PALMER SUBDIVISION
Knox County

TRAFFIC IMPACT STUDY

Prepared for :
Hardin Valley Partners

CDM Smith

October 2015
Revised April 2017

HARDIN VALLEY PROPERTIES

Knox County, Tennessee

TRAFFIC IMPACT STUDY

Prepared for

Hardin Valley Land Partners
10784 Hardin Valley Road
Knoxville, TN 37932

October 2015
Revised
April 2017

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Project No. 110997

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INTRODUCTION

This study was commissioned to address the impact and access of a proposed mixed use development in Knox County, Tennessee. The study required the collection of traffic data, generation of anticipated traffic volumes from the proposed site and development of projected traffic volumes from normal growth and from the development site. Analysis of the resulting traffic projections was conducted to determine the capacity and levels of service for the proposed site access. This study will develop measures necessary to mitigate traffic impacts including improved roadway geometrics and traffic control devices within the environs of the proposed development. The study scope addresses the proposed development access to the adjacent roadway facility and the adjacent intersections with Hardin Valley Road.

Site Description

The proposed development is approximately 31.75 acres with 4.86 acres fronting Hardin Valley Road assumed highway commercial including fast-food and bank uses. The remaining parcels will assume office. Given the limiting site topography an office density of 30,000 square feet of space was assumed. Current zoning of the study property is planned commercial. The assumed restaurants and a bank would access the adjacent highway directly and to a proposed street on the western boundary accessing the rear properties and shared with an adjacent planned Southeast Bank. The office development is assumed for the rear parcels. **Figure 1** illustrates the concept site plan for the development.

Site Location

The location of the site is in Knox County, south of Hardin Valley Road and west of its interchange with Pellissippi Parkway (SR-162). The site is located northwest of the Knoxville central business district (CBD). **Figure 2** is a vicinity map illustrating the site relative to local and regional access.

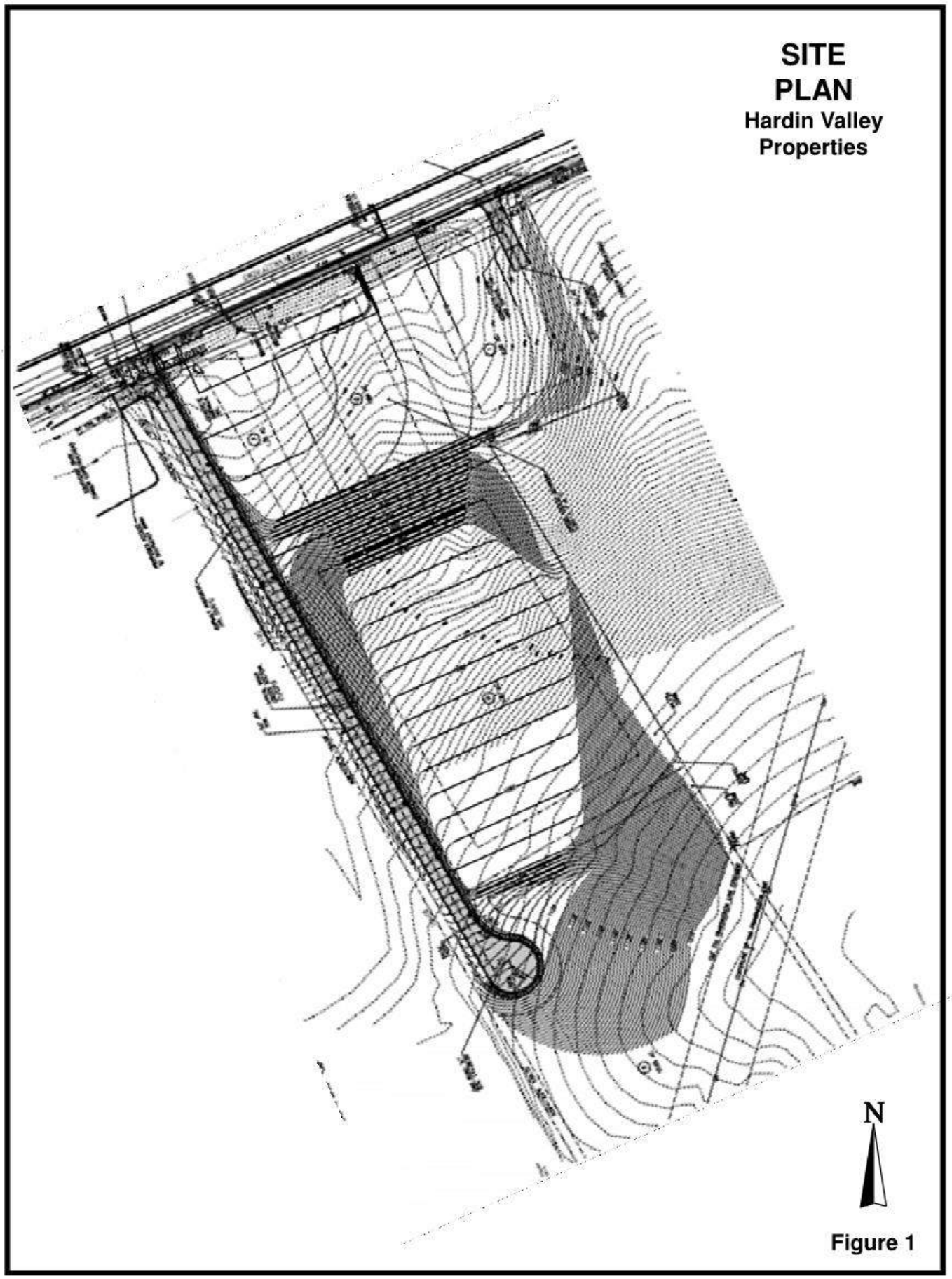
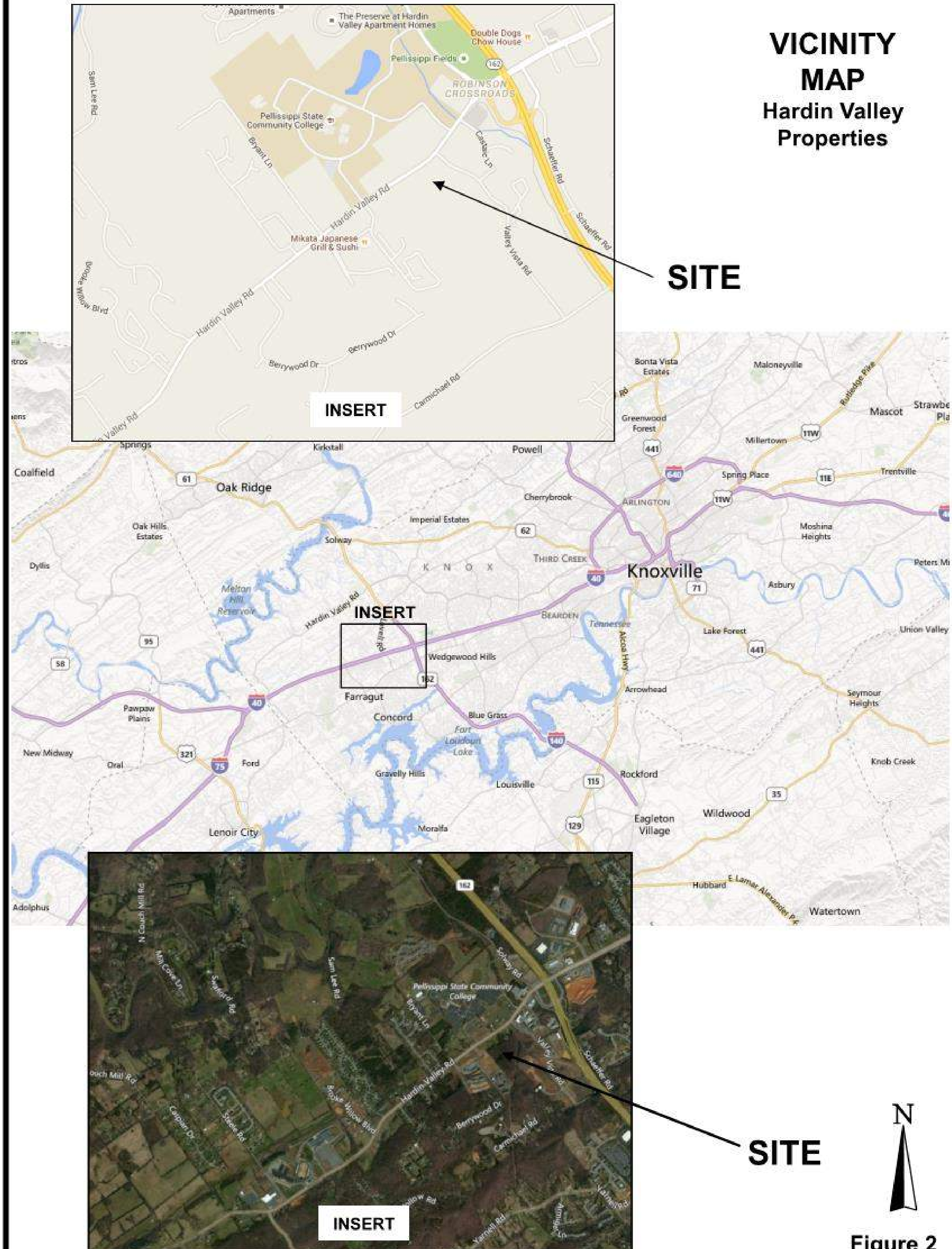


Figure 1

VICINITY MAP
Hardin Valley Properties



LOCAL AND REGIONAL ACCESS

The proposed development will add trips to both the local and regional facilities. Intersections between these facilities will be evaluated to determine the development's impact upon them. A brief description of these facilities is provided in this section.

Local Access

Access to the site is from two driveways; the westernmost driveway would be a shared access with an adjacent parcel. An access street intersecting Hardin Valley Road would also be developed for the office use. The 2014 average daily traffic (ADT) on Hardin Valley Road is approximately 17,440 west of Pellissippi Parkway. Hardin Valley Road is an east-west 3-lane arterial adjacent to the site and to the west becoming Hickory Creek Road, To the east, Hardin Valley Road becomes a 4-lane divided arterial highway through the Pellissippi Parkway extending to Middlebrook Pike east of Ball Camp Byington Road at Lovell Road (S.R. 131).

Regional Access

Ball Camp Byington Road (S.R. 131), to the north, intersects Byington Solway Road, which to the east, intersects Byington Beaver Ridge Road which extends north to Oak Ridge Highway (SR 62), an east-west state highway from Knoxville to Oak Ridge. From Middlebrook Pike, State Route 131 continues to Kingston Pike as Lovell Road intersecting Pellissippi Parkway (S.R. 162) and Interstate 40/75. Ball Camp Byington Road has a 2014 ADT of approximately 11,220.

Plans exist for the connection of Karns Valley Drive north and south of Oak Ridge Highway, providing an improved connection from Hardin Valley Road via Westcott Boulevard north to West Emory Road, intersecting Oak Ridge Highway. Westcott Boulevard intersects Hardin Valley Road to the east of the site and is signalized.

Emory Road (S.R. 131) is the extension of the State's secondary facility to the northeast intersecting Clinton Highway (U.S. 25W), Interstate 75 North, Norris Freeway (U.S. 441), Maynardville Pike (S.R. 33), and Tazewell Pike (S.R. 331). Emory Road extends to Washington Pike, which connects to State Highway 61 to the east. This east and west facility provides many connections to the north.

North of the site, Oak Ridge Highway (S.R. 62) is a two-lane primary state route extending east to Knoxville with an interchange at Interstate 640 and west to Pellissippi Parkway (S.R. 162),

which extends into Oak Ridge. The 2014 average daily traffic (ADT) on Oak Ridge Highway is 15,870 to the east and 11,680 to the west near the Anderson county line.

Pellissippi Parkway (S.R. 162) is a 4-lane divided expressway with an ADT of 44,780 extending north to Oak Ridge Highway and south of Hardin Valley Road with an ADT of 59,110 becoming I-140 with an interchange with Interstate 40/75. To the south, S.R. 131 also intersects Pellissippi Parkway (S.R. 162). Interstates 40 and 75 provide regional access throughout Tennessee, I-40 extends east and west from Memphis to Asheville, North Carolina, and I-75 extending north and south connects Lexington, Kentucky and Chattanooga Tennessee through Knoxville. South of the site on I-40/75, east of Pellissippi Parkway, the 2014 ADT is 161,240.

EXISITING TRAFFIC CONDITIONS

Existing Traffic Volumes, Intersection Geometry, and Control

The posted speed limit for Hardin Valley Road is 40mph adjacent to the site. The study intersections are Hardin Valley Road at the site's proposed access and the Pellissippi Parkway interchange. In the site vicinity, Hardin Valley Road is signalized at the Pellissippi interchange, and Knox County currently plans a traffic signal for the Greenland Way intersection. Other intersecting streets are STOP controlled.

Turning movement counts (TMC) were conducted for the intersections of Hardin Valley Road at Greenland Way and Valley Vista Road in January 2016. Peak hours for Valley Vista Road were found to be 7:30-8:30AM and 5:00-6:00PM. For Greenland Way, the peak hours were found to be7:45-8:45AM and 3:15-4:15PM. Theses counts were compared to 2013 turning movement data collected for Valley Vista Road in January, which determined a reduction during the AM peak hour and a minimal increase during the PM peak hour. The increase was 4.3-percent. Because of inclement weather, turning movement counts for the Pellissippi Parkway interchange from May 2014 were used for this study but increased by 5.1-percent for 2016 reflecting the growth rate consistent with this study and further discussed later in this report. **Figure 3** illustrates the 2016 peak-hour traffic volumes.

Existing Capacity and Level of Service

In order to evaluate the current operations of the traffic control devices, capacity and level of service were calculated using the **2010 Highway Capacity Manual, Special Report 209** published by the Transportation Research Board (TRB). Signalized and unsignalized intersections are evaluated based on estimated intersection delays, which may be related to level of service (LOS).

Level of service and capacity are the measurements of an intersection's ability to accommodate traffic volumes. Levels of service for intersections range from A to F. LOS A is the best, and LOS F is failing. For signalized intersections, a LOS of A has an average estimated intersection delay of less than 10 seconds, and LOS F has an estimated delay of greater than 80 seconds. A LOS of C and D are typical design values. Within urban areas, a LOS D, delay between 35 and 55 seconds, is considered acceptable by the Institute of Transportation Engineers (ITE) for signalized intersections.

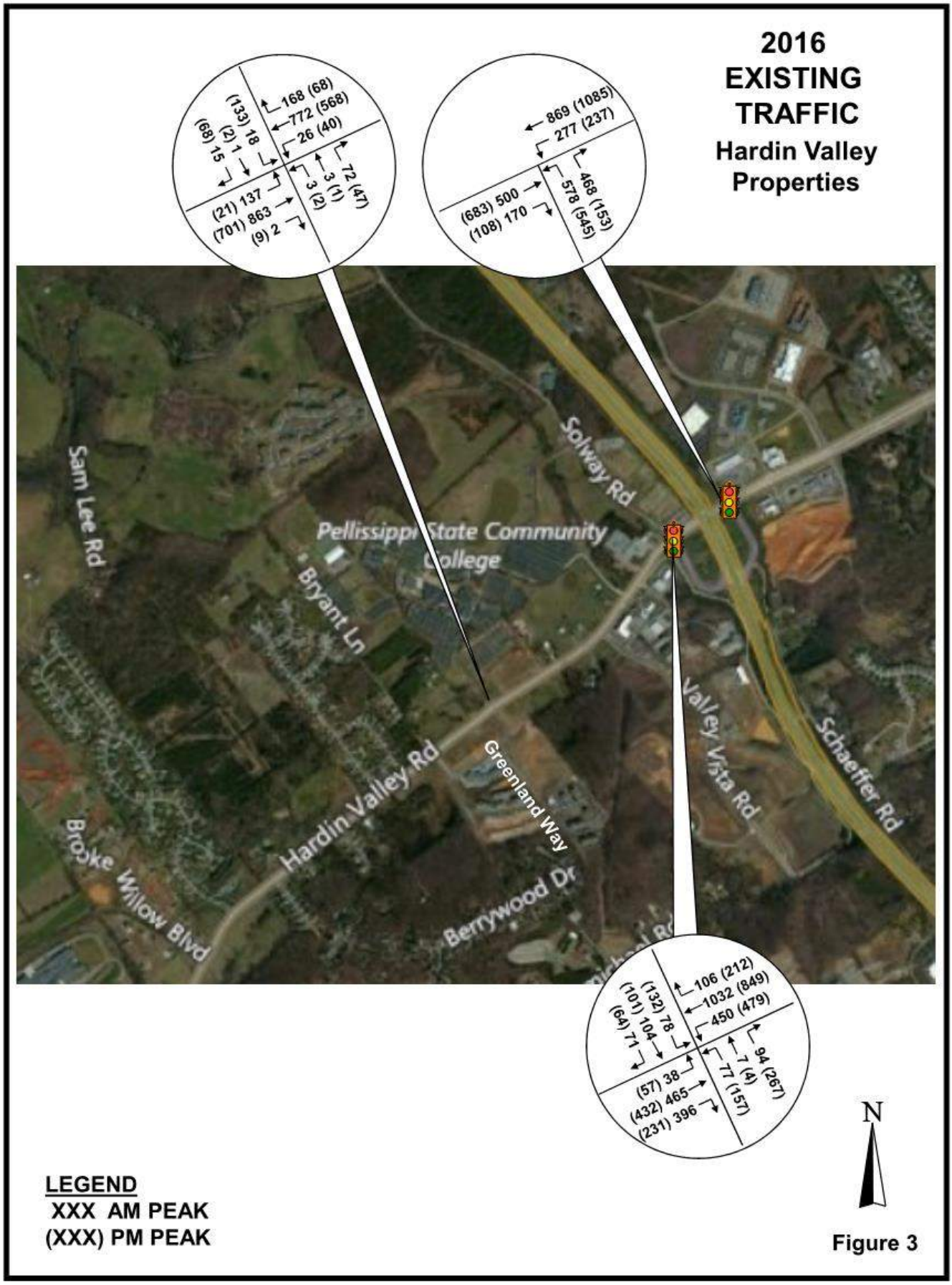

2016
EXISTING
TRAFFIC
Hardin Valley
Properties
(133) 18
(2) 1
(68) 15
168 (68)
772 (568)
26 (40)
(21) 137
(701) 863
(9) 2
3 (1)
3 (2)
72 (47)
869 (1085)
277 (237)
(683) 500
(108) 170
578 (545)
468 (153)
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
Hardin Valley Rd
Greenland Way
Valley Vista Rd
Schaeffer Rd
Brooke Willow Blvd
Berrywood Dr
(101) 104
(64) 71
(132) 78
106 (212)
1032 (849)
450 (479)
(57) 38
(432) 465
(231) 396
77 (157)
7 (4)
94 (267)
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 3

Unsignalized intersection levels of service have lower thresholds of delays. A LOS of F exceeds estimated delays of 50 seconds. For urban arterials, minor approaches may frequently experience levels of service E. A full level of service description for unsignalized and signalized intersections is presented in **Tables 1 and 2**, respectively. Analyses of existing conditions are conducted using the Synchro Version 9 software, developed by Trafficware. **Table 3** presents the analyses conducted for the study intersections.

Table 1
LEVEL-OF-SERVICE (LOS) DESCRIPTION
FOR TWO-WAY STOP INTERSECTIONS

Level of Service	Average Control Delay per Vehicle (seconds)
A	≤ 10.0
B	> 10.0 and ≤ 15.0
C	> 15.0 and ≤ 25.0
D	> 25.0 and ≤ 35.0
E	> 35.0 and ≤ 50.0
F	> 50.0

SOURCE: Highway Capacity Manual, TRB Special Report 209

Table 2
LEVEL-OF-SERVICE (LOS) DESCRIPTION
FOR SIGNALIZED INTERSECTIONS

LOS	Average Control Delay per Vehicle (seconds)	Description
A	≤ 10.0	Very low delay with extremely favorable progression. Most vehicles don't stop.
B	> 10.0 and ≤ 20.0	Generally good progression. Increase number of stops from that described for LOS "A" resulting in higher delays
C	> 20.0 and ≤ 35.0	Fair progression with increased delay. Number of stopping vehicles become significant; however, many still pass through the intersection without stopping. Stable flow.
D	> 35.0 and ≤ 55.0	The influence of congestion becomes more noticeable. Longer delays resulting from unfavorable progression, longer cycles, or high V/C ratios. Approaching unstable flow.
E	> 55.0 and ≤ 80.0	Limit of acceptable delay. Long delays associated with poor progression, long cycles, or high V/C ratios.
F	> 80.0	Unacceptable operation resulting from oversaturation (flow rates exceed capacity). Poor progression, long cycles, and high V/C ratios.

SOURCE: Highway Capacity Manual, TRB Special Report 209

Table 3
2016 Capacity and Level of Service

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	V/C	DELAY	LOS
Hardin Valley Road & Pellissippi Pkwy NB Ramp	**SIGNAL**	**AM**	**1.12**	**35.0**	**D**
		PM	**0.82**	**26.0**	**C**
Hardin Valley Road & Pellissippi Pkwy SB Ramp	**SIGNAL**	**AM**	**0.96**	**34.4**	**C**
		PM	**0.92**	**36.9**	**D**
Hardin Valley Road & Greenland Way	**STOP SBL/NBR**	**AM**	**0.64 / 0.05**	**80.3 / 47.5**	**F / E**
		PM	**1.39 / 0.20**	**263.4 / 19.2**	**F / C**
NEW SIGNAL (Under Construction)	*SIGNAL*	*AM*	*0.67*	*8.6*	*A*
		PM	*0.77*	*18.3*	*B*

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approaches.

Analyses determined that the existing signalized traffic conditions are acceptable with a minimum LOS D. However, the intersection capacity ratios (Volume to Capacity, V/C ratio) for the Pellissippi Parkway interchange are greater than 0.90 during the AM peak hour suggesting unstable conditions. Minimal variations in the traffic volumes may significantly increase delays and impact the current levels of service. Adjustments to the Synchro models were made to reflect the inefficient and adverse lane distribution and adverse queues experienced with the Pellissippi Parkway interchange. The traffic queues are extensive and lane distributions are much less than ideal with the westbound left-turn movement to southbound Pellissippi Parkway spilling over to the adjacent thru lane. The traffic volume for the westbound Hardin Valley Road to southbound Pellissippi Parkway movement exceeds 400 vehicles during the peak hours and exceeds the available storage. This movement requires double left-turn lanes with adequate storage to facilitate a more efficient operation minimizing traffic queues currently experienced. Queues for the interchange are illustrated using SimTraffic and can be found in the Appendix of the report.

The 2014 ADT of 17,440 for Hardin Valley Road is approaching the capacity of a 3-lane section with lane volume densities making accessibility difficult.

BACKGROUND TRAFFIC CONDITIONS

Future traffic conditions or background conditions are the anticipated conditions regardless of the proposed development and is the study baseline. Traffic through the study area should continue to grow as the region develops.

Background Traffic Volumes

The count history available through the TDOT count station located on S.R. 131 south of the site suggests a 1.5-percent annual growth rate between 2002 and 2013. Studies in the vicinity of this site have utilized a 2-percent growth rate. Hardin Valley Road has seen much more growth. Therefore, for study purposes, an annual compounded growth rate of 2.5-percent was assumed.

The completion of the site development is assumed for 2020. Actual buildout of the development will depend on economic and market conditions, but 2020 should be acceptable for this study. Using the horizon years of 2020, the growth rate for the project vicinity, background traffic may be estimated for the transportation system. An annual compounded growth rate of 2.5-percent results in a growth factor of 1.104 for 2020, illustrated in **Figure 4A**. In addition to the growth rate utilized, several planned developments were included in the background traffic projections including the following sites:

1. FedEx Distribution Center (Base data used for this study)
2. Butler Farm Industrial Park
3. Zaxby's Restaurant (Immediately adjacent to the site, east)
4. Bank Development (Immediately adjacent to the site, west)

Approved traffic studies were reviewed for this study and their trips distributed as documented in their respective reports. The respective trip generation is presented in **Table 4**.

Table 4
Background Trip Generation

LAND USE	L.U.C.	DENSITY	DAILY TRIPS	AM PEAK HOUR ENTER	AM PEAK HOUR EXIT	PM PEAK HOUR ENTER	PM PEAK HOUR EXIT
Butler Farm Industrial (1)	140	855,000 sqft	3297	524	156	234	417
FedEx (1)	710	208,361 sqft	1,948	166	179	186	165
Southeast Bank	932	4,500 sqft	667	31	23	55	55
Zaxby's (1)	934	3,800 sqft	1,885	0	0	65	60

Note: Trip generation and distribution documented in their respective reports.

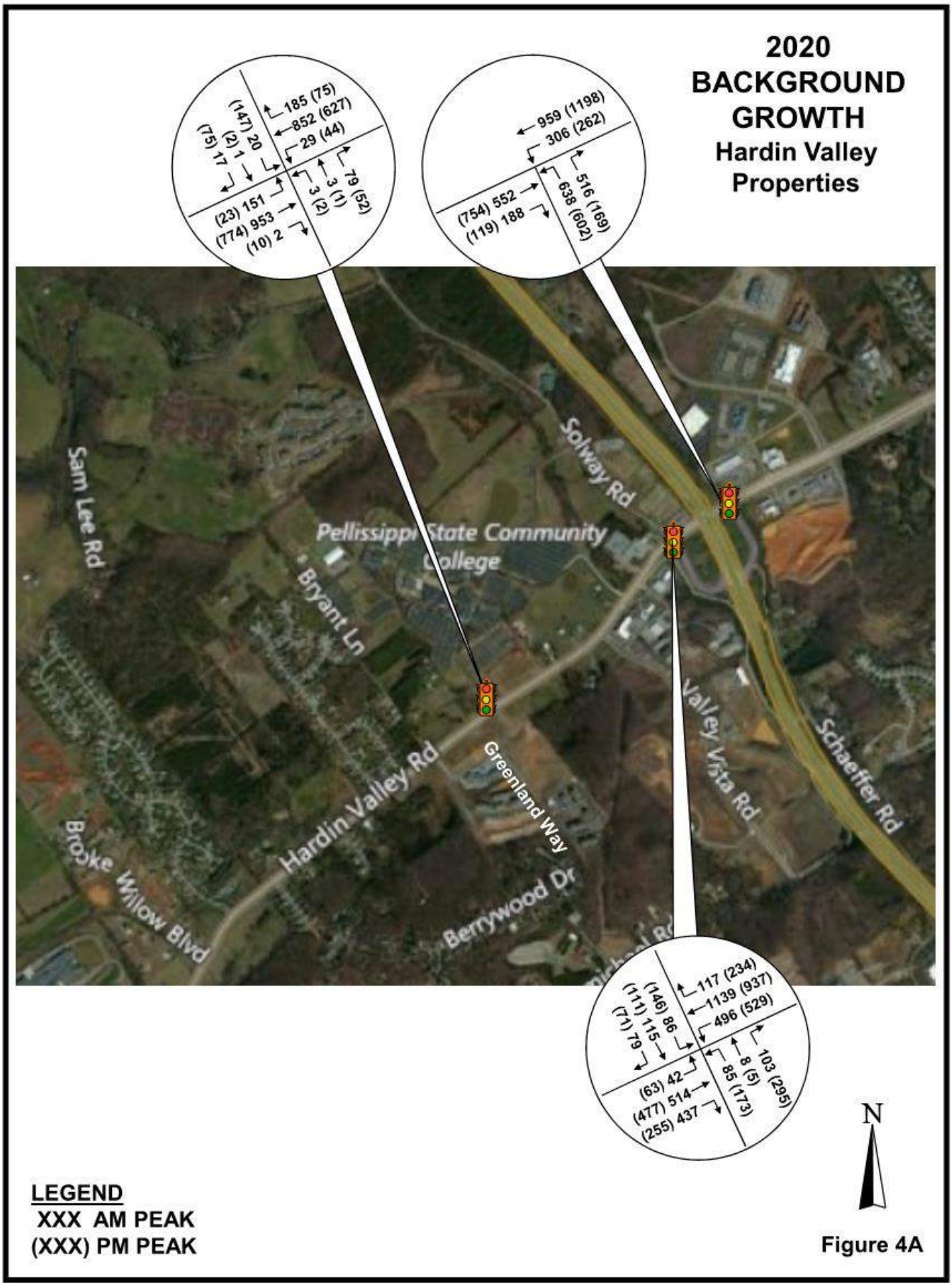

2020
BACKGROUND
GROWTH
Hardin Valley
Properties
185 (75)
852 (627)
29 (44)
(147) 20
(2) 1
(75) 17
79 (52)
3 (1)
3 (2)
(23) 151
(774) 953
(10) 2
959 (1198)
306 (262)
516 (169)
638 (602)
(754) 552
(119) 188
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
Hardin Valley Rd
Greenland Way
Valley Vista Rd
Schaeffer Rd
Brooke Willow Blvd
Berrywood Dr
117 (234)
1139 (937)
496 (529)
(146) 86
(111) 115
(71) 79
103 (295)
8 (5)
85 (173)
(63) 42
(477) 514
(255) 437
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 4A

The distribution of the trips are illustrated in the Appendix of this report. The total of these distributed trips are illustrated in **Figure 4B**. The 2020 total background traffic is illustrated in **Figure 4C**.

Background Capacity and Level of Service

The study intersections on Hardin Valley Road and the Pellissippi Parkway were again evaluated for capacity and level of service. In addition, the proposed western street access for the study site is shared with the adjacent planned Southeast Bank; therefore this shared access is analyzed for the background condition. **Table 5** presents the intersection 2020 Capacity and LOS for background traffic conditions.

Table 5
2020 Background
Capacity and Levels of Service

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	V/C	DELAY	LOS
Hardin Valley Road & Pellissippi Pkwy NB Ramp	**SIGNAL**	**AM**	**1.02**	**32.6**	**C**
		PM	**1.02**	**41.9**	**D**
Hardin Valley Road & Pellissippi Pkwy SB Ramp	**SIGNAL**	**AM**	**0.99**	**37.3**	**D**
		PM	**1.04**	**47.5**	**D**
Hardin Valley Road & Greenland Way	*SIGNAL*	*AM*	*0.76*	*10.2*	*B*
		PM	*0.75*	*16.0*	*B*
Hardin Valley Road & Proposed Street Access (West)	**STOP NBL/NBR**	**AM**	**0.04 / 0.07**	**37.9 / 33.9**	**E / D**
		PM	**0.06 / 0.14**	**27.6 / 28.7**	**D / D**

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approaches.

The analyses found that the signalized study intersections may operate at acceptable levels of service. The Pellissippi Parkway interchange may operate with very high capacity ratios thereby unstable traffic conditions. These V/C ratios result in significant increases in delay with the background traffic increases further aggravating the adverse queues at the Pellissippi Parkway interchange as insufficient left-turn storage is available. The Southeast Bank development STOP controlled access with Hardin Valley Road appears to achieve a good LOS. Planned signalization of the Greenland Way, west of the site, should also assist in accessing the western driveway as it would result in some gaps in the adjacent flow of traffic.

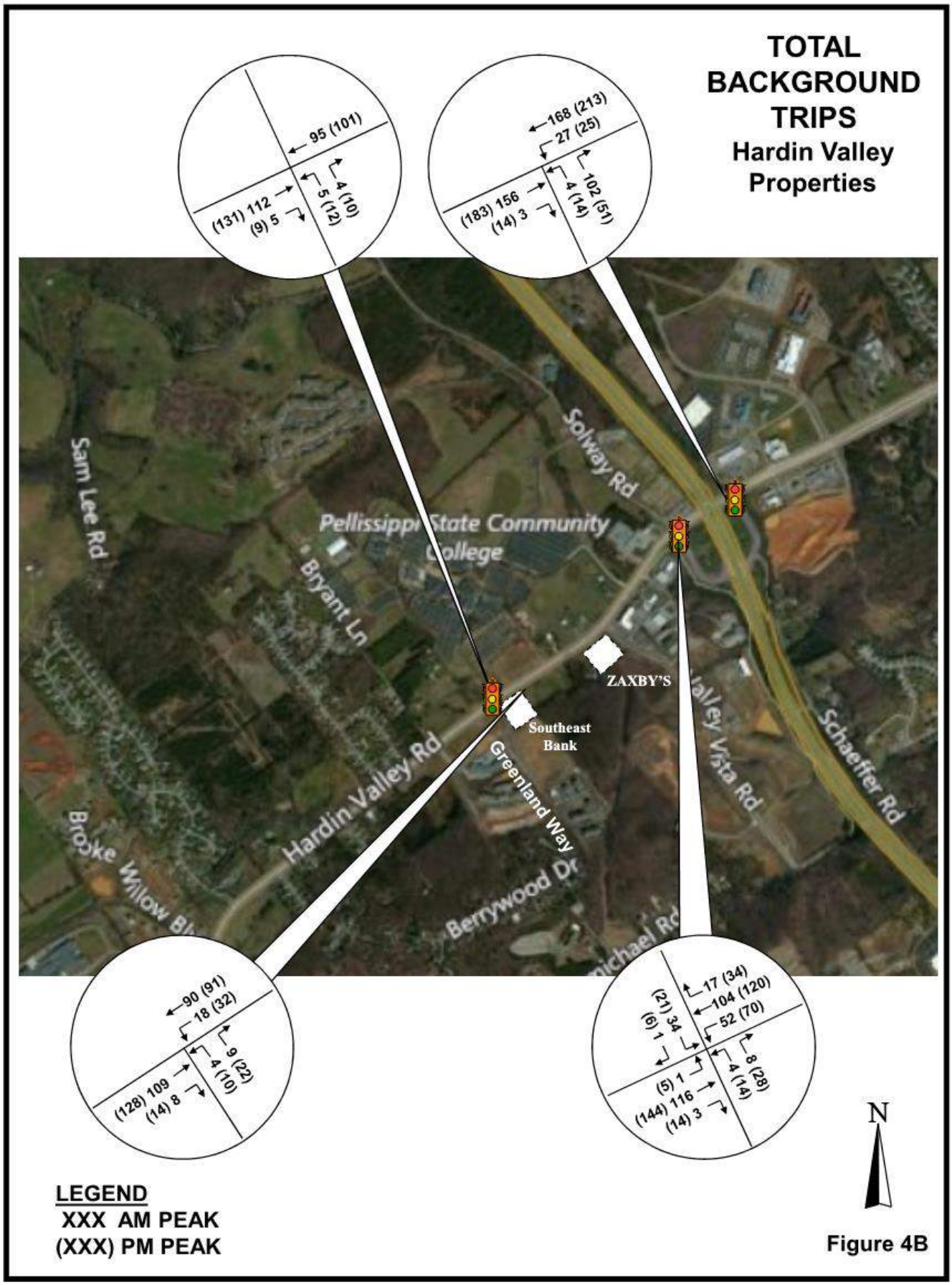

TOTAL BACKGROUND TRIPS
Hardin Valley Properties
95 (101)
(131) 112
(9) 5
5 (12)
4 (10)
168 (213)
27 (25)
(183) 156
(14) 3
4 (14)
102 (51)
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
ZAXBY'S
Southeast Bank
Hardin Valley Rd
Greenland Way
Valley Vista Rd
Schaeffer Rd
Brooke Willow Blvd
Berrywood Dr
Michael Rd
90 (91)
18 (32)
(128) 109
(14) 8
4 (10)
9 (22)
17 (34)
104 (120)
52 (70)
(21) 34
(6) 1
(5) 1
(144) 116
(14) 3
4 (14)
8 (28)
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 4B

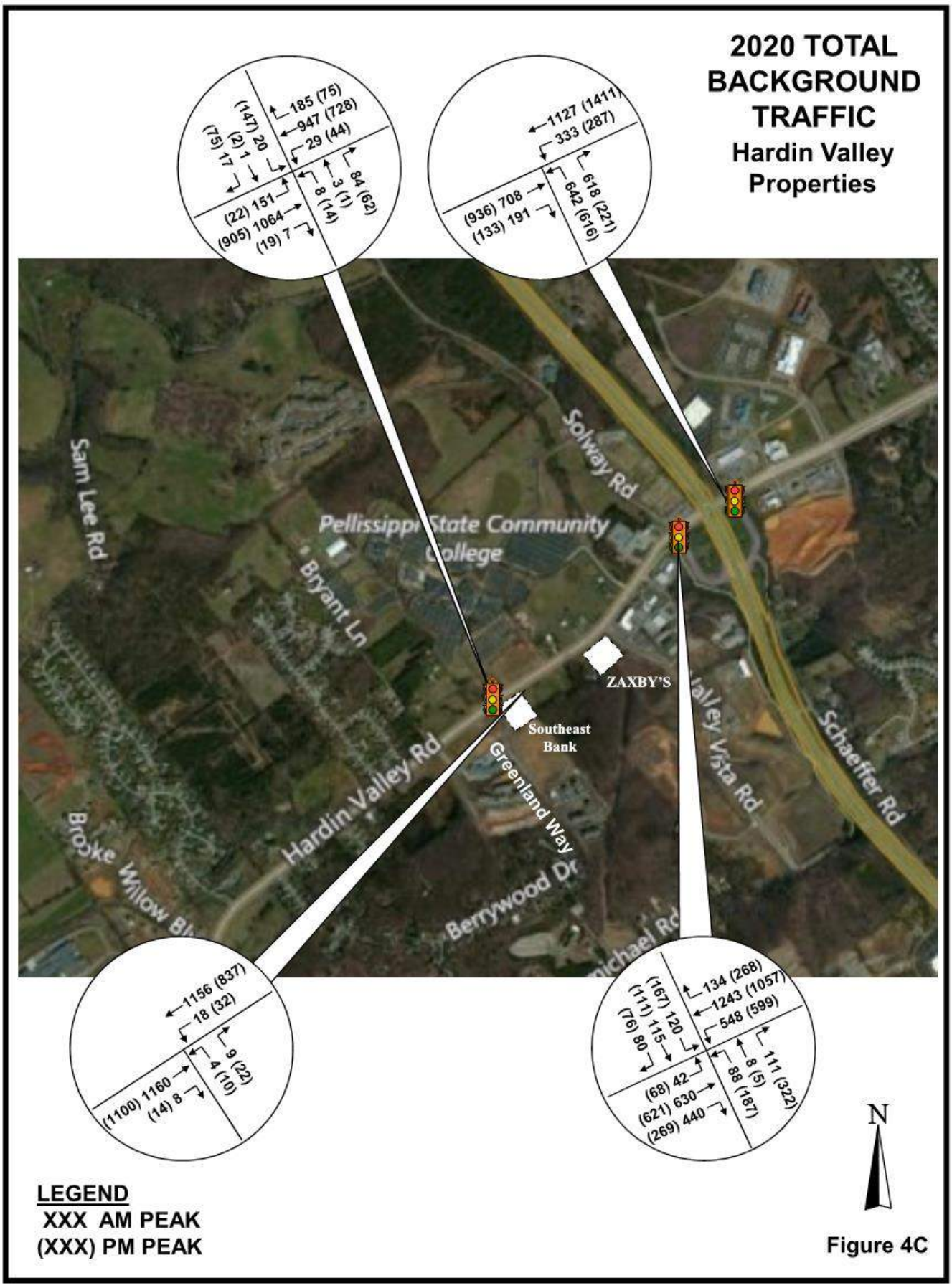

2020 TOTAL BACKGROUND TRAFFIC
Hardin Valley Properties
185 (75)
947 (728)
29 (44)
(147) 20
(2) 1
(75) 17
(22) 151
(905) 1064
(19) 7
8 (14)
3 (1)
84 (62)
1127 (1411)
333 (287)
(936) 708
(133) 191
642 (616)
618 (221)
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
ZAXBY'S
Southeast Bank
Hardin Valley Rd
Greenland Way
Berrywood Dr
Brooke Willow Bl
Valley Vista Rd
Schaeffer Rd
1156 (837)
18 (32)
(1100) 1160
(14) 8
4 (10)
9 (22)
134 (268)
1243 (1057)
548 (599)
(167) 120
(111) 115
(76) 80
(68) 42
(621) 630
(269) 440
88 (187)
8 (5)
111 (322)
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 4C

With the lane volume for Hardin Valley Road near or exceeding 1,100vph, the lane density is significant and may restrict traffic from efficiently entering Hardin Valley Road from an unsignalized approach. The multilane section of Hardin Valley Road should be extended to the west as the eastbound thru traffic represents 75-percent of the intersection capacity with the signalization.

PROJECT IMPACTS

Trip Generation

Project traffic was developed using the publication, **Trip Generation, 9th Edition**. **Trip Generation** is published by the Institute of Transportation Engineers (ITE) and represents national data collected for many different land uses including industrial, residential, and commercial uses. **Trip Generation** is an essential tool in calculating the traffic, which may be generated by a proposed development.

This development concept does not have any proposed specific uses at this time; therefore, the study assumes highway commercial for the uses adjacent to the Hardin Valley Road including two fastfood restaurants and a bank. Average sizes of the fast food (2-4,500sqft) and bank (4,500sqft) were assumed for the study. For the property accessing the proposed street behind the highway oriented uses, office use was assumed at the direction of the developer with a proposed density of 30,000 square feet of general office (LUC 710).

Some trip generation studies have included surveys addressing pass-by traffic. This is traffic already on the adjacent street that is attracted to the proposed development. Studies conducted for pass-by traffic have suggested that a percentage of the traffic generated by commercial retail, such as the land use at hand, may originate from the existing traffic flow; therefore, the project does not necessarily introduce all new traffic to the transportation system.

Pass-by traffic percentages differ relative to specific land uses and their densities. Some studies have shown varied results; however, the ITE publications, **Transportation and Land Development** by Virgil G. Stover and Frank J. Koepke, and **Trip Generation** have combined these studies to suggest uniform rates for given land uses. These rates range from 14-percent for hardware stores to 60-percent for neighborhood shopping centers, gross leasable area less than 100,000 square feet. Service stations and fast-food restaurants also exhibit high pass-by rates of 58-percent and 45-percent, respectively.

With the above in mind, a 40-percent pass-by rate was assumed for the highway commercial. Shared trips were not assumed for the site. From the trip generation calculations, the proposed site may generate approximately 5,660 daily weekday trips. After the consideration of pass-by trips and internal trips, approximately 3,605 new daily trips may be generated for a typical weekday. **Table 6** presents the trip generation of this proposed site.

Table 6
TRIP GENERATION

LAND USE	L.U.C.	DENSITY	DAILY TRIPS	AM PEAK HOUR ENTER	AM PEAK HOUR EXIT	PM PEAK HOUR ENTER	PM PEAK HOUR EXIT
OFFICE	710	30,000 sqft	526	64	9	19	93
BANK	912	4,500 sqft	667	31	23	55	55
FAST FOOD RESTAURANT	934	9,000 sqft	4,465	208	200	153	141
Total Trips Generated		43,500 sqft	5,658	303	232	227	289
Highway Commercial		13,500 sqft	5,132	239	223	208	196
Primary Trips	60%		3,079	143	134	125	118
Pass-by Trips	40%		2,053	96	89	83	78
Total Primary Trips (New)			3,605	207	143	144	211

Source: Trip Generation, 9th Edition.

Trip Distribution And Assignment

The distribution and assignment was assumed based on the existing traffic patterns, land use characteristics, and the major street network. Traffic access to the site assumes different distributions for the office and highway commercial peak hours. **Figures 5A and 5B** illustrate distributions for the site's office and highway commercial primary trips, respectively. From the east, 75-percent of the generated office trips are assumed to enter and exit. To and from the west, 25-percent of the generated office trips are assumed. With the highway commercial, it is assumed that more of the trips will be generated within the site vicinity; therefore, more trips should be localized thereby increasing traffic to and from the west. The east and west distribution is therefore assumed 65- and 35-percent, respectively.

Figure 6 illustrates the Pass-by distribution and assignment. Pass-by trips are assumed to distribute 50-percent east and west of the site.

By multiplying the assumed intersection trip assignments with the trip generation, project associated trips were determined. **Figures 7A and B** illustrate the proposed project primary and pass-by trips for the site. **Figure 7C** illustrates the total site generated trips.

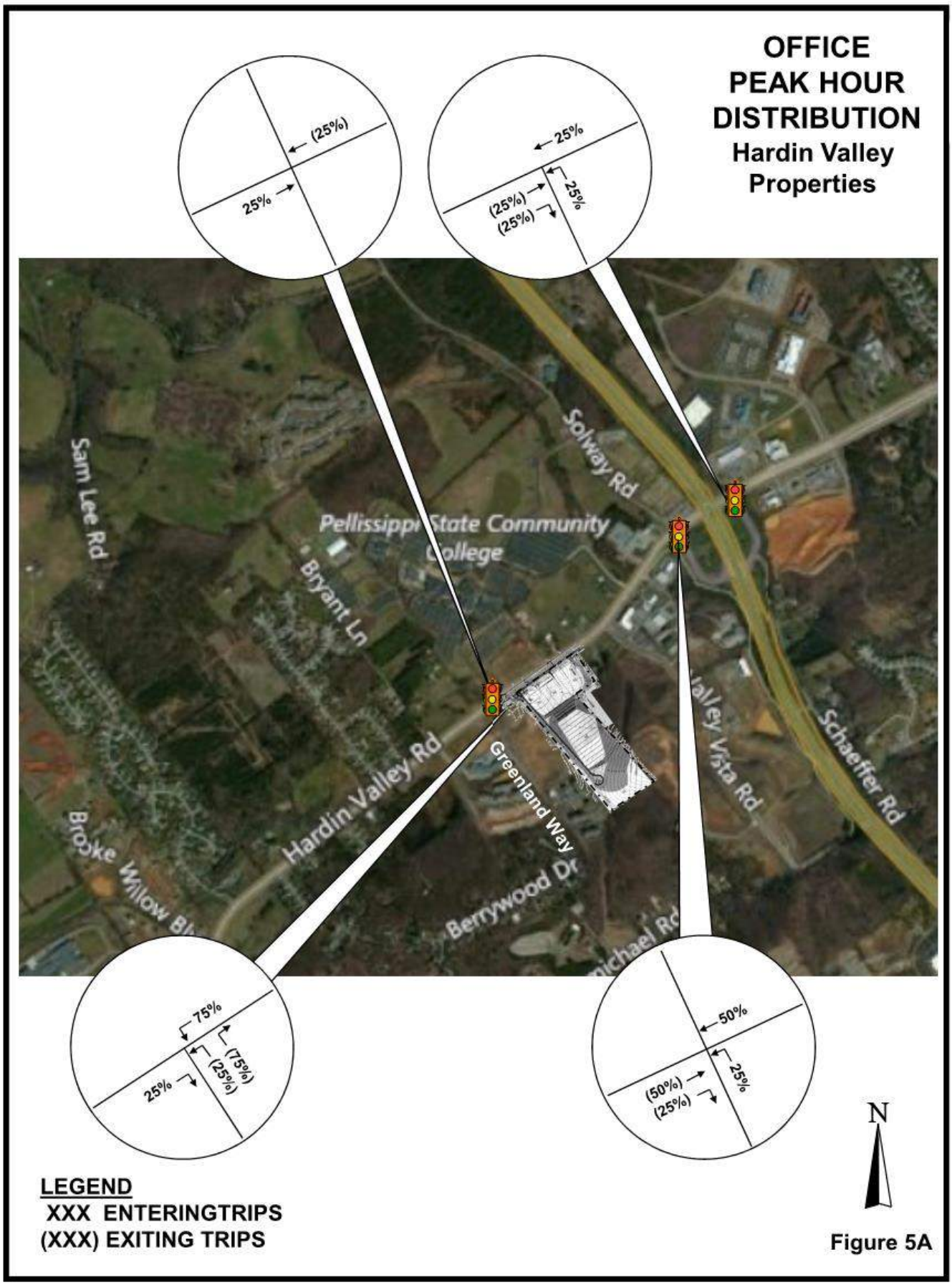

OFFICE
PEAK HOUR
DISTRIBUTION
Hardin Valley
Properties
(25%)
25%
25%
(25%)
(25%)
25%
Sam Lee Rd
Bryant Ln
Solway Rd
Pellissippi State Community College
Hardin Valley Rd
Greenland Way
Schaeffer Rd
Brooke Willow Bl
Berrywood Dr
75%
25%
(75%)
(25%)
50%
(50%)
(25%)
25%
N
LEGEND
XXX ENTERINGTRIPS
(XXX) EXITING TRIPS

Figure 5A

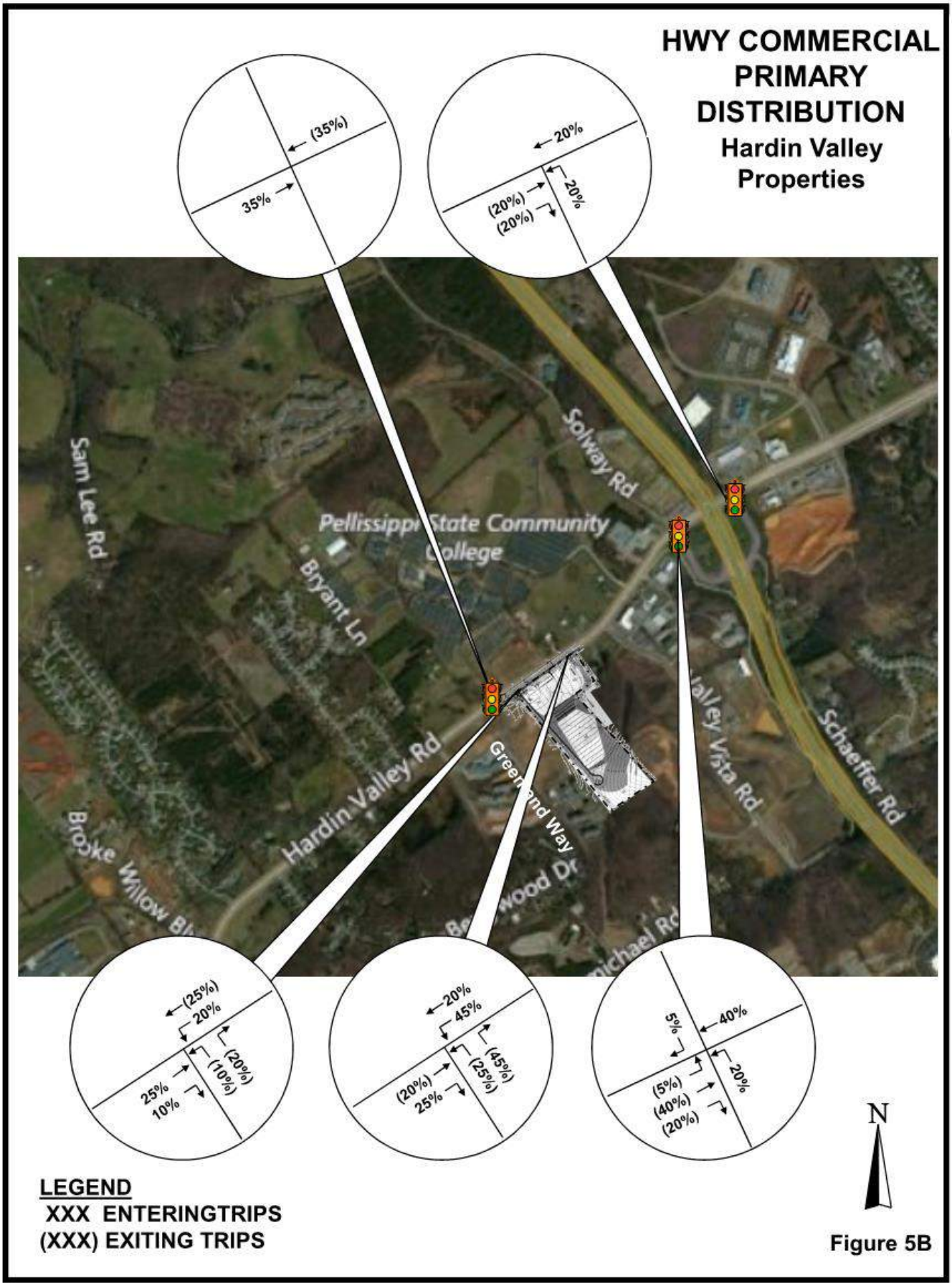
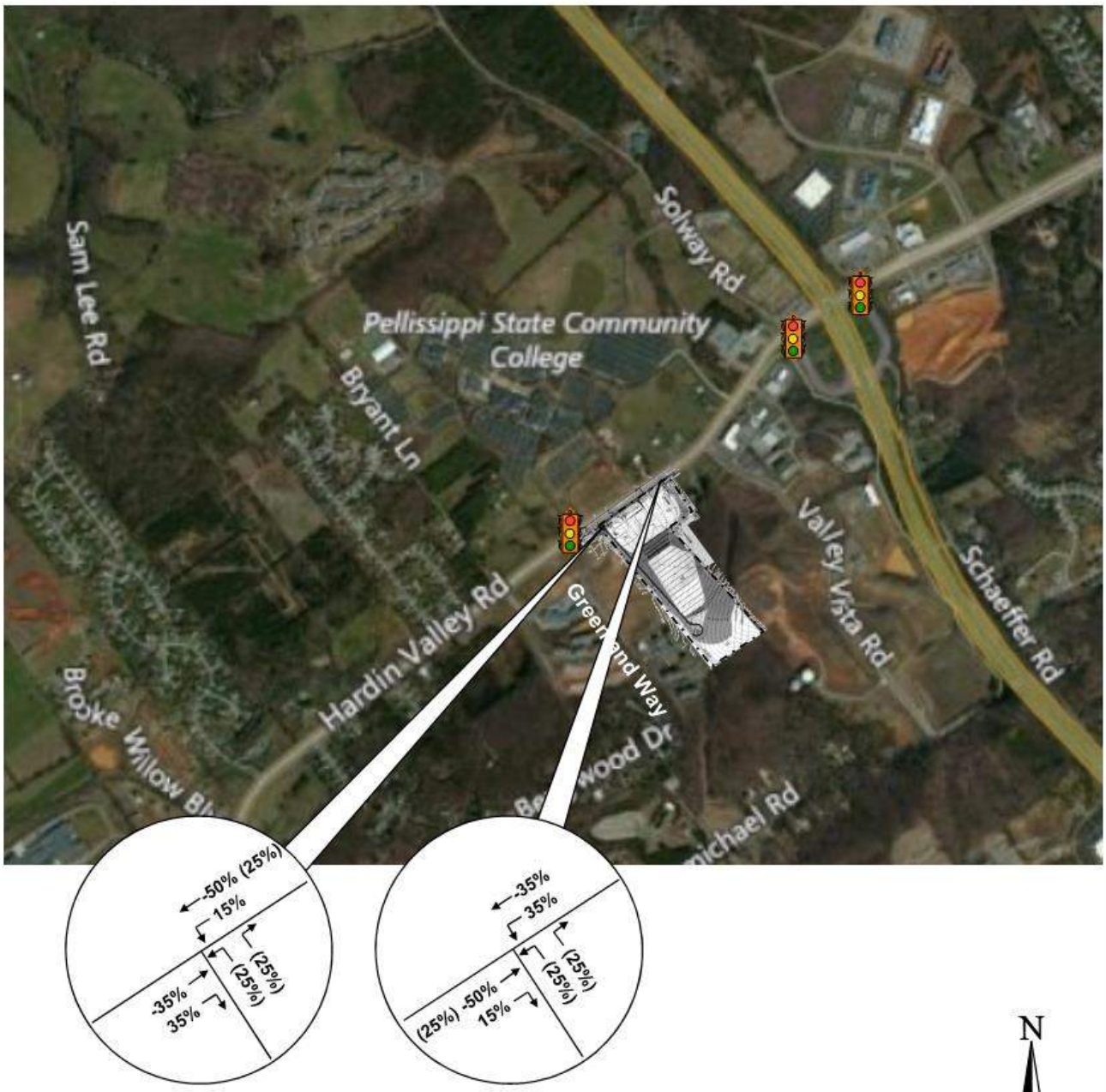

HWY COMMERCIAL
PRIMARY
DISTRIBUTION
Hardin Valley
Properties
(35%)
35%
20%
(20%)
(20%)
20%
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
Hardin Valley Rd
Greenland Way
Valley Vista Rd
Schaeffer Rd
Brooke Willow Bl
(25%)
20%
25%
10%
(20%)
(10%)
20%
45%
(20%)
25%
(45%)
(25%)
5%
40%
(5%)
(40%)
(20%)
20%
N
LEGEND
XXX ENTERINGTRIPS
(XXX) EXITING TRIPS

Figure 5B

HWY COMMERCIAL PASS-BY ASSIGNMENT

Hardin Valley Properties



LEGEND
XXX ENTERINGTRIPS
(XXX) EXITING TRIPS

Figure 6

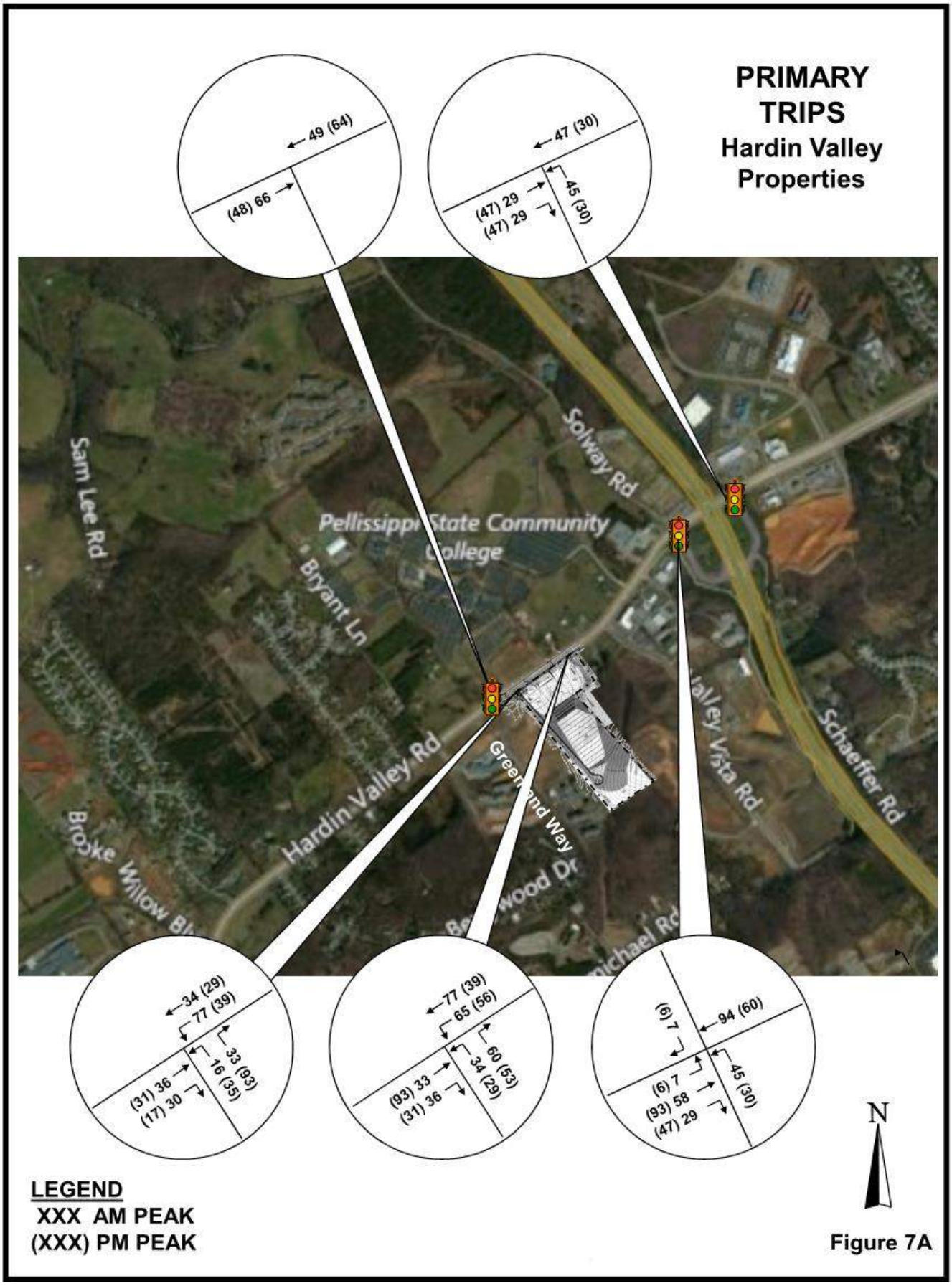
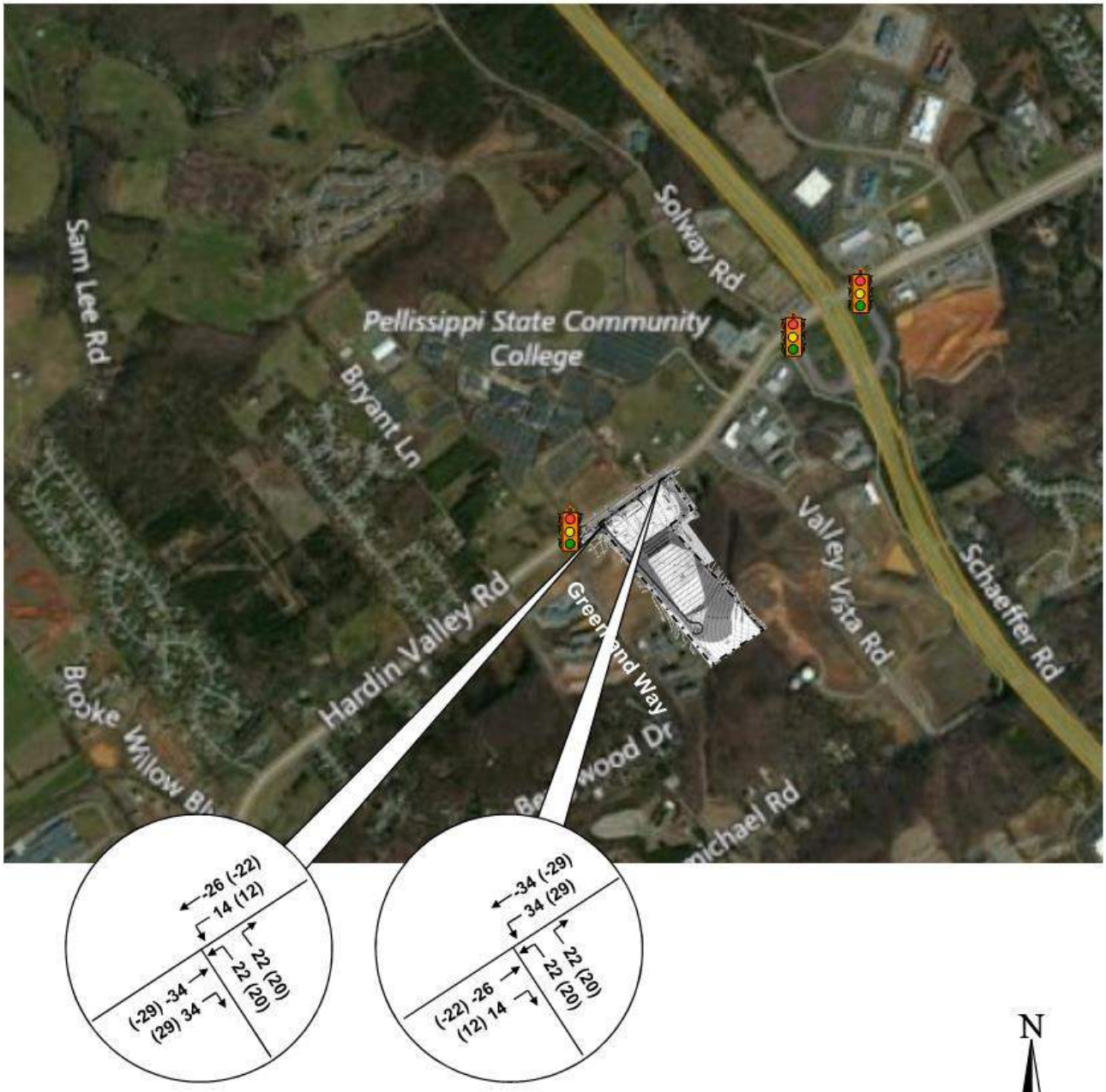

PRIMARY TRIPS
Hardin Valley Properties
49 (64)
(48) 66
47 (30)
(47) 29
(47) 29
45 (30)
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
Hardin Valley Rd
Brooke Willow Bl
Greenland Way
Valley Vista Rd
Schaeffer Rd
34 (29)
77 (39)
(31) 36
(17) 30
33 (93)
16 (35)
77 (39)
65 (56)
(93) 33
(31) 36
60 (53)
34 (29)
(6) 7
94 (60)
(6) 7
(93) 58
(47) 29
45 (30)
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 7A

PASS-BY TRIPS

Hardin Valley Properties



LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 7B

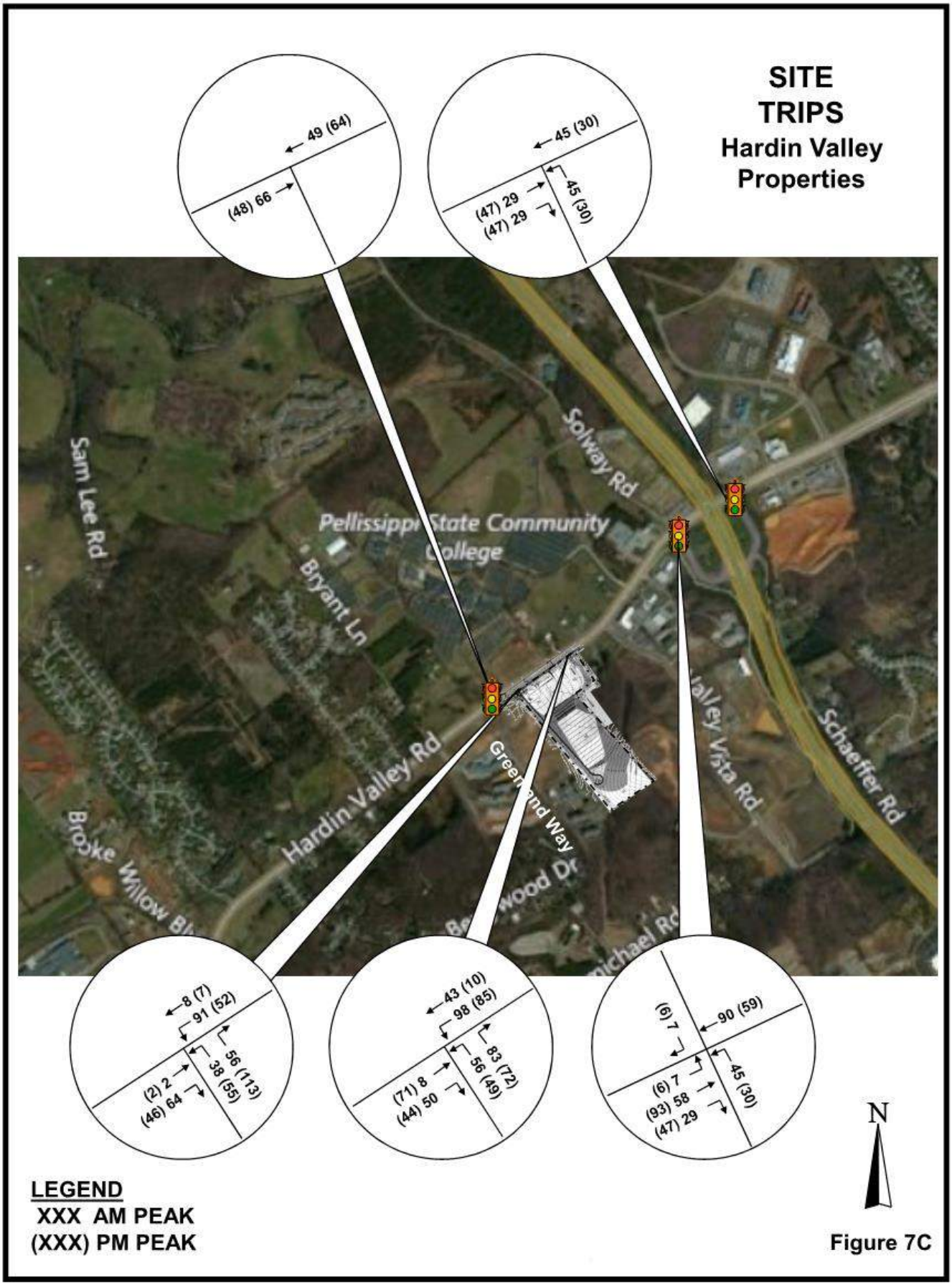

SITE
TRIPS
Hardin Valley
Properties
49 (64)
(48) 66
45 (30)
(47) 29
(47) 29
45 (30)
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
Hardin Valley Rd
Greenland Way
Valley Vista Rd
Schaeffer Rd
Brooke Willow Bl
8 (7)
91 (52)
(2) 2
(46) 64
38 (55)
56 (113)
43 (10)
98 (85)
(71) 8
(44) 50
56 (49)
83 (72)
(6) 7
90 (59)
(6) 7
(93) 58
(47) 29
45 (30)
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 7C

Projected Traffic Volumes

With the addition of project trips to background traffic for the horizon year 2020, the projected traffic volumes were developed. **Figure 8** illustrates the 2020 projected traffic. From these projected traffic volumes, the proposed site has less than a 5-percent impact on the Pellissippi Parkway northbound ramps and less than a 7-percent impact on the southbound ramps. The projected intersection volumes are used to analyze the intersection's future capacity and LOS and for turn lane warrants.

Left-turn lane access is provided with the existing two way left-turn lane (TWLTL). Traffic conditions require minimal right turn volumes to justify right-turn lanes, with the threshold of 25vph satisfying the criteria for right-turn lanes and the proposed street access.

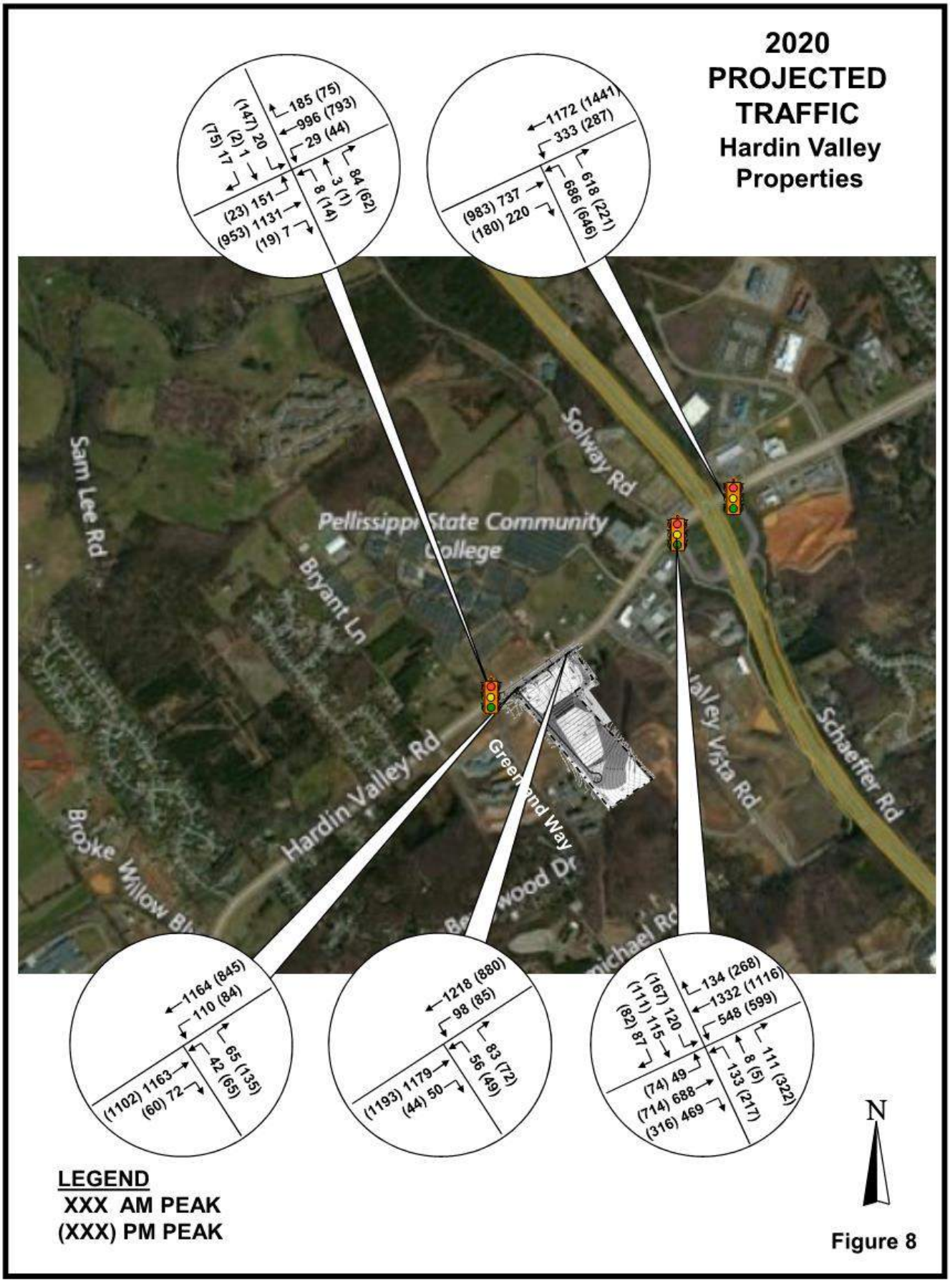

2020
PROJECTED
TRAFFIC
Hardin Valley
Properties
185 (75)
996 (793)
29 (44)
(147) 20
(75) 17
(2) 1
(23) 151
(953) 1131
(19) 7
8 (14)
3 (1)
84 (62)
1172 (1441)
333 (287)
(983) 737
(180) 220
686 (646)
618 (221)
Sam Lee Rd
Solway Rd
Pellissippi State Community College
Bryant Ln
Hardin Valley Rd
Brooke Willow Blvd
Greenland Way
Wood Dr
Valley Vista Rd
Schaeffer Rd
Michael Rd
1164 (845)
110 (84)
(1102) 1163
(60) 72
42 (65)
65 (135)
1218 (880)
98 (85)
(1193) 1179
(44) 50
56 (49)
83 (72)
134 (268)
1332 (1116)
548 (599)
(167) 120
(111) 115
(82) 87
(74) 49
(714) 688
(316) 469
133 (217)
8 (5)
111 (322)
N
LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 8

Projected Capacity and Level of Service

Traffic is analyzed with the proposed development to again determine the capacity and LOS for the site access and study intersections. **Table 7** presents the results of these analyses. **Table 8** presents the summary of all the capacity and LOS analyses.

Table 7
Projected 2020
Capacity and Levels of Service

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	V/C	DELAY	LOS
Hardin Valley Road & Pellissippi Pkwy NB Ramp	**SIGNAL**	**AM**	**1.05**	**42.1**	**D**
		PM	**1.06**	**51.0**	**D**
Hardin Valley Road & Pellissippi Pkwy SB Ramp	**SIGNAL**	**AM**	**1.04**	**47.0**	**D**
		PM	**1.09**	**62.8**	**E**
Hardin Valley Road & Greenland Way	*SIGNAL*	*AM*	*0.79*	*11.5*	*B*
		PM	*0.78*	*17.3*	*B*
Hardin Valley Road & Proposed Street Access (West)	**STOP NBL/NBR**	**AM**	**0.84 / 0.64**	**195.0 / 82.9**	**F / F**
		PM	**0.59 / 0.99**	**70.9 / 130.7**	**F / F**
Hardin Valley Road & Proposed East Access	**STOP NBL/NBR**	**AM**	**0.86 / 0.85**	**207.4 / 125.8**	**F / F**
		PM	**0.47 / 0.64**	**61.5 / 76.9**	**F / F**

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approaches.

The Pellissippi Parkway southbound ramp intersection may operate at LOS F during the AM peak hour. This interchange will continue to deteriorate, operating with high capacity ratios, longer delays and adverse queues. Adverse queues will continue to exceed available storage and spill over to the adjacent lanes hindering the traffic flow through interchange. In order to achieve an improved LOS for the southbound ramps, the intersection capacity must be increased, requiring interchange improvements including a double left-turn lanes for Hardin Valley Road to southbound Pellissippi Parkway and increased left-turn storage for the northbound ramp. Improvements are currently being discussed with TDOT but are not currently scheduled. For the proposed site street and driveway access, the STOP controlled approaches may operate at levels of service F during the morning peak hour due to the very high lane volumes experienced on Hardin Valley Road which are such that a 4-lane minimum facility is necessary for acceptable levels of service.

Table 8
SUMMARY OF
CAPACITY AND LEVEL OF SERVICE

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	2016 TRAFFIC			2020 BACKGROUND			2020 BUILDOUT		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
Hardin Valley Road	SIGNAL	AM	1.12	35.0	D	1.02	32.6	C	1.05	42.1	D
& Pellissippi Pkwy NB Ramp		PM	0.82	26.0	C	1.02	41.9	D	1.06	51.0	D
Hardin Valley Road	SIGNAL	AM	0.96	34.4	C	0.99	37.3	D	1.04	47.0	D
& Pellissippi Pkwy SB Ramp		PM	0.92	36.9	D	1.04	47.5	D	1.09	62.8	E
Hardin Valley Road	STOP	AM	0.64 / 0.05	80.3 / 47.5	F / E						
& Greenland Way	SBL/NBR	PM	1.39 / 0.2	263.4 / 19.2	F / C						
NEW SIGNAL	*SIGNAL*	*AM*	*0.67*	*8.6*	*A*	*0.76*	*10.2*	*B*	*0.79*	*11.5*	*B*
(Under Construction)		*PM*	*0.77*	*18.3*	*B*	*0.75*	*16.0*	*B*	*0.78*	*17.3*	*B*
Hardin Valley Road	STOP	AM				0.04 / 0.07	37.9 / 33.9	E / D	0.84 / 0.64	195.0 / 82.9	F / F
& Proposed Street Access (West)	NBL/NBR	PM				0.06 / 0.14	27.6 / 28.7	D / D	0.59 / 0.99	70.9 / 130.7	F / F
Hardin Valley Road	STOP	AM							0.86 / 0.85	207.4 / 125.8	F / F
& Proposed East Access	NBL/NBR	PM							0.47 / 0.64	61.5 / 76.9	F / F

Note: Average vehicle delay estimated in seconds. STOP control analyses presented by minor approaches.

RECOMMENDATIONS

The projected traffic volumes, analyses conducted, and Knox County policies identified the following improvements necessary for the maintenance of an acceptable LOS during the peak hours:

1. Provide for 100-foot right-turn lanes and minimum 45-foot curb radius for efficient ingress to the proposed site.

2. Provide for separate left- and right- turn lanes from the site egress for efficiency of the access.

3. Consideration should be given to the further widening of Hardin Valley Road for the continued development of the corridor.

4. Minimize landscaping, using low growing vegetation and signing at the planned accesses to insure that safe sight-distance is maintained.

Roadway and intersection design should conform to the recommended standards and practices adopted by the Institute of Transportation Engineers (ITE), American Association of State and Highway Officials (AASHTO), and Knox County.

CONCLUSION

The proposed site is a mixed use development including highway type commercial and office located in northwest Knox County, Tennessee. The study included projected traffic with and without the proposed development. Background traffic, which may be anticipated regardless of the proposed development, was determined using a 2.5-percent compounded growth rate until the horizon year 2020. The Butler Farm industrial development was included in the 2020 background conditions. In addition to the Butler Farm development, the FedEx distribution center, an adjacent Zaxby's, and a Southeast Bank were included in the study.

Trips for the proposed site were generated using the ITE publication, **Trip Generation**, **9th Edition**. The study assumed several uses including fast food and banking uses along the adjacent highway with office development behind the highway commercial. The proposed site may generate approximately 5,660 daily weekday trips, and after the consideration of pass-by trips and internal trips, approximately 3,605 new daily trips may be generated for a typical weekday. Trips generated were distributed to the Hardin Valley Road and the adjacent signalized intersections at the Pellissippi Parkway. From these projected traffic volumes, the proposed site has less than a 5-percent impact on the Pellissippi Parkway northbound ramps and less than a 7-percent impact on the southbound ramps.

Using the projected turning movements for the existing and projected traffic conditions, with and without the proposed development, capacity and level of service analyses were conducted using the **2010 Highway Capacity Manual**. The site access and study intersections may fail during the peak hours until Hardin Valley Road can be improved to a multi-lane facility, as its lane volumes are currently challenged with densities that limit STOP controlled approaches accessibility. To minimize the delays to Hardin Valley Road, egress from the site should have left- and right-turn lanes.

APPENDIX

Trip Generation
Background Trip Assignments
Turn Lane Analyses
Pellissippi Parkway Queuing Analyses
Capacity & LOS Analyses
Traffic Counts

TRIP GENERATION

25-Jan-16

AVERAGE

LAND USE	L.U.C	SIZE	DAILY TRAFFIC	AM PEAK ENTER	AM PEAK EXIT	AM PEAK TOTAL	PM PEAK ENTER	PM PEAK EXIT	PM PEAK TOTAL
RESTAURANT (w. drive t	934	9,000	4,465	208	200	409	153	141	294
DRIVE-IN BANK	912	4,500	667	31	23	54	55	55	109
OFFICE BLDG.	710	30,000	331	41	6	47	8	37	45
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
RESTAURANT (w. drive t	934	3,800	1,885	88	85	173	65	60	124
DRIVE-IN BANK	912	4,500	667	31	23	54	55	55	109
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			8,015	400	337	737	334	347	681

REGRESSION

LAND USE	L.U.C	SIZE	DAILY TRAFFIC	AM PEAK ENTER	AM PEAK EXIT	AM PEAK TOTAL	PM PEAK ENTER	PM PEAK EXIT	PM PEAK TOTAL
RESTAURANT (w. drive t	934	9,000	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DRIVE-IN BANK	912	4,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OFFICE BLDG.	710	30,000	526	64	9	73	19	93	112
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
RESTAURANT (w. drive t	934	3,800	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DRIVE-IN BANK	912	4,500	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			526	64	9	73	19	93	112

SATURDAY / SUNDAY

LAND USE	L.U.C	SIZE	SAT DAILY TRAFFIC	SAT PEAK ENTER	SAT PEAK EXIT	SAT PEAK TOTAL	SUN DAILY TRAFFIC	SUN PEAK ENTER	SUN PEAK EXIT	SUN PEAK TOTAL
RESTAURANT (w. drive t	934	9,000	6,498	271	260	531	4,884	314	340	655
DRIVE-IN BANK	912	4,500	388	60	58	118	144	N/A	N/A	22
OFFICE BLDG.	710	30,000	93	7	6	13	32	3	2	5
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
RESTAURANT (w. drive t	934	3,800	2,744	114	110	224	2,062	133	144	276
DRIVE-IN BANK	912	4,500	388	60	58	118	144	N/A	N/A	22
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			10,112	513	492	1,005	7,265	450	486	979

Fast-Food Restaurant with Drive-Through Window
(934)

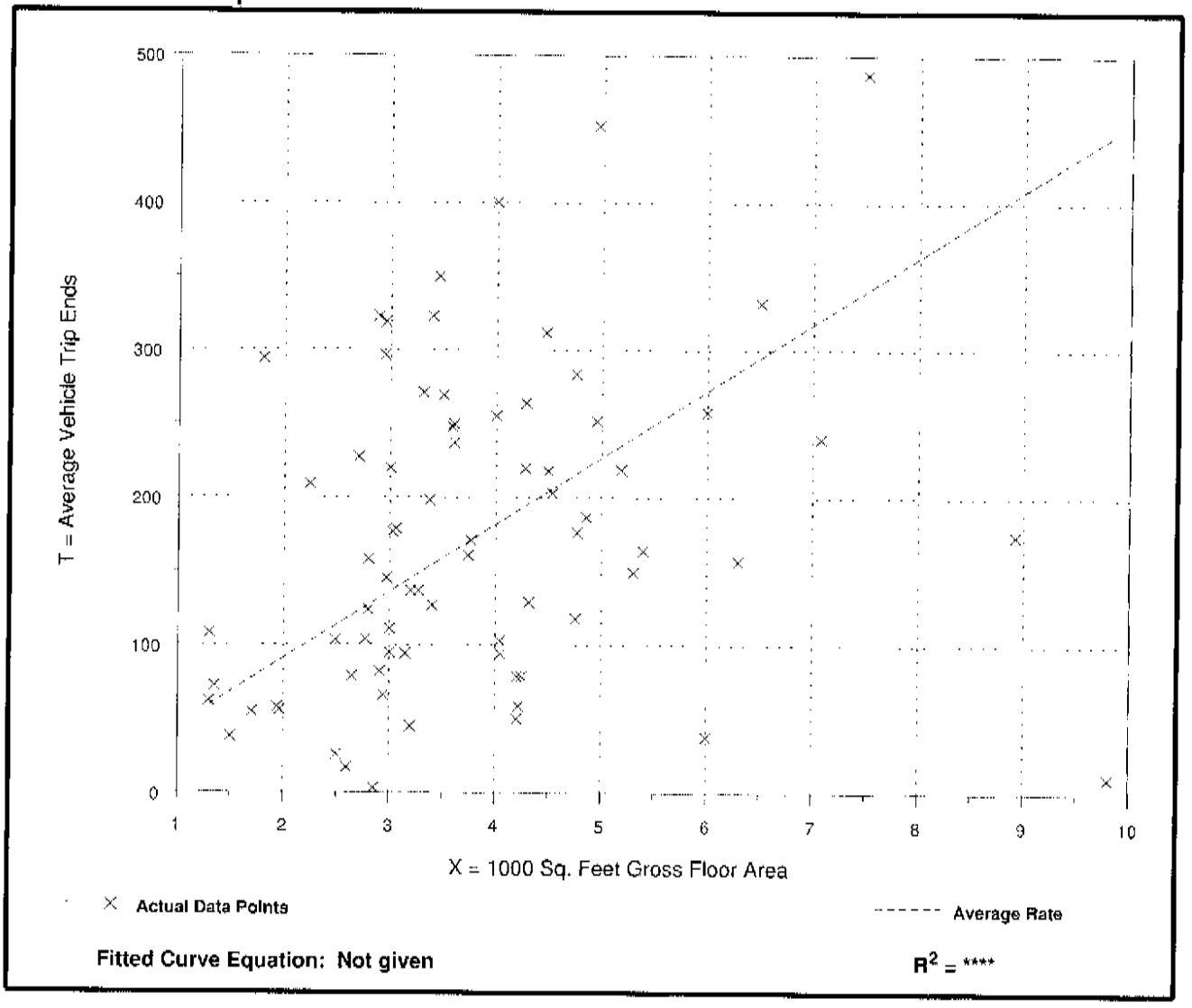
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 75
Average 1000 Sq. Feet GFA: 4
Directional Distribution: 51% entering, 49% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
45.42	1.02 - 163.33	28.63

