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MEMORANDUM

TO: Scott Fuller
IBG Partners, LLC

CC: Paul Tummonds
John T. Epting
Christopher Morrison

FROM: Michael J. Workosky
Catherine Proot
Wells & Associates, LLC

DATE: June 2, 2004

SUBJECT: Revised Traffic Analysis for 4600 Wisconsin Avenue: Washington, D.C.

Introduction

This memorandum presents a revised traffic analysis for the 4600 Wisconsin Avenue development, located in Washington, D.C. The subject site is bounded on the east by Wisconsin Avenue, the south by Brandywine Street, and on the west by a public alley, in the northwest section of Washington, D.C., as shown on Figure A-1.

This project was the subject of a traffic study prepared by Wells & Associates, dated June 21, 2003. That study assumed a total of 43 residential units and 4,500 S.F. of retail space.

The traffic analysis has been revised to include the updated development program that includes the following uses:

1. Forty-two (42) residential units.
2. 1,650 S.F. of ground-level commercial uses.

The updated site development plan is shown on Figure A-2.

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ZONING COMMISSION
District of Columbia
CASE NO.03-27
EXHIBIT NO.26F

For continuity purposes, this revised study includes all of the existing and background information and analyses from the previously submitted report, dated June 21, 2003. The existing, background future and total future analyses have been updated using the 2000 Highway Capacity Manual (HCM) methodology using the Synchro version 6.0 software.

Background Information

The property is occupied by a Billiards facility, a dry cleaners and tailor store, and a single occupant office space that currently generates vehicle trips on the roadways and at the intersections surrounding the site. These existing trips would essentially be "replaced" by the new trips generated by 4600 Wisconsin Avenue. Since this existing traffic must rely on curb parking, a destination, or location (such as a dedicated parking lot) to quantify these trips is not available. While these existing vehicle trips have been estimated for comparison purposes, they have not been deducted from the road network. Therefore, the actual net affect of 4600 Wisconsin Avenue would be less than reported in this traffic study.

Site Access and Loading

Access to the site would remain as previously proposed, from a driveway on Brandywine Street. This driveway is located west of the Wisconsin Avenue intersection, and serve 44 below-grade parking spaces on two levels. Two of these spaces would be reserved for retail use. The main residential lobby will be on Brandywine Street.

As outlined in the original traffic study, the number of proposed off-street parking spaces would exceed the District of Columbia requirements. Since the retail space is planned to be community based and service oriented, and the condominium owners occupy the majority of the building, the developers of the site are not providing off-street loading. The potential for a loading zone in front of the building to accommodate anticipated typical on-street loading activity, such as UPS or FedEx

deliveries, should be investigated to accommodate these activities.

Existing Levels of Service

Existing peak hour levels of service were updated at all key intersections in the study area based on the existing lane usage and traffic control shown on Figure A-3, existing vehicular traffic counts shown on Figure A-4, existing pedestrian counts, existing traffic signal timings, and the 2000 Highway Capacity Manual (HCM) methodology using the Synchro version 6.0 software.

All key intersections currently operate at acceptable levels of service during all peak hours. The results are presented in Appendix C and summarized in Table B-1.

Background Future Traffic Forecasts

Background future peak hour traffic forecasts were estimated based on existing traffic counts shown on Figure A-4, existing pedestrian counts, pipeline project traffic shown on Figure A-5 and the background traffic growth (estimated at one (1) percent per year compounded for three (3) years between 2002 and 2005). These estimates include the traffic currently being generated by the land uses at 4600 Wisconsin Avenue. The 2005 background traffic forecasts are shown on Figure A-6.

Background future peak hour levels of service were estimated at all key off-site intersections in the study area for the year of project buildout (2005) based on the existing intersection lane usage and traffic control shown on Figure A-3, the background traffic forecasts shown on Figure A-6, and the HCM methodology using the Synchro version 6.0 software.

All key intersections would continue to operate at acceptable levels of service during all peak hours. The results are presented in Appendix D and summarized in Table B-1.

Site Trip Generation Analysis

The existing land uses that will be displaced by the 4600 Wisconsin Avenue project currently generate vehicle traffic that utilizes the roadways adjacent to the site. A portion of this traffic would essentially be "replaced" by the new traffic generated by the project. These existing trips have been estimated and compared to those generated by the proposed development program and the matter-of-right development potential of the property for analysis purposes.

The number of peak hour trips anticipated to be generated by the existing, proposed, and potential development programs were estimated based on Institute of Transportation Engineers (ITE) trip generation rates as reported in Trip Generation, 6th Edition and experience with comparable projects located at Metrorail stations throughout the metropolitan area.

The following development programs were analyzed:

Existing Development

1. 9,494 S.F. Billiards (assumed bowling/restaurant).
2. 2,534 S.F. Cleaners, Tailor and single occupant office space (assumed retail).

Proposed Development

1. 42 residential units.
2. 1,650 S.F. Retail.

Potential Matter-of-Right Development

1. 12,661 S.F. of residential (8 units).
2. 19,000 S.F. Commercial.

The results of these analyses are summarized on Table B-2. Individual trip generation calculations for the existing and potential conditions are included in Appendix G of the June 21,

2003 report, and the analysis for the proposed condition is contained in Table B-4.

It is estimated that the revised development program for 4600 Wisconsin Avenue would generate 20 weekday AM peak hour vehicle-trips, 41 PM peak hour vehicle-trips, and 47 Saturday mid-day peak hour vehicle-trips. Consistent with the previous study, these estimates are based on the assumptions that 40 percent of all residential trips, and 60 percent of all retail trips, will be Metrorail, Metrobus, or walk trips on weekdays. Twenty (20) percent of all residential trips, and 50 percent of all retail trips, were assumed to be non-auto trips on Saturdays.

Trip Generation Comparison of Previous versus Proposed Program

The site trip generation analysis of the previously proposed development program (43 residential units and 4,500 S.F. of commercial use), contained in Table B-3, was compared to the currently proposed development program (42 residential units and 1,650 S.F. of commercial use), shown on Table B-4.

The site trip generation comparison summary is included in Table B-5 and indicates that the currently proposed development program would generate five (or 20 percent) *fewer* trips during the AM peak hour, 17 (or 29 percent) *fewer* trips during the PM peak hour, and 29 (or 38 percent) *fewer* trips during the Saturday mid-day peak hour than the previously proposed development program. A complete summary table of each trip type is included in Table B-6.

Trip Generation Comparison of Current Program versus Existing and Potential Matter-of-Right Land Uses

A comparison of existing versus proposed uses indicates that the proposed program would generate 13 *more* trips during the AM peak hour, 25 *fewer* trips during the PM peak hour, and 88 *fewer* trips on Saturday.

In addition, the proposed development program would generate fewer trips during all peak hours than a potential matter-of-right development program for the site. It would generate 8 *fewer* AM peak hour trips, 47 *fewer* PM peak hour trips, and 104 *fewer* trips on Saturday.

As noted in the original traffic report, the proposed development program for 4600 Wisconsin Avenue would generate slightly more trips during the AM peak hour, but fewer trips during the PM peak hour and on Saturday than existing conditions. The development of this project would place less burden on the transportation infrastructure during the PM and Saturday peak periods.

Site Traffic Assignments

The updated site-generated traffic volumes were assigned to the public road network according to the original directional distributions developed in the original traffic report. The revised site traffic assignments are shown on Figure A-7. Individual traffic assignments for inbound and outbound trips for the residential and retail components of the project are summarized in Figures A-8, A-9, A-10, and A-11.

Total Future Traffic Forecasts

These site traffic assignments shown on Figure A-7 were added to the future background traffic volumes shown on Figure A-6 to yield the total future traffic forecasts shown on Figure A-12.

Future peak hour levels of service with 4600 Wisconsin Avenue were estimated at all key intersections in the study area based on the lane usage and traffic controls shown on Figure A-3, the total future traffic forecasts shown on Figure A-12, and the HCM methodology using the Synchro version 6.0 software. It is noted that these results include traffic currently being generated by the existing uses occupying the site.

The results of the updated analyses indicate that all key intersections would continue to operate at acceptable levels of service during all peak hours. The reduced development program for 4600 Wisconsin Avenue development would continue to have only minimal impact on the public streets, as nearly all traffic movements, overall levels of service, v/c ratios, and delays would remain similar to background conditions.

The results are presented in Appendix E and summarized in Table B-1.

Conclusions

The conclusions of this revised traffic study are summarized below:

1. The revised development program for 4600 Wisconsin Avenue would have only a minimal impact on public streets. Nearly all traffic movements, overall levels of service, v/c ratios, and delays would remain similar to background conditions with full development of the site. These estimates are conservative without reductions for traffic generated by existing uses, and are consistent with the previously submitted traffic study.

2. The revised 4600 Wisconsin Avenue development program, that includes 42 residential units and 1,650 S.F, of commercial uses, is expected to generate 20 AM peak hour trips (6 in and 15 out), 41 PM peak hour trips (24 in and 18 out), and 47 Saturday mid-day trips (25 in and 23 out), upon completion. This program results in a reduction of vehicle trips during the AM, PM, and Saturday peak hours than previously proposed.

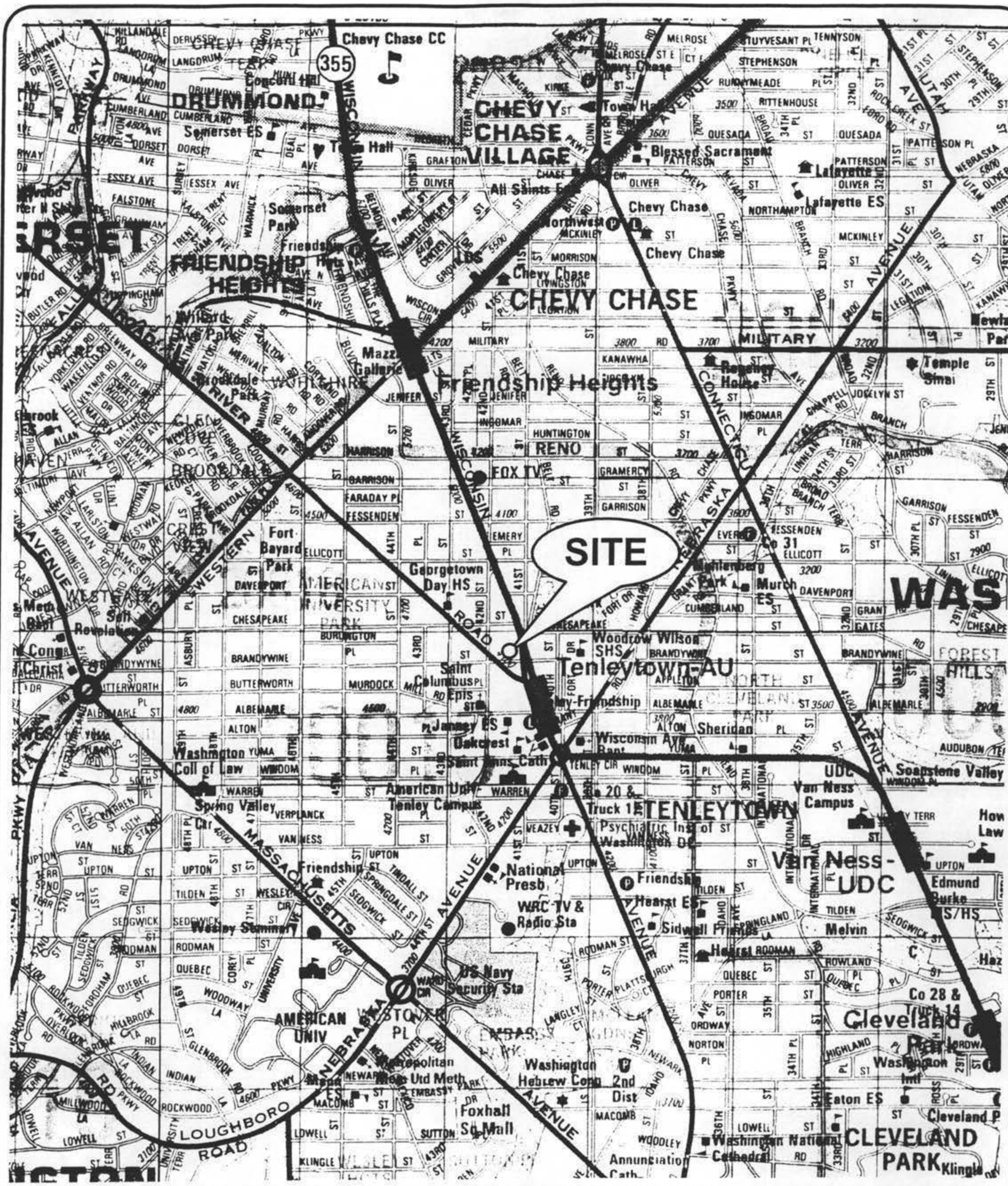
3. All of the key intersections currently operate at an acceptable level of service (LOS) "D" or better during both the AM and PM peak hours on weekdays and Saturday, and would continue to do so under background and total future conditions.

4. The proposed project provides adequate off-street parking based on District of Columbia requirements. The developers of the site are investigating designating a loading zone in front of the building t accommodate anticipated typical on-street loading activities, such as UPS or FedEx deliveries.

\2072\4600 WISCONSIN ANEVUE\4600 WISCONSIN AVENUE REVISED TRAFFIC ANALYSIS (JUNE 2004)

Appendix A

4600 Wisconsin Avenue Development
Figures



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Figure A–1
Site Location

North
Schematic

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4600 Wisconsin Avenue
Washington, D.C.

