Intersection Capacity Utilization	110.5%	ICU Level of Service	H
Analysis Period (min)	15		

* User Entered Value

Intersection	
Int Delay, s/veh	127.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	238	674	226	21	309	79	53	46	10	62	35	156
Future Vol, veh/h	238	674	226	21	309	79	53	46	10	62	35	156
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	3	3	3	2	2	2	2	2	2
Mvmt Flow	251	709	238	22	325	83	56	48	11	65	37	164

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	408	0	0	947	0	0	1841	1782	828	1770	1859	367
Stage 1	-	-	-	-	-	-	1329	1329	-	411	411	-
Stage 2	-	-	-	-	-	-	512	453	-	1359	1448	-
Critical Hdwy	4.12	-	-	4.13	-	-	6	6	6	6	6	6
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	2	2	2	2	2	2
Pot Cap-1 Maneuver	1151	-	-	721	-	-	134	145	565	148	130	1079
Stage 1	-	-	-	-	-	-	266	332	-	1001	1072	-
Stage 2	-	-	-	-	-	-	866	1017	-	254	284	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1151	-	-	721	-	-	~ 39	71	565	~ 42	64	1079
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 39	71	-	~ 42	64	-
Stage 1	-	-	-	-	-	-	136	170	-	513	1029	-
Stage 2	-	-	-	-	-	-	680	976	-	91	145	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.5	$ 682.2	$ 660.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	54	1151	-	-	721	-	-	117
HCM Lane V/C Ratio	2.125	0.218	-	-	0.031	-	-	2.276
HCM Control Delay (s)	$ 682.2	9	0	-	10.2	0	-	$ 660.5
HCM Lane LOS	F	A	A	-	B	A	-	F
HCM 95th %tile Q(veh)	11.4	0.8	-	-	0.1	-	-	23

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon