TRANSPORTATION IMPACT ANALYSIS

for

The University of North Carolina at Chapel Hill Development Plan

Prepared for

The University of North Carolina at Chapel Hill

Prepared by

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July 3, 2001

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EXECUTIVE SUMMARY

This initial Transportation Impact Analysis for the University of North Carolina at Chapel Hill Development Plan is being submitted to the Town in accordance with the requirements of the Town of Chapel Hill's Office/Institutional-4 (OI-4) Zoning District regulations. The purpose of this initial analysis, and subsequent updates, is to provide an assessment of the transportation implications of the Development Plan and develop mitigation measures to address any impacts. Transportation elements addressed include automobile traffic, transit, parking, bicycle and pedestrian traffic, and associated air quality issues.

The Development Plan projects will add approximately 5.9 million gross square feet of new development to the campus. Some of this new area is required to address current space deficits. The net increase in new occupiable floor area for the Development Plan is approximately 3.6 million square feet, or an estimated 35 percent increase over existing occupiable floor area. There is also an anticipated increase in employee growth of 35 percent. Students are expected to grow by 13 percent to just under 30,000.

The Development Plan will permanently displace 3,811 existing surface spaces, and add 5,361 new spaces to Main Campus. The net parking impact of the proposed Development Plan is an increase of 1,550 spaces. Of these, 1,398 are for patients/visitors, 421 are for employees, and there is a net loss of 239 for resident students.

When the growth in employees and students is taken into account, the following Main Campus parking "shortfalls" are projected to occur with implementation of the Development Plan (shortfall is defined as the difference between the amount of Main Campus parking that would be required if parking continued to be provided at current rates, and the amount that will be actually provided):

- 2,675 employee spaces
- 39 commuting student spaces
- 502 resident student spaces

The resident student parking will be accommodated in storage parking. Therefore the total number of commuters that must be diverted to alternatives modes is 2,715. The analysis described in this report has projected that these commuters will use the following modes in lieu of driving and parking on Main Campus:

Chapel Hill Transit:	1,500
Regional transit:	250
Ridesharing:	150
Park-and-ride:	815
Total:	*2,715*

Future visitor parking needs are accommodated in the Plan, and take priority over other groups.

Other strategies that are being pursued include increased teleworking, cycling, and walking. It is important to note that the University has budgeted and advertised for a fulltime Transportation Demand Management (TDM) coordinator. The role of this person, expected to be on board by Fall 2001, will be to promote and assist employees in learning about and using alternative modes.

In addition to addressing the commuting needs of employees and students, these strategies will also help reduce traffic congestion on Main Campus and reduce exhaust emissions.

An analysis of roadway intersections on or near Main Campus that may be impacted by the Development Plan was also undertaken for existing conditions, and year 2010 with and without the Development Plan (No-Build and Build conditions respectively), per the *Transportation Impact Analysis Guidelines*.

Some of the intersection traffic count data used in the analysis are almost ten years old. Therefore the accuracy of the 2010 projections is somewhat questionable. Conclusions regarding improvements to intersections should wait until completion of the first update of the Transportation Impact Analysis, which will utilize current data to be collected in the fall.

The analysis showed that conditions at several intersections that are suffering poor levels of service in 2001 will deteriorate further in 2010 as a result of growth in background traffic unrelated to the Development Plan. While the Development Plan will not significantly increase Main Campus parking, the location of some of the planned parking decks will add traffic to some intersections, causing congestion to increase at these locations.

Geometric improvements could be considered at several intersections even without the Development Plan. In addition, signal timing and phasing modifications may be appropriate at some intersections, but should be based on the analyses that will be undertaken with current counts later this year.

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1.0 INTRODUCTION

This initial Transportation Impact Analysis for the University of North Carolina at Chapel Hill Development Plan is being submitted to the Town in accordance with the requirements of the Town of Chapel Hill's Office/Institutional-4 (OI-4) Zoning District regulations. The purpose of this initial analysis, and subsequent updates, is to provide an assessment of the transportation implications of the Development Plan and develop mitigation measures to address impacts. Transportation elements addressed include automobile traffic, transit, parking, bicycle and pedestrian traffic, and associated air quality issues.

The report is divided into three sections. The first presents the Development Plan, discusses population growth and associated increases in Main Campus parking demand, and details the impact of the plan and population growth on Main Campus parking. This section provides an estimate of the shortfall in Main Campus parking as a result of employee growth, enrollment expansion, and Development Plan construction.

The next section discusses trip generation and trip reduction strategies. As required by the *Transportation Impact Analysis Guidelines*, vehicular trip generation was first calculated assuming the Development Plan was a hypothetical, suburban development where no or very limited trip reduction strategies applied. The impacts of the proposed trip reduction strategies that are integral to the Development Plan are then calculated for comparison purposes. This section also describes the various strategies that are proposed to address the limited employee and student parking increases in the Development Plan.

The final section provides analyses for key intersections in the Development Plan area, and discusses mitigation options where they are warranted.

The Initial Transportation Impact Analysis relies on existing data only. Some of the data, and in particular some of the intersection traffic counts, are almost ten years old. All counts have been factored to the year 2001 (existing conditions) using historic traffic growth data, and then extrapolated to the year 2010, the year the final project in the Development Plan is projected to be completed. Therefore the accuracy of the 2010 projections is very questionable, as are any conclusions that may be drawn from the analyses using this data.

The first update of the Transportation Impact Analysis for the Development Plan is scheduled for the fall of this year. At that time, current data will be collected to provide a baseline set of information for monitoring purposes, and to allow more precise analyses, conclusions and recommendations to be made.

2.0 DEVELOPMENT PLAN

Figure 2-1 and Table 2-1 show and detail University projects planned for construction between 2001 and 2010. The list only includes projects involving new square footage (rehabilitations that add no additional square footage are not included). These projects will add approximately 5.9 million gross square feet of new development to the campus, a 43 percent increase over the campus' existing 13.7 million square feet. Some of this new area is required to address current space deficits (i.e., will not result in an increase in employees or students). During this same period, existing buildings totaling approximately 235,000 gross square feet will be demolished. Parking decks account for about 1.9 million square feet of the Plan. Infrastructure projects make up 135,000 square feet. Therefore, the net increase in new floor area for the Development Plan is assumed to be approximately 3.6 million square feet, or an estimated 35 percent increase over existing occupiable floor area. Projects in the Plan can be separated into the following categories:

Classification	Square Footage
Academic	1,383,090
Cultural	102,725
Housing	635,612
Infrastructure	135,600
Office	163,200
Parking	1,885,000
Research	457,400
Student Life	307,300
UNC Health Care	831,350
Total	5,901,277

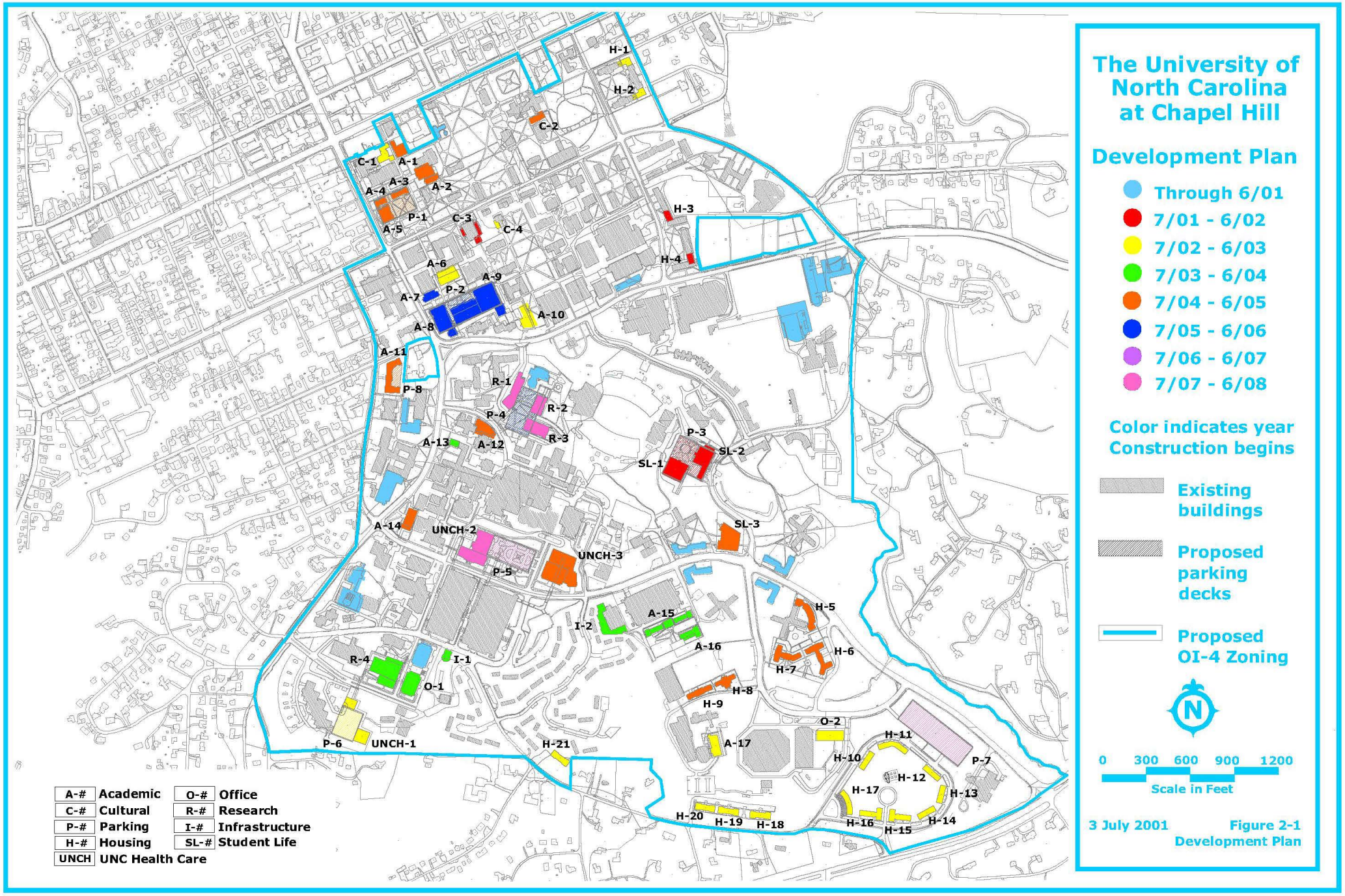

The University of North Carolina at Chapel Hill
Development Plan
Through 6/01
7/01 - 6/02
7/02 - 6/03
7/03 - 6/04
7/04 - 6/05
7/05 - 6/06
7/06 - 6/07
7/07 - 6/08
Color indicates year Construction begins
Existing buildings
Proposed parking decks
Proposed OI-4 Zoning
N
0 300 600 900 1200
Scale in Feet
3 July 2001
Figure 2-1
Development Plan
A-# Academic
C-# Cultural
P-# Parking
H-# Housing
UNCH UNC Health Care
O-# Office
R-# Research
I-# Infrastructure
SL-# Student Life
H-1
H-2
C-2
C-1
A-1
A-3
A-4
A-2
P-1
C-3
C-4
A-5
H-3
H-4
A-6
A-9
P-2
A-7
A-10
A-8
A-11
P-8
R-1
R-2
P-4
R-3
A-13
A-12
P-3
SL-2
SL-1
A-14
UNCH-2
SL-3
UNCH-3
P-5
H-5
A-15
I-2
A-16
H-6
H-7
R-4
I-1
O-1
H-8
H-9
O-2
H-11
P-6
UNCH-1
H-21
A-17
H-10
P-7
H-12
H-17
H-13
H-20
H-19
H-18
H-16
H-15
H-14

Table 2-1
University of North Carolina at Chapel Hill Development Plan

Map Number	Description	Anticipated Construction Start Date	Anticipated Construction Completion Date	New facility/ expansion/ replacement	Gross Square Footage	General Use	Current activities or buildings on site	Origin of employees or other occupants	Remarks
A-1	ACADEMIC	Mar-05	Feb-07	New facility	31,800	Office/classroom	Hill Annex	combination of existing and some new employees	to address space deficiencies and allow for expanding multimedia programs
A-2	ACADEMIC	Mar-05	Feb-07	New facility	73,100	Office/classroom	Hill Hall Addition, parking		
A-3	ACADEMIC	Mar-05	Feb-07	New facility	25,600	Office/classroom	parking		
A-4	ACADEMIC	Mar-05	Feb-07	New facility	20,000	Office/classroom	Abernethy, parking		
A-5	ACADEMIC	Mar-05	Feb-07	New facility	55,200	Office/classroom	Abernethy, parking		
A-6	ACADEMIC	Jul-03	Jun-05	Replacement	90,000	Classroom/research	parking	employees from Venable Hall	will replace Venable Hall and allow for expansion
A-7	ACADEMIC	Feb-06	Aug-08	New facility	41,000	Office/class/research	Parking	combination of existing and some new employees	to address space deficiencies and allow for enrollment expansion
A-8	ACADEMIC	Feb-06	Aug-08	New facility	154,500	Office/class/research	NROTC		
A-9	ACADEMIC	Feb-06	Aug-08	New facility	396,700	Office/class/research	Venable Hall		
A-10	ACADEMIC	Jul-03	Jun-05	New facility	112,500	Office/class/research	parking	combination of existing and some new employees	will address space deficiencies and allow for enrollment expansion
A-11	ACADEMIC	Mar-04	Feb-06	New facility	82,000	Office/classroom	Parking		to address space deficiencies and allow for enrollment expansion
A-12	ACADEMIC	Nov-01	Oct-03	Expansion	69,500	Classroom/lab/office	parking		to allow for expansion of program
A-13	ACADEMIC	Aug-02	Jul-04	New facility	10,200	Classroom/office	None	employees moving from second floor of Chase Hall	
A-14	ACADEMIC	Aug-04	Aug-06	New facility	84,990	Classroom/office	Parking		to address space deficiencies and allow for enrollment expansion
A-15	ACADEMIC	Mar-04	Feb-06	New facility	59,700		Parking	employees from E. Franklin, Hamilton Hall, Battle Hall, Alumni, Caldwell, Dey &Hanes Art Center, Coates, Porthole, Student Union	to address space deficiencies and allow for enrollment expansion
A-16	ACADEMIC	Mar-04	Feb-06	New facility	23,100		Parking		
A-17	ACADEMIC	Jun-02	Dec-03	Expansion	53,200	Classroom/office	None	combination of existing and some new employees	To accommodate expanding program
	Total Academic				**1,383,090**				
C-1	CULTURAL	Dec-02	May-04	Expansion	36,000	Gallery	parking, open space	existing employees	expanding public spaces, adding galleries
C-2	CULTURAL	May-02	Nov-03	Expansion	26,400	Planetarium	None	existing employees	includes renovation of planetarium
C-3	CULTURAL	Dec-01	Jan-03	Expansion	37,325	Auditorium	parking, open space	existing employees	expansion of stage house and public facilities; removing some seats
C-4	CULTURAL	Nov-02	Feb-04	Renovation	3,000	Office/lounge/snack bar	YMCA	existing employees	primarily pedestrian traffic
	Total Cultural				**102,725**				

Note: The Development Plan does not include 946 units of student housing that are currently under construction.

Map Number	Description	Anticipated Construction Start Date	Anticipated Construction Completion Date	New facility/ expansion/ replacement	Gross Square Footage	General Use	Current activities or buildings on site	Origin of employees or other occupants	Remarks
H-1	HOUSING	May-03	Jul-04	Renovation	13,500	Residential	Vacant space between dorms	no new people	no additional units
H-2	HOUSING	May-03	Jul-04	Renovation	13,500	Residential	Vacant space between dorms	no new people	no additional units
H-3	HOUSING	May-02	Jul-03	Renovation	6,656	Residential	Vacant space between dorms	no new people	no additional units
H-4	HOUSING	May-02	Jul-03	Renovation	6,656	Residential	Vacant space between dorms	no new people	no additional units
H-5	HOUSING	Mar-05	Feb-07	New facility	68,400	Residential	None	New students	To accommodate expanding enrollment
H-6	HOUSING	Mar-05	Feb-07		60,000		Parking		
H-7	HOUSING	Mar-05	Feb-07		74,800		Parking		
H-8	HOUSING	Mar-05	Feb-07		43,200		Parking		
H-9	HOUSING	Mar-05	Feb-07		42,000		Parking		
H-10	APT.	Jan-03	Jun-04		21,600	Residential	None; some parking	students relocating from existing Odum Village	306 units
H-11	APT.	Jan-03	Jun-04		34,200				
H-12	APT.	Jan-03	Jun-04		21,900				
H-13	APT.	Jan-03	Jun-04		19,500				
H-14	APT.	Jan-03	Jun-04		21,000				
H-15	APT.	Jan-03	Jun-04		31,500				
H-16	APT.	Jan-03	Jun-04		31,500				
H-17	APT.	Jan-03	Jun-04	New facility	27,000				
H-18	APT.	May-05	Feb-07		25,800			New students	to allow for enrollment expansion
H-19	APT.	May-05	Feb-07		24,300				
H-20	APT.	May-05	Feb-07	New facility	24,300	None			
H-21	APT.	Jan-03	Jun-04		24,300			students relocating from existing	
	Total Housing				**635,612**				
I-1	INFRASTRUCTURE	Jul-03	Dec-04		20,000	N/A	N/A	N/A	
I-2	INFRASTRUCTURE	Aug-03	Dec-05		115,600			N/A	
	Total Infrastructure				**135,600**				
O-1	OFFICE	Jul-03	May-05	New facility	133,200		Grounds and Housing Support Services		to relocate employees currently off-site
O-2	OFFICE	Nov-02	Nov-05	New facility	30,000	Office	Parking		
	Total Office				**163,200**				
P-1	PARKING	Dec-04	May-06	New facility	115,500	Parking	parking, part of Swain Hall		330 spaces
P-2	PARKING	Aug-05	Apr-07	New facility	210,000	Parking	Venable Hall/parking		600 spaces
P-3	PARKING	May-02	Oct-04	New facility	252,600	Parking	Parking		700 spaces
P-4	PARKING	Dec-05	Jan-07	New facility	350,000	Parking	Parking		1,000 spaces
P-5	PARKING	Nov-07	Mar-10	New facility	255,500	Parking	None		730 spaces
P-6	PARKING	Dec-02	Nov-05	New facility	134,400	Parking	Parking		350 spaces
P-7	PARKING	Aug-07	Sep-09	New facility	525,000	Parking	Parking		1,500 spaces
P-8	PARKING	Mar-04	Jul-06	New facility	42,000	Parking	below building		120 spaces
	Total Parking				**1,885,000**				

Note: The Development Plan does not include 946 units of student housing that are currently under construction.

Map Number	Description	Anticipated Construction Start Date	Anticipated Construction Completion Date	New facility/ expansion/ replacement	Gross Square Footage	General Use	Current activities or buildings on site	Origin of employees or other occupants	Remarks
R-1	RESEARCH	Jul-07	Jul-10	New facility	109,000	Research	Parking	new	To address space deficiencies and allow for enrollment expansion
R-2	RESEARCH	Jul-07	Jul-10	New facility	49,000	Research	Parking	new	To address space deficiencies and allow for enrollment expansion
R-3	RESEARCH	Jul-07	Jul-10	New facility	74,400	Research	Parking	new	To address space deficiencies and allow for enrollment expansion
R-4	RESEARCH	Aug-02	Dec-04	New facility	225,000	Research	Grounds and Housing Support Services	new	to address research space deficiencies
	Total Research				**457,400**				
SL-1	STUDENT LIFE	Jun-02	Jul-04	New facility	54,400	recreation/ bookstore/ grocery/office	Parking	a few new employees	to address space deficiencies and allow for enrollment expansion
SL-2	STUDENT LIFE	Jun-02	Jul-04	Replacement	126,900	Dining	Parking	Chase Hall	Replacing Chase Hall (dining)
SL-3	STUDENT LIFE	Jun-04	Aug-05	New facility	126,000	Office	Chase Hall, service parking	employees relocating from existing academic buildings	to relocate some employees currently off-site
	Total Student Life				**307,300**				
UNCH-1	HOSPITAL	2002/03	2005/06	Expansion	196,280	Clinic/offices/procedures	Parking	Hospital and ACC Clinic	to decompress existing facilities
UNCH-2	HOSPITAL	2007/08	2010/11	Replacement	343,180	Clinics/offices/procedures	Parking	Hospital and ACC Clinic	to decompress existing facilities
UNCH-3	HOSPITAL	2004/05	2007/08	Replacement	291,890	Clinics/procedure areas	Parking	Gravely Building	to replace Gravely Building, which will be demolished
	Total UNC Healthcare				**831,350**				
Campus Total					**5,901,277**				

Note: The Development Plan does not include 946 units of student housing that are currently under construction.

2.1 POPULATION GROWTH

Anticipated growth in employees and student enrollment during the course of the Development Plan is shown in Table 2-2 and Table 2-3 below. The tables indicate that there is an anticipated increase in employees of 35 percent. Students are expected to grow by 13 percent, overall, to just under 30,000. Resident students are expected to grow at a higher rate than commuting students. This is reflected in the units currently under construction (946 beds not in development plan) and planned construction for 1,000 students shown in the Development Plan.

Parking impacts on each of these groups is discussed in the following section.

Table 2-2: Anticipated Employee Growth (2000-2010)

	2000	2010	2000-2010
Number of Employees	14,303	19,337	5,034
Employees on Main Campus*	13,016	17,597	4,581
Employees off Main Campus	1,287	1,740	453
Growth Rate			35%

*Permit data were used to estimate the percentage of employees who work (and park) off campus, approximately 9 percent.

Table 2-3: Anticipated Student Growth (2000-2010)

	2000	2010	2000-2010	Growth Rate
Number of Students	25,872	29,249	3,377	13%
Resident Students	7,244	10,136	2,892	40%
Commuting Students	18,369	18,821	452	2.5%

Notes:

1. Year 2000 breakout of resident and commuting students based on existing percentages (28% resident, 71% commuter). For year 2010 the percentages were adjusted to account for a planned increase in resident students of 1,946. This includes 946 beds currently under construction that are not part of the Development Plan and an additional 1,000 beds included in the Plan.
2. All students not accommodated by residence halls or family housing are assumed to be commuting students.
3. Present number of students in family housing is assumed to remain constant.

2.2 PARKING IMPACTS

2.2.1 Existing Parking

The total number of parking spaces owned by the University in the 2000/2001 academic year is 17,620 of which approximately 14,200 are on Main Campus (excluding motorcycle parking). Of these, approximately 5,450 are in the four parking decks on South Campus. Existing Main Campus parking facilities are shown in Figure 2-2.

Currently there is not enough parking on Main Campus for all employees wanting to park there. There are approximately 8,000 spaces for approximately 13,000,Main Campus employees, or 0.61 spaces per Main Campus employee (because of the oversell ratio which accounts for some people not being on Main Campus on any particular day because of vacation, illness, etc., the number of parking permits issued is higher, 0.77 per employee).

The rate for students is much lower (less than 10 percent for both resident students and commuting students). No freshman is eligible for a parking permit on Main Campus. In addition, no student residing off-campus within a 2-mile radius of the Bell Tower is eligible.

2.2.2 Displaced Parking

The Development Plan will permanently displace 3,811 existing surface spaces (excluded from this number are 185 losses due to construction staging and 428 student family spaces which are added back with the construction of new student family units). These anticipated losses are shown by location and user in Table 2-5 and Figure 2-3. It should be cautioned that these are estimates only, and that there are several factors that could affect the actual losses:

- Included are spaces lost to future parking deck construction. The final size and configuration of the deck will determine how many surface spaces, if any, could be retained.

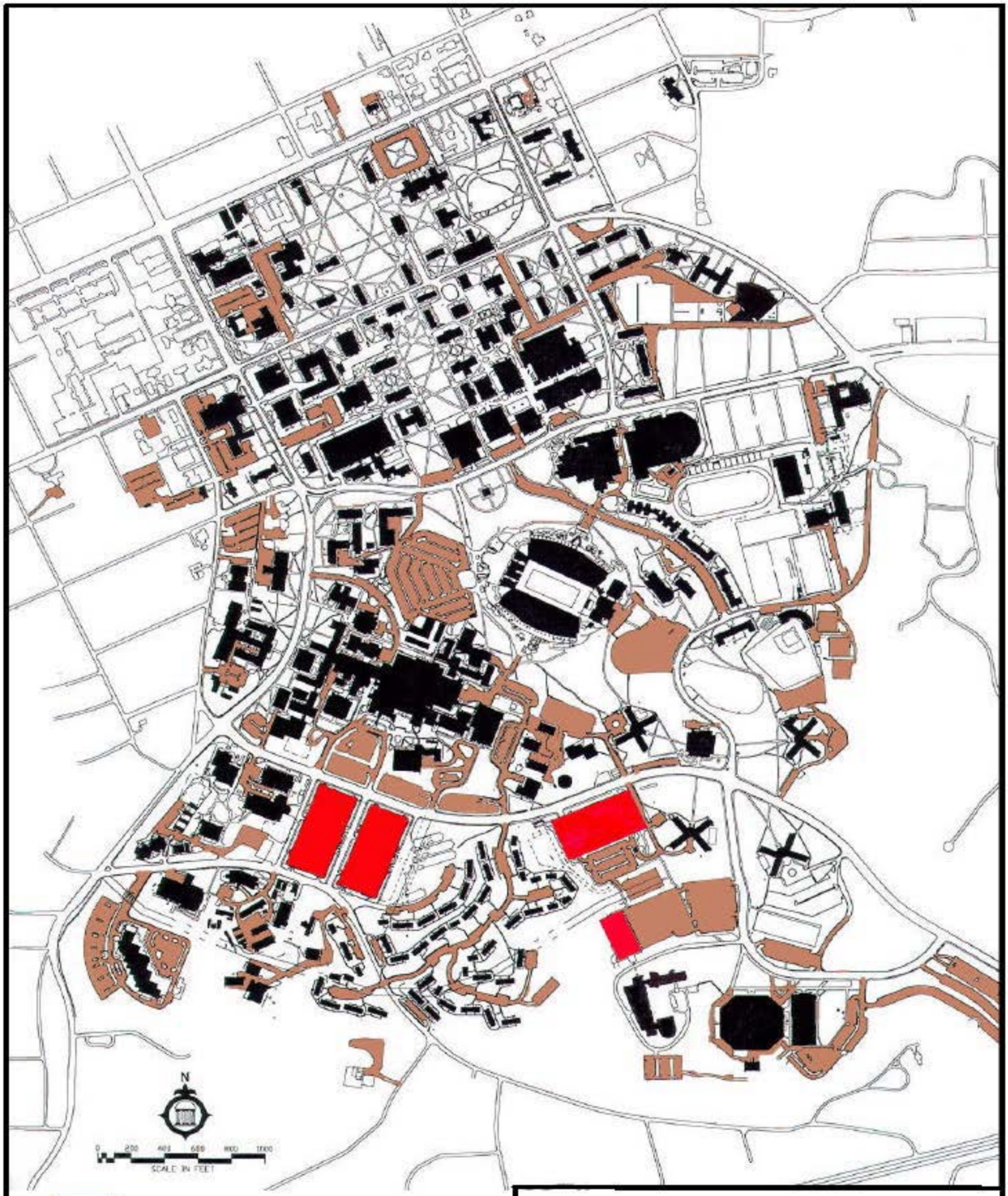
- It has been assumed that some service and disability spaces, as well as some permit spaces at some sites, may be retained. The actual number will depend on the configuration of future buildings, landscaping, etc.

2.2.3 Additional Main Campus Parking

The Development Plan will permanently add 5,366 new spaces to Main Campus (this includes a net increase of 36 spaces for student family housing). The remaining 5,330 spaces are all being provided in eight new structures (either free standing decks or on the lower level of buildings), as indicated below. These new structures are shown in Table 2-4.

Summary of Parking Impacts

As shown in Table 2-5, the net parking impact of the proposed Development Plan is an increase of 1,550 spaces. Of these, 1,398 are for patients/visitors, 421 are for employees, and there is a net loss of 239 for resident students and 30 for service vehicles.



Surface Parking

Parking Decks

Figure 2-2

Existing Main Campus Parking Facilities

Table 2-4: Summary of New Parking in Development Plan

Facility	Number of Spaces
ACC	350
Bell Tower	1,000
Cameron	330
Manning	1,500
McCauley	120
NC H& C	730
Rams Head	700
Venable	600
Total	**5,330**

Table 2-5: Parking Impacts of Development Plan

Lot Name	Parking Zone	Employee	Student	Visitor	Service	Net Change
ACC (new structure)				198		198
Bell Tower (new structure)	BG	541				541
Bowles	S11	-628				-628
Cameron (new structure)	ND1			330		330
Conner	N4		-20			-20
Craige Surface	CD	-249				-249
Dental School	S6	-55				-55
Glaxo/HousingSupport/MFM/MRI	S6	-95				-95
Gravely	CG	-135		730		595
Hanes				-63		-63
Hinton James	M	45	-250			-205
Kenan/McColl Visitor Parking				-40		-40
Manning (new structure)	S11	932				932
McCauley Street	W	-34				-34
Neurosciences	CG	-100				-100
North Medical Drive				-10	-10	-20
Porthole	N2	-40				-40
Ramshead (new structure)	S5			303		303
Ridge Road	S1	-17				-17
Service					-20	-20
Sitterson	NG2	-135				-135
Student Family Housing	MR/MR2		31			31
Swain	NG1	-184		-50		-234
Venable (new structure)	ND2	600				600
Wilson Library	N8	-25				-25
		421	**-239**	**1398**	**-30**	**1550**

Notes:

1. Numbers are preliminary and subject to change, depending on the final footprint of each project.
2. These numbers represent net changes only. For example, the Ramshead structure will have 700 spaces, but 397 are displaced as a result of its construction. The net impact, which is shown in this table, is 303 spaces.

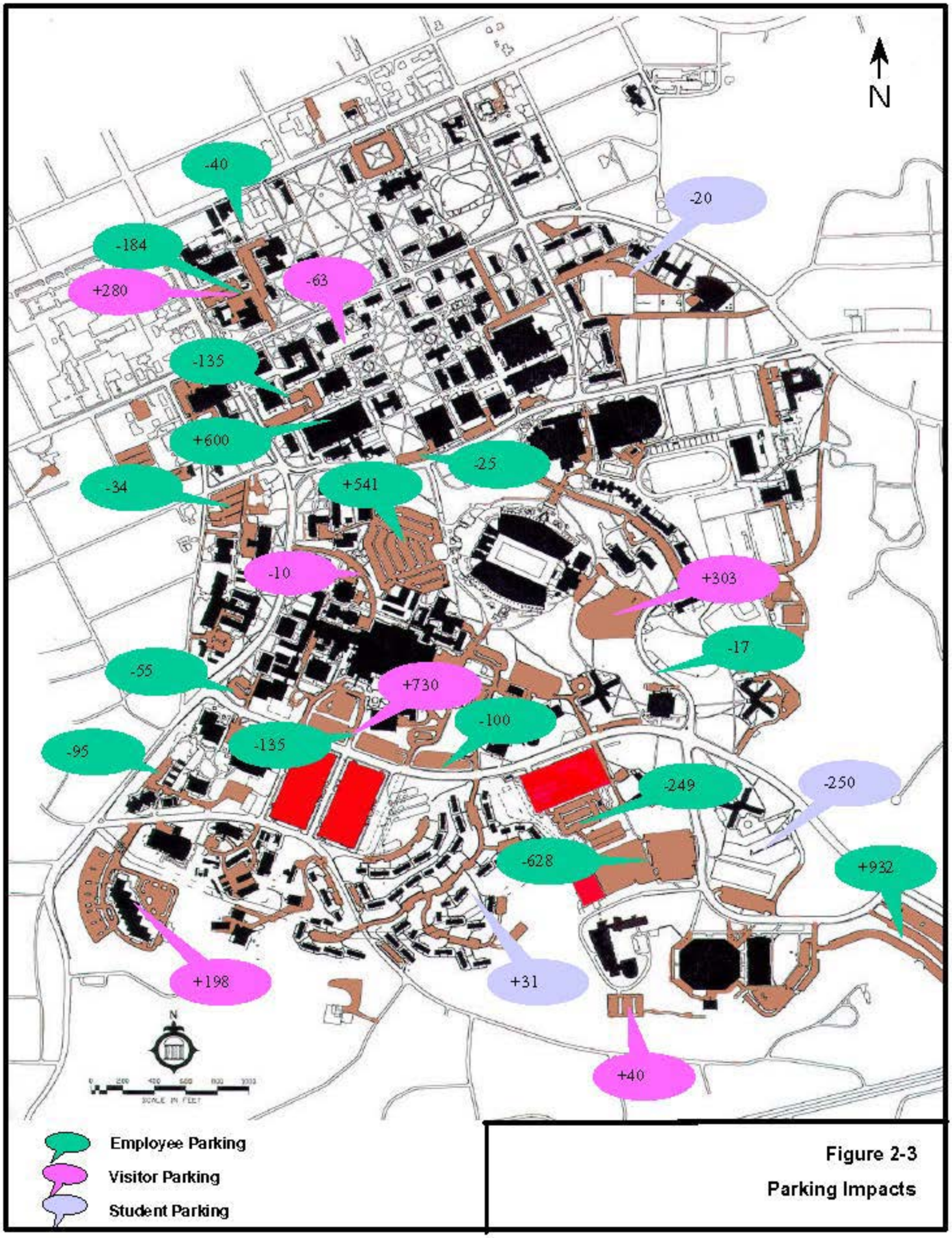


Figure 2-3

Parking Impacts

2.2.4 Future Parking Demand

Table 2-6 summarizes the demand for Main Campus parking spaces by user group based on current demand, projected employee growth rates, and parking impacts of the Development Plan. The findings of this table are summarized in this section.

Employees

If future parking were provided at the same overall Main Campus employee to space ratio as today, approximately 3,100 more spaces would be needed on Main Campus to support the Development Plan (see Table 2-6). Of the net increase of 1,550 spaces, 421 are allocated to employees. Therefore, by 2010, there would be a net shortage of approximately 2,675 Main Campus parking spaces for employees.

Resident Students

If future Main Campus parking for resident students were provided at the same overall ratio as today, approximately 232 new spaces would be needed to support the increased enrollment associated with the Development Plan (see Table 2-6). This includes provisions for the housing currently under construction, which is not part of the Plan. Increased parking for resident students is not provided for in the Development Plan, which actually decreases the amount of resident student parking on Main Campus. These vehicles will need to be accommodated in storage lots.

Commuting Students

Using the same methodology as described for employees and resident students, Table 2-6 indicates an increased demand for Main Campus parking by commuting students of approximately 39 spaces. There is no net change in parking spaces for commuting students as a result of the Development Plan. At this time, it is anticipated that all commuting student surface parking that is eliminated will be replaced in the decks.

Student Family Housing

Students in family housing are being relocated to new housing with per unit parking built into its development plan. The new development will contain the same number of units as today (306) so no new parking demand is anticipated.

Patients/Visitors

A slightly different methodology was used to project parking demand for Hospitals and University patients and visitors. As shown in the table, current demand (assumed to be the current number of spaces occupied by patients/visitors) was projected to grow by the anticipated growth rate in number of patients and visitors for the Hospitals (61 percent) and by the growth rate in occupiable square footage (excludes parking decks) for University visitors (approximately 35 percent).

> Hospitals Patients/Visitors. Future new patient/visitor demand is projected to be 972 spaces. The Development Plan provides a net increase of 928 visitor spaces, resulting in a shortage of visitor spaces. However, an estimated 250 empty visitor spaces currently exist in the Dogwood Deck. Adding these yields a surplus of just over 200 spaces for Hospitals patients and visitors.
>
> University Visitors. Assuming a 35 percent increase in University visitors, there would be an increase in visitor demand for Main Campus spaces of 375 spaces. The Development Plan provides a net increase of 470 visitor spaces. Therefore,

as with the Hospitals patients and visitors, there is a projected surplus of almost 100 spaces for University visitors.

Overall, based on a total additional demand of approximately 4,700 spaces, a net provision of 1,550 spaces, and taking into account the 250 currently vacant spaces in the Dogwood Deck, the Development Plan would require about 2,900 additional Main Campus spaces if current permit and visitor allocation trends were maintained. Section 3.0 explains the University's plans to address this "shortfall" through park and ride and other alternative transportation options.

Table 2-6: 2010 Main Campus Parking Space Analysis

A.	Employee[1]	Student		Total
		Resident	Commuter	
Existing ratio of Main Campus spaces to population[2]	0.61	0.08	0.09	
Future Increase (2001 - 2010)	5034	2888	447	
Future New Main Campus Parking Demand[3]	3094	232	39	3365
Net Parking Provided in Development Plan[4]	421	(270)	0	151
Shortage/Surplus[5]	(2673)	(502)	(39)	(3214)

B.	Patient/Visitor		Total
	Hospitals	University	
Current Demand[6]	1603	1072	2675
Future Growth[7]	0.61	0.35	--
Future New Demand	972	375	1347
Net Parking Provided in Development Plan	928	470	1398
Existing Empty Spaces	250	0	250
Shortage/Surplus	206	95	301

[1]Employees working on Main Campus Only. Parking permits for "prime remote" locations were used to estimate the number of employees working off-campus (9 percent). It is assumed that these employees get parking spaces. An estimated 250 spaces in the Dogwood Deck. These were not used to calculate the ratio of spaces to patients.

[2]Assumes that parking is satisfied according to existing ratio of spaces to population.

[3]Calculated by multiplying future increase by existing ratio of spaces to population.

[4]See Table 2-4. Excludes family student housing gain of 36 spaces and service loss of 30 spaces.

[5]It is assumed that no additional (net) student parking will be provided on Main Campus. Any unsatisfied demand must be accommodated by use of alternative modes, park and ride, or storage lots.

[6]Existing occupied spaces. Based on Year 2000 data. An estimated 250 Hospitals visitor spaces are empty in the Dogwood Deck. These are not included in current demand.

[7]Hospitals patient/visitor growth based on 2010 projections. University visitor growth assumed to equal growth in

3.0 TRIP GENERATION AND REDUCTION STRATEGIES

The section discusses trip generation and the proposed trip reduction strategies and their estimated impacts. As required by the *Transportation Impact Analysis Guidelines*, vehicular trip generation was first calculated assuming the Development Plan was a hypothetical, suburban development where no or very limited trip reduction strategies applied. The impacts of the proposed trip reduction strategies that are integral to the Development Plan are then calculated for comparison purposes.

The remainder of this section describes the various strategies that are proposed to address the limited employee and student parking increases in the Development Plan. The air quality impacts of these strategies are also estimated.

3.1 ESTIMATED VEHICULAR TRIP REDUCTIONS

As required by the *Transportation Impact Analysis Guidelines*, an estimate of the impact of the proposed trip reduction strategies on the amount of vehicular trips that will be generated by the Development Plan has been made by comparing it with a similar, hypothetical development where no, or very limited, trip reduction strategies applied.

3.1.1 Trip Generation Based on the Institute of Transportation Engineers Trip Generation Manual

The amount of vehicular traffic that could be generated by the Development Plan if it were a typical suburban development was estimated using trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (6th Edition). The ITE *Trip Generation Manual* is the standard document used by traffic engineers for estimating the amount of traffic that will be generated by a new development for projects across the U.S, including Chapel Hill.

Trips were estimated for the A.M. and P.M. peak hours, and for a typical weekday (24-hour period) using the following land use categories that are included in the ITE manual:

- University/College (ITE Land Use Code 550) for all academic-related buildings (buildings referred to as Academic, Cultural, Office and Student Life in the Development Plan).

- Research and Development (ITE Land Use Code 760) for all buildings referred to as Research in the Development Plan.

- Hospital (ITE Land Use Code 610) for all buildings referred to as UNC Healthcare in the Development Plan.

- Supermarket (ITE Land Use Code 850) for a planned supermarket in the Rams Head project (even though almost all customers will walk to the supermarket).

These land uses, the basis for estimating vehicular trips, and the generated trips are shown in Table 3-1. The following should be noted:

- The increase in the number of students is used as the basis for estimating traffic generated by the University/College. (Estimating traffic by taking the difference in

traffic generated by the existing enrollment and the future enrollment yields a very similar answer.)

- The supermarket is assumed to be a typical suburban facility for the purpose of determining ITE traffic generation.

- The ITE housing category of apartments is used for all housing by assuming (a) that the 306 units of family housing are similar to apartments, and (b) each residential housing unit, which has four beds, is equivalent to two apartments.

Table 3-1: ITE Trip Generation Rates

ITE Land Use Code			ITE MANUAL RATES*			
	USE	Gsf/Units	ADT	AM Enter	AM Exit	AM Total
550	University/College	3,377 students	7,967	523	131	654
760	Research & Dev. Center	457,400 sf	3,578	427	87	514
610	Hospital	831,350 sf	10,571	512	190	702
850	Supermarket	10,000 sf	1,115	7	5	12
220	Apartments	809 dwelling units	4,983	65	340	405
		LAND USE TOTALS	**28,214**	**1,534**	**753**	**2,287**

ITE Land Use Code			ITE MANUAL RATES*			
	USE	Gsf/Units	ADT	PM Enter	PM Exit	PM Total
550	University/College	3,377 students	7,967	233	544	777
760	Research & Dev. Center	457,400 sf	3,578	71	401	472
610	Hospital	831,350 sf	10,571	171	542	713
850	Supermarket	10,000 sf	1,115	69	66	135
220	Apartments	809 dwelling units	4,983	306	151	456
		LAND USE TOTALS	**28,214**	**850**	**1,703**	**2,553**

3.1.2 Trip Reduction

The ITE analysis provides an estimate of the vehicular trips that would be generated in a suburban setting without trip reduction measures. Obviously, the University already employs trip reduction strategies that would result in the Development Plan generating less traffic than the above analysis. These include limiting parking and supporting the Town's transit and park-and-ride systems. Currently there are only approximately 0.61 spaces on Main Campus for every Main Campus University/Hospitals employee (or a ratio of Main Campus parking spaces to employees of 0.61). In addition, non-resident students living within two miles of the Bell tower are not eligible for a permit.

An integral element of the adopted Main Campus Master Plan is to minimize the increase in Main Campus parking as the campus grows, by promoting and increasing the use of alternative forms of transportation. The parking and transportation initiatives that are inherent in the Development Plan are consistent with the transportation strategy for the Master Plan.

The increase in Main Campus employee and student parking accompanying the Development Plan is significantly less than current ratios. Therefore, an increased proportion of employees and students will need to use alternative modes to commute to campus. The increased use of alternatives is commensurate with the reduced amount of parking.

It should be noted that trip reduction strategies apply to students and employees only. The needs of visitors, particularly Hospitals patients and visitors, will continue to be satisfied.

3.1.3 Employee Parking Shortfall

University and Hospitals employment is projected to increase by 5,034 employees in the timeframe of the Development Plan (i.e., within the next 10 years). If parking were to be provided at the current ratio of 0.61 Main Campus spaces per employee, approximately 3,100 additional spaces would be required.

The Development Plan includes a net increase of 421 employee parking spaces. The "shortfall" is therefore approximately 2,675 spaces. The vehicular trips that would have been generated by these spaces represents the reduction in campus traffic compared to providing parking at current ratios, while the employees that would have used these spaces represent the required increase in use of alternatives modes.

3.1.4 Calculation of Vehicular Trip Reduction

A "shortfall" of 2,675 employee spaces can be translated into a reduction in vehicular trips for the A.M. and P.M. peak periods, and for a typical weekday compared to providing parking at current ratios, by applying the number of trips generated by a parking space (refer to Section 4.0). The results are shown in Table 3-2.

Table 3-2: Vehicular Trip Reductions

	Trip Rates	Reduction in Trips for Development Plan	Total Reduction Compared to ITE Trips	Total ITE Trips	Percent Trip Reduction
Weekday	3.5	9,362	11,559	28,214	41%
A.M. Peak Hour	0.48	1,284	1,585	2,287	69%
P.M. Peak Hour	0.50	1,337	1,651	2,553	65%

Currently approximately 77 percent of Main Campus employees have permits and therefore can drive and park on Main Campus. In a suburban setting, approximately 95 percent of employees drive (supported by employee surveys undertaken in the Research Triangle Park). Therefore, parking is currently provided at approximately 81 percent of what is assumed in the ITE rates. The reductions associated with the Development Plan are divided by 0.81 to provide a comparison with ITE trip rates. The resulting trip reductions are shown in the last column of the table.

The following should be noted regarding the conclusions:

- They must be interpreted with care since they merge the results of two different methodologies for estimating trip generation. Both methodologies have inherent shortcomings.

- The reductions do not account for trips associated with reduced student parking. This reduction will be minimal, however, since most of the lost student parking is for residents of whom only a small proportion use their car on any particular day.

It should also be noted that the reduced parking ratios and corresponding traffic reductions are not limited to new employees and students. Trip reduction strategies to achieve these reductions are now, and will continue to be, implemented across the entire campus population. For example, the use of alternatives modes to compensate for the 2,675-space "shortfall" must entail enticing some current employees to switch from driving alone and parking on Main Campus to transit, ridesharing, or using park-and-ride.

3.2 TRIP REDUCTION STRATEGIES AND IMPACTS

As described earlier, on a typical day there will be an employee parking "shortfall" of approximately 2,675 spaces on Main Campus. Students, both resident and commuter, will also face shortfalls that must be addressed by alternatives means, or "trip reduction strategies".

This section describes:

- The number of additional people (employees and students) associated with the Development Plan that must be accommodated by alternative means of travel.

- The trip reduction strategies that will be employed.

- The estimated impact of these strategies.

3.2.1 Estimates of Persons to be Diverted to Alternatives Modes

The number of additional persons that must be accommodated in alternative modes comprises the proportion of new employees and students (resident and commuter) whose parking cannot be satisfied on Main Campus. It is assumed that the proportion of employees and students (and even visitors) currently using alternative modes to driving alone to Main Campus will remain the same. Therefore transit ridership, park-and-ride demand, bicycle use, etc. would continue to increase in proportion to campus growth. While these additional demands must be planned for, they theoretically do not require more aggressive efforts on the part of the University and other agencies to be achieved. They can be considered natural growth in the use of these modes, resulting from University, Town and regional efforts.

The additional persons that must be accommodated include:

- **2,675 employees**. The employee parking "shortfall" is 2,675 vehicles, approximately 10 percent of which are carpools. While the number of employees affected is therefore slightly higher, carpoolers will be given preference so that mainly single occupant vehicles will be displaced.

- **39 commuters**. These account for estimated growth in the commuting student population, with no significant corresponding increase in parking. Again, it is assumed that only drive-alone commuters will be affected.

Therefore, the total number of persons that must be diverted to alternatives modes is 2,715.

In addition, an additional **502 spaces** must be found for resident students. This accounts for estimated growth in resident students and a net loss in Main Campus parking for this group. This parking will be accommodated in the PR lot which is planned to be expanded to add approximately 500 spaces.

3.2.2 Trip Reduction Strategies

Transportation Strategy For Main Campus

The transportation strategies that are inherent in the Development Plan are consistent with the overall transportation strategy that guided the preparation of the recent Main Campus Master Plan (described in several transportation reports that accompany the Master Plan). These in turn reflect the objectives and recommendations that were developed in 1997/98 by a Parking and Transit Task Force. A clear theme of the Task Force was that the University should promote alternative modes of transportation and other initiatives such as teleworking to reduce the impact of traffic and parking on the campus. Key objectives established by the Task Force included:

- To encourage a campus and Town environment that is supportive of pedestrians and other alternative modes of transportation.

- To offer affordable, flexible, and convenient transportation options that will serve the diverse lifestyles of the campus community.

- To reduce the demand for parking on Main Campus while maintaining an adequate supply for visitors.

- To develop an efficient comprehensive transportation system to better serve the entire University community.