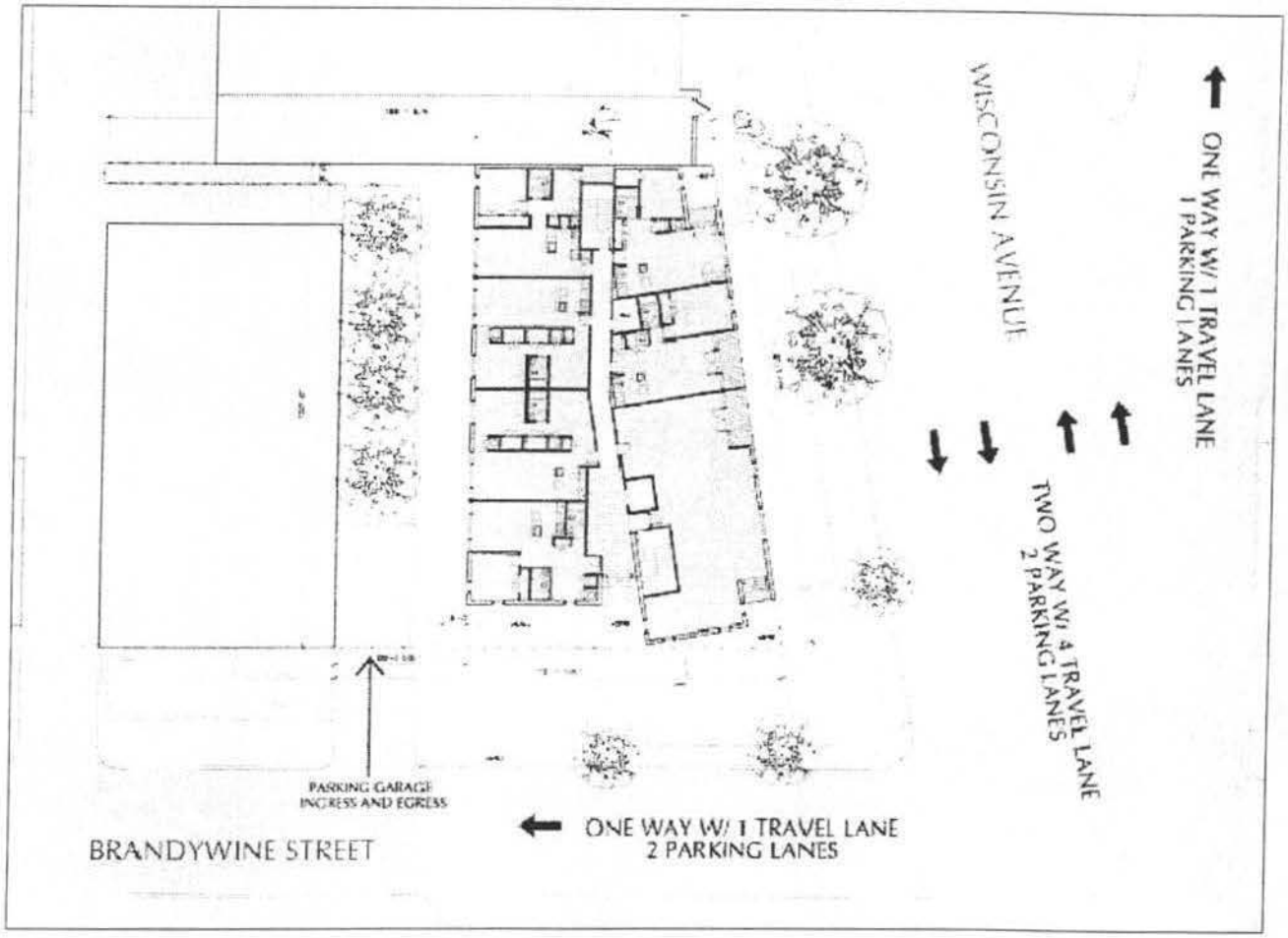
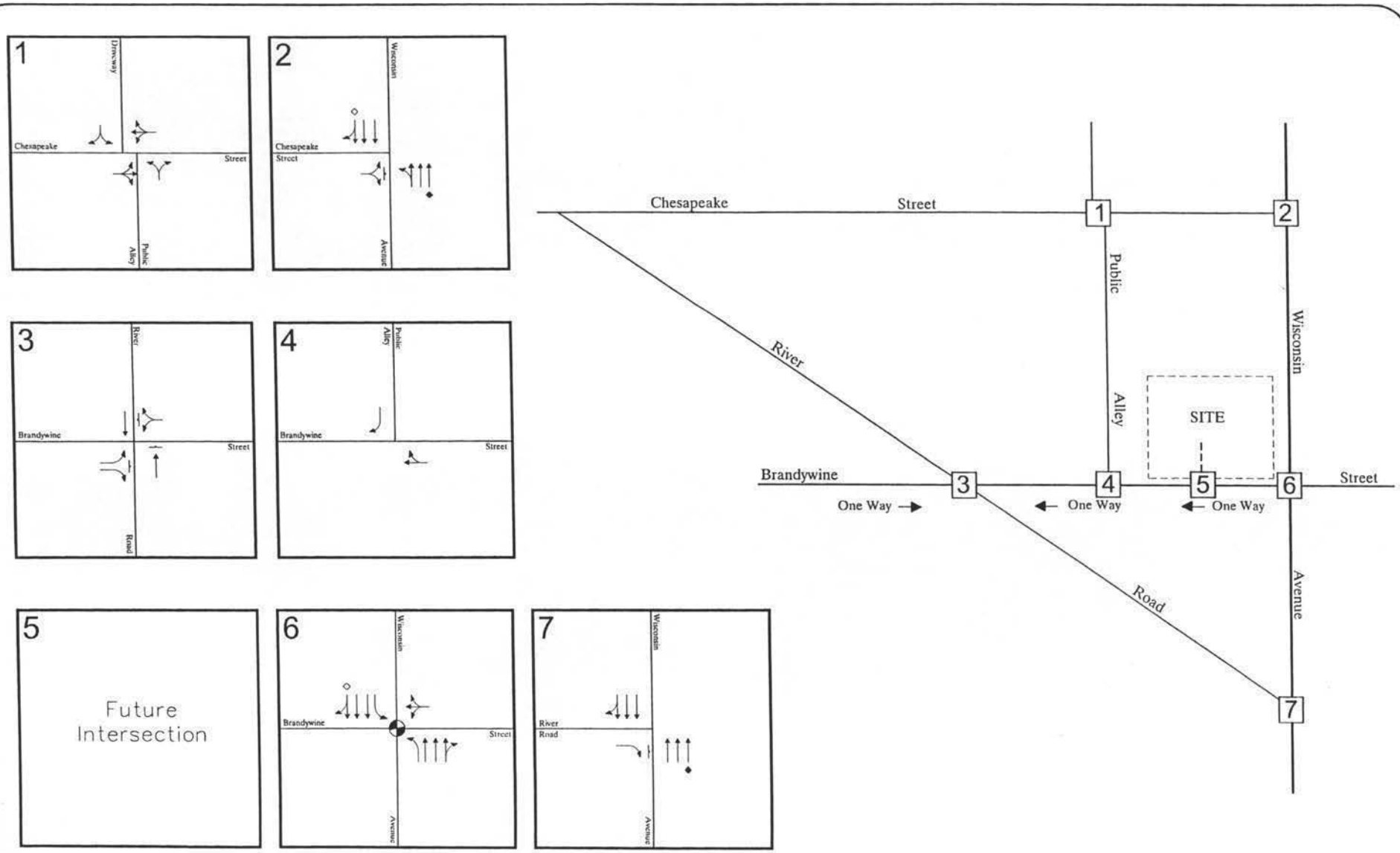


Figure A–2
Proposed Site Plan

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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◇ Curb Lane Utilized from 7-9:30 AM
◆ Curb Lane Utilized from 4-6:30 PM
← Represents One Travel Lane
Signalized Intersection
Stop Sign
Bus Stop

North
Schematic

Figure A-3
Intersection Lane Use and Traffic Control

4600 Wisconsin Avenue
Washington, D.C.

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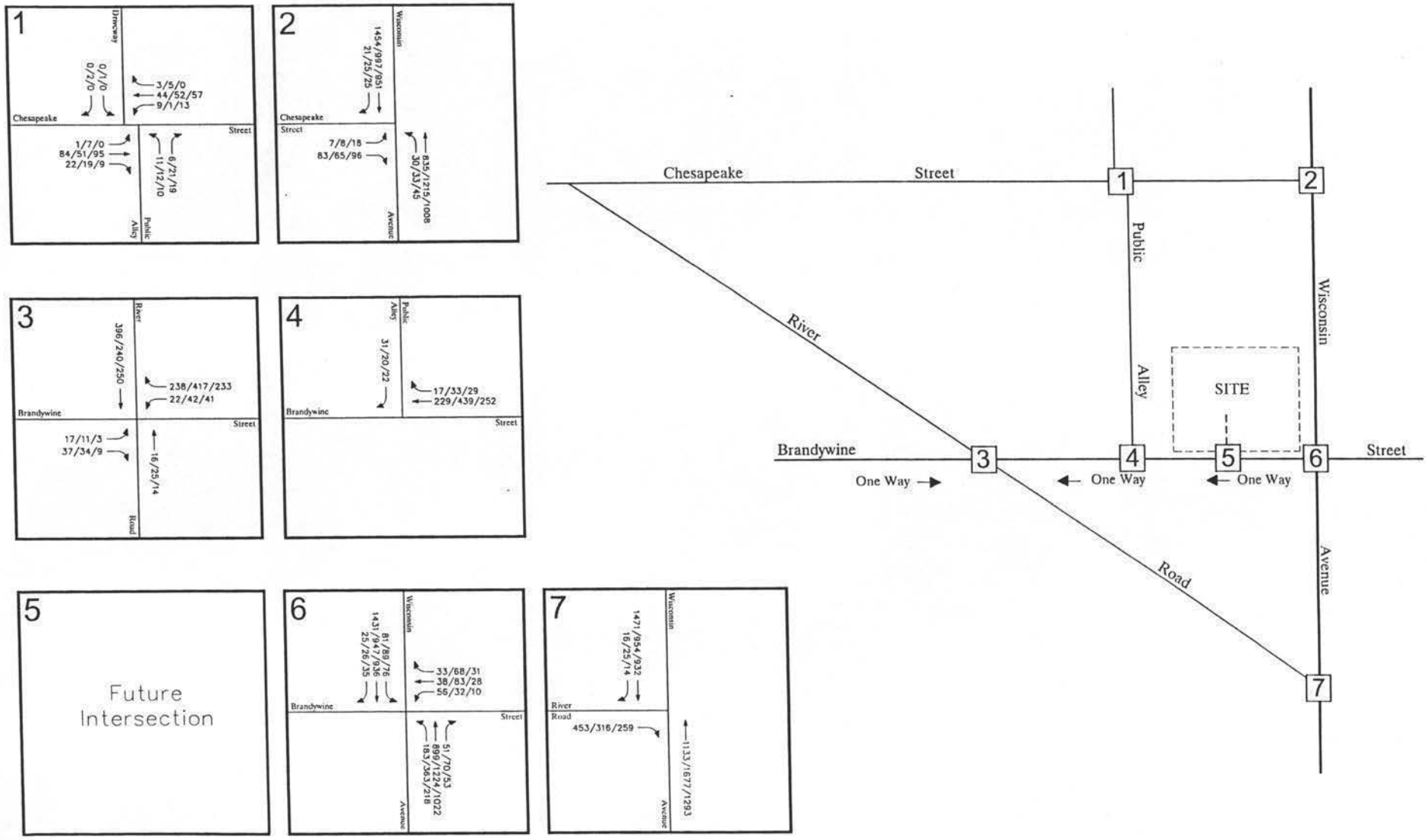


Figure A–4
Existing Vehicular Traffic Counts

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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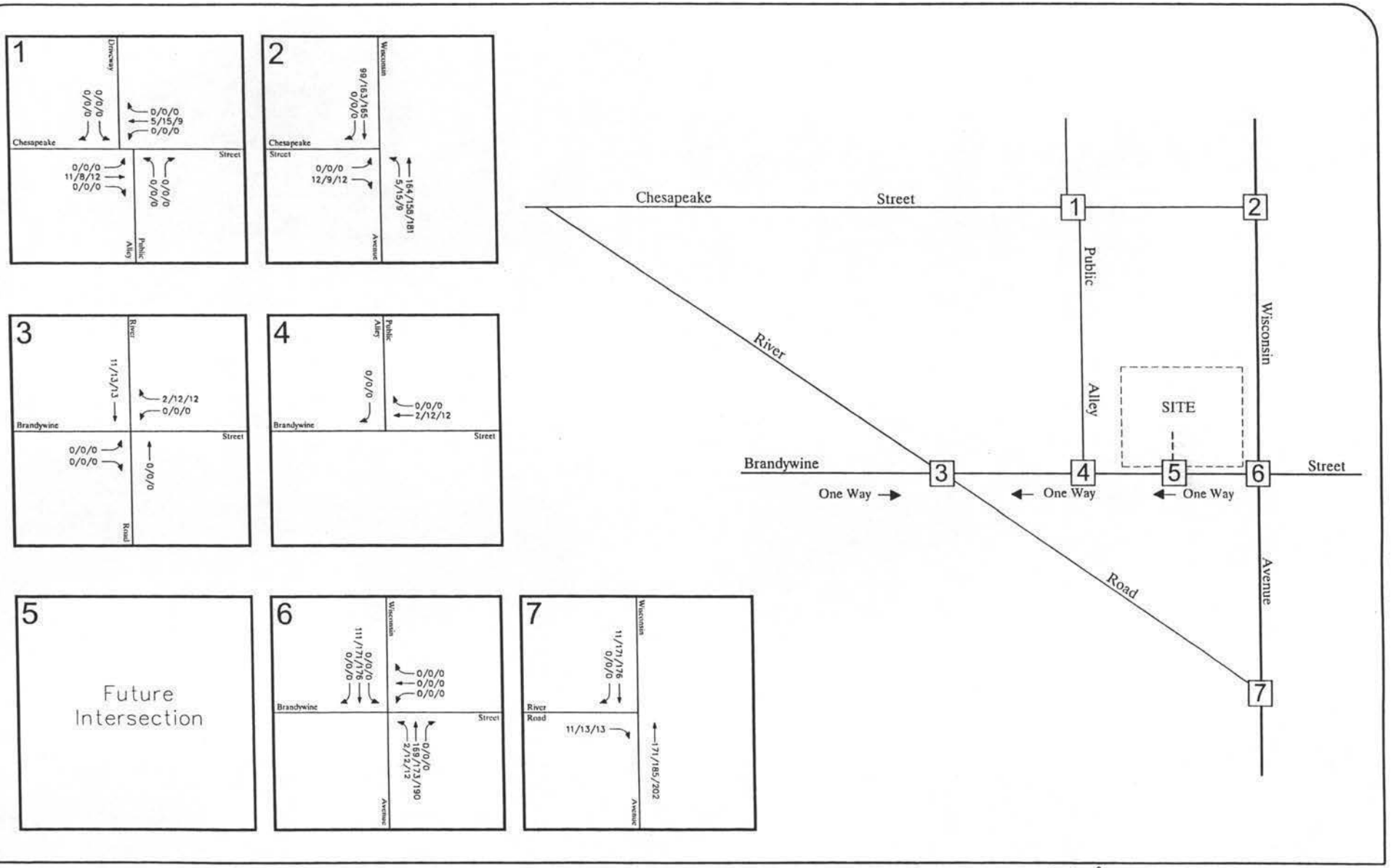