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Fast-Food Restaurant with Drive-Through Window
(934)

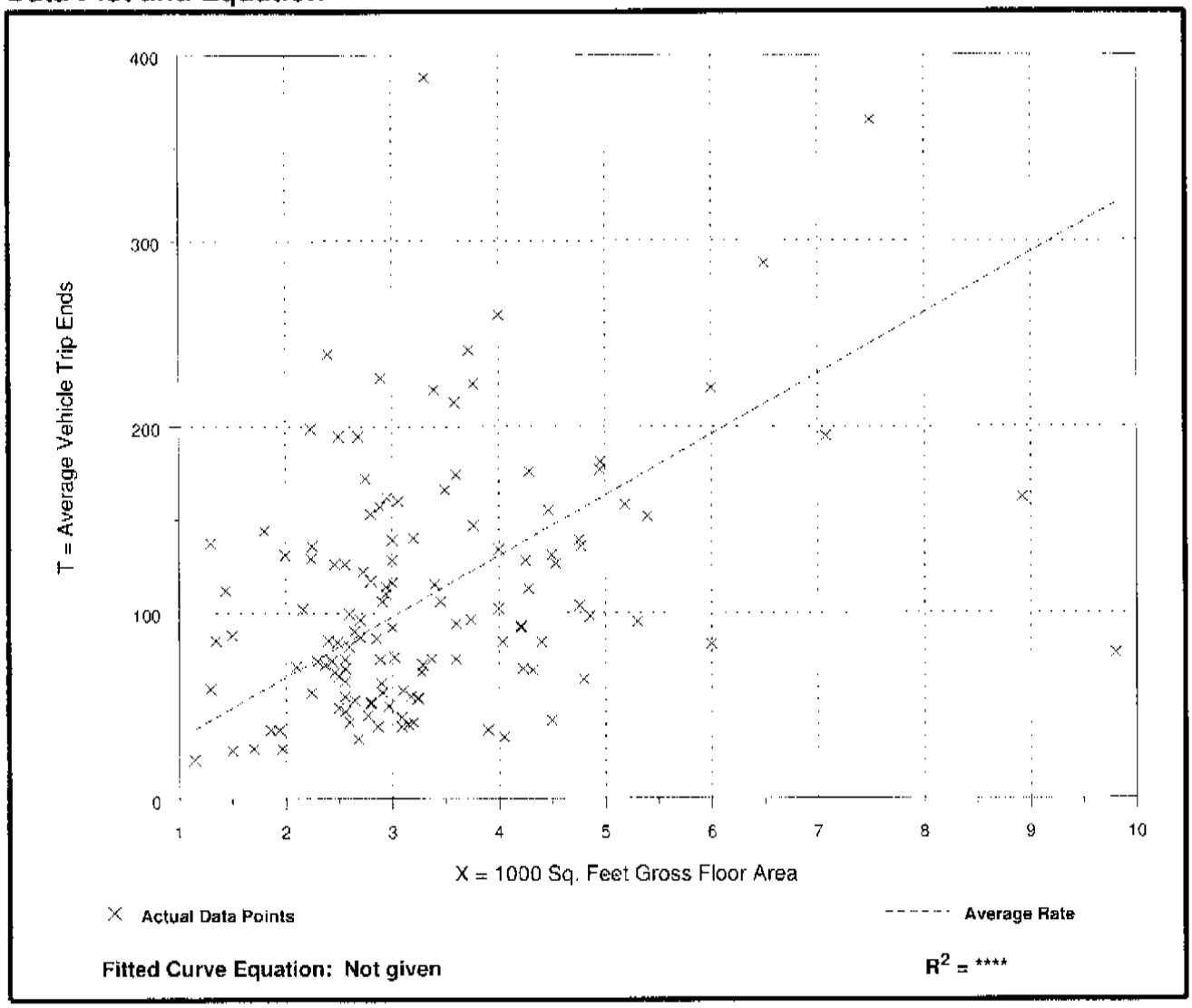
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 132
Average 1000 Sq. Feet GFA: 3
Directional Distribution: 52% entering, 48% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
32.65	7.96 - 117.15	19.73

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Drive-in Bank
(912)

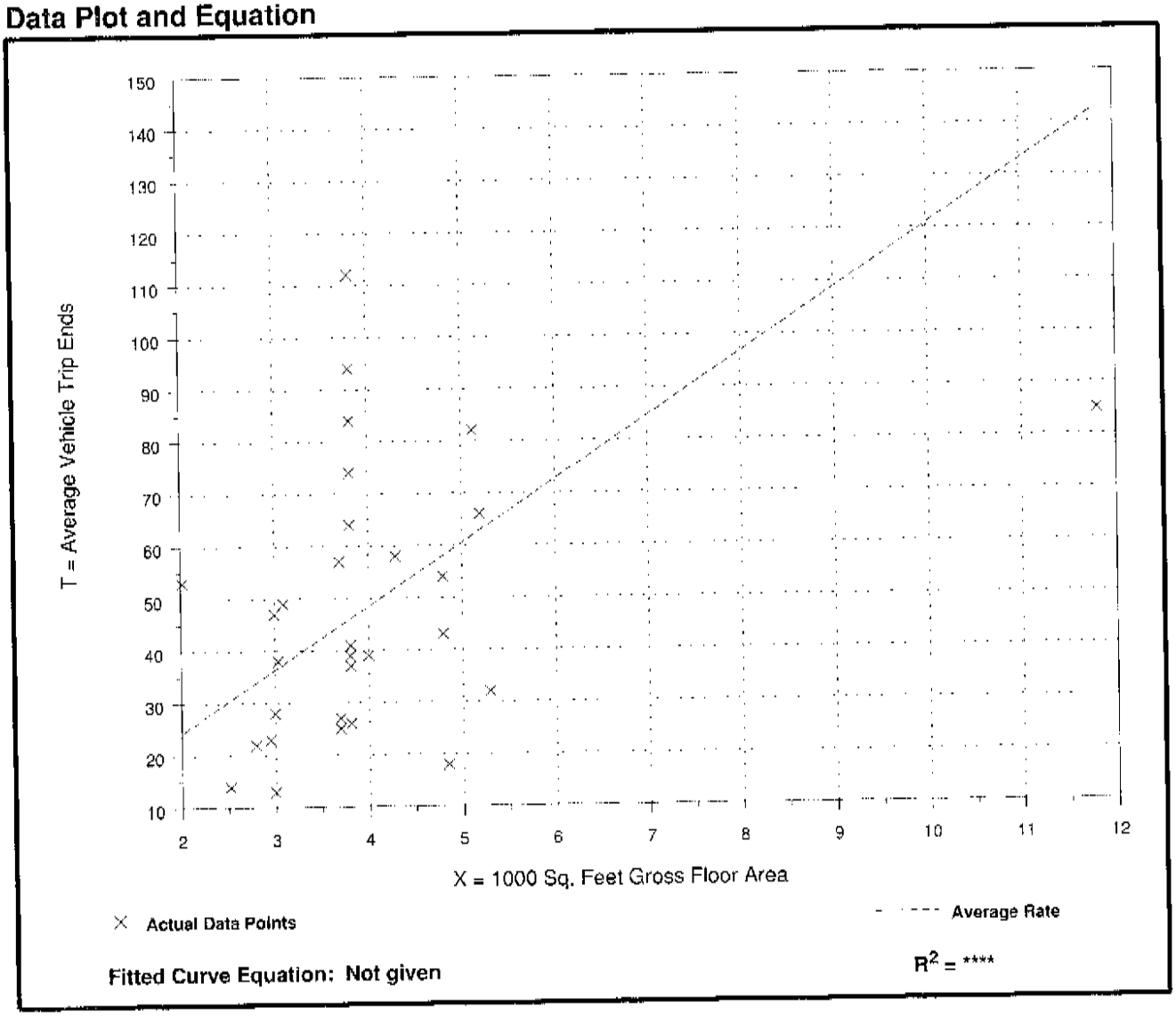
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 31
Average 1000 Sq. Feet GFA: 4
Directional Distribution: 57% entering, 43% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
12.08	3.71 - 29.40	6.88

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Drive-in Bank
(912)

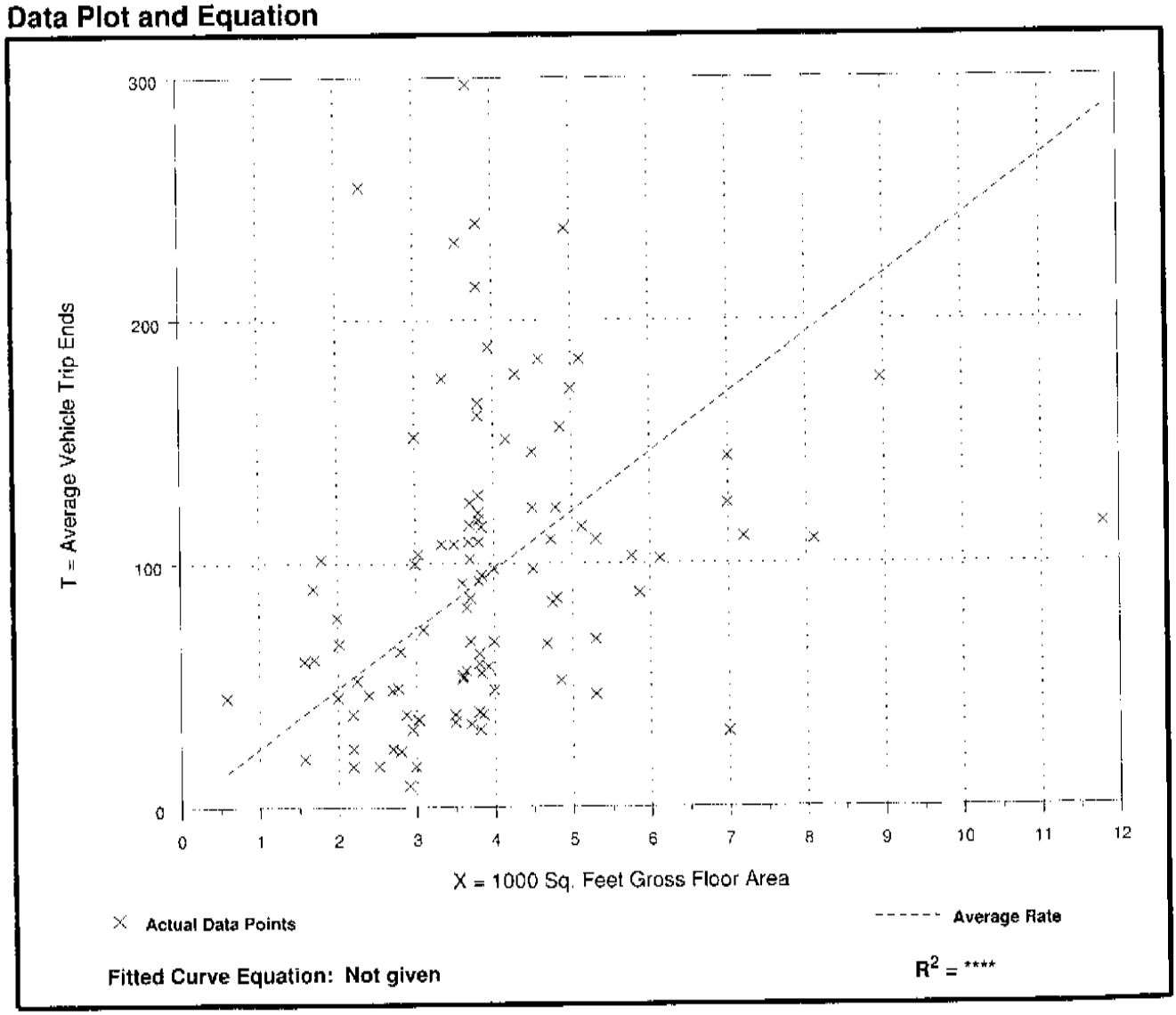
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Floor Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 102
Average 1000 Sq. Feet GFA: 4
Directional Distribution: 50% entering, 50% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
24.30	3.09 - 109.68	16.24

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

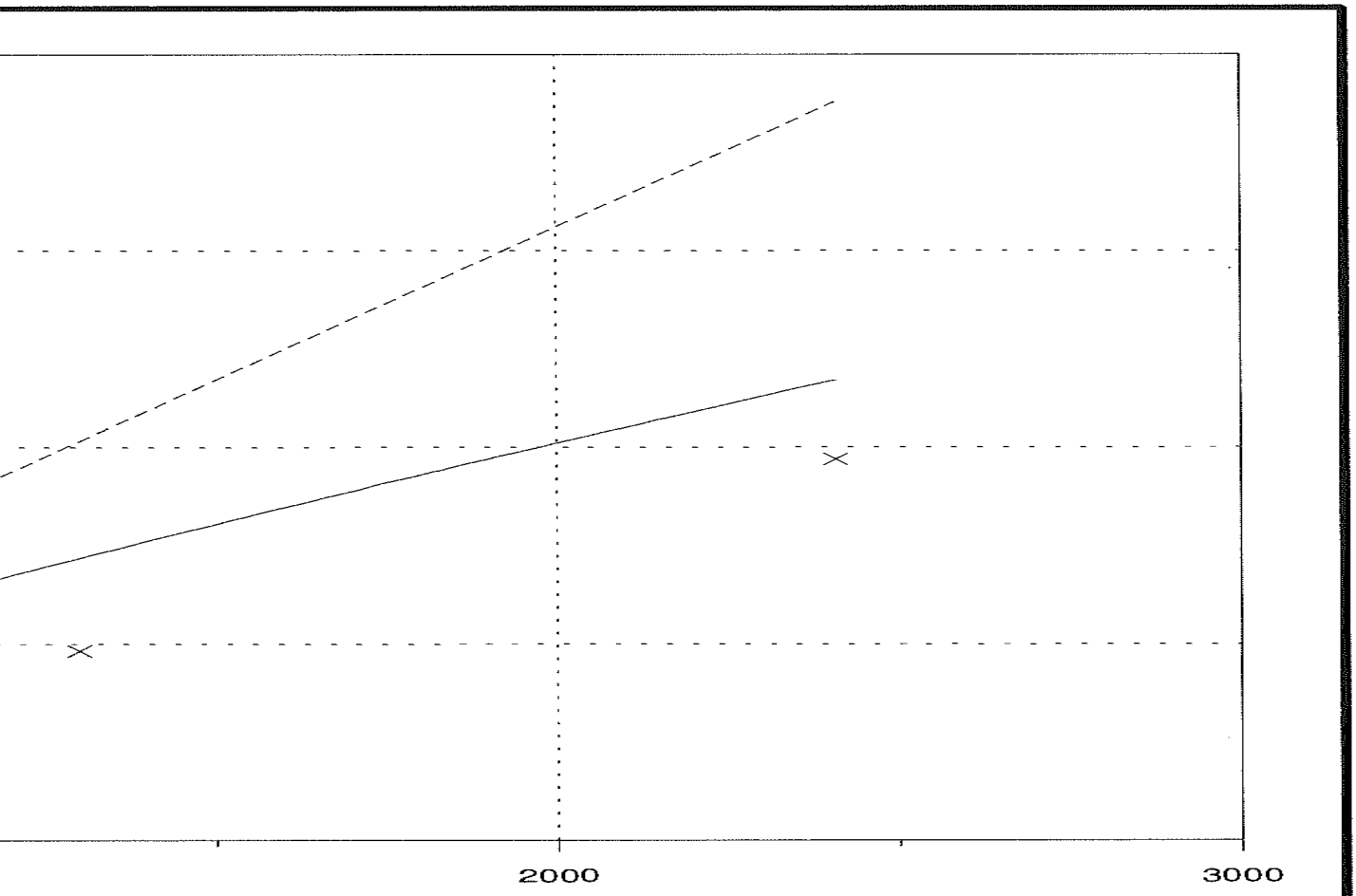
ffice Building
710)

: 1000 Sq. Feet Gross Floor Area
: Weekday,
A.M. Peak Hour

s: 218
A: 222
n: 88% entering, 12% exiting

s Floor Area

ge of Rates	Standard Deviation
- 5.98	1.40



Sq. Feet Gross Floor Area

Fitted Curve — — — — — — Average Rate

.57 $R^2 = 0.83$

Engineers

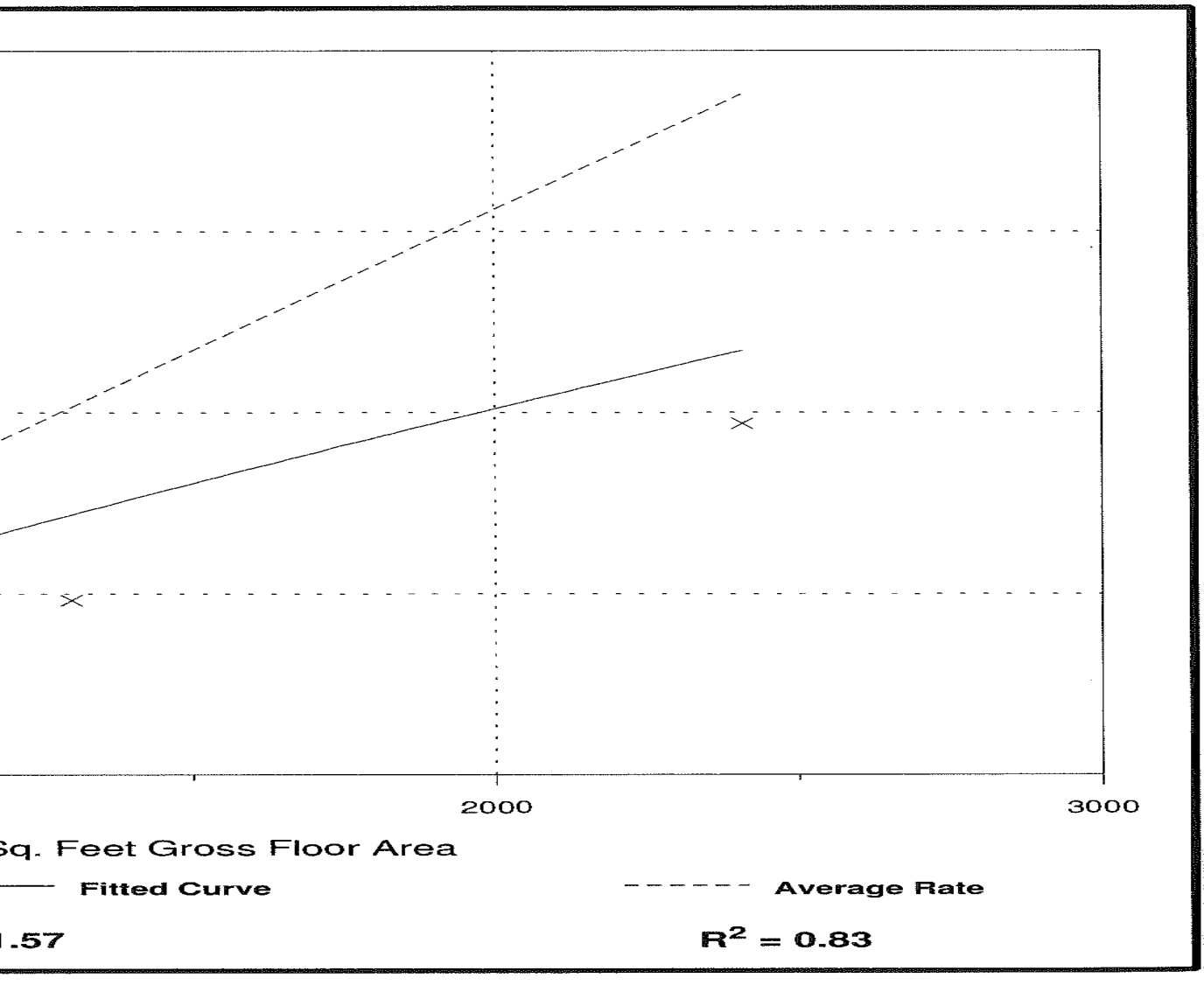
ffice Building
710)