Key recommendations from the Task Force were to:

- Minimize traffic on Main Campus
- Create a pedestrian-oriented environment
- Minimize new parking
- Focus on alternatives:

    - transit
    - bicycles
    - ridesharing
    - park-and-ride
    - off-campus vehicle storage
    - flexible work hours
    - teleworking

Many of the transportation strategies needed to support the Master Plan and Development Plan are not new to the University. A substantial number of employees and students now use alternative forms of transportation to travel to the campus. The University is a major financial supporter of Chapel Hill Transit (CHT), and funds the free and very popular U and R-U routes on Main Campus. It has participated in the development of park-and ride lots. It assists commuters in forming carpools, provides preferential parking for vanpools, and provides a free emergency ride to park-and ride lots. In conjunction with the Town, cycling is being promoted and improvements are included in the Master Plan. The Master Plan also allows for fixed guideway transit to ultimately serve the campus.

A Transit and Parking Advisory Committee (TPAC) met in late 2000/early 2001 to develop a detailed program for the first few years. Most of the elements of the trip reduction strategies described below are an outcome of that effort.

The following key strategies and, where applicable, their projected impacts, are described below for:

- Chapel Hill Transit
- Regional transit
- Ridesharing
- Teleworking
- Cycling
- Walking
- Park-and-ride

It is important to note that the University has budgeted and advertised for a fulltime Transportation Demand Management (TDM) coordinator. The role of this person, expected to on board by the beginning of the fall, will be to promote and assist employees in learning about and using alternative modes.

Chapel Hill Transit

Chapel Hill Transit (CHT) carries approximately 11,000 riders on a typical weekday. An estimated 90 percent are University students or employees using the service to travel to the campus or other destinations in Chapel Hill or Carrboro. A survey of University commuters undertaken in 1997 (*University Commuting Study*, Department of Pubic Safety) found that approximately five percent of employees and 26 percent of students used the bus to commute.

Table 3-3 shows the number of daily boardings and alightings at Main Campus stops in 1998. The total, approximately 10,000, indicates that the majority of the CHT ridership is to or within Main Campus. Subsequent updates of the Transportation Impact Analysis will include updated counts at each Main Campus stop to ascertain trends in Main Campus ridership.

Table 3-3: Chapel Hill Transit Daily Boardings and Alightings

Stop Locations	Boarding	Alighting
Cameron Ave. @ Davie Hall	100	165
Cameron Ave. @ Pittsboro St.	5	74
Cameron Ave. @ Swain Hall	243	247
E Franklin St @ Coffee Shop	718	424
E Franklin St @ Planetarium	98	39
East Ramp @ Deck	0	1
East Ramp @ FLO Bldg	0	2
East Ramp @ Mason Farm Rd.	5	17
F Lot @ Skipper Bowles Dr.	96	1
F Lot-Lower Level	24	4
F Parking Lot-Family Practice	31	80
FLOB @ Mason Farm Rd. ACC	0	1
FLOB Bldg West Ramp	12	37
Manning Drive @ Chase Hall	519	466
Manning Drive @ Craige Dorm	1	2
Manning Drive @ East Ramp	87	52
Manning Drive @ FLO Building	213	282
Manning Drive @ Gravely Drive	64	72
Manning Drive @ Hibbard	34	65
Manning Drive @ James Dorm	354	835
Manning Drive @ Skipper Bowles Drive	13	0
Mason Farm Rd @ Ambul Care Ctr	17	36
NCMH @ Parking Lot	241	439
Pittsboro Street @ Credit Union	450	424
Pittsboro Street @ Newman Center	224	137
Pittsboro Street @ SECU	0	0
Pittsboro Street @ University Drive	86	71
Raleigh Street @ Alderman Dorm	19	2
Raleigh Street @ Connor Dorm	71	30
Raleigh Street @ Davis Library	125	132
Raleigh Street @ Lewis Dorm	125	80
Raleigh Street @ Mangum Dorm	99	140
Raleigh Street @ Spencer Dorm	34	42
Ridge Road @ Avery Dorm	10	1
Ridge Road @ Eringhaus	1115	26
Ridge Road @ Stadium Dr.	24	38
S. Columbia St. @ Abernethy Hall	275	351
S. Columbia St. @ Carrington Hall	553	422
S. Columbia St. @ Frat Court	365	392
S. Columbia St. @ Health Sci. Lib.	594	496
S. Columbia St. @ Mason Farm Rd.	5	24
S. Columbia St. @ Old Pittsboro Rd.	0	0
S. Columbia St. @ Sitterson Hall	424	766
S. Columbia St. @ Westwood St.	3	0
Skipper Bowles Drive @ SAC Lot	29	50
Skipper Bowles Drive @ Bowles Lot	32	89
Skipper Bowles Drive @ Craige Dorm	4	35
Skipper Bowles Drive @ F Lot	116	71
Skipper Bowles Drive @ Hinton James	43	0
Skipper Bowles Drive @ James Dorm	107	14
Skipper Bowles Drive @ Manning	114	129
Skipper Bowles Drive @ Smith Center	230	191
Skipper Bowles Drive @ Smith Center	243	302
Skipper Bowles Drive @ Tennis Ct.	15	0
South Road @ Carmichael	17	1
South Road @ Coker Hall	82	27
South Road @ Fetzer Gym	336	186
South Road @ Institute of Gvt.	36	11
South Road @ Kenan Labs	2	192
South Road @ Raleigh St.	2	14
South Road @ Student Store	945	448
Stadium Drive @ Fetzer Gym	138	1069
Stadium Drive @ Ridge Road	41	98
Stadium Drive @ South Rd.	0	0
Stadium Drive @ Stadium Gate 2	43	34
West Drive @ FLOB	4	1
West Drive @ Mason Farm Rd.	2	1
TOTALS	10057	9878

There is potential for a significantly larger proportion of University employees and students to use CHT. Travel statistics from the 1997 commuting survey revealed that for University employees:

- 40 percent live in a Chapel Hill zip code.
- 35 percent live within five miles of work.
- Only 5 percent use the bus to get to work.
- 70 percent drive alone to work everyday.
- 45 percent who live less than two miles from campus drive alone at least one day a week.
- 17 percent who drive live less that a ¼ mile from a bus stop.

Similar statistics for commuting students show:

- 73 percent live in Chapel Hill/Carrboro.
- Almost 70 percent live less than five miles from the campus.
- Over 40 percent drive alone at least one day a week.
- Over 40 percent who drive alone or carpool live less than ¼ mile from a bus stop.

Geocoding of employee and student home addresses confirmed that only a small proportion of employees and students residing within ¼ mile of bus route currently use the bus for commuting, as indicated in Table 3-4. Figure 3-1 and Figure 3-2, respectively, show the location of residences and the population within a quarter mile of a bus route. The conclusion is that with appropriate improvements and marketing there is potential for many more employees, and to some degree students, to use CHT to travel to the campus (students living within two miles of the Bell Tower are not eligible for a parking permit).

Earlier this year TPAC analyzed, and estimated costs for, a variety of transit service improvements, including:

- Making the entire CHT system fare-free
- Extending the peak hour headways to the midday period
- Increasing evening service on weekdays and on weekends
- Introducing a night parking program with transit service extended to midnight on key student routes
- Adding more on-campus transit routes, including express service to outlying facilities
- Extending the U and RU routes to later hours
- Increasing service to park-and-ride lots

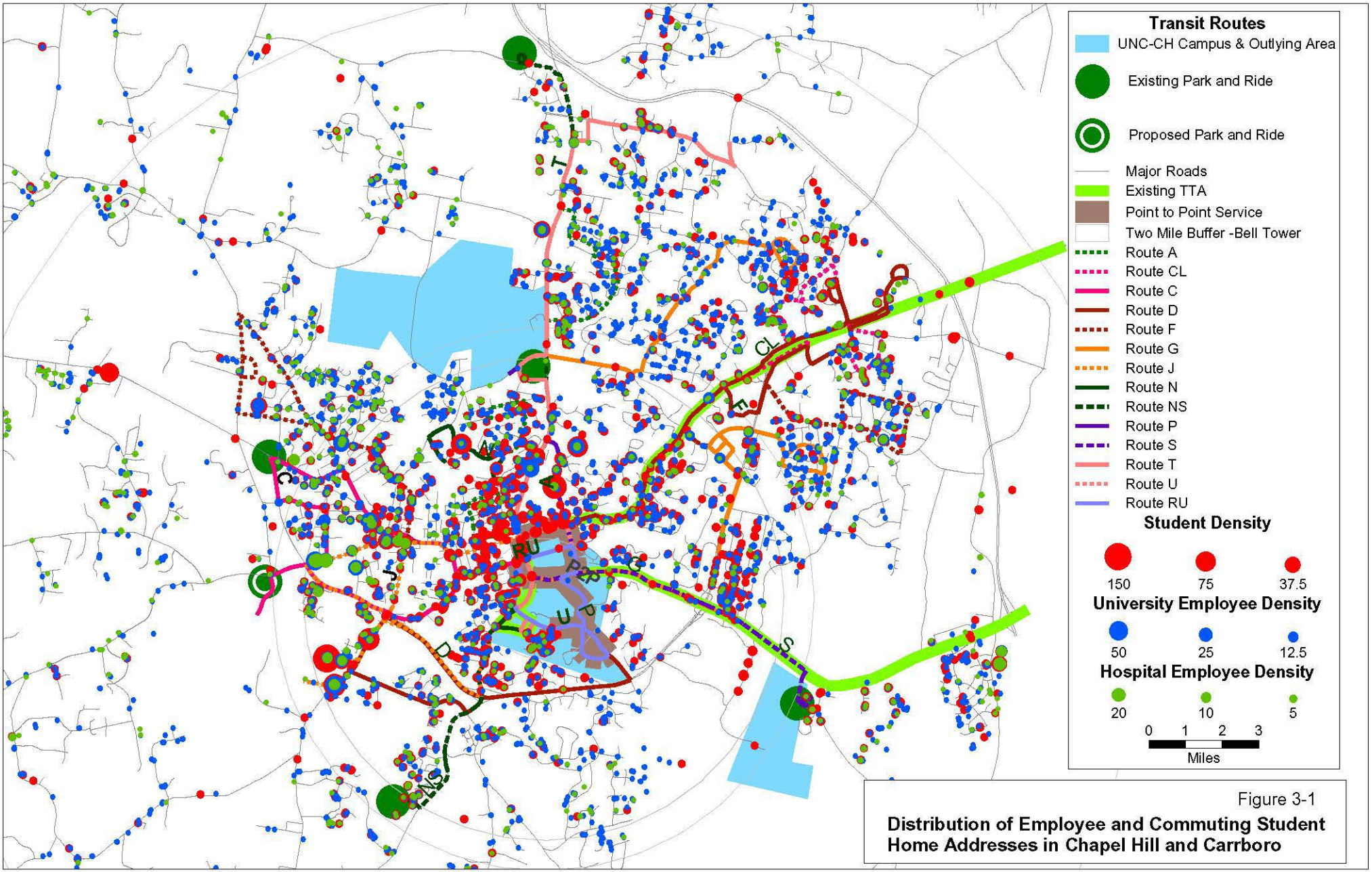


Figure 3-1

Distribution of Employee and Commuting Student Home Addresses in Chapel Hill and Carrboro

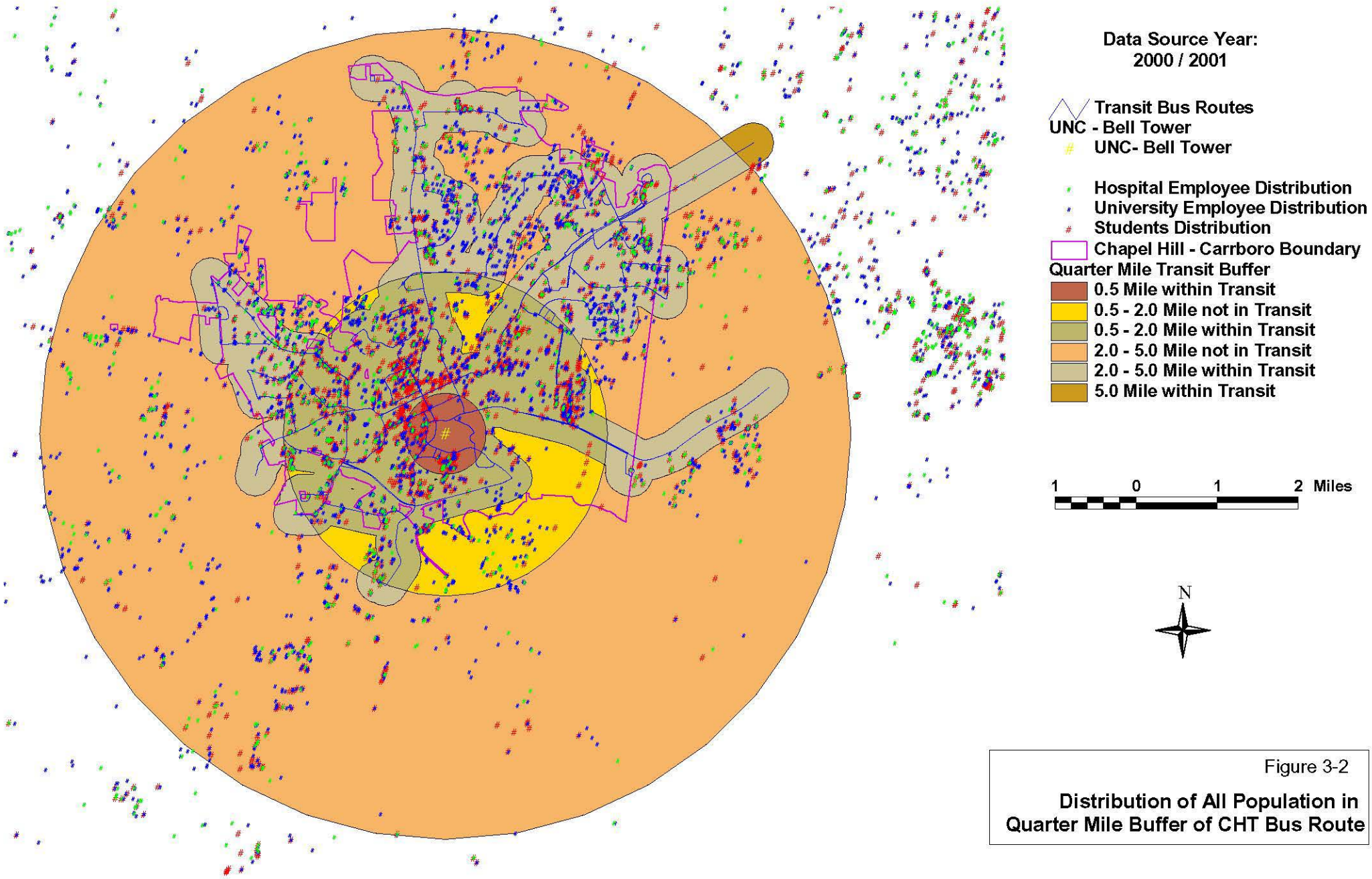


Figure 3-2

Distribution of All Population in Quarter Mile Buffer of CHT Bus Route

Table 3-4: Potential Commuter Ridership for Chapel Hill Transit

	Total Population in Chapel Hill/Carrboro[1]	Residence Within 1/4 Mile of Bus Route, and				Residence Outside 1/4 Mile of Bus Route, and		
		Within 0.5 Mile Radius from Bell Tower	Within 0.5 - 2.0 Mile Radius from Bell Tower	Within 2.0 - 5.0 Mile Radius from Bell Tower	> 5.0 Mile Radius from Bell Tower	Within 0.5 - 2.0 Mile Radius from Bell Tower	Within 2.0 - 5.0 Mile Radius from Bell Tower	> 5.0 Mile Radius from Bell Tower
STUDENTS								
Population	**11,549**	828	7,291	2,523	0	110	797	
Transit use based on 1997 survey:								
- percent			25.90%	46.70%	-			
- number of students			2,103	1,178				
Drive alone 1+ days/week based on 1997 survey:								
- percent			15.60%	47.50%				
- number of students			1,267	1,198				
Potential New Transit Riders based on Drive Alone[2]			***0 since not eligible for permit***	***599***				
EMPLOYEES								
Population:								
- Hospitals	**1,914**	34	651	573	-	46	391	218
- University	**6,640**	103	2,496	1,917	-	256	1,273	596
Total	**8,554**	**137**	**3,147**	**2,490**	**-**	**302**	**1,664**	**814**
Transit use based on 1997 survey:								
- percent			10.30%	13.50%				
- number of employees			338	336				
Drive alone 1+ days/week based on 1997 survey:								
- percent			44.80%	72.00%				
- number of employees			1,471	1,793				
Potential New Transit Riders based on Drive Alone[2]			***736***	***896***				

Notes:

1. Population and residence data is for 2000/2001. Address location based on geocoding in GIS.
2. Percent transit riders in 0.5 to 2 mile radius includes 0 to 1/2 mile in 1997 University commuter survey. Population in 0 to 0.5 mile subtracted since these people unlikely to use transit.
   Potential new riders assumes drive alone commuters drive alone at least 50% of days (students now average 3.5 days and 83% employees drive alone 5+ days/week).
   New ridership assumes 50% of eligible drive-alone drivers are diverted to transit with fare free and service improvements.
   Ridership would be higher if employee and student growth was considered (assuming similar proportion live in Chapel Hill/Carrboro).

Before TPAC concluded its meetings, the students passed a referendum to increase their transit fee to contribute $500,000 towards making CHT fare-free. Subsequently the University administration and the Towns of Chapel Hill and Carrboro approved budgets for fare-free. It is anticipated that the system will become fare-free in early 2002.

Experience with fare-free systems has demonstrated potential to dramatically increase ridership. This occurred at the University of Colorado at Boulder and at the University of Florida at Gainesville. Fare-free initiatives in downtown Seattle and Portland, Oregon, boosted ridership by approximately 50 percent.

An additional on-campus route, similar to the U and RU routes, to serve the eastern part of the campus will go into effect in January, 2000. The University is committed to work with the towns in progressively moving forward with some of the additional transit improvements that were analyzed earlier this year. These service improvements such as extended hours and improved frequency will also increase ridership.

Table 3-4 shows that over 2,000 additional existing employees and students could use CHT if 50 percent of those residing within a ¼ mile of a route and now driving alone switched to transit. This is equivalent to 4,000 daily riders, or about a 55 percent increase in ridership to Main Campus (excluding the U and RU routes). While this is considered achievable with a combination of fare-free operation and service improvements, a more moderate estimate of **1,500** additional persons is being used in this report.

It should be noted that even intra-campus service improvements can reduce the number of people driving to work by enabling employees to move around campus for personal or business travel without the need for a car. This allows some employees to commute by alternative means since they don't need their car during the day.

The University supports the Town of Chapel Hill's initiatives to improve bus running times. This includes signal pre-emption with a priority traffic signal (where equipment on the bus is used to electronically transmit a message to the signal as the bus approaches to give that direction the next green light), queue jump lanes at congested intersections, and busway lanes or treatments. Examples of potential busways that the University and town could jointly consider are:

- To the Friday Center (possibly as part of a busway facility in the US 15-501 corridor and/or to RTP).

- To the Horace Williams property using the University/Norfolk Southern railway corridor (possibly implemented as part of the development of the Horace Williams property).

The University can also join the Town in ensuring that state-of-the-art technology buses are purchased as the CHT fleet is expanded, or existing buses replaced. New innovations include low floor vehicles and hybrid (electric-diesel) propulsion that allows buses to operate on quiet, pollution-free electric motors in areas where there are a lot of people. There are also new guidance technologies (optical and magnetic) that reduce the minimum width of the vehicle path and aid in signal pre-emption. In addition, the University's new Transportation Demand Management coordinator will introduce

programs to make employees and students more familiar and comfortable with the service.

Several bus stops on Main Campus are equipped with shelters. Table 3-5 provides an inventory of amenities provided at each of the Main Campus bus stops. The Main Campus Master Plan recommended that the University, in conjunction with the Town, develop a standard for an attractive, high quality shelter, and over time replace all existing shelters.

Regional Transit

The Triangle Transit Authority (TTA) now provides regional transit service from Durham and areas to the east (including Raleigh) via a transfer center in the Research Triangle Park (RTP). The TTA counts show that approximately 250 people use the service to travel to Chapel Hill on typical weekday, of which approximately 200 alight on Main Campus. Buses run every 30 minutes in the peak periods.

In March/April of 2002 the TTA will be doubling the frequency of service on these routes (i.e., service every 15 minutes in the peak periods). The TTA has projected that this improvement could increase ridership to Chapel Hill by 125 percent (i.e., from 200 to 450 persons) by 2005. This number can be expected to be higher by 2010 (the year the final building in the Development Plan is completed), at which time Phase I of the regional rail system will be operating with a major transfer hub in RTP.

As a conservative estimate, an additional **250** people can be expected to use TTA service to commute to Main Campus (above and beyond any increase based on current utilization rates).

Ridesharing

The 1997 commuter survey revealed that approximately eight percent of employees and commuting students carpool at least one day a week. Less than one percent use a vanpool.

The University has introduced a number of measures to encourage ridesharing, including preferential parking and emergency rides back to park-and-ride lots. This program will be boosted when a Transportation Demand Management coordinator is hired. A recent survey undertaken by the Research Triangle Foundation showed that since the introduction of the SMARTCOMMUTE@RTP program in 2000, car and vanpooling has increased by more than 50 percent by providing on-site travel coordinators; travel demand management web sites and a web-based matching program; preferred parking and emergency rides home; transit subsidies; and on-site transit sales.

The introduction of a Transportation Demand Management coordinator, in conjunction with more widespread of incentives, could conservatively increase carpooling from eight to ten percent of employees, or more than 300 employees on typical day. At a vehicle occupancy ratio of approximately 2 persons per carpool, this translates into **150** vehicles, and a corresponding reduction in parking spaces.

Table 3-5: UNC-Chapel Hill Campus Bus Stop Inventory

ID#	Location Name	Bus Stop Base	Shelter (size)	Other Amenities	Bus Route Served	Nearest Call Box
1	Aycock Family Medicine	concrete slab	shelter w/ seating		C, N, P, S	at stop
2	S-11 lot @ Skipper Bowles Dr.	concrete slab	shelter w/ seating		C, N, P, S	Aycock Family Medicine
3	Skipper Bowles Dr. @ entrance to S-11 lot	existing concrete sidewalk			C, N, P, S, R-U	tennis courts
4	Skipper Bowles Dr. across from S-11 lot	concrete slab	shelter w/ seating	trashcan	C, N, P, S, U	tennis courts
5	Dean Smith Center	existing concrete sidewalk			C, N, P, S, R-U	tennis courts
6	Skipper Bowles Dr. across from Dean Smith Center	concrete slab	shelter w/ seating	trashcan, newspaper	C, N, P, S, U	tennis courts
7	Skipper Bowles Dr. @ tennis courts	concrete slab	shelter w/ seating	trashcan	C, N, P, S, U	at stop
8	Skipper Bowles Dr. @ employee S-11 lot	existing concrete sidewalk			C, N, P, S, R-U	tennis courts
9	Skipper Bowles Dr. @ Craige Dorm	existing concrete sidewalk			C, N, P, S, R-U	tennis courts
10	Ridge Rd. @ Ehringhaus Dorm	concrete slab	shelter w/ seating	trashcan	A, P, R-U	Chase Dining Hall
11	Chase Dining Hall	concrete slab	shelter w/ seating	trashcan	A, C, N, S, U, H Exp.	Chase Dining Hall
12	Manning Dr. @ Craige Dorm	existing brick sidewalk			A, C, N, S, R-U	Chase Dining Hall
13	Manning Dr. @ Craige Deck	existing brick sidewalk			A, C, N, S, R-U	Bennett Bldg.
14	Hibbard Dr. & Manning Dr.	existing brick sidewalk		brick wall suitable for seating	A, C, N, S, R-U	Bennett Bldg.
15	Hibbard Dr. & Manning Dr. @ CG lot	existing brick sidewalk			A, C, N, S, U, H Exp.	Bennett Bldg.
16	Dogwood Deck on Manning Dr.	existing brick sidewalk			A, C, S, R-U	Manning Dr. & West Dr.
17	Manning Dr. across from Cardinal Deck	concrete slab	shelter w/ seating	trashcan	A, C, CL, D, G, N, N/S, S, T, U, H Exp., T/G	Manning Dr. & West Dr.
18	East Dr. & Jackson Cir.	existing brick sidewalk			CL, D, G, N, N/S, T, T/G	Bennett Bldg.
19	Mason Farm Rd. across from deck	existing brick sidewalk			CL, D, G, N, N/S, T, T/G	Manning Dr. & West Dr.
20	Mason Farm Rd. @ EPA	existing brick sidewalk			D, N, N/S	EPA
21	West Dr. & Mason Farm Rd.	existing brick sidewalk		stone wall suitable for seating	CL, D, G, N, N/S, T, T/G	Manning Dr. & West Dr.
22	Mason Farm Rd. & S. Columbia St.				D, N, N/S	EPA
23	S. Columbia St. @ BSRC	existing brick sidewalk			Carborro Plaza Exp., J, N	EPA
24	Manning Dr. @ Mary Ellen Jones Building	concrete slab	shelter w/ seating	trashcan	A, C, CL, D, G, N/S, S, T, R-U, T/G	Manning Dr. & West Dr.
25	University Dr. & Pittsboro St.	existing brick sidewalk			A, C, CL, Carborro Plaza Exp., D, G, J, N, N/S, S	Rosenau Hall
26	Pittsboro St. @ State Employees' Credit Union	existing brick sidewalk	shelter w/ seating		A, C, CL, Carborro Plaza Exp., D, G, J, N, N/S, S	Miller Hall
27	Newman Center	existing brick sidewalk	shelter w/ seating	trashcan, stone wall suitable for s	A, C, CL, Carborro Plaza Exp., D, G, J, N, N/S, S	Miller Hall
28	S. Columbia St. @ Health Sciences Library	existing concrete sidewalk	shelter (by building)	benches, trashcan	A, C, CL, Carborro Plaza Exp., D, G, J, N, N/S, S	Rosenau Hall
29	S. Columbia St. @ Carrington Nursing	concrete slab	shelter w/ seating	trashcan	A, C, CL, Carborro Plaza Exp., D, G, J, N, N/S, S	Carrington Hall
30	South Rd. @ S. Columbia St.	existing brick sidewalk			G, S, T/G	Navy ROTC
31	South Rd. @ Coker	existing brick sidewalk		stone wall suitable for seating	G, S, H Exp., T/G	Kenan Labs
32	South Rd. @ Undergraduate Library	existing brick sidewalk	shelter	stone wall suitable for seating, tra	A, G, P, S, U, T/G	Undergraduate Library
33	South Rd. @ Fetzer Gym	existing brick sidewalk	shelter w/ seating	benches, trashcan	A, G, P, S, R-U, H Exp., T/G	South Rd. & Raleigh Rd
34	Stadium Dr. @ Kenan Stadium	existing brick sidewalk		trashcan	A, P, U	at stop
35	Stadium Dr. @ Carmichael Dorm	existing brick sidewalk		trashcan	A, P, R-U	Kenan Stadium
36	Ridge Rd. & Stadium Dr.	existing brick sidewalk		trashcan	A, P, U	Avery Dorm
37	Ridge Rd. @ Avery Dorm	existing brick sidewalk			A, P, R-U	Avery Dorm
38	South Rd. @ Institute of Government	concrete slab	shelter w/ seating	trashcan	G, S, H Exp., T/G	Knapp Bldg.
39	South Rd. @ cemetery	dirt walkway		stone wall suitable for seating	G, S, T/G	South Rd. & Raleigh Rd.
40	South Rd. @ Carmichael Auditorium	existing brick sidewalk		trashcan	G, S, H Exp., T/G	behind Carmichael Aud.
41	South Rd. @ Winston Dorm	existing brick sidewalk		trashcan, stone wall suitable for s	G, S	South Rd. & Raleigh Rd.
42	Raleigh Rd. @ Connor Dorm	existing brick sidewalk		stone wall suitable for seating	A, P, R-U	Raleigh Rd. @ Davis Lib.
43	Raleigh Rd. @ Student Union	existing brick sidewalk		brick wall suitable for seating	A, P, U	Raleigh Rd. @ Davis Lib.
44	Raleigh Rd. @ Lewis Dorm	existing brick sidewalk		stone wall suitable for seating	A, P, R-U	Raleigh Rd. @ Davis Lib.
45	Raleigh Rd. @ Mangum Dorm	existing brick sidewalk		stone wall suitable for seating, tra	A, P, U	Raleigh Rd. @ Davis Lib.
46	Raleigh Rd. @ Alderman Dorm	existing brick sidewalk		stone wall suitable for seating, tra	A, P	Spencer Dorm
47	Raleigh Rd. @ Spencer Dorm	existing brick sidewalk		stone wall suitable for seating	A, P, U	Spencer Dorm
48	Cameron Ave. @ New East	existing brick sidewalk			R-U	Old West
49	Cameron Ave. @ Swain Hall	existing brick sidewalk			R-U	Abernathy Hall
50	S. Columbia St. @ Sitterson Hall	existing brick sidewalk	shelter	stone wall suitable for seating, tra	A, C, CL, Carborro Plaza Exp., D, G, J, N, N/S, S	Navy ROTC
51	S. Columbia St. @ Abernathy Hall	concrete slab	shelter w/ seating	trashcan	A, CL, D, G, J, N, N/S, T, U, T/G	Abernathy Hall
52	S. Columbia St. @ Fraternity Court	existing brick sidewalk	shelter w/ seating	trashcan	A, CL, D, G, J, N, N/S, T, T/G	Abernathy Hall
53	Franklin St. @ Carolina Coffee Shop	existing brick sidewalk	shelter w/ seating	benches, trashcan	CL, D, F, U, M Shuttle, C/D, A/T	Hill Annex
54	Franklin St. @ Planetarium	existing brick sidewalk		benches, trashcan	CL, D, F, U, M Shuttle, C/D, A/T	Graham Memorial

Teleworking
Title 25 of the North Carolina Administrative Code (25 NCAC 1c.0801-.0813) provides guidelines and requirements for State teleworking programs. It has been adopted by the State Legislature effective April 1, 2001. The goal is to replace 20 percent of state employees' commuting miles with telework, without reducing hours worked or productivity (the State of Arizona achieved 13 percent after many years). In addition to the environmental and traffic congestion benefits, an explicit objective of the program is to assist in recruiting and retaining employees.

The state has appointed a full-time teleworking coordinator to manage the program and assist state agencies in establishing programs. TPAC supported teleworking as a trip reduction strategy, and an initial meeting has been held between the University and the state coordinator. Some University employees already telework.

The University is supportive of the concept of teleworking which will be explored in detail when the Transportation Demand Management coordinator is hired. For the purpose of this study, no increase in teleworking is assumed.

Cycling
Bicycles are an important means of travel on and to the Main Campus. The climate, topography for parts of the campus and surrounding areas, and relatively short trips make cycling a viable travel option for many students and employees. In addition, students living off-campus but within a two-mile radius of the Bell Tower are not eligible to receive a campus parking permit.

The 1997 commuting survey determined that 16.5 percent of commuting students use a bicycle to commute to campus. Close to four percent of employees regularly ride to work. In 1997, bike racks on Main Campus could accommodate over 4,200 bicycles.

Table 3-6 identifies locations where bicycle counts will be collected in updates to the Transportation Impact Analysis.

There are a number of existing bicycle lanes or paths on and around Main Campus, including:

- Cameron Avenue (Pittsboro Street to Merritt Mill Road). This is heavily used, with approximately 600 riders counted coming into the campus between 7 and 9 A.M. and 370 riders counted leaving the campus between 4 and 6 P.M. in 1996.

- Pittsboro Street between Cameron Street and Manning Drive (one-way southbound)

- Country Club Road

In addition, some access roads to Main Campus (including Raleigh Road and Airport Road), have wide (15 feet) inside lanes. The extra width is beneficial to cyclists. On Main Campus, cyclists are permitted to use sidewalks. The programmed improvements to South Columbia Street include 4-foot wide bike lanes on both sides between the Bypass and Mason Farm Road (though the bicycle lanes are likely to be extended northwards to Manning Drive).

Table 3-6: Existing Bicycle Counts

Location	
Cameron Avenue (west of Pittsboro Street)	DATA NOT AVAILABLE
Columbia Street	
Airport Road	
McCauley Street	
South Road	
Manning Drive	
Columbia Street/Fraternity Court pedestrian crossing	

Both Chapel Hill and Carrboro strongly support cycling. Adopted plans for both towns include new bicycle facilities to be implemented as funding becomes available. The purpose is to ultimately develop a network of interconnected bike routes and paths, including improved access to the Main Campus and Downtowns. The Town of Chapel Hill also published a draft bicycle plan in 1998, based on the goal of promoting and encourage bicycling as an alternative means of transportation to lessen traffic congestion, air pollution, and the demand for expanded parking and roadways.

As part of the Master Plan development, a bicycle plan advisory group consisting of representatives from the University and the towns was convened to discuss campus needs, and to identify potential bike routes. The group formulated the following Main Campus biking mission:

> *To design efficient bicycle transit routes which are safe for bicyclists and pedestrians; to develop adequate bicycle parking facilities, educational programs, and enforcement; to implement policies and incentives to support transportation by bicycle; and to develop architectural guidelines for buildings which include attention to showers and clothing storage for bicycle commuters.*

The overall goal is to encourage more cycling, to improve safety for cyclists, and in particular, to cater to the inexperienced or uninitiated cyclist. The group noted that several examples of successful bicycle programs at other universities (measured by an increase in the use of bicycles, and a reduction in traffic and parking needs), demonstrate the potential for increased bicycle use at the University. In every case a strong commitment, backed by a substantial increase in the budget, was made to enhance cycling. The better known programs include the University of California at Davis where an intensive bicycle program resulted in 15,000 bike commuters on any given day. In 1996, 60 percent of student and 20 percent of employee trips to campus were on foot or bicycle. Following improvements in bicycle facilities at Stanford University, 21 percent of employees bike to work.

A number of improvements were identified and included in the Master Plan. While these do not provide a complete network of bicycle routes on Main Campus, they enhance connectivity and safety at a reasonable cost, and with minimal adverse impacts. Recommended improvements include a number of bicycle paths and lanes (or wide outside lanes), primarily on South Campus where major changes proposed in the Master

Plan provide opportunities for incorporating bicycle facilities. These improvements are in addition to a commitment to control traffic speeds on campus streets to improve safety for cyclists and pedestrians.

Other recommendations that emerged for the Master Plan address the importance of supporting facilities and policies, and include:

- The planning and design of new buildings and facilities to include showers, along with storage for bicycles and cyclists' equipment.
- Signs strategically located to help cyclists locate bicycle parking facilities.
- A detailed field survey to identify minor improvements that will facilitate cycling (e.g., curb cuts).
- Commuters giving up a parking permit to use an alternative mode of travel be eligible to receive, at no cost, a number of one-day parking permits.
- An orientation program for all incoming students and employees, to introduce bicycles and other alternatives such as transit and ridesharing.
- Preparation of a bicycle map showing routes and locations of racks, and including regulations and responsibilities.
- Safety equipment continue to be distributed free of charge, funded by proceeds of abandoned bicycle sales.
- A standing bicycle group be organized to continue addressing bicycle issues.

Improvements on Main Campus and within the towns will be implemented over time. For the purpose of this study, no increase in cycling is assumed.

Pedestrians

A priority objective of the Master Plan was to create a more pedestrian-friendly and accessible campus. Numerous pedestrian enhancements, including pedestrian bridges, are included in the plan. While the pedestrian environment will be improved, it is unlikely that that alone will divert a significant number of drive-alone commuters. Table 3-7 identifies locations where pedestrian counts will be collected in updates to the Transportation Impact Analysis, as well as a summary of available counts.

Table 3-7: Pedestrian Counts

Location	North-South			East-West			Date
	AM Peak	PM Peak	Daily Total	AM Peak	PM Peak	Daily Total	
Franklin Street at the Post Office pedestrian crossing	Not available						
Franklin Street at the Carolina Coffee Shop pedestrian crossing	Not available						
Hillsborough Street/Franklin Street	Not available						
Columbia Street/Franklin Street	411	335	3530	421	539	5327	1992
Cameron Avenue/Pittsboro Street	19	33	238	329	246	2516	2000
South Road/Columbia Street	Not applicable			240		1095	1989
South Road/Bell Tower Lot entrance	580		3050	Not applicable			1989
Manning Drive/Ridge Road	Not available						
Franklin Street/Church Street	Not available						
Columbia Street/Fraternity Court pedestrian crossing	Not applicable			223	336	2043	1989

Park-and-Ride

Park-and-ride is one of the key strategies for reducing Main Campus parking needs. The intent of the University, in cooperation with the Town, is to offer commuters a well-planned and operated park-and-ride system providing a level of convenience approaching that of peripheral parking lots on Main Campus.

Parking Facilities

There are now four public park-and-ride facilities serving Chapel Hill/Carrboro, as follows (estimated utilization is as of February 2001):

- NC 54/Friday Center (500 spaces, 100 percent utilized with an estimated 50 additional users or overflow not accommodated on a typical day)
- Southern Village (400 spaces, 90 percent utilized)
- Eubanks Road (400 spaces, 40 percent utilized)
- Carrboro (40 spaces, 100 percent utilized with an estimated 10 percent, or 15, additional users not accommodated on a typical day)

The University also operates park-and-ride lots exclusively for University use:

- P lot on Airport Road (318 spaces, 70 percent occupied)
- PH at the Friday Center for Hospitals employees only (230 spaces, 100 percent utilized)

Therefore, the total current supply is 1,988 spaces and the current demand is estimated at 1,675. While there is an overall surplus of spaces, some lots are over capacity, while others are underutilized.

Two key deficiencies should be noted:

- There are no park-and-ride ride lots in the US 15-510 corridor from the north (Durham). However, the University has leased a 100-space lot in this corridor that will become available in the fall.

- The Friday Center lot on NC 54 is typically overflowing (and is also used by some commuters from the US 15-50 corridor).

The need for more park-and-ride ride facilities on several approaches to Main Campus was identified in the Master Plan. Additional park-and-ride capacity is required to address existing deficiencies, cater to the increasing demand that will occur at current ratios, and accommodate additional demand resulting from reduced parking availability on Main Campus in the future.

Assuming that the current demand increases in proportion to the projected 35 percent increase in employment yields an increase in future demand of 590 spaces.

The trip reduction strategies described earlier can divert approximately 1,900 of the 2,715 additional commuters who are required to use alternative modes, including:

Chapel Hill Transit:	1,500
Regional transit:	250
Ridesharing:	150
Total:	*1,900*

Therefore, the remaining "shortfall" to be addressed by increased park-and-ride is 815 persons or vehicles (assuming park-and-ride vehicles are single occupant). The total additional demand is therefore 1,405 spaces.

The amount of additional park-and-ride spaces required in each major approach corridor is calculated and shown in Table 3-8. Figure 3-3 and Figure 3-4, respectively, show the regional distribution of University/Hospitals employees and the proportion of employees by approach corridor for Main Campus. The total requirement is for an additional 1,530 spaces by 2010, half of which are required in the US 15-501 corridor from the north. This takes into account the total demand and the current supply of spaces.

A 400-space lot is planned for Jones Ferry Road. This will address the needs of the NC 54 corridor from the west (221 spaces), reducing the overall requirement to 1,310 spaces.

The following should be noted about these results:

- There are a number of assumptions in both the total requirement estimate and the breakdown by corridor. There is the risk that one corridor may be oversupplied, with a shortage in another (as currently occurs). At the same time, a new park-and-ride facility could be located to serve more than one corridor (the Friday Center lot does this to some extent now, and possibly the P lot).

- The total shortfall of 1,310 spaces is not required until 2010. Therefore implementation must be phased.

- The effectiveness of other strategies (e.g., transit, ridesharing, teleworking, and even housing initiatives) will ultimately determine how much park-and-ride is required. The impacts of these will be monitored. The projected use of these alternatives in this report is conservative, and the required park-and-ride spaces may be less.

Table 3-8: Demand for Park-and-Ride by Corridor

Approach Direction	Current		% of Total Commuters in Corridor[6]	Theoretical Current Demand[7]	Adjusted Current Demand[8]	Future Additional Demand[9]	Main Campus Shortfall[10]	Total Demand	Spaces Needed[11]
	Number of Spaces	Actual Demand							
US 15-501 from N[1]	0	Not known	30.7%	516	420	147	250	817	817
NC 54 from E[2]	500	550	26.2%	439	400	140	213	753	253
US 15-501 from S	400	360	11.8%	198	340	119	96	555	155
Farrington Rd. from S	0	Not known	3.7%	62	40	14	30	84	84
NC 54 from W[3]	140	155	14.5%	244	180	63	118	361	221
I-40 from W/NC 86 from N[4]	718	383	13.1%	219	300	105	106	511	-207
Subtotal	*1758*	*1448*	*100.0%*						
Additional (PH Lot)[5]	230	230							
Total Park-and-Ride Spaces	**1988**	**1678**		1678	1680	588	815	3083	1532

Notes

1. Actual demand is likely to be high given the number of commuters in the corridor, but currently there is no park-and-ride in the corridor to provide a measure of the demand.
2. Actual demand for NC 54 from east factored up on assumption that sufficient demand from east exists now to fill lot. Excludes PH lot which is used by Hospitals employees from multiple corridors.
3. Demand for NC 54 from west factored up by 10% of lot capacity since often not enough spaces to satisfy demand.
4. I-40 from west/NC 86 from north includes Eubanks Lot (400 spaces) and P lot (318 spaces).
5. PH lot included in current total demand but not considered a corridor lot since serves Hospitals employees from multiple corridors.
6. Based on geocoding of addresses.
7. Assumes demand is a function of the percentage of commuters in the corridor.
8. Determined by adjusting theoretical current demand for actual demand numbers while keeping total constant. For example, it is known that some commuters in corridors where there is no park-and-ride park in facilities in adjacent corridors.
9. Based on projected employee growth of 35 percent.
10. Number of commuters who are unable to park on Main Campus and who are not accommodated by other travel options (refer to text).
11. Total (1,532 spaces) excludes surplus in NC 86 corridor.

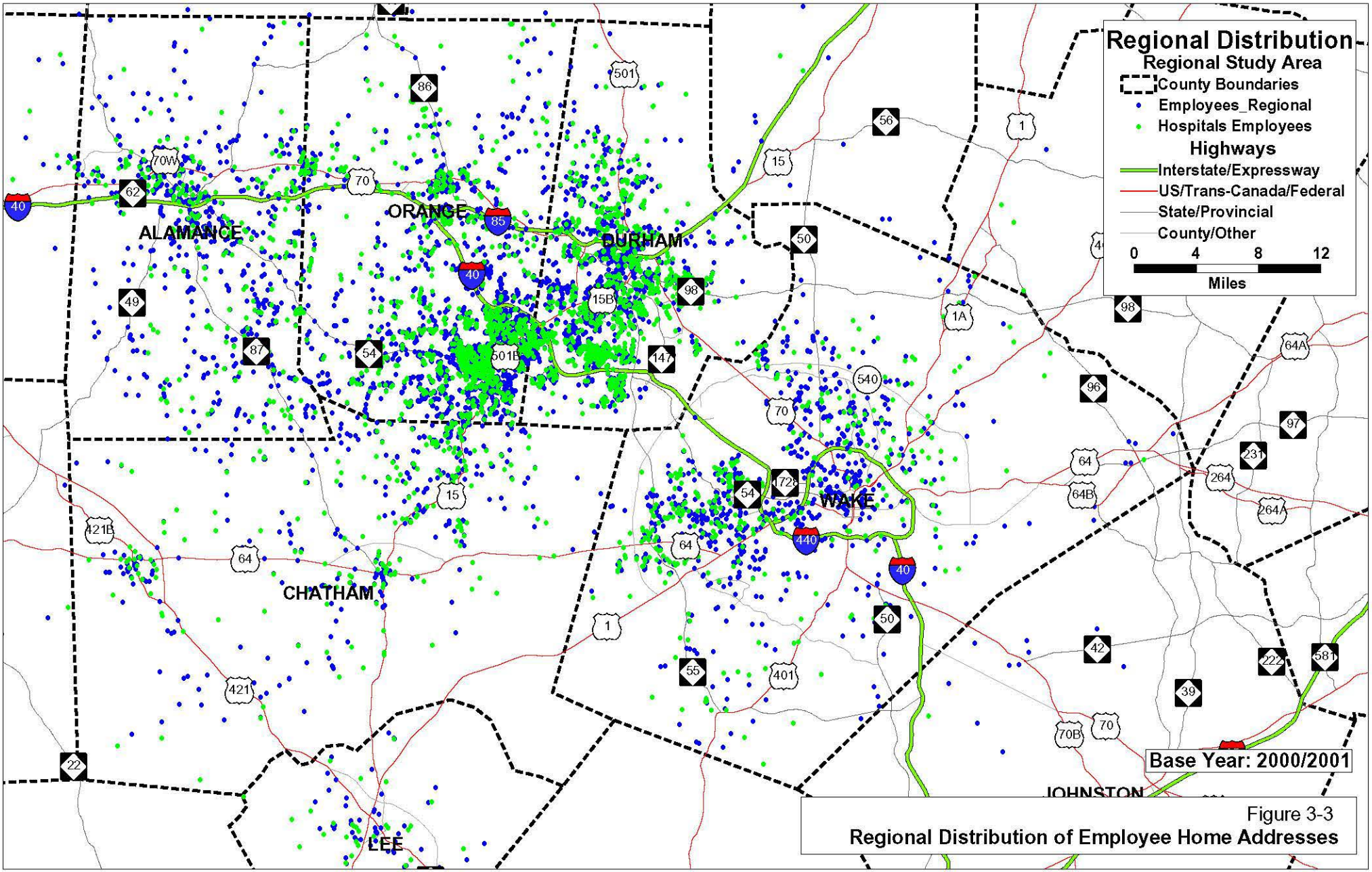


Figure 3-3
Regional Distribution of Employee Home Addresses

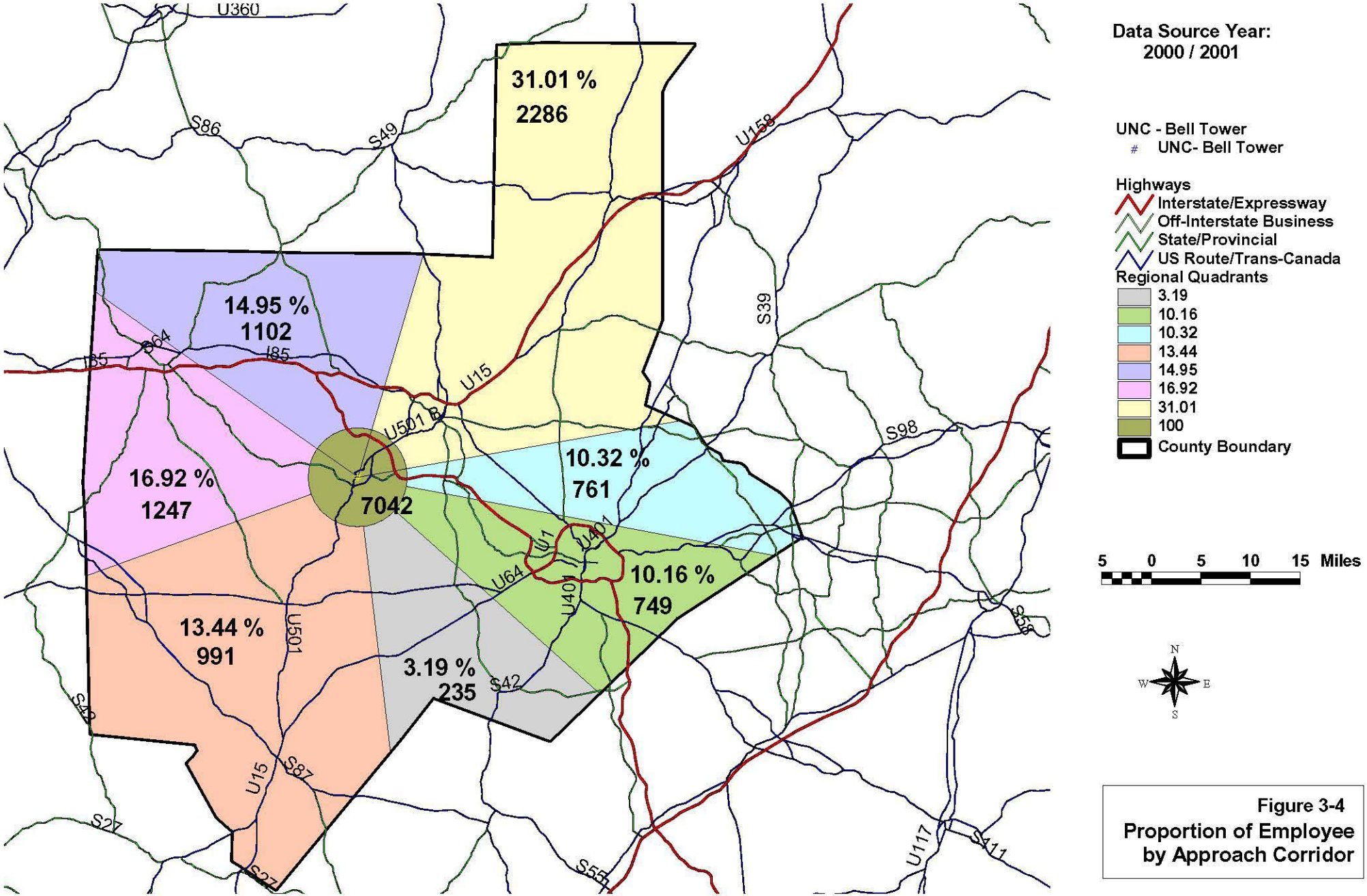


Figure 3-4
Proportion of Employee by Approach Corridor

The University has initiated studies to identify suitable sites in several corridors for purchasing of acquiring or leasing land or existing parking lots that are underutilized during the week. The current studies are focused on the US 15-501 corridor from the north and the NC 54 corridor from the east. However, the results of the analysis show that the US 15-501 corridor is a higher priority, and adding a large facility in the short term may in fact alleviate the current shortage in the NC 54 corridor.