Figure A–5
Pipeline Project Traffic Assignments

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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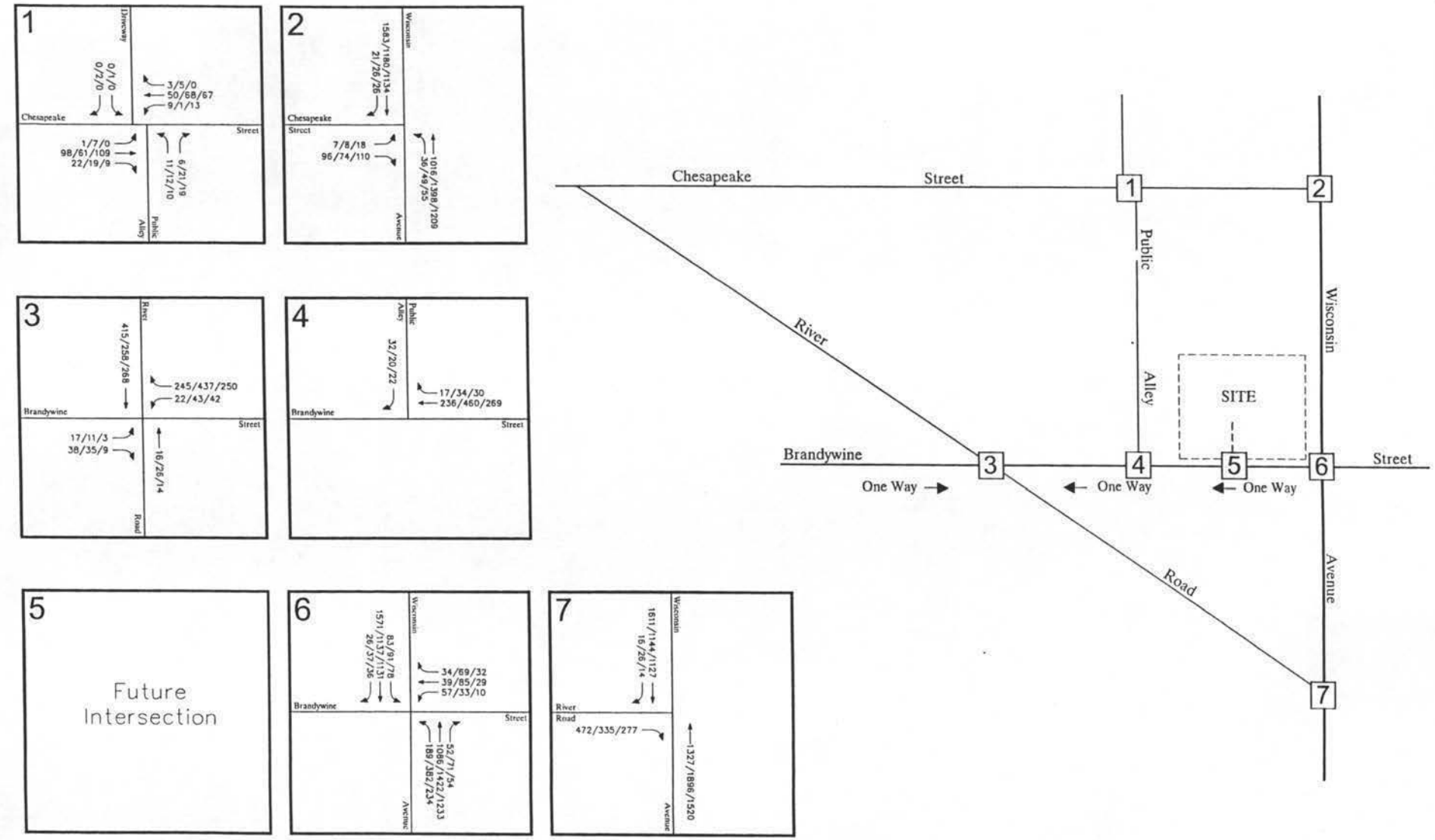


Figure A–6
Background Future 2005 Peak Hour Traffic Forecasts

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

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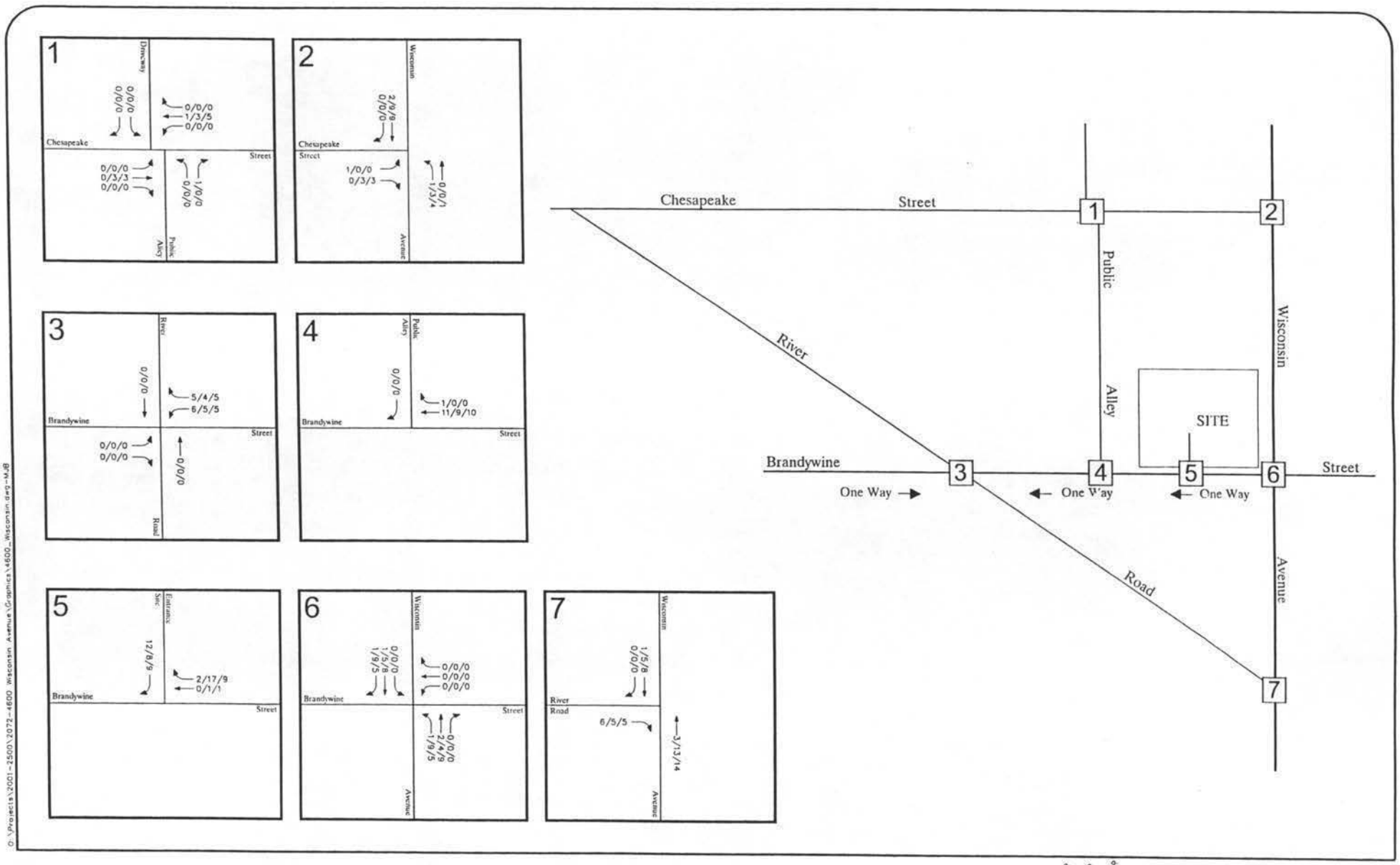


Figure A–7
Site–Generated Traffic Assignments

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
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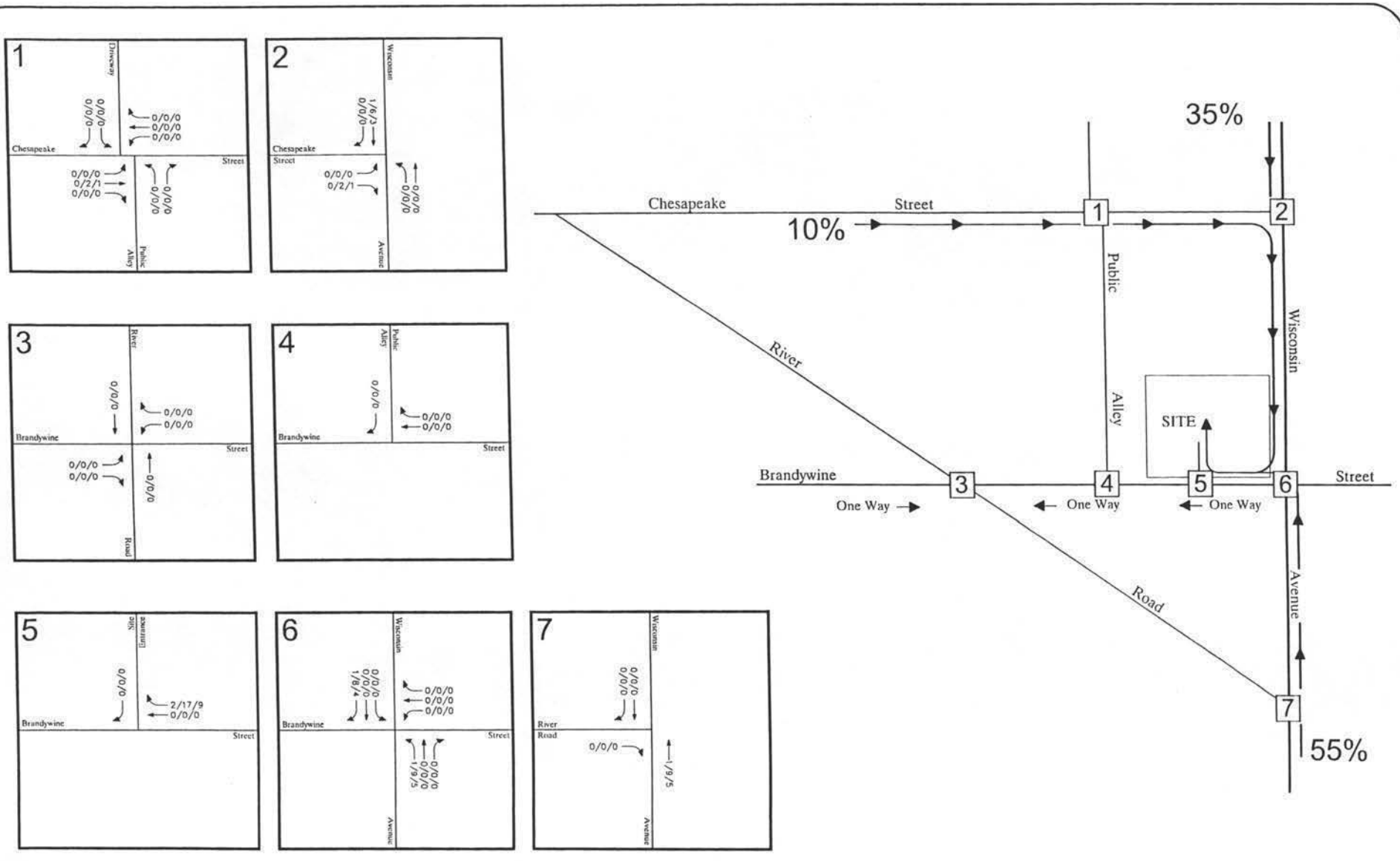


Figure A–8
Site–Generated Traffic Assignments and
Directional Distribution (In – Residential)

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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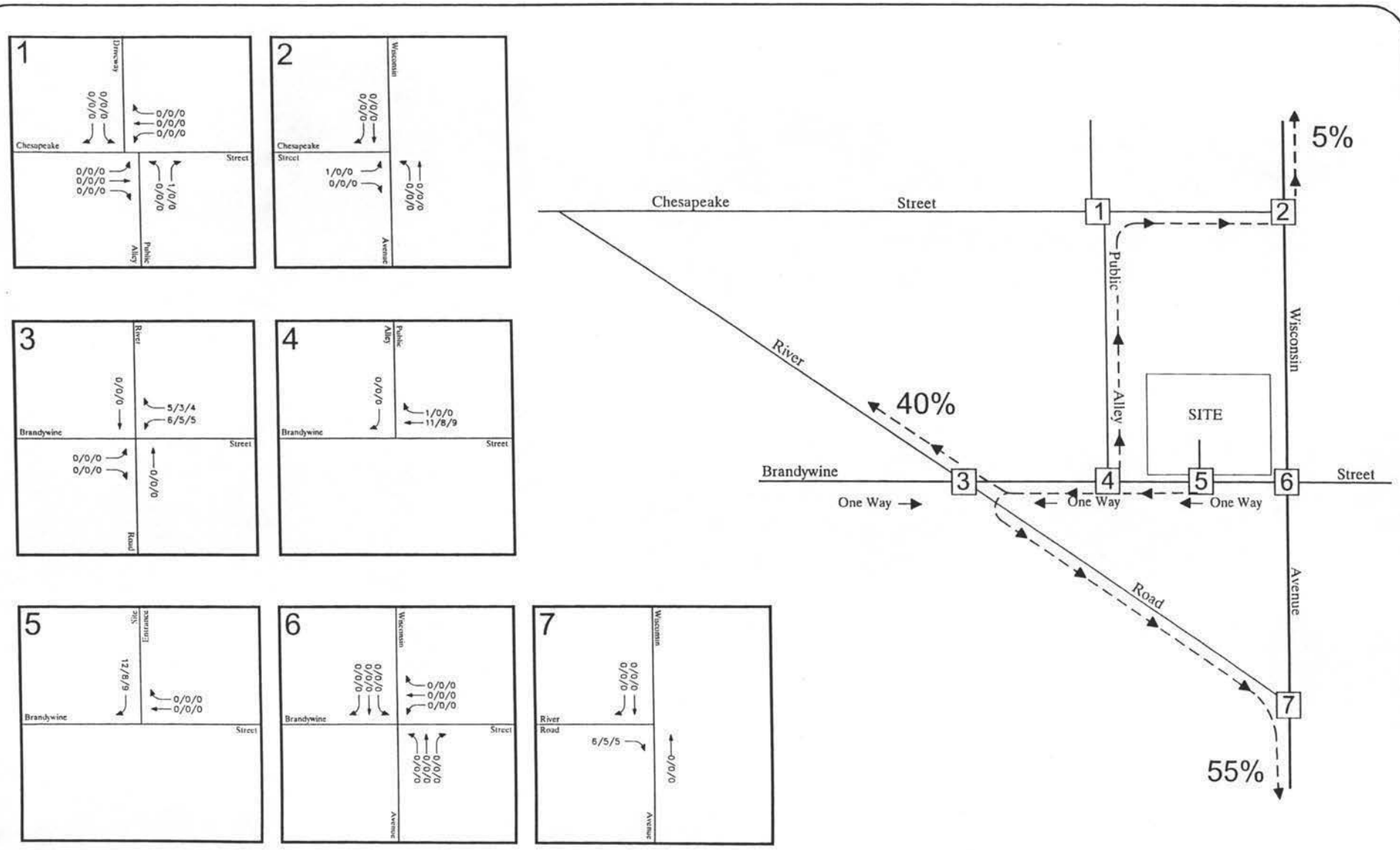