: 1000 Sq. Feet Gross Floor Area
: Weekday,
A.M. Peak Hour

s: 218
A: 222
n: 88% entering, 12% exiting

s Floor Area

ge of Rates	Standard Deviation
- 5.98	1.40



Sq. Feet Gross Floor Area

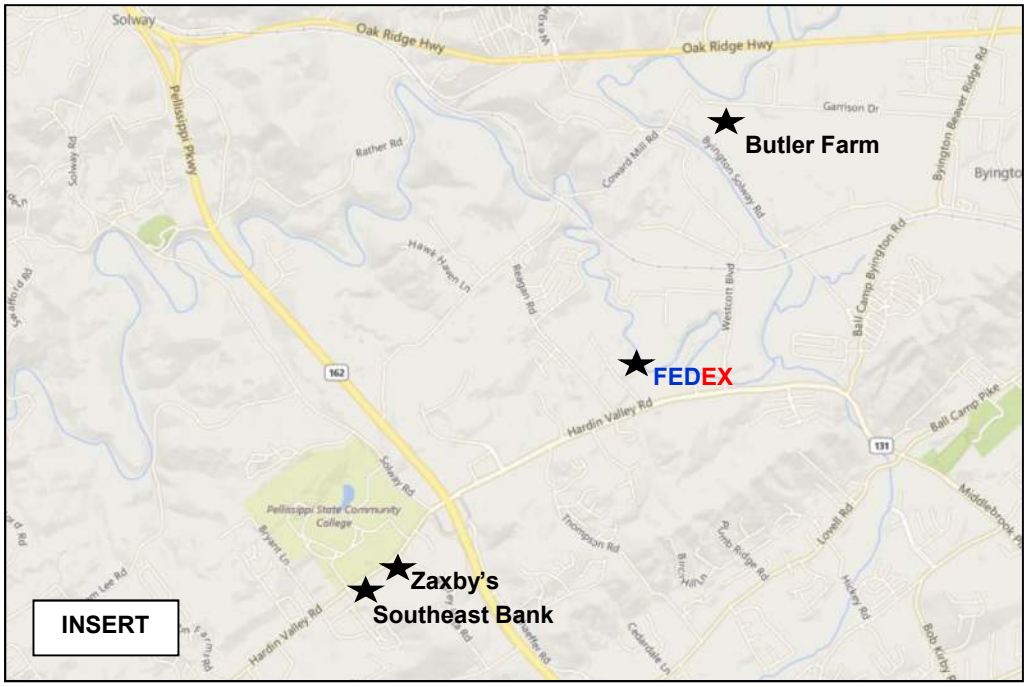
Fitted Curve Average Rate

1.57 $R^2 = 0.83$

Engineers

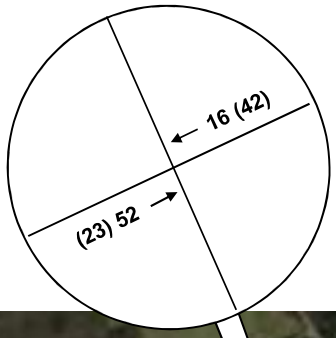
BACKGROUND RELATED PROJECTS

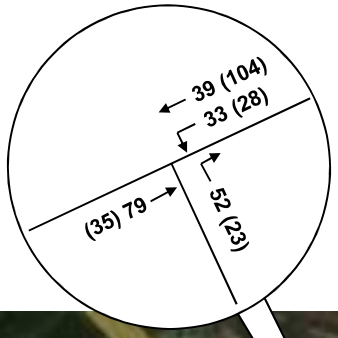
Hardin Valley Properties

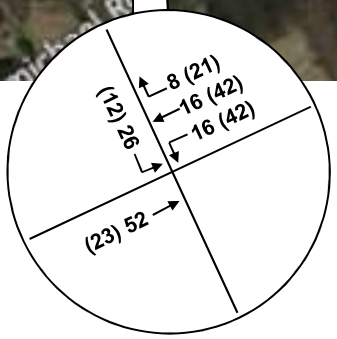


BUTLER SITE TRIPS

Hardin Valley Properties







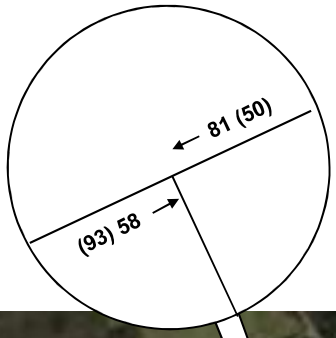
LEGEND

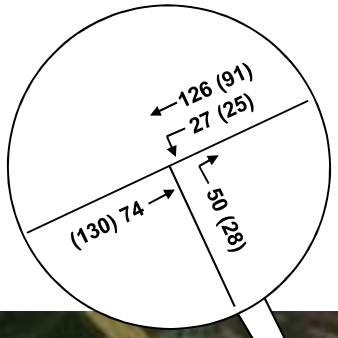
XXX AM PEAK

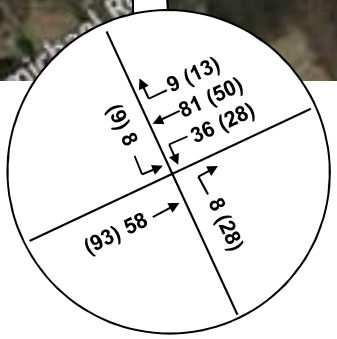
(XXX) PM PEAK

FEDEX DISTRIBUTION CTR TRIPS

Hardin Valley Properties







LEGEND

XXX AM PEAK

(XXX) PM PEAK

ZAXBY'S TRIPS

Hardin Valley Properties

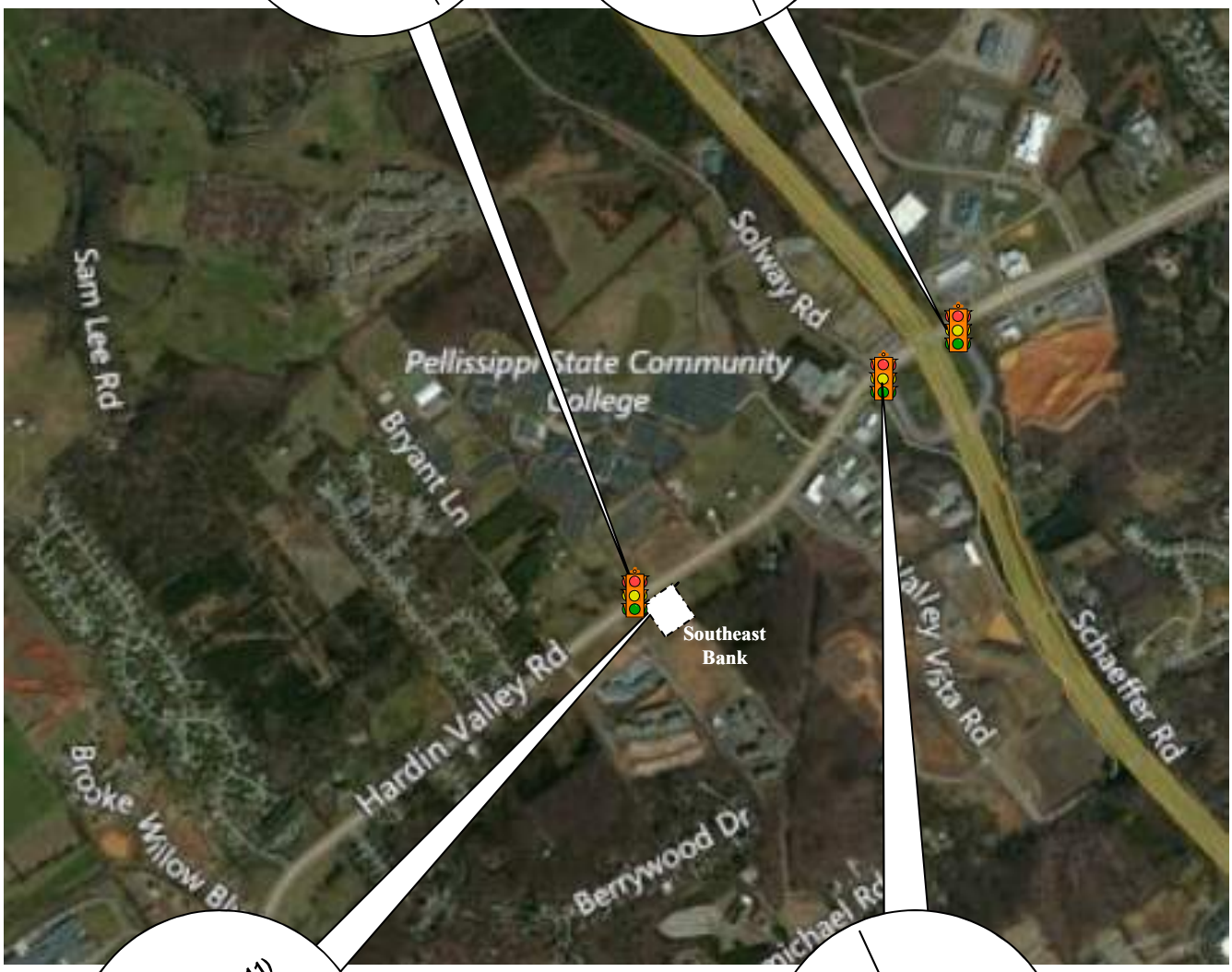
LEGEND

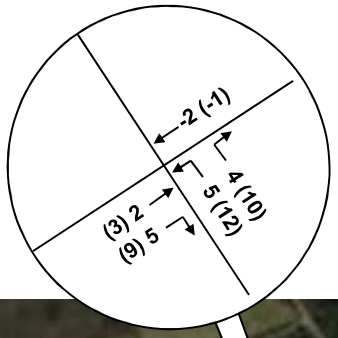
XXX AM PEAK

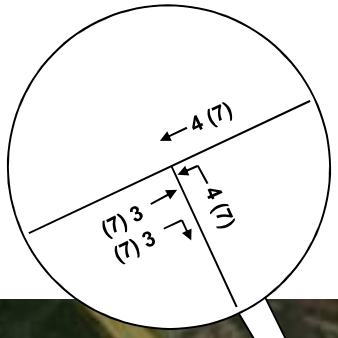
(XXX) PM PEAK

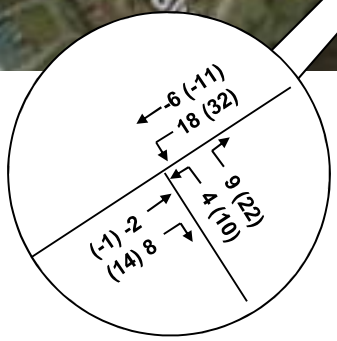
SOUTHEAST BANK TRIPS

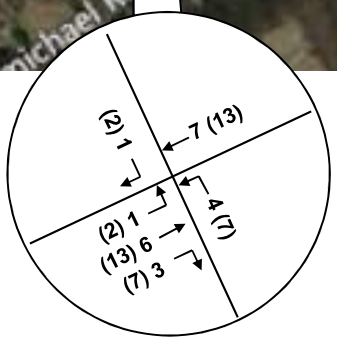
Hardin Valley Properties











N

LEGEND

XXX AM PEAK

(XXX) PM PEAK

RIGHT-TURN LANE VOLUME THRESHOLDS FOR TWO-LANE ROADWAYS WITH A PREVAILING SPEED OF 36 TO 45 MPH

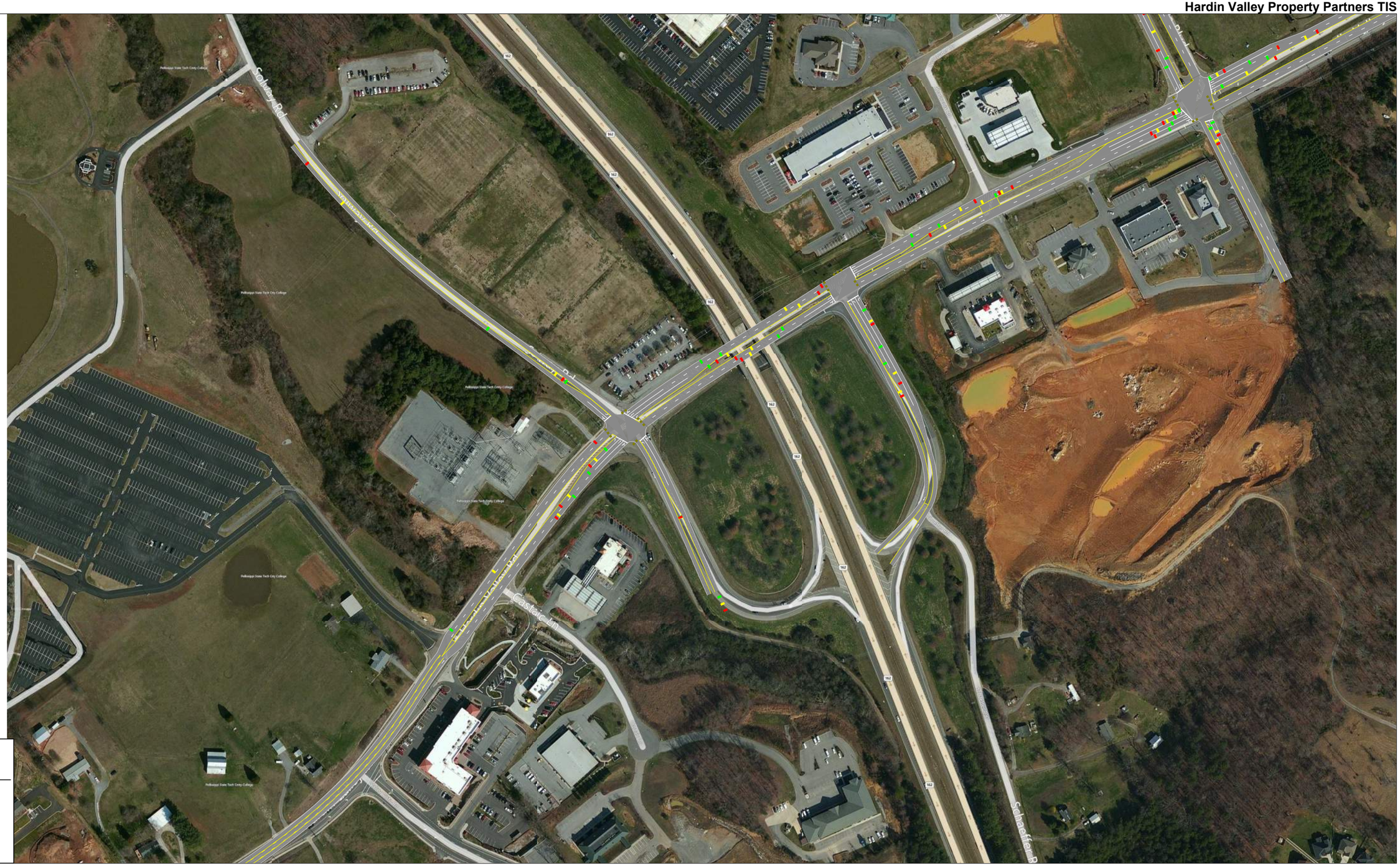
RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	<100	100 - 199	200 - 249	250 - 299	300 - 349	350 - 399
Fewer Than 25 25 - 49 50 - 99						
100 - 149 150 - 199						
200 - 249 250 - 299					Yes	Yes Yes
300 - 349 350 - 399			Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

RIGHT-TURN VOLUME	THROUGH VOLUME PLUS LEFT-TURN VOLUME *					
	350 - 399	400 - 449	450 - 499	500 - 549	550 - 600	+ / > 600
Fewer Than 25 25 - 49 50 - 99	Hardin Valley EB at WEST and EAST Access (AM and PM peak hour)				Yes	Yes Yes
100 - 149 150 - 199		Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
200 - 249 250 - 299	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
300 - 349 350 - 399	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
400 - 449 450 - 499	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
500 - 549 550 - 599	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes
600 or More	Yes	Yes	Yes	Yes	Yes	Yes

* Or through volume only if a left-turn lane exists.

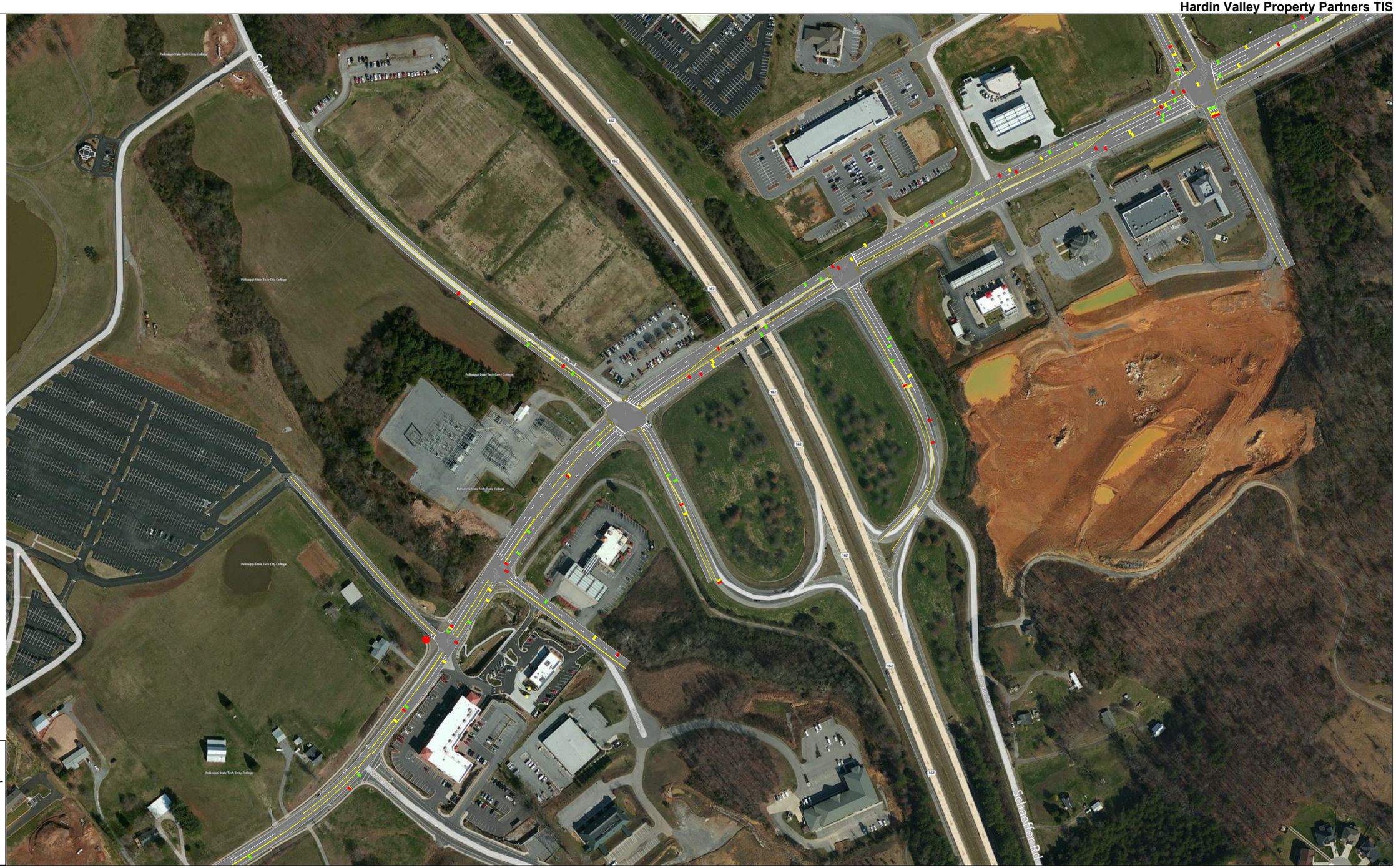
Queue Lengths
All Intervals

Color	Queue Type
	Average
	95th Percentile
	Max Observed



Queue Lengths
All Intervals

Color	Queue Type
	Average
	95th Percentile
	Max Observed



Queue Lengths
All Intervals

Color	Queue Type
	Average
	95th Percentile
	Max Observed

Queue Lengths
All Intervals

Color	Queue Type
	Average
	95th Percentile
	Max Observed

Queue Lengths
All Intervals

Color	Queue Type
	Average
	95th Percentile
	Max Observed


Pellissippi State Tech Cmty College
Solway Rd
Pentwater Dr
162
Queue Lengths
All Intervals
Color Queue Type
Average
95th Percentile
Max Observed

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	815	379	966	723	520
v/c Ratio	0.81	1.12	0.63	1.02	0.53
Control Delay	25.0	97.0	9.8	68.0	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	25.0	97.0	9.8	68.0	11.7
Queue Length 50th (ft)	152	~187	258	~423	140
Queue Length 95th (ft)	168	#241	340	#535	223
Internal Link Dist (ft)	662		399	634	
Turn Bay Length (ft)		150		225	350
Base Capacity (vph)	1001	339	1530	708	973
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.81	1.12	0.63	1.02	0.53

Intersection Summary

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

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	500	170	277	869	578	468
Future Volume (vph)	500	170	277	869	578	468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.0	5.5	5.0	5.0
Lane Util. Factor	*0.95		1.00	*0.85	*0.50	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3410		1770	3167	1770	1583
Flt Permitted	1.00		0.13	1.00	0.95	1.00
Satd. Flow (perm)	3410		244	3167	1770	1583
Peak-hour factor, PHF	0.81	0.86	0.73	0.90	0.80	0.90
Adj. Flow (vph)	617	198	379	966	722	520
RTOR Reduction (vph)	34	0	0	0	0	24
Lane Group Flow (vph)	781	0	379	966	723	496
Turn Type	NA		pm+pt	NA	Prot	pt+ov
Protected Phases	2		1	6	3	3 1
Permitted Phases			6			
Actuated Green, G (s)	25.5		43.5	43.5	36.0	54.0
Effective Green, g (s)	25.5		43.5	43.5	36.0	54.0
Actuated g/C Ratio	0.28		0.48	0.48	0.40	0.60
Clearance Time (s)	5.5		5.0	5.5	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	966		338	1530	708	949
v/s Ratio Prot	0.23		c0.16	0.31	c0.41	0.31
v/s Ratio Perm			c0.38			
v/c Ratio	0.81		1.12	0.63	1.02	0.52
Uniform Delay, d1	30.0		24.2	17.3	27.0	10.5
Progression Factor	0.68		0.49	0.46	1.00	1.00
Incremental Delay, d2	5.3		81.4	1.6	39.3	0.5
Delay (s)	25.6		93.2	9.7	66.3	11.0
Level of Service	C		F	A	E	B
Approach Delay (s)	25.6			33.2	43.2	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	64.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	105	255	110	134	46	1075	484	1376
v/c Ratio	0.40	0.93	0.57	0.40	0.22	0.81	0.94	0.90
Control Delay	32.4	74.4	40.1	12.6	12.4	26.8	46.8	20.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	74.4	40.1	12.6	12.4	26.8	46.8	20.5
Queue Length 50th (ft)	47	128	50	6	9	235	211	~337
Queue Length 95th (ft)	73	#183	71	13	19	265	m#322	m#606
Internal Link Dist (ft)		1172		456		745		662
Turn Bay Length (ft)	75		150		100		175	
Base Capacity (vph)	262	275	193	331	223	1323	534	1537
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.93	0.57	0.40	0.21	0.81	0.91	0.90

Intersection Summary

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

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

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

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	78	104	71	77	7	94	38	465	396	450	1032	106
Future Volume (vph)	78	104	71	77	7	94	38	465	396	450	1032	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	*0.73	
Frt	1.00	0.94		1.00	0.86		1.00	0.93		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1743		1770	1608		1770	3292		1770	2676	
Flt Permitted	0.61	1.00		0.31	1.00		0.13	1.00		0.11	1.00	
Satd. Flow (perm)	1131	1743		587	1608		243	3292		209	2676	
Peak-hour factor, PHF	0.74	0.71	0.65	0.70	0.58	0.77	0.82	0.81	0.79	0.93	0.84	0.72
Adj. Flow (vph)	105	146	109	110	12	122	46	574	501	484	1229	147
RTOR Reduction (vph)	0	29	0	0	105	0	0	171	0	0	7	0
Lane Group Flow (vph)	105	226	0	110	29	0	46	904	0	484	1369	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.5	12.7		17.5	12.7		34.6	30.6		57.5	48.5	
Effective Green, g (s)	17.5	12.7		17.5	12.7		34.6	30.6		57.5	48.5	
Actuated g/C Ratio	0.19	0.14		0.19	0.14		0.38	0.34		0.64	0.54	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	253	245		177	226		161	1119		513	1442	
v/s Ratio Prot	0.02	c0.13		c0.03	0.02		0.01	0.27		c0.23	c0.51	
v/s Ratio Perm	0.06			0.09			0.10			0.37		
v/c Ratio	0.42	0.92		0.62	0.13		0.29	0.81		0.94	0.95	
Uniform Delay, d1	31.1	38.2		31.5	33.8		20.5	27.0		25.3	19.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.11	0.64	
Incremental Delay, d2	1.1	36.8		6.6	0.3		1.0	6.3		20.0	10.7	
Delay (s)	32.2	75.0		38.1	34.1		21.5	33.3		48.0	23.3	
Level of Service	C	E		D	C		C	C		D	C	
Approach Delay (s)		62.5			35.9			32.8			29.7	
Approach LOS		E			D			C			C	

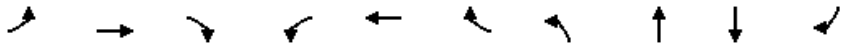
Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Traffic Volume (veh/h)	137	863	2	26	772	168	18	1	15	3	3	72
Future Volume (Veh/h)	137	863	2	26	772	168	18	1	15	3	3	72
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.45	0.45	0.45	0.75	0.75	0.75
Hourly flow rate (vph)	152	959	2	30	898	195	40	2	33	4	4	96
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1093			961			2319	2223	898	2238	2416	959
vC1, stage 1 conf vol							958	958		1263	1263	
vC2, stage 2 conf vol							1361	1265		976	1153	
vCu, unblocked vol	1093			961			2319	2223	898	2238	2416	959
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	76			96			35	99	90	95	96	69
cM capacity (veh/h)	638			716			62	136	338	89	93	312

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SE 1	NW 1	NW 2
Volume Total	152	959	2	30	898	195	75	4	100
Volume Left	152	0	0	30	0	0	40	4	0
Volume Right	0	0	2	0	0	195	33	0	96
cSH	638	1700	1700	716	1700	1700	116	89	285
Volume to Capacity	0.24	0.56	0.00	0.04	0.53	0.11	0.64	0.05	0.35
Queue Length 95th (ft)	23	0	0	3	0	0	83	3	38
Control Delay (s)	12.4	0.0	0.0	10.2	0.0	0.0	80.3	47.5	24.3
Lane LOS	B			B			F	E	C
Approach Delay (s)	1.7			0.3			80.3	25.2	
Approach LOS							F	D	

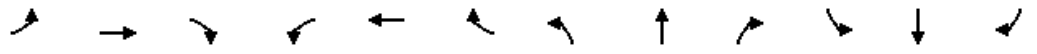
Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	66.5%	ICU Level of Service		C
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	152	959	2	30	898	195	4	100	42	33
v/c Ratio	0.38	0.68	0.00	0.07	0.68	0.17	0.03	0.44	0.43	0.17
Control Delay	4.4	9.7	0.0	0.7	3.8	0.3	38.3	15.8	52.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	9.7	0.0	0.7	3.8	0.3	38.3	15.8	52.9	5.9
Queue Length 50th (ft)	12	275	0	0	48	0	2	2	23	0
Queue Length 95th (ft)	20	421	0	m1	m65	m1	10	31	27	0
Internal Link Dist (ft)		1070			757			556	653	
Turn Bay Length (ft)	100		200	100		100	100			100
Base Capacity (vph)	403	1407	1211	400	1324	1169	120	229	98	196
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.68	0.00	0.07	0.68	0.17	0.03	0.44	0.43	0.17

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	863	2	26	772	168	3	3	72	18	1	15
Future Volume (vph)	137	863	2	26	772	168	3	3	72	18	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.86			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1595			1778	1583
Flt Permitted	0.21	1.00	1.00	0.21	1.00	1.00	0.73	1.00			0.60	1.00
Satd. Flow (perm)	392	1863	1583	396	1863	1583	1359	1595			1111	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.86	0.86	0.86	0.75	0.75	0.75	0.45	0.45	0.45
Adj. Flow (vph)	152	959	2	30	898	195	4	4	96	40	2	33
RTOR Reduction (vph)	0	0	1	0	0	43	0	87	0	0	0	30
Lane Group Flow (vph)	152	959	1	30	898	152	4	13	0	0	42	3
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	72.4	66.4	66.4	67.6	64.0	64.0	8.0	8.0			8.0	8.0
Effective Green, g (s)	72.4	66.4	66.4	67.6	64.0	64.0	8.0	8.0			8.0	8.0
Actuated g/C Ratio	0.80	0.74	0.74	0.75	0.71	0.71	0.09	0.09			0.09	0.09
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	407	1374	1167	352	1324	1125	120	141			98	140
v/s Ratio Prot	c0.02	c0.51		0.00	0.48			0.01				
v/s Ratio Perm	0.28		0.00	0.06		0.10	0.00				c0.04	0.00
v/c Ratio	0.37	0.70	0.00	0.09	0.68	0.13	0.03	0.09			0.43	0.02
Uniform Delay, d1	6.2	6.4	3.1	5.3	7.3	4.2	37.5	37.7			38.8	37.4
Progression Factor	1.00	1.00	1.00	0.33	0.32	0.10	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.6	3.0	0.0	0.0	1.3	0.1	0.5	1.2			13.1	0.3
Delay (s)	6.8	9.3	3.1	1.8	3.6	0.5	38.0	38.9			51.9	37.7
Level of Service	A	A	A	A	A	A	D	D			D	D
Approach Delay (s)		9.0			3.0			38.9			45.7	
Approach LOS		A			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service		A	
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	90.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	68.1%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	984	263	1233	649	163
v/c Ratio	0.69	0.75	0.67	0.88	0.20
Control Delay	22.3	43.0	17.1	50.1	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	22.3	43.0	17.1	50.1	9.9
Queue Length 50th (ft)	277	134	223	326	39
Queue Length 95th (ft)	341	221	321	383	71
Internal Link Dist (ft)	662		399	634	
Turn Bay Length (ft)		150		225	350
Base Capacity (vph)	1419	387	1853	815	845
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.69	0.68	0.67	0.80	0.19

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	683	108	237	1085	545	153
Future Volume (vph)	683	108	237	1085	545	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.0	5.5	5.0	5.0
Lane Util. Factor	0.95		1.00	*0.85	*0.65	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3442		1770	3167	2300	1583
Flt Permitted	1.00		0.14	1.00	0.95	1.00
Satd. Flow (perm)	3442		261	3167	2300	1583
Peak-hour factor, PHF	0.85	0.60	0.90	0.88	0.84	0.94
Adj. Flow (vph)	804	180	263	1233	649	163
RTOR Reduction (vph)	16	0	0	0	0	27
Lane Group Flow (vph)	968	0	263	1233	649	136
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases			6			3
Actuated Green, G (s)	44.8		64.4	64.4	35.1	49.7
Effective Green, g (s)	44.8		64.4	64.4	35.1	49.7
Actuated g/C Ratio	0.41		0.59	0.59	0.32	0.45
Clearance Time (s)	5.5		5.0	5.5	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1401		353	1854	733	787
v/s Ratio Prot	0.28		0.10	c0.39	c0.28	0.02
v/s Ratio Perm			c0.34			0.06
v/c Ratio	0.69		0.75	0.67	0.89	0.17
Uniform Delay, d1	26.9		17.2	15.5	35.5	17.9
Progression Factor	0.72		1.86	0.93	1.00	1.00
Incremental Delay, d2	2.1		7.9	1.8	12.4	0.1
Delay (s)	21.5		39.9	16.1	47.9	18.0
Level of Service	C		D	B	D	B
Approach Delay (s)	21.5			20.3	41.9	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	176	184	199	308	93	800	551	1186
v/c Ratio	0.77	0.84	0.93	0.71	0.53	0.65	0.89	0.87
Control Delay	59.0	72.9	85.1	15.8	32.7	27.9	34.5	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	72.9	85.1	15.8	32.7	27.9	34.5	23.3
Queue Length 50th (ft)	104	113	120	5	21	210	241	429
Queue Length 95th (ft)	139	#228	#171	0	31	285	#392	#655
Internal Link Dist (ft)		1172		456		736		662
Turn Bay Length (ft)	75		150		100		175	
Base Capacity (vph)	228	227	214	440	180	1239	671	1371
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.81	0.93	0.70	0.52	0.65	0.82	0.87

Intersection Summary

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

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	132	101	64	157	4	267	57	432	231	479	849	212
Future Volume (vph)	132	101	64	157	4	267	57	432	231	479	849	212
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	*0.65	
Frt	1.00	0.94		1.00	0.85		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1755		1770	1591		1770	3320		1770	2335	
Flt Permitted	0.32	1.00		0.36	1.00		0.11	1.00		0.17	1.00	
Satd. Flow (perm)	596	1755		665	1591		199	3320		312	2335	
Peak-hour factor, PHF	0.75	0.89	0.90	0.79	0.50	0.89	0.61	0.92	0.70	0.87	0.94	0.75
Adj. Flow (vph)	176	113	71	199	8	300	93	470	330	551	903	283
RTOR Reduction (vph)	0	20	0	0	269	0	0	108	0	0	14	0
Lane Group Flow (vph)	176	164	0	199	39	0	93	692	0	551	1172	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.5	12.5		20.5	11.5		43.1	37.5		73.5	62.9	
Effective Green, g (s)	22.5	12.5		20.5	11.5		43.1	37.5		73.5	62.9	
Actuated g/C Ratio	0.20	0.11		0.19	0.10		0.39	0.34		0.67	0.57	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	228	199		214	166		157	1131		619	1335	
v/s Ratio Prot	0.07	0.09		c0.08	0.02		0.03	0.21		c0.25	0.50	
v/s Ratio Perm	0.09			c0.10			0.20			c0.34		
v/c Ratio	0.77	0.82		0.93	0.24		0.59	0.61		0.89	0.88	
Uniform Delay, d1	39.0	47.7		42.3	45.2		23.4	30.2		24.4	20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.98	0.86	
Incremental Delay, d2	14.9	23.1		41.8	0.7		5.9	2.5		11.0	6.0	
Delay (s)	53.9	70.8		84.1	46.0		29.3	32.7		34.8	23.4	
Level of Service	D	E		F	D		C	C		C	C	
Approach Delay (s)		62.5			60.9			32.3			27.0	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	701	9	40	568	68	2	1	47	133	2	68
Future Volume (Veh/h)	21	701	9	40	568	68	2	1	47	133	2	68
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.89	0.89	0.89	0.74	0.74	0.74	0.60	0.60	0.60
Hourly flow rate (vph)	28	935	12	45	638	76	3	1	64	222	3	113
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	714			947			1834	1795	935	1752	1731	638
vC1, stage 1 conf vol							991	991		728	728	
vC2, stage 2 conf vol							842	804		1024	1003	
vCu, unblocked vol	714			947			1834	1795	935	1752	1731	638
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			98	100	80	0	99	76
cM capacity (veh/h)	886			725			177	237	322	160	227	477

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	28	935	12	45	638	76	68	222	116
Volume Left	28	0	0	45	0	0	3	222	0
Volume Right	0	0	12	0	0	76	64	0	113
cSH	886	1700	1700	725	1700	1700	342	160	463
Volume to Capacity	0.03	0.55	0.01	0.06	0.38	0.04	0.20	1.39	0.25
Queue Length 95th (ft)	2	0	0	5	0	0	18	346	24
Control Delay (s)	9.2	0.0	0.0	10.3	0.0	0.0	19.2	263.4	15.3
Lane LOS	A			B			C	F	C
Approach Delay (s)	0.3			0.6			19.2	178.3	
Approach LOS							C	F	

Intersection Summary				
Average Delay	29.1			
Intersection Capacity Utilization	57.6%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	935	12	45	638	76	4	64	222	116
v/c Ratio	0.06	0.78	0.01	0.16	0.51	0.07	0.01	0.17	0.79	0.28
Control Delay	4.1	18.8	0.0	2.0	5.8	1.1	29.0	9.6	55.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	18.8	0.0	2.0	5.8	1.1	29.0	9.6	55.8	8.6
Queue Length 50th (ft)	4	391	0	1	13	0	2	0	121	1
Queue Length 95th (ft)	9	396	0	m2	m199	m4	9	21	123	11
Internal Link Dist (ft)		1234			758		386			790
Turn Bay Length (ft)	100		200	100		100		100	100	
Base Capacity (vph)	495	1200	1042	275	1241	1075	331	367	281	408
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.78	0.01	0.16	0.51	0.07	0.01	0.17	0.79	0.28

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	701	9	40	568	68	2	1	47	133	2	68
Future Volume (vph)	21	701	9	40	568	68	2	1	47	133	2	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1795	1583	1770	1591	
Flt Permitted	0.33	1.00	1.00	0.13	1.00	1.00		0.89	1.00	0.76	1.00	
Satd. Flow (perm)	611	1863	1583	249	1863	1583		1656	1583	1407	1591	
Peak-hour factor, PHF	0.75	0.75	0.75	0.89	0.89	0.89	0.74	0.74	0.74	0.60	0.60	0.60
Adj. Flow (vph)	28	935	12	45	638	76	3	1	64	222	3	113
RTOR Reduction (vph)	0	0	4	0	0	22	0	0	51	0	90	0
Lane Group Flow (vph)	28	935	8	45	638	54	0	4	13	222	26	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		
Actuated Green, G (s)	58.8	56.4	56.4	61.2	57.6	57.6		18.0	18.0	18.0	18.0	
Effective Green, g (s)	58.8	56.4	56.4	61.2	57.6	57.6		18.0	18.0	18.0	18.0	
Actuated g/C Ratio	0.65	0.63	0.63	0.68	0.64	0.64		0.20	0.20	0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	430	1167	992	230	1192	1013		331	316	281	318	
v/s Ratio Prot	0.00	c0.50		c0.01	0.34						0.02	
v/s Ratio Perm	0.04		0.00	0.12		0.03		0.00	0.01	c0.16		
v/c Ratio	0.07	0.80	0.01	0.20	0.54	0.05		0.01	0.04	0.79	0.08	
Uniform Delay, d1	6.4	12.6	6.3	11.5	8.9	6.0		28.9	29.0	34.2	29.3	
Progression Factor	1.00	1.00	1.00	0.39	0.59	0.37		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	5.8	0.0	0.2	0.7	0.0		0.1	0.2	19.9	0.5	
Delay (s)	6.5	18.4	6.3	4.6	5.9	2.3		28.9	29.3	54.1	29.8	
Level of Service	A	B	A	A	A	A		C	C	D	C	
Approach Delay (s)		17.9			5.5			29.3			45.8	
Approach LOS		B			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	978	362	1225	698	672
v/c Ratio	0.98	0.96	0.77	1.01	0.69
Control Delay	41.7	53.6	8.2	68.9	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.7	53.6	8.2	68.9	17.1
Queue Length 50th (ft)	227	132	284	~449	254
Queue Length 95th (ft)	m#389	#352	249	#691	389
Internal Link Dist (ft)	662		399	634	
Turn Bay Length (ft)		150		225	350
Base Capacity (vph)	1000	376	1599	690	976
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.98	0.96	0.77	1.01	0.69