A number of potential sites were discussed as part of the Master Plan project and by TPAC. Currently 13 sites are being analyzed for potential purchase or lease in the US 15-501 corridor, and nine in the NC 54 corridor (including the possibility of building a parking deck at the Friday Center).

Transit Service

In addition to finding appropriate sites for more park-and-ride, the key to a successful park-and ride system is the ability to run an efficient and quick transit shuttle service to Main Campus. Travel times on the roads can be expected to worsen over time. This is an inconvenience to users, and therefore a disadvantage of park-and-ride as well as adding costs to park-and-ride transit service.

Transit improvements recommended by TPAC included:

- Adding more express service to Friday Center and P park-and-ride lots.
- Extending the hours of service to the park-and-ride lots until 8:00 P.M.

These recommendations have been adopted by the University and will go into effect in January 2002.

Options for improving bus running times that the University and Town can jointly consider include signal pre-emption, queue bypass lanes, and possibly busway lanes or treatments. These improvements are in addition to more frequent service, more express buses, longer hours, and improved security. Examples of potential busways are described under Chapel Hill Transit improvements.

3.2.3 Summary of Trip Reduction Impacts

The following Main Campus parking "shortfalls" are projected to occur with implementation of the Development Plan (shortfall is defined as the difference between the amount of Main Campus parking that would be required if parking continued to be provided at current rates, and the amount that will be actually provided):

- 2,675 employee spaces
- 39 commuting student spaces
- 502 resident student spaces

The total number of commuters that must be diverted to alternatives modes is therefore 2,715. It is projected that these commuters will use the following modes in lieu of driving and parking on Main Campus:

Chapel Hill Transit:	1,500
Regional transit:	250

Ridesharing:	150
Park-and-ride:	815
Total:	*2,715*

The resident student parking will be accommodated in the expanded PR lot.

3.3 AIR QUALITY IMPACTS

Based on the diversion of driving commuters to other modes compared to ITE trip rates (as described in Section 3-1), an estimate was prepared of the corresponding reduction in emissions of NOx, VOC's, and CO. The methodology and results are shown in Table 3-9. A number of assumptions were made in preparing this estimate:

- No emissions benefits were assumed for a switch to park-and-ride, since most of the trip would still be made via automobile, and the first few miles of a car trip account for most of the pollution. However, emissions on Main Campus will be reduced.

- Since the diverted auto trips are assumed to be commuter trips, no off-peak emission reductions are considered, only A.M. and P.M. peak periods.

- An average trip length of four miles was assumed for all trips diverted to Chapel Hill Transit (CHT). Multiplying by 1,500 trips yields 6,000 vehicle-miles of travel (VMT) eliminated.

- An average trip length of 14 miles was assumed for all trips diverted to regional transit or ridesharing. Multiplying by 400 trips yields an eliminated VMT of 5,600.

- The two VMT values obtained above were distributed among six functional classes of urban streets. In the case of trips served by CHT, a relatively small portion of travel was assigned to interstates, while locals, collectors, and arterials carried a larger share.

- The January 26, 2000 *Conformity Analysis Report and Conformity Finding for the Durham-Chapel Hill-Carrboro Planning Organization 2025 Long Range Transportation Plan* was the source for estimating average speeds and composite emission rates by functional class and peak periods for 2010.

- Since the *Conformity Report* provides values for only 2005 and 2025, 2010 composite emission factors were obtained by averaging values for these two years.

- A total of 250 work days were assumed in calculating total annual emission reductions.

Using this methodology, the following emission reductions were estimated for 2010:

- NOx: 29 kg/day (7,305 kg/year)

- VOC: 28 kg/day (7,100 kg/year)

- CO: 302 kg/day (75,460 kg/year)

Table 3-9: Estimated Air Quality Impacts

EMISSION REDUCTIONS: NOx				
Functional Classification	Composite Emission Rate	VMT (Served by CHT)	VMT (Outside CHT)	NOx Emissions (Kg)
AM				
Interstate	1.52	300	1,232	2.32
Freeway	1.30	1,320	1,064	3.10
Other Princ Art	1.24	1,380	1,064	3.03
Minor Arterial	1.16	1,500	1,232	3.16
Collector	1.11	840	560	1.55
Local	1.20	660	448	1.33
AM TOTAL		6,000	5,600	**14.49**
PM				
Interstate	1.60	300	1,232	2.45
Freeway	1.32	1,320	1,064	3.14
Other Princ Art	1.25	1,380	1,064	3.05
Minor Arterial	1.16	1,500	1,232	3.18
Collector	1.13	840	560	1.58
Local	1.20	660	448	1.33
PM TOTAL		6,000	5,600	**14.73**
TOTAL DAILY NOx REDUCTION				**29.22**
TOTAL ANNUAL NOx REDUCTION				**7,305**

EMISSION REDUCTIONS: VOC				
Functional Classification	Composite Emission Rate	VMT (Served by CHT)	VMT (Outside CHT)	VOC Emissions (Kg)
AM				
Interstate	1.07	300	1,232	1.65
Freeway	1.21	1,320	1,064	2.89
Other Princ Art	1.38	1,380	1,064	3.38
Minor Arterial	1.47	1,500	1,232	4.02
Collector	1.33	840	560	1.86
Local	1.42	660	448	1.58
AM TOTAL		6,000	5,600	**15.37**
PM				
Interstate	0.94	300	1,232	1.44
Freeway	1.02	1,320	1,064	2.44
Other Princ Art	1.18	1,380	1,064	2.89
Minor Arterial	1.24	1,500	1,232	3.38
Collector	1.12	840	560	1.57
Local	1.20	660	448	1.32
PM TOTAL		6,000	5,600	**13.03**
TOTAL DAILY VOC REDUCTION				**28.40**
TOTAL ANNUAL VOC REDUCTION				**7,100**

EMISSION REDUCTIONS: CO				
Functional Classification	Composite Emission Rate	VMT (Served by CHT)	VMT (Outside CHT)	CO Emissions (Kg)
AM				
Interstate	9.42	300	1,232	14.43
Freeway	12.44	1,320	1,064	29.67
Other Princ Art	16.12	1,380	1,064	39.39
Minor Arterial	18.36	1,500	1,232	50.16
Collector	15.48	840	560	21.67
Local	17.12	660	448	18.97
AM TOTAL		6,000	5,600	**174.29**
PM				
Interstate	7.04	300	1,232	10.78
Freeway	8.93	1,320	1,064	21.29
Other Princ Art	12.04	1,380	1,064	29.44
Minor Arterial	13.40	1,500	1,232	36.61
Collector	11.19	840	560	15.67
Local	12.43	660	448	13.77
PM TOTAL		6,000	5,600	**127.55**
TOTAL DAILY CO REDUCTION				**301.84**
TOTAL ANNUAL CO REDUCTION				**75,461**

4.0 INTERSECTION IMPACTS AND MITIGATION

4.1 INTRODUCTION

This section provides an analysis of roadway intersections on or near Main Campus that may be impacted by the Development Plan. Intersection level of service analysis was undertaken for existing conditions, and year 2010 with and without the Development Plan (No-Build and Build conditions respectively), per the *Transportation Impact Analysis Guidelines*. The methodology and assumptions are described, including development of background traffic data, trip generation, distribution, and assignment, and level of service analyses.

The basis for determining the impacts is the changes in parking supply rather than the building projects contained in the Development Plan, in accordance with the *Transportation Impact Analysis Guidelines*. This is because, unlike a more typical project where the parking needs of the project are satisfied, increases in parking on Main Campus will be limited and will not correspond to growth in occupiable floor area (as discussed in Section 3.0). Furthermore, parking increases on Main Campus are not allocated to specific new buildings, but added to the overall supply for allocation to the entire campus population.

As described in Section 2.0, the Development Plan will result in a net increase of 1,550 spaces on Main Campus. This comprises 3,811 surface spaces eliminated by projects and the addition of 5,361 new spaces of which 5,330 are in structures. The impact analysis takes into account the location of the losses and gains.

The study area network of streets and intersections is displayed in Figure 4-1. As indicated in Figure 4-1, 25 intersections were identified for the analysis.

As discussed in Section 4.3, some of the intersection traffic count data used in the analysis are almost ten years old. All counts have been factored to the year 2001 (existing conditions) using historic traffic growth data, and then extrapolated to the year 2010, the year the final project in the Development Plan is projected to be completed. Therefore the accuracy of the 2010 projections is somewhat questionable. Conclusions regarding improvements to intersections should wait until completion of the first update of the Transportation Impact Analysis, which will utilize current data to be collected in the fall.

4.2 EXISTING CONDITIONS

4.2.1 Campus Access and Study Area

The study area network of streets and intersections is displayed in Figure 4-1. Roadway and intersection geometric data were collected by field investigations and taken from traffic signal plans provided by the North Carolina Department of Transportation (NCDOT) and the Town of Chapel Hill. Figure 4-2 shows the study area and intersection geometrics used in the analysis.

◯ **Study Area Intersections**

Figure 4-1

Study Area Roadways and Intersections

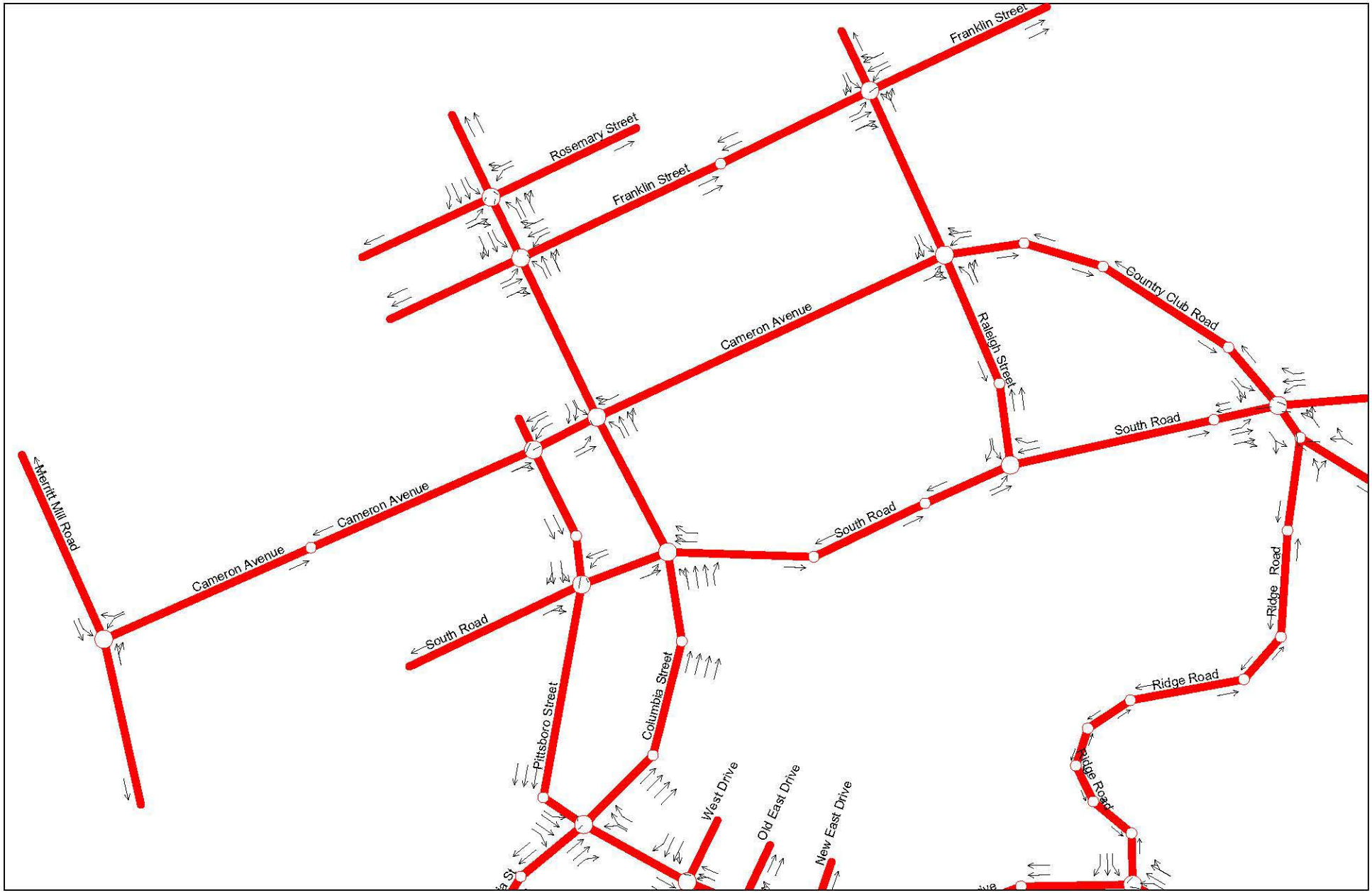


Figure 4-2a
Study Area Intersection and Roadway Geometrics

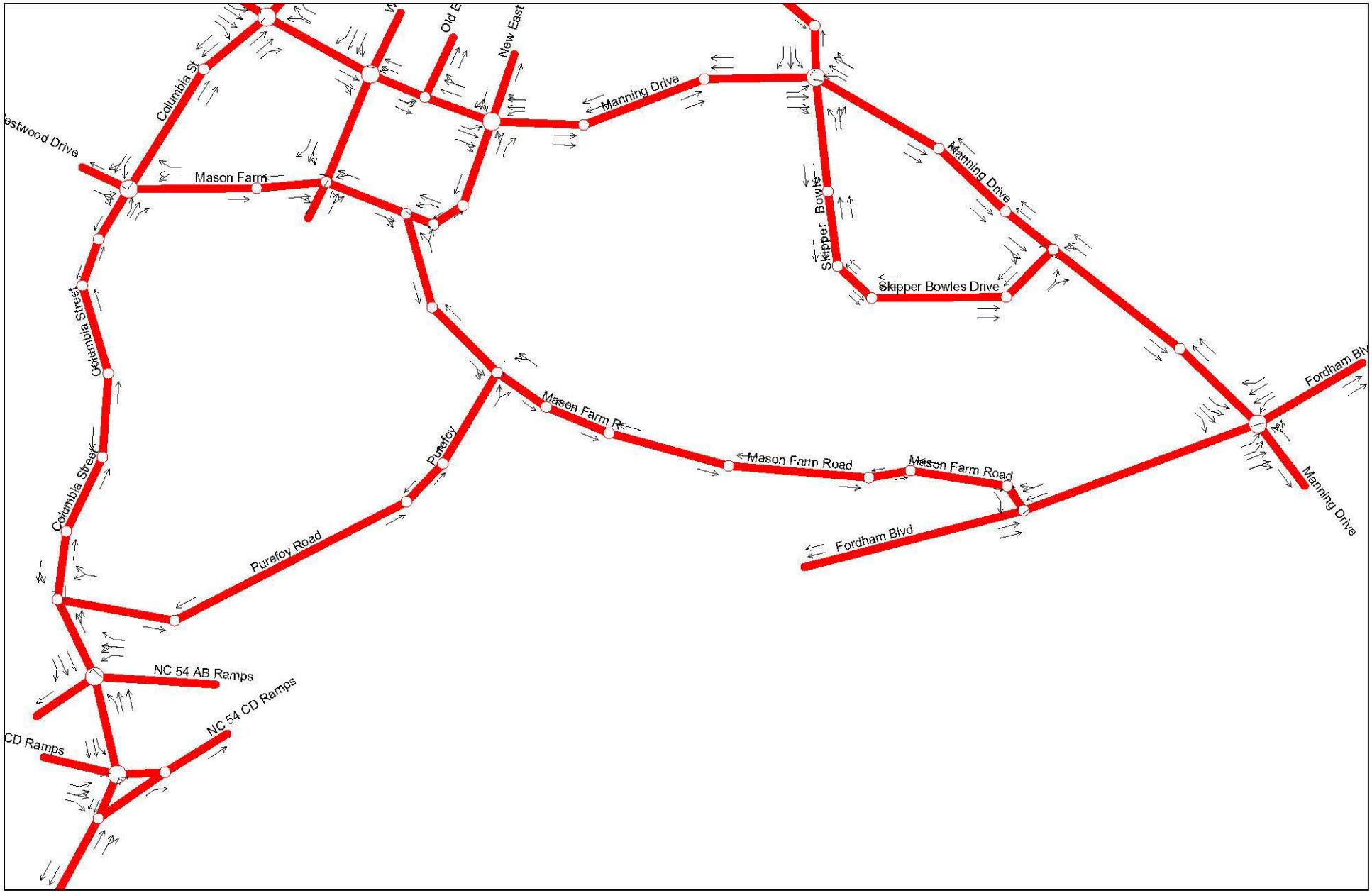


Figure 4-2b
Study Area Intersection and Roadway Geometrics

4.2.2 Existing Roads

This section describes the existing streets within and in the vicinity of the campus. Average Daily Traffic (ADT) information was obtained from the NCDOT for the surrounding network of roads. The latest counts from the NCDOT are from the year 1999. Utilizing these counts, historical traffic data, and data collected from the Town for the study area, estimates were made of the existing (2001) volumes along the study area roadways (see Table 4-1). The estimated 2001 daily volumes are also shown in Figure 4-3.

As shown in Figure 4-1, there are several routes into and out of the campus. In addition, there is a good interconnectivity of streets within the campus. Regional access to the campus is provided primarily via NC 54 (Raleigh Road from the east and West Franklin Street from the west), US 15-501 (South Columbia Street and Fordham Boulevard from the south and East Franklin Street from the north-east), and NC Route 86 (North Columbia Street/Airport Road from the north).

The major corridors within the campus include South Columbia Street, Raleigh Street, Cameron Avenue (west of Columbia Street), South Road and Manning Drive. Additionally, McCauley Street serves as an alternate route to the heavily used Cameron Avenue corridor providing access to the campus from the west. It also is an essential link from southbound Pittsboro Street to South Road leading east, and from South Road to southbound Pittsboro Street. Similarly, Battle Lane, Boundary Street, and Park Place provide an alternate route to Franklin Street from the east thereby reducing traffic volumes on sections of Raleigh Street.

Country Club Road and Ridge Road are important inter-connecting roads along the eastern edge of the campus. Several other roads including Stadium Drive, West Drive, East Drive and Skipper Bowles Drive are included in the intra-campus circulation network, all providing access to major parking facilities.

Several of these roads also serve as major through routes for traffic passing through the campus (including traffic destined for the Central Business District of the Town). South Columbia Street, South Road, and Country Club Road are by virtue of their location in the regional network particularly convenient for through traffic.

The majority of the roads are either two or four-lane undivided roads. Columbia Street is a four-lane roadway north of Cameron Street. Between Manning Drive and Cameron Avenue, Columbia Street is the northbound component of a one-way road pair which includes southbound Pittsboro Street. This section of Columbia Street comprises three to four lanes. Pittsboro Street is a two-lane road for its entire length.

Other multi-lane roadways include Manning Drive (four lanes) and Franklin Street (also four lanes). South Road, while a major campus road, is only a two-lane road through the Main Campus.

Historical traffic volumes were obtained from the NCDOT, the Town, and other available data for the study area streets and are displayed in Table 4-1. For each previous year of data, an average growth rate was calculated. Using these growth rates, intersection turning movement data was adjusted in an attempt to reflect 2001 volumes.

Table 4-1: Existing and Historical Average Daily Traffic Volumes

Roadway	Average Daily Traffic Volumes (ADT)						Annual Growth					2001 Estimated Volume
	1989	1990	1992	1994	1997	1999	89 - 99	90-99	92-99	94 - 99	97 - 99	
S. Columbia St. (south of Franklin St.)	15,300	19,400	17,900	18,400	17,500	18,000	1.6%	-0.8%	0.1%	-0.4%	1.4%	18,400
Raleigh St. (south of Franklin St.)	10,700											12,000
Cameron Ave. (west of Pittsboro St.)	9,000	11,100	11,100	9,900	9,100	9,900	0.9%	-1.2%	-1.5%	0.0%	4.4%	10,300
Cameron Ave. (east of S. Columbia St.)	6,100											7,600
Country Club Rd. (north of South Rd.)	11,500	8,000	8,800	12,100	14,600	14,000	2.0%	8.3%	8.4%	3.1%	-2.1%	14,800
South Rd. (east of Columbia St.)	11,500	13,500	12,200	11,400	11,000	10,000	-1.2%	-2.9%	-2.6%	-2.5%	-4.5%	10,200
South Rd. (east of Raleigh St.)	8,300	12,400	8,500	9,600	8,300	9,700	1.5%	-2.4%	2.0%	0.2%	8.4%	10,100
Pittsboro St. (south of McCauley St.)	8,500	10,600	10,700	11,900	11,000	11,000	2.7%	0.4%	0.4%	-1.5%	0.0%	11,200
Manning Dr. (east of Columbia St.)	10,900	14,200	14,200	12,700	12,300	16,000	4.3%	1.4%	1.8%	5.2%	15.0%	17,300
Ridge Rd. (at Manning)	7,200					8,400	1.5%					8,700
S. Columbia St. (south of Mason Farm Rd.)	12,300	11,600	12,900	15,400	17,500	16,000	2.7%	4.2%	3.4%	0.8%	-4.3%	17,000
Manning Dr. (east of Ridge Rd.)	11,100	9,000	9,100	12,000	15,100	16,000	4.0%	8.6%	10.8%	6.7%	3.0%	17,600

NOTES:

1. All volumes are typical weekday (24-hour). Existing volumes (2001) are based on 1999 counts, increased by an estimated growth rate annually to obtain 2001 volumes.
2. All yearly volumes 1990-1999 from NCDOT. Year 1989 volumes taken from June 1990 Parking Decks Study for The University of North Carolina at Chapel Hill.

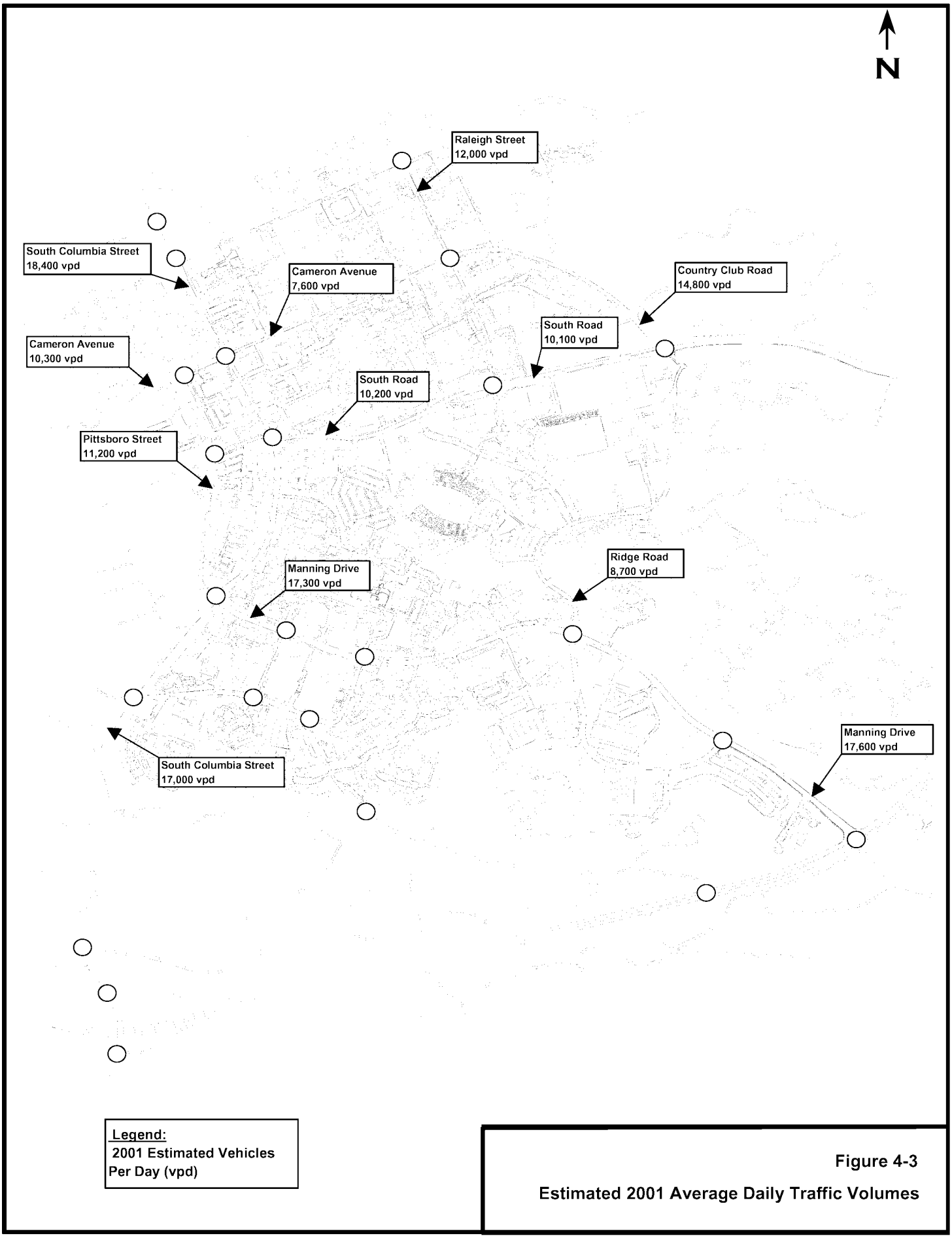


Figure 4-3

Estimated 2001 Average Daily Traffic Volumes

4.3 EXISTING INTERSECTION LEVEL OF SERVICE ANALYSIS

Per the *Transportation Impact Analysis Guidelines*, the following existing intersections were identified for traffic impact for Existing, No-Build (year 2010 conditions without the development), and Build conditions (with the Development Plan implemented):

1. South Columbia Street and Rosemary Street
2. South Columbia Street and Franklin Street
3. Franklin Street and Raleigh Street (signalized)
4. Merritt Mill Road and Cameron Avenue (signalized)
5. Cameron Avenue and Pittsboro Street (signalized)
6. Cameron Avenue and South Columbia Street (signalized)
7. Cameron Avenue and Raleigh Street (signalized)
8. Pittsboro Street and McCauley Street (signalized)
9. South Columbia Street and South Road (signalized)
10. Raleigh Street and South Road (signalized)
11. Country Club Road and South Road (signalized)
12. South Columbia Street and Manning Drive (signalized)
13. Manning Drive and West Dive (signalized)
14. Manning Drive and East Drive (signalized)
15. Ridge Road and Manning Drive (signalized)
16. Mason Farm Road and South Columbia Street (signalized)
17. Mason Farm Road and West Drive (unsignalized)
18. Mason Farm Road and East Drive (unsignalized)
19. Mason Farm Road and Purefoy Road (unsignalized)
20. Manning Drive and Skipper Bowles Drive (unsignalized)
21. South Columbia Street and Purefoy Road (unsignalized)
22. South Columbia Street and Fordham Boulevard Northern AB Ramp (signalized)
23. South Columbia Street and Fordham Boulevard Southern CD Ramp (signalized)
24. Mason Farm Road and Fordham Boulevard (unsignalized)
25. Manning Drive and Fordham Boulevard (signalized)

Existing roadway geometry for all of the above intersections can be found in Figure 2-2.

4.3.1 Count Data

As requested by the Town, intersection turning movement data was requested and collected from several sources. These sources included the Town, the University, the NCDOT, and previous studies by local consultants, dating back to 1989. From this data, the most recent counts, their date and source are summarized in Table 4-2.

Historical traffic volumes were obtained from the NCDOT, the Town, and other available data for the study area streets and are displayed in Table 4-1. For each previous year of data, an average growth rate was calculated. Using these growth rates, intersection turning movement volumes were adjusted in an attempt to reflect 2001 volumes. For each intersection, the estimated 2001 A.M. and P.M. peak hour turning movement volumes are summarized in Table 4-3 and displayed in Figure 4-4 and Figure 4-5, respectively.

Table 4-2: Available Intersection Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Date	Source
1	Columbia Street/Rosemary Street	194	201	26	15	143	20	30	356	85	74	696	199	2001	NCDOT
2	Columbia Street/Franklin Street	43	395	117	83	327	47	76	396	80	53	609	65	1992	NCDOT
3	Franklin Street/Raleigh Street	5	302	64	59	508	84	77	211	22	52	418	23	2000	NCDOT
4	Merritt Mill Road/Cameron Avenue	0	0	0	63	0	55	0	123	487	118	69	0	2000	UNC
5	Cameron Avenue/Pittsboro Street	0	176	166	875	155	0	0	0	0	0	0	0	2000	NCDOT
6	Cameron Avenue/Columbia Street	29	140	0	0	159	65	186	475	71	112	0	678	1992	Town of Chapel Hill
7	Cameron Avenue/Raleigh Street	22	128	40	73	235	210	28	122	65	336	299	76	1992	Town of Chapel Hill
8	Pittsboro Street/McCauley Street	0	224	88	156	59	0	0	0	0	205	667	9	1992	Town of Chapel Hill
9	Columbia Street/South Road	72	305	0	0	206	210	91	565	0	0	0	0	1992	Town of Chapel Hill
10	Raleigh Street/South Road	88	318	0	0	425	21	0	0	0	77	0	240	1992	Town of Chapel Hill
11	Country Club Road/South Road	28	118	46	421	421	390	23	75	83	271	174	16	1997	UNC
12	Columbia Street/Manning Drive	82	434	0	77	0	216	0	563	160	0	0	0	1996	Health Affairs Study Update
13	Manning Drive/West Drive	0	538	272	124	158	0	0	0	0	79	51	76	1999	UNC Hospitals Study
14	Manning Drive/East Drive	20	421	30	109	330	22	79	13	281	30	6	8	1999	UNC Hospitals Study
15	Ridge Road/Manning Drive	84	280	64	4	520	80	44	44	4	12	72	296	2000	UNC
16	Mason Farm Road/Columbia Street	7	5	3	88	6	109	12	596	445	137	222	4	1996	Health Affairs Study Update
17	Mason Farm Road/West Drive	0	493	27	21	153	0	25	0	46	35	29	104	1996	Health Affairs Study Update
18	Mason Farm Road/East Drive	0	441	184	25	79	0	124	0	67	0	0	0	1996	Health Affairs Study Update
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
24	Mason Farm Road/Fordham Boulevard	0	2532	0	0	710	132	0	0	0	0	0	5	1996	Health Affairs Study Update
25	Manning Drive/Fordham Boulevard	356	2173	3	10	807	752	11	8	20	213	5	24	1996	Health Affairs Study Update

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Date	Source
1	Columbia Street/Rosemary Street	267	268	64	87	265	88	40	778	72	59	562	270	2001	NCDOT
2	Columbia Street/Franklin Street	355	897	49	51	752	43	204	771	119	167	828	87	1992	NCDOT
3	Franklin Street/Raleigh Street	28	651	142	65	641	129	102	263	30	120	356	32	2000	NCDOT
4	Merritt Mill Road/Cameron Avenue	0	0	0	418	0	167	0	118	274	113	237	0	2000	UNC
5	Cameron Avenue/Pittsboro Street	0	198	217	753	432	0	0	0	0	0	0	0	2000	NCDOT
6	Cameron Avenue/Columbia Street	49	156	0	0	232	74	390	723	56	149	0	568	1992	Town of Chapel Hill
7	Cameron Avenue/Raleigh Street	36	232	65	61	183	252	69	200	154	222	302	91	1992	Town of Chapel Hill
8	Pittsboro Street/McCauley Street	0	125	29	304	174	0	0	0	0	236	545	18	1992	Town of Chapel Hill
9	Columbia Street/South Road	136	292	0	0	364	380	120	741	0	0	0	0	1992	Town of Chapel Hill
10	Raleigh Street/South Road	304	479	0	0	457	50	0	0	0	157	0	303	1992	Town of Chapel Hill
11	Country Club Road/South Road	55	458	43	146	381	394	34	195	266	477	115	31	1997	UNC
12	Columbia Street/Manning Drive	109	223	0	239	0	407	0	514	76	0	0	0	1996	Health Affairs Study Update
13	Manning Drive/West Drive	0	244	52	55	513	0	0	0	0	112	49	140	1999	UNC Hospitals Study
14	Manning Drive/East Drive	11	247	11	96	516	26	152	12	327	29	7	32	1999	UNC Hospitals Study
15	Ridge Road/Manning Drive	156	784	100	1	176	172	124	132	64	128	40	124	2000	UNC
16	Mason Farm Road/Columbia Street	4	5	5	368	9	164	3	353	76	85	714	6	1996	Health Affairs Study Update
17	Mason Farm Road/West Drive	0	227	9	3	284	0	18	0	17	60	7	164	1996	Health Affairs Study Update
18	Mason Farm Road/East Drive	0	303	102	25	79	0	221	0	33	0	0	0	1996	Health Affairs Study Update
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	No Data Available
24	Mason Farm Road/Fordham Boulevard	0	1318	0	0	2279	39	0	0	0	0	0	23	1996	Health Affairs Study Update
25	Manning Drive/Fordham Boulevard	81	1235	2	8	1960	174	7	3	0	882	11	351	1996	Health Affairs Study Update

Table 4-3: Estimated Year 2001 Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Estimated Annual Growth Rates* EB-WB	NB-SB
1	Columbia Street/Rosemary Street	194	201	26	15	143	20	30	356	85	74	696	199	0.0%	0.0%
2	Columbia Street/Franklin Street	43	395	117	83	327	47	76	396	80	53	609	65	0.0%	0.0%
3	Franklin Street/Raleigh Street	5	305	65	60	513	85	78	213	22	53	422	23	1.0%	5.0%
4	Merritt Mill Road/Cameron Avenue	0	0	0	66	0	57	0	128	506	123	72	0	4.0%	5.0%
5	Cameron Avenue/Pittsboro Street	0	185	174	919	163	0	0	0	0	0	0	0	5.0%	4.0%
6	Cameron Avenue/Columbia Street	36	172	0	0	195	80	228	582	87	137	0	831	2.5%	1.0%
7	Cameron Avenue/Raleigh Street	32	186	58	106	341	305	41	177	94	487	434	110	5.0%	2.5%
8	Pittsboro Street/McCauley Street	0	295	116	205	78	0	0	0	0	270	877	12	3.5%	1.0%
9	Columbia Street/South Road	78	332	0	0	225	229	99	616	0	0	0	0	1.0%	1.0%
10	Raleigh Street/South Road	108	390	0	0	521	26	0	0	0	94	0	294	2.5%	2.0%
11	Country Club Road/South Road	32	137	53	488	488	452	27	87	96	314	202	19	4.0%	1.0%
12	Columbia Street/Manning Drive	103	543	0	96	0	270	0	704	200	0	0	0	5.0%	5.0%
13	Manning Drive/West Drive	0	592	299	136	174	0	0	0	0	87	56	84	5.0%	1.0%
14	Manning Drive/East Drive	22	463	33	120	363	24	87	14	309	33	7	9	5.0%	1.0%
15	Ridge Road/Manning Drive	88	294	67	4	546	84	46	46	4	13	76	311	5.0%	1.0%
16	Mason Farm Road/Columbia Street	7	5	3	88	6	109	12	596	445	137	222	4	0.0%	5.0%
17	Mason Farm Road/West Drive	0	493	27	21	153	0	25	0	46	35	29	104	0.0%	1.0%
18	Mason Farm Road/East Drive	0	463	193	26	83	0	130	0	70	0	0	0	1.0%	0.0%
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	-
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0	-	-
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	-
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	-
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	-
24	Mason Farm Road/Fordham Boulevard	0	3038	0	0	852	158	0	0	0	0	0	6	4.0%	1.0%
25	Manning Drive/Fordham Boulevard	427	2608	4	12	968	902	13	10	24	256	6	29	4.0%	3.0%

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Estimated Annual Growth Rates* EB-WB	NB-SB
1	Columbia Street/Rosemary Street	267	268	64	87	265	88	40	778	72	59	562	270	0.0%	0.0%
2	Columbia Street/Franklin Street	355	897	49	51	752	43	204	771	119	167	828	87	0.0%	0.0%
3	Franklin Street/Raleigh Street	28	658	143	66	647	130	103	266	30	121	360	32	1.0%	5.0%
4	Merritt Mill Road/Cameron Avenue	0	0	0	435	0	174	0	123	285	118	246	0	4.0%	5.0%
5	Cameron Avenue/Pittsboro Street	0	208	228	791	454	0	0	0	0	0	0	0	5.0%	4.0%
6	Cameron Avenue/Columbia Street	60	191	0	0	284	91	478	886	69	183	0	696	2.5%	1.0%
7	Cameron Avenue/Raleigh Street	52	336	94	88	265	365	100	290	223	322	438	132	5.0%	2.5%
8	Pittsboro Street/McCauley Street	0	164	38	400	229	0	0	0	0	310	717	24	3.5%	1.0%
9	Columbia Street/South Road	148	318	0	0	397	414	131	808	0	0	0	0	1.0%	1.0%
10	Raleigh Street/South Road	372	587	0	0	560	61	0	0	0	192	0	371	2.5%	2.0%
11	Country Club Road/South Road	64	531	50	169	442	457	39	226	309	553	133	36	4.0%	1.0%
12	Columbia Street/Manning Drive	136	279	0	299	0	509	0	643	95	0	0	0	5.0%	5.0%
13	Manning Drive/West Drive	0	268	57	61	564	0	0	0	0	123	54	154	5.0%	1.0%
14	Manning Drive/East Drive	12	272	12	106	568	29	167	13	360	32	8	35	5.0%	1.0%
15	Ridge Road/Manning Drive	164	823	105	1	185	181	130	139	67	134	42	130	5.0%	1.0%
16	Mason Farm Road/Columbia Street	4	5	5	368	9	164	3	353	76	85	714	6	0.0%	5.0%
17	Mason Farm Road/West Drive	0	227	9	3	284	0	18	0	17	60	7	164	0.0%	1.0%
18	Mason Farm Road/East Drive	0	318	107	26	83	0	232	0	35	0	0	0	1.0%	0.0%
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	-
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0	-	-
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	-	-
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	-
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	-	-
24	Mason Farm Road/Fordham Boulevard	0	1582	0	0	2735	47	0	0	0	0	0	28	4.0%	1.0%
25	Manning Drive/Fordham Boulevard	97	1482	2	10	2352	209	8	4	0	1058	13	421	4.0%	3.0%

* - Growth Rates used to adjust available data to existing year volumes

Figure 4-4a

Estimated Year 2001 A.M. Peak Hour Turning Movement Volumes

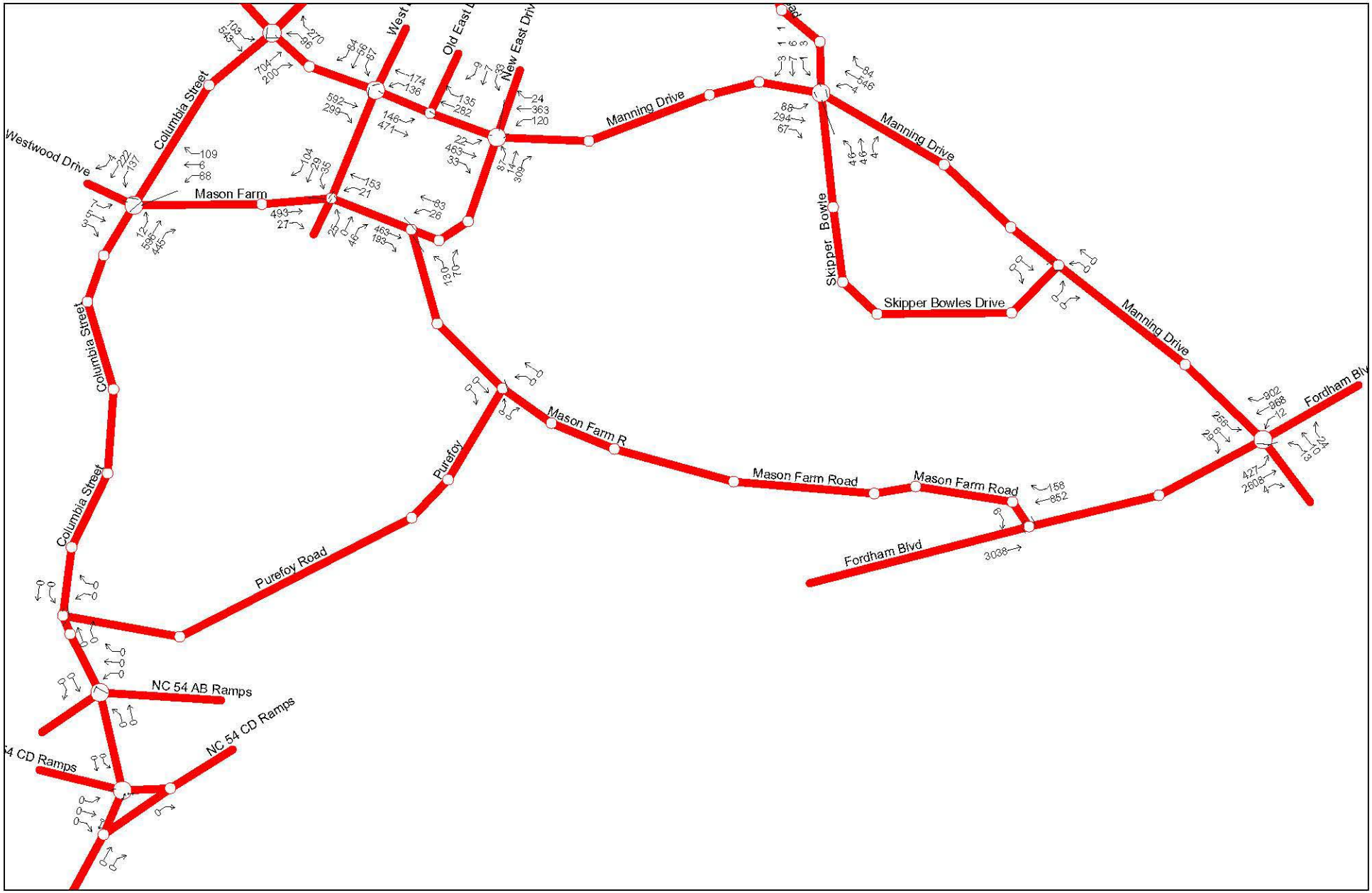


Figure 4-4b
Estimated Year 2001 A.M. Peak Hour Turning Movement Volumes

Figure 4-5a

Estimated Year 2001 P.M. Peak Hour Turning Movement Volumes

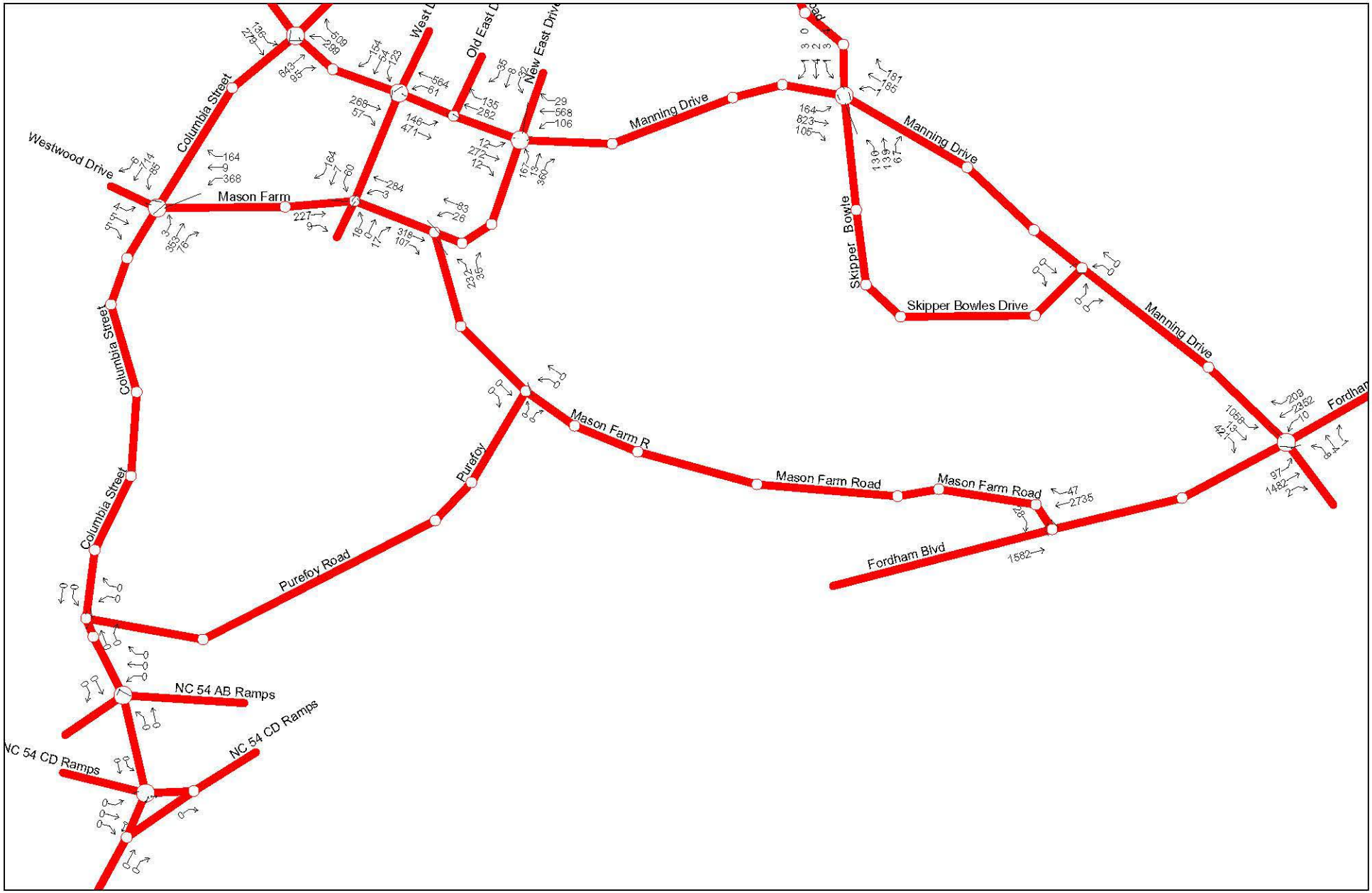


Figure 4-5b
Estimated Year 2001 P.M. Peak Hour Turning Movement Volumes

4.3.2 Level of Service Criteria

Peak hour level of service (LOS) measures the adequacy of the intersection geometrics and traffic controls of a particular intersection or approach for the given turning movement volumes. Levels-of-service range from A through F, based on the average control delay experienced by vehicles traveling through the intersection during the peak hour. Control delay represents the portion of total delay attributed to traffic control devices (e.g., signals or stop signs). The engineering profession generally accepts level of service D as an acceptable operating condition for signalized intersections in urban areas and level of service C for rural areas.