Figure A–9
Site–Generated Traffic Assignments and
Directional Distribution (Out – Residential)

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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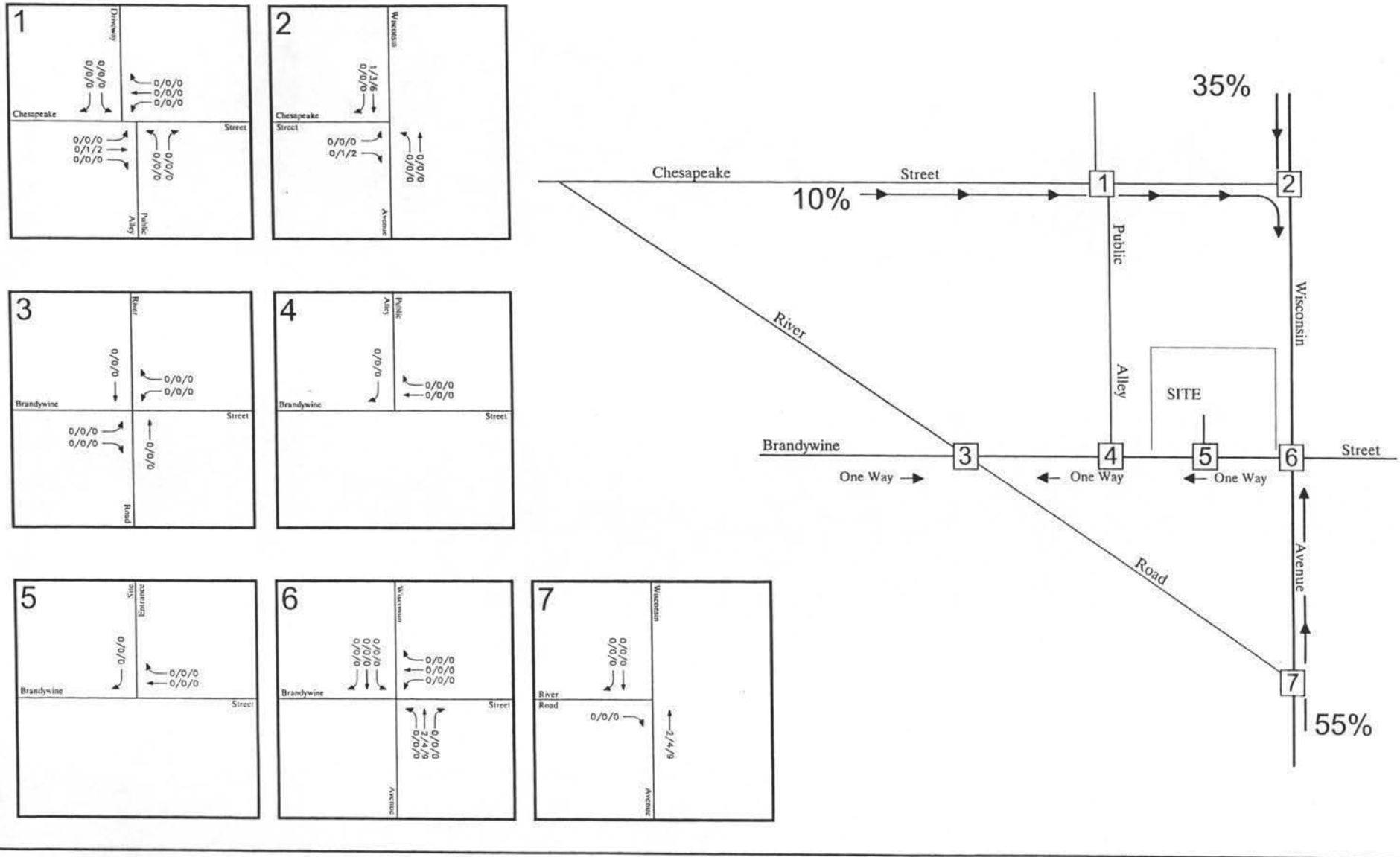


Figure A–10
Site–Generated Traffic Assignments and
Directional Distribution (In – Retail)

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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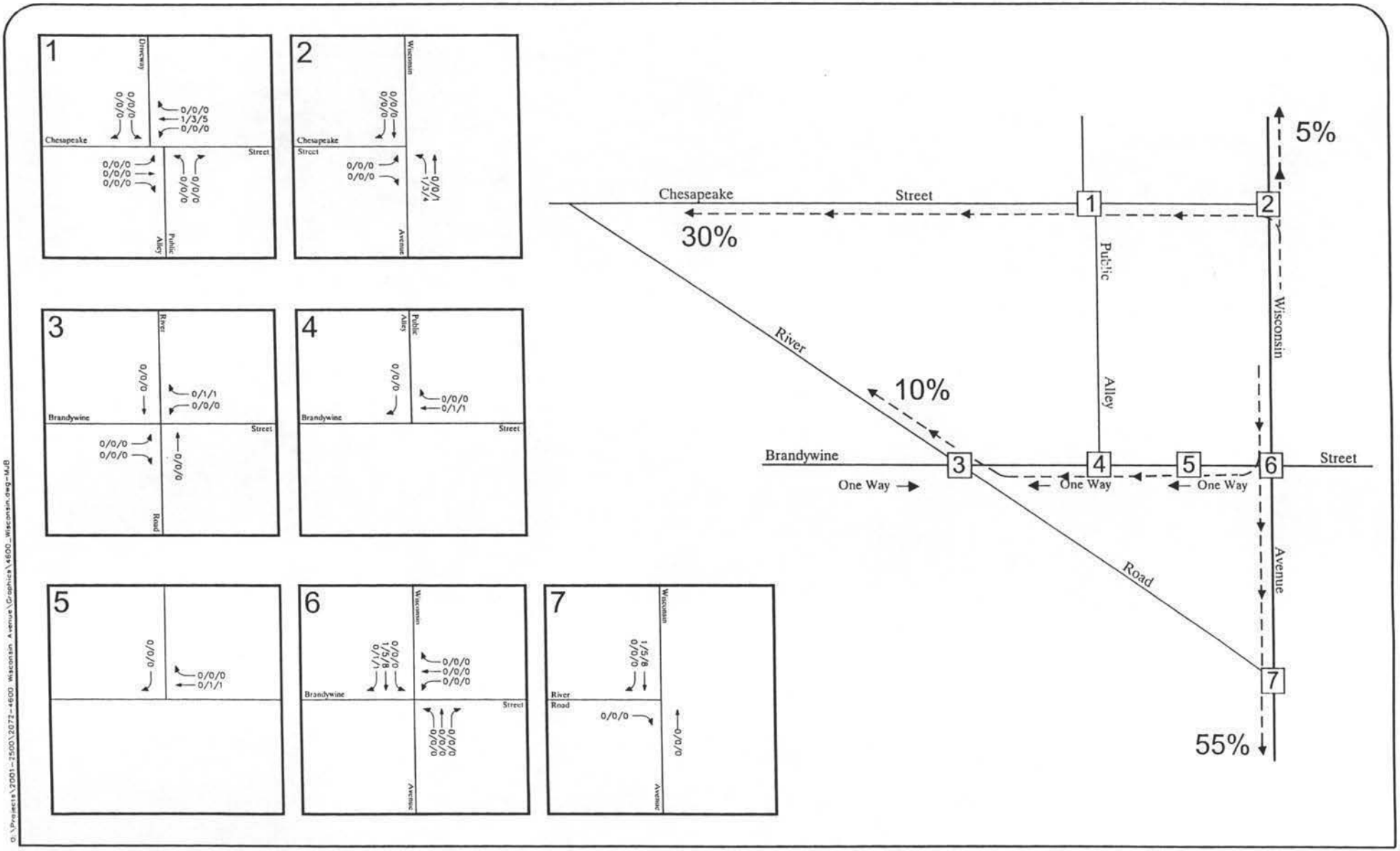


Figure A–11
Site–Generated Traffic Assignments and
Directional Distribution (Out – Retail)

North
Schematic

4600 Wisconsin Avenue
Washington, D.C.

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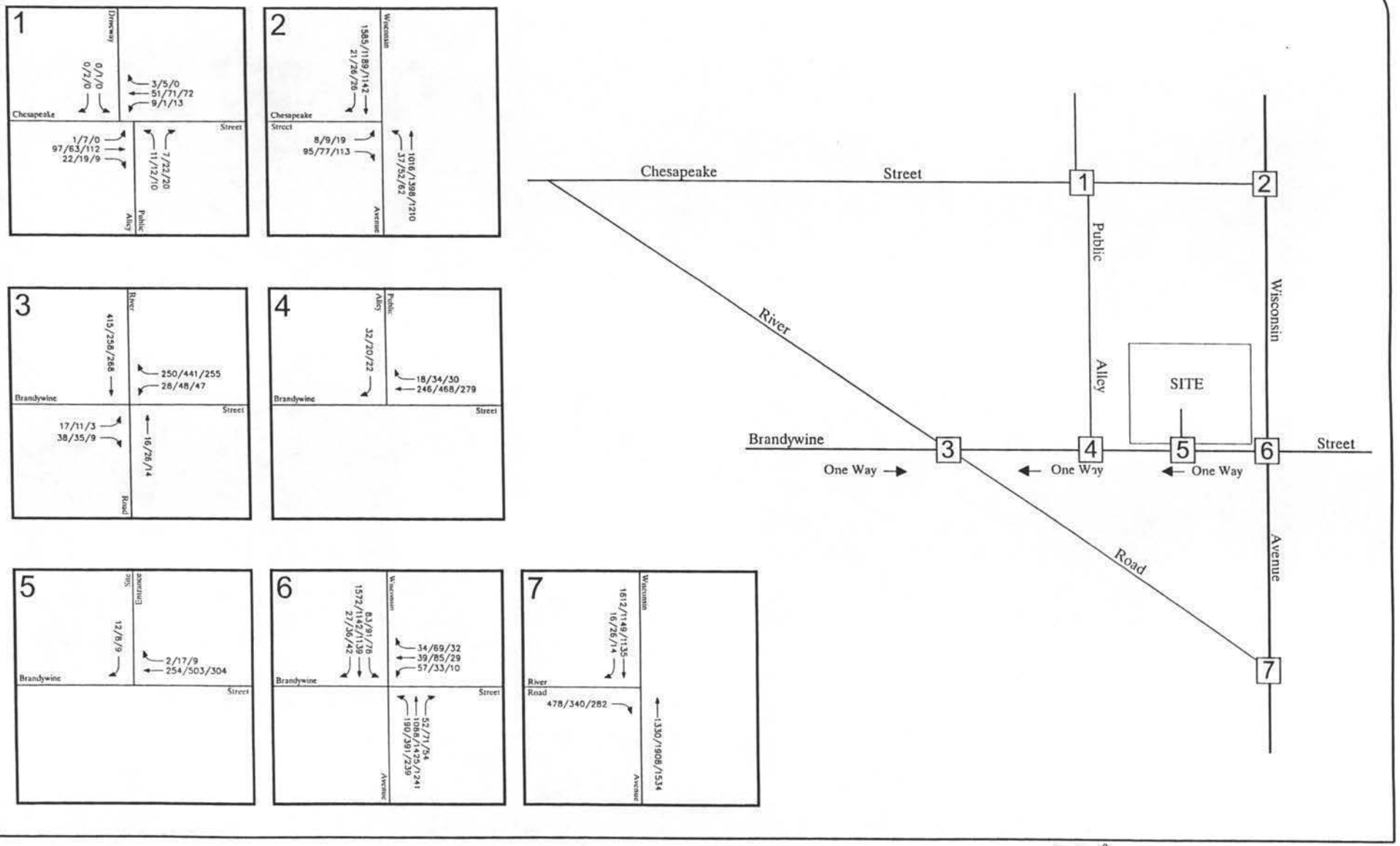


Figure A–12
Total Future 2005 Peak Hour Traffic Forecasts

AM PEAK HOUR
PM PEAK HOUR
SAT PEAK HOUR
000/000/000

North
Schematic

4600 Wisconsin Avenue
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Appendix B

4600 Wisconsin Avenue Development
Tables

Table B-1
4600 Wisconsin Avenue
Intersection Levels of Service Summary [1 & 2]