Intersection Summary

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

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

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	708	191	333	1127	642	618
Future Volume (vph)	708	191	333	1127	642	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.0	5.5	5.0	5.0
Lane Util. Factor	0.95		1.00	*0.85	*0.50	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3426		1770	3167	1770	1583
Flt Permitted	1.00		0.12	1.00	0.95	1.00
Satd. Flow (perm)	3426		222	3167	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	770	208	362	1225	698	672
RTOR Reduction (vph)	24	0	0	0	0	12
Lane Group Flow (vph)	954	0	362	1225	698	660
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases			6			3
Actuated Green, G (s)	28.5		50.5	50.5	39.0	56.0
Effective Green, g (s)	28.5		50.5	50.5	39.0	56.0
Actuated g/C Ratio	0.28		0.50	0.50	0.39	0.56
Clearance Time (s)	5.5		5.0	5.5	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	976		375	1599	690	965
v/s Ratio Prot	0.28		c0.16	0.39	c0.39	0.12
v/s Ratio Perm			c0.32			0.30
v/c Ratio	0.98		0.97	0.77	1.01	0.68
Uniform Delay, d1	35.4		28.7	20.0	30.5	15.7
Progression Factor	0.66		0.80	0.28	1.00	1.00
Incremental Delay, d2	17.3		30.0	2.5	37.2	2.0
Delay (s)	40.8		52.9	8.1	67.7	17.7
Level of Service	D		D	A	E	B
Approach Delay (s)	40.8			18.3	43.2	
Approach LOS	D			B	D	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	130	212	96	130	46	1163	596	1497
v/c Ratio	0.62	0.89	0.55	0.49	0.25	0.93	0.98	0.90
Control Delay	48.9	76.0	45.9	15.8	13.1	33.3	56.1	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	76.0	45.9	15.8	13.1	33.3	56.1	18.6
Queue Length 50th (ft)	70	119	51	5	10	324	~336	352
Queue Length 95th (ft)	#133	#268	97	60	m13	#459	m#490	m#783
Internal Link Dist (ft)		1172		456		503		662
Turn Bay Length (ft)	75		150		100		175	
Base Capacity (vph)	208	238	173	283	200	1254	607	1666
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.89	0.55	0.46	0.23	0.93	0.98	0.90

Intersection Summary

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

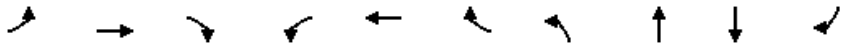
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	120	115	80	88	8	111	42	630	440	548	1243	134
Future Volume (vph)	120	115	80	88	8	111	42	630	440	548	1243	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		*1.00	*0.73	
Frt	1.00	0.94		1.00	0.86		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1748		1770	1603		1770	3321		1770	2680	
Flt Permitted	0.50	1.00		0.36	1.00		0.12	1.00		0.11	1.00	
Satd. Flow (perm)	933	1748		677	1603		226	3321		196	2680	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	125	87	96	9	121	46	685	478	596	1351	146
RTOR Reduction (vph)	0	25	0	0	108	0	0	127	0	0	6	0
Lane Group Flow (vph)	130	187	0	96	22	0	46	1036	0	596	1491	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.2	12.2		15.8	11.0		37.0	33.0		68.0	59.0	
Effective Green, g (s)	18.2	12.2		15.8	11.0		37.0	33.0		68.0	59.0	
Actuated g/C Ratio	0.18	0.12		0.16	0.11		0.37	0.33		0.68	0.59	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	213		159	176		145	1095		605	1581	
v/s Ratio Prot	c0.04	c0.11		0.03	0.01		0.01	0.31		c0.30	0.56	
v/s Ratio Perm	0.07			0.07			0.10			c0.37		
v/c Ratio	0.59	0.88		0.60	0.13		0.32	0.95		0.99	0.94	
Uniform Delay, d1	36.4	43.2		37.7	40.2		23.3	32.6		28.6	19.0	
Progression Factor	1.00	1.00		1.00	1.00		0.98	0.81		1.17	0.65	
Incremental Delay, d2	4.2	31.1		6.3	0.3		1.0	14.2		24.4	8.4	
Delay (s)	40.6	74.3		44.0	40.5		23.8	40.7		57.9	20.7	
Level of Service	D	E		D	D		C	D		E	C	
Approach Delay (s)		61.5			42.0			40.1			31.3	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	164	1157	8	32	1029	201	9	94	23	18
v/c Ratio	0.45	0.77	0.01	0.10	0.73	0.16	0.08	0.45	0.25	0.10
Control Delay	5.3	11.9	0.0	1.0	7.3	0.4	44.5	17.5	50.6	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.3	11.9	0.0	1.0	7.3	0.4	44.5	17.5	50.6	1.2
Queue Length 50th (ft)	13	425	0	1	29	0	5	2	14	0
Queue Length 95th (ft)	21	673	0	m1	m472	m0	21	50	40	0
Internal Link Dist (ft)		725			201			257	457	
Turn Bay Length (ft)	100		200	100		100	100			100
Base Capacity (vph)	381	1512	1295	314	1403	1223	110	211	91	177
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.77	0.01	0.10	0.73	0.16	0.08	0.45	0.25	0.10

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	1064	7	29	947	185	8	3	84	20	1	17
Future Volume (vph)	151	1064	7	29	947	185	8	3	84	20	1	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1592			1778	1583
Flt Permitted	0.17	1.00	1.00	0.15	1.00	1.00	0.74	1.00			0.61	1.00
Satd. Flow (perm)	311	1863	1583	275	1863	1583	1383	1592			1139	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	1157	8	32	1029	201	9	3	91	22	1	18
RTOR Reduction (vph)	0	0	2	0	0	32	0	85	0	0	0	17
Lane Group Flow (vph)	164	1157	6	32	1029	169	9	9	0	0	23	1
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	85.1	78.0	78.0	78.1	74.5	74.5	6.4	6.4			6.4	6.4
Effective Green, g (s)	85.1	78.0	78.0	78.1	74.5	74.5	6.4	6.4			6.4	6.4
Actuated g/C Ratio	0.85	0.78	0.78	0.78	0.74	0.74	0.06	0.06			0.06	0.06
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	368	1453	1234	268	1387	1179	88	101			72	101
v/s Ratio Prot	c0.03	c0.62		0.00	0.55			0.01				
v/s Ratio Perm	0.35		0.00	0.09		0.11	0.01				c0.02	0.00
v/c Ratio	0.45	0.80	0.01	0.12	0.74	0.14	0.10	0.09			0.32	0.01
Uniform Delay, d1	9.3	6.4	2.4	8.0	7.3	3.6	44.1	44.1			44.7	43.8
Progression Factor	1.00	1.00	1.00	0.48	0.68	0.17	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.9	4.6	0.0	0.1	1.7	0.1	0.5	0.4			2.6	0.0
Delay (s)	10.1	11.0	2.4	3.9	6.6	0.7	44.6	44.4			47.3	43.9
Level of Service	B	B	A	A	A	A	D	D			D	D
Approach Delay (s)		10.8			5.6			44.4			45.8	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1160	8	18	1156	4	9
Future Volume (Veh/h)	1160	8	18	1156	4	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1261	9	20	1257	4	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	281					
pX, platoon unblocked			0.23		0.23	0.23
vC, conflicting volume			1270		2562	1266
vC1, stage 1 conf vol					1266	
vC2, stage 2 conf vol					1297	
vCu, unblocked vol			502		6110	483
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			92		96	93
cM capacity (veh/h)			245		114	135

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1270	20	1257	4	10
Volume Left	0	20	0	4	0
Volume Right	9	0	0	0	10
cSH	1700	245	1700	114	135
Volume to Capacity	0.75	0.08	0.74	0.04	0.07
Queue Length 95th (ft)	0	7	0	3	6
Control Delay (s)	0.0	21.0	0.0	37.9	33.9
Lane LOS		C		E	D
Approach Delay (s)	0.0	0.3		35.0	
Approach LOS				E	

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1169	0	0	1174	0	0
Future Volume (Veh/h)	1169	0	0	1174	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1271	0	0	1276	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	889					
pX, platoon unblocked			0.25		0.25	0.25
vC, conflicting volume			1271		2547	1271
vC1, stage 1 conf vol					1271	
vC2, stage 2 conf vol					1276	
vCu, unblocked vol			576		5726	576
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			247		115	128

Direction, Lane #	EB 1	WB 1	WB 2	NW 1	NW 2
Volume Total	1271	0	1276	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.75	0.00	0.75	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS				A	A
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS				A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1162	312	1534	670	240
v/c Ratio	1.00	0.96	0.93	0.99	0.26
Control Delay	41.3	80.8	28.8	67.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	80.8	28.8	67.7	11.8
Queue Length 50th (ft)	~400	189	320	465	74
Queue Length 95th (ft)	m#535	#353	#745	#715	119
Internal Link Dist (ft)	662		399	634	
Turn Bay Length (ft)		150		225	350
Base Capacity (vph)	1162	325	1655	675	913
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.00	0.96	0.93	0.99	0.26

Intersection Summary

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

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

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	936	133	287	1411	616	221
Future Volume (vph)	936	133	287	1411	616	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.0	5.5	5.0	5.0
Lane Util. Factor	0.95		1.00	*0.85	*0.50	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3473		1770	3167	1770	1583
Flt Permitted	1.00		0.10	1.00	0.95	1.00
Satd. Flow (perm)	3473		180	3167	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1017	145	312	1534	670	240
RTOR Reduction (vph)	10	0	0	0	0	8
Lane Group Flow (vph)	1152	0	312	1534	670	232
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases			6			3
Actuated Green, G (s)	36.5		57.5	57.5	42.0	58.0
Effective Green, g (s)	36.5		57.5	57.5	42.0	58.0
Actuated g/C Ratio	0.33		0.52	0.52	0.38	0.53
Clearance Time (s)	5.5		5.0	5.5	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1152		325	1655	675	906
v/s Ratio Prot	0.33		0.14	c0.48	c0.38	0.04
v/s Ratio Perm			c0.36			0.11
v/c Ratio	1.00		0.96	0.93	0.99	0.26
Uniform Delay, d1	36.7		33.1	24.3	33.8	14.2
Progression Factor	0.58		1.50	0.74	1.00	1.00
Incremental Delay, d2	18.4		37.1	9.8	32.6	0.2
Delay (s)	39.8		86.6	27.9	66.5	14.4
Level of Service	D		F	C	E	B
Approach Delay (s)	39.8			37.9	52.7	
Approach LOS	D			D	D	

Intersection Summary			
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	182	204	203	355	74	967	651	1440
v/c Ratio	0.93	0.96	0.96	0.72	0.43	0.91	1.01	0.92
Control Delay	87.9	95.4	91.7	14.1	25.4	43.5	54.9	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.9	95.4	91.7	14.1	25.4	43.5	54.9	27.3
Queue Length 50th (ft)	110	128	124	3	21	325	~422	421
Queue Length 95th (ft)	#214	#276	#238	96	m27	#454	m#492	m#519
Internal Link Dist (ft)		1172		456		503		662
Turn Bay Length (ft)	75		150		100		175	
Base Capacity (vph)	196	213	212	496	180	1058	646	1559
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.96	0.96	0.72	0.41	0.91	1.01	0.92

Intersection Summary

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

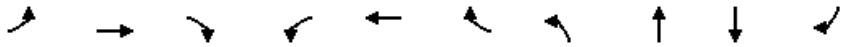
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	167	111	76	187	5	322	68	621	269	599	1057	268
Future Volume (vph)	167	111	76	187	5	322	68	621	269	599	1057	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		*1.00	*0.73	
Frt	1.00	0.94		1.00	0.85		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1749		1770	1587		1770	3379		1770	2637	
Flt Permitted	0.33	1.00		0.31	1.00		0.12	1.00		0.11	1.00	
Satd. Flow (perm)	621	1749		573	1587		226	3379		196	2637	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	121	83	203	5	350	74	675	292	651	1149	291
RTOR Reduction (vph)	0	22	0	0	309	0	0	44	0	0	13	0
Lane Group Flow (vph)	182	182	0	203	46	0	74	923	0	651	1427	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.0	12.0		22.0	13.0		38.5	33.0		74.0	63.5	
Effective Green, g (s)	20.0	12.0		22.0	13.0		38.5	33.0		74.0	63.5	
Actuated g/C Ratio	0.18	0.11		0.20	0.12		0.35	0.30		0.67	0.58	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	196	190		212	187		156	1013		646	1522	
v/s Ratio Prot	0.07	0.10		c0.08	0.03		0.02	0.27		c0.33	0.54	
v/s Ratio Perm	0.10			c0.11			0.14			c0.35		
v/c Ratio	0.93	0.96		0.96	0.25		0.47	0.91		1.01	0.94	
Uniform Delay, d1	43.0	48.7		41.8	44.1		26.5	37.1		30.9	21.4	
Progression Factor	1.00	1.00		1.00	1.00		1.14	0.95		1.10	1.07	
Incremental Delay, d2	44.0	52.2		49.2	0.7		1.6	10.1		22.2	5.0	
Delay (s)	86.9	101.0		91.0	44.8		31.9	45.3		56.1	27.9	
Level of Service	F	F		F	D		C	D		E	C	
Approach Delay (s)		94.4			61.6			44.4			36.7	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	24	984	21	48	791	82	15	68	162	82
v/c Ratio	0.06	0.76	0.02	0.16	0.60	0.07	0.11	0.22	0.80	0.25
Control Delay	3.9	17.4	0.3	2.4	4.5	0.7	40.0	11.5	72.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	17.4	0.3	2.4	4.5	0.7	40.0	11.5	72.1	10.6
Queue Length 50th (ft)	4	462	0	4	113	1	9	1	109	0
Queue Length 95th (ft)	10	669	2	m4	m148	m1	28	39	#205	41
Internal Link Dist (ft)		725			201			257	457	
Turn Bay Length (ft)	100		200	100		100	100			100
Base Capacity (vph)	434	1292	1113	292	1327	1142	156	343	230	354
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.76	0.02	0.16	0.60	0.07	0.10	0.20	0.70	0.23

Intersection Summary

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

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	905	19	44	728	75	14	1	62	147	2	75
Future Volume (vph)	22	905	19	44	728	75	14	1	62	147	2	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1587			1775	1583
Flt Permitted	0.27	1.00	1.00	0.15	1.00	1.00	0.46	1.00			0.68	1.00
Satd. Flow (perm)	495	1863	1583	283	1863	1583	863	1587			1265	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	984	21	48	791	82	15	1	67	160	2	82
RTOR Reduction (vph)	0	0	7	0	0	15	0	56	0	0	0	69
Lane Group Flow (vph)	24	984	14	48	791	67	15	12	0	0	162	13
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	79.2	75.6	75.6	81.6	76.8	76.8	17.6	17.6			17.6	17.6
Effective Green, g (s)	79.2	75.6	75.6	81.6	76.8	76.8	17.6	17.6			17.6	17.6
Actuated g/C Ratio	0.72	0.69	0.69	0.74	0.70	0.70	0.16	0.16			0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	398	1280	1087	274	1300	1105	138	253			202	253
v/s Ratio Prot	0.00	c0.53		c0.01	0.42			0.01				
v/s Ratio Perm	0.04		0.01	0.12		0.04	0.02				c0.13	0.01
v/c Ratio	0.06	0.77	0.01	0.18	0.61	0.06	0.11	0.05			0.80	0.05
Uniform Delay, d1	6.4	11.4	5.4	11.2	8.7	5.2	39.5	39.1			44.5	39.1
Progression Factor	1.00	1.00	1.00	0.52	0.39	0.19	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.1	4.5	0.0	0.1	0.8	0.0	0.3	0.1			20.0	0.1
Delay (s)	6.5	15.9	5.5	5.9	4.2	1.1	39.8	39.2			64.6	39.2
Level of Service	A	B	A	A	A	A	D	D			E	D
Approach Delay (s)		15.5			4.0			39.3			56.0	
Approach LOS		B			A			D			E	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1100	14	32	837	10	22
Future Volume (Veh/h)	1100	14	32	837	10	22
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1196	15	35	910	11	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	281					
pX, platoon unblocked			0.60		0.60	0.60
vC, conflicting volume			1211		2184	1204
vC1, stage 1 conf vol					1204	
vC2, stage 2 conf vol					980	
vCu, unblocked vol			1019		2638	1006
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			91		94	86
cM capacity (veh/h)			409		170	176

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1211	35	910	11	24
Volume Left	0	35	0	11	0
Volume Right	15	0	0	0	24
cSH	1700	409	1700	170	176
Volume to Capacity	0.71	0.09	0.54	0.06	0.14
Queue Length 95th (ft)	0	7	0	5	12
Control Delay (s)	0.0	14.6	0.0	27.6	28.7
Lane LOS		B		D	D
Approach Delay (s)	0.0	0.5		28.4	
Approach LOS				D	

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1122	0	0	869	0	0
Future Volume (Veh/h)	1122	0	0	869	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1220	0	0	945	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	889					
pX, platoon unblocked			0.55		0.55	0.55
vC, conflicting volume			1220		2165	1220
vC1, stage 1 conf vol					1220	
vC2, stage 2 conf vol					945	
vCu, unblocked vol			987		2718	987
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			382		166	164

Direction, Lane #	EB 1	WB 1	WB 2	NW 1	NW 2
Volume Total	1220	0	945	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.72	0.00	0.56	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS				A	A
Approach Delay (s)	0.0	0.0		0.0	
Approach LOS				A	

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1040	362	1274	746	672
v/c Ratio	1.04	1.01	0.81	1.03	0.68
Control Delay	56.1	83.2	11.5	74.5	17.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	83.2	11.5	74.5	17.6
Queue Length 50th (ft)	~352	~170	85	~566	280
Queue Length 95th (ft)	m#458	#392	88	#797	415
Internal Link Dist (ft)	662		399	634	
Turn Bay Length (ft)		150		225	350
Base Capacity (vph)	1004	358	1569	724	988
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.04	1.01	0.81	1.03	0.68

Intersection Summary

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

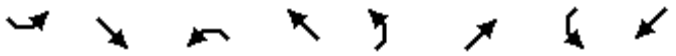
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	737	220	333	1172	686	618
Future Volume (vph)	737	220	333	1172	686	618
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.0	5.5	5.0	5.0
Lane Util. Factor	0.95		1.00	*0.85	*0.50	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3417		1770	3167	1770	1583
Flt Permitted	1.00		0.11	1.00	0.95	1.00
Satd. Flow (perm)	3417		204	3167	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	801	239	362	1274	746	672
RTOR Reduction (vph)	26	0	0	0	0	11
Lane Group Flow (vph)	1014	0	362	1274	746	661
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases			6			3
Actuated Green, G (s)	31.5		54.5	54.5	45.0	63.0
Effective Green, g (s)	31.5		54.5	54.5	45.0	63.0
Actuated g/C Ratio	0.29		0.50	0.50	0.41	0.57
Clearance Time (s)	5.5		5.0	5.5	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	978		357	1569	724	978
v/s Ratio Prot	0.30		c0.17	0.40	c0.42	0.11
v/s Ratio Perm			c0.34			0.31
v/c Ratio	1.04		1.01	0.81	1.03	0.68
Uniform Delay, d1	39.2		33.4	23.4	32.5	16.4
Progression Factor	0.62		1.32	0.33	1.00	1.00
Incremental Delay, d2	31.5		45.2	3.6	41.5	1.9
Delay (s)	55.9		89.4	11.3	74.0	18.3
Level of Service	E		F	B	E	B
Approach Delay (s)	55.9			28.6	47.6	
Approach LOS	E			C	D	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



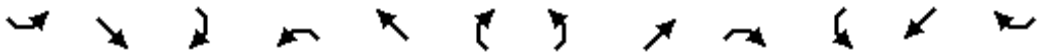
Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	130	220	145	130	53	1258	596	1594
v/c Ratio	0.63	1.03	0.88	0.48	0.31	0.95	1.02	0.96
Control Delay	52.7	111.9	86.8	16.6	18.8	41.4	68.3	25.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.7	111.9	86.8	16.6	18.8	41.4	68.3	25.7
Queue Length 50th (ft)	79	~147	89	6	12	413	~399	433
Queue Length 95th (ft)	#141	#303	#170	63	m17	#562	m#528	m#901
Internal Link Dist (ft)		1172		456		503		662
Turn Bay Length (ft)	75		150		100		175	
Base Capacity (vph)	207	214	164	269	180	1318	582	1655
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	1.03	0.88	0.48	0.29	0.95	1.02	0.96

Intersection Summary

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

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

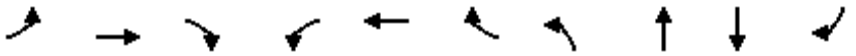
m Volume for 95th percentile queue is metered by upstream signal.



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	120	115	87	133	8	111	49	688	469	548	1332	134
Future Volume (vph)	120	115	87	133	8	111	49	688	469	548	1332	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		*1.00	*0.73	
Frt	1.00	0.94		1.00	0.86		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1742		1770	1603		1770	3324		1770	2682	
Flt Permitted	0.47	1.00		0.36	1.00		0.10	1.00		0.09	1.00	
Satd. Flow (perm)	867	1742		677	1603		186	3324		166	2682	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	130	125	95	145	9	121	53	748	510	596	1448	146
RTOR Reduction (vph)	0	25	0	0	109	0	0	110	0	0	5	0
Lane Group Flow (vph)	130	195	0	145	21	0	53	1148	0	596	1589	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.0	12.0		17.0	11.0		45.3	40.0		77.0	66.7	
Effective Green, g (s)	19.0	12.0		17.0	11.0		45.3	40.0		77.0	66.7	
Actuated g/C Ratio	0.17	0.11		0.15	0.10		0.41	0.36		0.70	0.61	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	190		164	160		152	1208		582	1626	
v/s Ratio Prot	0.04	c0.11		c0.05	0.01		0.02	0.35		c0.30	0.59	
v/s Ratio Perm	0.07			0.09			0.13			c0.42		
v/c Ratio	0.63	1.03		0.88	0.13		0.35	0.95		1.02	0.98	
Uniform Delay, d1	40.8	49.0		44.8	45.1		25.4	34.0		33.0	20.9	
Progression Factor	1.00	1.00		1.00	1.00		1.16	0.89		1.13	0.70	
Incremental Delay, d2	5.8	72.4		38.8	0.4		1.2	14.7		33.6	11.9	
Delay (s)	46.6	121.4		83.6	45.5		30.7	45.1		70.9	26.6	
Level of Service	D	F		F	D		C	D		E	C	
Approach Delay (s)		93.6			65.6			44.6			38.6	
Approach LOS		F			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		

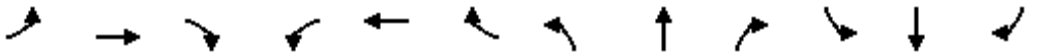
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	164	1229	8	32	1083	201	9	94	23	18
v/c Ratio	0.47	0.80	0.01	0.11	0.75	0.16	0.09	0.47	0.28	0.11
Control Delay	5.7	12.7	0.0	1.1	9.0	0.7	49.9	19.2	57.4	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	12.7	0.0	1.1	9.0	0.7	49.9	19.2	57.4	1.4
Queue Length 50th (ft)	13	503	0	1	347	6	6	2	16	0
Queue Length 95th (ft)	21	792	0	m1	m607	m9	23	53	43	1
Internal Link Dist (ft)		725			201			257	457	
Turn Bay Length (ft)	100		200	100		100	100			100
Base Capacity (vph)	375	1544	1321	280	1441	1251	100	200	82	161
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.80	0.01	0.11	0.75	0.16	0.09	0.47	0.28	0.11

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	151	1131	7	29	996	185	8	3	84	20	1	17
Future Volume (vph)	151	1131	7	29	996	185	8	3	84	20	1	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1592			1778	1583
Flt Permitted	0.16	1.00	1.00	0.13	1.00	1.00	0.74	1.00			0.61	1.00
Satd. Flow (perm)	292	1863	1583	239	1863	1583	1383	1592			1139	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	164	1229	8	32	1083	201	9	3	91	22	1	18
RTOR Reduction (vph)	0	0	2	0	0	27	0	86	0	0	0	17
Lane Group Flow (vph)	164	1229	6	32	1083	174	9	8	0	0	23	1
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	95.3	88.0	88.0	87.9	84.3	84.3	6.4	6.4			6.4	6.4
Effective Green, g (s)	95.3	88.0	88.0	87.9	84.3	84.3	6.4	6.4			6.4	6.4
Actuated g/C Ratio	0.87	0.80	0.80	0.80	0.77	0.77	0.06	0.06			0.06	0.06
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	351	1490	1266	241	1427	1213	80	92			66	92
v/s Ratio Prot	c0.03	c0.66		0.00	0.58			0.01				
v/s Ratio Perm	0.37		0.00	0.10		0.11	0.01				c0.02	0.00
v/c Ratio	0.47	0.82	0.01	0.13	0.76	0.14	0.11	0.09			0.35	0.01
Uniform Delay, d1	10.9	6.5	2.2	10.0	7.2	3.4	49.1	49.0			49.8	48.8
Progression Factor	1.00	1.00	1.00	0.42	0.81	0.30	1.00	1.00			1.00	1.00
Incremental Delay, d2	1.0	5.3	0.0	0.1	2.3	0.1	0.6	0.4			3.2	0.0
Delay (s)	11.9	11.8	2.2	4.3	8.1	1.2	49.7	49.5			53.0	48.9
Level of Service	B	B	A	A	A	A	D	D			D	D
Approach Delay (s)		11.8			7.0			49.5			51.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1163	72	110	1164	42	65
Future Volume (Veh/h)	1163	72	110	1164	42	65
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1264	78	120	1265	46	71
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	281					
pX, platoon unblocked			0.21		0.21	0.21
vC, conflicting volume			1342		2808	1303
vC1, stage 1 conf vol					1303	
vC2, stage 2 conf vol					1505	
vCu, unblocked vol			743		7770	556
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			33		16	36
cM capacity (veh/h)			180		55	111

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1342	120	1265	46	71
Volume Left	0	120	0	46	0
Volume Right	78	0	0	0	71
cSH	1700	180	1700	55	111
Volume to Capacity	0.79	0.67	0.74	0.84	0.64
Queue Length 95th (ft)	0	98	0	91	81
Control Delay (s)	0.0	57.6	0.0	195.0	82.9
Lane LOS		F		F	F
Approach Delay (s)	0.0	5.0		126.9	
Approach LOS				F	

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1179	50	98	1218	56	83
Future Volume (Veh/h)	1179	50	98	1218	56	83
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1282	54	107	1324	61	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	889					
pX, platoon unblocked			0.23		0.23	0.23
vC, conflicting volume			1336		2847	1309
vC1, stage 1 conf vol					1309	
vC2, stage 2 conf vol					1538	
vCu, unblocked vol			779		7421	660
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			44		4	15
cM capacity (veh/h)			191		64	105

Direction, Lane #	EB 1	WB 1	WB 2	NW 1	NW 2
Volume Total	1336	107	1324	61	90
Volume Left	0	107	0	61	0
Volume Right	54	0	0	0	90
cSH	1700	191	1700	64	105
Volume to Capacity	0.79	0.56	0.78	0.96	0.85
Queue Length 95th (ft)	0	75	0	115	123
Control Delay (s)	0.0	45.7	0.0	207.4	125.8
Lane LOS		E		F	F
Approach Delay (s)	0.0	3.4		158.8	
Approach LOS				F	

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1264	312	1566	702	240
v/c Ratio	1.06	1.01	0.95	1.04	0.27
Control Delay	56.2	93.5	31.3	79.8	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	93.5	31.3	79.8	12.5
Queue Length 50th (ft)	~502	~190	331	~536	77
Queue Length 95th (ft)	m#529	#365	#772	#763	123
Internal Link Dist (ft)	662		399	634	
Turn Bay Length (ft)		150		225	350
Base Capacity (vph)	1192	309	1655	675	898
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.06	1.01	0.95	1.04	0.27

Intersection Summary

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

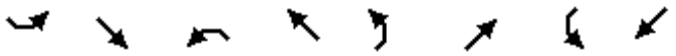
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	983	180	287	1441	646	221
Future Volume (vph)	983	180	287	1441	646	221
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5		5.0	5.5	5.0	5.0
Lane Util. Factor	0.95		1.00	*0.85	*0.50	1.00
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3457		1770	3167	1770	1583
Flt Permitted	1.00		0.09	1.00	0.95	1.00
Satd. Flow (perm)	3457		175	3167	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1068	196	312	1566	702	240
RTOR Reduction (vph)	14	0	0	0	0	7
Lane Group Flow (vph)	1250	0	312	1566	702	233
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	2		1	6	3	1
Permitted Phases			6			3
Actuated Green, G (s)	37.5		57.5	57.5	42.0	57.0
Effective Green, g (s)	37.5		57.5	57.5	42.0	57.0
Actuated g/C Ratio	0.34		0.52	0.52	0.38	0.52
Clearance Time (s)	5.5		5.0	5.5	5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1178		308	1655	675	892
v/s Ratio Prot	0.36		0.14	c0.49	c0.40	0.04
v/s Ratio Perm			c0.39			0.11
v/c Ratio	1.06		1.01	0.95	1.04	0.26
Uniform Delay, d1	36.2		33.8	24.8	34.0	14.8
Progression Factor	0.55		1.48	0.74	1.00	1.00
Incremental Delay, d2	34.9		52.8	11.9	45.5	0.2
Delay (s)	54.8		102.8	30.3	79.5	14.9
Level of Service	D		F	C	E	B
Approach Delay (s)	54.8			42.3	63.0	
Approach LOS	D			D	E	

Intersection Summary			
HCM 2000 Control Delay	51.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



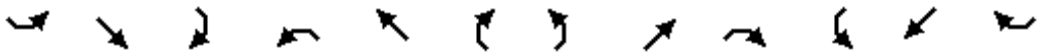
Lane Group	SEL	SET	NWL	NWT	NEL	NET	SWL	SWT
Lane Group Flow (vph)	182	210	236	355	80	1119	651	1504
v/c Ratio	0.86	0.98	0.97	0.70	0.46	1.06	1.06	0.99
Control Delay	71.3	100.6	88.4	13.3	27.0	76.4	69.8	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.3	100.6	88.4	13.3	27.0	76.4	69.8	36.9
Queue Length 50th (ft)	107	132	144	3	21	~440	~459	~514
Queue Length 95th (ft)	#202	#285	#273	95	m27	#578	m#486	m#606
Internal Link Dist (ft)		1172		456		503		662
Turn Bay Length (ft)	75		150		100		175	
Base Capacity (vph)	212	214	244	507	180	1058	614	1512
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.98	0.97	0.70	0.44	1.06	1.06	0.99

Intersection Summary

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

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

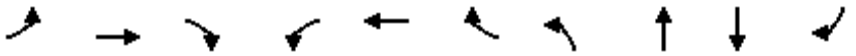
m Volume for 95th percentile queue is metered by upstream signal.



Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	167	111	82	217	5	322	74	714	316	599	1116	268
Future Volume (vph)	167	111	82	217	5	322	74	714	316	599	1116	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		*1.00	*0.73	
Frt	1.00	0.94		1.00	0.85		1.00	0.95		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1744		1770	1587		1770	3376		1770	2641	
Flt Permitted	0.33	1.00		0.29	1.00		0.12	1.00		0.11	1.00	
Satd. Flow (perm)	621	1744		532	1587		226	3376		196	2641	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	182	121	89	236	5	350	80	776	343	651	1213	291
RTOR Reduction (vph)	0	24	0	0	305	0	0	46	0	0	12	0
Lane Group Flow (vph)	182	186	0	236	50	0	80	1074	0	651	1492	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.0	12.0		25.0	14.0		38.5	33.0		72.0	61.5	
Effective Green, g (s)	21.0	12.0		25.0	14.0		38.5	33.0		72.0	61.5	
Actuated g/C Ratio	0.19	0.11		0.23	0.13		0.35	0.30		0.65	0.56	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	212	190		244	201		156	1012		614	1476	
v/s Ratio Prot	0.07	0.11		c0.10	0.03		0.03	0.32		c0.33	0.56	
v/s Ratio Perm	0.09			c0.12			0.15			c0.37		
v/c Ratio	0.86	0.98		0.97	0.25		0.51	1.06		1.06	1.01	
Uniform Delay, d1	41.3	48.9		39.8	43.2		28.3	38.5		31.7	24.2	
Progression Factor	1.00	1.00		1.00	1.00		1.11	0.95		1.09	1.06	
Incremental Delay, d2	27.4	58.4		47.9	0.6		2.4	43.7		37.4	15.0	
Delay (s)	68.7	107.3		87.7	43.9		33.7	80.4		71.9	40.6	
Level of Service	E	F		F	D		C	F		E	D	
Approach Delay (s)		89.4			61.4			77.3			50.1	
Approach LOS		F			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	62.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

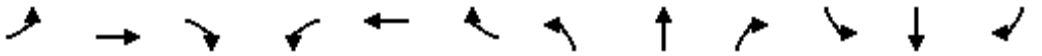
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	25	1036	21	48	862	82	15	68	162	82
v/c Ratio	0.06	0.80	0.02	0.18	0.65	0.07	0.11	0.22	0.82	0.26
Control Delay	3.7	18.7	0.3	3.0	6.5	0.9	40.9	11.8	75.7	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.7	18.7	0.3	3.0	6.5	0.9	40.9	11.8	75.7	10.8
Queue Length 50th (ft)	4	503	0	4	182	1	9	1	110	0
Queue Length 95th (ft)	10	736	2	m5	m214	m1	29	39	#213	42
Internal Link Dist (ft)		725			201			257	457	
Turn Bay Length (ft)	100		200	100		100	100			100
Base Capacity (vph)	390	1301	1120	261	1334	1148	146	329	218	341
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.80	0.02	0.18	0.65	0.07	0.10	0.21	0.74	0.24

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	953	19	44	793	75	14	1	62	147	2	75
Future Volume (vph)	23	953	19	44	793	75	14	1	62	147	2	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1587			1775	1583
Flt Permitted	0.23	1.00	1.00	0.13	1.00	1.00	0.46	1.00			0.68	1.00
Satd. Flow (perm)	429	1863	1583	238	1863	1583	852	1587			1265	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	1036	21	48	862	82	15	1	67	160	2	82
RTOR Reduction (vph)	0	0	6	0	0	15	0	57	0	0	0	69
Lane Group Flow (vph)	25	1036	15	48	862	67	15	11	0	0	162	13
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	79.6	76.0	76.0	82.0	77.2	77.2	17.2	17.2			17.2	17.2
Effective Green, g (s)	79.6	76.0	76.0	82.0	77.2	77.2	17.2	17.2			17.2	17.2
Actuated g/C Ratio	0.72	0.69	0.69	0.75	0.70	0.70	0.16	0.16			0.16	0.16
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	354	1287	1093	244	1307	1110	133	248			197	247
v/s Ratio Prot	0.00	c0.56		c0.01	0.46			0.01				
v/s Ratio Perm	0.05		0.01	0.14		0.04	0.02				c0.13	0.01
v/c Ratio	0.07	0.80	0.01	0.20	0.66	0.06	0.11	0.05			0.82	0.05
Uniform Delay, d1	7.2	11.8	5.3	13.0	9.1	5.1	39.8	39.4			44.9	39.5
Progression Factor	1.00	1.00	1.00	0.60	0.50	0.26	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.1	5.4	0.0	0.2	1.6	0.1	0.4	0.1			23.3	0.1
Delay (s)	7.3	17.3	5.3	8.0	6.2	1.4	40.2	39.5			68.2	39.6
Level of Service	A	B	A	A	A	A	D	D			E	D
Approach Delay (s)		16.8			5.9			39.6			58.6	
Approach LOS		B			A			D			E	

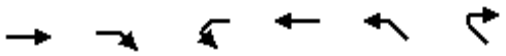
Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1102	60	84	845	65	135
Future Volume (Veh/h)	1102	60	84	845	65	135
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1198	65	91	918	71	147
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	281					
pX, platoon unblocked			0.32		0.32	0.32
vC, conflicting volume			1263		2330	1230
vC1, stage 1 conf vol					1230	
vC2, stage 2 conf vol					1100	
vCu, unblocked vol			760		4093	659
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			67		41	1
cM capacity (veh/h)			273		120	149

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2
Volume Total	1263	91	918	71	147
Volume Left	0	91	0	71	0
Volume Right	65	0	0	0	147
cSH	1700	273	1700	120	149
Volume to Capacity	0.74	0.33	0.54	0.59	0.99
Queue Length 95th (ft)	0	35	0	73	183
Control Delay (s)	0.0	24.7	0.0	70.9	130.7
Lane LOS		C		F	F
Approach Delay (s)	0.0	2.2		111.2	
Approach LOS				F	

Intersection Summary			
Average Delay	10.6		
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations						
Traffic Volume (veh/h)	1193	44	85	880	49	72
Future Volume (Veh/h)	1193	44	85	880	49	72
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1297	48	92	957	53	78
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			TWLTL		
Median storage veh)	2			2		
Upstream signal (ft)	889					
pX, platoon unblocked			0.50		0.50	0.50
vC, conflicting volume			1345		2462	1321
vC1, stage 1 conf vol					1321	
vC2, stage 2 conf vol					1141	
vCu, unblocked vol			1187		3442	1139
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)			2.2		3.5	3.3
p0 queue free %			68		53	36
cM capacity (veh/h)			291		114	121

Direction, Lane #	EB 1	WB 1	WB 2	NW 1	NW 2
Volume Total	1345	92	957	53	78
Volume Left	0	92	0	53	0
Volume Right	48	0	0	0	78
cSH	1700	291	1700	114	121
Volume to Capacity	0.79	0.32	0.56	0.47	0.64
Queue Length 95th (ft)	0	33	0	51	83
Control Delay (s)	0.0	23.0	0.0	61.5	76.9
Lane LOS		C		F	F
Approach Delay (s)	0.0	2.0		70.7	
Approach LOS				F	

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		

CDM SMITH Inc.
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(865) 963-4300

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Groups Printed- Unshifted

	GREENLAND WAY Southbound				HARDIN VALLEY Westbound				GREENLAND WAY Northbound				HARDIN VALLEY Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	1	1	6	109	20	135	1	2	15	18	11	140	2	153	307
07:15 AM	2	1	1	4	3	157	34	194	0	0	15	15	17	179	4	200	413
07:30 AM	1	2	6	9	1	183	13	197	2	0	20	22	8	231	1	240	468
07:45 AM	4	0	1	5	8	161	9	178	1	1	18	20	11	258	1	270	473
Total	7	3	9	19	18	610	76	704	4	3	68	75	47	808	8	863	1661
08:00 AM	2	0	2	4	7	257	15	279	0	1	25	26	36	240	1	277	586
08:15 AM	4	0	2	6	6	212	64	282	2	1	18	21	50	179	0	229	538
08:30 AM	8	1	10	19	5	142	80	227	0	0	11	11	40	186	0	226	483
08:45 AM	8	1	7	16	12	74	119	205	1	1	9	11	66	114	0	180	412
Total	22	2	21	45	30	685	278	993	3	3	63	69	192	719	1	912	2019
*** BREAK ***																	
03:00 PM	42	4	27	73	10	95	18	123	2	1	14	17	11	124	1	136	349
03:15 PM	63	1	21	85	6	134	22	162	0	1	14	15	2	93	1	96	358
03:30 PM	32	1	21	54	8	147	17	172	1	0	10	11	11	200	4	215	452
03:45 PM	19	0	9	28	17	158	16	191	0	0	17	17	2	240	2	244	480
Total	156	6	78	240	41	534	73	648	3	2	55	60	26	657	8	691	1639
04:00 PM	19	0	17	36	9	129	13	151	1	0	6	7	6	168	2	176	370
04:15 PM	18	0	14	32	19	139	9	167	2	0	18	20	4	105	1	110	329
04:30 PM	40	0	24	64	19	142	11	172	3	0	11	14	2	102	4	108	358
04:45 PM	18	0	8	26	25	157	14	196	1	0	18	19	10	106	5	121	362
Total	95	0	63	158	72	567	47	686	7	0	53	60	22	481	12	515	1419
05:00 PM	39	0	29	68	20	176	10	206	2	0	12	14	3	108	4	115	403
05:15 PM	18	0	9	27	20	154	13	187	1	0	18	19	11	104	6	121	354
05:30 PM	21	0	15	36	41	183	18	242	0	1	7	8	10	143	1	154	440
05:45 PM	28	0	7	35	28	149	42	219	3	0	7	10	15	126	3	144	408
Total	106	0	60	166	109	662	83	854	6	1	44	51	39	481	14	534	1605
Grand Total	386	11	231	628	270	3058	557	3885	23	9	283	315	326	3146	43	3515	8343
Apprch %	61.5	1.8	36.8		6.9	78.7	14.3		7.3	2.9	89.8		9.3	89.5	1.2		
Total %	4.6	0.1	2.8	7.5	3.2	36.7	6.7	46.6	0.3	0.1	3.4	3.8	3.9	37.7	0.5	42.1	

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	GREENLAND WAY Southbound				HARDIN VALLEY Westbound				GREENLAND WAY Northbound				HARDIN VALLEY Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	4	0	1	5	**8**	161	9	178	1	**1**	18	20	11	**258**	**1**	270	473
08:00 AM	2	0	2	4	7	**257**	15	279	0	1	**25**	**26**	36	240	1	**277**	**586**
08:15 AM	4	0	2	6	6	212	64	**282**	**2**	1	18	21	**50**	179	0	229	538
08:30 AM	**8**	**1**	**10**	**19**	5	142	**80**	227	0	0	11	11	40	186	0	226	483
Total Volume	18	1	15	34	26	772	168	966	3	3	72	78	137	863	2	1002	2080
% App. Total	52.9	2.9	44.1		2.7	79.9	17.4		3.8	3.8	92.3		13.7	86.1	0.2		
PHF	.563	.250	.375	.447	.813	.751	.525	.856	.375	.750	.720	.750	.685	.836	.500	.904	.887
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:15 PM																	
03:15 PM	**63**	**1**	**21**	**85**	6	134	**22**	162	0	**1**	14	15	2	93	1	96	358
03:30 PM	32	1	21	54	8	147	17	172	**1**	0	10	11	**11**	200	**4**	215	452
03:45 PM	19	0	9	28	**17**	**158**	16	**191**	0	0	**17**	**17**	2	**240**	2	**244**	**480**
04:00 PM	19	0	17	36	9	129	13	151	1	0	6	7	6	168	2	176	370
Total Volume	133	2	68	203	40	568	68	676	2	1	47	50	21	701	9	731	1660
% App. Total	65.5	1	33.5		5.9	84	10.1		4	2	94		2.9	95.9	1.2		
PHF	.528	.500	.810	.597	.588	.899	.773	.885	.500	.250	.691	.735	.477	.730	.563	.749	.865

CDM SMITH Inc.

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File Name : Valley Vista
Site Code : 00000000
Start Date : 1/19/2016
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Groups Printed- Unshifted

	VALLEY VISTA Southbound				HARDIN VALLEY Westbound				VALLEY VISTA Northbound				HARDIN VALLEY Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	5	130	0	135	2	0	6	8	0	158	2	160	303
07:15 AM	0	0	0	0	11	196	0	207	4	0	9	13	0	224	9	233	453
07:30 AM	0	0	0	0	16	171	0	187	7	0	13	20	0	231	6	237	444
07:45 AM	0	0	0	0	9	153	15	177	4	0	17	21	0	221	17	238	436
Total	0	0	0	0	41	650	15	706	17	0	45	62	0	834	34	868	1636
08:00 AM	0	0	0	0	12	232	6	250	18	0	10	28	0	205	7	212	490
08:15 AM	0	0	0	0	9	247	0	256	17	0	16	33	0	196	0	196	485
08:30 AM	0	0	0	0	16	215	0	231	14	0	17	31	0	197	5	202	464
08:45 AM	0	0	0	0	15	140	15	170	28	0	26	54	0	111	4	115	339
Total	0	0	0	0	52	834	21	907	77	0	69	146	0	709	16	725	1778
*** BREAK ***																	
03:00 PM	0	0	0	0	10	109	0	119	5	0	10	15	0	140	4	144	278
03:15 PM	0	0	0	0	9	185	0	194	2	0	8	10	0	179	6	185	389
03:30 PM	0	0	0	0	13	142	0	155	5	0	6	11	0	181	9	190	356
03:45 PM	0	0	0	0	14	212	0	226	4	0	11	15	0	278	18	296	537
Total	0	0	0	0	46	648	0	694	16	0	35	51	0	778	37	815	1560
04:00 PM	0	0	0	0	7	142	0	149	4	0	15	19	0	152	9	161	329
04:15 PM	0	0	0	0	13	174	0	187	7	0	15	22	0	144	6	150	359
04:30 PM	0	0	0	0	15	148	0	163	7	0	8	15	0	140	2	142	320
04:45 PM	0	0	0	0	15	200	0	215	5	0	11	16	0	154	6	160	391
Total	0	0	0	0	50	664	0	714	23	0	49	72	0	590	23	613	1399
05:00 PM	0	0	0	0	20	173	0	193	9	0	19	28	0	130	4	134	355
05:15 PM	0	0	0	0	18	203	0	221	11	0	30	41	0	146	5	151	413
05:30 PM	0	0	0	0	11	206	0	217	9	0	12	21	0	144	3	147	385
05:45 PM	0	0	0	0	9	257	0	266	6	0	16	22	0	167	4	171	459
Total	0	0	0	0	58	839	0	897	35	0	77	112	0	587	16	603	1612
Grand Total	0	0	0	0	247	3635	36	3918	168	0	275	443	0	3498	126	3624	7985
Apprch %	0	0	0		6.3	92.8	0.9		37.9	0	62.1		0	96.5	3.5		
Total %	0	0	0	0	3.1	45.5	0.5	49.1	2.1	0	3.4	5.5	0	43.8	1.6	45.4	

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	VALLEY VISTA Southbound				HARDIN VALLEY Westbound				VALLEY VISTA Northbound				HARDIN VALLEY Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	0	0	0	0	9	153	**15**	177	4	0	**17**	21	0	**221**	**17**	**238**	436
08:00 AM	0	0	0	0	12	232	6	250	**18**	0	10	28	0	205	7	212	**490**
08:15 AM	0	0	0	0	9	**247**	0	**256**	17	0	16	**33**	0	196	0	196	485
08:30 AM	0	0	0	0	**16**	215	0	231	14	0	17	31	0	197	5	202	464
Total Volume	0	0	0	0	46	847	21	914	53	0	60	113	0	819	29	848	1875
% App. Total	0	0	0		5	92.7	2.3		46.9	0	53.1		0	96.6	3.4		
PHF	.000	.000	.000	.000	.719	.857	.350	.893	.736	.000	.882	.856	.000	.926	.426	.891	.957
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	**20**	173	0	193	9	0	19	28	0	130	4	134	355
05:15 PM	0	0	0	0	18	203	0	221	**11**	0	**30**	**41**	0	146	**5**	151	413
05:30 PM	0	0	0	0	11	206	0	217	9	0	12	21	0	144	3	147	385
05:45 PM	0	0	0	0	9	**257**	0	**266**	6	0	16	22	0	**167**	4	**171**	**459**
Total Volume	0	0	0	0	58	839	0	897	35	0	77	112	0	587	16	603	1612
% App. Total	0	0	0		6.5	93.5	0		31.2	0	68.8		0	97.3	2.7		
PHF	.000	.000	.000	.000	.725	.816	.000	.843	.795	.000	.642	.683	.000	.879	.800	.882	.878

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File Name : HV at Pkwy NB
Site Code : 00000000
Start Date : 5/7/2014
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Groups Printed- Unshifted

	PELLI RAMP NB Southbound				HV Westbound				PELLI RAMP NB Northbound				HV Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	0	0	0	0	0	122	56	178	85	0	75	160	44	77	0	121	459
07:15 AM	0	0	0	0	0	186	75	261	86	0	119	205	39	114	0	153	619
07:30 AM	0	0	0	0	0	211	90	301	111	0	125	236	47	98	0	145	682
07:45 AM	0	0	0	0	0	229	50	279	124	0	133	257	36	147	0	183	719
Total	0	0	0	0	0	748	271	1019	406	0	452	858	166	436	0	602	2479
08:00 AM	0	0	0	0	0	201	49	250	124	0	173	297	40	117	0	157	704
08:15 AM	0	0	0	0	0	155	38	193	116	0	97	213	34	78	0	112	518
08:30 AM	0	0	0	0	0	131	47	178	102	0	69	171	29	93	0	122	471
08:45 AM	0	0	0	0	0	121	21	142	92	0	100	192	21	91	0	112	446
Total	0	0	0	0	0	608	155	763	434	0	439	873	124	379	0	503	2139
*** BREAK ***																	
03:00 PM	0	0	0	0	0	144	7	151	24	0	68	92	27	99	0	126	369
03:15 PM	0	0	0	0	0	151	6	157	29	0	77	106	11	99	0	110	373
03:30 PM	0	0	0	0	0	214	28	242	13	0	107	120	12	114	0	126	488
03:45 PM	0	0	0	0	0	162	28	190	29	0	131	160	14	146	0	160	510
Total	0	0	0	0	0	671	69	740	95	0	383	478	64	458	0	522	1740
04:00 PM	0	0	0	0	0	158	23	181	17	0	77	94	27	140	0	167	442
04:15 PM	0	0	0	0	0	169	35	204	35	0	85	120	17	134	0	151	475
04:30 PM	0	0	0	0	0	203	49	252	36	0	97	133	34	147	0	181	566
04:45 PM	0	0	0	0	0	168	25	193	27	0	90	117	22	146	0	168	478
Total	0	0	0	0	0	698	132	830	115	0	349	464	100	567	0	667	1961
05:00 PM	0	0	0	0	0	226	44	270	38	0	105	143	10	142	0	152	565
05:15 PM	0	0	0	0	0	293	58	351	31	0	118	149	25	191	0	216	716
05:30 PM	0	0	0	0	0	234	63	297	38	0	155	193	25	141	0	166	656
05:45 PM	0	0	0	0	0	280	61	341	39	0	141	180	43	176	0	219	740
Total	0	0	0	0	0	1033	226	1259	146	0	519	665	103	650	0	753	2677
Grand Total	0	0	0	0	0	3758	853	4611	1196	0	2142	3338	557	2490	0	3047	10996
Apprch %	0	0	0		0	81.5	18.5		35.8	0	64.2		18.3	81.7	0		
Total %	0	0	0	0	0	34.2	7.8	41.9	10.9	0	19.5	30.4	5.1	22.6	0	27.7	

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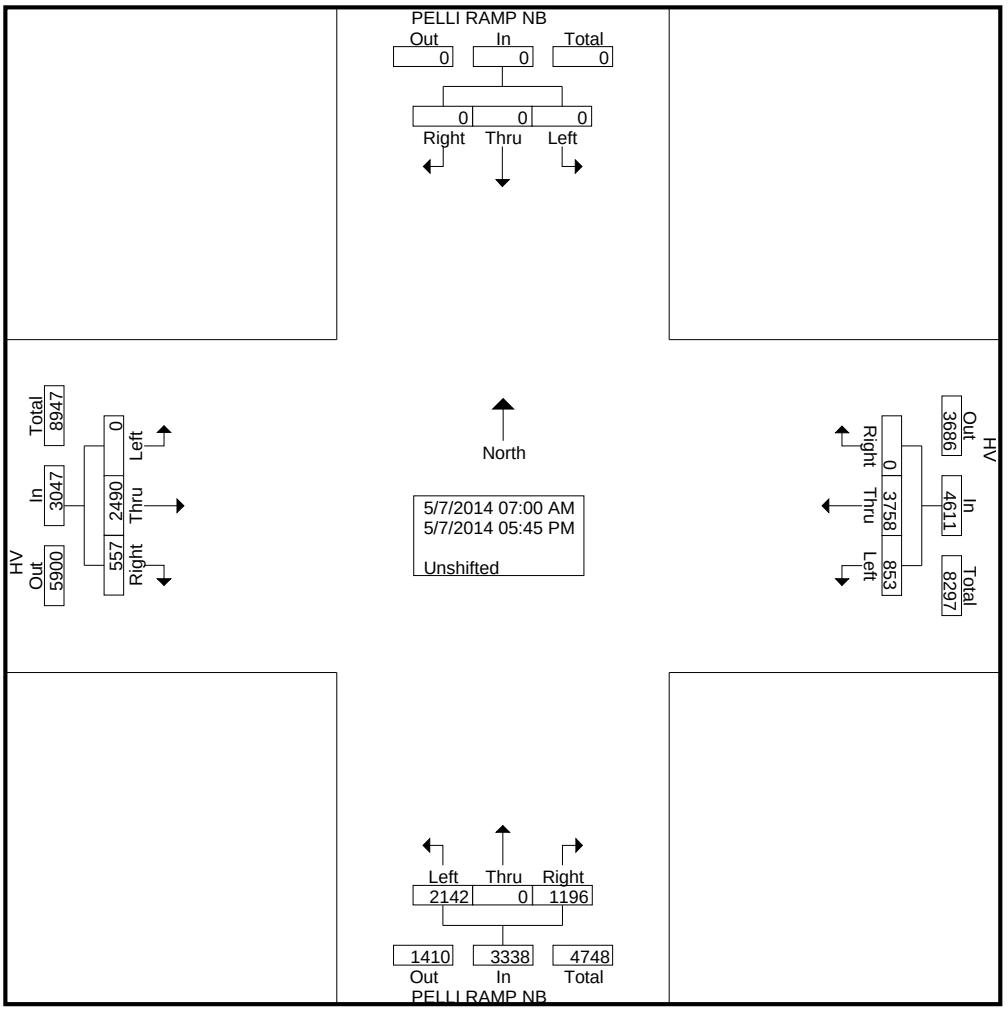

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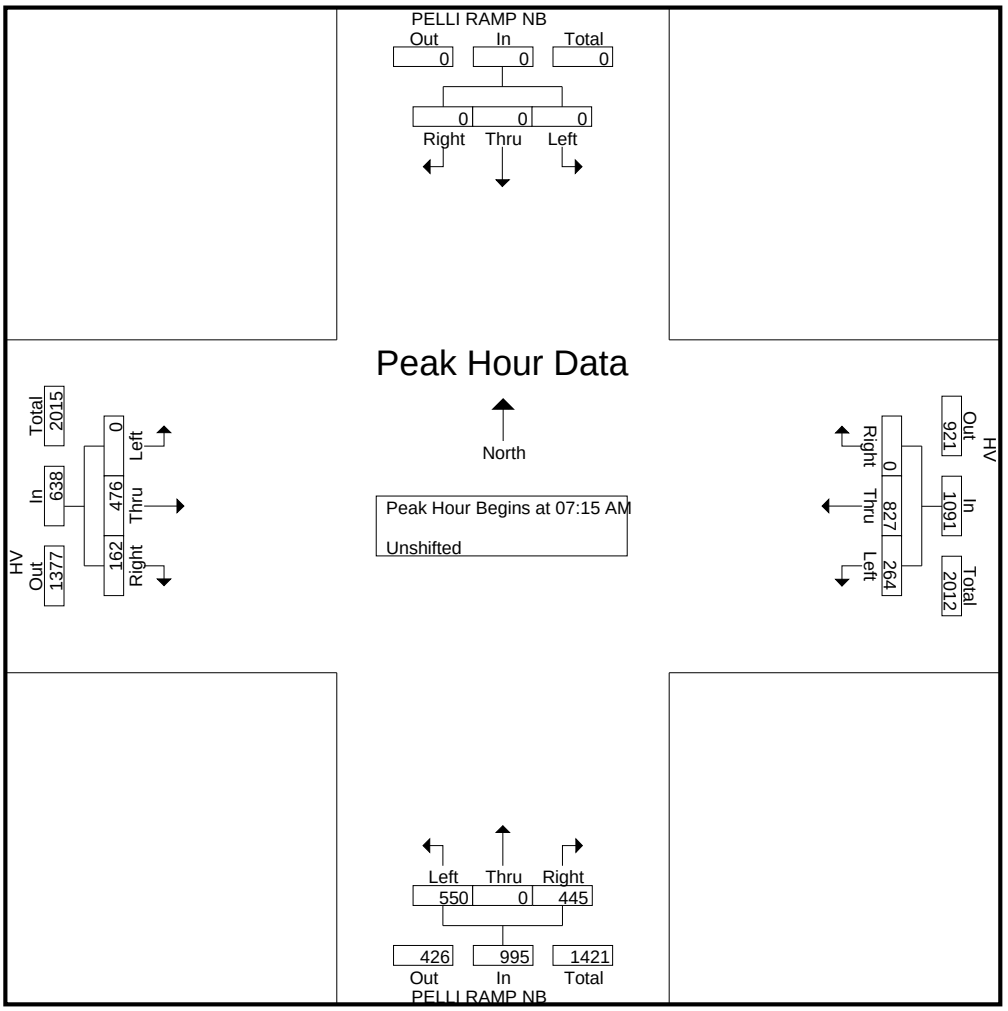
	PELLI RAMP NB Southbound				HV Westbound				PELLI RAMP NB Northbound				HV Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	186	75	261	86	0	119	205	39	114	0	153	619
07:30 AM	0	0	0	0	0	211	**90**	**301**	111	0	125	236	**47**	98	0	145	682
07:45 AM	0	0	0	0	0	**229**	50	279	**124**	0	133	257	36	**147**	0	**183**	**719**
08:00 AM	0	0	0	0	0	201	49	250	124	0	**173**	**297**	40	117	0	157	704
Total Volume	0	0	0	0	0	827	264	1091	445	0	550	995	162	476	0	638	2724
% App. Total	0	0	0		0	75.8	24.2		44.7	0	55.3		25.4	74.6	0		
PHF	.000	.000	.000	.000	.000	.903	.733	.906	.897	.000	.795	.838	.862	.810	.000	.872	.947