At unsignalized intersections, a level of service E is generally considered acceptable only if the side street encounters delay. Nevertheless, side streets typically function at level of service F during peak traffic periods, because the traffic volumes often do not warrant a traffic signal to assist side street traffic. Table 4-4 below provides a general description of the various LOS categories and delay ranges.

Table 4-4: Level of Service Descriptions for Intersections

Level of Service	Description	Signalized Intersection	Unsignalized Intersection
A	Little or no delay	<= 10 sec.	<= 10 sec.
B	Short traffic delay	10-20 sec.	10-15 sec.
C	Average traffic delay	20-35 sec.	15-25 sec.
D	Long traffic delay	35-55 sec.	25-35 sec.
E	Very long traffic delay	55-80 sec.	35-50 sec.
F	Unacceptable delay	> 80 sec.	> 50 sec.

4.3.3 Analysis Results

Capacity analysis for the existing roadway geometrics and traffic volumes were performed for both morning and afternoon peak hour periods using *Synchro Professional Version 5* and *Highway Capacity Software* (HCS) *Version 4* software packages. A network outlining the study area was created in Synchro using existing geometric and timing/phasing data. Signalized intersections were grouped according to the Town's signal system zones, and timing splits were optimized within these zones using cycle length's provided by the Town Traffic Engineer. Lane widths, grades, pedestrian volumes, etc, were included in the analysis when available.

Table 4-5 summarizes the existing intersection levels of service. In Table 4-5, the overall intersection level of service and worst movement level of service are provided. The Appendix contains the output obtained from Synchro, which summarizes the HCS levels of service. Caution should be used when examining at the results of Table 4-5, because of the age of some of the intersection turning movement counts. As indicated in Table 4-2, many intersection counts are nearly ten years old, which affects the accuracy of the results.

Table 4-5 shows that the overall intersection level of service for the majority of the study area intersections is LOS D or better, while some minor street approaches are suffering some longer delays (worse than LOS D). Specifically, the worse delays (LOS F) are

being experienced at the Manning Drive/Fordham Boulevard intersection in both the A.M. and P.M. peak hours. Heavy traffic volumes are experienced on both approaches of Fordham Boulevard during both peak hours, while the southbound left-turn from Manning Drive in the afternoon is extremely heavy with significant queuing that typically extends back towards the Skipper Bowles Drive intersection. In addition, the Cameron Avenue/Raleigh Street intersection is operating at LOS F in both peak hours. However, the only available counts at this intersection appear to be high (the original data was from 1992) when compared with adjacent intersections.

Delays at Country Club Road/South Road are also unacceptable in the P.M. peak hour due to heavy turning movements on both northbound and southbound approaches. Also, the close proximity of the Ridge Road/Country Club Road "T" intersection results in more delays for northbound vehicles. Lastly, the P.M. level of service at the Columbia Street/Franklin Street intersection is poor on basically all approaches. Here again, the original data from 1992 seems high when compared to the very recent counts at the Columbia Street/Rosemary Street intersection (2001) during the P.M. peak hour.

Table 4-5: Existing (2001) Intersection Levels of Service

ID #	Intersection	Control	AM Peak	PM Peak
1	Columbia Street/Rosemary Street	Signalized	C (SB-C)	C (EB-D)
2	Columbia Street/Franklin Street	Signalized	B (EB-D)	F (SB-F)
3	Franklin Street/Raleigh Street	Signalized	B (WB-C)	B (WB-C)
4	Merritt Mill Road/Cameron Avenue	Signalized	B (WB-D)	C (WB-D)
5	Cameron Avenue/Pittsboro Street	Signalized	B (EB-C)	B (EB-C)
6	Cameron Avenue/Columbia Street	Signalized	C (WB-D)	D (WB-E)
7	Cameron Avenue/Raleigh Street	Signalized	F (EB-F)	F (EB-F)
8	Pittsboro Street/McCauley Street	Signalized	C (WB-E)	C (SB-C)
9	Columbia Street/South Road	Signalized	D (WB-E)	E (WB-F)
10	Raleigh Street/South Road	Signalized	B (SB-D)	B (SB-C)
11	Country Club Road/South Road	Signalized	C (NB-E)	E (NB-F)
12	Columbia Street/Manning Drive	Signalized	C (SB-C)	C (SB-C)
13	Manning Drive/West Drive	Signalized	A (SB-D)	B (SB-D)
14	Manning Drive/East Drive	Signalized	B (NB-D)	B (NB-D)
15	Ridge Road/Manning Drive	Signalized	D (SB-F)	C (NB-D)
16	Mason Farm Road/Columbia Street	Signalized	B (WB-D)	C (WB-D)
17	Mason Farm Road/West Drive	Unsignalized	A (NB-C)	A (NB-C)
18	Mason Farm Road/East Drive	Unsignalized	D (EB-E)	B (EB-C)
19	Mason Farm Road/Purefoy Road	Unsignalized	n/a	n/a
20	Manning Drive/Skipper Bowles Drive	Unsignalized	n/a	n/a
21	Columbia Street/Purefoy Road	Unsignalized	n/a	n/a
22	Columbia Street/Fordham Boulevard (northern ramp)	Signalized	n/a	n/a
23	Columbia Street/Fordham Boulevard (southern ramp)	Signalized	n/a	n/a
24	Mason Farm Road/Fordham Boulevard	Unsignalized	A (SB-E)	A (SB-F)
25	Manning Drive/Fordham Boulevard	Signalized	E (SB-F)	F (SB-F)

n/a = No data available.

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

Note: Turning movement counts used the analysis were based on best available data, which for several intersections was up to ten years old. The results of the analysis should not be used for design and care should be taken when interpreting the results.

4.4 TRIP GENERATION

To determine the impact of the future development on the campus, parking was determined to be the best indicator of additional trips on the study area network. The overall additional parking on campus will increase by approximately 1,550 spaces. In some areas of campus, parking will decrease, while in other areas parking will increase. The objective of the future analysis is to determine the impact of these changes on surrounding intersections. To accomplish this, the parking was converted into peak hour vehicle trips and then distributed to the study area network, as described below.

4.4.1 Parking Generation Rates

Parking generation rates (the number of vehicular trips generated per parking space) were applied to the parking sites, which lost or gained spaces. These were developed for three types of users: employees (including commuter students assuming the employee rate), visitor/patients, and resident students. The rates are shown in Table 4-6 and were developed using traffic counts undertaken at the entry and exit points of selected parking facilities over the last few years, data from card readers at entries to gated facilities, and exit counts in the visitor portion of the first Health Affairs deck (now referred to as the Cardinal Deck). No data are available for resident student parking, and the rates in the table are estimates only.

Table 4-6: Trip Generation Rates (Vehicle Trips)

User Type	Trip Rates (Trips per Space)				
	Weekday	A.M. In	A.M. Out	P.M. In	P.M. Out
Employee/Commuter Student	3.5	0.40	0.08	0.10	0.40
Visitor/Patient	6.0	0.40	0.12	0.20	0.40
Resident Student	0.5	0.05	0.10	0.15	0.15

4.4.2 Campus Parking Areas and Distribution

Since there are nearly 30 parking lots on the campus that will be impacted by the Development Plan, the campus was divided into eight geographical areas to simplify the analysis. Within each area, the net change in trips was then distributed over the study area network, based on an overall regional distribution of traffic and an understanding of how traffic uses the intra-campus road network. The regional distribution of traffic was determined from employee and Hospital patient home address data. Intra-campus traffic distribution was based on the existing A.M. and P.M. traffic counts (see Figure 4-4 and Figure 4-5).

On the following page, Table 4-7 summarizes the trip generation by campus parking area. The parking areas and overall directional distribution of traffic per area are shown in Figure 4-6.

Table 4-7: Trip Generation by Campus Parking Area

Campus Parking Areas*	Lot Name	Parking Designation	Parking Totals (spaces)	AM In (trips)	AM Out (trips)	PM In (trips)	PM Out (trips)
1	Porthole	Employee	-40	-16	-3	-4	-16
1	Cameron Deck	Visitor	330	132	40	66	132
1	Swain	Net Change	-234	-94	-21	-28	-94
		Area 1 Totals	56	22	16	34	22
2	Sitterson	Employee	-135	-54	-11	-14	-54
2	Venable Deck	Employee	600	240	48	60	240
2	McCauley Street	Employee	-34	-14	-3	-3	-14
		Area 2 Totals	431	172	34	43	172
3	Wilson Library	Employee	-25	-10	-2	-3	-10
3	North Medical Drive	Service	-20	-8	-2	-2	-8
		Area 3 Totals	-45	-18	-4	-5	-18
4	Conner	Student	-20	-1	-2	-3	-3
4	Hanes	Visitor	-63	-25	-8	-13	-25
4	Service	Service	-20	-8	-2	-2	-8
		Area 4 Totals	-103	-34	-11	-18	-36
5	Ramshead	Visitor	303	121	36	61	121
5	Ridge Road	Employee	-17	-7	-1	-2	-7
		Area 5 Totals	286	114	35	59	114
6	Glaxo/HousingSupport/MFM/MRI	Employee	-95	-38	-8	-10	-38
6	ACC	Visitor	198	79	24	40	79
		Area 6 Totals	103	41	16	30	41
7a	Dental School	Employee	-55	-22	-4	-6	-22
7a	Gravely	Net Change	595	238	77	133	238
7a	Neurosciences	Employee	-100	-40	-8	-10	-40
		Area 7a Totals	440	176	64	117	176
7b	Student Family Housing	Student	31	2	3	5	5
7b	Bell Tower	Employee	541	216	43	54	216
7b	Craige Surface	Employee/Student	-249	-100	-20	-25	-100
		Area 7b Totals	323	119	26	35	122
		Area 7 Totals	763	295	91	152	298
8	Bowles	Employee	-628	-251	-50	-63	-251
8	Kenan/McColl Visitor Parking	Visitor	-40	-16	-5	-8	-16
8	Hinton James	Student	-205	-10	-21	-31	-31
8	Manning	Employee/Student	932	373	75	93	373
		Area 8 Totals	59	95	-1	-8	75

	Parking Totals (spaces)	AM In (trips)	AM Out (trips)	PM In (trips)	PM Out (trips)
Campus-Wide Totals	**1,550**	**688**	**176**	**287**	**669**

*See Figure 4-6 for Campus Parking Areas Locations

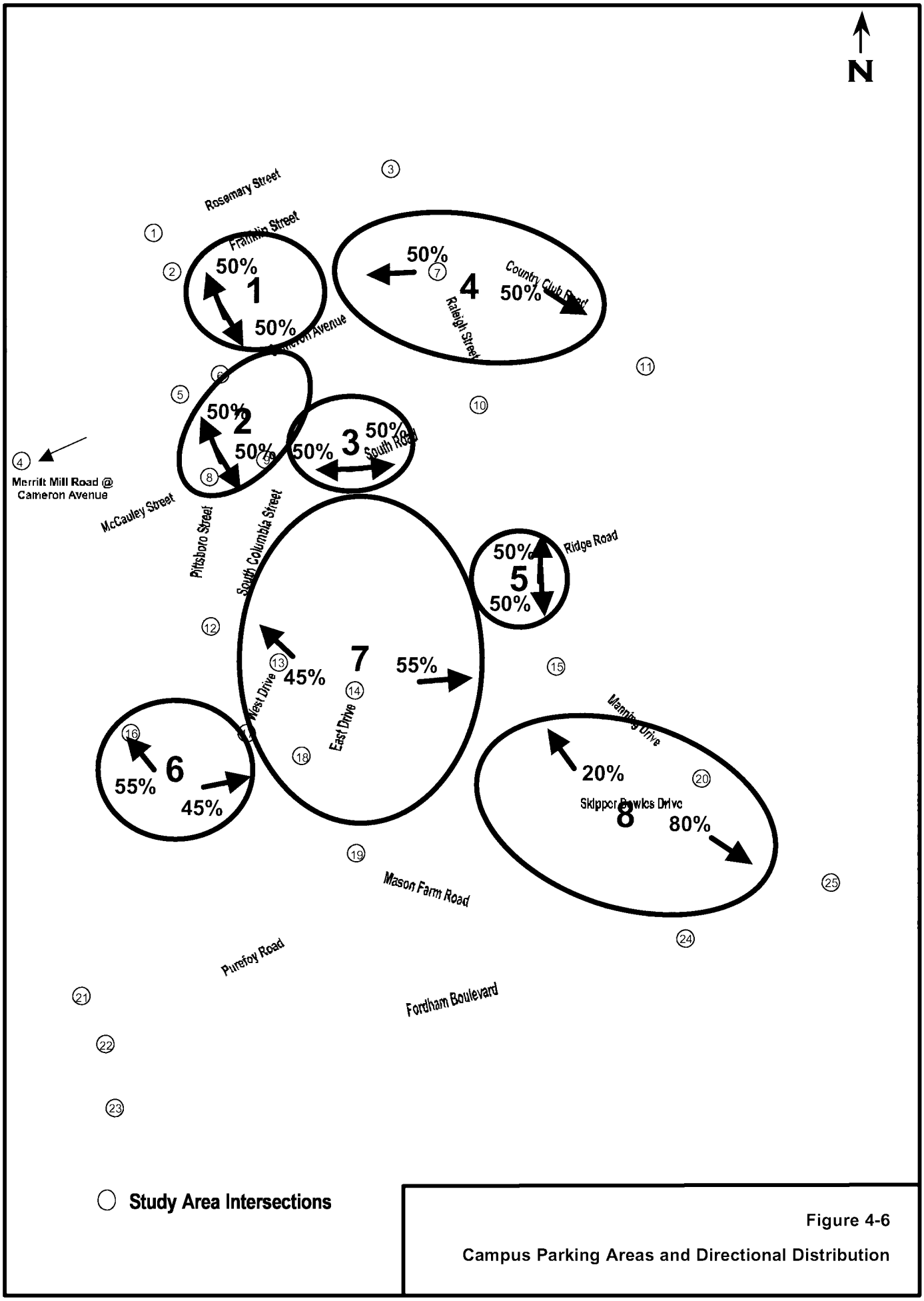


Figure 4-6

Campus Parking Areas and Directional Distribution

4.5 TRAFFIC PROJECTIONS

The background traffic analysis is presented for the following cases:

- Year 2010 No-Build scenario traffic projections, consisting of projected background traffic growth.
- Year 2010 Build scenario traffic projections, including background traffic growth and Development Plan traffic as described in Section 4.4.

4.5.1 No-Build Scenario

No-Build traffic was developed for 2010, which is the year the final project in the Development Plan will be completed. No-Build year 2010 intersection Average Daily Traffic (ADT) and turning movement volumes were determined as described below.

No-Build Average Daily Traffic

Based on historical count data from NCDOT and projected annual growth rates determined from the regional travel demand model, annual growth rates were applied to existing traffic to yield the future background traffic. The annual growth rates and projected future ADT's for study area roads are listed in Table 4-9 and are displayed in Figure 4-9.

No-Build Turning Movement Volumes

Utilizing the annual growth rates from Table 4-9, the intersection turning movement counts listed in Table 4-8 and shown in Figure 4-4 and Figure 4-5 were adjusted to reflect future year 2010 conditions. Growth rates were applied to each approach of the intersections, ranging from one to three percent annually. These volumes were then used in the 2010 No-Build analysis.

Table 4-8: Future No-Build Year 2010 Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Estimated 2001-2010 Annual Growth Rates* EB-WB	NB-SB
1	Columbia Street/Rosemary Street	211	219	28	16	156	22	33	388	93	81	759	217	1.0%	2.0%
2	Columbia Street/Franklin Street	49	448	133	94	371	53	86	449	91	60	691	74	1.5%	2.0%
3	Franklin Street/Raleigh Street	5	332	71	65	559	93	85	232	24	58	460	25	1.0%	1.0%
4	Merritt Mill Road/Cameron Avenue	0	0	0	75	0	65	0	145	574	140	82	0	1.5%	2.0%
5	Cameron Avenue/Pittsboro Street	0	210	197	1043	185	0	0	0	0	0	0	0	1.5%	2.0%
6	Cameron Avenue/Columbia Street	41	195	0	0	221	91	259	661	99	155	0	943	1.5%	2.5%
7	Cameron Avenue/Raleigh Street	36	211	66	120	387	346	47	201	107	553	493	125	1.5%	1.0%
8	Pittsboro Street/McCauley Street	0	335	132	233	89	0	0	0	0	306	995	14	1.5%	1.0%
9	Columbia Street/South Road	99	422	0	0	286	291	126	782	0	0	0	0	3.0%	2.5%
10	Raleigh Street/South Road	132	478	0	0	638	32	0	0	0	115	0	360	2.5%	1.0%
11	Country Club Road/South Road	35	149	58	532	532	493	29	95	105	342	220	21	1.0%	2.5%
12	Columbia Street/Manning Drive	117	616	0	109	0	306	0	799	227	0	0	0	1.5%	1.5%
13	Manning Drive/West Drive	41	699	402	237	317	48	0	0	0	36	18	36	1.5%	1.5%
14	Manning Drive/East Drive	209	578	162	447	280	198	143	91	464	0	0	0	1.5%	1.5%
15	Ridge Road/Manning Drive	100	334	76	5	620	95	52	52	5	15	86	353	1.5%	2.5%
16	Mason Farm Road/Columbia Street	8	5	3	96	7	119	13	650	485	149	242	4	1.0%	1.5%
17	Mason Farm Road/West Drive	0	537	29	23	167	0	27	0	50	38	32	113	1.0%	1.0%
18	Mason Farm Road/East Drive	0	505	210	28	90	0	142	0	76	0	0	0	1.0%	1.0%
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	1.0%	1.0%
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0	1.0%	2.5%
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	1.0%	1.5%
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	1.5%	1.5%
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	1.5%	1.5%
24	Mason Farm Road/Fordham Boulevard	0	3448	0	0	967	179	0	0	0	0	0	7	1.5%	1.0%
25	Manning Drive/Fordham Boulevard	485	2960	5	14	1099	1024	15	11	27	291	7	33	1.5%	2.5%

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	Estimated 2001-2010 Annual Growth Rates* EB-WB	NB-SB
1	Columbia Street/Rosemary Street	291	292	70	95	289	96	44	848	78	64	613	294	1.0%	2.0%
2	Columbia Street/Franklin Street	403	1018	56	58	854	49	232	875	135	190	940	99	1.5%	2.0%
3	Franklin Street/Raleigh Street	31	717	156	72	705	142	112	290	33	132	392	35	1.0%	1.0%
4	Merritt Mill Road/Cameron Avenue	0	0	0	494	0	197	0	140	323	134	279	0	1.5%	2.0%
5	Cameron Avenue/Pittsboro Street	0	236	259	898	515	0	0	0	0	0	0	0	1.5%	2.0%
6	Cameron Avenue/Columbia Street	68	217	0	0	322	103	543	1006	78	208	0	790	1.5%	2.5%
7	Cameron Avenue/Raleigh Street	59	381	107	100	301	414	114	329	253	365	497	150	1.5%	1.0%
8	Pittsboro Street/McCauley Street	0	186	43	454	260	0	0	0	0	352	814	27	1.5%	1.0%
9	Columbia Street/South Road	188	404	0	0	504	526	166	1026	0	0	0	0	3.0%	2.5%
10	Raleigh Street/South Road	456	719	0	0	686	75	0	0	0	235	0	454	2.5%	1.0%
11	Country Club Road/South Road	70	579	55	184	482	498	43	246	337	603	145	39	1.0%	2.5%
12	Columbia Street/Manning Drive	154	317	0	339	0	578	0	730	108	0	0	0	1.5%	1.5%
13	Manning Drive/West Drive	41	282	75	121	885	48	0	0	0	36	18	36	1.5%	1.5%
14	Manning Drive/East Drive	97	379	68	171	510	171	274	103	646	0	0	0	1.5%	1.5%
15	Ridge Road/Manning Drive	186	934	119	1	210	205	148	158	76	152	48	148	1.5%	2.5%
16	Mason Farm Road/Columbia Street	4	5	5	401	10	179	3	385	83	93	778	7	1.0%	1.5%
17	Mason Farm Road/West Drive	0	247	10	3	310	0	20	0	19	65	8	179	1.0%	1.0%
18	Mason Farm Road/East Drive	0	347	117	28	90	0	253	0	38	0	0	0	1.0%	1.0%
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	1.0%	1.0%
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0	1.0%	2.5%
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0	1.0%	1.5%
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	1.5%	1.5%
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0	1.5%	1.5%
24	Mason Farm Road/Fordham Boulevard	0	1796	0	0	3104	53	0	0	0	0	0	32	1.5%	1.0%
25	Manning Drive/Fordham Boulevard	110	1682	2	11	2670	237	9	5	0	1201	15	478	1.5%	2.5%

Intersections 13 & 14 reflect Hospitals proposed new circulation.

* - Growth Rates based on NCDOT historical traffic counts and 2025 regional demand model data.

Figure 4-7a

Future No-Build Year 2010 A.M. Peak Hour Turning Movement Volumes

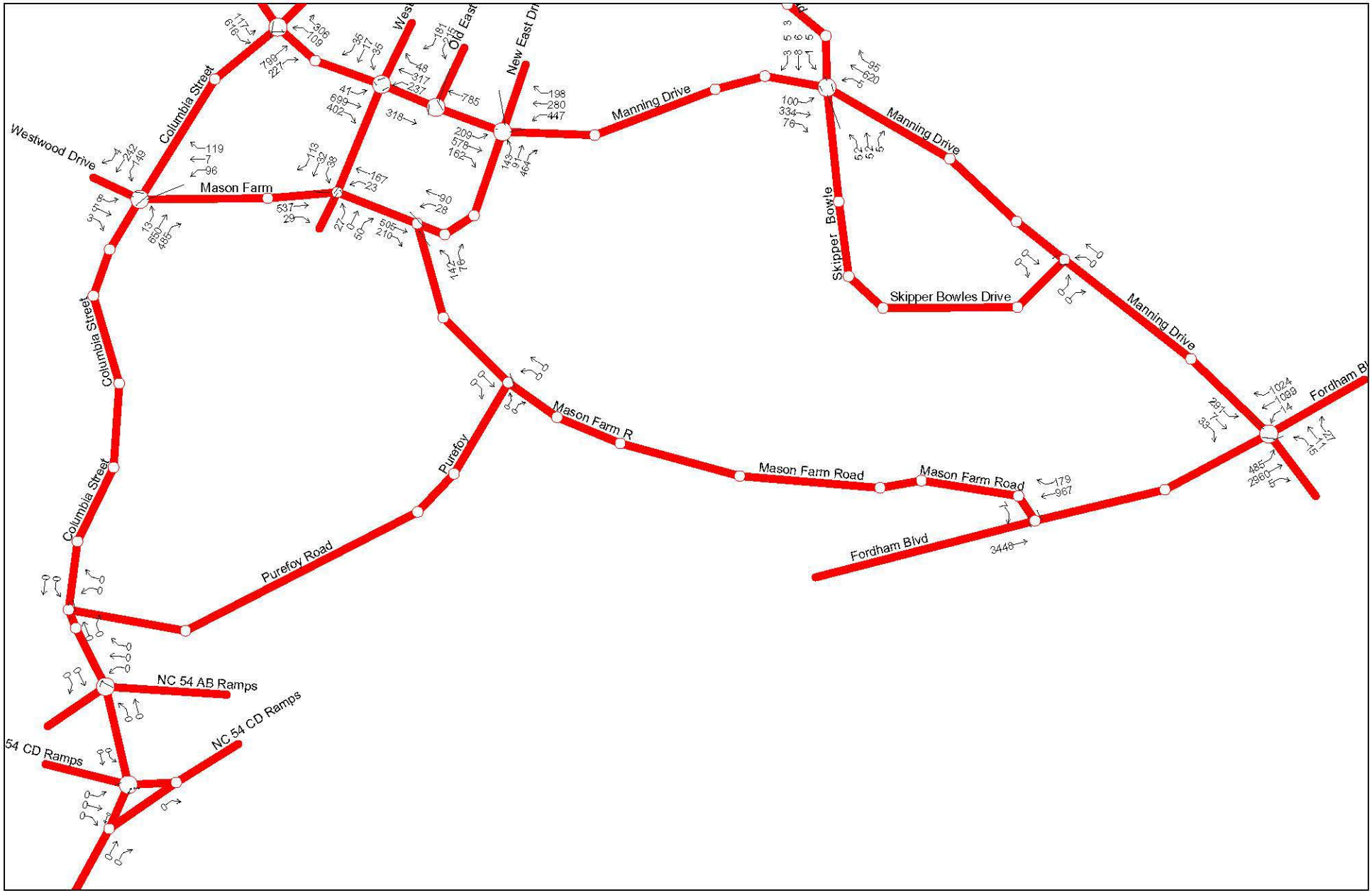


Figure 4-7b

Future No-Build Year 2010 A.M. Peak Hour Turning Movement Volumes

Figure 4-8a

Future No-Build Year 2010 P.M. Peak Hour Turning Movement Volumes

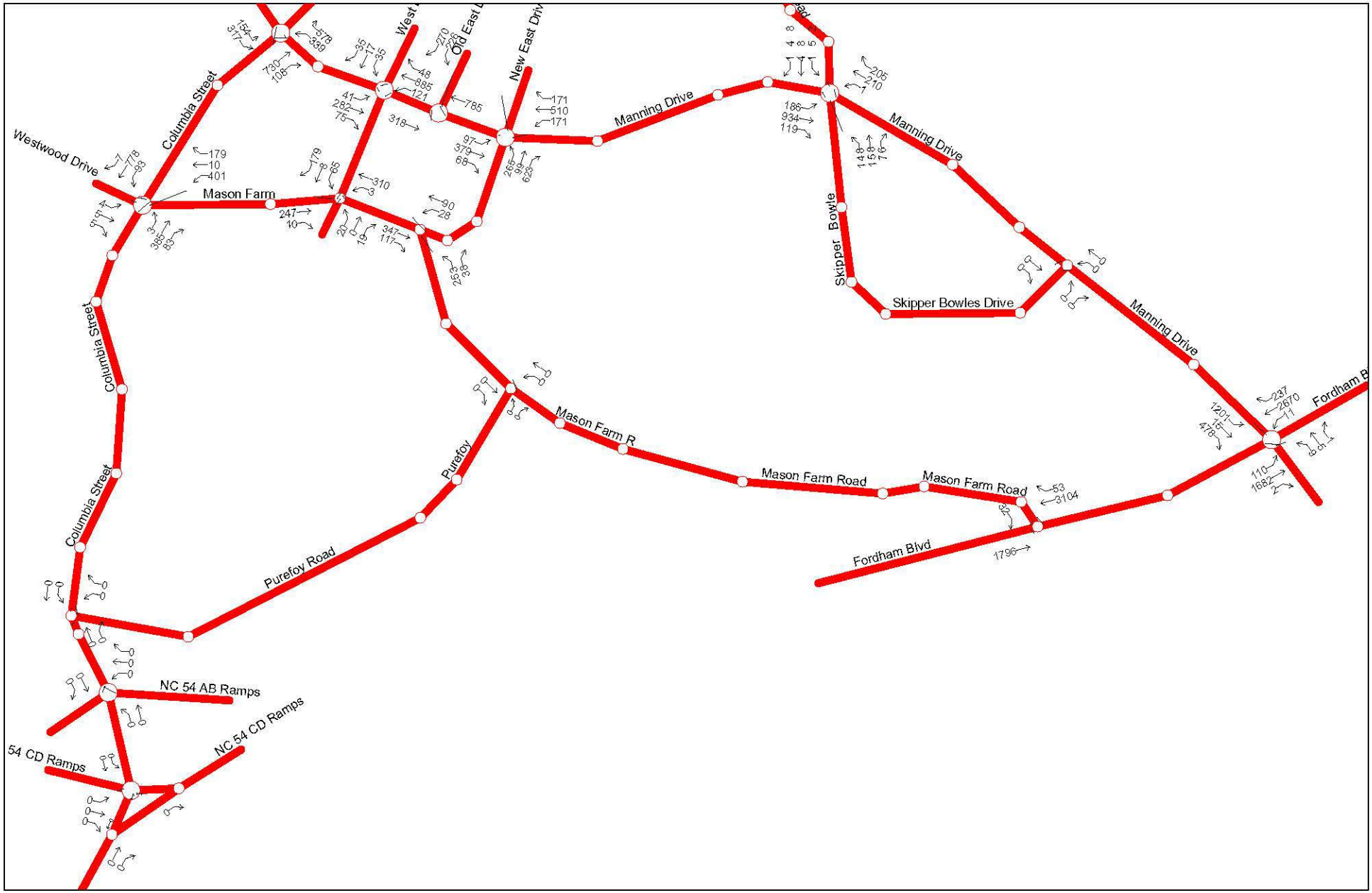


Figure 4-8b

Future No-Build Year 2010 P.M. Peak Hour Turning Movement Volumes

4.5.2 Build Scenario

The development of the 2010 Build scenario volumes included the following steps:

- The 2010 No-Build volumes (Table 4-8) were used as a base to account for existing and future annual growth in traffic.

- The future parking generated trips (as described in Section 4.4) were added to the 2010 No-Build volumes to yield 2010 Build volumes.

The Build scenario traffic volumes for the morning and afternoon peak hours are listed in Table 4-10 and illustrated in Figure 4-10 and Figure 4-11. The increase in traffic along the majority of campus roads will be minimal, though increases in individual turning movements at some intersections near proposed parking facilities will be significant. In some areas where parking is bring eliminated, some turning movements will actually decrease compared to the No-Build scenario.

The annual growth rates and projected future ADT's for study area roads are listed in Table 4-9 and are displayed in Figure 4-9.

Table 4-9: Existing and Future (2010) Traffic Volumes

Roadway	Estimated 2001 ADT	Projected 2010 No-Build ADT	2001-2010 Annual Growth Rate	Estimated 2010 Build ADT
S. Columbia St. (south of Franklin St.)	18,400	22,100	2.2%	23,200
Raleigh St. (south of Franklin St.)	12,000	13,100	1.0%	13,400
Cameron Ave. (west of Pittsboro St.)	10,300	11,700	1.5%	12,300
Cameron Ave. (east of S. Columbia St.)	7,600	8,600	1.5%	8,800
Country Club Rd. (north of South Rd.)	14,800	15,700	0.7%	16,300
South Rd. (east of Columbia St.)	10,200	13,100	3.2%	13,500
South Rd. (east of Raleigh St.)	10,100	12,200	2.4%	12,600
Pittsboro St. (south of McCauley St.)	11,200	12,800	1.6%	13,700
Manning Dr. (east of Columbia St.)	17,300	19,900	1.6%	23,300
Ridge Rd. (at Manning)	8,700	10,700	2.5%	13,200
S. Columbia St. (south of Mason Farm Rd.)	17,000	19,300	1.5%	21,600
Manning Dr. (east of Ridge Rd.)	17,600	19,600	1.2%	22,500

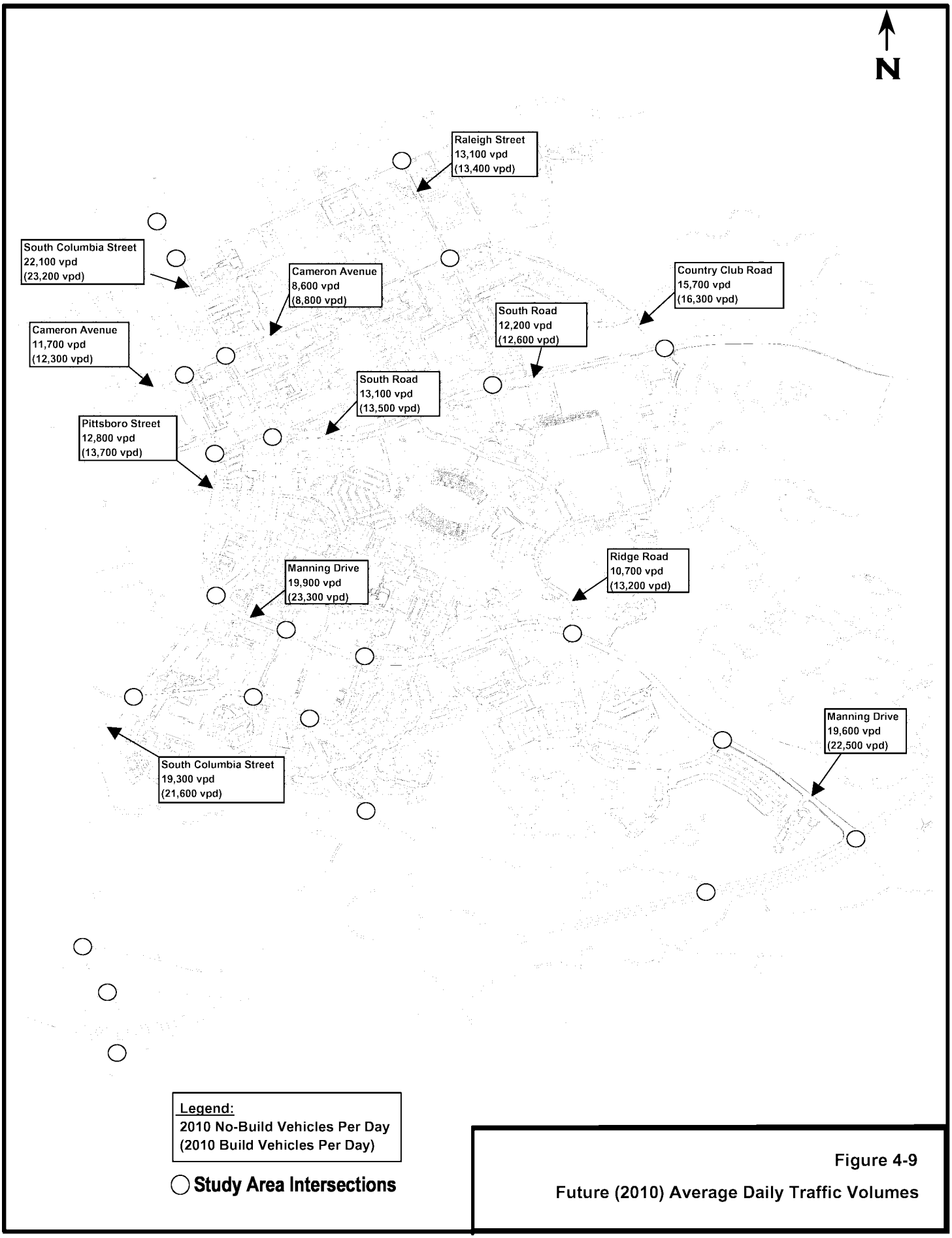


Figure 4-9

Future (2010) Average Daily Traffic Volumes

Table 4-10: Future Build Year 2010 Turning Movement Volumes

AM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	211	219	31	16	156	22	37	417	97	81	798	217
2	Columbia Street/Franklin Street	49	450	140	99	372	53	95	486	98	61	734	74
3	Franklin Street/Raleigh Street	5	339	73	61	564	93	86	236	24	58	484	25
4	Merritt Mill Road/Cameron Avenue	0	0	0	80	0	68	0	145	578	144	82	0
5	Cameron Avenue/Pittsboro Street	0	206	209	1107	193	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	42	197	0	0	224	96	275	712	102	152	0	1002
7	Cameron Avenue/Raleigh Street	36	214	66	120	385	351	47	201	107	569	498	126
8	Pittsboro Street/McCauley Street	0	345	141	233	94	0	0	0	0	319	1057	15
9	Columbia Street/South Road	108	436	0	0	288	295	131	887	44	0	0	0
10	Raleigh Street/South Road	132	489	0	0	680	32	0	0	0	115	0	360
11	Country Club Road/South Road	35	156	62	612	572	487	33	102	123	346	240	29
12	Columbia Street/Manning Drive	117	677	11	120	0	370	0	881	303	0	0	0
13	Manning Drive/West Drive	41	837	402	243	391	48	0	0	0	36	18	36
14	Manning Drive/East Drive	209	672	162	453	409	198	162	91	506	0	0	0
15	Ridge Road/Manning Drive	141	381	85	5	754	124	52	52	5	19	96	414
16	Mason Farm Road/Columbia Street	8	5	3	108	7	122	13	805	540	155	258	4
17	Mason Farm Road/West Drive	0	576	29	23	185	0	27	0	50	38	32	119
18	Mason Farm Road/East Drive	0	542	212	30	98	0	152	0	100	0	0	0
19	Mason Farm Road/Purefoy Road	5	0	0	0	0	0	0	0	0	0	2	0
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0
24	Mason Farm Road/Fordham Boulevard	0	3448	0	0	967	205	0	0	0	0	0	11
25	Manning Drive/Fordham Boulevard	553	2960	5	14	1117	1188	15	11	27	333	7	41

PM Peak Hour

ID #	Intersection	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
1	Columbia Street/Rosemary Street	291	292	72	97	289	96	54	909	83	64	653	294
2	Columbia Street/Franklin Street	403	1018	60	60	855	50	243	921	144	190	984	99
3	Franklin Street/Raleigh Street	31	730	156	72	707	142	114	309	35	132	402	35
4	Merritt Mill Road/Cameron Avenue	0	0	0	520	0	210	0	140	327	139	279	0
5	Cameron Avenue/Pittsboro Street	0	237	267	976	555	0	0	0	0	0	0	0
6	Cameron Avenue/Columbia Street	82	217	0	0	320	102	617	1127	84	208	0	874
7	Cameron Avenue/Raleigh Street	59	373	102	100	309	438	113	329	253	368	497	148
8	Pittsboro Street/McCauley Street	0	191	49	454	262	0	0	0	0	380	869	28
9	Columbia Street/South Road	192	413	0	0	501	530	174	1104	20	0	0	0
10	Raleigh Street/South Road	456	773	0	0	699	75	0	0	0	233	0	451
11	Country Club Road/South Road	70	627	60	237	495	495	49	278	390	609	156	46
12	Columbia Street/Manning Drive	154	365	24	377	0	664	0	750	153	0	0	0
13	Manning Drive/West Drive	41	377	75	126	1007	48	0	0	0	36	18	36
14	Manning Drive/East Drive	97	518	68	190	606	171	290	103	695	0	0	0
15	Ridge Road/Manning Drive	224	1050	119	1	287	224	155	166	76	181	48	227
16	Mason Farm Road/Columbia Street	4	5	5	434	10	186	3	443	130	98	835	7
17	Mason Farm Road/West Drive	0	300	10	3	335	0	20	0	19	65	8	184
18	Mason Farm Road/East Drive	0	396	121	28	115	0	259	0	54	0	0	0
19	Mason Farm Road/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0
20	Manning Drive/Skipper Bowles Drive	0	0	0	0	0	0	0	0	0	0	0	0
21	Columbia Street/Purefoy Road	0	0	0	0	0	0	0	0	0	0	0	0
22	Columbia Street/Fordham Boulevard (northern ramp)	0	0	0	0	0	0	0	0	0	0	0	0
23	Columbia Street/Fordham Boulevard (southern ramp)	0	0	0	0	0	0	0	0	0	0	0	0
24	Mason Farm Road/Fordham Boulevard	0	1796	0	0	3104	72	0	0	0	0	0	36
25	Manning Drive/Fordham Boulevard	135	1682	2	11	2678	308	9	5	0	1343	15	539

Figure 4-10a

Future Build Year 2010 A.M. Peak Hour Turning Movement Volumes

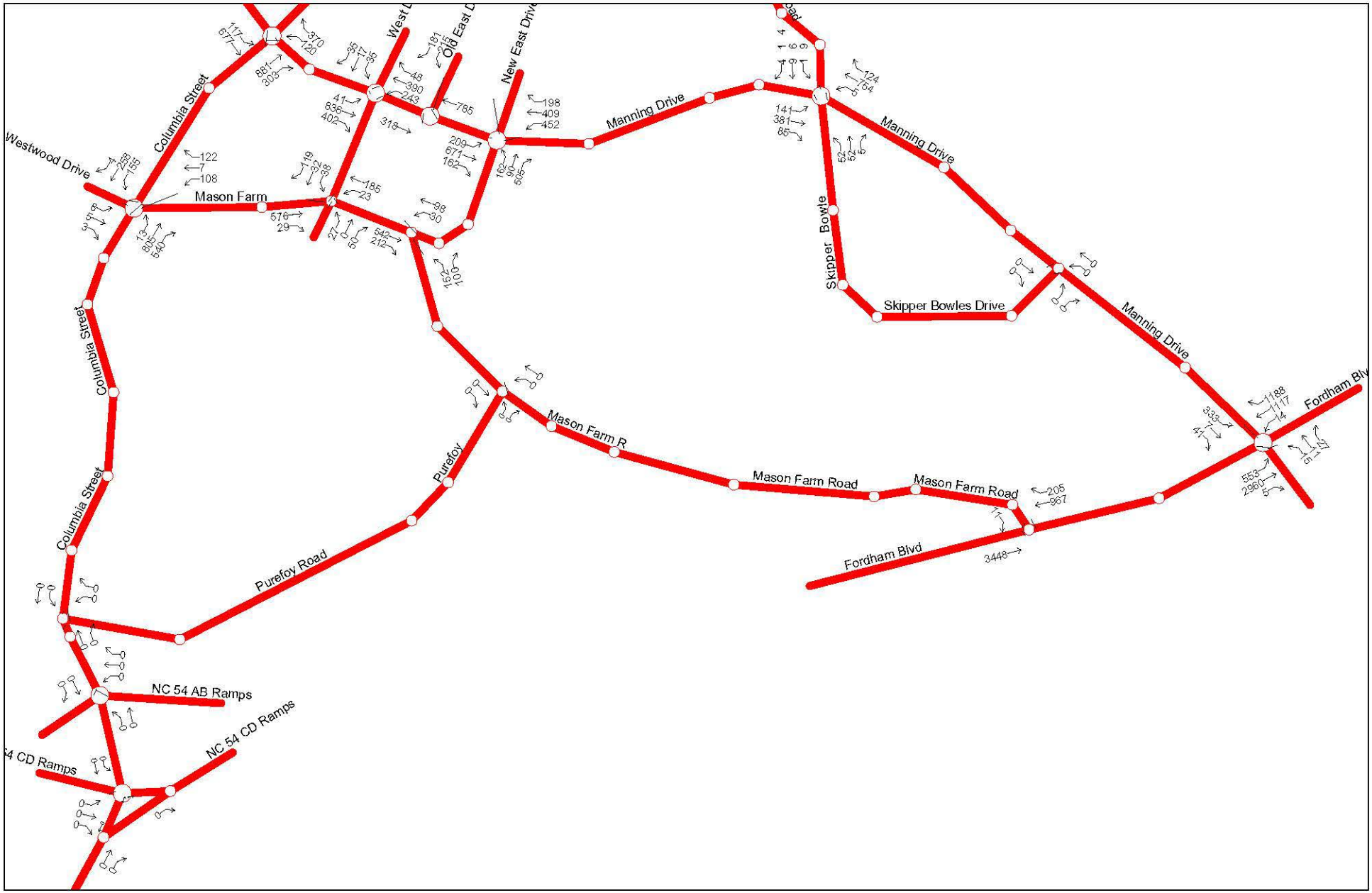


Figure 4-10b

Future Build Year 2010 A.M. Peak Hour Turning Movement Volumes

Figure 4-11a

Future Build Year 2010 P.M. Peak Hour Turning Movement Volumes

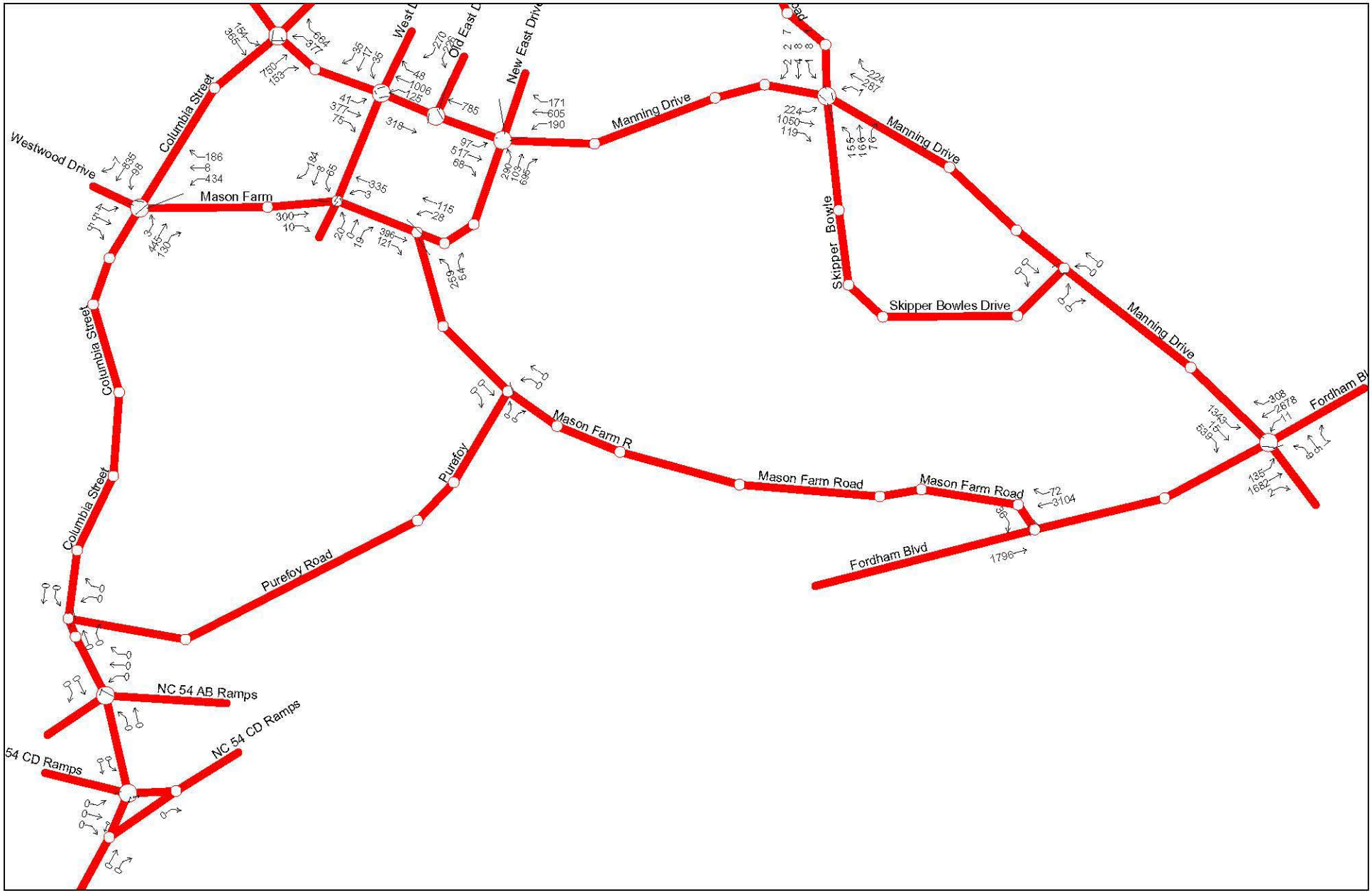


Figure 4-11b

Future Build Year 2010 P.M. Peak Hour Turning Movement Volumes

4.6 FUTURE INTERSECTION LEVEL OF SERVICE ANALYSIS

Morning and afternoon peak-hour capacity analyses were performed for the future 2010 No-Build and Build conditions. Per the *Transportation Impact Analysis Guidelines*, all intersections listed in Section 4.3 for which counts were available were analyzed for the A.M. and P.M. peak hours.

The traffic volumes computed for both scenarios were used to conduct an intersection capacity analysis in the same manner that the existing intersections were examined. The No-Build and Build cases utilized the existing geometrics shown Figure 4-2. The LOS results are summarized in Table 4-11.