Location	Operating Condition	Intersection Approach	Levels of Service: Existing Conditions AM Peak	Existing Conditions PM Peak	Existing Conditions Saturday	Background Future Conditions AM Peak	Background Future Conditions PM Peak	Background Future Conditions Saturday	Total Future Conditions AM Peak	Total Future Conditions PM Peak	Total Future Conditions Saturday
1. Chesapeake Street / Alley	Unsignalized	EBLTR	A [0.1]	A [0.7]	A [0.0]	A [0.1]	A [0.6]	A [0.0]	A [0.1]	A [0.6]	A [0.0]
		WBLTR	A [1.3]	A [0.1]	A [1.5]	A [1.1]	A [0.1]	A [1.3]	A [1.1]	A [0.1]	A [1.2]
		NBL	A [9.9]	A [9.6]	B [10.2]	B [10.0]	A [9.8]	B [10.5]	B [10.0]	A [9.9]	B[10.5]
		NBR	A [8.9]	A [8.8]	A [9.1]	A [9.0]	A [8.8]	A [9.2]	A [9.0]	A [8.9]	A [9.2]
		SBL	A [0.0]	A [9.8]	A [0.0]	A [0.0]	A [10.0]	A [0.0]	A [0.0]	B[10.0]	A [0.0]
		SBR	A [0.0]	A [8.6]	A [0.0]	A [0.0]	A [8.7]	A [0.0]	A [0.0]	A [8.7]	A [0.0]
2. Wisconsin Avenue / Chesapeake Street	Unsignalized	EBLR	C[16.4]	B[15.0]	C[21.3]	C[18.8]	C[16.8]	D[29.9]	C[20.3]	C[17.4]	D[33.1]
		NBL	A [2.9]	A [2.2]	A [2.5]	A [4.0]	A [3.9]	A [3.8]	A[4.1]	A[4.2]	A[4.3]
3. Brandywine Street / River Road	Unsignalized	EBL	D [26.1]	D [27.1]	C [16.5]	C [21.5]	D [29.9]	C [17.5]	C [21.8]	D[30.3]	C[17.7]
		EBR	A [9.0]	B [10.1]	B [10.2]	B [12.4]	B [10.3]	B [10.3]	B [12.4]	B [10.3]	B [10.3]
		WBL	B [14.5]	B [11.9]	B [11.6]	C [15.3]	B [12.2]	B [11.9]	C [15.5]	B [12.3]	B [12.0]
		WBR	C [15.4]	B [11.3]	A [9.7]	A [9.7]	B [11.6]	A [9.8]	A [9.7]	B[11.6]	A [9.9]
		SBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
		NBT	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]
4. Brandywine Street / Alley	Unsignalized	SBR	B [10.3]	B [12.3]	B [10.6]	B [10.3]	B [12.6]	B [10.8]	B [10.4]	B [12.3]	B [10.8]
5. Brandywine Street / Site Entrance	Unsignalized	SBR	N/A	N/A	N/A	N/A	N/A	N/A	A [7.0]	A [7.6]	A [7.1]
		WBTR	N/A	N/A	N/A	N/A	N/A	N/A	A[8.7]	B[13.4]	A[9.3]
6. Wisconsin Avenue / Brandywine Street	Signalized	WB	D(35.3)	D(39.6)	C(33.0)	D(35.4)	D(39.9)	C(33.0)	D(35.4)	D(39.9)	C(33.0)
		NB	C (20.1)	B (18.5)	B(19.2)	C(22.4)	C(23.5)	C (23.4)	C(22.5)	C(24.7)	C(24.4)
		SB	B (16.5)	D(35.2)	B (17.7)	B (17.4)	D(48.2)	C (20.1)	B(17.4)	D(50.5)	C(20.4)
		Overall	B (18.8)	C(25.9)	B (19.0)	C (20.3)	C (34.0)	C (22.2)	C(20.3)	D(35.4)	C(22.8)
7. Wisconsin Avenue / River Road	Unsignalized	EBR	C [21.9]	C [16.0]	C [17.2]	C [21.8]	C [15.3]	B [13.9]	C[22.3]	B[14.9]	C[22.1]
		SBTR	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]	A [0.0]

Notes: [1] Intersection analyses based on Synchro software.
[2] Numbers in brackets/parantheses represent average delays in seconds per vehicle.

Table B-2
4600 Wisconsin Avenue
Trip Generation Comparison Summary

Trip Type/ Land Use	Trip Generation Summary AM Peak Hour In	Out	Total	PM Peak Hour In	Out	Total	Saturday Peak Hour In	Out	Total
Vehicle Trip Summary (Net New Trips)									
Existing Uses	5	3	7	39	35	66	81	54	135
Proposed Uses	6	15	20	24	18	41	25	23	47
Potential Uses	15	13	28	43	46	89	79	72	151
Trip Generation Comparison									
Existing vs. Proposed	1	12	13	-15	-17	-25	-56	-31	-88
Proposed vs. Potential	-9	2	-8	-19	-28	-47	-54	-49	-104

Note: Trip generation based on ITE and previous studies. Refer to Appendix G for summaries.

Table B-3
4600 Wisconsin Avenue
Site Trip Generation Analysis (W&A June 21, 2003 report)

Trip Type/ Land Use	ITE Code	Size	Units	Trip Generation Summary AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Vehicle-Trips (1)												
Apartments	220	43	Units	4	21	25	28	14	42	11	11	22
Retail	820	4,500	SF	15	10	25	39	42	81	60	56	116
Total				19	31	50	67	56	123	71	67	138
Person-Trips (2)												
Apartments	220	43	Units	5	24	29	32	16	48	13	13	26
Retail	820	4,500	SF	24	16	40	62	67	130	97	89	186
Total				29	40	69	94	83	178	110	102	212
Auto Person-Trips (3)												
Apartments	220	43	Units	3	14	17	19	10	29	10	10	21
Retail	820	4,500	SF	10	6	16	25	27	52	49	45	93
Total				13	21	33	44	36	81	59	55	114
Auto Vehicle-Trips (2)												
Apartments	220	43	Units	3	13	15	17	8	25	9	9	18
Retail	820	4,500	SF	6	4	10	16	17	33	30	28	58
Total				9	17	25	32	26	58	40	37	76

Notes:

(1) Trip Generation obtained from ITE's Trip Generation, 6th Edition.

(2) Residential average vehicle occupancy 1.15 (persons per vehicle)
Retail average vehicle occupancy 1.60 (persons per vehicle)

(3) Non-auto mode split were adapted from the *Development-Related Ridership Survey II*, Washington Metropolitan Area Transit Authority, December 1989. Distance to Metro: 1,000 feet

	Weekday	Saturday
Residential Condo Non-auto mode split:	40%	20%
Retail Non-auto mode split:	60%	50%

Table B-4
4600 Wisconsin Avenue
Site Trip Generation Analysis (May 2004 Update)

Trip Type/ Land Use	ITE Code	Size	Units	Trip Generation Summary AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Vehicle-Trips (1)												
Apartments	220	42	Units	4	20	24	27	14	41	11	11	22
Retail	820	1,650	SF	9	5	14	20	22	42	31	29	60
Total				12	26	38	48	35	83	42	40	82
Person-Trips (2)												
Apartments	220	42	Units	4	23	28	32	16	47	13	13	25
Retail	820	1,650	SF	14	9	22	32	35	67	50	46	96
Total				18	32	50	64	51	114	63	59	121
Auto Person-Trips (3)												
Apartments	220	42	Units	2	14	17	19	10	28	10	10	20
Retail	820	1,650	SF	6	4	9	13	14	27	25	23	48
Total				8	17	26	32	24	55	35	33	68
Auto Vehicle-Trips (2)												
Apartments	220	42	Units	2	12	15	17	8	25	9	9	17
Retail	820	1,650	SF	4	2	6	8	9	17	16	14	30
Total				6	15	20	24	18	41	25	23	47

Notes:

(1) Trip Generation obtained from ITE's Trip Generation, 6th Edition.

(2) Residential average vehicle occupancy 1.15 (persons per vehicle)
Retail average vehicle occupancy 1.60 (persons per vehicle)

(3) Non-auto mode split were adapted from the *Development-Related Ridership Survey II*, Washington Metropolitan Area Transit Authority, December 1989. Distance to Metro: 1,000 Feet

	Weekday	Saturday
Residential Condo Non-auto mode split:	40%	20%
Retail Non-auto mode split:	60%	50%

Table B-5
4600 Wisconsin Avenue
Site Trip Generation Comparison

Trip Type/ Land Use	ITE Code	Size	Units	Trip Generation Summary AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
W&A Report (June 21, 2003)												
Apartments	220	43	Units	3	13	15	17	8	25	9	9	18
Retail	820	4,500	SF	6	4	10	16	17	33	30	28	58
Total				9	17	25	32	26	58	40	37	76
May 2004 Update												
Apartments	220	42	Units	2	12	15	17	8	25	9	9	17
Retail	820	1,650	SF	4	2	6	8	9	17	16	14	30
Total				6	15	20	24	18	41	25	23	47
Difference				(3)	(2)	(5)	(8)	(8)	(17)	(15)	(14)	(29)
% Difference				33.33%	11.76%	20.00%	25.00%	30.77%	29.31%	37.50%	37.84%	38.16%

Notes:

(1) Trip Generation obtained from ITE's Trip Generation, 6th Edition.

(2) Residential average vehicle occupancy 1.15 (persons per vehicle)
Retail average vehicle occupancy 1.60 (persons per vehicle)

(3) Non-auto mode split were adapted from the *Development-Related Ridership Survey II*, Washington Metropolitan Area Transit Authority, December 1989. Distance to Metro: 0

	Weekday	Saturday
Residential Condo Non-auto mode split:	40%	20%
Retail Non-auto mode split:	60%	50%

Table B-6
4600 Wisconsin Avenue
Site Trip Generation Comparison

Trip Type/ Land Use	ITE Code	Size	Units	Trip Generation Summary AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total
Vehicle-Trips (1)												
Difference				(7)	(5)	(12)	(19)	(21)	(40)	(29)	(27)	(56)
% Difference				35.69%	16.68%	24.00%	28.93%	36.82%	32.52%	41.03%	40.53%	40.79%
Person-Trips (2)												
Difference				(8)	(6)	(14)	(22)	(24)	(46)	(34)	(31)	(65)
% Difference				37.93%	20.00%	27.54%	31.91%	38.55%	35.96%	42.73%	42.16%	42.92%
Auto Person-Trips (3)												
Difference				(5)	(4)	(8)	(13)	(14)	(28)	(27)	(25)	(52)
% Difference				36.51%	16.35%	23.35%	27.27%	35.16%	31.93%	39.90%	39.16%	40.25%
Auto Vehicle-Trips (2)												
Difference				(4)	(3)	(7)	(11)	(13)	(24)	(24)	(22)	(45)
% Difference				35.10%	11.76%	19.98%	25.00%	30.77%	28.28%	37.50%	36.46%	37.82%

Appendix C

Existing Levels of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes					0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.96		1.00	0.99		1.00	1.00	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1972		1593	4522		1652	4734	
Flt Permitted					0.98		0.14	1.00		0.95	1.00	
Satd. Flow (perm)					1972		240	4522		1652	4734	
Volume (vph)	0	0	0	56	38	33	183	899	51	81	1431	25
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	0	0	62	42	37	203	999	57	90	1590	28
RTOR Reduction (vph)	0	0	0	0	13	0	0	6	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	128	0	203	1050	0	90	1616	0
Confl. Peds. (#/hr)						19			44			
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		51.0	51.0		14.0	56.0	
Effective Green, g (s)					21.0		52.0	52.0		15.0	57.0	
Actuated g/C Ratio					0.21		0.52	0.52		0.15	0.57	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					414		260	2351		248	2698	
v/s Ratio Prot							c0.08	0.23		0.05	c0.34	
v/s Ratio Perm					0.07		c0.33					
v/c Ratio					0.31		0.78	0.45		0.36	0.60	
Uniform Delay, d1					33.4		23.0	15.0		38.2	14.0	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					1.9		20.4	0.6		4.1	1.0	
Delay (s)					35.3		43.4	15.6		42.3	15.0	
Level of Service					D		D	B		D	B	
Approach Delay (s)		0.0			35.3			20.1			16.5	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes					0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.99		1.00	1.00	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1752		1593	4512		1486	3120	
Flt Permitted					0.99		0.19	1.00		0.95	1.00	
Satd. Flow (perm)					1752		312	4512		1486	3120	
Volume (vph)	0	0	0	32	83	68	363	1224	70	89	947	26
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	0	0	36	92	76	403	1360	78	99	1052	29
RTOR Reduction (vph)	0	0	0	0	21	0	0	6	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	183	0	403	1432	0	99	1079	0
Confl. Peds. (#/hr)						29			78			35
Parking (#/hr)				0	0	0				0	0	0
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		58.0	58.0		7.0	42.0	
Effective Green, g (s)					21.0		59.0	59.0		8.0	43.0	
Actuated g/C Ratio					0.21		0.59	0.59		0.08	0.43	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					368		492	2662		119	1342	
v/s Ratio Prot							c0.20	0.32		0.07	c0.35	
v/s Ratio Perm					0.10		0.29					
v/c Ratio					0.50		0.82	0.54		0.83	0.80	
Uniform Delay, d1					34.8		23.7	12.3		45.3	24.8	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					4.7		14.1	0.8		46.4	5.2	
Delay (s)					39.6		37.8	13.1		91.7	30.0	
Level of Service					D		D	B		F	C	
Approach Delay (s)		0.0			39.6			18.5			35.2	
Approach LOS		A			D			B			D	