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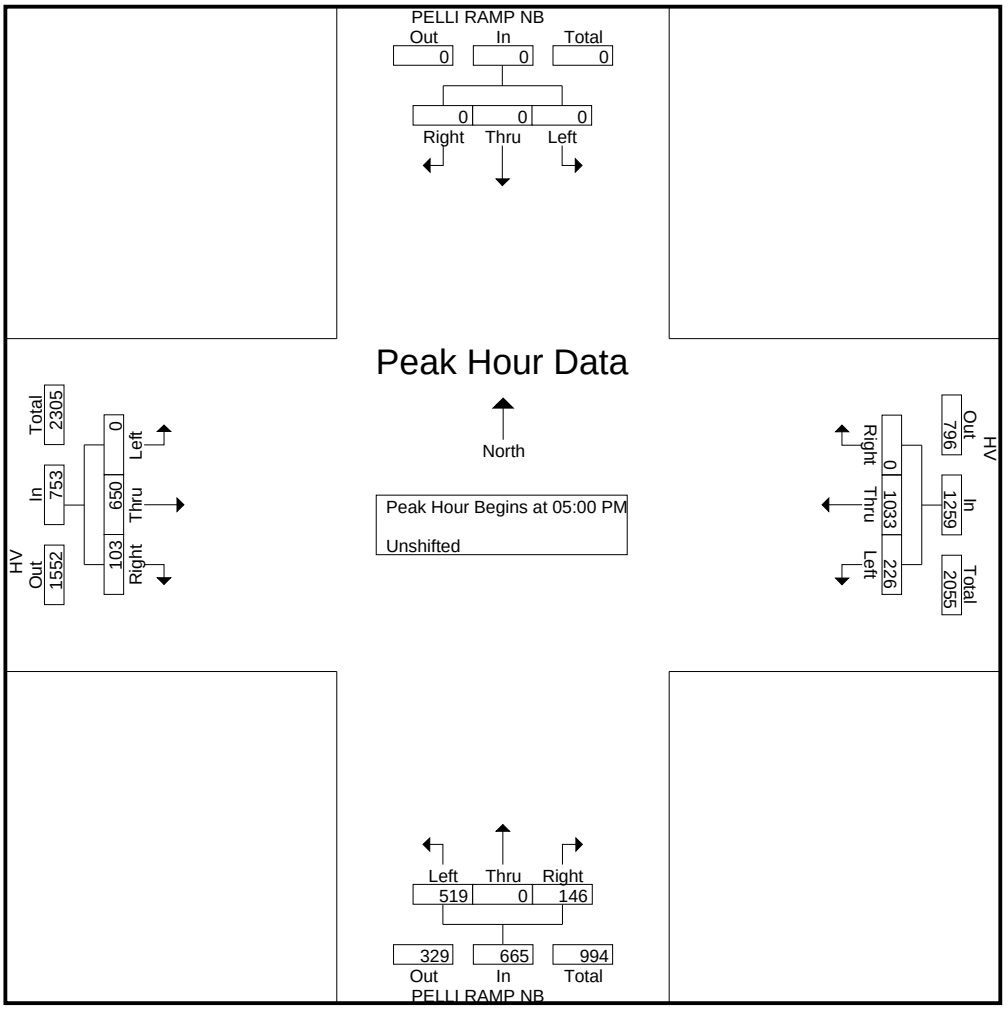
	PELLI RAMP NB Southbound				HV Westbound				PELLI RAMP NB Northbound				HV Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	226	44	270	38	0	105	143	10	142	0	152	565
05:15 PM	0	0	0	0	0	**293**	58	**351**	31	0	118	149	25	**191**	0	216	716
05:30 PM	0	0	0	0	0	234	**63**	297	38	0	**155**	**193**	25	141	0	166	656
05:45 PM	0	0	0	0	0	280	61	341	**39**	0	141	180	**43**	176	0	**219**	**740**
Total Volume	0	0	0	0	0	1033	226	1259	146	0	519	665	103	650	0	753	2677
% App. Total	0	0	0		0	82	18		22	0	78		13.7	86.3	0		
PHF	.000	.000	.000	.000	.000	.881	.897	.897	.936	.000	.837	.861	.599	.851	.000	.860	.904



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Counted by: Allyson Foster

File Name : HV at Pkwy SB
Site Code : 00000000
Start Date : 5/7/2014
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	SOLWAY Southbound				HARDIN VALLEY Westbound				PELLISSIPPI PKWY SB Northbound				HARDIN VALLEY Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
07:00 AM	27	9	16	52	8	115	62	185	21	0	16	37	64	75	2	141	415
07:15 AM	26	20	17	63	21	210	103	334	23	2	26	51	92	105	7	204	652
07:30 AM	16	21	15	52	12	212	115	339	29	1	18	48	119	105	8	232	671
07:45 AM	8	35	25	68	33	268	115	416	18	1	11	30	94	136	10	240	754
Total	77	85	73	235	74	805	395	1274	91	4	71	166	369	421	27	817	2492
08:00 AM	18	23	17	58	35	292	95	422	19	3	18	40	72	97	11	180	700
08:15 AM	12	19	14	45	38	203	72	313	23	2	14	39	80	122	6	208	605
08:30 AM	8	14	14	36	29	135	76	240	23	1	19	43	79	72	3	154	473
08:45 AM	6	19	10	35	41	135	60	236	20	5	16	41	47	46	16	109	421
Total	44	75	55	174	143	765	303	1211	85	11	67	163	278	337	36	651	2199
*** BREAK ***																	
03:00 PM	5	31	32	68	26	132	71	229	19	0	16	35	79	89	11	179	511
03:15 PM	9	21	28	58	44	173	63	280	15	1	16	32	72	96	6	174	544
03:30 PM	15	23	23	61	34	188	108	330	17	3	22	42	90	150	12	252	685
03:45 PM	13	24	38	75	39	163	91	293	29	2	26	57	94	150	24	268	693
Total	42	99	121	262	143	656	333	1132	80	6	80	166	335	485	53	873	2433
04:00 PM	12	33	32	77	29	167	105	301	34	1	25	60	90	119	7	216	654
04:15 PM	12	32	20	64	33	178	78	289	33	2	37	72	63	83	3	149	574
04:30 PM	13	29	49	91	35	154	101	290	49	0	35	84	67	100	7	174	639
04:45 PM	16	27	29	72	47	170	76	293	66	1	33	100	54	100	10	164	629
Total	53	121	130	304	144	669	360	1173	182	4	130	316	274	402	27	703	2496
05:00 PM	17	25	42	84	39	214	131	384	71	0	47	118	78	112	8	198	784
05:15 PM	16	27	28	71	67	211	127	405	61	2	38	101	42	101	22	165	742
05:30 PM	12	17	27	56	49	213	122	384	56	1	31	88	46	98	14	158	686
05:45 PM	9	21	25	55	62	190	74	326	59	2	31	92	47	96	13	156	629
Total	54	90	122	266	217	828	454	1499	247	5	147	399	213	407	57	677	2841
Grand Total	270	470	501	1241	721	3723	1845	6289	685	30	495	1210	1469	2052	200	3721	12461
Apprch %	21.8	37.9	40.4		11.5	59.2	29.3		56.6	2.5	40.9		39.5	55.1	5.4		
Total %	2.2	3.8	4	10	5.8	29.9	14.8	50.5	5.5	0.2	4	9.7	11.8	16.5	1.6	29.9	

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Counted by: Allyson Foster

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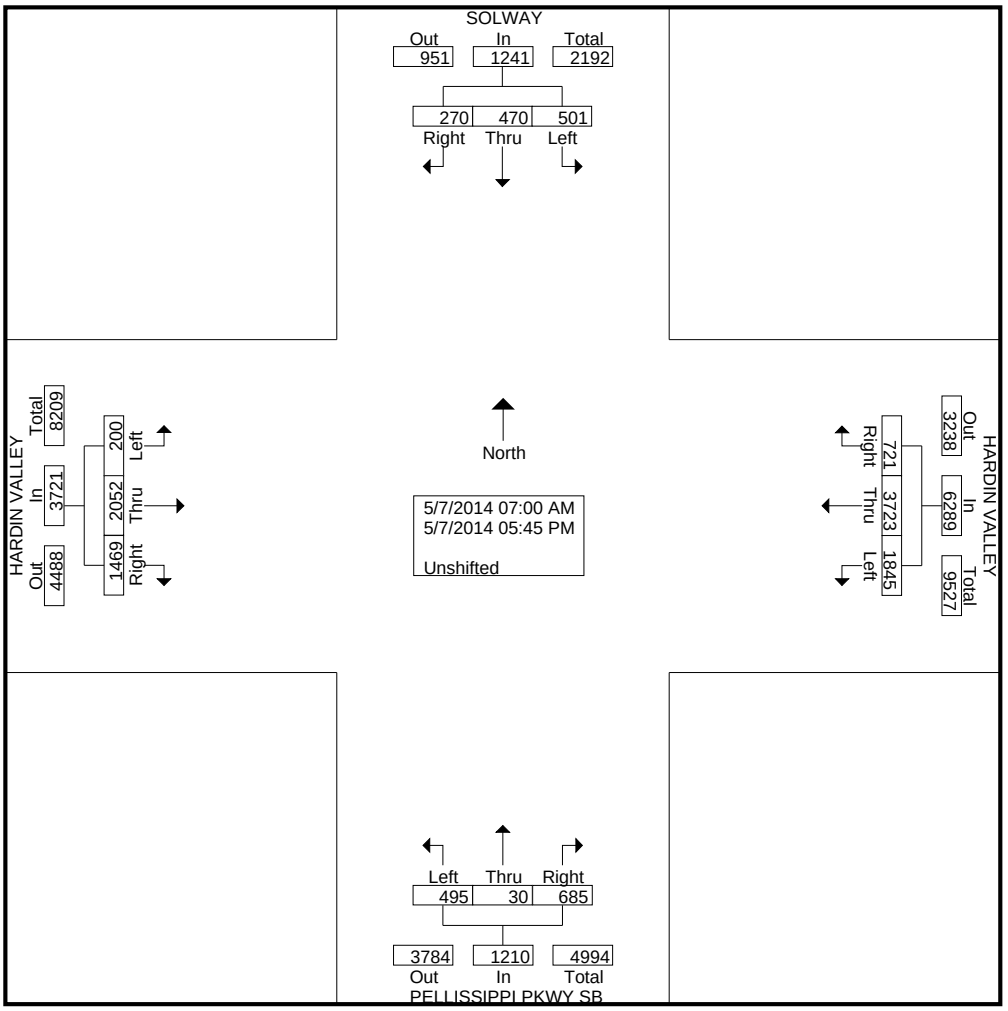
Site Code : 00000000
Start Date : 5/7/2014
Page No : 2



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Site Code : 00000000
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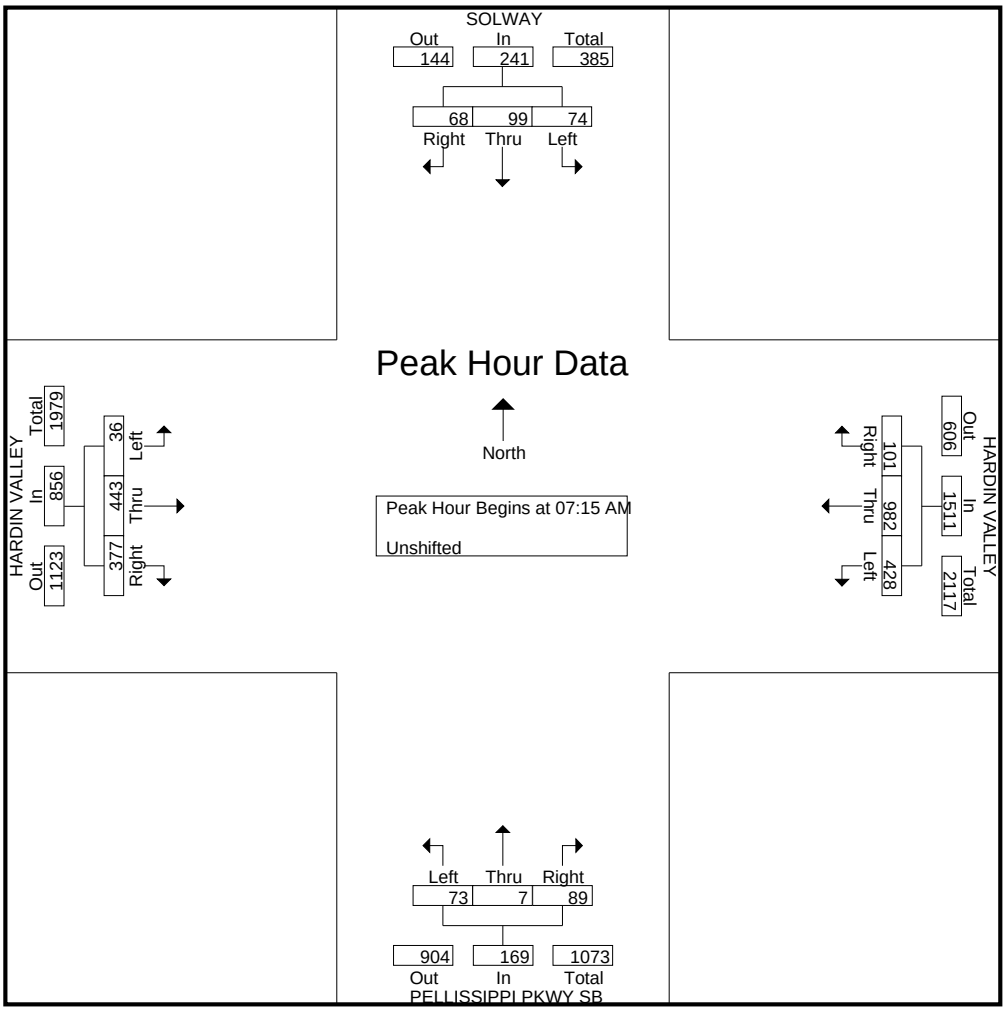
Page No : 3

	SOLWAY Southbound				HARDIN VALLEY Westbound				PELLISSIPPI PKWY SB Northbound				HARDIN VALLEY Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	**26**	20	17	63	21	210	103	334	23	2	**26**	**51**	92	105	7	204	652
07:30 AM	16	21	15	52	12	212	**115**	339	**29**	1	18	48	**119**	105	8	232	671
07:45 AM	8	**35**	**25**	**68**	33	268	115	416	18	1	11	30	94	**136**	10	**240**	**754**
08:00 AM	18	23	17	58	**35**	**292**	95	**422**	19	**3**	18	40	72	97	**11**	180	700
Total Volume	68	99	74	241	101	982	428	1511	89	7	73	169	377	443	36	856	2777
% App. Total	28.2	41.1	30.7		6.7	65	28.3		52.7	4.1	43.2		44	51.8	4.2		
PHF	.654	.707	.740	.886	.721	.841	.930	.895	.767	.583	.702	.828	.792	.814	.818	.892	.921



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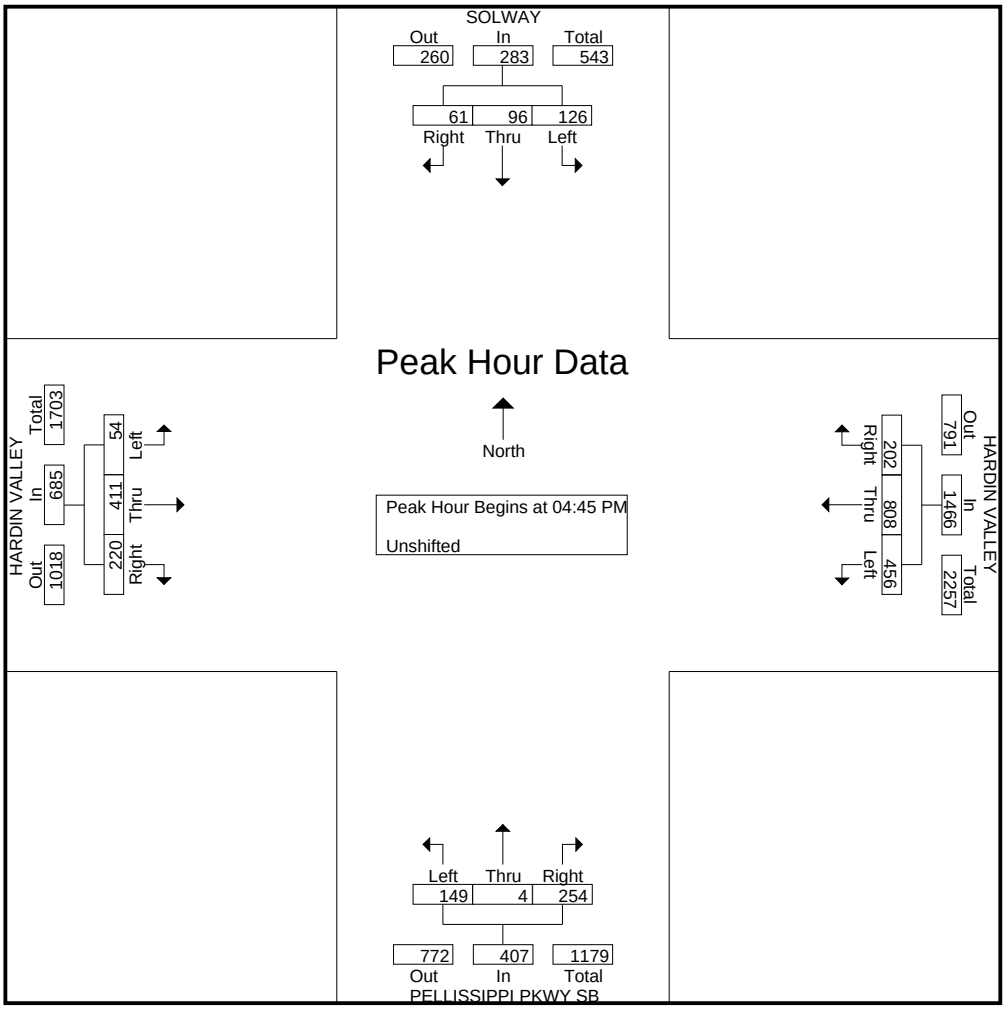
Counted by: Allyson Foster

File Name : HV at Pkwy SB
Site Code : 00000000
Start Date : 5/7/2014
Page No : 4

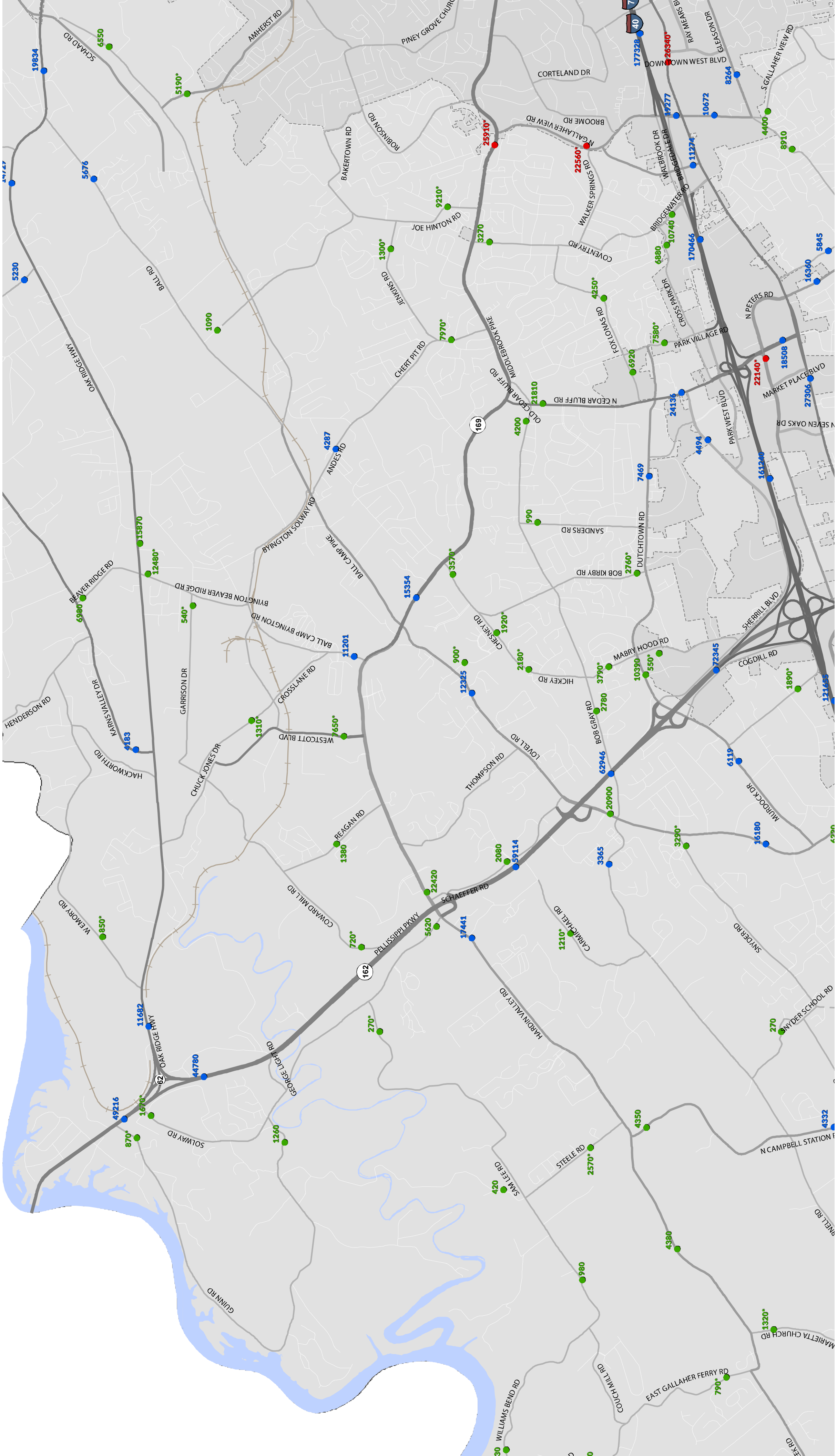
	SOLWAY Southbound				HARDIN VALLEY Westbound				PELLISSIPPI PKWY SB Northbound				HARDIN VALLEY Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	16	**27**	29	72	47	170	76	293	66	1	33	100	54	100	10	164	629
05:00 PM	**17**	25	**42**	**84**	39	**214**	**131**	384	**71**	0	**47**	**118**	**78**	**112**	8	**198**	**784**
05:15 PM	16	27	28	71	**67**	211	127	**405**	61	**2**	38	101	42	101	**22**	165	742
05:30 PM	12	17	27	56	49	213	122	384	56	1	31	88	46	98	14	158	686
Total Volume	61	96	126	283	202	808	456	1466	254	4	149	407	220	411	54	685	2841
% App. Total	21.6	33.9	44.5		13.8	55.1	31.1		62.4	1	36.6		32.1	60	7.9		
PHF	.897	.889	.750	.842	.754	.944	.870	.905	.894	.500	.793	.862	.705	.917	.614	.865	.906



Attachment 1
Traffic Counts

Project: Greystone Vista Apartments
Date Conducted: 1/23/2013

	Hardin Valley Road Eastbound			Hardin Valley Road Westbound			Valley Vista Road Northbound			
Start	Thru	Right	Total	Left	Thru	Total	Right	Left	Total	Int. Total
7:00 AM	168	1	169	3	145	148	2	8	10	327
7:15 AM	208	1	209	8	205	213	7	5	12	434
7:30 AM	273	4	277	10	169	179	11	4	15	471
7:45 AM	265	12	277	7	222	229	11	6	17	523
Total	914	18	932	28	741	769	31	23	54	1755
8:00 AM	193	4	197	8	293	301	12	9	21	519
8:15 AM	240	3	243	8	269	277	13	13	26	546
8:30 AM	147	3	150	16	129	145	12	8	20	315
8:45 AM	84	3	87	12	94	106	13	5	18	211
Total	664	13	677	44	785	829	50	35	85	1591
11:00 AM	86	0	86	13	81	94	3	2	5	185
11:15 AM	86	2	88	13	104	117	5	7	12	217
11:30 AM	120	2	122	12	102	114	8	8	16	252
11:45 AM	187	6	193	20	85	105	7	6	13	311
Total	479	10	489	58	372	430	23	23	46	965
12:00 PM	122	3	125	15	94	109	7	2	9	243
12:15 PM	99	1	100	13	101	114	9	7	16	230
12:30 PM	138	4	142	10	108	118	6	7	13	273
12:45 PM	200	4	204	23	91	114	13	5	18	336
Total	559	12	571	61	394	455	35	21	56	1082
2:00 PM	157	2	159	9	130	139	14	3	17	315
2:15 PM	159	3	162	8	174	182	5	12	17	361
2:30 PM	111	5	116	7	166	173	5	6	11	300
2:45 PM	271	10	281	6	149	155	3	17	20	456
Total	698	20	718	30	619	649	27	38	65	1432
3:00 PM	295	9	304	15	107	122	2	5	7	433
3:15 PM	255	12	267	11	108	119	6	5	11	397
3:30 PM	202	4	206	6	129	135	9	4	13	354
3:45 PM	120	7	127	10	141	151	2	1	3	281
Total	872	32	904	42	485	527	19	15	34	1465
4:00 PM	163	2	165	17	147	164	7	6	13	342
4:15 PM	123	1	124	8	146	154	2	8	10	288
4:30 PM	164	5	169	14	167	181	8	5	13	363
4:45 PM	147	6	153	14	168	182	9	3	12	347
Total	597	14	611	53	628	681	26	22	48	1340
5:00 PM	165	3	168	19	188	207	6	3	9	384
5:15 PM	150	3	153	22	210	232	4	10	14	399
5:30 PM	140	2	142	20	187	207	8	10	18	367
5:45 PM	157	4	161	23	186	209	7	18	25	395
Total	612	12	624	84	771	855	25	41	66	1545
Grand Total	5395	131	5526	400	4795	5195	236	218	454	11175
Approach %	97.6	2.4		7.7	92.3		52.0	48.0		
Total %	48.3	1.2	49.4	3.6	42.9	46.5	2.1	2.0	4.1	


SCHAD RD
AMHERST RD
PINEY GROVE CHURCH
RAY MEARS BLVD
GLEASON DR
DOWNTOWN WEST BLVD
CORTELAND DR
S GALLAHER VIEW RD
ROBINSON RD
BROOME RD
N GALLAHER VIEW RD
BAKERTOWN RD
WALBROOK DR
BRIDGEDALE DR
WALKER SPRINGS RD
JOE HINTON RD
BRIDGEWATER RD
COVENTRY RD
BALL RD
JENKINS RD
CROSS PARK DR
N PETERS RD
FOX LONAS RD
OAK RIDGE HWY
CHERT PIT RD
MIDDLEBROOK PIKE
PARK VILLAGE RD
MARKET PLACE BLVD
OLD CEDAR BLUFF RD
N CEDAR BLUFF RD
N SEVEN OAKS DR
PARK WEST BLVD
ANDES RD
BYINGTON SOLWAY RD
SANDERS RD
DUTCHTOWN RD
BALL CAMP PIKE
BEAVER RIDGE RD
BYINGTON BEAVER RIDGE RD
BOB KIRBY RD
SHERRILL BLVD
BALL CAMP BYINGTON RD
CHESNEY RD
MABRY HOOD RD
COGDILL RD
HICKEY RD
KARNS VALLEY DR
GARRISON DR
CROSSLANE RD
HENDERSON RD
BOB GRAY RD
WESTCOTT BLVD
HACKWORTH RD
LOVELL RD
CHUCK JONES DR
THOMPSON RD
MURDOCK DR
REAGAN RD
SCHAEFFER RD
W EMORY RD
COWARD MILL RD
PELLISSIPPI PKWY
CARMICHAEL RD
SNYDER RD
HARDIN VALLEY RD
SNYDER SCHOOL RD
OAK RIDGE HWY
GEORGE LIGHT RD
SOLWAY RD
N CAMPBELL STATION RD
STEELE RD
SAM LEE RD
GUINN RD
MARIETTA CHURCH RD
COUCH MILL RD
EAST GALLAHER FERRY RD
WILLIAMS BEND RD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Smith