It should be stressed that many of the LOS analyses are based on old traffic counts. Therefore the results are questionable and should not be used for developing intersection improvements.

4.6.1 No-Build Analysis Results

As in the Existing Conditions analysis described in Section 4.3, many of the same intersections that were suffering poor levels of service in 2001 will also fail in 2010 even without the Development Plan. In particular, the following intersections were determined to experience a substantial deterioration in operations:

- The intersection of Columbia Street and Cameron Avenue deteriorates substantially in the afternoon peak period as a result of background traffic growth.
- The unsignalized intersection of Mason Farm Road and East Drive (behind the Dogwood deck) fails in the morning peak period.
- The South Road/ Country Club intersection fails in the afternoon peak period

4.6.2 Build Analysis Results

The following intersections were further degraded under the Build conditions:

- The intersection of Columbia Street and Cameron Avenue deteriorates in the morning peak period.
- The intersection of Pittsboro Street and McCauley Street deteriorates in both peak periods.

Table 4-11: Future (2010) Intersection No-Build and Build Levels of Service

			Existing (2001)		No-Build (2010)		Build (2010)	
ID #	Intersection	Control	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1	Columbia Street/Rosemary Street	Signalized	C (SB-C)	C (EB-D)	C (SB-C)	D (EB-F)	C (SB-C)	D (EB-F)
2	Columbia Street/Franklin Street	Signalized	B (EB-D)	F (SB-F)	B (EB-D)	F (SB-F)	C (EB-D)	F (SB-F)
3	Franklin Street/Raleigh Street	Signalized	B (WB-C)	B (WB-C)	B (WB-C)	D (NB-F)	B (WB-C)	D (NB-F)
4	Merritt Mill Road/Cameron Avenue	Signalized	B (WB-D)	C (WB-D)	B (WB-E)	D (WB-E)	B (WB-E)	D (WB-E)
5	Cameron Avenue/Pittsboro Street	Signalized	B (EB-C)	B (EB-C)	B (EB-C)	B (EB-C)	B (EB-C)	C (EB-C)
6	Cameron Avenue/Columbia Street	Signalized	C (WB-D)	D (WB-E)	D (WB-E)	F (WB-F)	E (WB-F)	F (SB-F)
7	Cameron Avenue/Raleigh Street	Signalized	F (EB-F)	F (EB-F)	F (EB-F)	F (EB-F)	F (EB-F)	F (EB-F)
8	Pittsboro Street/McCauley Street	Signalized	C (WB-E)	C (SB-C)	D (SB-E)	D (SB-D)	E (SB-F)	E (SB-E)
9	Columbia Street/South Road	Signalized	D (WB-E)	E (WB-F)	D (WB-F)	F (WB-F)	D (WB-F)	F (WB-F)
10	Raleigh Street/South Road	Signalized	B (SB-D)	B (SB-C)	B (SB-D)	D (WB-D)	C (SB-E)	D (SB-D)
11	Country Club Road/South Road	Signalized	C (NB-E)	E (NB-F)	C (NB-E)	F (NB-F)	C (NB-F)	F (NB-F)
12	Columbia Street/Manning Drive	Signalized	C (SB-C)	C (SB-C)	C (NB-D)	C (SB-C)	C (NB-F)	C (SB-C)
13	Manning Drive/West Drive	Signalized	A (SB-D)	B (SB-D)	A (SB-D)	A (SB-D)	A (SB-D)	A (SB-D)
14	Manning Drive/East Drive	Signalized	B (NB-D)	B (NB-D)	C (NB-C)	B (NB-C)	C (NB-C)	B (NB-C)
15	Ridge Road/Manning Drive	Signalized	D (SB-F)	C (NB-D)	D (SB-F)	C (NB-D)	D (SB-F)	C (NB-D)
16	Mason Farm Road/Columbia Street	Signalized	B (WB-D)	C (WB-D)	B (WB-D)	C (WB-D)	B (WB-D)	D (WB-D)
17	Mason Farm Road/West Drive	Unsignalized	A (NB-C)	A (NB-C)	A (NB-C)	A (NB-C)	A (NB-C)	A (NB-C)
18	Mason Farm Road/East Drive	Unsignalized	D (EB-E)	B (EB-C)	F (EB-F)	C (EB-C)	F (EB-F)	C (EB-D)
19	Mason Farm Road/Purefoy Road	Unsignalized	n/a	n/a	n/a	n/a	n/a	n/a
20	Manning Drive/Skipper Bowles Drive	Unsignalized	n/a	n/a	n/a	n/a	n/a	n/a
21	Columbia Street/Purefoy Road	Unsignalized	n/a	n/a	n/a	n/a	n/a	n/a
22	Columbia Street/Fordam Boulevard (northern ramp)	Signalized	n/a	n/a	n/a	n/a	n/a	n/a
23	Columbia Street/Fordam Boulevard (southern ramp)	Signalized	n/a	n/a	n/a	n/a	n/a	n/a
24	Mason Farm Road/Fordham Boulevard	Unsignalized	A (SB-E)	A (SB-F)	A (SB-B)	A (SB-F)	A (SB-B)	A (SB-F)
25	Manning Drive/Fordham Boulevard	Signalized	E (SB-F)	F (SB-F)	F (EB-F)	F (WB-F)	F (EB-F)	F (WB-F)

n/a = No data available.

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

Note: Turning movement counts used the analysis were based on best available data, which for several intersections was up to ten years old. The results of the analysis should not be used for design and care should be taken when interpreting the results.

4.7 MITIGATION STRATEGIES

4.7.1 Intersection Improvements

Geometric improvements could be considered at several intersections even without the Development Plan. In addition, signal timing and phasing modifications may be appropriate at some intersections, but should be based on the analyses that will be undertaken with current counts to be collected in the fall of this year. Geometric improvements may be appropriate at the following intersections:

Columbia Street/South Road

The separate right turn slip lane from South Columbia onto South Road should be eliminated to provide a tighter urban-type intersection. This will improve pedestrian safety at the intersection, as well as increasing the distance between the intersection and the existing service driveway on the north side of South Road into the Venable site. Increased distance is necessary for the driveway to serve as access to the proposed parking deck in the lower levels of the building. Eastbound traffic queued to enter the driveway is less likely to affect the Columbia Street intersection. Removal of the island at the intersection also allows for a short left-turn lane to be constructed.

In conjunction with this modification, McCauley Street between Columbia and Pittsboro Streets should be upgraded. In particular, minor widening is recommended to provide a separate left-turn lane from eastbound McCauley Street into Columbia Street. This will results in a full three-lane section for this block. Redevelopment on the north side, including the R.O.T.C. building site, also provides the opportunity for realigning the eastern approach (to the north) to provide a more symmetrical intersection.

South Road/Country Club Road

An analysis of this intersection with future traffic volumes identified the long-term need for the following improvements:

- Widen the north side to provide a double left-turn lane.
- Widen the south side to provide a separate right-turn lane.

These improvements can be undertaken by widening to the east side.

An additional improvement recommended for this area is the realignment of the junction of Ridge Road and Country Club Road to give priority to Ridge Road since this is the major movement. This will be particularly important with construction of a parking deck on the Rams Head lot, and can be achieved by eliminating a small number of parking spaces on the west side of the intersection.

Manning Drive/Ridge Road

While LOS is not projected to be problematic, Manning Drive is a major access street into Main Campus, and the main access to the Hospitals. It is a wide four-lane street, expanding to five lanes at major intersections and driveways. It has the character of a suburban arterial road rather than an urban street. While posted at 25 M.P.H., its appearance and design encourage speeding. The high volume of traffic, in conjunction with speeding, pose a major safety hazard to the many pedestrians who cross the street in the vicinity of the student housing towers and the Hospitals area. Pedestrian

Safety and aesthetic improvements in the vicinity of Ridge Road (the student housing area) are very desirable in the near term, particularly with the additional student housing currently under construction. Therefore, measures to reduce and calm traffic and improve the appearance of Manning Drive should be studied. This could include adding a median through this area.

Mason Farm Road/East Drive
The unsignalized intersection of Mason Farm Road/East Drive may need signalization in the near future (although the Master Plan includes changes to the road network in this area). The existing level of service is currently acceptable, according to available counts, but is projected to be failing by 2010. Signalizing the intersection will provide safe entry/exit to the recently completed Health Affairs decks.

Mason Farm Road/West Drive
The level of service analysis did not indicate any congestion problems at this unsignalized intersection, but based on field observations, this intersection suffers from delay problems on the southbound West Drive approach. As with the East Drive intersection, signalization may be required.

Manning Drive/Skipper Bowles Drive
No data was available to analyze this intersection, but future plans for parking expansion in this area may necessitate signalization.

4.7.2 Mid-Block Improvements

South Columbia Street between Manning Drive and South Road
Modifications to South Columbia Street between Manning Drive and South Road are also recommended to improve safety for cyclists and pedestrians. This section of South Columbia Street is one-way northbound with four traffic lanes, though the eastern curb lane is almost exclusively used by buses in the peak times. Preliminary 2025 traffic projections indicate that two lanes with a bus lane should result in acceptable traffic conditions.

There also is a desire to narrow the pavement through this area (now 43 feet including the paved gutter) as it represents a barrier between the Health Science buildings on the two sides. The number of lanes may also encourage motorists to travel at speeds in excess of the 25 M.P.H. limit. Pedestrian flows across the street are high, and safety is a concern even with the signalized pedestrian crossing in front of the Health Sciences Library. The street directly north of the Manning Drive intersection has additional width on the west side which can also be narrowed by extending the curb out to achieve a symmetrical section.

The options considered for this street are described in the reports accompanying the Master Plan. The preferred improvements consist of:

- Narrowing the street to three lanes: two 11-foot general traffic lanes, and a 14-foot bus/bicycle only lane on the east side.

- Extending the eastern sidewalk out by four feet to narrow the pavement to the required dimension.

- At the southern end of the street section, eliminating the excess pavement on the west side by extending the curb out to achieve a symmetrical section.

- At McCauley Street, modifying the intersection as described earlier, and re-stripe the northbound lanes to provide one shared through/left-turn lane, one exclusive through lane, and one shared/right-turn lane.

Ridge Road
Ridge Road is an important north-south connection on the campus. It is the only significant north-south route aside from Columbia/Pittsboro Streets. In the peak periods it is used by South Campus employees area as an alternate route to using the Bypass to travel between NC 54 from the east and the Hospitals area. Construction of a parking deck on the Rams Head lot will also add to the traffic on Ridge Road. Minor improvements are desirable.

The most significant safety problem is created by the sharp curve near the drive by the practice field. For a 20 M.P.H. design speed, cars turning left or right out of the drive need 230 feet sight distance to see approaching vehicles. Cars turning left out of the drive need 210 feet to clear approaching vehicles from the left.

The sight line out of the drive is now restricted by cars parking on the right side of the drive and by cars parking on the north side of Ridge Road on both sides of the drive. There is also a sign on the left side of the drive, which interferes with the left view.

The following improvements are recommended:

- Remove the last parking space on the right side of the drive at Ridge Road.
- Remove the last two parking spaces in the curve on the left (north side) Ridge Road approach to the drive.
- Remove the parking spaces between the gate to the Hockey field and the drive on the north side of Ridge Road.
- Move the sign 20 feet back from Ridge Road.

Because of the steepness of the eastern drive to the tennis court parking lots on the south side of Ridge Road, consideration should be given to closing this entrance. However, there is no sight distance problem associated with it.

A deck on the Rams Head lot will require a left-turn lane to be installed on Ridge Road. This will eliminate some on-street parking.

Columbia Street/Cameron Avenue
There are severe pedestrian/vehicular conflicts at the west end of Cameron Avenue between South Columbia Street and Raleigh Road at change of class. In addition, these conflicts can cause traffic to back up from Cameron Avenue onto Columbia Street. Options considered to improve Cameron Street include:

- Closing Cameron Avenue at mid-block between about 9:00 and 5:00 on school days.

- Making Cameron one-way westbound, thereby not restricting anyone from using the street during the day.

- Through the use of special pavement, signage and education, encouraging pedestrians to cross only at specific locations, in particular, to try and move crossings away from Columbia Street, thereby providing more roadway length for vehicles to queue when blocked by pedestrians.

TRANSPORTATION IMPACT ANALYSIS APPENDIX

INTERSECTION LEVELS OF SERVICE WORKSHEETS

EXISTING 2001

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	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	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	0.90		1.00	1.00	0.74
Flpb, ped/bikes	0.88	1.00		0.84	1.00		1.00	1.00		0.78	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1257	1596		1255	1503		1433	2602		1120	2867	1017
Flt Permitted	0.61	1.00		0.53	1.00		0.95	1.00		0.41	1.00	1.00
Satd. Flow (perm)	807	1596		704	1503		1433	2602		487	2867	1017
Volume (vph)	194	201	26	15	143	20	30	356	85	74	696	199
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	216	223	29	17	159	22	33	396	94	82	773	221
Lane Group Flow (vph)	216	252	0	17	181	0	33	490	0	82	773	221
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Perm			Perm			Prot			Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	42.0	42.0		42.0	42.0		5.0	46.0		35.0	35.0	35.0
Effective Green, g (s)	44.0	44.0		44.0	44.0		7.0	48.0		37.0	37.0	37.0
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.07	0.48		0.37	0.37	0.37
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	355	702		310	661		100	1249		180	1061	376
v/s Ratio Prot		0.16			0.12		0.02	c0.19			c0.27	
v/s Ratio Perm	c0.27			0.02						0.17		0.22
v/c Ratio	0.61	0.36		0.05	0.27		0.33	0.39		0.46	0.73	0.59
Uniform Delay, d1	21.4	18.6		16.1	17.8		44.3	16.7		23.9	27.2	25.4
Progression Factor	1.00	1.00		1.00	1.00		0.47	0.13		1.00	1.00	1.00
Incremental Delay, d2	7.6	1.4		0.3	1.0		7.5	0.8		8.1	4.4	6.6
Delay (s)	29.0	20.1		16.4	18.9		28.2	3.1		32.0	31.6	32.0
Level of Service	C	C		B	B		C	A		C	C	C
Approach Delay (s)		24.2			18.6			4.6			31.7	
Approach LOS		C			B			A			C	

Intersection Summary

HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.94		1.00	0.98		1.00	0.95		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		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)	1433	2887		1486	2852		1433	2747		1433	2783	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1433	2887		1486	2852		1433	2747		1433	2783	
Volume (vph)	43	395	117	83	327	47	76	396	80	53	609	65
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	48	439	130	92	363	52	84	440	89	59	677	72
Lane Group Flow (vph)	48	569	0	92	415	0	84	529	0	59	749	0
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	3.6	27.7		9.1	33.2		7.2	32.8		6.4	32.0	
Effective Green, g (s)	5.6	29.7		11.1	35.2		9.2	34.8		8.4	34.0	
Actuated g/C Ratio	0.06	0.30		0.11	0.35		0.09	0.35		0.08	0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	80	857		165	1004		132	956		120	946	
v/s Ratio Prot	0.03	c0.20		c0.06	0.15		c0.06	0.19		0.04	c0.27	
v/s Ratio Perm												
v/c Ratio	0.60	0.66		0.56	0.41		0.64	0.55		0.49	0.79	
Uniform Delay, d1	46.1	30.8		42.1	24.6		43.8	26.3		43.8	29.8	
Progression Factor	1.00	1.00		0.67	0.40		0.51	0.26		0.51	0.32	
Incremental Delay, d2	11.5	4.0		3.3	1.0		4.9	0.3		2.2	3.3	
Delay (s)	57.7	34.8		31.6	10.8		27.4	7.2		24.7	12.8	
Level of Service	E	C		C	B		C	A		C	B	
Approach Delay (s)		36.6			14.6			10.0			13.7	
Approach LOS		D			B			A			B	

Intersection Summary

HCM Average Control Delay	18.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	9	10	9	10	11	12	12	12	10	10	10
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98			0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1420	2783		1429	2888			1637		1480	1551	
Flt Permitted	0.28	1.00		0.45	1.00			0.71		0.52	1.00	
Satd. Flow (perm)	425	2783		678	2888			1175		815	1551	
Volume (vph)	5	305	65	60	513	85	78	213	22	53	422	23
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	339	72	67	570	94	87	237	24	59	469	26
Lane Group Flow (vph)	6	411	0	67	664	0	0	348	0	59	495	0
Confl. Peds. (#/hr)	11		3	3		11	5		5	5		5
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	36.0	36.0		36.0	36.0			52.0		52.0	52.0	
Effective Green, g (s)	38.0	38.0		38.0	38.0			54.0		54.0	54.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38			0.54		0.54	0.54	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lane Grp Cap (vph)	162	1058		258	1097			635		440	838	
v/s Ratio Prot		0.15			c0.23						c0.32	
v/s Ratio Perm	0.01			0.10				0.30		0.07		
v/c Ratio	0.04	0.39		0.26	0.61			0.55		0.13	0.59	
Uniform Delay, d1	19.5	22.5		21.3	25.0			15.0		11.4	15.5	
Progression Factor	0.29	0.27		1.00	1.00			0.63		1.00	1.00	
Incremental Delay, d2	0.4	0.9		2.4	2.5			1.1		0.6	3.0	
Delay (s)	6.1	7.0		23.8	27.4			10.6		12.0	18.6	
Level of Service	A	A		C	C			B		B	B	
Approach Delay (s)		7.0			27.1			10.6			17.9	
Approach LOS		A			C			B			B	

Intersection Summary

HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	D

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	14	14	15	15	9	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.89		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1699	1520	1645		1433	1676
Flt Permitted	0.95	1.00	1.00		0.33	1.00
Satd. Flow (perm)	1699	1520	1645		495	1676
Volume (vph)	66	57	128	506	123	72
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	73	63	142	562	137	80
Lane Group Flow (vph)	73	63	704	0	137	80
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	4.0	10.0	67.0		79.0	79.0
Effective Green, g (s)	6.0	14.0	69.0		81.0	81.0
Actuated g/C Ratio	0.06	0.15	0.73		0.85	0.85
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	107	288	1195		501	1429
v/s Ratio Prot	c0.04	0.02	c0.43		c0.02	0.05
v/s Ratio Perm		0.02			0.21	
v/c Ratio	0.68	0.22	0.59		0.27	0.06
Uniform Delay, d1	43.6	35.7	6.2		4.9	1.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	16.5	0.4	2.1		0.3	0.1
Delay (s)	60.0	36.1	8.4		5.2	1.2
Level of Service	E	D	A		A	A
Approach Delay (s)	48.9		8.4			3.7
Approach LOS	D		A			A

Intersection Summary

HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0							
Lane Util. Factor		1.00		0.97	1.00							
Frpb, ped/bikes		0.98		1.00	1.00							
Flpb, ped/bikes		1.00		1.00	1.00							
Frt		0.93		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		1540		2987	1676							
Flt Permitted		1.00		0.95	1.00							
Satd. Flow (perm)		1540		2987	1676							
Volume (vph)	0	185	174	919	163	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	206	193	1021	181	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	399	0	1021	181	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			13	13								
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Actuated Green, G (s)		40.0		48.0	100.0							
Effective Green, g (s)		42.0		50.0	100.0							
Actuated g/C Ratio		0.42		0.50	1.00							
Clearance Time (s)		6.0		6.0	6.0							
Lane Grp Cap (vph)		647		1494	1676							
v/s Ratio Prot		c0.26		c0.34	0.11							
v/s Ratio Perm												
v/c Ratio		0.62		0.68	0.11							
Uniform Delay, d1		22.7		19.0	0.0							
Progression Factor		1.00		0.98	1.00							
Incremental Delay, d2		4.4		1.2	0.1							
Delay (s)		27.1		19.7	0.1							
Level of Service		C		B	A							
Approach Delay (s)		27.1			16.8			0.0			0.0	
Approach LOS		C			B			A			A	

Intersection Summary

HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.8%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	11	12	12	12	12	12	10	10	10	11	11	12
Total Lost time (s)	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	0.95		1.00		0.88
Frt	1.00	1.00			0.96		1.00	0.98		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1540	1676			1611		1486	2915		1540		2508
Flt Permitted	0.22	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	350	1676			1611		1486	2915		1540		2508
Volume (vph)	36	172	0	0	195	80	228	582	87	137	0	831
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	191	0	0	217	89	253	647	97	152	0	923
Lane Group Flow (vph)	40	191	0	0	306	0	253	744	0	152	0	923
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Actuated Green, G (s)	17.9	17.9			17.9		27.1	27.1		37.0		37.0
Effective Green, g (s)	19.9	19.9			19.9		29.1	29.1		39.0		39.0
Actuated g/C Ratio	0.20	0.20			0.20		0.29	0.29		0.39		0.39
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	70	334			321		432	848		601		978
v/s Ratio Prot		0.11			c0.19		0.17	c0.26		0.10		c0.37
v/s Ratio Perm	0.11											
v/c Ratio	0.57	0.57			0.95		0.59	0.88		0.25		0.94
Uniform Delay, d1	36.2	36.2			39.6		30.3	33.8		20.6		29.4
Progression Factor	0.99	1.00			0.83		0.42	0.45		0.49		0.44
Incremental Delay, d2	9.4	2.0			7.1		4.9	10.8		0.2		14.2
Delay (s)	45.1	38.3			40.1		17.6	26.0		10.4		27.2
Level of Service	D	D			D		B	C		B		C
Approach Delay (s)		39.4			40.1			23.9			24.8	
Approach LOS		D			D			C			C	

Intersection Summary

HCM Average Control Delay	27.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.2%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	9	11	11	10	10	10	10	12	12
Total Lost time (s)		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	
Frt		0.97		1.00	0.93		1.00	0.95		1.00	0.97	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620		1433	1506		1486	1484		1486	1626	
Flt Permitted		0.29		0.47	1.00		0.29	1.00		0.52	1.00	
Satd. Flow (perm)		476		704	1506		450	1484		819	1626	
Volume (vph)	32	186	58	106	341	305	41	177	94	487	434	110
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	36	207	64	118	379	339	46	197	104	541	482	122
Lane Group Flow (vph)	0	307	0	118	718	0	46	301	0	541	604	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		35.0		35.0	35.0		53.0	53.0		53.0	53.0	
Effective Green, g (s)		37.0		37.0	37.0		55.0	55.0		55.0	55.0	
Actuated g/C Ratio		0.37		0.37	0.37		0.55	0.55		0.55	0.55	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		176		260	557		248	816		450	894	
v/s Ratio Prot					0.48			0.20			0.37	
v/s Ratio Perm		c0.64		0.17			0.10			c0.66		
v/c Ratio		1.74		0.45	1.29		0.19	0.37		1.20	0.68	
Uniform Delay, d1		31.5		23.8	31.5		11.3	12.7		22.5	16.1	
Progression Factor		0.71		0.85	0.89		0.72	0.81		0.78	0.83	
Incremental Delay, d2		354.5		1.2	142.5		1.6	1.3		110.1	4.0	
Delay (s)		376.8		21.4	170.6		9.8	11.6		127.7	17.4	
Level of Service		F		C	F		A	B		F	B	
Approach Delay (s)		376.8			149.5			11.4			69.5	
Approach LOS		F			F			B			E	

Intersection Summary

HCM Average Control Delay	123.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.42		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	129.0%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		0.96		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1451		1593	1676						3144	
Flt Permitted		1.00		0.32	1.00						0.99	
Satd. Flow (perm)		1451		532	1676						3144	
Volume (vph)	0	295	116	205	78	0	0	0	0	270	877	12
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	328	129	228	87	0	0	0	0	300	974	13
Lane Group Flow (vph)	0	457	0	228	87	0	0	0	0	0	1287	0
Parking (#/hr)		0										
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		40.6		40.6	40.6						47.4	
Effective Green, g (s)		42.6		42.6	42.6						49.4	
Actuated g/C Ratio		0.43		0.43	0.43						0.49	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		618		227	714						1553	
v/s Ratio Prot		0.31			0.05							
v/s Ratio Perm				c0.43							0.41	
v/c Ratio		0.74		1.00	0.12						0.83	
Uniform Delay, d1		24.1		28.7	17.4						21.7	
Progression Factor		1.00		0.89	0.51						0.40	
Incremental Delay, d2		4.6		55.1	0.1						4.1	
Delay (s)		28.7		80.6	8.9						12.8	
Level of Service		C		F	A						B	
Approach Delay (s)		28.7			60.8			0.0			12.8	
Approach LOS		C			E			A			B	

Intersection Summary

HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	14	12	12	13	13	12	11	11	11	11	11
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.99			1.00	1.00		0.99				
Satd. Flow (prot)		1771			1646	1399		4394				
Flt Permitted		0.99			1.00	1.00		0.99				
Satd. Flow (perm)		1771			1646	1399		4394				
Volume (vph)	78	332	0	0	225	229	99	616	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	87	369	0	0	250	254	110	684	0	0	0	0
Lane Group Flow (vph)	0	456	0	0	250	254	0	794	0	0	0	0
Turn Type	Split					Perm	Perm					
Protected Phases	1	1			3			2				
Permitted Phases						3	2					
Actuated Green, G (s)		31.0			19.3	19.3		31.7				
Effective Green, g (s)		33.0			21.3	21.3		33.7				
Actuated g/C Ratio		0.33			0.21	0.21		0.34				
Clearance Time (s)		6.0			6.0	6.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		584			351	298		1481				
v/s Ratio Prot		c0.26			0.15							
v/s Ratio Perm						0.18		0.18				
v/c Ratio		0.78			0.71	0.85		0.54				
Uniform Delay, d1		30.2			36.5	37.8		26.8				
Progression Factor		0.80			1.05	2.07		0.79				
Incremental Delay, d2		4.5			5.7	17.7		1.3				
Delay (s)		28.6			43.9	96.2		22.4				
Level of Service		C			D	F		C				
Approach Delay (s)		28.6			70.3			22.4			0.0	
Approach LOS		C			E			C			A	

Intersection Summary

HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	12	12	11	11	11	11
Total Lost time (s)	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
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.35	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	587	1676	1621	1378	1540	1378
Volume (vph)	108	390	521	26	94	294
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	433	579	29	104	327
Lane Group Flow (vph)	120	433	579	29	104	327
Turn Type	D.P+P			Perm		pt+ov
Protected Phases	1	1 2	2		3	3 1
Permitted Phases	2			2		
Actuated Green, G (s)	69.6	75.6	60.9	60.9	12.4	27.1
Effective Green, g (s)	73.6	77.6	62.9	62.9	14.4	29.1
Actuated g/C Ratio	0.74	0.78	0.63	0.63	0.14	0.29
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	540	1301	1020	867	222	401
v/s Ratio Prot	0.02	0.26	c0.36		0.07	c0.24
v/s Ratio Perm	0.14			0.02		
v/c Ratio	0.22	0.33	0.57	0.03	0.47	0.82
Uniform Delay, d1	9.5	3.4	10.7	7.0	39.3	33.0
Progression Factor	2.06	2.02	0.40	0.05	0.96	1.06
Incremental Delay, d2	0.2	0.1	1.9	0.1	1.1	8.4
Delay (s)	19.8	7.0	6.2	0.4	38.8	43.4
Level of Service	B	A	A	A	D	D
Approach Delay (s)		9.8	6.0		42.2	
Approach LOS		A	A		D	

Intersection Summary

HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.0%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	14	12	12	14	11	16	12	12	15	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1711	3391		1770	1863	1689	1711	2084			1910	
Flt Permitted	0.16	1.00		0.60	1.00	1.00	0.24	1.00			0.92	
Satd. Flow (perm)	294	3391		1115	1863	1689	437	2084			1775	
Volume (vph)	32	137	53	488	488	452	314	202	19	27	87	96
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	36	152	59	542	542	502	349	224	21	30	97	107
Lane Group Flow (vph)	36	211	0	542	542	502	349	245	0	0	234	0
Turn Type	Perm			pm+pt		Perm	pm+pt			Perm		
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	22.5	22.5		49.5	49.5	49.5	38.5	38.5			13.8	
Effective Green, g (s)	24.5	24.5		51.5	51.5	51.5	40.5	40.5			15.8	
Actuated g/C Ratio	0.24	0.24		0.52	0.52	0.52	0.40	0.40			0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	72	831		725	959	870	441	844			280	
v/s Ratio Prot		0.06		c0.17	0.29		c0.16	0.12				
v/s Ratio Perm	0.12			c0.21		0.30	c0.16				0.13	
v/c Ratio	0.50	0.25		0.75	0.57	0.58	0.79	0.29			0.84	
Uniform Delay, d1	32.5	30.4		19.9	16.6	16.7	23.9	20.1			40.8	
Progression Factor	0.63	0.54		1.00	1.00	1.00	0.70	0.61			1.00	
Incremental Delay, d2	22.0	0.7		4.2	2.4	2.8	0.9	0.0			18.9	
Delay (s)	42.4	17.2		24.2	19.0	19.5	17.6	12.3			59.8	
Level of Service	D	B		C	B	B	B	B			E	
Approach Delay (s)		20.8			20.9			15.4			59.8	
Approach LOS		C			C			B			E	

Intersection Summary

HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.1%	ICU Level of Service	D

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.95		1.00		0.88		0.95	1.00			
Frt	1.00	1.00		1.00		0.85		1.00	0.85			
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539		1770		2787		3539	1583			
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539		1770		2787		3539	1583			
Volume (vph)	103	543	0	96	0	270	0	704	200	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	114	603	0	107	0	300	0	782	222	0	0	0
Lane Group Flow (vph)	114	603	0	107	0	300	0	782	222	0	0	0
Turn Type	Split			custom		custom			pm+ov			
Protected Phases	1	1		3				2	3			
Permitted Phases				3		3			2			
Actuated Green, G (s)	21.2	21.2		12.0		12.0		48.8	60.8			
Effective Green, g (s)	23.2	23.2		14.0		14.0		50.8	64.8			
Actuated g/C Ratio	0.23	0.23		0.14		0.14		0.51	0.65			
Clearance Time (s)	6.0	6.0		6.0		6.0		6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0			
Lane Grp Cap (vph)	411	821		248		390		1798	1089			
v/s Ratio Prot	0.06	c0.17		0.06				c0.22	0.03			
v/s Ratio Perm						0.11			0.11			
v/c Ratio	0.28	0.73		0.43		0.77		0.43	0.20			
Uniform Delay, d1	31.5	35.5		39.4		41.4		15.5	7.1			
Progression Factor	0.95	0.92		0.88		0.50		0.62	0.69			
Incremental Delay, d2	0.2	1.9		1.2		8.8		0.7	0.1			
Delay (s)	30.3	34.5		35.9		29.4		10.4	5.0			
Level of Service	C	C		D		C		B	A			
Approach Delay (s)		33.8			31.1			9.2			0.0	
Approach LOS		C			C			A			A	

Intersection Summary

HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						3.0	3.0
Lane Util. Factor		0.95			0.95						0.95	1.00
Frpb, ped/bikes		0.92			1.00						1.00	0.95
Flpb, ped/bikes		1.00			0.98						1.00	1.00
Frt		0.95			1.00						1.00	0.85
Flt Protected		1.00			0.98						0.97	1.00
Satd. Flow (prot)		3099			3389						3434	1506
Flt Permitted		1.00			0.56						0.97	1.00
Satd. Flow (perm)		3099			1926						3434	1506
Volume (vph)	0	592	299	136	174	0	0	0	0	87	56	84
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	658	332	151	193	0	0	0	0	97	62	93
Lane Group Flow (vph)	0	990	0	0	344	0	0	0	0	0	159	93
Confl. Peds. (#/hr)	30		120	120		30				100		20
Turn Type				pm+pt						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases				6								4
Actuated Green, G (s)		78.3			78.3						9.7	9.7
Effective Green, g (s)		81.3			81.3						12.7	12.7
Actuated g/C Ratio		0.81			0.81						0.13	0.13
Clearance Time (s)		6.0			6.0						6.0	6.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		2519			1566						436	191
v/s Ratio Prot		c0.32									0.05	
v/s Ratio Perm					0.18							0.06
v/c Ratio		0.39			0.22						0.36	0.49
Uniform Delay, d1		2.6			2.1						40.0	40.6
Progression Factor		0.83			0.78						1.00	1.00
Incremental Delay, d2		0.4			0.1						0.5	2.0
Delay (s)		2.6			1.7						40.5	42.6
Level of Service		A			A						D	D
Approach Delay (s)		2.6			1.7			0.0			41.2	
Approach LOS		A			A			A			D	

Intersection Summary

HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.97			1.00	0.97		0.98	
Flpb, ped/bikes	0.89	1.00		0.96	1.00			0.95	1.00		0.98	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		0.98	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	
Satd. Flow (prot)	1463	3198		1584	3180			1576	1440		1583	
Flt Permitted	0.50	1.00		0.40	1.00			0.75	1.00		0.75	
Satd. Flow (perm)	772	3198		660	3180			1226	1440		1223	
Volume (vph)	22	463	33	120	363	24	87	14	309	33	7	9
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	24	514	37	133	403	27	97	16	343	37	8	10
Lane Group Flow (vph)	24	551	0	133	430	0	0	113	343	0	55	0
Confl. Peds. (#/hr)	140		100	100		140	40		20	20		40
Turn Type	pm+pt			pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	61.2	58.8		75.5	67.1			12.5	23.2		12.5	
Effective Green, g (s)	67.2	61.8		78.5	70.1			15.5	29.2		15.5	
Actuated g/C Ratio	0.67	0.62		0.78	0.70			0.16	0.29		0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	556	1976		645	2229			190	464		190	
v/s Ratio Prot	0.00	c0.17		0.03	0.14				c0.10			
v/s Ratio Perm	0.03			0.13				0.09	0.14		0.04	
v/c Ratio	0.04	0.28		0.21	0.19			0.59	0.74		0.29	
Uniform Delay, d1	5.5	8.8		2.9	5.2			39.3	32.0		37.4	
Progression Factor	0.44	0.41		0.47	0.50			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.3		0.2	0.2			4.9	6.1		0.8	
Delay (s)	2.4	4.0		1.5	2.8			44.3	38.0		38.2	
Level of Service	A	A		A	A			D	D		D	
Approach Delay (s)		3.9			2.5			39.6			38.2	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1652	3327		1652	3353		1652	1842		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.70	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1652	3327		1652	3353		1221	1842		1343	1863	1583
Volume (vph)	88	294	67	4	546	84	46	46	4	13	76	311
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	98	327	74	4	607	93	51	51	4	14	84	346
Lane Group Flow (vph)	98	401	0	4	700	0	51	55	0	14	84	346
Turn Type	Prot			Prot			Perm			pm+pt		Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	9.6	63.4		1.3	55.1		10.2	10.2		17.3	17.3	17.3
Effective Green, g (s)	11.6	65.4		3.3	57.1		12.2	12.2		19.3	19.3	19.3
Actuated g/C Ratio	0.12	0.65		0.03	0.57		0.12	0.12		0.19	0.19	0.19
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	192	2176		55	1915		149	225		272	360	306
v/s Ratio Prot	c0.06	0.12		0.00	c0.21			0.03		0.00	0.05	
v/s Ratio Perm							0.04			0.01		0.22
v/c Ratio	0.51	0.18		0.07	0.37		0.34	0.24		0.05	0.23	1.13
Uniform Delay, d1	41.5	6.8		46.9	11.6		40.2	39.7		32.9	34.1	40.4
Progression Factor	0.92	0.93		1.00	1.00		1.00	1.00		0.74	0.81	0.84
Incremental Delay, d2	2.2	0.2		0.6	0.5		1.4	0.6		0.1	0.3	87.1
Delay (s)	40.4	6.5		47.4	12.2		41.6	40.3		24.5	27.8	120.9
Level of Service	D	A		D	B		D	D		C	C	F
Approach Delay (s)		13.2			12.4			40.9			100.3	
Approach LOS		B			B			D			F	

Intersection Summary

HCM Average Control Delay	36.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.5%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Total Lost time (s)		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	
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785			1746	1554	1796	1891	1714	1676	1760	
Flt Permitted		0.87			0.73	1.00	0.60	1.00	1.00	0.28	1.00	
Satd. Flow (perm)		1588			1330	1554	1141	1891	1714	494	1760	
Volume (vph)	7	5	3	88	6	109	12	596	445	137	222	4
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	8	6	3	98	7	121	13	662	494	152	247	4
Lane Group Flow (vph)	0	17	0	0	105	121	13	662	494	152	251	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		12.9			12.9	12.9	60.9	60.9	60.9	75.1	75.1	
Effective Green, g (s)		14.9			14.9	14.9	62.9	62.9	62.9	77.1	77.1	
Actuated g/C Ratio		0.15			0.15	0.15	0.63	0.63	0.63	0.77	0.77	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		237			198	232	718	1189	1078	501	1357	
v/s Ratio Prot								c0.35		c0.03	0.14	
v/s Ratio Perm		0.01			c0.08	0.08	0.01		0.29	0.20		
v/c Ratio		0.07			0.53	0.52	0.02	0.56	0.46	0.30	0.18	
Uniform Delay, d1		36.6			39.3	39.3	7.0	10.6	9.7	5.8	3.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	1.81	0.78	
Incremental Delay, d2		0.1			2.7	2.1	0.0	1.9	1.4	0.3	0.3	
Delay (s)		36.7			42.0	41.4	7.0	12.5	11.1	10.9	2.7	
Level of Service		D			D	D	A	B	B	B	A	
Approach Delay (s)		36.7			41.7			11.8			5.8	
Approach LOS		D			D			B			A	

Intersection Summary

HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	493	27	21	153	0	25	0	46	35	29	104
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	548	30	23	170	0	28	0	51	39	32	116
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
vC, conflicting volume	170			578			911	779	563	831	794	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			86	100	90	85	90	87
cM capacity (veh/h)	1407			996			200	319	526	256	313	874

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	578	193	79	71	116
Volume Left	0	23	28	39	0
Volume Right	30	0	51	0	116
cSH	1700	996	334	279	874
Volume to Capacity	0.34	0.02	0.24	0.25	0.13
Queue Length (ft)	0	2	23	25	11
Control Delay (s)	0.0	1.2	19.1	22.2	9.7
Lane LOS		A	C	C	A
Approach Delay (s)	0.0	1.2	19.1	14.5	
Approach LOS			C	B	

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (veh/h)	463	193	26	83	130	70
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	514	214	29	92	144	78

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	729	29	92	222
Volume Left (vph)	0	29	0	144
Volume Right (vph)	214	0	0	78
Hadj (s)	-0.1	0.2	0.0	0.0
Departure Headway (s)	4.7	6.5	6.3	5.8
Degree Utilization, x	0.95	0.05	0.16	0.36
Capacity (veh/h)	757	419	439	597
Control Delay (s)	43.2	8.7	9.3	12.1
Approach Delay (s)	43.2	9.2		12.1
Approach LOS	E	A		B

Intersection Summary			
Delay	32.9		
HCM Level of Service	D		
Intersection Capacity Utilization	59.6%	ICU Level of Service	A

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary

Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	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	0.0%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	3038	852	158	0	6
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	3376	947	176	0	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	1122				2722	561
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	618				17	471

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1688	1688	631	491	7
Volume Left	0	0	0	0	0
Volume Right	0	0	0	176	7
cSH	1700	1700	1700	1700	471
Volume to Capacity	0.99	0.99	0.37	0.29	0.01
Queue Length (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	12.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.8
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	96.6%	ICU Level of Service	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			-4%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	3519	3627		1770	3539	1583	3502	1900	1615		1709	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.99	
Satd. Flow (perm)	3519	3627		1770	3539	1583	3502	1900	1615		1709	
Volume (vph)	427	2608	4	12	968	902	256	6	29	13	10	24
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	474	2898	4	13	1076	1002	284	7	32	14	11	27
Lane Group Flow (vph)	474	2902	0	13	1076	1002	284	7	32	0	52	0
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		
Protected Phases	5	2		1	6	4	4	4	5	8	8	
Permitted Phases						6			4			
Actuated Green, G (s)	22.3	99.0		3.1	79.8	87.8	8.0	8.0	30.3		5.9	
Effective Green, g (s)	24.3	101.0		5.1	81.8	91.8	10.0	10.0	34.3		7.9	
Actuated g/C Ratio	0.17	0.72		0.04	0.58	0.66	0.07	0.07	0.24		0.06	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	611	2617		64	2068	1083	250	136	396		96	
v/s Ratio Prot	c0.13	c0.80		0.01	0.30	c0.07	0.08	0.00	0.01		c0.03	
v/s Ratio Perm						0.57			0.01			
v/c Ratio	0.78	1.11		0.20	0.52	0.93	1.14	0.05	0.08		0.54	
Uniform Delay, d1	55.2	19.5		65.5	17.4	21.1	65.0	60.6	40.7		64.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.1	55.2		1.6	0.9	12.9	98.5	0.2	0.1		6.1	
Delay (s)	61.4	74.7		67.0	18.3	34.0	163.5	60.7	40.8		70.4	
Level of Service	E	E		E	B	C	F	E	D		E	
Approach Delay (s)		72.8			26.2			149.2			70.4	
Approach LOS		E			C			F			E	

Intersection Summary

HCM Average Control Delay	60.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	108.4%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	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	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	0.96		1.00	0.96		1.00	1.00	0.74
Flpb, ped/bikes	0.93	1.00		0.89	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1338	1544		1321	1439		1433	2807		1433	2867	1017
Flt Permitted	0.41	1.00		0.44	1.00		0.95	1.00		0.15	1.00	1.00
Satd. Flow (perm)	584	1544		606	1439		1433	2807		224	2867	1017
Volume (vph)	267	268	64	87	265	88	40	778	72	59	562	270
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	297	298	71	97	294	98	44	864	80	66	624	300
Lane Group Flow (vph)	297	369	0	97	392	0	44	944	0	66	624	300
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Perm			Perm			Prot			Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	46.0	46.0		46.0	46.0		4.0	42.0		32.0	32.0	32.0
Effective Green, g (s)	48.0	48.0		48.0	48.0		6.0	44.0		34.0	34.0	34.0
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.06	0.44		0.34	0.34	0.34
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	280	741		291	691		86	1235		76	975	346
v/s Ratio Prot		0.24			0.27		0.03	c0.34			0.22	
v/s Ratio Perm	c0.51			0.16						0.29		0.30
v/c Ratio	1.06	0.50		0.33	0.57		0.51	0.76		0.87	0.64	0.87
Uniform Delay, d1	26.0	17.8		16.1	18.6		45.6	23.6		30.9	27.8	30.9
Progression Factor	1.00	1.00		1.00	1.00		0.48	0.12		1.00	1.00	1.00
Incremental Delay, d2	70.7	2.4		3.1	3.4		2.0	0.4		71.1	3.2	24.2
Delay (s)	96.7	20.2		19.2	21.9		23.6	3.2		102.0	31.1	55.1
Level of Service	F	C		B	C		C	A		F	C	E
Approach Delay (s)		54.3			21.4			4.1			43.1	
Approach LOS		D			C			A			D	

Intersection Summary

HCM Average Control Delay	29.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	1433	3161		1486	2949		1433	2913		1433	2826	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1433	3161		1486	2949		1433	2913		1433	2826	
Volume (vph)	355	897	49	51	752	43	204	771	119	167	828	87
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	394	997	54	57	836	48	227	857	132	186	920	97
Lane Group Flow (vph)	394	1051	0	57	884	0	227	989	0	186	1017	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.2	37.8		3.2	21.8		10.0	27.0		8.0	25.0	
Effective Green, g (s)	21.2	39.8		5.2	23.8		12.0	29.0		10.0	27.0	
Actuated g/C Ratio	0.21	0.40		0.05	0.24		0.12	0.29		0.10	0.27	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	304	1258		77	702		172	845		143	763	
v/s Ratio Prot	c0.27	0.33		0.04	c0.30		c0.16	0.34		0.13	c0.36	
v/s Ratio Perm												
v/c Ratio	1.30	0.84		0.74	1.26		1.32	1.17		1.30	1.33	
Uniform Delay, d1	39.4	27.1		46.7	38.1		44.0	35.5		45.0	36.5	
Progression Factor	1.00	1.00		0.72	0.73		0.78	0.56		0.80	0.66	
Incremental Delay, d2	155.4	6.7		25.1	125.6		155.1	80.6		174.9	158.2	
Delay (s)	194.8	33.8		58.8	153.4		189.2	100.4		210.7	182.4	
Level of Service	F	C		E	F		F	F		F	F	
Approach Delay (s)		77.7			147.7			117.0			186.8	
Approach LOS		E			F			F			F	

Intersection Summary

HCM Average Control Delay	128.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	110.6%	ICU Level of Service	G

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	9	10	9	10	11	12	12	12	10	10	10
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.98	1.00			1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.97			0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1418	2724		1407	2858			1630		1473	1540	
Flt Permitted	0.22	1.00		0.21	1.00			0.64		0.45	1.00	
Satd. Flow (perm)	331	2724		312	2858			1049		696	1540	
Volume (vph)	28	658	143	66	647	130	103	266	30	121	360	32
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	31	731	159	73	719	144	114	296	33	134	400	36
Lane Group Flow (vph)	31	890	0	73	863	0	0	443	0	134	436	0
Confl. Peds. (#/hr)	21		66	66		21	15		15	15		15
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	43.0	43.0		43.0	43.0			45.0		45.0	45.0	
Effective Green, g (s)	45.0	45.0		45.0	45.0			47.0		47.0	47.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.47		0.47	0.47	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lane Grp Cap (vph)	149	1226		140	1286			493		327	724	
v/s Ratio Prot		c0.33			0.30						0.28	
v/s Ratio Perm	0.09			0.23				c0.42		0.19		
v/c Ratio	0.21	0.73		0.52	0.67			0.90		0.41	0.60	
Uniform Delay, d1	16.7	22.5		19.8	21.7			24.3		17.4	19.6	
Progression Factor	0.39	0.32		1.00	1.00			0.73		1.00	1.00	
Incremental Delay, d2	1.2	1.5		13.2	2.8			2.7		3.8	3.7	
Delay (s)	7.8	8.7		33.0	24.5			20.6		21.2	23.3	
Level of Service	A	A		C	C			C		C	C	
Approach Delay (s)		8.6			25.1			20.6			22.8	
Approach LOS		A			C			C			C	

Intersection Summary

HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.4%	ICU Level of Service	E

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	14	14	15	15	9	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.91		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1699	1520	1670		1433	1676
Flt Permitted	0.95	1.00	1.00		0.34	1.00
Satd. Flow (perm)	1699	1520	1670		518	1676
Volume (vph)	435	174	123	285	118	246
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	483	193	137	317	131	273
Lane Group Flow (vph)	483	193	454	0	131	273
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	26.8	31.8	45.2		56.2	56.2
Effective Green, g (s)	28.8	35.8	47.2		58.2	58.2
Actuated g/C Ratio	0.30	0.38	0.50		0.61	0.61
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	515	637	830		385	1027
v/s Ratio Prot	c0.28	c0.02	c0.27		0.03	0.16
v/s Ratio Perm		0.10			0.18	
v/c Ratio	0.94	0.30	0.55		0.34	0.27
Uniform Delay, d1	32.2	20.8	16.5		9.5	8.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	24.8	0.3	2.6		0.5	0.6
Delay (s)	57.0	21.1	19.1		10.0	9.1
Level of Service	E	C	B		B	A
Approach Delay (s)	46.8		19.1			9.4
Approach LOS	D		B			A

Intersection Summary

HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0							
Lane Util. Factor		1.00		0.97	1.00							
Frpb, ped/bikes		0.98		1.00	1.00							
Flpb, ped/bikes		1.00		1.00	1.00							
Frt		0.93		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		1529		2987	1676							
Flt Permitted		1.00		0.95	1.00							
Satd. Flow (perm)		1529		2987	1676							
Volume (vph)	0	208	228	791	454	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	231	253	879	504	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	484	0	879	504	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			13	13								
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Actuated Green, G (s)		45.0		43.0	100.0							
Effective Green, g (s)		47.0		45.0	100.0							
Actuated g/C Ratio		0.47		0.45	1.00							
Clearance Time (s)		6.0		6.0	6.0							
Lane Grp Cap (vph)		719		1344	1676							
v/s Ratio Prot		c0.32		c0.29	0.30							
v/s Ratio Perm												
v/c Ratio		0.67		0.65	0.30							
Uniform Delay, d1		20.5		21.4	0.0							
Progression Factor		1.00		0.80	1.00							
Incremental Delay, d2		5.0		0.2	0.0							
Delay (s)		25.5		17.4	0.0							
Level of Service		C		B	A							
Approach Delay (s)		25.5			11.1			0.0			0.0	
Approach LOS		C			B			A			A	