Intersection Summary			
HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes					0.95		1.00	0.99		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.94		1.00	0.99		1.00	0.99	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1689		1593	4517		1486	3106	
Flt Permitted					0.99		0.26	1.00		0.95	1.00	
Satd. Flow (perm)					1689		444	4517		1486	3106	
Volume (vph)	0	0	0	10	28	31	218	1022	53	76	936	35
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	0	0	11	31	34	242	1136	59	84	1040	39
RTOR Reduction (vph)	0	0	0	0	27	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	49	0	242	1189	0	84	1076	0
Confl. Peds. (#/hr)						63			82			99
Parking (#/hr)				0	0	0				0	0	0
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		51.0	51.0		14.0	56.0	
Effective Green, g (s)					21.0		52.0	52.0		15.0	57.0	
Actuated g/C Ratio					0.21		0.52	0.52		0.15	0.57	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					355		346	2349		223	1770	
v/s Ratio Prot							c0.07	0.26		0.06	c0.35	
v/s Ratio Perm					0.03		c0.29					
v/c Ratio					0.14		0.70	0.51		0.38	0.61	
Uniform Delay, d1					32.1		22.0	15.6		38.3	14.2	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					0.8		11.2	0.8		4.8	1.6	
Delay (s)					33.0		33.1	16.4		43.1	15.7	
Level of Service					C		C	B		D	B	
Approach Delay (s)		0.0			33.0			19.2			17.7	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	83	30	835	1454	21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	92	33	928	1616	23
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.91	0.87	0.87			
vC, conflicting volume	2202	580	1669			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1631	205	1462			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	86	91			
cM capacity (veh/h)	74	677	386			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	100	343	619	646	646	346
Volume Left	8	33	0	0	0	0
Volume Right	92	0	0	0	0	23
cSH	414	386	1700	1700	1700	1700
Volume to Capacity	0.24	0.09	0.36	0.38	0.38	0.20
Queue Length 95th (ft)	23	7	0	0	0	0
Control Delay (s)	16.4	2.9	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	16.4	1.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	8	65	33	1215	997	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	72	37	1350	1108	28
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.91	0.86	0.86			
vC, conflicting volume	1689	598	1166			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1017	368	1029			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	86	93			
cM capacity (veh/h)	191	527	562			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	81	307	540	540	739	397
Volume Left	9	37	0	0	0	0
Volume Right	72	0	0	0	0	28
cSH	442	562	1700	1700	1700	1700
Volume to Capacity	0.18	0.07	0.32	0.32	0.43	0.23
Queue Length 95th (ft)	17	5	0	0	0	0
Control Delay (s)	15.0	2.2	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	15.0	0.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	96	45	1008	951	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	107	50	1120	1057	28
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1775	572	1114			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1291	360	983			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	80	92			
cM capacity (veh/h)	118	541	593			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	127	423	747	704	380
Volume Left	20	50	0	0	0
Volume Right	107	0	0	0	28
cSH	346	593	1700	1700	1700
Volume to Capacity	0.37	0.08	0.44	0.41	0.22
Queue Length 95th (ft)	41	7	0	0	0
Control Delay (s)	21.3	2.5	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	21.3	0.9		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	73.2%	ICU Level of Service	D	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	453	0	1133	1471	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	503	0	1259	1634	18
Pedestrians	122			7		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	10			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	2395	683	1774			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2231	55	1442			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	28	100			
cM capacity (veh/h)	26	703	330			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	503	629	629	654	654	345
Volume Left	0	0	0	0	0	0
Volume Right	503	0	0	0	0	18
cSH	703	1700	1700	1700	1700	1700
Volume to Capacity	0.72	0.37	0.37	0.38	0.38	0.20
Queue Length 95th (ft)	152	0	0	0	0	0
Control Delay (s)	21.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	21.9	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	316	0	1677	954	25
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	351	0	1863	1060	28
Pedestrians	131			18		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	11			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	1826	516	1219			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1646	136	946			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	48	100			
cM capacity (veh/h)	70	675	557			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	351	621	621	621	424	424	240
Volume Left	0	0	0	0	0	0	0
Volume Right	351	0	0	0	0	0	28
cSH	675	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.37	0.37	0.37	0.25	0.25	0.14
Queue Length 95th (ft)	76	0	0	0	0	0	0
Control Delay (s)	16.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	16.0	0.0			0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	259	0	1293	932	14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	288	0	1437	1036	16
Pedestrians	38			7		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	3			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked						
vC, conflicting volume	1800	398	1089			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1800	398	1089			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	50	100			
cM capacity (veh/h)	69	579	616			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	288	718	718	414	414	223
Volume Left	0	0	0	0	0	0
Volume Right	288	0	0	0	0	16
cSH	579	1700	1700	1700	1700	1700
Volume to Capacity	0.50	0.42	0.42	0.24	0.24	0.13
Queue Length 95th (ft)	69	0	0	0	0	0
Control Delay (s)	17.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	17.2	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	229	17	0	31
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	254	19	0	34
Pedestrians		4			32	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			184			
pX, platoon unblocked	0.94				0.94	0.94
vC, conflicting volume	305				296	300
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260				250	254
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1197				678	720

Direction, Lane #	WB 1	SB 1
Volume Total	273	34
Volume Left	0	0
Volume Right	19	34
cSH	1700	720
Volume to Capacity	0.16	0.05
Queue Length 95th (ft)	0	4
Control Delay (s)	0.0	10.3
Lane LOS		B
Approach Delay (s)	0.0	10.3
Approach LOS		B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations			↱			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	439	33	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	488	37	0	22
Pedestrians		3			22	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			184			
pX, platoon unblocked	0.87				0.87	0.87
vC, conflicting volume	546				528	531
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	477				456	459
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	927				480	514

Direction, Lane #	WB 1	SB 1
Volume Total	524	22
Volume Left	0	0
Volume Right	37	22
cSH	1700	514
Volume to Capacity	0.31	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	12.3
Lane LOS		B
Approach Delay (s)	0.0	12.3
Approach LOS		B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	252	29	0	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	280	32	0	24
Pedestrians		3			46	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			184			
pX, platoon unblocked	0.92				0.92	0.92
vC, conflicting volume	358				342	345
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304				287	290
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	1122				628	669

Direction, Lane #	WB 1	SB 1
Volume Total	312	24
Volume Left	0	0
Volume Right	32	24
cSH	1700	669
Volume to Capacity	0.18	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	10.6
Lane LOS		B
Approach Delay (s)	0.0	10.6
Approach LOS		B

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	17	0	37	22	0	238	396	0	0	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	0	41	24	0	264	440	0	0	18
Pedestrians							50		7	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							6		1	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	729	458	68	549	458	447			440	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	729	458	68	549	458	447			440	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	90	100	96	94	100	56			100	
cM capacity (veh/h)	189	499	940	403	499	607			1120	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	19	41	24	264	440	18
Volume Left	19	0	24	0	0	0
Volume Right	0	41	0	264	0	0
cSH	189	940	403	607	1700	1700
Volume to Capacity	0.10	0.04	0.06	0.44	0.26	0.01
Queue Length 95th (ft)	8	3	5	55	0	0
Control Delay (s)	26.1	9.0	14.5	15.4	0.0	0.0
Lane LOS	D	A	B	C		
Approach Delay (s)	14.4		15.4		0.0	0.0
Approach LOS	B		C			

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	11	0	34	42	0	417	25	0	0	240
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	0	38	47	0	463	28	0	0	267
Pedestrians							16		7	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							2		1	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	765	294	283	348	294	35			28	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	765	294	283	348	294	35			28	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	93	100	95	92	100	55			100	
cM capacity (veh/h)	175	617	743	565	617	1030			1586	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	12	38	47	463	28	267
Volume Left	12	0	47	0	0	0
Volume Right	0	38	0	463	0	0
cSH	175	743	565	1030	1700	1700
Volume to Capacity	0.07	0.05	0.08	0.45	0.02	0.16
Queue Length 95th (ft)	6	4	7	59	0	0
Control Delay (s)	27.1	10.1	11.9	11.3	0.0	0.0
Lane LOS	D	B	B	B		
Approach Delay (s)	14.3		11.4		0.0	0.0
Approach LOS	B		B			

Intersection Summary			
Average Delay	7.6		
Intersection Capacity Utilization	36.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	3	0	9	41	0	233	14	0	0	250
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	0	10	46	0	259	16	0	0	278
Pedestrians							32		17	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							4		2	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	569	293	310	335	293	33			16	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	569	293	310	335	293	33			16	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	99	100	99	92	100	75			100	
cM capacity (veh/h)	317	618	704	588	618	1021			1602	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	3	10	46	259	16	278
Volume Left	3	0	46	0	0	0
Volume Right	0	10	0	259	0	0
cSH	317	704	588	1021	1700	1700
Volume to Capacity	0.01	0.01	0.08	0.25	0.01	0.16
Queue Length 95th (ft)	1	1	6	25	0	0
Control Delay (s)	16.5	10.2	11.6	9.7	0.0	0.0
Lane LOS	C	B	B	A		
Approach Delay (s)	11.8		10.0		0.0	0.0
Approach LOS	B		B			

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	38.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰		↱	↰		↱
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	84	22	9	44	3	11	0	6	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	93	24	10	49	3	12	0	7	0	0	0
Pedestrians								10			14	
Lane Width (ft)								10.0			8.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	66			128			188	204	116	199	215	65
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	66			128			188	204	116	199	215	65
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	99	100	100	100
cM capacity (veh/h)	1524			1448			754	677	930	736	668	992

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	119	62	12	7	0	0
Volume Left	1	10	12	0	0	0
Volume Right	24	3	0	7	0	0
cSH	1524	1448	754	930	1700	1700
Volume to Capacity	0.00	0.01	0.02	0.01	0.00	0.00
Queue Length 95th (ft)	0	1	1	1	0	0
Control Delay (s)	0.1	1.3	9.9	8.9	0.0	0.0
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.1	1.3	9.5		0.0	
Approach LOS			A		A	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰		↱	↰		↱
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	51	19	1	52	5	12	0	21	1	0	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	57	21	1	58	6	13	0	23	1	0	2
Pedestrians								11			6	
Lane Width (ft)								10.0			8.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	69			89			159	165	78	175	173	67
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	69			89			159	165	78	175	173	67
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	100	98	100	100	100
cM capacity (veh/h)	1526			1495			789	715	975	757	708	994

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	86	64	13	23	1	2
Volume Left	8	1	13	0	1	0
Volume Right	21	6	0	23	0	2
cSH	1526	1495	789	975	757	994
Volume to Capacity	0.01	0.00	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	0	0	1	2	0	0
Control Delay (s)	0.7	0.1	9.6	8.8	9.8	8.6
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.7	0.1	9.1		9.0	
Approach LOS			A		A	

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	23.9%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↖		↱	↖		↱
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	95	9	13	57	0	10	0	19	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	106	10	14	63	0	11	0	21	0	0	0
Pedestrians		3			3			22			10	
Lane Width (ft)		15.0			15.0			10.0			8.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	73			138			228	235	136	237	240	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	73			138			228	235	136	237	240	76
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	98	100	100	100
cM capacity (veh/h)	1518			1424			697	645	896	678	641	976

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	116	78	11	21	0	0
Volume Left	0	14	11	0	0	0
Volume Right	10	0	0	21	0	0
cSH	1518	1424	697	896	1700	1700
Volume to Capacity	0.00	0.01	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	0	1	1	2	0	0
Control Delay (s)	0.0	1.5	10.2	9.1	0.0	0.0
Lane LOS		A	B	A	A	A
Approach Delay (s)	0.0	1.5	9.5		0.0	
Approach LOS			A		A	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix D

Background Future Levels of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes					0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.96		1.00	0.99		1.00	1.00	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1971		1593	4530		1652	4731	
Flt Permitted					0.98		0.12	1.00		0.95	1.00	
Satd. Flow (perm)					1971		196	4530		1652	4731	
Volume (vph)	0	0	0	57	39	34	189	1086	52	83	1571	26
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	0	0	63	43	38	210	1207	58	92	1746	29
RTOR Reduction (vph)	0	0	0	0	13	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	131	0	210	1260	0	92	1773	0
Confl. Peds. (#/hr)						19			44			24
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		51.0	51.0		14.0	56.0	
Effective Green, g (s)					21.0		52.0	52.0		15.0	57.0	
Actuated g/C Ratio					0.21		0.52	0.52		0.15	0.57	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					414		242	2356		248	2697	
v/s Ratio Prot							c0.09	0.28		0.06	c0.37	
v/s Ratio Perm					0.07		c0.36					
v/c Ratio					0.32		0.87	0.53		0.37	0.66	
Uniform Delay, d1					33.4		24.4	16.0		38.3	14.8	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					2.0		31.8	0.9		4.2	1.3	
Delay (s)					35.4		56.2	16.8		42.5	16.1	
Level of Service					D		E	B		D	B	
Approach Delay (s)		0.0			35.4			22.4			17.4	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes					0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.99		1.00	1.00	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1753		1593	4520		1486	3123	
Flt Permitted					0.99		0.11	1.00		0.95	1.00	
Satd. Flow (perm)					1753		192	4520		1486	3123	
Volume (vph)	0	0	0	33	85	69	382	1422	71	91	1137	27
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	0	0	37	94	77	424	1580	79	101	1263	30
RTOR Reduction (vph)	0	0	0	0	21	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	187	0	424	1654	0	101	1291	0
Confl. Peds. (#/hr)						29			78			35
Parking (#/hr)				0	0	0				0	0	0
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		58.0	58.0		7.0	42.0	
Effective Green, g (s)					21.0		59.0	59.0		8.0	43.0	
Actuated g/C Ratio					0.21		0.59	0.59		0.08	0.43	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					368		450	2667		119	1343	
v/s Ratio Prot							c0.23	0.37		0.07	c0.41	
v/s Ratio Perm					0.11		0.33					
v/c Ratio					0.51		0.94	0.62		0.85	0.96	
Uniform Delay, d1					34.9		29.3	13.3		45.4	27.7	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					4.9		30.2	1.1		49.2	16.9	
Delay (s)					39.9		59.5	14.3		94.6	44.6	
Level of Service					D		E	B		F	D	
Approach Delay (s)		0.0			39.9			23.5			48.2	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	33.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.8%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes					0.95		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.94		1.00	0.99		1.00	1.00	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1686		1593	4526		1486	3111	
Flt Permitted					0.99		0.20	1.00		0.95	1.00	
Satd. Flow (perm)					1686		329	4526		1486	3111	
Volume (vph)	0	0	0	10	29	32	234	1233	54	78	1131	36
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	0	0	11	32	36	260	1370	60	87	1257	40
RTOR Reduction (vph)	0	0	0	0	28	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	51	0	260	1425	0	87	1295	0
Confl. Peds. (#/hr)						63			82			99
Parking (#/hr)				0	0	0				0	0	0
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		51.0	51.0		14.0	56.0	
Effective Green, g (s)					21.0		52.0	52.0		15.0	57.0	
Actuated g/C Ratio					0.21		0.52	0.52		0.15	0.57	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					354		297	2354		223	1773	
v/s Ratio Prot							c0.09	0.31		0.06	c0.42	
v/s Ratio Perm					0.03		c0.37					
v/c Ratio					0.14		0.88	0.61		0.39	0.73	
Uniform Delay, d1					32.2		24.6	16.8		38.4	15.8	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					0.8		28.3	1.2		5.1	2.7	
Delay (s)					33.0		52.9	18.0		43.4	18.5	
Level of Service					C		D	B		D	B	
Approach Delay (s)		0.0			33.0			23.3			20.1	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	7	96	36	1016	1583	21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	107	40	1129	1759	23
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.87	0.84	0.84			
vC, conflicting volume	2459	628	1812			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1805	186	1591			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	84	88			
cM capacity (veh/h)	52	678	336			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	114	416	753	704	704	375
Volume Left	8	40	0	0	0	0
Volume Right	107	0	0	0	0	23
cSH	374	336	1700	1700	1700	1700
Volume to Capacity	0.31	0.12	0.44	0.41	0.41	0.22
Queue Length 95th (ft)	32	10	0	0	0	0
Control Delay (s)	18.8	4.0	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	18.8	1.4		0.0		
Approach LOS	C					