Intersection Summary

HCM Average Control Delay	14.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	11	12	12	12	12	12	10	10	10	11	11	12
Total Lost time (s)	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	0.95		1.00		0.88
Frt	1.00	1.00			0.97		1.00	0.99		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1540	1676			1622		1486	2941		1540		2508
Flt Permitted	0.17	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	270	1676			1622		1486	2941		1540		2508
Volume (vph)	60	191	0	0	284	91	478	886	69	183	0	696
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	67	212	0	0	316	101	531	984	77	203	0	773
Lane Group Flow (vph)	67	212	0	0	417	0	531	1061	0	203	0	773
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Actuated Green, G (s)	22.0	22.0			22.0		33.0	33.0		27.0		27.0
Effective Green, g (s)	24.0	24.0			24.0		35.0	35.0		29.0		29.0
Actuated g/C Ratio	0.24	0.24			0.24		0.35	0.35		0.29		0.29
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	65	402			389		520	1029		447		727
v/s Ratio Prot		0.13			c0.26		0.36	c0.36		0.13		c0.31
v/s Ratio Perm	0.25											
v/c Ratio	1.03	0.53			1.07		1.02	1.03		0.45		1.06
Uniform Delay, d1	38.0	33.1			38.0		32.5	32.5		29.0		35.5
Progression Factor	0.71	0.72			0.83		0.57	0.57		0.12		0.12
Incremental Delay, d2	112.2	1.1			37.7		35.3	29.6		0.1		31.8
Delay (s)	139.0	24.7			69.3		53.6	48.2		3.6		36.1
Level of Service	F	C			E		D	D		A		D
Approach Delay (s)		52.2			69.3			50.0			29.3	
Approach LOS		D			E			D			C	

Intersection Summary

HCM Average Control Delay	46.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	9	11	11	10	10	10	10	12	12
Total Lost time (s)		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	
Frt		0.97		1.00	0.91		1.00	0.93		1.00	0.97	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1624		1433	1480		1486	1463		1486	1618	
Flt Permitted		0.15		0.22	1.00		0.32	1.00		0.36	1.00	
Satd. Flow (perm)		251		325	1480		494	1463		557	1618	
Volume (vph)	52	336	94	88	265	365	100	290	223	322	438	132
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	58	373	104	98	294	406	111	322	248	358	487	147
Lane Group Flow (vph)	0	535	0	98	700	0	111	570	0	358	634	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		27.0		27.0	27.0		61.0	61.0		61.0	61.0	
Effective Green, g (s)		29.0		29.0	29.0		63.0	63.0		63.0	63.0	
Actuated g/C Ratio		0.29		0.29	0.29		0.63	0.63		0.63	0.63	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		73		94	429		311	922		351	1019	
v/s Ratio Prot					0.47			0.39			0.39	
v/s Ratio Perm		c2.13		0.30			0.22			c0.64		
v/c Ratio		7.33		1.04	1.63		0.36	0.62		1.02	0.62	
Uniform Delay, d1		35.5		35.5	35.5		8.8	11.2		18.5	11.3	
Progression Factor		1.20		0.88	0.88		0.36	0.38		0.75	0.73	
Incremental Delay, d2		2872.3		84.0	290.7		2.8	2.8		51.6	2.7	
Delay (s)		2914.9		115.3	321.8		6.0	7.0		65.5	10.9	
Level of Service		F		F	F		A	A		E	B	
Approach Delay (s)		2914.9			296.4			6.9			30.6	
Approach LOS		F			F			A			C	

Intersection Summary

HCM Average Control Delay	609.1	HCM Level of Service	F
HCM Volume to Capacity ratio	3.02		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	148.3%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		0.97		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1471		1593	1676						3128	
Flt Permitted		1.00		0.58	1.00						0.99	
Satd. Flow (perm)		1471		977	1676						3128	
Volume (vph)	0	164	38	400	229	0	0	0	0	310	717	24
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	182	42	444	254	0	0	0	0	344	797	27
Lane Group Flow (vph)	0	224	0	444	254	0	0	0	0	0	1168	0
Parking (#/hr)		0										
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		49.0		49.0	49.0						39.0	
Effective Green, g (s)		51.0		51.0	51.0						41.0	
Actuated g/C Ratio		0.51		0.51	0.51						0.41	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		750		498	855						1282	
v/s Ratio Prot		0.15			0.15							
v/s Ratio Perm				c0.45							0.37	
v/c Ratio		0.30		0.89	0.30						0.91	
Uniform Delay, d1		14.2		22.0	14.1						27.8	
Progression Factor		1.00		0.73	0.66						0.55	
Incremental Delay, d2		0.2		12.2	0.1						9.1	
Delay (s)		14.4		28.3	9.5						24.2	
Level of Service		B		C	A						C	
Approach Delay (s)		14.4			21.5			0.0			24.2	
Approach LOS		B			C			A			C	

Intersection Summary

HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	14	12	12	13	13	12	11	11	11	11	11
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.98			1.00	1.00		0.99				
Satd. Flow (prot)		1760			1646	1399		4393				
Flt Permitted		0.98			1.00	1.00		0.99				
Satd. Flow (perm)		1760			1646	1399		4393				
Volume (vph)	148	318	0	0	397	414	131	808	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	164	353	0	0	441	460	146	898	0	0	0	0
Lane Group Flow (vph)	0	517	0	0	441	460	0	1044	0	0	0	0
Turn Type	Split					Perm	Perm					
Protected Phases	1	1			3			2				
Permitted Phases						3	2					
Actuated Green, G (s)		29.5			26.8	26.8		25.7				
Effective Green, g (s)		31.5			28.8	28.8		27.7				
Actuated g/C Ratio		0.32			0.29	0.29		0.28				
Clearance Time (s)		6.0			6.0	6.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		554			474	403		1217				
v/s Ratio Prot		c0.29			0.27							
v/s Ratio Perm						0.33		0.24				
v/c Ratio		0.93			0.93	1.14		0.86				
Uniform Delay, d1		33.2			34.6	35.6		34.3				
Progression Factor		0.74			1.12	1.29		0.81				
Incremental Delay, d2		17.8			19.7	83.2		7.2				
Delay (s)		42.6			58.5	129.2		34.9				
Level of Service		D			E	F		C				
Approach Delay (s)		42.6			94.6			34.9			0.0	
Approach LOS		D			F			C			A	

Intersection Summary

HCM Average Control Delay	58.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	99.5%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	12	12	11	11	11	11
Total Lost time (s)	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
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.24	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	411	1676	1621	1378	1540	1378
Volume (vph)	372	587	560	61	192	371
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	413	652	622	68	213	412
Lane Group Flow (vph)	413	652	622	68	213	412
Turn Type	D.P+P			Perm		pt+ov
Protected Phases	1	1 2	2		3	3 1
Permitted Phases	2			2		
Actuated Green, G (s)	66.8	72.8	49.0	49.0	15.2	39.0
Effective Green, g (s)	70.8	74.8	51.0	51.0	17.2	41.0
Actuated g/C Ratio	0.71	0.75	0.51	0.51	0.17	0.41
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	525	1254	827	703	265	565
v/s Ratio Prot	c0.16	0.39	0.38		0.14	c0.30
v/s Ratio Perm	c0.40			0.05		
v/c Ratio	0.79	0.52	0.75	0.10	0.80	0.73
Uniform Delay, d1	22.1	5.2	19.5	12.6	39.8	24.8
Progression Factor	0.75	0.54	0.27	0.00	0.92	0.91
Incremental Delay, d2	7.4	0.4	4.3	0.2	1.7	0.4
Delay (s)	24.0	3.1	9.6	0.2	38.3	22.9
Level of Service	C	A	A	A	D	C
Approach Delay (s)		11.2	8.7		28.2	
Approach LOS		B	A		C	

Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	14	12	12	14	11	16	12	12	15	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97			0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1711	3493		1770	1863	1689	1711	2044			1894	
Flt Permitted	0.22	1.00		0.18	1.00	1.00	0.14	1.00			0.97	
Satd. Flow (perm)	400	3493		339	1863	1689	250	2044			1836	
Volume (vph)	64	531	50	169	442	457	553	133	36	39	226	309
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	71	590	56	188	491	508	614	148	40	43	251	343
Lane Group Flow (vph)	71	646	0	188	491	508	614	188	0	0	637	0
Turn Type	Perm			pm+pt		Perm	pm+pt			Perm		
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	16.0	16.0		27.0	27.0	27.0	61.0	61.0			28.0	
Effective Green, g (s)	18.0	18.0		29.0	29.0	29.0	63.0	63.0			30.0	
Actuated g/C Ratio	0.18	0.18		0.29	0.29	0.29	0.63	0.63			0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	72	629		198	540	490	581	1288			551	
v/s Ratio Prot		0.18		0.07	0.26		c0.31	0.09				
v/s Ratio Perm	0.18			0.21		0.30	0.36				c0.35	
v/c Ratio	0.99	1.03		0.95	0.91	1.04	1.06	0.15			1.16	
Uniform Delay, d1	40.9	41.0		32.6	34.2	35.5	27.7	7.5			35.0	
Progression Factor	0.87	0.89		1.00	1.00	1.00	0.96	0.96			1.00	
Incremental Delay, d2	92.8	39.7		49.0	21.8	50.5	30.0	0.0			89.3	
Delay (s)	128.4	76.2		81.6	56.0	86.0	56.6	7.3			124.3	
Level of Service	F	E		F	E	F	E	A			F	
Approach Delay (s)		81.4			72.9			45.0			124.3	
Approach LOS		F			E			D			F	

Intersection Summary

HCM Average Control Delay	77.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.8%	ICU Level of Service	G

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.95		1.00		0.88		0.95	1.00			
Frt	1.00	1.00		1.00		0.85		1.00	0.85			
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539		1770		2787		3539	1583			
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539		1770		2787		3539	1583			
Volume (vph)	136	279	0	299	0	509	0	643	95	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	151	310	0	332	0	566	0	714	106	0	0	0
Lane Group Flow (vph)	151	310	0	332	0	566	0	714	106	0	0	0
Turn Type	Split			custom		custom			pm+ov			
Protected Phases	1	1		3				2	3			
Permitted Phases				3		3			2			
Actuated Green, G (s)	14.4	14.4		28.6		28.6		39.0	67.6			
Effective Green, g (s)	16.4	16.4		30.6		30.6		41.0	71.6			
Actuated g/C Ratio	0.16	0.16		0.31		0.31		0.41	0.72			
Clearance Time (s)	6.0	6.0		6.0		6.0		6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0			
Lane Grp Cap (vph)	290	580		542		853		1451	1197			
v/s Ratio Prot	0.09	c0.09		0.19				c0.20	0.03			
v/s Ratio Perm						0.20			0.04			
v/c Ratio	0.52	0.53		0.61		0.66		0.49	0.09			
Uniform Delay, d1	38.2	38.3		29.6		30.2		21.8	4.3			
Progression Factor	0.63	0.80		0.93		0.87		0.75	0.96			
Incremental Delay, d2	0.8	0.4		2.0		1.9		1.2	0.0			
Delay (s)	24.9	31.1		29.6		28.3		17.5	4.2			
Level of Service	C	C		C		C		B	A			
Approach Delay (s)		29.1			28.8			15.8			0.0	
Approach LOS		C			C			B			A	

Intersection Summary

HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						3.0	3.0
Lane Util. Factor		0.95			0.95						0.95	1.00
Frpb, ped/bikes		0.96			1.00						1.00	0.95
Flpb, ped/bikes		1.00			0.99						1.00	1.00
Frt		0.97			1.00						1.00	0.85
Flt Protected		1.00			1.00						0.97	1.00
Satd. Flow (prot)		3307			3475						3420	1506
Flt Permitted		1.00			0.87						0.97	1.00
Satd. Flow (perm)		3307			3048						3420	1506
Volume (vph)	0	268	57	61	564	0	0	0	0	123	54	154
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	298	63	68	627	0	0	0	0	137	60	171
Lane Group Flow (vph)	0	361	0	0	695	0	0	0	0	0	197	171
Confl. Peds. (#/hr)	30		120	120		30				100		20
Turn Type				pm+pt						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases				6								4
Actuated Green, G (s)		77.3			77.3						10.7	10.7
Effective Green, g (s)		80.3			80.3						13.7	13.7
Actuated g/C Ratio		0.80			0.80						0.14	0.14
Clearance Time (s)		6.0			6.0						6.0	6.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		2656			2448						469	206
v/s Ratio Prot		0.11									0.06	
v/s Ratio Perm					c0.23							0.11
v/c Ratio		0.14			0.28						0.42	0.83
Uniform Delay, d1		2.2			2.5						39.5	42.0
Progression Factor		1.11			1.11						1.00	1.00
Incremental Delay, d2		0.1			0.1						0.6	23.7
Delay (s)		2.5			2.9						40.1	65.7
Level of Service		A			A						D	E
Approach Delay (s)		2.5			2.9			0.0			52.0	
Approach LOS		A			A			A			D	

Intersection Summary

HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00	0.97		0.96	
Flpb, ped/bikes	0.94	1.00		0.92	1.00			0.95	1.00		0.99	
Frt	1.00	0.99		1.00	0.99			1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.98	
Satd. Flow (prot)	1546	3239		1512	3208			1571	1429		1517	
Flt Permitted	0.40	1.00		0.52	1.00			0.68	1.00		0.82	
Satd. Flow (perm)	650	3239		820	3208			1112	1429		1271	
Volume (vph)	12	272	12	106	568	29	167	13	360	32	8	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	302	13	118	631	32	186	14	400	36	9	39
Lane Group Flow (vph)	13	315	0	118	663	0	0	200	400	0	84	0
Confl. Peds. (#/hr)	140		100	100		140	40		20	20		40
Turn Type	pm+pt			pm+pt			Perm		pm+ov	Perm		
Protected Phases	5	2		1	6			8	1		4	
Permitted Phases	2			6			8		8	4		
Actuated Green, G (s)	52.7	51.4		66.3	59.0			21.7	30.6		21.7	
Effective Green, g (s)	58.7	54.4		69.3	62.0			24.7	36.6		24.7	
Actuated g/C Ratio	0.59	0.54		0.69	0.62			0.25	0.37		0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	420	1762		651	1989			275	566		314	
v/s Ratio Prot	0.00	0.10		0.02	c0.21				c0.08			
v/s Ratio Perm	0.02			0.10				c0.18	0.20		0.07	
v/c Ratio	0.03	0.18		0.18	0.33			0.73	0.71		0.27	
Uniform Delay, d1	8.6	11.5		5.2	9.1			34.6	27.1		30.4	
Progression Factor	0.51	0.69		0.67	0.72			1.00	1.00		1.00	
Incremental Delay, d2	0.0	0.2		0.1	0.4			9.2	4.0		0.5	
Delay (s)	4.4	8.2		3.6	7.0			43.8	31.1		30.8	
Level of Service	A	A		A	A			D	C		C	
Approach Delay (s)		8.1			6.5			35.3			30.8	
Approach LOS		A			A			D			C	

Intersection Summary

HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.93		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1652	3363		1652	3168		1652	1772		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.73	1.00		0.40	1.00	1.00
Satd. Flow (perm)	1652	3363		1652	3168		1263	1772		741	1863	1583
Volume (vph)	164	823	105	1	185	181	130	139	67	134	42	130
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	182	914	117	1	206	201	144	154	74	149	47	144
Lane Group Flow (vph)	182	1031	0	1	407	0	144	228	0	149	47	144
Turn Type	Prot			Prot			Perm			pm+pt		Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	15.1	50.6		1.2	36.7		16.2	16.2		30.2	30.2	30.2
Effective Green, g (s)	17.1	52.6		3.2	38.7		18.2	18.2		32.2	32.2	32.2
Actuated g/C Ratio	0.17	0.53		0.03	0.39		0.18	0.18		0.32	0.32	0.32
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	282	1769		53	1226		230	323		342	600	510
v/s Ratio Prot	c0.11	c0.31		0.00	0.13			c0.13		c0.04	0.03	
v/s Ratio Perm							0.11			0.10		0.09
v/c Ratio	0.65	0.58		0.02	0.33		0.63	0.71		0.44	0.08	0.28
Uniform Delay, d1	38.6	16.2		46.9	21.6		37.8	38.4		32.9	23.6	25.3
Progression Factor	0.97	0.68		1.00	1.00		1.00	1.00		0.88	0.96	0.97
Incremental Delay, d2	4.9	1.4		0.1	0.7		5.2	6.9		0.7	0.0	0.2
Delay (s)	42.4	12.4		47.0	22.3		43.0	45.3		29.6	22.6	24.7
Level of Service	D	B		D	C		D	D		C	C	C
Approach Delay (s)		16.9			22.3			44.4			26.6	
Approach LOS		B			C			D			C	

Intersection Summary

HCM Average Control Delay	23.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Total Lost time (s)		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	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1755			1743	1554	1796	1891	1714	1676	1762	
Flt Permitted		0.92			0.72	1.00	0.20	1.00	1.00	0.38	1.00	
Satd. Flow (perm)		1641			1315	1554	370	1891	1714	666	1762	
Volume (vph)	4	5	5	368	9	164	3	353	76	85	714	6
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	6	6	409	10	182	3	392	84	94	793	7
Lane Group Flow (vph)	0	16	0	0	419	182	3	392	84	94	800	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		33.7			33.7	33.7	45.1	45.1	45.1	54.3	54.3	
Effective Green, g (s)		35.7			35.7	35.7	47.1	47.1	47.1	56.3	56.3	
Actuated g/C Ratio		0.36			0.36	0.36	0.47	0.47	0.47	0.56	0.56	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		586			469	555	174	891	807	427	992	
v/s Ratio Prot								0.21		0.01	c0.45	
v/s Ratio Perm		0.01			c0.32	0.12	0.01		0.05	0.11		
v/c Ratio		0.03			0.89	0.33	0.02	0.44	0.10	0.22	0.81	
Uniform Delay, d1		20.9			30.4	23.4	14.1	17.6	14.7	11.3	17.5	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.68	0.56	
Incremental Delay, d2		0.0			19.0	0.3	0.2	1.6	0.3	0.3	6.9	
Delay (s)		20.9			49.3	23.8	14.3	19.2	15.0	7.9	16.7	
Level of Service		C			D	C	B	B	B	A	B	
Approach Delay (s)		20.9			41.6			18.4			15.8	
Approach LOS		C			D			B			B	

Intersection Summary

HCM Average Control Delay	24.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	227	9	3	284	0	18	0	17	60	7	164
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	252	10	3	316	0	20	0	19	67	8	182
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
vC, conflicting volume	316			262			766	579	257	598	584	316
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			92	100	98	83	98	75
cM capacity (veh/h)	1245			1302			236	425	781	403	422	725

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	262	319	39	74	182
Volume Left	0	3	20	67	0
Volume Right	10	0	19	0	182
cSH	1700	1302	357	405	725
Volume to Capacity	0.15	0.00	0.11	0.18	0.25
Queue Length (ft)	0	0	9	17	25
Control Delay (s)	0.0	0.1	16.3	15.9	11.6
Lane LOS		A	C	C	B
Approach Delay (s)	0.0	0.1	16.3	12.9	
Approach LOS			C	B	

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	41.4%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (veh/h)	318	107	26	83	232	35
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	353	119	29	92	258	39

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	472	29	92	297
Volume Left (vph)	0	29	0	258
Volume Right (vph)	119	0	0	39
Hadj (s)	-0.1	0.2	0.0	0.1
Departure Headway (s)	4.9	6.4	6.2	5.5
Degree Utilization, x	0.64	0.05	0.16	0.45
Capacity (veh/h)	712	430	446	612
Control Delay (s)	16.3	8.6	9.2	13.0
Approach Delay (s)	16.3	9.1		13.0
Approach LOS	C	A		B

Intersection Summary			
Delay	14.2		
HCM Level of Service	B		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary

Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	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	0.0%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1582	2735	47	0	28
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	1758	3039	52	0	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	3091				3944	1546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	70
cM capacity (veh/h)	104				2	103

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	879	879	2026	1065	31
Volume Left	0	0	0	0	0
Volume Right	0	0	0	52	31
cSH	1700	1700	1700	1700	103
Volume to Capacity	0.52	0.52	1.19	0.63	0.30
Queue Length (ft)	0	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	0.0	54.1
Lane LOS					F
Approach Delay (s)	0.0		0.0		54.1
Approach LOS					F

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	95.7%	ICU Level of Service	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1582	2735	47	0	28
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	1758	3039	52	0	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	3091				3944	1546
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	70
cM capacity (veh/h)	104				2	103

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	879	879	2026	1065	31
Volume Left	0	0	0	0	0
Volume Right	0	0	0	52	31
cSH	1700	1700	1700	1700	103
Volume to Capacity	0.52	0.52	1.19	0.63	0.30
Queue Length (ft)	0	0	0	0	29
Control Delay (s)	0.0	0.0	0.0	0.0	54.1
Lane LOS					F
Approach Delay (s)	0.0		0.0		54.1
Approach LOS					F

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	95.7%	ICU Level of Service	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			-4%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	3519	3627		1770	3539	1583	3502	1900	1615		1787	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	3519	3627		1770	3539	1583	3502	1900	1615		1787	
Volume (vph)	97	1482	2	10	2352	209	1058	13	421	8	4	1
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	108	1647	2	11	2613	232	1176	14	468	9	4	1
Lane Group Flow (vph)	108	1649	0	11	2613	232	1176	14	468	0	14	0
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		
Protected Phases	5	2		1	6	4	4	4	5	8	8	
Permitted Phases						6			4			
Actuated Green, G (s)	5.0	76.1		2.8	73.9	106.0	32.1	32.1	37.1		2.9	
Effective Green, g (s)	7.0	78.1		4.8	75.9	110.0	34.1	34.1	41.1		4.9	
Actuated g/C Ratio	0.05	0.57		0.03	0.55	0.80	0.25	0.25	0.30		0.04	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	179	2054		62	1948	1309	866	470	481		63	
v/s Ratio Prot	0.03	0.45		0.01	c0.74	0.04	c0.34	0.01	c0.05		c0.01	
v/s Ratio Perm						0.10			0.24			
v/c Ratio	0.60	0.80		0.18	1.34	0.18	1.36	0.03	0.97		0.22	
Uniform Delay, d1	64.1	23.8		64.6	31.0	3.3	51.9	39.4	47.9		64.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	5.6	2.4		1.4	157.2	0.1	168.6	0.0	33.9		1.8	
Delay (s)	69.7	26.1		66.0	188.2	3.4	220.5	39.4	81.7		66.4	
Level of Service	E	C		E	F	A	F	D	F		E	
Approach Delay (s)		28.8			172.7			179.8			66.4	
Approach LOS		C			F			F			E	

Intersection Summary

HCM Average Control Delay	134.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.27		
Actuated Cycle Length (s)	137.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	125.8%	ICU Level of Service	H

c Critical Lane Group

2010 NO-BUILD

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	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	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	0.90		1.00	1.00	0.74
Flpb, ped/bikes	0.88	1.00		0.86	1.00		1.00	1.00		0.80	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1265	1598		1272	1503		1433	2600		1146	2867	1017
Flt Permitted	0.59	1.00		0.51	1.00		0.95	1.00		0.39	1.00	1.00
Satd. Flow (perm)	785	1598		676	1503		1433	2600		471	2867	1017
Volume (vph)	211	219	28	16	156	22	33	388	93	81	759	217
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	234	243	31	18	173	24	37	431	103	90	843	241
Lane Group Flow (vph)	234	274	0	18	197	0	37	534	0	90	843	241
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Perm			Perm			Prot			Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	41.0	41.0		41.0	41.0		4.0	47.0		37.0	37.0	37.0
Effective Green, g (s)	43.0	43.0		43.0	43.0		6.0	49.0		39.0	39.0	39.0
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.06	0.49		0.39	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	338	687		291	646		86	1274		184	1118	397
v/s Ratio Prot		0.17			0.13		0.03	c0.21			c0.29	
v/s Ratio Perm	c0.30			0.03						0.19		0.24
v/c Ratio	0.69	0.40		0.06	0.30		0.43	0.42		0.49	0.75	0.61
Uniform Delay, d1	23.1	19.6		16.7	18.7		45.4	16.4		23.0	26.4	24.4
Progression Factor	1.00	1.00		1.00	1.00		0.52	0.26		1.00	1.00	1.00
Incremental Delay, d2	11.1	1.7		0.4	1.2		12.8	0.9		9.0	4.7	6.7
Delay (s)	34.2	21.3		17.1	19.9		36.5	5.1		32.0	31.1	31.1
Level of Service	C	C		B	B		D	A		C	C	C
Approach Delay (s)		27.3			19.7			7.1			31.2	
Approach LOS		C			B			A			C	

Intersection Summary

HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		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)	1433	3076		1486	2917		1433	2898		1433	2825	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1433	3076		1486	2917		1433	2898		1433	2825	
Volume (vph)	49	448	133	94	371	53	86	449	91	60	691	74
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	498	148	104	412	59	96	499	101	67	768	82
Lane Group Flow (vph)	54	646	0	104	471	0	96	600	0	67	850	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.3	26.1		10.2	30.0		7.2	31.5		8.2	32.5	
Effective Green, g (s)	8.3	28.1		12.2	32.0		9.2	33.5		10.2	34.5	
Actuated g/C Ratio	0.08	0.28		0.12	0.32		0.09	0.34		0.10	0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	119	864		181	933		132	971		146	975	
v/s Ratio Prot	0.04	c0.21		0.07	c0.16		c0.07	0.21		0.05	c0.30	
v/s Ratio Perm												
v/c Ratio	0.45	0.75		0.57	0.50		0.73	0.62		0.46	0.87	
Uniform Delay, d1	43.7	32.7		41.4	27.6		44.2	27.9		42.3	30.7	
Progression Factor	1.00	1.00		0.55	0.38		0.61	0.30		0.70	0.21	
Incremental Delay, d2	2.7	5.9		3.2	1.4		1.8	0.1		1.6	6.2	
Delay (s)	46.4	38.6		26.1	11.8		28.8	8.6		31.2	12.8	
Level of Service	D	D		C	B		C	A		C	B	
Approach Delay (s)		39.2			14.4			11.3			14.1	
Approach LOS		D			B			B			B	

Intersection Summary

HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	9	10	9	10	11	12	12	12	10	10	10
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.94	1.00			1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.98			0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1413	2725		1355	2875			1633		1469	1549	
Flt Permitted	0.25	1.00		0.42	1.00			0.66		0.51	1.00	
Satd. Flow (perm)	364	2725		598	2875			1099		783	1549	
Volume (vph)	5	332	71	65	559	93	85	232	24	58	460	25
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	369	79	72	621	103	94	258	27	64	511	28
Lane Group Flow (vph)	6	448	0	72	724	0	0	379	0	64	539	0
Confl. Peds. (#/hr)	21		66	66		21	15		15	15		15
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	35.0	35.0		35.0	35.0			53.0		53.0	53.0	
Effective Green, g (s)	37.0	37.0		37.0	37.0			55.0		55.0	55.0	
Actuated g/C Ratio	0.37	0.37		0.37	0.37			0.55		0.55	0.55	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lane Grp Cap (vph)	135	1008		221	1064			604		431	852	
v/s Ratio Prot		0.16			c0.25						c0.35	
v/s Ratio Perm	0.02			0.12				0.34		0.08		
v/c Ratio	0.04	0.44		0.33	0.68			0.63		0.15	0.63	
Uniform Delay, d1	20.2	23.8		22.6	26.5			15.5		11.0	15.5	
Progression Factor	0.31	0.29		1.00	1.00			0.75		1.00	1.00	
Incremental Delay, d2	0.5	1.1		3.9	3.5			0.5		0.7	3.6	
Delay (s)	6.7	8.1		26.5	30.0			12.1		11.8	19.1	
Level of Service	A	A		C	C			B		B	B	
Approach Delay (s)		8.1			29.7			12.1			18.3	
Approach LOS		A			C			B			B	

Intersection Summary

HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	94.3%	ICU Level of Service	E

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	14	14	15	15	9	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.89		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1699	1520	1645		1433	1676
Flt Permitted	0.95	1.00	1.00		0.26	1.00
Satd. Flow (perm)	1699	1520	1645		385	1676
Volume (vph)	75	65	145	574	140	82
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	83	72	161	638	156	91
Lane Group Flow (vph)	83	72	799	0	156	91
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	4.0	10.9	66.1		79.0	79.0
Effective Green, g (s)	6.0	14.9	68.1		81.0	81.0
Actuated g/C Ratio	0.06	0.16	0.72		0.85	0.85
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	107	302	1179		426	1429
v/s Ratio Prot	c0.05	0.02	c0.49		c0.03	0.05
v/s Ratio Perm		0.03			0.28	
v/c Ratio	0.78	0.24	0.68		0.37	0.06
Uniform Delay, d1	43.8	35.1	7.4		4.5	1.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	28.9	0.4	3.1		0.5	0.1
Delay (s)	72.7	35.5	10.5		5.1	1.2
Level of Service	E	D	B		A	A
Approach Delay (s)	55.4		10.5			3.6
Approach LOS	E		B			A

Intersection Summary

HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0							
Lane Util. Factor		1.00		0.97	1.00							
Frpb, ped/bikes		0.98		1.00	1.00							
Flpb, ped/bikes		1.00		1.00	1.00							
Frt		0.93		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		1540		2987	1676							
Flt Permitted		1.00		0.95	1.00							
Satd. Flow (perm)		1540		2987	1676							
Volume (vph)	0	210	197	1043	185	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	233	219	1159	206	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	452	0	1159	206	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			13	13								
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Actuated Green, G (s)		40.0		48.0	100.0							
Effective Green, g (s)		42.0		50.0	100.0							
Actuated g/C Ratio		0.42		0.50	1.00							
Clearance Time (s)		6.0		6.0	6.0							
Lane Grp Cap (vph)		647		1494	1676							
v/s Ratio Prot		c0.29		c0.39	0.12							
v/s Ratio Perm												
v/c Ratio		0.70		0.78	0.12							
Uniform Delay, d1		23.8		20.4	0.0							
Progression Factor		1.00		0.64	1.00							
Incremental Delay, d2		6.2		1.1	0.0							
Delay (s)		30.0		14.2	0.0							
Level of Service		C		B	A							
Approach Delay (s)		30.0			12.1			0.0			0.0	
Approach LOS		C			B			A			A	

Intersection Summary

HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	11	12	12	12	12	12	10	10	10	11	11	12
Total Lost time (s)	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	0.95		1.00		0.88
Frt	1.00	1.00			0.96		1.00	0.98		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1540	1676			1611		1486	2915		1540		2508
Flt Permitted	0.20	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	324	1676			1611		1486	2915		1540		2508
Volume (vph)	41	195	0	0	221	91	259	661	99	155	0	943
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	217	0	0	246	101	288	734	110	172	0	1048
Lane Group Flow (vph)	46	217	0	0	347	0	288	844	0	172	0	1048
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Actuated Green, G (s)	18.0	18.0			18.0		26.0	26.0		38.0		38.0
Effective Green, g (s)	20.0	20.0			20.0		28.0	28.0		40.0		40.0
Actuated g/C Ratio	0.20	0.20			0.20		0.28	0.28		0.40		0.40
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	65	335			322		416	816		616		1003
v/s Ratio Prot		0.13			c0.22		0.19	c0.29		0.11		c0.42
v/s Ratio Perm	0.14											
v/c Ratio	0.71	0.65			1.08		0.69	1.03		0.28		1.04
Uniform Delay, d1	37.3	36.8			40.0		32.2	36.0		20.3		30.0
Progression Factor	0.98	0.95			0.85		0.41	0.42		0.50		0.66
Incremental Delay, d2	24.6	3.5			40.9		5.7	33.8		0.2		37.2
Delay (s)	61.4	38.3			75.1		18.9	49.0		10.3		57.1
Level of Service	E	D			E		B	D		B		E
Approach Delay (s)		42.3			75.1			41.3			50.5	
Approach LOS		D			E			D			D	

Intersection Summary

HCM Average Control Delay	49.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.6%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	9	11	11	10	10	10	10	12	12
Total Lost time (s)		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	
Frt		0.97		1.00	0.93		1.00	0.95		1.00	0.97	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620		1433	1506		1486	1483		1486	1626	
Flt Permitted		0.27		0.44	1.00		0.22	1.00		0.49	1.00	
Satd. Flow (perm)		444		662	1506		346	1483		760	1626	
Volume (vph)	36	211	66	120	387	346	47	201	107	553	493	125
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	234	73	133	430	384	52	223	119	614	548	139
Lane Group Flow (vph)	0	347	0	133	814	0	52	342	0	614	687	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		36.0		36.0	36.0		52.0	52.0		52.0	52.0	
Effective Green, g (s)		38.0		38.0	38.0		54.0	54.0		54.0	54.0	
Actuated g/C Ratio		0.38		0.38	0.38		0.54	0.54		0.54	0.54	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		169		252	572		187	801		410	878	
v/s Ratio Prot					0.54			0.23			0.42	
v/s Ratio Perm		c0.78		0.20			0.15			c0.81		
v/c Ratio		2.05		0.53	1.42		0.28	0.43		1.50	0.78	
Uniform Delay, d1		31.0		24.0	31.0		12.4	13.8		23.0	18.3	
Progression Factor		0.88		0.97	0.93		0.72	0.66		0.91	0.90	
Incremental Delay, d2		490.0		1.9	199.9		3.7	1.7		236.1	6.7	
Delay (s)		517.3		25.1	228.6		12.6	10.7		257.1	23.2	
Level of Service		F		C	F		B	B		F	C	
Approach Delay (s)		517.3			200.0			10.9			133.6	
Approach LOS		F			F			B			F	

Intersection Summary

HCM Average Control Delay	183.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.73		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	144.7%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		0.96		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1451		1593	1676						3144	
Flt Permitted		1.00		0.31	1.00						0.99	
Satd. Flow (perm)		1451		522	1676						3144	
Volume (vph)	0	335	132	233	89	0	0	0	0	306	995	14
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	372	147	259	99	0	0	0	0	340	1106	16
Lane Group Flow (vph)	0	519	0	259	99	0	0	0	0	0	1462	0
Parking (#/hr)		0										
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		47.0		47.0	47.0						41.0	
Effective Green, g (s)		49.0		49.0	49.0						43.0	
Actuated g/C Ratio		0.49		0.49	0.49						0.43	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		711		256	821						1352	
v/s Ratio Prot		0.36			0.06							
v/s Ratio Perm				c0.50							0.47	
v/c Ratio		0.73		1.01	0.12						1.08	
Uniform Delay, d1		20.2		25.5	13.8						28.5	
Progression Factor		1.00		1.28	0.83						0.53	
Incremental Delay, d2		3.8		45.0	0.0						46.2	
Delay (s)		24.0		77.7	11.5						61.4	
Level of Service		C		E	B						E	
Approach Delay (s)		24.0			59.4			0.0			61.4	
Approach LOS		C			E			A			E	

Intersection Summary

HCM Average Control Delay	52.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	103.1%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	14	12	12	13	13	12	11	11	11	11	11
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.99			1.00	1.00		0.99				
Satd. Flow (prot)		1771			1646	1399		4394				
Flt Permitted		0.99			1.00	1.00		0.99				
Satd. Flow (perm)		1771			1646	1399		4394				
Volume (vph)	99	422	0	0	286	291	126	782	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	110	469	0	0	318	323	140	869	0	0	0	0
Lane Group Flow (vph)	0	579	0	0	318	323	0	1009	0	0	0	0
Turn Type	Split					Perm	Perm					
Protected Phases	1	1			3			2				
Permitted Phases						3	2					
Actuated Green, G (s)		35.3			20.8	20.8		25.9				
Effective Green, g (s)		37.3			22.8	22.8		27.9				
Actuated g/C Ratio		0.37			0.23	0.23		0.28				
Clearance Time (s)		6.0			6.0	6.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		661			375	319		1226				
v/s Ratio Prot		c0.33			0.19							
v/s Ratio Perm						0.23		0.23				
v/c Ratio		0.88			0.85	1.01		0.82				
Uniform Delay, d1		29.2			36.9	38.6		33.7				
Progression Factor		0.81			1.17	1.74		0.68				
Incremental Delay, d2		5.9			11.9	45.4		5.7				
Delay (s)		29.6			55.1	112.4		28.6				
Level of Service		C			E	F		C				
Approach Delay (s)		29.6			84.0			28.6			0.0	
Approach LOS		C			F			C			A	

Intersection Summary

HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	12	12	11	11	11	11
Total Lost time (s)	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
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.27	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	456	1676	1621	1378	1540	1378
Volume (vph)	132	478	638	32	115	360
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	147	531	709	36	128	400
Lane Group Flow (vph)	147	531	709	36	128	400
Turn Type	D.P+P			Perm		pt+ov
Protected Phases	1	1 2	2		3	3 1
Permitted Phases	2			2		
Actuated Green, G (s)	67.4	73.4	61.4	61.4	14.6	26.6
Effective Green, g (s)	71.4	75.4	63.4	63.4	16.6	28.6
Actuated g/C Ratio	0.71	0.75	0.63	0.63	0.17	0.29
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	417	1264	1028	874	256	394
v/s Ratio Prot	0.03	0.32	c0.44		0.08	c0.29
v/s Ratio Perm	0.22			0.03		
v/c Ratio	0.35	0.42	0.69	0.04	0.50	1.02
Uniform Delay, d1	7.0	4.4	11.9	6.9	37.9	35.7
Progression Factor	0.63	0.22	0.26	0.00	0.99	0.58
Incremental Delay, d2	0.4	0.2	3.2	0.1	0.8	36.1
Delay (s)	4.8	1.2	6.4	0.1	38.3	56.7
Level of Service	A	A	A	A	D	E
Approach Delay (s)		2.0	6.1		52.3	
Approach LOS		A	A		D	

Intersection Summary

HCM Average Control Delay	17.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	14	12	12	14	11	16	12	12	15	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.99			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1711	3391		1770	1863	1689	1711	2084			1910	
Flt Permitted	0.44	1.00		0.46	1.00	1.00	0.20	1.00			0.92	
Satd. Flow (perm)	795	3391		852	1863	1689	368	2084			1767	
Volume (vph)	35	149	58	532	532	493	342	220	21	29	95	105
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	166	64	591	591	548	380	244	23	32	106	117
Lane Group Flow (vph)	39	230	0	591	591	548	380	267	0	0	255	0
Turn Type	Perm			pm+pt		Perm	pm+pt			Perm		
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	17.4	17.4		48.5	48.5	48.5	39.5	39.5			13.6	
Effective Green, g (s)	19.4	19.4		50.5	50.5	50.5	41.5	41.5			15.6	
Actuated g/C Ratio	0.19	0.19		0.50	0.50	0.50	0.42	0.42			0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	154	658		679	941	853	447	865			276	
v/s Ratio Prot		0.07		c0.24	0.32		c0.19	0.13				
v/s Ratio Perm	0.05			c0.20		0.32	c0.17				0.14	
v/c Ratio	0.25	0.35		0.87	0.63	0.64	0.85	0.31			0.92	
Uniform Delay, d1	34.2	34.8		18.7	17.9	18.1	24.3	19.6			41.6	
Progression Factor	0.88	0.88		1.00	1.00	1.00	0.98	0.98			1.00	
Incremental Delay, d2	3.6	1.4		11.7	3.2	3.7	1.5	0.0			34.4	
Delay (s)	33.8	32.1		30.5	21.1	21.8	25.2	19.3			76.0	
Level of Service	C	C		C	C	C	C	B			E	
Approach Delay (s)		32.3			24.5			22.8			76.0	
Approach LOS		C			C			C			E	

Intersection Summary

HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	D

c Critical Lane Group

Movement	SBL2	SBL	SBR	NWL	NWR	NWR2	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.97		1.00		0.88		0.95	1.00			
Frt	1.00	1.00		1.00		0.85		1.00	0.85			
Flt Protected	0.95	0.95		0.95		1.00		1.00	1.00			
Satd. Flow (prot)	1770	3433		1770		2787		3539	1583			
Flt Permitted	0.95	0.95		0.95		1.00		1.00	1.00			
Satd. Flow (perm)	1770	3433		1770		2787		3539	1583			
Volume (vph)	117	616	0	109	0	306	0	799	227	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	130	684	0	121	0	340	0	888	252	0	0	0
Lane Group Flow (vph)	130	684	0	121	0	340	0	888	252	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	1	1		3				2	3			
Permitted Phases						3			2			
Actuated Green, G (s)	24.1	24.1		12.2		12.2		45.7	57.9			
Effective Green, g (s)	26.1	26.1		14.2		14.2		47.7	61.9			
Actuated g/C Ratio	0.26	0.26		0.14		0.14		0.48	0.62			
Clearance Time (s)	6.0	6.0		6.0		6.0		6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0			
Lane Grp Cap (vph)	462	896		251		396		1688	1043			
v/s Ratio Prot	0.07	c0.20		0.07				c0.25	0.03			
v/s Ratio Perm						0.12			0.12			
v/c Ratio	0.28	0.76		0.48		0.86		0.53	0.24			
Uniform Delay, d1	29.5	34.1		39.5		41.9		18.3	8.5			
Progression Factor	0.94	0.93		0.94		0.96		0.60	0.47			
Incremental Delay, d2	0.0	0.4		1.4		16.2		1.1	0.1			
Delay (s)	27.9	32.1		38.4		56.2		12.0	4.1			
Level of Service	C	C		D		E		B	A			
Approach Delay (s)		31.5		51.5				10.3			0.0	
Approach LOS		C		D				B			A	

Intersection Summary

HCM Average Control Delay	25.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						3.0	3.0
Lane Util. Factor		0.95			0.95						1.00	1.00
Frpb, ped/bikes		0.92			0.99						1.00	0.95
Flpb, ped/bikes		1.00			0.99						1.00	1.00
Frt		0.95			0.99						1.00	0.85
Flt Protected		1.00			0.98						0.97	1.00
Satd. Flow (prot)		3068			3358						1802	1506
Flt Permitted		0.90			0.50						0.97	1.00
Satd. Flow (perm)		2776			1720						1802	1506
Volume (vph)	41	699	402	237	317	48	0	0	0	35	17	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	777	447	263	352	53	0	0	0	39	19	39
Lane Group Flow (vph)	0	1270	0	0	668	0	0	0	0	0	58	39
Confl. Peds. (#/hr)	30		120	120		30				100		20
Turn Type	Perm			pm+pt						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases	2			6								4
Actuated Green, G (s)		80.6			80.6						7.4	7.4
Effective Green, g (s)		83.6			83.6						10.4	10.4
Actuated g/C Ratio		0.84			0.84						0.10	0.10
Clearance Time (s)		6.0			6.0						6.0	6.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		2321			1438						187	157
v/s Ratio Prot											c0.03	
v/s Ratio Perm		c0.46			0.39							0.03
v/c Ratio		0.55			0.46						0.31	0.25
Uniform Delay, d1		2.5			2.2						41.5	41.2
Progression Factor		1.32			0.95						1.00	1.00
Incremental Delay, d2		0.9			0.2						0.9	0.8
Delay (s)		4.1			2.3						42.4	42.0
Level of Service		A			A						D	D
Approach Delay (s)		4.1			2.3			0.0			42.3	
Approach LOS		A			A			A			D	

Intersection Summary

HCM Average Control Delay	5.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes	1.00	0.93		1.00	0.81			1.00	0.98			
Flpb, ped/bikes	0.91	1.00		1.00	1.00			0.95	1.00			
Frt	1.00	0.97		1.00	0.94			1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00			
Satd. Flow (prot)	1504	2967		1652	2522			1610	1447			
Flt Permitted	0.45	1.00		0.20	1.00			0.97	1.00			
Satd. Flow (perm)	720	2967		347	2522			1610	1447			
Volume (vph)	209	578	162	447	280	198	143	91	464	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	232	642	180	497	311	220	159	101	516	0	0	0
Lane Group Flow (vph)	232	822	0	497	531	0	0	260	516	0	0	0
Confl. Peds. (#/hr)	140		100	100		140	40		20	20		40
Turn Type	pm+pt			pm+pt			Perm		pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	2			6			8		8			
Actuated Green, G (s)	47.3	38.5		70.1	55.3			17.9	43.5			
Effective Green, g (s)	53.3	41.5		73.1	58.3			20.9	49.5			
Actuated g/C Ratio	0.53	0.42		0.73	0.58			0.21	0.50			
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Grp Cap (vph)	476	1231		627	1470			336	760			
v/s Ratio Prot	0.06	0.28		c0.23	0.21				c0.19			
v/s Ratio Perm	0.20			c0.35				0.16	0.16			
v/c Ratio	0.49	0.67		0.79	0.36			0.77	0.68			
Uniform Delay, d1	12.9	23.7		16.6	11.0			37.3	19.2			
Progression Factor	1.29	0.86		0.82	0.55			1.00	1.00			
Incremental Delay, d2	0.8	2.9		6.4	0.6			10.6	2.4			
Delay (s)	17.4	23.2		20.0	6.7			47.9	21.6			
Level of Service	B	C		B	A			D	C			
Approach Delay (s)		21.9			13.1			30.4			0.0	
Approach LOS		C			B			C			A	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1652	3326		1652	3353		1652	1837		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.67	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1652	3326		1652	3353		1159	1837		1332	1863	1583
Volume (vph)	100	334	76	5	620	95	52	52	5	15	86	353
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	111	371	84	6	689	106	58	58	6	17	96	392
Lane Group Flow (vph)	111	455	0	6	795	0	58	64	0	17	96	392
Turn Type	Prot			Prot			Perm			pm+pt		Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	10.0	62.1		1.6	53.7		10.1	10.1		18.3	18.3	18.3
Effective Green, g (s)	12.0	64.1		3.6	55.7		12.1	12.1		20.3	20.3	20.3
Actuated g/C Ratio	0.12	0.64		0.04	0.56		0.12	0.12		0.20	0.20	0.20
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	198	2132		59	1868		140	222		289	378	321
v/s Ratio Prot	c0.07	0.14		0.00	c0.24			0.03		0.00	0.05	
v/s Ratio Perm							0.05			0.01		0.25
v/c Ratio	0.56	0.21		0.10	0.43		0.41	0.29		0.06	0.25	1.22
Uniform Delay, d1	41.5	7.5		46.6	12.9		40.7	40.0		32.2	33.5	39.8
Progression Factor	0.94	1.26		1.00	1.00		1.00	1.00		0.71	0.81	2.46
Incremental Delay, d2	2.8	0.2		0.8	0.7		2.0	0.7		0.1	0.3	118.7
Delay (s)	41.9	9.6		47.4	13.6		42.7	40.7		23.0	27.3	216.6
Level of Service	D	A		D	B		D	D		C	C	F
Approach Delay (s)		15.9			13.8			41.7			174.1	
Approach LOS		B			B			D			F	