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	67.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	8	74	49	1398	1180	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	82	54	1553	1311	29
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.88	0.81	0.81			
vC, conflicting volume	1996	700	1370			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1107	392	1221			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	83	88			
cM capacity (veh/h)	153	478	447			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	91	365	621	621	874	466
Volume Left	9	54	0	0	0	0
Volume Right	82	0	0	0	0	29
cSH	396	447	1700	1700	1700	1700
Volume to Capacity	0.23	0.12	0.37	0.37	0.51	0.27
Queue Length 95th (ft)	22	10	0	0	0	0
Control Delay (s)	16.8	3.9	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	16.8	0.9			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	18	110	55	1209	1134	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	20	122	61	1343	1260	29
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.83	0.82	0.82			
vC, conflicting volume	2112	674	1319			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1496	389	1172			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	75	87			
cM capacity (veh/h)	79	489	475			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	142	509	896	840	449
Volume Left	20	61	0	0	0
Volume Right	122	0	0	0	29
cSH	283	475	1700	1700	1700
Volume to Capacity	0.50	0.13	0.53	0.49	0.26
Queue Length 95th (ft)	66	11	0	0	0
Control Delay (s)	29.9	3.8	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	29.9	1.4		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	472	0	1327	1611	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	524	0	1474	1790	18
Pedestrians	122			7		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	10			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2658	735	1930			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2544	0	1572			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	28	100			
cM capacity (veh/h)	15	726	280			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	524	737	737	716	716	376
Volume Left	0	0	0	0	0	0
Volume Right	524	0	0	0	0	18
cSH	726	1700	1700	1700	1700	1700
Volume to Capacity	0.72	0.43	0.43	0.42	0.42	0.22
Queue Length 95th (ft)	156	0	0	0	0	0
Control Delay (s)	21.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	21.8	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	68.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	335	0	1896	1144	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	372	0	2107	1271	29
Pedestrians	131			18		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	11			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2119	587	1431			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1830	0	917			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	48	100			
cM capacity (veh/h)	46	717	496			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	372	702	702	702	508	508	283
Volume Left	0	0	0	0	0	0	0
Volume Right	372	0	0	0	0	0	29
cSH	717	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.52	0.41	0.41	0.41	0.30	0.30	0.17
Queue Length 95th (ft)	76	0	0	0	0	0	0
Control Delay (s)	15.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	15.3	0.0			0.0		
Approach LOS	C						

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	277	0	1520	1127	14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	308	0	1689	1252	16
Pedestrians	38			7		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	3			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	2142	470	1306			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2048	193	1120			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	57	100			
cM capacity (veh/h)	42	708	540			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	308	844	844	501	501	266
Volume Left	0	0	0	0	0	0
Volume Right	308	0	0	0	0	16
cSH	708	1700	1700	1700	1700	1700
Volume to Capacity	0.43	0.50	0.50	0.29	0.29	0.16
Queue Length 95th (ft)	55	0	0	0	0	0
Control Delay (s)	13.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	13.9	0.0		0.0		
Approach LOS	B					

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	236	17	0	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	262	19	0	36
Pedestrians		4			32	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			184			
pX, platoon unblocked	0.94				0.94	0.94
vC, conflicting volume	313				304	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				256	260
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1188				671	712

Direction, Lane #	WB 1	SB 1
Volume Total	281	36
Volume Left	0	0
Volume Right	19	36
cSH	1700	712
Volume to Capacity	0.17	0.05
Queue Length 95th (ft)	0	4
Control Delay (s)	0.0	10.3
Lane LOS		B
Approach Delay (s)	0.0	10.3
Approach LOS		B

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	460	34	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	511	38	0	22
Pedestrians		3			22	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			184			
pX, platoon unblocked	0.86				0.86	0.86
vC, conflicting volume	571				552	555
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	499				477	481
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	898				461	494

Direction, Lane #	WB 1	SB 1
Volume Total	549	22
Volume Left	0	0
Volume Right	38	22
cSH	1700	494
Volume to Capacity	0.32	0.04
Queue Length 95th (ft)	0	4
Control Delay (s)	0.0	12.6
Lane LOS		B
Approach Delay (s)	0.0	12.6
Approach LOS		B

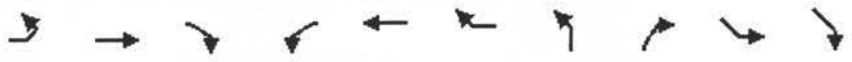
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	269	30	0	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	299	33	0	24
Pedestrians		3			46	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)			184			
pX, platoon unblocked	0.91				0.91	0.91
vC, conflicting volume	378				362	365
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320				302	305
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	1098				611	650

Direction, Lane #	WB 1	SB 1
Volume Total	332	24
Volume Left	0	0
Volume Right	33	24
cSH	1700	650
Volume to Capacity	0.20	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	10.8
Lane LOS		B
Approach Delay (s)	0.0	10.8
Approach LOS		B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	17	0	38	22	0	245	16	0	0	415
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	0	42	24	0	272	18	0	0	461
Pedestrians							50		7	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							6		1	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	758	479	511	571	479	25			18	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	758	479	511	571	479	25			18	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	92	100	92	93	100	74			100	
cM capacity (veh/h)	237	486	531	375	486	1043			1599	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	19	42	24	272	18	461
Volume Left	19	0	24	0	0	0
Volume Right	0	42	0	272	0	0
cSH	237	531	375	1043	1700	1700
Volume to Capacity	0.08	0.08	0.07	0.26	0.01	0.27
Queue Length 95th (ft)	6	6	5	26	0	0
Control Delay (s)	21.5	12.4	15.3	9.7	0.0	0.0
Lane LOS	C	B	C	A		
Approach Delay (s)	15.2		10.1		0.0	0.0
Approach LOS	C		B			

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	51.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	11	0	35	43	0	437	26	0	0	258
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	0	39	48	0	486	29	0	0	287
Pedestrians							16		7	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							2		1	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	808	316	303	370	316	36			29	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	808	316	303	370	316	36			29	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	92	100	95	91	100	53			100	
cM capacity (veh/h)	157	600	724	545	600	1029			1584	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	12	39	48	486	29	287
Volume Left	12	0	48	0	0	0
Volume Right	0	39	0	486	0	0
cSH	157	724	545	1029	1700	1700
Volume to Capacity	0.08	0.05	0.09	0.47	0.02	0.17
Queue Length 95th (ft)	6	4	7	65	0	0
Control Delay (s)	29.9	10.3	12.2	11.6	0.0	0.0
Lane LOS	D	B	B	B		
Approach Delay (s)	15.0		11.6		0.0	0.0
Approach LOS	B		B			

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	3	0	9	42	0	250	14	0	0	268
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	0	10	47	0	278	16	0	0	298
Pedestrians							32		17	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							4		2	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	608	313	330	355	313	33			16	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	608	313	330	355	313	33			16	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	99	100	99	92	100	73			100	
cM capacity (veh/h)	291	602	686	570	602	1021			1602	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	3	10	47	278	16	298
Volume Left	3	0	47	0	0	0
Volume Right	0	10	0	278	0	0
cSH	291	686	570	1021	1700	1700
Volume to Capacity	0.01	0.01	0.08	0.27	0.01	0.18
Queue Length 95th (ft)	1	1	7	28	0	0
Control Delay (s)	17.5	10.3	11.9	9.8	0.0	0.0
Lane LOS	C	B	B	A		
Approach Delay (s)	12.1		10.1		0.0	0.0
Approach LOS	B		B			

Intersection Summary			
Average Delay	5.3		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖		↗	↖		↗
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	97	22	9	50	3	11	0	6	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	108	24	10	56	3	12	0	7	0	0	0
Pedestrians								10			14	
Lane Width (ft)								10.0			8.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	73			142			209	225	130	220	236	71
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	73			142			209	225	130	220	236	71
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	99	100	100	100
cM capacity (veh/h)	1515			1431			730	659	913	713	650	983

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	133	69	12	7	0	0
Volume Left	1	10	12	0	0	0
Volume Right	24	3	0	7	0	0
cSH	1515	1431	730	913	1700	1700
Volume to Capacity	0.00	0.01	0.02	0.01	0.00	0.00
Queue Length 95th (ft)	0	1	1	1	0	0
Control Delay (s)	0.1	1.1	10.0	9.0	0.0	0.0
Lane LOS	A	A	B	A	A	A
Approach Delay (s)	0.1	1.1	9.6		0.0	
Approach LOS			A		A	

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	20.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖		↗	↖		↗
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	60	19	1	68	5	12	0	21	1	0	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	67	21	1	76	6	13	0	23	1	0	2
Pedestrians								11			6	
Lane Width (ft)								10.0			8.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	87			99			187	193	88	203	201	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	87			99			187	193	88	203	201	84
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 %	99			100			98	100	98	100	100	100
cM capacity (veh/h)	1504			1483			757	690	963	725	683	972

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	96	82	13	23	1	2
Volume Left	8	1	13	0	1	0
Volume Right	21	6	0	23	0	2
cSH	1504	1483	757	963	725	972
Volume to Capacity	0.01	0.00	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	0	0	1	2	0	0
Control Delay (s)	0.6	0.1	9.8	8.8	10.0	8.7
Lane LOS	A	A	A	A	A	A
Approach Delay (s)	0.6	0.1	9.2		9.1	
Approach LOS			A		A	

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰		↱	↰		↱
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	109	9	13	67	0	10	0	19	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	121	10	14	74	0	11	0	21	0	0	0
Pedestrians		3			3			22			10	
Lane Width (ft)		15.0			15.0			10.0			8.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	84			153			254	261	151	264	266	87
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	84			153			254	261	151	264	266	87
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	98	100	100	100
cM capacity (veh/h)	1504			1406			670	624	879	651	620	963

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	131	89	11	21	0	0
Volume Left	0	14	11	0	0	0
Volume Right	10	0	0	21	0	0
cSH	1504	1406	670	879	1700	1700
Volume to Capacity	0.00	0.01	0.02	0.02	0.00	0.00
Queue Length 95th (ft)	0	1	1	2	0	0
Control Delay (s)	0.0	1.3	10.5	9.2	0.0	0.0
Lane LOS		A	B	A	A	A
Approach Delay (s)	0.0	1.3	9.6		0.0	
Approach LOS			A		A	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E

Total Future Levels of Service

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.91	
Frpb, ped/bikes					0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.96		1.00	0.99		1.00	1.00	
Flt Protected					0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1971		1593	4530		1652	4730	
Flt Permitted					0.98		0.12	1.00		0.95	1.00	
Satd. Flow (perm)					1971		196	4530		1652	4730	
Volume (vph)	0	0	0	57	39	34	190	1088	52	83	1572	27
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	0	0	63	43	38	211	1209	58	92	1747	30
RTOR Reduction (vph)	0	0	0	0	13	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	131	0	211	1262	0	92	1775	0
Confl. Peds. (#/hr)						19			44			24
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		51.0	51.0		14.0	56.0	
Effective Green, g (s)					21.0		52.0	52.0		15.0	57.0	
Actuated g/C Ratio					0.21		0.52	0.52		0.15	0.57	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					414		242	2356		248	2696	
v/s Ratio Prot							c0.09	0.28		0.06	c0.38	
v/s Ratio Perm					0.07		c0.37					
v/c Ratio					0.32		0.87	0.54		0.37	0.66	
Uniform Delay, d1					33.4		24.4	16.0		38.3	14.8	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					2.0		32.4	0.9		4.2	1.3	
Delay (s)					35.4		56.8	16.8		42.5	16.1	
Level of Service					D		E	B		D	B	
Approach Delay (s)		0.0			35.4			22.5			17.4	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes					0.98		1.00	0.99		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.95		1.00	0.99		1.00	1.00	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1753		1593	4520		1486	3118	
Flt Permitted					0.99		0.11	1.00		0.95	1.00	
Satd. Flow (perm)					1753		192	4520		1486	3118	
Volume (vph)	0	0	0	33	85	69	391	1425	71	91	1142	36
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	0	0	37	94	77	434	1583	79	101	1269	40
RTOR Reduction (vph)	0	0	0	0	21	0	0	5	0	0	2	0
Lane Group Flow (vph)	0	0	0	0	187	0	434	1657	0	101	1307	0
Confl. Peds. (#/hr)						29			78			35
Parking (#/hr)				0	0	0				0	0	0
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		58.0	58.0		7.0	42.0	
Effective Green, g (s)					21.0		59.0	59.0		8.0	43.0	
Actuated g/C Ratio					0.21		0.59	0.59		0.08	0.43	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					368		450	2667		119	1341	
v/s Ratio Prot							c0.23	0.37		0.07	c0.42	
v/s Ratio Perm					0.11		0.34					
v/c Ratio					0.51		0.96	0.62		0.85	0.97	
Uniform Delay, d1					34.9		29.9	13.3		45.4	28.0	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					4.9		34.4	1.1		49.2	19.2	
Delay (s)					39.9		64.3	14.4		94.6	47.1	
Level of Service					D		E	B		F	D	
Approach Delay (s)		0.0			39.9			24.7			50.5	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	35.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.3%	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												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	16	16	16	9	9	9	10	10	10
Total Lost time (s)					4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor					1.00		1.00	0.91		1.00	0.95	
Frpb, ped/bikes					0.95		1.00	1.00		1.00	1.00	
Flpb, ped/bikes					1.00		1.00	1.00		1.00	1.00	
Frt					0.94		1.00	0.99		1.00	0.99	
Flt Protected					0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)					1686		1593	4526		1486	3106	
Flt Permitted					0.99		0.19	1.00		0.95	1.00	
Satd. Flow (perm)					1686		319	4526		1486	3106	
Volume (vph)	0	0	0	10	29	32	239	1241	54	78	1139	42
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	0	0	11	32	36	266	1379	60	87	1266	47
RTOR Reduction (vph)	0	0	0	0	28	0	0	5	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	51	0	266	1434	0	87	1310	0
Confl. Peds. (#/hr)						63			82			99
Parking (#/hr)				0	0	0				0	0	0
Turn Type				Perm			pm+pt			Prot		
Protected Phases					8		5	2		1	6	
Permitted Phases				8			2					
Actuated Green, G (s)					20.0		51.0	51.0		14.0	56.0	
Effective Green, g (s)					21.0		52.0	52.0		15.0	57.0	
Actuated g/C Ratio					0.21		0.52	0.52		0.15	0.57	
Clearance Time (s)					5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)					354		293	2354		223	1770	
v/s Ratio Prot							c0.09	0.32		0.06	c0.42	
v/s Ratio Perm					0.03		c0.38					
v/c Ratio					0.14		0.91	0.61		0.39	0.74	
Uniform Delay, d1					32.2		25.1	16.9		38.4	16.0	
Progression Factor					1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2					0.8		33.5	1.2		5.1	2.8	
Delay (s)					33.0		58.6	18.0		43.4	18.8	
Level of Service					C		E	B		D	B	
Approach Delay (s)		0.0			33.0			24.4			20.4	
Approach LOS		A			C			C			C	

Intersection Summary			
HCM Average Control Delay	22.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	8	95	37	1016	1585	21
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	106	41	1129	1761	23
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.87	0.84	0.84			
vC, conflicting volume	2463	629	1814			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1810	186	1593			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	83	84	88			
cM capacity (veh/h)	52	677	335			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	114	417	753	704	704	376
Volume Left	9	41	0	0	0	0
Volume Right	106	0	0	0	0	23
cSH	349	335	1700	1700	1700	1700
Volume to Capacity	0.33	0.12	0.44	0.41	0.41	0.22
Queue Length 95th (ft)	35	10	0	0	0	0
Control Delay (s)	20.3	4.1	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	20.3	1.5		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	77	52	1398	1189	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	10	86	58	1553	1321	29
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.88	0.81	0.81			
vC, conflicting volume	2013	705	1380			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1124	398	1233			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	82	87			
cM capacity (veh/h)	148	474	442			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	96	368	621	621	881	469
Volume Left	10	58	0	0	0	0
Volume Right	86	0	0	0	0	29
cSH	385	442	1700	1700	1700	1700
Volume to Capacity	0.25	0.13	0.37	0.37	0.52	0.28
Queue Length 95th (ft)	24	11	0	0	0	0
Control Delay (s)	17.4	4.2	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.4	1.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	19	113	62	1210	1142	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	21	126	69	1344	1269	29
Pedestrians	30				14	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	4.0				4.0	
Percent Blockage	3				1	
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				446	433	
pX, platoon unblocked	0.83	0.82	0.82			
vC, conflicting volume	2137	679	1328			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1523	394	1183			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	74	85			
cM capacity (veh/h)	74	485	470			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	147	517	896	846	452
Volume Left	21	69	0	0	0
Volume Right	126	0	0	0	29
cSH	270	470	1700	1700	1700
Volume to Capacity	0.54	0.15	0.53	0.50	0.27
Queue Length 95th (ft)	75	13	0	0	0
Control Delay (s)	33.1	4.3	0.0	0.0	0.0
Lane LOS	D	A			
Approach Delay (s)	33.1	1.6		0.0	
Approach LOS	D				

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	478	0	1330	1612	16
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	531	0	1478	1791	18
Pedestrians	122			7		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	10			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.75	0.75	0.75			
vC, conflicting volume	2661	735	1931			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2547	0	1572			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	27	100			
cM capacity (veh/h)	15	725	279			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	531	739	739	716	716	376
Volume Left	0	0	0	0	0	0
Volume Right	531	0	0	0	0	18
cSH	725	1700	1700	1700	1700	1700
Volume to Capacity	0.73	0.43	0.43	0.42	0.42	0.22
Queue Length 95th (ft)	162	0	0	0	0	0
Control Delay (s)	22.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	22.3	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	340	0	1908	1149	26
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	378	0	2120	1277	29
Pedestrians	131			18		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	11			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked	0.78	0.78	0.78			
vC, conflicting volume	2129	589	1437			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1878	0	986			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	49	100			
cM capacity (veh/h)	44	739	482			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	378	707	707	707	511	511	284
Volume Left	0	0	0	0	0	0	0
Volume Right	378	0	0	0	0	0	29
cSH	739	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.51	0.42	0.42	0.42	0.30	0.30	0.17
Queue Length 95th (ft)	74	0	0	0	0	0	0
Control Delay (s)	14.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	14.9	0.0			0.0		
Approach LOS	B						

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	282	0	1534	1135	14
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	313	0	1704	1261	16
Pedestrians	38			7		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	3			1		
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked						
vC, conflicting volume	2159	473	1315			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2159	473	1315			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	39	100			
cM capacity (veh/h)	39	517	505			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	313	852	852	504	504	268
Volume Left	0	0	0	0	0	0
Volume Right	313	0	0	0	0	16
cSH	517	1700	1700	1700	1700	1700
Volume to Capacity	0.61	0.50	0.50	0.30	0.30	0.16
Queue Length 95th (ft)	100	0	0	0	0	0
Control Delay (s)	22.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	22.1	0.0		0.0		
Approach LOS	C					

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	54.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	246	18	0	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	273	20	0	36
Pedestrians		4			32	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	325				315	319
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	325				315	319
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	95
cM capacity (veh/h)	1207				663	705

Direction, Lane #	WB 1	SB 1
Volume Total	293	36
Volume Left	0	0
Volume Right	20	36
cSH	1700	705
Volume to Capacity	0.17	0.05
Queue Length 95th (ft)	0	4
Control Delay (s)	0.0	10.4
Lane LOS		B
Approach Delay (s)	0.0	10.4
Approach LOS		B

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	25.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	468	34	0	20
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	520	38	0	22
Pedestrians		3			22	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			2	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	580				561	564
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	580				561	564
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	979				481	517

Direction, Lane #	WB 1	SB 1
Volume Total	558	22
Volume Left	0	0
Volume Right	38	22
cSH	1700	517
Volume to Capacity	0.33	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	12.3
Lane LOS		B
Approach Delay (s)	0.0	12.3
Approach LOS		B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	0	279	30	0	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	310	33	0	24
Pedestrians		3			46	
Lane Width (ft)		0.0			10.0	
Walking Speed (ft/s)		4.0			4.0	
Percent Blockage		0			3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	389				373	376
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	389				373	376
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	96
cM capacity (veh/h)	1132				608	649

Direction, Lane #	WB 1	SB 1
Volume Total	343	24
Volume Left	0	0
Volume Right	33	24
cSH	1700	649
Volume to Capacity	0.20	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	10.8
Lane LOS		B
Approach Delay (s)	0.0	10.8
Approach LOS		B

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	27.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	17	0	38	28	0	250	16	0	0	415
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	19	0	42	31	0	278	18	0	0	461
Pedestrians							50		7	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							6		1	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	764	479	511	571	479	25			18	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	764	479	511	571	479	25			18	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	92	100	92	92	100	73			100	
cM capacity (veh/h)	233	486	531	375	486	1043			1599	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	19	42	31	278	18	461
Volume Left	19	0	31	0	0	0
Volume Right	0	42	0	278	0	0
cSH	233	531	375	1043	1700	1700
Volume to Capacity	0.08	0.08	0.08	0.27	0.01	0.27
Queue Length 95th (ft)	7	6	7	27	0	0
Control Delay (s)	21.8	12.4	15.5	9.7	0.0	0.0
Lane LOS	C	B	C	A		
Approach Delay (s)	15.3		10.3		0.0	0.0
Approach LOS	C		B			

Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	51.0%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	11	0	35	48	0	441	26	0	0	258
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	0	39	53	0	490	29	0	0	287
Pedestrians							16		7	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							2		1	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	813	316	303	370	316	36			29	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	813	316	303	370	316	36			29	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	92	100	95	90	100	52			100	
cM capacity (veh/h)	154	600	724	545	600	1029			1584	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	12	39	53	490	29	287
Volume Left	12	0	53	0	0	0
Volume Right	0	39	0	490	0	0
cSH	154	724	545	1029	1700	1700
Volume to Capacity	0.08	0.05	0.10	0.48	0.02	0.17
Queue Length 95th (ft)	6	4	8	66	0	0
Control Delay (s)	30.3	10.3	12.3	11.6	0.0	0.0
Lane LOS	D	B	B	B		
Approach Delay (s)	15.0		11.7		0.0	0.0
Approach LOS	C		B			

Intersection Summary			
Average Delay	7.8		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SEL	SER
Lane Configurations										
Sign Control		Stop			Stop		Free		Free	
Grade		0%			0%		0%		0%	
Volume (veh/h)	3	0	9	47	0	255	14	0	0	268
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	0	10	52	0	283	16	0	0	298
Pedestrians							32		17	
Lane Width (ft)							16.0		16.0	
Walking Speed (ft/s)							4.0		4.0	
Percent Blockage							4		2	
Right turn flare (veh)										
Median type		None			None					
Median storage veh)										
Upstream signal (ft)										
pX, platoon unblocked										
vC, conflicting volume	614	313	330	355	313	33			16	
vC1, stage 1 conf vol										
vC2, stage 2 conf vol										
vCu, unblocked vol	614	313	330	355	313	33			16	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2			4.1	
tC, 2 stage (s)										
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3			2.2	
p0 queue free %	99	100	99	91	100	72			100	
cM capacity (veh/h)	287	602	686	570	602	1021			1602	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SE 1
Volume Total	3	10	52	283	16	298
Volume Left	3	0	52	0	0	0
Volume Right	0	10	0	283	0	0
cSH	287	686	570	1021	1700	1700
Volume to Capacity	0.01	0.01	0.09	0.28	0.01	0.18
Queue Length 95th (ft)	1	1	8	28	0	0
Control Delay (s)	17.7	10.3	12.0	9.9	0.0	0.0
Lane LOS	C	B	B	A		
Approach Delay (s)	12.2		10.2		0.0	0.0
Approach LOS	B		B			

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↖		↗	↖		↗
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	97	22	9	51	3	11	0	7	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	1	108	24	10	57	3	12	0	8	0	0	0
Pedestrians								10			14	
Lane Width (ft)								10.0			8.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	74			142			211	226	130	222	237	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	74			142			211	226	130	222	237	72
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	99	100	100	100
cM capacity (veh/h)	1514			1431			729	658	913	709	649	982

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	133	70	12	8	0	0
Volume Left	1	10	12	0	0	0
Volume Right	24	3	0	8	0	0
cSH	1514	1431	729	913	1700	1700
Volume to Capacity	0.00	0.01	0.02	0.01	0.00	0.00
Queue Length 95th (ft)	0	1	1	1	0	0
Control Delay (s)	0.1	1.1	10.0	9.0	0.0	0.0
Lane LOS	A	A	B	A	A	A
Approach Delay (s)	0.1	1.1	9.6		0.0	
Approach LOS			A		A	

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	20.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰		↱	↰		↱
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	7	63	19	1	71	5	12	0	22	1	0	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	8	70	21	1	79	6	13	0	24	1	0	2
Pedestrians								11			6	
Lane Width (ft)								10.0			8.0	
Walking Speed (ft/s)								4.0			4.0	
Percent Blockage								1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	90			102			193	200	92	210	208	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	90			102			193	200	92	210	208	88
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 %	99			100			98	100	97	100	100	100
cM capacity (veh/h)	1500			1479			749	684	958	716	678	967

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	99	86	13	24	1	2
Volume Left	8	1	13	0	1	0
Volume Right	21	6	0	24	0	2
cSH	1500	1479	749	958	716	967
Volume to Capacity	0.01	0.00	0.02	0.03	0.00	0.00
Queue Length 95th (ft)	0	0	1	2	0	0
Control Delay (s)	0.6	0.1	9.9	8.9	10.0	8.7
Lane LOS	A	A	A	A	B	A
Approach Delay (s)	0.6	0.1	9.2		9.2	
Approach LOS			A		A	

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	24.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰		↱	↰		↱
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	112	9	13	72	0	10	0	20	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	124	10	14	80	0	11	0	22	0	0	0
Pedestrians		3			3			22			10	
Lane Width (ft)		15.0			15.0			10.0			8.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			0			2			1	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	90			156			263	270	154	274	275	93
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	90			156			263	270	154	274	275	93
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			98	100	97	100	100	100
cM capacity (veh/h)	1497			1402			661	616	875	640	613	956

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	134	94	11	22	0	0
Volume Left	0	14	11	0	0	0
Volume Right	10	0	0	22	0	0
cSH	1497	1402	661	875	1700	1700
Volume to Capacity	0.00	0.01	0.02	0.03	0.00	0.00
Queue Length 95th (ft)	0	1	1	2	0	0
Control Delay (s)	0.0	1.2	10.5	9.2	0.0	0.0
Lane LOS		A	B	A	A	A
Approach Delay (s)	0.0	1.2	9.7		0.0	
Approach LOS			A		A	

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	0	254	2	0	12
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	282	2	0	13

Direction, Lane #	WB 1	SB 1
Volume Total (vph)	284	13
Volume Left (vph)	0	0
Volume Right (vph)	2	13
Hadj (s)	0.03	-0.57
Departure Headway (s)	4.0	3.9
Degree Utilization, x	0.31	0.01
Capacity (veh/h)	902	845
Control Delay (s)	8.7	7.0
Approach Delay (s)	8.7	7.0
Approach LOS	A	A

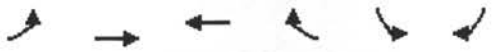
Intersection Summary			
Delay	8.7		
HCM Level of Service	A		
Intersection Capacity Utilization	23.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	0	503	17	0	8
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	559	19	0	9

Direction, Lane #	WB 1	SB 1
Volume Total (vph)	578	9
Volume Left (vph)	0	0
Volume Right (vph)	19	9
Hadj (s)	0.01	-0.57
Departure Headway (s)	3.9	4.6
Degree Utilization, x	0.63	0.01
Capacity (veh/h)	909	698
Control Delay (s)	13.4	7.6
Approach Delay (s)	13.4	7.6
Approach LOS	B	A

Intersection Summary			
Delay	13.3		
HCM Level of Service	B		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	0	0	304	9	0	9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	0	338	10	0	10

Direction, Lane #	WB 1	SB 1
Volume Total (vph)	348	10
Volume Left (vph)	0	0
Volume Right (vph)	10	10
Hadj (s)	0.02	-0.57
Departure Headway (s)	3.9	4.1
Degree Utilization, x	0.38	0.01
Capacity (veh/h)	907	808
Control Delay (s)	9.3	7.1
Approach Delay (s)	9.3	7.1
Approach LOS	A	A

Intersection Summary			
Delay	9.3		
HCM Level of Service	A		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		