Intersection Summary

HCM Average Control Delay	56.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Total Lost time (s)		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	
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785			1746	1554	1796	1891	1714	1676	1761	
Flt Permitted		0.86			0.73	1.00	0.59	1.00	1.00	0.23	1.00	
Satd. Flow (perm)		1570			1330	1554	1118	1891	1714	413	1761	
Volume (vph)	8	5	3	96	7	119	13	650	485	149	242	4
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	6	3	107	8	132	14	722	539	166	269	4
Lane Group Flow (vph)	0	18	0	0	115	132	14	722	539	166	273	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		13.3			13.3	13.3	59.0	59.0	59.0	74.7	74.7	
Effective Green, g (s)		15.3			15.3	15.3	61.0	61.0	61.0	76.7	76.7	
Actuated g/C Ratio		0.15			0.15	0.15	0.61	0.61	0.61	0.77	0.77	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		240			203	238	682	1154	1046	465	1351	
v/s Ratio Prot								c0.38		c0.04	0.16	
v/s Ratio Perm		0.01			c0.09	0.08	0.01		0.31	0.23		
v/c Ratio		0.08			0.57	0.55	0.02	0.63	0.52	0.36	0.20	
Uniform Delay, d1		36.3			39.3	39.2	7.7	12.3	11.1	7.5	3.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	2.36	1.79	
Incremental Delay, d2		0.1			3.6	2.8	0.1	2.6	1.8	0.5	0.3	
Delay (s)		36.4			42.9	42.0	7.8	14.9	12.9	18.2	6.1	
Level of Service		D			D	D	A	B	B	B	A	
Approach Delay (s)		36.4			42.4			14.0			10.7	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	17.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	537	29	23	167	0	27	0	50	38	32	113
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	597	32	26	186	0	30	0	56	42	36	126
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
vC, conflicting volume	186			629			993	849	613	905	866	186
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			82	100	89	81	87	85
cM capacity (veh/h)	1389			953			170	290	493	224	284	857

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	629	211	86	78	126
Volume Left	0	26	30	42	0
Volume Right	32	0	56	0	126
cSH	1700	953	295	248	857
Volume to Capacity	0.37	0.03	0.29	0.31	0.15
Queue Length (ft)	0	2	29	32	13
Control Delay (s)	0.0	1.3	22.1	26.1	9.9
Lane LOS		A	C	D	A
Approach Delay (s)	0.0	1.3	22.1	16.1	
Approach LOS			C	C	

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (veh/h)	505	210	28	90	142	76
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	561	233	31	100	158	84

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	794	31	100	242
Volume Left (vph)	0	31	0	158
Volume Right (vph)	233	0	0	84
Hadj (s)	-0.1	0.2	0.0	0.0
Departure Headway (s)	4.8	6.7	6.5	6.0
Degree Utilization, x	1.06	0.06	0.18	0.40
Capacity (veh/h)	746	412	435	594
Control Delay (s)	71.3	8.9	9.7	12.9
Approach Delay (s)	71.3	9.5		12.9
Approach LOS	F	A		B

Intersection Summary			
Delay	52.2		
HCM Level of Service	F		
Intersection Capacity Utilization	64.3%	ICU Level of Service	B

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary

Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	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	0.0%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	3448	967	179	0	7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	3831	1074	199	0	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	1273				3089	637
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	98
cM capacity (veh/h)	541				9	420

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1916	1916	716	557	8
Volume Left	0	0	0	0	0
Volume Right	0	0	0	199	8
cSH	1700	1700	1700	1700	420
Volume to Capacity	1.13	1.13	0.42	0.33	0.02
Queue Length (ft)	0	0	0	0	1
Control Delay (s)	0.0	0.0	0.0	0.0	13.7
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.7
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	109.2%	ICU Level of Service	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			-4%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	3519	3627		1770	3539	1583	3502	1900	1615		1710	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.99	
Satd. Flow (perm)	3519	3627		1770	3539	1583	3502	1900	1615		1710	
Volume (vph)	485	2960	5	14	1099	1024	291	7	33	15	11	27
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	539	3289	6	16	1221	1138	323	8	37	17	12	30
Lane Group Flow (vph)	539	3295	0	16	1221	1138	323	8	37	0	59	0
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		
Protected Phases	5	2		1	6	4	4	4	5	8	8	
Permitted Phases						6			4			
Actuated Green, G (s)	22.6	82.7		2.9	63.0	73.1	10.1	10.1	32.7		5.7	
Effective Green, g (s)	24.6	84.7		4.9	65.0	77.1	12.1	12.1	36.7		7.7	
Actuated g/C Ratio	0.20	0.68		0.04	0.52	0.61	0.10	0.10	0.29		0.06	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	690	2450		69	1834	1024	338	183	473		105	
v/s Ratio Prot	c0.15	c0.91		0.01	0.34	c0.11	0.09	0.00	0.02		c0.03	
v/s Ratio Perm						0.61			0.01			
v/c Ratio	0.78	1.34		0.23	0.67	1.11	0.96	0.04	0.08		0.56	
Uniform Delay, d1	47.8	20.4		58.4	22.2	24.2	56.4	51.4	32.1		57.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	5.7	158.0		1.7	0.9	63.9	37.0	0.1	0.1		6.7	
Delay (s)	53.6	178.4		60.1	23.1	88.0	93.4	51.5	32.2		63.9	
Level of Service	D	F		E	C	F	F	D	C		E	
Approach Delay (s)		160.8			54.5			86.3			63.9	
Approach LOS		F			D			F			E	

Intersection Summary

HCM Average Control Delay	117.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	125.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	120.3%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	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	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	0.96		1.00	0.96		1.00	1.00	0.74
Flpb, ped/bikes	0.94	1.00		0.90	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1350	1543		1340	1439		1433	2807		1433	2867	1017
Flt Permitted	0.38	1.00		0.41	1.00		0.95	1.00		0.12	1.00	1.00
Satd. Flow (perm)	543	1543		572	1439		1433	2807		178	2867	1017
Volume (vph)	291	292	70	95	289	96	44	848	78	64	613	294
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	323	324	78	106	321	107	49	942	87	71	681	327
Lane Group Flow (vph)	323	402	0	106	428	0	49	1029	0	71	681	327
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Perm			Perm			Prot			Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	46.0	46.0		46.0	46.0		4.0	42.0		32.0	32.0	32.0
Effective Green, g (s)	48.0	48.0		48.0	48.0		6.0	44.0		34.0	34.0	34.0
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.06	0.44		0.34	0.34	0.34
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	261	741		275	691		86	1235		61	975	346
v/s Ratio Prot		0.26			0.30		0.03	c0.37			0.24	
v/s Ratio Perm	c0.59			0.19						c0.40		0.32
v/c Ratio	1.24	0.54		0.39	0.62		0.57	0.83		1.16	0.70	0.95
Uniform Delay, d1	26.0	18.3		16.6	19.2		45.7	24.8		33.0	28.6	32.1
Progression Factor	1.00	1.00		1.00	1.00		0.52	0.16		1.00	1.00	1.00
Incremental Delay, d2	135.3	2.8		4.0	4.1		2.5	0.6		166.6	4.1	36.3
Delay (s)	161.3	21.1		20.6	23.4		26.2	4.5		199.6	32.7	68.4
Level of Service	F	C		C	C		C	A		F	C	E
Approach Delay (s)		83.6			22.8			5.5			54.5	
Approach LOS		F			C			A			D	

Intersection Summary

HCM Average Control Delay	40.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.7%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	1433	3160		1486	2949		1433	2913		1433	2826	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1433	3160		1486	2949		1433	2913		1433	2826	
Volume (vph)	403	1018	56	58	854	49	232	875	135	190	940	99
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	448	1131	62	64	949	54	258	972	150	211	1044	110
Lane Group Flow (vph)	448	1193	0	64	1003	0	258	1122	0	211	1154	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	19.2	37.8		3.2	21.8		10.0	26.0		9.0	25.0	
Effective Green, g (s)	21.2	39.8		5.2	23.8		12.0	28.0		11.0	27.0	
Actuated g/C Ratio	0.21	0.40		0.05	0.24		0.12	0.28		0.11	0.27	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	304	1258		77	702		172	816		158	763	
v/s Ratio Prot	c0.31	0.38		0.04	c0.34		c0.18	0.39		0.15	c0.41	
v/s Ratio Perm												
v/c Ratio	1.47	0.95		0.83	1.43		1.50	1.38		1.34	1.51	
Uniform Delay, d1	39.4	29.1		47.0	38.1		44.0	36.0		44.5	36.5	
Progression Factor	1.00	1.00		0.76	0.75		0.71	0.48		0.76	0.72	
Incremental Delay, d2	230.2	15.7		40.4	199.1		227.8	169.5		185.3	236.9	
Delay (s)	269.6	44.8		75.9	227.5		259.2	186.9		219.2	263.2	
Level of Service	F	D		E	F		F	F		F	F	
Approach Delay (s)		106.2			218.4			200.4			256.4	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	189.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	123.8%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	9	10	9	10	11	12	12	12	10	10	10
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.97			0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1420	2724		1433	2857			1633		1475	1540	
Flt Permitted	0.20	1.00		0.19	1.00			0.54		0.42	1.00	
Satd. Flow (perm)	305	2724		292	2857			888		648	1540	
Volume (vph)	31	717	156	72	705	142	112	290	33	132	392	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	797	173	80	783	158	124	322	37	147	436	39
Lane Group Flow (vph)	34	970	0	80	941	0	0	483	0	147	475	0
Confl. Peds. (#/hr)	21		66	66		21	15		15	15		15
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	46.0	46.0		46.0	46.0			42.0		42.0	42.0	
Effective Green, g (s)	48.0	48.0		48.0	48.0			44.0		44.0	44.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48			0.44		0.44	0.44	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lane Grp Cap (vph)	146	1308		140	1371			391		285	678	
v/s Ratio Prot		c0.36			0.33						0.31	
v/s Ratio Perm	0.11			0.27				c0.54		0.23		
v/c Ratio	0.23	0.74		0.57	0.69			1.24		0.52	0.70	
Uniform Delay, d1	15.2	21.0		18.6	20.2			28.0		20.3	22.7	
Progression Factor	0.41	0.33		1.00	1.00			0.95		1.00	1.00	
Incremental Delay, d2	0.3	0.4		15.8	2.8			108.0		6.5	5.9	
Delay (s)	6.6	7.3		34.5	23.0			134.6		26.8	28.6	
Level of Service	A	A		C	C			F		C	C	
Approach Delay (s)		7.3			23.9			134.6			28.2	
Approach LOS		A			C			F			C	

Intersection Summary

HCM Average Control Delay	36.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	107.0%	ICU Level of Service	F

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	14	14	15	15	9	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.91		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1699	1520	1671		1433	1676
Flt Permitted	0.95	1.00	1.00		0.29	1.00
Satd. Flow (perm)	1699	1520	1671		445	1676
Volume (vph)	494	197	140	323	134	279
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	549	219	156	359	149	310
Lane Group Flow (vph)	549	219	515	0	149	310
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	28.0	32.0	45.0		55.0	55.0
Effective Green, g (s)	30.0	36.0	47.0		57.0	57.0
Actuated g/C Ratio	0.32	0.38	0.49		0.60	0.60
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	537	640	827		329	1006
v/s Ratio Prot	c0.32	0.02	c0.31		c0.03	0.18
v/s Ratio Perm		0.12			0.24	
v/c Ratio	1.02	0.34	0.62		0.45	0.31
Uniform Delay, d1	32.5	21.1	17.5		10.9	9.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	44.6	0.3	3.5		1.0	0.8
Delay (s)	77.1	21.4	21.0		11.9	10.1
Level of Service	E	C	C		B	B
Approach Delay (s)	61.2		21.0			10.7
Approach LOS	E		C			B

Intersection Summary

HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0							
Lane Util. Factor		1.00		0.97	1.00							
Frpb, ped/bikes		0.98		1.00	1.00							
Flpb, ped/bikes		1.00		1.00	1.00							
Frt		0.93		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		1529		2987	1676							
Flt Permitted		1.00		0.95	1.00							
Satd. Flow (perm)		1529		2987	1676							
Volume (vph)	0	236	259	898	515	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	262	288	998	572	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	550	0	998	572	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			13	13								
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Actuated Green, G (s)		47.0		41.0	100.0							
Effective Green, g (s)		49.0		43.0	100.0							
Actuated g/C Ratio		0.49		0.43	1.00							
Clearance Time (s)		6.0		6.0	6.0							
Lane Grp Cap (vph)		749		1284	1676							
v/s Ratio Prot		c0.36		c0.33	0.34							
v/s Ratio Perm												
v/c Ratio		0.73		0.78	0.34							
Uniform Delay, d1		20.3		24.4	0.0							
Progression Factor		1.00		0.82	1.00							
Incremental Delay, d2		6.3		0.4	0.1							
Delay (s)		26.6		20.4	0.1							
Level of Service		C		C	A							
Approach Delay (s)		26.6			13.0			0.0			0.0	
Approach LOS		C			B			A			A	

Intersection Summary

HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	11	12	12	12	12	12	10	10	10	11	11	12
Total Lost time (s)	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	0.95		1.00		0.88
Frt	1.00	1.00			0.97		1.00	0.99		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1540	1676			1622		1486	2941		1540		2508
Flt Permitted	0.17	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	270	1676			1622		1486	2941		1540		2508
Volume (vph)	68	217	0	0	322	103	543	1006	78	208	0	790
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	241	0	0	358	114	603	1118	87	231	0	878
Lane Group Flow (vph)	76	241	0	0	472	0	603	1205	0	231	0	878
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Actuated Green, G (s)	22.0	22.0			22.0		34.0	34.0		26.0		26.0
Effective Green, g (s)	24.0	24.0			24.0		36.0	36.0		28.0		28.0
Actuated g/C Ratio	0.24	0.24			0.24		0.36	0.36		0.28		0.28
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	65	402			389		535	1059		431		702
v/s Ratio Prot		0.14			c0.29		0.41	c0.41		0.15		c0.35
v/s Ratio Perm	0.28											
v/c Ratio	1.17	0.60			1.21		1.13	1.14		0.54		1.25
Uniform Delay, d1	38.0	33.7			38.0		32.0	32.0		30.5		36.0
Progression Factor	0.69	0.69			1.00		0.45	0.45		0.16		0.25
Incremental Delay, d2	153.4	2.0			98.3		59.8	63.3		0.1		114.0
Delay (s)	179.6	25.2			136.4		74.3	77.8		4.9		122.8
Level of Service	F	C			F		E	E		A		F
Approach Delay (s)		62.2			136.4			76.6			98.3	
Approach LOS		E			F			E			F	

Intersection Summary

HCM Average Control Delay	89.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	109.9%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	9	11	11	10	10	10	10	12	12
Total Lost time (s)		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	
Frt		0.97		1.00	0.91		1.00	0.93		1.00	0.97	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1623		1433	1480		1486	1463		1486	1618	
Flt Permitted		0.32		0.33	1.00		0.12	1.00		0.18	1.00	
Satd. Flow (perm)		515		497	1480		188	1463		281	1618	
Volume (vph)	59	381	107	100	301	414	114	329	253	365	497	150
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	423	119	111	334	460	127	366	281	406	552	167
Lane Group Flow (vph)	0	608	0	111	794	0	127	647	0	406	719	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.0		44.0	44.0		44.0	44.0		44.0	44.0	
Effective Green, g (s)		46.0		46.0	46.0		46.0	46.0		46.0	46.0	
Actuated g/C Ratio		0.46		0.46	0.46		0.46	0.46		0.46	0.46	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		237		229	681		86	673		129	744	
v/s Ratio Prot					0.54			0.44			0.44	
v/s Ratio Perm		c1.18		0.22			0.68			c1.45		
v/c Ratio		2.57		0.48	1.17		1.48	0.96		3.15	0.97	
Uniform Delay, d1		27.0		18.8	27.0		27.0	26.1		27.0	26.2	
Progression Factor		1.33		1.15	1.19		0.48	0.47		0.81	0.80	
Incremental Delay, d2		714.2		0.9	83.6		252.9	21.0		984.8	24.5	
Delay (s)		750.2		22.5	115.8		265.9	33.2		1006.7	45.4	
Level of Service		F		C	F		F	C		F	D	
Approach Delay (s)		750.2			104.4			71.4			392.3	
Approach LOS		F			F			E			F	

Intersection Summary

HCM Average Control Delay	306.9	HCM Level of Service	F
HCM Volume to Capacity ratio	2.85		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	166.4%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		0.97		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1470		1593	1676						3128	
Flt Permitted		1.00		0.55	1.00						0.99	
Satd. Flow (perm)		1470		927	1676						3128	
Volume (vph)	0	186	43	454	260	0	0	0	0	352	814	27
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	207	48	504	289	0	0	0	0	391	904	30
Lane Group Flow (vph)	0	255	0	504	289	0	0	0	0	0	1325	0
Parking (#/hr)		0										
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		49.0		49.0	49.0						39.0	
Effective Green, g (s)		51.0		51.0	51.0						41.0	
Actuated g/C Ratio		0.51		0.51	0.51						0.41	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		750		473	855						1282	
v/s Ratio Prot		0.17			0.17							
v/s Ratio Perm				c0.54							0.42	
v/c Ratio		0.34		1.07	0.34						1.03	
Uniform Delay, d1		14.5		24.5	14.5						29.5	
Progression Factor		1.00		0.84	0.59						0.52	
Incremental Delay, d2		0.3		34.3	0.0						29.5	
Delay (s)		14.8		54.9	8.5						44.9	
Level of Service		B		D	A						D	
Approach Delay (s)		14.8			38.0			0.0			44.9	
Approach LOS		B			D			A			D	

Intersection Summary

HCM Average Control Delay	39.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	97.8%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	14	12	12	13	13	12	11	11	11	11	11
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.98			1.00	1.00		0.99				
Satd. Flow (prot)		1760			1646	1399		4394				
Flt Permitted		0.98			1.00	1.00		0.99				
Satd. Flow (perm)		1760			1646	1399		4394				
Volume (vph)	188	404	0	0	504	526	166	1026	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	209	449	0	0	560	584	184	1140	0	0	0	0
Lane Group Flow (vph)	0	658	0	0	560	584	0	1324	0	0	0	0
Turn Type	Split					Perm	Perm					
Protected Phases	1	1			3			2				
Permitted Phases						3	2					
Actuated Green, G (s)		29.0			27.0	27.0		26.0				
Effective Green, g (s)		31.0			29.0	29.0		28.0				
Actuated g/C Ratio		0.31			0.29	0.29		0.28				
Clearance Time (s)		6.0			6.0	6.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		546			477	406		1230				
v/s Ratio Prot		c0.37			0.34							
v/s Ratio Perm						0.42		0.30				
v/c Ratio		1.21			1.17	1.44		1.08				
Uniform Delay, d1		34.5			35.5	35.5		36.0				
Progression Factor		0.81			1.01	1.03		0.78				
Incremental Delay, d2		104.0			87.7	203.1		47.1				
Delay (s)		132.0			123.5	239.5		75.2				
Level of Service		F			F	F		E				
Approach Delay (s)		132.0			182.7			75.2			0.0	
Approach LOS		F			F			E			A	

Intersection Summary

HCM Average Control Delay	126.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	123.6%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	12	12	11	11	11	11
Total Lost time (s)	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
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	146	1676	1621	1378	1540	1378
Volume (vph)	456	719	686	75	235	454
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	507	799	762	83	261	504
Lane Group Flow (vph)	507	799	762	83	261	504
Turn Type	D.P+P			Perm		pt+ov
Protected Phases	1	1 2	2		3	3 1
Permitted Phases	2			2		
Actuated Green, G (s)	68.0	74.0	44.0	44.0	14.0	44.0
Effective Green, g (s)	72.0	76.0	46.0	46.0	16.0	46.0
Actuated g/C Ratio	0.72	0.76	0.46	0.46	0.16	0.46
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	481	1274	746	634	246	634
v/s Ratio Prot	c0.27	0.48	0.47		c0.17	0.37
v/s Ratio Perm	c0.49			0.06		
v/c Ratio	1.05	0.63	1.02	0.13	1.06	0.79
Uniform Delay, d1	30.6	5.5	27.0	15.5	42.0	23.0
Progression Factor	0.70	1.01	0.32	0.02	0.77	0.90
Incremental Delay, d2	54.5	0.9	34.5	0.3	36.1	0.7
Delay (s)	75.9	6.5	43.1	0.6	68.3	21.5
Level of Service	E	A	D	A	E	C
Approach Delay (s)		33.4	38.9		37.4	
Approach LOS		C	D		D	

Intersection Summary

HCM Average Control Delay	36.1	HCM Level of Service	D
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	101.8%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	14	12	12	14	11	16	12	12	15	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97			0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1711	3493		1770	1863	1689	1711	2044			1894	
Flt Permitted	0.17	1.00		0.15	1.00	1.00	0.12	1.00			0.96	
Satd. Flow (perm)	313	3493		276	1863	1689	218	2044			1829	
Volume (vph)	70	579	55	184	482	498	603	145	39	43	246	337
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	643	61	204	536	553	670	161	43	48	273	374
Lane Group Flow (vph)	78	704	0	204	536	553	670	204	0	0	695	0
Turn Type	Perm			pm+pt		Perm	pm+pt			Perm		
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	21.0	21.0		31.0	31.0	31.0	57.0	57.0			27.0	
Effective Green, g (s)	23.0	23.0		33.0	33.0	33.0	59.0	59.0			29.0	
Actuated g/C Ratio	0.23	0.23		0.33	0.33	0.33	0.59	0.59			0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	72	803		181	615	557	517	1206			530	
v/s Ratio Prot		0.20		0.07	0.29		c0.34	0.10				
v/s Ratio Perm	0.25			c0.30		0.33	c0.43				0.38	
v/c Ratio	1.08	0.88		1.13	0.87	0.99	1.30	0.17			1.31	
Uniform Delay, d1	38.5	37.1		31.0	31.5	33.4	29.5	9.3			35.5	
Progression Factor	1.09	1.09		1.00	1.00	1.00	1.11	1.22			1.00	
Incremental Delay, d2	110.4	9.1		105.2	15.6	36.4	134.5	0.0			153.2	
Delay (s)	152.5	49.6		136.1	47.1	69.8	167.4	11.4			188.7	
Level of Service	F	D		F	D	E	F	B			F	
Approach Delay (s)		59.9			70.9			131.0			188.7	
Approach LOS		E			E			F			F	

Intersection Summary

HCM Average Control Delay	105.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	122.9%	ICU Level of Service	H

c Critical Lane Group

Movement	SBL2	SBL	SBR	NWL	NWR	NWR2	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.97		1.00		0.88		0.95	1.00			
Frt	1.00	1.00		1.00		0.85		1.00	0.85			
Flt Protected	0.95	0.95		0.95		1.00		1.00	1.00			
Satd. Flow (prot)	1770	3433		1770		2787		3539	1583			
Flt Permitted	0.95	0.95		0.95		1.00		1.00	1.00			
Satd. Flow (perm)	1770	3433		1770		2787		3539	1583			
Volume (vph)	154	317	0	339	0	578	0	730	108	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	171	352	0	377	0	642	0	811	120	0	0	0
Lane Group Flow (vph)	171	352	0	377	0	642	0	811	120	0	0	0
Turn Type	Split			Prot		custom			pm+ov			
Protected Phases	1	1		3				2	3			
Permitted Phases						3			2			
Actuated Green, G (s)	14.9	14.9		29.1		29.1		38.0	67.1			
Effective Green, g (s)	16.9	16.9		31.1		31.1		40.0	71.1			
Actuated g/C Ratio	0.17	0.17		0.31		0.31		0.40	0.71			
Clearance Time (s)	6.0	6.0		6.0		6.0		6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0			
Lane Grp Cap (vph)	299	580		550		867		1416	1189			
v/s Ratio Prot	0.10	c0.10		0.21				c0.23	0.03			
v/s Ratio Perm						0.23			0.04			
v/c Ratio	0.57	0.61		0.69		0.74		0.57	0.10			
Uniform Delay, d1	38.2	38.5		30.2		30.8		23.3	4.5			
Progression Factor	0.80	0.87		0.75		0.63		0.72	0.89			
Incremental Delay, d2	0.2	0.2		3.2		3.1		1.6	0.0			
Delay (s)	30.7	33.5		25.8		22.4		18.5	4.0			
Level of Service	C	C		C		C		B	A			
Approach Delay (s)		32.6		23.7				16.7			0.0	
Approach LOS		C		C				B			A	

Intersection Summary

HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						3.0	3.0
Lane Util. Factor		0.95			0.95						1.00	1.00
Frpb, ped/bikes		0.96			0.99						1.00	0.95
Flpb, ped/bikes		1.00			0.99						1.00	1.00
Frt		0.97			0.99						1.00	0.85
Flt Protected		0.99			0.99						0.97	1.00
Satd. Flow (prot)		3267			3429						1802	1506
Flt Permitted		0.77			0.82						0.97	1.00
Satd. Flow (perm)		2526			2832						1802	1506
Volume (vph)	41	282	75	121	885	48	0	0	0	35	17	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	313	83	134	983	53	0	0	0	39	19	39
Lane Group Flow (vph)	0	442	0	0	1170	0	0	0	0	0	58	39
Confl. Peds. (#/hr)	30		120	120		30				100		20
Turn Type	Perm			pm+pt						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases	2			6								4
Actuated Green, G (s)		80.7			80.7						7.3	7.3
Effective Green, g (s)		83.7			83.7						10.3	10.3
Actuated g/C Ratio		0.84			0.84						0.10	0.10
Clearance Time (s)		6.0			6.0						6.0	6.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		2114			2370						186	155
v/s Ratio Prot											c0.03	
v/s Ratio Perm		0.17			c0.41							0.03
v/c Ratio		0.21			0.49						0.31	0.25
Uniform Delay, d1		1.6			2.3						41.6	41.3
Progression Factor		1.17			1.06						1.00	1.00
Incremental Delay, d2		0.2			0.2						1.0	0.9
Delay (s)		2.1			2.5						42.5	42.2
Level of Service		A			A						D	D
Approach Delay (s)		2.1			2.5			0.0			42.4	
Approach LOS		A			A			A			D	

Intersection Summary

HCM Average Control Delay	4.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	65.0%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes	1.00	0.95		1.00	0.89			1.00	0.97			
Flpb, ped/bikes	0.95	1.00		0.97	1.00			0.95	1.00			
Frt	1.00	0.98		1.00	0.96			1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00			
Satd. Flow (prot)	1568	3066		1606	2821			1586	1440			
Flt Permitted	0.36	1.00		0.31	1.00			0.96	1.00			
Satd. Flow (perm)	602	3066		530	2821			1586	1440			
Volume (vph)	97	379	68	171	510	171	265	99	623	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	108	421	76	190	567	190	294	110	692	0	0	0
Lane Group Flow (vph)	108	497	0	190	757	0	0	404	692	0	0	0
Confl. Peds. (#/hr)	140		100	100		140	40		20	20		40
Turn Type	pm+pt			pm+pt			Perm		pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	2			6			8		8			
Actuated Green, G (s)	33.6	28.8		60.1	49.3			27.9	53.2			
Effective Green, g (s)	39.6	31.8		63.1	52.3			30.9	59.2			
Actuated g/C Ratio	0.40	0.32		0.63	0.52			0.31	0.59			
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Grp Cap (vph)	314	975		639	1475			490	896			
v/s Ratio Prot	0.03	0.16		0.08	c0.27				c0.22			
v/s Ratio Perm	0.11			0.10				0.25	0.26			
v/c Ratio	0.34	0.51		0.30	0.51			0.82	0.77			
Uniform Delay, d1	19.6	27.8		8.6	15.6			32.0	15.3			
Progression Factor	0.37	0.61		1.05	0.70			1.00	1.00			
Incremental Delay, d2	0.7	1.9		0.3	1.3			10.8	4.2			
Delay (s)	7.8	18.7		9.3	12.1			42.8	19.5			
Level of Service	A	B		A	B			D	B			
Approach Delay (s)		16.8			11.6			28.1			0.0	
Approach LOS		B			B			C			A	

Intersection Summary

HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	68.2%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.93		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1652	3363		1652	3167		1652	1772		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.72	1.00		0.35	1.00	1.00
Satd. Flow (perm)	1652	3363		1652	3167		1256	1772		660	1863	1583
Volume (vph)	186	934	119	1	210	205	148	158	76	152	48	148
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	207	1038	132	1	233	228	164	176	84	169	53	164
Lane Group Flow (vph)	207	1170	0	1	461	0	164	260	0	169	53	164
Turn Type	Prot			Prot			Perm			pm+pt		Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	16.1	50.9		0.8	35.6		17.5	17.5		30.3	30.3	30.3
Effective Green, g (s)	18.1	52.9		2.8	37.6		19.5	19.5		32.3	32.3	32.3
Actuated g/C Ratio	0.18	0.53		0.03	0.38		0.20	0.20		0.32	0.32	0.32
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	299	1779		46	1191		245	346		311	602	511
v/s Ratio Prot	0.13	c0.35		0.00	c0.15			c0.15		c0.05	0.03	
v/s Ratio Perm							0.13			0.13		0.10
v/c Ratio	0.69	0.66		0.02	0.39		0.67	0.75		0.54	0.09	0.32
Uniform Delay, d1	38.3	17.0		47.3	22.8		37.3	38.0		35.2	23.6	25.6
Progression Factor	0.96	1.16		1.00	1.00		1.00	1.00		0.59	0.51	0.65
Incremental Delay, d2	5.9	1.7		0.2	1.0		6.8	8.9		1.4	0.0	0.3
Delay (s)	42.8	21.4		47.5	23.7		44.0	46.9		22.3	12.0	16.9
Level of Service	D	C		D	C		D	D		C	B	B
Approach Delay (s)		24.6			23.8			45.8			18.6	
Approach LOS		C			C			D			B	

Intersection Summary

HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Total Lost time (s)		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	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1755			1743	1554	1796	1891	1714	1676	1762	
Flt Permitted		0.92			0.72	1.00	0.13	1.00	1.00	0.34	1.00	
Satd. Flow (perm)		1635			1316	1554	237	1891	1714	599	1762	
Volume (vph)	4	5	5	401	10	179	3	385	83	93	778	7
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	6	6	446	11	199	3	428	92	103	864	8
Lane Group Flow (vph)	0	16	0	0	457	199	3	428	92	103	872	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		34.9			34.9	34.9	43.9	43.9	43.9	53.1	53.1	
Effective Green, g (s)		36.9			36.9	36.9	45.9	45.9	45.9	55.1	55.1	
Actuated g/C Ratio		0.37			0.37	0.37	0.46	0.46	0.46	0.55	0.55	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		603			486	573	109	868	787	386	971	
v/s Ratio Prot								0.23		0.01	c0.49	
v/s Ratio Perm		0.01			c0.35	0.13	0.01		0.05	0.13		
v/c Ratio		0.03			0.94	0.35	0.03	0.49	0.12	0.27	0.90	
Uniform Delay, d1		20.1			30.5	22.8	14.8	18.9	15.5	12.3	20.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.79	0.60	
Incremental Delay, d2		0.0			26.5	0.4	0.5	2.0	0.3	0.4	12.6	
Delay (s)		20.1			57.0	23.2	15.3	20.9	15.8	10.1	24.5	
Level of Service		C			E	C	B	C	B	B	C	
Approach Delay (s)		20.1			46.8			20.0			23.0	
Approach LOS		C			D			B			C	

Intersection Summary

HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	247	10	3	310	0	20	0	19	65	8	179
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	274	11	3	344	0	22	0	21	72	9	199
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
vC, conflicting volume	344			286			834	631	280	652	637	344
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			89	100	97	80	98	72
cM capacity (veh/h)	1215			1277			202	397	759	370	394	698

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	286	348	43	81	199
Volume Left	0	3	22	72	0
Volume Right	11	0	21	0	199
cSH	1700	1277	314	372	698
Volume to Capacity	0.17	0.00	0.14	0.22	0.28
Queue Length (ft)	0	0	12	20	29
Control Delay (s)	0.0	0.1	18.3	17.3	12.2
Lane LOS		A	C	C	B
Approach Delay (s)	0.0	0.1	18.3	13.7	
Approach LOS			C	B	

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (veh/h)	347	117	28	90	253	38
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	386	130	31	100	281	42

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	516	31	100	323
Volume Left (vph)	0	31	0	281
Volume Right (vph)	130	0	0	42
Hadj (s)	-0.1	0.2	0.0	0.1
Departure Headway (s)	5.0	6.7	6.5	5.7
Degree Utilization, x	0.72	0.06	0.18	0.51
Capacity (veh/h)	698	419	434	598
Control Delay (s)	19.9	8.9	9.7	14.3
Approach Delay (s)	19.9	9.5		14.3
Approach LOS	C	A		B

Intersection Summary			
Delay	16.6		
HCM Level of Service	C		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	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	0.0%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1796	3104	53	0	32
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	1996	3449	59	0	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	3508				4476	1754
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	52
cM capacity (veh/h)	70				1	74

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	998	998	2299	1209	36
Volume Left	0	0	0	0	0
Volume Right	0	0	0	59	36
cSH	1700	1700	1700	1700	74
Volume to Capacity	0.59	0.59	1.35	0.71	0.48
Queue Length (ft)	0	0	0	0	49
Control Delay (s)	0.0	0.0	0.0	0.0	91.5
Lane LOS					F
Approach Delay (s)	0.0		0.0		91.5
Approach LOS					F

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	107.2%	ICU Level of Service	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			-4%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	3519	3627		1770	3539	1583	3502	1900	1615		1795	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	3519	3627		1770	3539	1583	3502	1900	1615		1795	
Volume (vph)	110	1682	2	11	2670	237	1201	15	478	9	5	1
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	122	1869	2	12	2967	263	1334	17	531	10	6	1
Lane Group Flow (vph)	122	1871	0	12	2967	263	1334	17	531	0	17	0
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		
Protected Phases	5	2		1	6	4	4	4	5	8	8	
Permitted Phases						6			4			
Actuated Green, G (s)	6.0	74.1		2.8	70.9	104.0	33.1	33.1	39.1		3.0	
Effective Green, g (s)	8.0	76.1		4.8	72.9	108.0	35.1	35.1	43.1		5.0	
Actuated g/C Ratio	0.06	0.56		0.04	0.53	0.79	0.26	0.26	0.31		0.04	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	205	2015		62	1883	1294	897	487	508		66	
v/s Ratio Prot	0.03	c0.52		0.01	c0.84	0.05	c0.38	0.01	c0.06		c0.01	
v/s Ratio Perm						0.11			0.27			
v/c Ratio	0.60	0.93		0.19	1.58	0.20	1.49	0.03	1.05		0.26	
Uniform Delay, d1	62.9	28.0		64.2	32.0	3.7	51.0	38.2	46.9		64.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.6	8.1		1.5	261.6	0.1	225.2	0.0	52.3		2.1	
Delay (s)	67.5	36.0		65.7	293.7	3.7	276.1	38.3	99.2		66.3	
Level of Service	E	D		E	F	A	F	D	F		E	
Approach Delay (s)		38.0			269.3			224.1			66.3	
Approach LOS		D			F			F			E	

Intersection Summary

HCM Average Control Delay	192.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.50		
Actuated Cycle Length (s)	137.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	140.2%	ICU Level of Service	H

c Critical Lane Group

2010 BUILD

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	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	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	0.90		1.00	1.00	0.74
Flpb, ped/bikes	0.88	1.00		0.86	1.00		1.00	1.00		0.82	1.00	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1265	1591		1274	1503		1433	2607		1169	2867	1017
Flt Permitted	0.59	1.00		0.50	1.00		0.95	1.00		0.37	1.00	1.00
Satd. Flow (perm)	785	1591		673	1503		1433	2607		452	2867	1017
Volume (vph)	211	219	31	16	156	22	37	417	97	81	798	217
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	234	243	34	18	173	24	41	463	108	90	887	241
Lane Group Flow (vph)	234	277	0	18	197	0	41	571	0	90	887	241
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Perm			Perm			Prot			Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	41.0	41.0		41.0	41.0		4.0	47.0		37.0	37.0	37.0
Effective Green, g (s)	43.0	43.0		43.0	43.0		6.0	49.0		39.0	39.0	39.0
Actuated g/C Ratio	0.43	0.43		0.43	0.43		0.06	0.49		0.39	0.39	0.39
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	338	684		289	646		86	1277		176	1118	397
v/s Ratio Prot		0.17			0.13		0.03	c0.22			c0.31	
v/s Ratio Perm	c0.30			0.03						0.20		0.24
v/c Ratio	0.69	0.40		0.06	0.30		0.48	0.45		0.51	0.79	0.61
Uniform Delay, d1	23.1	19.7		16.7	18.7		45.5	16.7		23.2	26.9	24.4
Progression Factor	1.00	1.00		1.00	1.00		0.71	0.64		1.00	1.00	1.00
Incremental Delay, d2	11.1	1.8		0.4	1.2		15.0	0.9		10.2	5.8	6.7
Delay (s)	34.2	21.4		17.1	19.9		47.1	11.6		33.5	32.8	31.1
Level of Service	C	C		B	B		D	B		C	C	C
Approach Delay (s)		27.3			19.7			14.0			32.5	
Approach LOS		C			B			B			C	

Intersection Summary

HCM Average Control Delay	25.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.97		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)	1433	3072		1486	2917		1433	2898		1433	2827	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1433	3072		1486	2917		1433	2898		1433	2827	
Volume (vph)	49	450	140	99	372	53	95	486	98	61	734	74
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	500	156	110	413	59	106	540	109	68	816	82
Lane Group Flow (vph)	54	656	0	110	472	0	106	649	0	68	898	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.4	24.0		9.2	26.8		9.9	35.6		7.2	32.9	
Effective Green, g (s)	8.4	26.0		11.2	28.8		11.9	37.6		9.2	34.9	
Actuated g/C Ratio	0.08	0.26		0.11	0.29		0.12	0.38		0.09	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	120	799		166	840		171	1090		132	987	
v/s Ratio Prot	0.04	c0.21		c0.07	0.16		c0.07	0.22		0.05	c0.32	
v/s Ratio Perm												
v/c Ratio	0.45	0.82		0.66	0.56		0.62	0.60		0.52	0.91	
Uniform Delay, d1	43.6	34.8		42.6	30.2		41.9	25.1		43.3	31.0	
Progression Factor	1.00	1.00		0.56	0.59		0.58	0.30		0.74	0.21	
Incremental Delay, d2	2.7	9.3		6.9	1.9		0.6	0.1		2.2	8.3	
Delay (s)	46.3	44.1		30.7	19.8		25.1	7.7		34.0	14.7	
Level of Service	D	D		C	B		C	A		C	B	
Approach Delay (s)		44.2			21.9			10.1			16.1	
Approach LOS		D			C			B			B	

Intersection Summary

HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	9	10	9	10	11	12	12	12	10	10	10
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes	0.99	1.00		0.95	1.00			1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.98			0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1414	2725		1357	2875			1636		1469	1550	
Flt Permitted	0.24	1.00		0.41	1.00			0.65		0.51	1.00	
Satd. Flow (perm)	350	2725		583	2875			1070		782	1550	
Volume (vph)	5	339	73	61	564	93	86	236	24	58	484	25
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	377	81	68	627	103	96	262	27	64	538	28
Lane Group Flow (vph)	6	458	0	68	730	0	0	385	0	64	566	0
Confl. Peds. (#/hr)	21		66	66		21	15		15	15		15
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.0	34.0		34.0	34.0			54.0		54.0	54.0	
Effective Green, g (s)	36.0	36.0		36.0	36.0			56.0		56.0	56.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.56		0.56	0.56	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lane Grp Cap (vph)	126	981		210	1035			599		438	868	
v/s Ratio Prot		0.17			c0.25						c0.37	
v/s Ratio Perm	0.02			0.12				0.36		0.08		
v/c Ratio	0.05	0.47		0.32	0.71			0.64		0.15	0.65	
Uniform Delay, d1	20.8	24.6		23.2	27.4			15.1		10.5	15.2	
Progression Factor	0.31	0.25		1.00	1.00			0.94		1.00	1.00	
Incremental Delay, d2	0.5	1.2		4.1	4.0			0.5		0.7	3.8	
Delay (s)	7.0	7.3		27.2	31.5			14.7		11.2	19.0	
Level of Service	A	A		C	C			B		B	B	
Approach Delay (s)		7.3			31.1			14.7			18.3	
Approach LOS		A			C			B			B	

Intersection Summary

HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	E

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	14	14	15	15	9	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.89		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1699	1520	1645		1433	1676
Flt Permitted	0.95	1.00	1.00		0.25	1.00
Satd. Flow (perm)	1699	1520	1645		379	1676
Volume (vph)	80	68	145	578	144	82
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	89	76	161	642	160	91
Lane Group Flow (vph)	89	76	803	0	160	91
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	4.0	11.3	65.7		79.0	79.0
Effective Green, g (s)	6.0	15.3	67.7		81.0	81.0
Actuated g/C Ratio	0.06	0.16	0.71		0.85	0.85
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	107	309	1172		426	1429
v/s Ratio Prot	c0.05	0.02	c0.49		c0.04	0.05
v/s Ratio Perm		0.03			0.28	
v/c Ratio	0.83	0.25	0.69		0.38	0.06
Uniform Delay, d1	44.0	34.8	7.7		4.8	1.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	39.7	0.4	3.3		0.6	0.1
Delay (s)	83.7	35.2	10.9		5.3	1.2
Level of Service	F	D	B		A	A
Approach Delay (s)	61.4		10.9			3.8
Approach LOS	E		B			A

Intersection Summary

HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.7%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0							
Lane Util. Factor		1.00		0.97	1.00							
Frpb, ped/bikes		0.98		1.00	1.00							
Flpb, ped/bikes		1.00		1.00	1.00							
Frt		0.93		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		1534		2987	1676							
Flt Permitted		1.00		0.95	1.00							
Satd. Flow (perm)		1534		2987	1676							
Volume (vph)	0	206	209	1107	193	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	229	232	1230	214	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	461	0	1230	214	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			13	13								
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Actuated Green, G (s)		39.0		49.0	100.0							
Effective Green, g (s)		41.0		51.0	100.0							
Actuated g/C Ratio		0.41		0.51	1.00							
Clearance Time (s)		6.0		6.0	6.0							
Lane Grp Cap (vph)		629		1523	1676							
v/s Ratio Prot		c0.30		c0.41	0.13							
v/s Ratio Perm												
v/c Ratio		0.73		0.81	0.13							
Uniform Delay, d1		24.9		20.4	0.0							
Progression Factor		1.00		0.46	1.00							
Incremental Delay, d2		7.4		0.4	0.0							
Delay (s)		32.3		9.9	0.0							
Level of Service		C		A	A							
Approach Delay (s)		32.3			8.5			0.0			0.0	
Approach LOS		C			A			A			A	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	11	12	12	12	12	12	10	10	10	11	11	12
Total Lost time (s)	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	0.95		1.00		0.88
Frt	1.00	1.00			0.96		1.00	0.98		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1540	1676			1608		1486	2917		1540		2508
Flt Permitted	0.21	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	341	1676			1608		1486	2917		1540		2508
Volume (vph)	42	197	0	0	224	96	275	712	102	152	0	1002
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	219	0	0	249	107	306	791	113	169	0	1113
Lane Group Flow (vph)	47	219	0	0	356	0	306	904	0	169	0	1113
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Actuated Green, G (s)	17.0	17.0			17.0		27.0	27.0		38.0		38.0
Effective Green, g (s)	19.0	19.0			19.0		29.0	29.0		40.0		40.0
Actuated g/C Ratio	0.19	0.19			0.19		0.29	0.29		0.40		0.40
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	65	318			306		431	846		616		1003
v/s Ratio Prot		0.13			c0.22		0.21	c0.31		0.11		c0.44
v/s Ratio Perm	0.14											
v/c Ratio	0.72	0.69			1.16		0.71	1.07		0.27		1.11
Uniform Delay, d1	38.0	37.7			40.5		31.7	35.5		20.2		30.0
Progression Factor	0.55	0.55			0.85		0.48	0.47		0.59		0.79
Incremental Delay, d2	26.9	4.9			77.1		4.9	42.8		0.2		59.7
Delay (s)	47.7	25.5			111.5		20.0	59.3		12.1		83.4
Level of Service	D	C			F		C	E		B		F
Approach Delay (s)		29.4			111.5			49.4			74.0	
Approach LOS		C			F			D			E	

Intersection Summary

HCM Average Control Delay	64.9	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	9	11	11	10	10	10	10	12	12
Total Lost time (s)		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	
Frt		0.97		1.00	0.93		1.00	0.95		1.00	0.97	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620		1433	1505		1486	1483		1486	1626	
Flt Permitted		0.28		0.45	1.00		0.20	1.00		0.48	1.00	
Satd. Flow (perm)		455		676	1505		314	1483		748	1626	
Volume (vph)	36	214	66	120	385	351	47	201	107	569	498	126
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	40	238	73	133	428	390	52	223	119	632	553	140
Lane Group Flow (vph)	0	351	0	133	818	0	52	342	0	632	693	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		38.0		38.0	38.0		50.0	50.0		50.0	50.0	
Effective Green, g (s)		40.0		40.0	40.0		52.0	52.0		52.0	52.0	
Actuated g/C Ratio		0.40		0.40	0.40		0.52	0.52		0.52	0.52	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		182		270	602		163	771		389	846	
v/s Ratio Prot					0.54			0.23			0.43	
v/s Ratio Perm		c0.77		0.20			0.17			c0.85		
v/c Ratio		1.93		0.49	1.36		0.32	0.44		1.62	0.82	
Uniform Delay, d1		30.0		22.4	30.0		13.8	15.0		24.0	20.1	
Progression Factor		1.01		0.95	0.92		0.76	0.71		0.96	0.94	
Incremental Delay, d2		433.2		1.3	171.5		5.1	1.8		292.3	8.4	
Delay (s)		463.4		22.6	199.0		15.6	12.5		315.3	27.4	
Level of Service		F		C	F		B	B		F	C	
Approach Delay (s)		463.4			174.4			12.9			164.7	
Approach LOS		F			F			B			F	

Intersection Summary

HCM Average Control Delay	182.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.76		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	146.2%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		0.96		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1450		1593	1676						3144	
Flt Permitted		1.00		0.30	1.00						0.99	
Satd. Flow (perm)		1450		505	1676						3144	
Volume (vph)	0	345	141	233	94	0	0	0	0	319	1057	15
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	383	157	259	104	0	0	0	0	354	1174	17
Lane Group Flow (vph)	0	540	0	259	104	0	0	0	0	0	1545	0
Parking (#/hr)		0										
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		48.0		48.0	48.0						40.0	
Effective Green, g (s)		50.0		50.0	50.0						42.0	
Actuated g/C Ratio		0.50		0.50	0.50						0.42	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		725		253	838						1320	
v/s Ratio Prot		0.37			0.06							
v/s Ratio Perm				c0.51							0.49	
v/c Ratio		0.74		1.02	0.12						1.17	
Uniform Delay, d1		19.9		25.0	13.3						29.0	
Progression Factor		1.00		0.36	0.16						0.81	
Incremental Delay, d2		4.2		43.3	0.0						82.3	
Delay (s)		24.1		52.4	2.1						105.8	
Level of Service		C		D	A						F	
Approach Delay (s)		24.1			38.0			0.0			105.8	
Approach LOS		C			D			A			F	

Intersection Summary

HCM Average Control Delay	77.7	HCM Level of Service	E
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	107.1%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	14	12	12	13	13	12	11	11	11	11	11
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frt		1.00			1.00	0.85		0.99				
Flt Protected		0.99			1.00	1.00		0.99				
Satd. Flow (prot)		1771			1646	1399		4370				
Flt Permitted		0.99			1.00	1.00		0.99				
Satd. Flow (perm)		1771			1646	1399		4370				
Volume (vph)	108	436	0	0	288	295	131	887	44	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	484	0	0	320	328	146	986	49	0	0	0
Lane Group Flow (vph)	0	604	0	0	320	328	0	1181	0	0	0	0
Turn Type	Split					Perm	Perm					
Protected Phases	1	1			3			2				
Permitted Phases						3	2					
Actuated Green, G (s)		34.3			19.9	19.9		27.8				
Effective Green, g (s)		36.3			21.9	21.9		29.8				
Actuated g/C Ratio		0.36			0.22	0.22		0.30				
Clearance Time (s)		6.0			6.0	6.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		643			360	306		1302				
v/s Ratio Prot		c0.34			0.19							
v/s Ratio Perm						0.23		0.27				
v/c Ratio		0.94			0.89	1.07		0.91				
Uniform Delay, d1		30.8			37.9	39.1		33.8				
Progression Factor		1.06			1.21	1.71		0.76				
Incremental Delay, d2		9.6			16.2	62.4		9.3				
Delay (s)		42.2			61.9	129.2		34.8				
Level of Service		D			E	F		C				
Approach Delay (s)		42.2			96.0			34.8			0.0	
Approach LOS		D			F			C			A	

Intersection Summary

HCM Average Control Delay	53.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	97.5%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	12	12	11	11	11	11
Total Lost time (s)	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
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.25	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	421	1676	1621	1378	1540	1378
Volume (vph)	132	489	680	32	115	360
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	147	543	756	36	128	400
Lane Group Flow (vph)	147	543	756	36	128	400
Turn Type	D.P+P			Perm		pt+ov
Protected Phases	1	1 2	2		3	3 1
Permitted Phases	2			2		
Actuated Green, G (s)	67.5	73.5	62.5	62.5	14.5	25.5
Effective Green, g (s)	71.5	75.5	64.5	64.5	16.5	27.5
Actuated g/C Ratio	0.72	0.76	0.64	0.64	0.16	0.28
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	383	1265	1046	889	254	379
v/s Ratio Prot	0.03	0.32	c0.47		0.08	c0.29
v/s Ratio Perm	0.25			0.03		
v/c Ratio	0.38	0.43	0.72	0.04	0.50	1.06
Uniform Delay, d1	7.5	4.4	11.8	6.5	38.0	36.2
Progression Factor	1.09	0.35	0.29	0.00	1.04	0.70
Incremental Delay, d2	0.4	0.2	3.6	0.1	0.8	48.1
Delay (s)	8.6	1.7	7.0	0.1	40.4	73.4
Level of Service	A	A	A	A	D	E
Approach Delay (s)		3.2	6.7		65.4	
Approach LOS		A	A		E	

Intersection Summary

HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	14	12	12	14	11	16	12	12	15	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98			0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			0.99	
Satd. Flow (prot)	1711	3388		1770	1863	1689	1711	2077			1905	
Flt Permitted	0.42	1.00		0.43	1.00	1.00	0.20	1.00			0.91	
Satd. Flow (perm)	762	3388		802	1863	1689	360	2077			1744	
Volume (vph)	35	156	62	612	572	487	346	240	29	33	102	123
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	173	69	680	636	541	384	267	32	37	113	137
Lane Group Flow (vph)	39	242	0	680	636	541	384	299	0	0	287	0
Turn Type	Perm			pm+pt		Perm	pm+pt			Perm		
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	16.0	16.0		50.0	50.0	50.0	38.0	38.0			14.0	
Effective Green, g (s)	18.0	18.0		52.0	52.0	52.0	40.0	40.0			16.0	
Actuated g/C Ratio	0.18	0.18		0.52	0.52	0.52	0.40	0.40			0.16	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	137	610		707	969	878	414	831			279	
v/s Ratio Prot		0.07		c0.29	0.34		c0.19	0.14				
v/s Ratio Perm	0.05			c0.21		0.32	c0.19				0.16	
v/c Ratio	0.28	0.40		0.96	0.66	0.62	0.93	0.36			1.03	
Uniform Delay, d1	35.4	36.2		19.2	17.5	17.0	26.2	21.0			42.0	
Progression Factor	0.83	0.80		1.00	1.00	1.00	0.90	0.90			1.00	
Incremental Delay, d2	4.7	1.8		24.7	3.5	3.2	3.9	0.0			61.5	
Delay (s)	34.2	30.9		43.9	21.0	20.2	27.4	19.0			103.5	
Level of Service	C	C		D	C	C	C	B			F	
Approach Delay (s)		31.3			29.1			23.7			103.5	
Approach LOS		C			C			C			F	

Intersection Summary

HCM Average Control Delay	35.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	95.7%	ICU Level of Service	E

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.95		1.00		0.88		0.95	1.00			
Frt	1.00	1.00		1.00		0.85		1.00	0.85			
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539		1770		2787		3539	1583			
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539		1770		2787		3539	1583			
Volume (vph)	117	677	0	120	0	370	0	881	303	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	130	752	0	133	0	411	0	979	337	0	0	0
Lane Group Flow (vph)	130	752	0	133	0	411	0	979	337	0	0	0
Turn Type	Split			custom		custom			pm+ov			
Protected Phases	1	1		3				2	3			
Permitted Phases				3		3			2			
Actuated Green, G (s)	27.0	27.0		12.8		12.8		42.2	55.0			
Effective Green, g (s)	29.0	29.0		14.8		14.8		44.2	59.0			
Actuated g/C Ratio	0.29	0.29		0.15		0.15		0.44	0.59			
Clearance Time (s)	6.0	6.0		6.0		6.0		6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0			
Lane Grp Cap (vph)	513	1026		262		412		1564	997			
v/s Ratio Prot	0.07	c0.21		0.08				c0.28	0.05			
v/s Ratio Perm						0.15			0.16			
v/c Ratio	0.25	0.73		0.51		1.00		0.63	0.34			
Uniform Delay, d1	27.2	32.0		39.2		42.6		21.5	10.5			
Progression Factor	0.74	0.83		0.86		1.37		0.63	0.57			
Incremental Delay, d2	0.0	0.3		1.5		42.1		1.6	0.2			
Delay (s)	20.2	26.9		35.1		100.5		15.2	6.2			
Level of Service	C	C		D		F		B	A			
Approach Delay (s)		25.9			84.6			12.9			0.0	
Approach LOS		C			F			B			A	

Intersection Summary

HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						3.0	3.0
Lane Util. Factor		0.95			0.95						1.00	1.00
Frpb, ped/bikes		0.93			0.99						1.00	0.95
Flpb, ped/bikes		1.00			0.99						1.00	1.00
Frt		0.95			0.99						1.00	0.85
Flt Protected		1.00			0.98						0.97	1.00
Satd. Flow (prot)		3118			3386						1802	1506
Flt Permitted		0.90			0.49						0.97	1.00
Satd. Flow (perm)		2814			1701						1802	1506
Volume (vph)	41	836	402	243	390	48	0	0	0	35	17	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	929	447	270	433	53	0	0	0	39	19	39
Lane Group Flow (vph)	0	1422	0	0	756	0	0	0	0	0	58	39
Confl. Peds. (#/hr)	30		120	120		30				100		20
Turn Type	Perm			pm+pt						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases	2			6								4
Actuated Green, G (s)		80.6			80.6						7.4	7.4
Effective Green, g (s)		83.6			83.6						10.4	10.4
Actuated g/C Ratio		0.84			0.84						0.10	0.10
Clearance Time (s)		6.0			6.0						6.0	6.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		2353			1422						187	157
v/s Ratio Prot											c0.03	
v/s Ratio Perm		c0.51			0.44							0.03
v/c Ratio		0.60			0.86dl						0.31	0.25
Uniform Delay, d1		2.7			2.4						41.5	41.2
Progression Factor		0.96			1.70						1.00	1.00
Incremental Delay, d2		1.1			0.4						0.9	0.8
Delay (s)		3.7			4.5						42.4	42.0
Level of Service		A			A						D	D
Approach Delay (s)		3.7			4.5			0.0			42.3	
Approach LOS		A			A			A			D	

Intersection Summary

HCM Average Control Delay	5.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	D

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes	1.00	0.94		1.00	0.85			1.00	0.98			
Flpb, ped/bikes	0.94	1.00		1.00	1.00			0.95	1.00			
Frt	1.00	0.97		1.00	0.95			1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00			
Satd. Flow (prot)	1549	3004		1652	2681			1603	1448			
Flt Permitted	0.40	1.00		0.15	1.00			0.97	1.00			
Satd. Flow (perm)	645	3004		260	2681			1603	1448			
Volume (vph)	209	671	162	452	409	198	162	90	505	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	232	746	180	502	454	220	180	100	561	0	0	0
Lane Group Flow (vph)	232	926	0	502	674	0	0	280	561	0	0	0
Confl. Peds. (#/hr)	140		100	100		140	40		20	20		40
Turn Type	pm+pt			pm+pt			Perm		pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	2			6			8		8			
Actuated Green, G (s)	46.2	37.1		69.8	54.7			18.2	44.9			
Effective Green, g (s)	52.2	40.1		72.8	57.7			21.2	50.9			
Actuated g/C Ratio	0.52	0.40		0.73	0.58			0.21	0.51			
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Grp Cap (vph)	446	1205		603	1547			340	780			
v/s Ratio Prot	0.06	0.31		c0.25	0.25				c0.21			
v/s Ratio Perm	0.21			c0.36				0.17	0.17			
v/c Ratio	0.52	0.77		0.83	0.44			0.82	0.72			
Uniform Delay, d1	13.4	25.9		21.4	12.0			37.6	19.0			
Progression Factor	1.20	0.73		0.89	0.48			1.00	1.00			
Incremental Delay, d2	1.1	4.7		8.3	0.8			14.8	3.2			
Delay (s)	17.2	23.6		27.2	6.6			52.4	22.2			
Level of Service	B	C		C	A			D	C			
Approach Delay (s)		22.3			15.4			32.3			0.0	
Approach LOS		C			B			C			A	

Intersection Summary

HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	3.0
Intersection Capacity Utilization	87.2%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1652	3328		1652	3349		1652	1837		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.64	1.00		0.72	1.00	1.00
Satd. Flow (perm)	1652	3328		1652	3349		1116	1837		1332	1863	1583
Volume (vph)	141	381	85	5	754	124	52	52	5	19	96	414
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	157	423	94	6	838	138	58	58	6	21	107	460
Lane Group Flow (vph)	157	517	0	6	976	0	58	64	0	21	107	460
Turn Type	Prot			Prot			Perm			pm+pt		Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	13.5	61.1		1.0	48.6		11.9	11.9		19.9	19.9	19.9
Effective Green, g (s)	15.5	63.1		3.0	50.6		13.9	13.9		21.9	21.9	21.9
Actuated g/C Ratio	0.16	0.63		0.03	0.51		0.14	0.14		0.22	0.22	0.22
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	256	2100		50	1695		155	255		309	408	347
v/s Ratio Prot	c0.10	0.16		0.00	c0.29			0.03		0.00	0.06	
v/s Ratio Perm							0.05			0.01		0.29
v/c Ratio	0.61	0.25		0.12	0.58		0.37	0.25		0.07	0.26	1.33
Uniform Delay, d1	39.5	8.1		47.2	17.2		39.1	38.4		31.0	32.4	39.1
Progression Factor	0.99	0.99		1.00	1.00		1.00	1.00		0.78	0.81	0.65
Incremental Delay, d2	2.9	0.2		1.1	1.4		1.5	0.5		0.1	0.2	159.0
Delay (s)	41.9	8.2		48.3	18.6		40.6	38.9		24.4	26.5	184.5
Level of Service	D	A		D	B		D	D		C	C	F
Approach Delay (s)		16.0			18.8			39.7			150.0	
Approach LOS		B			B			D			F	

Intersection Summary

HCM Average Control Delay	51.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Total Lost time (s)		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	
Frt		0.98			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1785			1746	1554	1796	1891	1714	1676	1761	
Flt Permitted		0.85			0.73	1.00	0.58	1.00	1.00	0.16	1.00	
Satd. Flow (perm)		1563			1327	1554	1100	1891	1714	279	1761	
Volume (vph)	8	5	3	108	7	122	13	805	540	155	258	4
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	9	6	3	120	8	136	14	894	600	172	287	4
Lane Group Flow (vph)	0	18	0	0	128	136	14	894	600	172	291	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		13.4			13.4	13.4	61.9	61.9	61.9	74.6	74.6	
Effective Green, g (s)		15.4			15.4	15.4	63.9	63.9	63.9	76.6	76.6	
Actuated g/C Ratio		0.15			0.15	0.15	0.64	0.64	0.64	0.77	0.77	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		241			204	239	703	1208	1095	335	1349	
v/s Ratio Prot								c0.47		c0.04	0.17	
v/s Ratio Perm		0.01			c0.10	0.09	0.01		0.35	0.35		
v/c Ratio		0.07			0.63	0.57	0.02	0.74	0.55	0.51	0.22	
Uniform Delay, d1		36.2			39.6	39.2	6.6	12.4	10.0	12.0	3.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	2.20	0.67	
Incremental Delay, d2		0.1			5.9	3.1	0.1	4.1	2.0	1.3	0.4	
Delay (s)		36.3			45.5	42.3	6.7	16.5	12.0	27.8	2.6	
Level of Service		D			D	D	A	B	B	C	A	
Approach Delay (s)		36.3			43.9			14.6			11.9	
Approach LOS		D			D			B			B	

Intersection Summary

HCM Average Control Delay	17.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	576	29	23	185	0	27	0	50	38	32	119
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	640	32	26	206	0	30	0	56	42	36	132
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
vC, conflicting volume	206			672			1063	913	656	968	929	206
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			80	100	88	79	86	84
cM capacity (veh/h)	1366			918			148	266	465	201	260	835

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	672	231	86	78	132
Volume Left	0	26	30	42	0
Volume Right	32	0	56	0	132
cSH	1700	918	266	224	835
Volume to Capacity	0.40	0.03	0.32	0.35	0.16
Queue Length (ft)	0	2	34	37	14
Control Delay (s)	0.0	1.3	24.8	29.3	10.1
Lane LOS		A	C	D	B
Approach Delay (s)	0.0	1.3	24.8	17.2	
Approach LOS			C	C	

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (veh/h)	542	212	30	98	152	100
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	602	236	33	109	169	111

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	838	33	109	280
Volume Left (vph)	0	33	0	169
Volume Right (vph)	236	0	0	111
Hadj (s)	-0.1	0.2	0.0	-0.1
Departure Headway (s)	5.0	6.9	6.7	5.9
Degree Utilization, x	1.15	0.06	0.20	0.46
Capacity (veh/h)	725	415	428	596
Control Delay (s)	103.9	9.2	10.2	14.0
Approach Delay (s)	103.9	10.0		14.0
Approach LOS	F	A		B

Intersection Summary			
Delay	73.3		
HCM Level of Service	F		
Intersection Capacity Utilization	68.9%	ICU Level of Service	B

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	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	0.0%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	3448	967	205	0	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	3831	1074	228	0	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	1302				3104	651
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	97
cM capacity (veh/h)	528				9	411

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	1916	1916	716	586	12
Volume Left	0	0	0	0	0
Volume Right	0	0	0	228	12
cSH	1700	1700	1700	1700	411
Volume to Capacity	1.13	1.13	0.42	0.34	0.03
Queue Length (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	14.0
Lane LOS					B
Approach Delay (s)	0.0		0.0		14.0
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	109.2%	ICU Level of Service	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			-4%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.99	
Satd. Flow (prot)	3519	3627		1770	3539	1583	3502	1900	1615		1710	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.99	
Satd. Flow (perm)	3519	3627		1770	3539	1583	3502	1900	1615		1710	
Volume (vph)	553	2960	5	14	1117	1188	333	7	41	15	11	27
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	614	3289	6	16	1241	1320	370	8	46	17	12	30
Lane Group Flow (vph)	614	3295	0	16	1241	1320	370	8	46	0	59	0
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		
Protected Phases	5	2		1	6	4	4	4	5	8	8	
Permitted Phases						6			4			
Actuated Green, G (s)	25.4	81.6		2.9	59.1	73.3	14.2	14.2	39.6		5.7	
Effective Green, g (s)	27.4	83.6		4.9	61.1	77.3	16.2	16.2	43.6		7.7	
Actuated g/C Ratio	0.21	0.65		0.04	0.48	0.60	0.13	0.13	0.34		0.06	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	751	2362		68	1684	1002	442	240	548		103	
v/s Ratio Prot	c0.17	c0.91		0.01	0.35	c0.17	0.11	0.00	0.02		c0.03	
v/s Ratio Perm						0.67			0.01			
v/c Ratio	0.82	1.40		0.24	0.74	1.32	0.84	0.03	0.08		0.57	
Uniform Delay, d1	48.1	22.4		59.9	27.2	25.6	54.8	49.2	28.8		58.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	6.9	180.4		1.8	1.7	149.9	12.9	0.1	0.1		7.5	
Delay (s)	55.0	202.8		61.7	28.9	175.5	67.8	49.3	28.9		66.2	
Level of Service	E	F		E	C	F	E	D	C		E	
Approach Delay (s)		179.6			104.2			63.2			66.2	
Approach LOS		F			F			E			E	

Intersection Summary

HCM Average Control Delay	143.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	128.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	121.6%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	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	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.95		1.00	0.96		1.00	0.96		1.00	1.00	0.74
Flpb, ped/bikes	0.94	1.00		0.90	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1350	1540		1341	1439		1433	2809		1433	2867	1017
Flt Permitted	0.38	1.00		0.40	1.00		0.95	1.00		0.12	1.00	1.00
Satd. Flow (perm)	543	1540		570	1439		1433	2809		178	2867	1017
Volume (vph)	291	292	72	97	289	96	54	909	83	64	653	294
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	323	324	80	108	321	107	60	1010	92	71	726	327
Lane Group Flow (vph)	323	404	0	108	428	0	60	1102	0	71	726	327
Confl. Peds. (#/hr)	91		140	140		91	79		170	170		79
Turn Type	Perm			Perm			Prot			Perm		Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		6
Actuated Green, G (s)	46.0	46.0		46.0	46.0		4.0	42.0		32.0	32.0	32.0
Effective Green, g (s)	48.0	48.0		48.0	48.0		6.0	44.0		34.0	34.0	34.0
Actuated g/C Ratio	0.48	0.48		0.48	0.48		0.06	0.44		0.34	0.34	0.34
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Lane Grp Cap (vph)	261	739		274	691		86	1236		61	975	346
v/s Ratio Prot		0.26			0.30		0.04	c0.39			0.25	
v/s Ratio Perm	c0.59			0.19						c0.40		0.32
v/c Ratio	1.24	0.55		0.39	0.62		0.70	0.89		1.16	0.74	0.95
Uniform Delay, d1	26.0	18.3		16.7	19.2		46.1	25.8		33.0	29.2	32.1
Progression Factor	1.00	1.00		1.00	1.00		0.68	0.46		1.00	1.00	1.00
Incremental Delay, d2	135.3	2.9		4.2	4.1		4.2	1.1		166.6	5.2	36.3
Delay (s)	161.3	21.2		20.9	23.4		35.7	12.9		199.6	34.3	68.4
Level of Service	F	C		C	C		D	B		F	C	E
Approach Delay (s)		83.5			22.9			14.0			54.7	
Approach LOS		F			C			B			D	

Intersection Summary

HCM Average Control Delay	42.5	HCM Level of Service	D
HCM Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	99.9%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	12	13	10	10	13	9	10	10	9	9	11
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.99		1.00	0.98		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)	1433	3159		1486	2948		1433	2913		1433	2827	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1433	3159		1486	2948		1433	2913		1433	2827	
Volume (vph)	403	1018	60	60	855	50	243	921	144	190	984	99
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	448	1131	67	67	950	56	270	1023	160	211	1093	110
Lane Group Flow (vph)	448	1198	0	67	1006	0	270	1183	0	211	1203	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	18.0	36.8		3.2	22.0		11.0	28.0		8.0	25.0	
Effective Green, g (s)	20.0	38.8		5.2	24.0		13.0	30.0		10.0	27.0	
Actuated g/C Ratio	0.20	0.39		0.05	0.24		0.13	0.30		0.10	0.27	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	287	1226		77	708		186	874		143	763	
v/s Ratio Prot	c0.31	0.38		0.05	c0.34		0.19	c0.41		0.15	c0.43	
v/s Ratio Perm												
v/c Ratio	1.56	0.98		0.87	1.42		1.45	1.35		1.48	1.58	
Uniform Delay, d1	40.0	30.2		47.1	38.0		43.5	35.0		45.0	36.5	
Progression Factor	1.00	1.00		0.73	0.68		1.00	0.36		0.75	0.69	
Incremental Delay, d2	268.8	20.8		48.7	195.4		206.0	159.8		245.1	265.3	
Delay (s)	308.8	50.9		82.9	221.3		249.4	172.3		278.8	290.5	
Level of Service	F	D		F	F		F	F		F	F	
Approach Delay (s)		121.1			212.7			186.6			288.7	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	198.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	126.1%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	9	9	10	9	10	11	12	12	12	10	10	10
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.99			1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.97			0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	
Satd. Flow (prot)	1433	2726		1433	2857			1634		1476	1541	
Flt Permitted	0.20	1.00		0.18	1.00			0.54		0.41	1.00	
Satd. Flow (perm)	300	2726		277	2857			890		633	1541	
Volume (vph)	31	730	156	72	707	142	114	309	35	132	402	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	34	811	173	80	786	158	127	343	39	147	447	39
Lane Group Flow (vph)	34	984	0	80	944	0	0	509	0	147	486	0
Confl. Peds. (#/hr)	21		66	66		21	15		15	15		15
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	45.0	45.0		45.0	45.0			43.0		43.0	43.0	
Effective Green, g (s)	47.0	47.0		47.0	47.0			45.0		45.0	45.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.45		0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	
Lane Grp Cap (vph)	141	1281		130	1343			401		285	693	
v/s Ratio Prot		c0.36			0.33						0.32	
v/s Ratio Perm	0.11			0.29				c0.57		0.23		
v/c Ratio	0.24	0.77		0.62	0.70			1.27		0.52	0.70	
Uniform Delay, d1	15.8	22.0		19.8	21.0			27.5		19.7	22.1	
Progression Factor	0.19	0.20		1.00	1.00			0.94		1.00	1.00	
Incremental Delay, d2	0.4	0.4		19.9	3.1			123.1		6.5	5.8	
Delay (s)	3.4	4.7		39.6	24.1			148.8		26.2	27.9	
Level of Service	A	A		D	C			F		C	C	
Approach Delay (s)		4.7			25.3			148.8			27.5	
Approach LOS		A			C			F			C	

Intersection Summary

HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.6%	ICU Level of Service	F

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	14	14	15	15	9	12
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.91		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1699	1520	1670		1433	1676
Flt Permitted	0.95	1.00	1.00		0.28	1.00
Satd. Flow (perm)	1699	1520	1670		429	1676
Volume (vph)	520	210	140	327	139	279
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	578	233	156	363	154	310
Lane Group Flow (vph)	578	233	519	0	154	310
Turn Type		pm+ov			pm+pt	
Protected Phases	8	1	2		1	6
Permitted Phases		8			6	
Actuated Green, G (s)	29.0	33.0	44.0		54.0	54.0
Effective Green, g (s)	31.0	37.0	46.0		56.0	56.0
Actuated g/C Ratio	0.33	0.39	0.48		0.59	0.59
Clearance Time (s)	6.0	6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	554	656	809		316	988
v/s Ratio Prot	c0.34	0.02	c0.31		c0.03	0.18
v/s Ratio Perm		0.13			0.26	
v/c Ratio	1.04	0.36	0.64		0.49	0.31
Uniform Delay, d1	32.0	20.5	18.3		11.6	9.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	50.0	0.3	3.9		1.2	0.8
Delay (s)	82.0	20.9	22.2		12.8	10.7
Level of Service	F	C	C		B	B
Approach Delay (s)	64.4		22.2			11.4
Approach LOS	E		C			B

Intersection Summary

HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	D

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	11	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0		4.0	4.0							
Lane Util. Factor		1.00		0.97	1.00							
Frpb, ped/bikes		0.98		1.00	1.00							
Flpb, ped/bikes		1.00		1.00	1.00							
Frt		0.93		1.00	1.00							
Flt Protected		1.00		0.95	1.00							
Satd. Flow (prot)		1527		2987	1676							
Flt Permitted		1.00		0.95	1.00							
Satd. Flow (perm)		1527		2987	1676							
Volume (vph)	0	237	267	976	555	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	263	297	1084	617	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	560	0	1084	617	0	0	0	0	0	0	0
Confl. Peds. (#/hr)			13	13								
Turn Type				Prot								
Protected Phases		2		1	6							
Permitted Phases												
Actuated Green, G (s)		46.0		42.0	100.0							
Effective Green, g (s)		48.0		44.0	100.0							
Actuated g/C Ratio		0.48		0.44	1.00							
Clearance Time (s)		6.0		6.0	6.0							
Lane Grp Cap (vph)		733		1314	1676							
v/s Ratio Prot		c0.37		c0.36	0.37							
v/s Ratio Perm												
v/c Ratio		0.76		0.82	0.37							
Uniform Delay, d1		21.3		24.6	0.0							
Progression Factor		1.00		1.21	1.00							
Incremental Delay, d2		7.4		0.6	0.1							
Delay (s)		28.8		30.4	0.1							
Level of Service		C		C	A							
Approach Delay (s)		28.8			19.4			0.0			0.0	
Approach LOS		C			B			A			A	

Intersection Summary

HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	11	12	12	12	12	12	10	10	10	11	11	12
Total Lost time (s)	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	0.95		1.00		0.88
Frt	1.00	1.00			0.97		1.00	0.99		1.00		0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)	1540	1676			1622		1486	2942		1540		2508
Flt Permitted	0.14	1.00			1.00		0.95	1.00		0.95		1.00
Satd. Flow (perm)	224	1676			1622		1486	2942		1540		2508
Volume (vph)	82	217	0	0	320	102	617	1127	84	208	0	874
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	91	241	0	0	356	113	686	1252	93	231	0	971
Lane Group Flow (vph)	91	241	0	0	469	0	686	1345	0	231	0	971
Turn Type	Perm						Split			custom		custom
Protected Phases		4			8		2	2		1		1
Permitted Phases	4									1		1
Actuated Green, G (s)	27.0	27.0			27.0		32.0	32.0		23.0		23.0
Effective Green, g (s)	29.0	29.0			29.0		34.0	34.0		25.0		25.0
Actuated g/C Ratio	0.29	0.29			0.29		0.34	0.34		0.25		0.25
Clearance Time (s)	6.0	6.0			6.0		6.0	6.0		6.0		6.0
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0		3.0
Lane Grp Cap (vph)	65	486			470		505	1000		385		627
v/s Ratio Prot		0.14			0.29		c0.46	0.46		0.15		c0.39
v/s Ratio Perm	c0.41											
v/c Ratio	1.40	0.50			1.00		1.36	1.34		0.60		1.55
Uniform Delay, d1	35.5	29.4			35.5		33.0	33.0		33.1		37.5
Progression Factor	0.80	0.73			0.99		0.87	0.87		0.60		0.58
Incremental Delay, d2	239.2	0.6			11.9		162.5	155.9		0.2		247.6
Delay (s)	267.5	22.3			47.0		191.3	184.7		20.0		269.4
Level of Service	F	C			D		F	F		B		F
Approach Delay (s)		89.5			47.0			186.9			221.5	
Approach LOS		F			D			F			F	

Intersection Summary

HCM Average Control Delay	172.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.43		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	118.4%	ICU Level of Service	G

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	12	12	9	11	11	10	10	10	10	12	12
Total Lost time (s)		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	
Frt		0.97		1.00	0.91		1.00	0.93		1.00	0.97	
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1624		1433	1478		1486	1463		1486	1619	
Flt Permitted		0.25		0.34	1.00		0.12	1.00		0.18	1.00	
Satd. Flow (perm)		410		508	1478		192	1463		281	1619	
Volume (vph)	59	373	102	100	309	438	113	329	253	368	497	148
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	66	414	113	111	343	487	126	366	281	409	552	164
Lane Group Flow (vph)	0	593	0	111	830	0	126	647	0	409	716	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		44.0		44.0	44.0		44.0	44.0		44.0	44.0	
Effective Green, g (s)		46.0		46.0	46.0		46.0	46.0		46.0	46.0	
Actuated g/C Ratio		0.46		0.46	0.46		0.46	0.46		0.46	0.46	
Clearance Time (s)		6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		189		234	680		88	673		129	745	
v/s Ratio Prot					0.56			0.44			0.44	
v/s Ratio Perm		c1.45		0.22			0.66			c1.46		
v/c Ratio		3.14		0.47	1.22		1.43	0.96		3.17	0.96	
Uniform Delay, d1		27.0		18.6	27.0		27.0	26.1		27.0	26.1	
Progression Factor		1.31		0.79	0.84		0.36	0.35		0.82	0.81	
Incremental Delay, d2		972.4		0.7	105.7		232.2	20.4		995.1	23.4	
Delay (s)		1007.7		15.4	128.4		242.0	29.7		1017.2	44.5	
Level of Service		F		B	F		F	C		F	D	
Approach Delay (s)		1007.7			115.1			64.3			398.2	
Approach LOS		F			F			E			F	

Intersection Summary

HCM Average Control Delay	350.7	HCM Level of Service	F
HCM Volume to Capacity ratio	3.15		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	168.1%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Total Lost time (s)		4.0		4.0	4.0						4.0	
Lane Util. Factor		1.00		1.00	1.00						0.95	
Frt		0.97		1.00	1.00						1.00	
Flt Protected		1.00		0.95	1.00						0.99	
Satd. Flow (prot)		1467		1593	1676						3128	
Flt Permitted		1.00		0.54	1.00						0.99	
Satd. Flow (perm)		1467		910	1676						3128	
Volume (vph)	0	191	49	454	262	0	0	0	0	380	869	28
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	212	54	504	291	0	0	0	0	422	966	31
Lane Group Flow (vph)	0	266	0	504	291	0	0	0	0	0	1419	0
Parking (#/hr)		0										
Turn Type				Perm						Perm		
Protected Phases		4			8						6	
Permitted Phases				8						6		
Actuated Green, G (s)		49.0		49.0	49.0						39.0	
Effective Green, g (s)		51.0		51.0	51.0						41.0	
Actuated g/C Ratio		0.51		0.51	0.51						0.41	
Clearance Time (s)		6.0		6.0	6.0						6.0	
Vehicle Extension (s)		3.0		3.0	3.0						3.0	
Lane Grp Cap (vph)		748		464	855						1282	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm				c0.55							0.45	
v/c Ratio		0.36		1.09	0.34						1.11	
Uniform Delay, d1		14.7		24.5	14.5						29.5	
Progression Factor		1.00		1.49	1.47						0.55	
Incremental Delay, d2		0.3		42.8	0.0						55.6	
Delay (s)		15.0		79.4	21.4						71.7	
Level of Service		B		E	C						E	
Approach Delay (s)		15.0			58.1			0.0			71.7	
Approach LOS		B			E			A			E	

Intersection Summary

HCM Average Control Delay	61.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.5%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710	1710
Lane Width	12	14	12	12	13	13	12	11	11	11	11	11
Total Lost time (s)		4.0			4.0	4.0		4.0				
Lane Util. Factor		1.00			0.95	0.95		0.91				
Frt		1.00			1.00	0.85		1.00				
Flt Protected		0.98			1.00	1.00		0.99				
Satd. Flow (prot)		1760			1646	1399		4385				
Flt Permitted		0.98			1.00	1.00		0.99				
Satd. Flow (perm)		1760			1646	1399		4385				
Volume (vph)	192	413	0	0	501	530	174	1104	20	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	213	459	0	0	557	589	193	1227	22	0	0	0
Lane Group Flow (vph)	0	672	0	0	557	589	0	1442	0	0	0	0
Turn Type	Split					Perm	Perm					
Protected Phases	1	1			3			2				
Permitted Phases						3	2					
Actuated Green, G (s)		29.0			26.0	26.0		27.0				
Effective Green, g (s)		31.0			28.0	28.0		29.0				
Actuated g/C Ratio		0.31			0.28	0.28		0.29				
Clearance Time (s)		6.0			6.0	6.0		6.0				
Vehicle Extension (s)		3.0			3.0	3.0		3.0				
Lane Grp Cap (vph)		546			461	392		1272				
v/s Ratio Prot		c0.38			0.34							
v/s Ratio Perm						0.42		0.33				
v/c Ratio		1.23			1.21	1.50		1.13				
Uniform Delay, d1		34.5			36.0	36.0		35.5				
Progression Factor		0.68			0.88	0.79		0.77				
Incremental Delay, d2		113.0			102.1	231.6		68.5				
Delay (s)		136.4			133.7	260.1		96.0				
Level of Service		F			F	F		F				
Approach Delay (s)		136.4			198.7			96.0			0.0	
Approach LOS		F			F			F			A	

Intersection Summary

HCM Average Control Delay	140.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	127.0%	ICU Level of Service	H

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1710	1710	1710	1710	1710	1710
Lane Width	12	12	11	11	11	11
Total Lost time (s)	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
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1593	1676	1621	1378	1540	1378
Flt Permitted	0.09	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	143	1676	1621	1378	1540	1378
Volume (vph)	456	773	699	75	233	451
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	507	859	777	83	259	501
Lane Group Flow (vph)	507	859	777	83	259	501
Turn Type	D.P+P			Perm		pt+ov
Protected Phases	1	1 2	2		3	3 1
Permitted Phases	2			2		
Actuated Green, G (s)	68.0	74.0	45.0	45.0	14.0	43.0
Effective Green, g (s)	72.0	76.0	47.0	47.0	16.0	45.0
Actuated g/C Ratio	0.72	0.76	0.47	0.47	0.16	0.45
Clearance Time (s)	6.0		6.0	6.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	465	1274	762	648	246	620
v/s Ratio Prot	c0.27	0.51	0.48		c0.17	0.36
v/s Ratio Perm	c0.51			0.06		
v/c Ratio	1.09	0.67	1.02	0.13	1.05	0.81
Uniform Delay, d1	31.7	5.9	26.5	14.9	42.0	23.8
Progression Factor	0.73	0.87	0.37	0.05	1.24	1.53
Incremental Delay, d2	66.8	1.3	33.1	0.3	33.2	0.7
Delay (s)	89.9	6.5	42.9	1.0	85.1	37.2
Level of Service	F	A	D	A	F	D
Approach Delay (s)		37.4	38.9		53.5	
Approach LOS		D	D		D	

Intersection Summary

HCM Average Control Delay	41.9	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	F

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	12	14	12	12	14	11	16	12	12	15	12
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97			0.93	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00			1.00	
Satd. Flow (prot)	1711	3493		1770	1863	1689	1711	2039			1892	
Flt Permitted	0.19	1.00		0.16	1.00	1.00	0.11	1.00			0.96	
Satd. Flow (perm)	343	3493		298	1863	1689	206	2039			1824	
Volume (vph)	70	627	60	237	495	495	609	156	46	49	278	390
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	78	697	67	263	550	550	677	173	51	54	309	433
Lane Group Flow (vph)	78	764	0	263	550	550	677	224	0	0	796	0
Turn Type	Perm			pm+pt		Perm	pm+pt			Perm		
Protected Phases		2		1	6		7	4			8	
Permitted Phases	2			6		6	4			8		
Actuated Green, G (s)	19.0	19.0		31.0	31.0	31.0	57.0	57.0			29.0	
Effective Green, g (s)	21.0	21.0		33.0	33.0	33.0	59.0	59.0			31.0	
Actuated g/C Ratio	0.21	0.21		0.33	0.33	0.33	0.59	0.59			0.31	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	72	734		216	615	557	483	1203			565	
v/s Ratio Prot		0.22		c0.10	0.30		c0.34	0.11				
v/s Ratio Perm	0.23			c0.30		0.33	c0.49				0.44	
v/c Ratio	1.08	1.04		1.22	0.89	0.99	1.40	0.19			1.41	
Uniform Delay, d1	39.5	39.5		30.6	31.8	33.3	40.2	9.4			34.5	
Progression Factor	1.07	1.07		1.00	1.00	1.00	1.17	0.66			1.00	
Incremental Delay, d2	108.0	37.5		132.4	18.0	35.2	181.9	0.0			194.4	
Delay (s)	150.1	79.6		163.0	49.8	68.5	228.9	6.2			228.9	
Level of Service	F	E		F	D	E	F	A			F	
Approach Delay (s)		86.2			79.2			173.6			228.9	
Approach LOS		F			E			F			F	

Intersection Summary

HCM Average Control Delay	133.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.30		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	132.6%	ICU Level of Service	H

c Critical Lane Group

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
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			
Lane Util. Factor	1.00	0.95		1.00		0.88		0.95	1.00			
Frt	1.00	1.00		1.00		0.85		1.00	0.85			
Flt Protected	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (prot)	1770	3539		1770		2787		3539	1583			
Flt Permitted	0.95	1.00		0.95		1.00		1.00	1.00			
Satd. Flow (perm)	1770	3539		1770		2787		3539	1583			
Volume (vph)	154	365	0	377	0	664	0	750	153	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	171	406	0	419	0	738	0	833	170	0	0	0
Lane Group Flow (vph)	171	406	0	419	0	738	0	833	170	0	0	0
Turn Type	Split			custom		custom			pm+ov			
Protected Phases	1	1		3				2	3			
Permitted Phases				3		3			2			
Actuated Green, G (s)	15.2	15.2		30.6		30.6		36.2	66.8			
Effective Green, g (s)	17.2	17.2		32.6		32.6		38.2	70.8			
Actuated g/C Ratio	0.17	0.17		0.33		0.33		0.38	0.71			
Clearance Time (s)	6.0	6.0		6.0		6.0		6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0		3.0		3.0	3.0			
Lane Grp Cap (vph)	304	609		577		909		1352	1184			
v/s Ratio Prot	0.10	c0.11		0.24				c0.24	0.05			
v/s Ratio Perm						0.26			0.06			
v/c Ratio	0.56	0.67		0.73		0.81		0.62	0.14			
Uniform Delay, d1	38.0	38.7		29.8		30.9		25.0	4.7			
Progression Factor	0.73	0.82		0.73		0.61		0.79	1.25			
Incremental Delay, d2	0.2	0.3		3.9		4.8		2.0	0.1			
Delay (s)	28.0	32.1		25.5		23.5		21.8	6.0			
Level of Service	C	C		C		C		C	A			
Approach Delay (s)		30.9			24.2			19.1			0.0	
Approach LOS		C			C			B			A	

Intersection Summary

HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	B

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0			3.0						3.0	3.0
Lane Util. Factor		0.95			0.95						1.00	1.00
Frpb, ped/bikes		0.96			1.00						1.00	0.95
Flpb, ped/bikes		1.00			0.99						1.00	1.00
Frt		0.98			0.99						1.00	0.85
Flt Protected		1.00			0.99						0.97	1.00
Satd. Flow (prot)		3320			3445						1802	1506
Flt Permitted		0.77			0.80						0.97	1.00
Satd. Flow (perm)		2568			2780						1802	1506
Volume (vph)	41	377	75	125	1006	48	0	0	0	35	17	35
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	46	419	83	139	1118	53	0	0	0	39	19	39
Lane Group Flow (vph)	0	548	0	0	1310	0	0	0	0	0	58	39
Confl. Peds. (#/hr)	30		120	120		30				100		20
Turn Type	Perm			pm+pt						Split		Perm
Protected Phases		2		1	6					4	4	
Permitted Phases	2			6								4
Actuated Green, G (s)		80.7			80.7						7.3	7.3
Effective Green, g (s)		83.7			83.7						10.3	10.3
Actuated g/C Ratio		0.84			0.84						0.10	0.10
Clearance Time (s)		6.0			6.0						6.0	6.0
Vehicle Extension (s)		3.0			3.0						3.0	3.0
Lane Grp Cap (vph)		2149			2327						186	155
v/s Ratio Prot											c0.03	
v/s Ratio Perm		0.21			c0.47							0.03
v/c Ratio		0.26			0.56						0.31	0.25
Uniform Delay, d1		1.7			2.5						41.6	41.3
Progression Factor		1.32			1.18						1.00	1.00
Incremental Delay, d2		0.3			0.3						1.0	0.9
Delay (s)		2.5			3.3						42.5	42.2
Level of Service		A			A						D	D
Approach Delay (s)		2.5			3.3			0.0			42.4	
Approach LOS		A			A			A			D	

Intersection Summary

HCM Average Control Delay	5.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	10	10	10	10	10	10	10	10	10	10	10
Total Lost time (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00			
Frpb, ped/bikes	1.00	0.96		1.00	0.90			1.00	0.98			
Flpb, ped/bikes	0.96	1.00		1.00	1.00			0.94	1.00			
Frt	1.00	0.98		1.00	0.97			1.00	0.85			
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00			
Satd. Flow (prot)	1588	3122		1652	2878			1584	1441			
Flt Permitted	0.33	1.00		0.20	1.00			0.96	1.00			
Satd. Flow (perm)	549	3122		342	2878			1584	1441			
Volume (vph)	97	517	68	190	605	171	290	103	695	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	108	574	76	211	672	190	322	114	772	0	0	0
Lane Group Flow (vph)	108	650	0	211	862	0	0	436	772	0	0	0
Confl. Peds. (#/hr)	140		100	100		140	40		20	20		40
Turn Type	pm+pt			pm+pt			Perm		pm+ov			
Protected Phases	5	2		1	6			8	1			
Permitted Phases	2			6			8		8			
Actuated Green, G (s)	32.3	26.3		59.6	47.6			28.4	55.7			
Effective Green, g (s)	38.3	29.3		62.6	50.6			31.4	61.7			
Actuated g/C Ratio	0.38	0.29		0.63	0.51			0.31	0.62			
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0	6.0			
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0			
Lane Grp Cap (vph)	304	915		611	1456			497	932			
v/s Ratio Prot	0.03	c0.21		0.10	0.30				c0.25			
v/s Ratio Perm	0.10			0.11				0.28	0.28			
v/c Ratio	0.36	0.71		0.35	0.59			0.88	0.83			
Uniform Delay, d1	20.4	31.6		10.0	17.4			32.5	15.0			
Progression Factor	0.52	0.71		0.73	0.82			1.00	1.00			
Incremental Delay, d2	0.7	4.6		0.3	1.7			15.9	6.1			
Delay (s)	11.2	27.1		7.7	16.0			48.4	21.1			
Level of Service	B	C		A	B			D	C			
Approach Delay (s)		24.9			14.4			31.0			0.0	
Approach LOS		C			B			C			A	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	10	11	12	10	11	12	10	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.93		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1652	3369		1652	3196		1652	1775		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.72	1.00		0.23	1.00	1.00
Satd. Flow (perm)	1652	3369		1652	3196		1256	1775		425	1863	1583
Volume (vph)	224	1050	119	1	287	224	155	166	76	181	48	227
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	249	1167	132	1	319	249	172	184	84	201	53	252
Lane Group Flow (vph)	249	1299	0	1	568	0	172	268	0	201	53	252
Turn Type	Prot			Prot			Perm			pm+pt		Perm
Protected Phases	5	2		1	6			8		7	4	
Permitted Phases							8			4		4
Actuated Green, G (s)	23.4	50.2		0.8	27.6		17.0	17.0		31.0	31.0	31.0
Effective Green, g (s)	25.4	52.2		2.8	29.6		19.0	19.0		33.0	33.0	33.0
Actuated g/C Ratio	0.25	0.52		0.03	0.30		0.19	0.19		0.33	0.33	0.33
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	420	1759		46	946		239	337		275	615	522
v/s Ratio Prot	c0.15	c0.39		0.00	0.18			0.15		c0.07	0.03	
v/s Ratio Perm							0.14			c0.17		0.16
v/c Ratio	0.59	0.74		0.02	0.60		0.72	0.80		0.73	0.09	0.48
Uniform Delay, d1	32.8	18.6		47.3	30.1		38.0	38.6		26.5	23.1	26.7
Progression Factor	0.96	0.89		1.00	1.00		1.00	1.00		0.61	0.55	0.30
Incremental Delay, d2	1.6	2.1		0.2	2.8		9.9	12.2		6.1	0.0	0.4
Delay (s)	33.0	18.5		47.5	33.0		47.9	50.8		22.4	12.7	8.4
Level of Service	C	B		D	C		D	D		C	B	A
Approach Delay (s)		20.9			33.0			49.7			14.4	
Approach LOS		C			C			D			B	

Intersection Summary

HCM Average Control Delay	26.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	C

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	11	12	12	14	11	11	11
Grade (%)		-1%			-3%			-3%			4%	
Total Lost time (s)		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	
Frt		0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.99			0.95	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1755			1742	1554	1796	1891	1714	1676	1762	
Flt Permitted		0.92			0.72	1.00	0.09	1.00	1.00	0.27	1.00	
Satd. Flow (perm)		1630			1313	1554	172	1891	1714	476	1762	
Volume (vph)	4	5	5	434	8	186	3	445	130	98	835	7
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	6	6	482	9	207	3	494	144	109	928	8
Lane Group Flow (vph)	0	16	0	0	491	207	3	494	144	109	936	0
Turn Type	Perm			Perm		Perm	Perm		Perm	pm+pt		
Protected Phases		4			8			2		1	6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		36.0			36.0	36.0	42.0	42.0	42.0	52.0	52.0	
Effective Green, g (s)		38.0			38.0	38.0	44.0	44.0	44.0	54.0	54.0	
Actuated g/C Ratio		0.38			0.38	0.38	0.44	0.44	0.44	0.54	0.54	
Clearance Time (s)		6.0			6.0	6.0	6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		619			499	591	76	832	754	329	951	
v/s Ratio Prot								0.26		0.02	c0.53	
v/s Ratio Perm		0.01			c0.37	0.13	0.02		0.08	0.16		
v/c Ratio		0.03			0.98	0.35	0.04	0.59	0.19	0.33	0.98	
Uniform Delay, d1		19.4			30.7	22.2	16.0	21.2	17.1	13.9	22.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00	1.00	0.73	0.55	
Incremental Delay, d2		0.0			35.9	0.4	1.0	3.1	0.6	0.6	25.3	
Delay (s)		19.4			66.6	22.5	16.9	24.3	17.7	10.7	37.8	
Level of Service		B			E	C	B	C	B	B	D	
Approach Delay (s)		19.4			53.5			22.8			35.0	
Approach LOS		B			D			C			D	

Intersection Summary

HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	96.5%	ICU Level of Service	E

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	300	10	3	335	0	20	0	19	65	8	184
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	333	11	3	372	0	22	0	21	72	9	204
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
vC, conflicting volume	372			344			927	718	339	739	723	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			87	100	97	78	97	70
cM capacity (veh/h)	1186			1215			170	354	703	323	351	674

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	344	376	43	81	204
Volume Left	0	3	22	72	0
Volume Right	11	0	21	0	204
cSH	1700	1215	269	325	674
Volume to Capacity	0.20	0.00	0.16	0.25	0.30
Queue Length (ft)	0	0	14	24	32
Control Delay (s)	0.0	0.1	20.9	19.7	12.7
Lane LOS		A	C	C	B
Approach Delay (s)	0.0	0.1	20.9	14.7	
Approach LOS			C	B	

Intersection Summary

Average Delay	4.9		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (veh/h)	396	121	28	115	259	54
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	440	134	31	128	288	60

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total (vph)	574	31	128	348
Volume Left (vph)	0	31	0	288
Volume Right (vph)	134	0	0	60
Hadj (s)	-0.1	0.2	0.0	0.1
Departure Headway (s)	5.2	7.0	6.8	5.9
Degree Utilization, x	0.83	0.06	0.24	0.57
Capacity (veh/h)	679	405	420	578
Control Delay (s)	28.5	9.3	10.8	16.3
Approach Delay (s)	28.5	10.5		16.3
Approach LOS	D	B		C

Intersection Summary			
Delay	21.9		
HCM Level of Service	C		
Intersection Capacity Utilization	57.6%	ICU Level of Service	A

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	NB 1	SE 1	NW 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1622		1023	1084

Direction, Lane #	SE 1	SE 2	NW 1	NW 2	NE 1	NE 2
Volume Total	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	0	0
Control Delay (s)	0.0	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	0.0%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	0	0	0	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type				Perm		Perm	pm+pt					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					6
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)												
Lane Util. Factor												
Frt												
Flt Protected												
Satd. Flow (prot)												
Flt Permitted												
Satd. Flow (perm)												
Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm		Perm							pm+pt		
Protected Phases		4						2		1	6	
Permitted Phases	4		4							6		
Actuated Green, G (s)												
Effective Green, g (s)												
Actuated g/C Ratio												
Clearance Time (s)												
Vehicle Extension (s)												
Lane Grp Cap (vph)												
v/s Ratio Prot												
v/s Ratio Perm												
v/c Ratio												
Uniform Delay, d1												
Progression Factor												
Incremental Delay, d2												
Delay (s)												
Level of Service												
Approach Delay (s)		0.0			0.0			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	0.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.00		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	0.0%	ICU Level of Service	A

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↱
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	1796	3104	72	0	36
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (veh/h)	0	1996	3449	80	0	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume	3529				4487	1764
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	45
cM capacity (veh/h)	69				1	73

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	998	998	2299	1230	40
Volume Left	0	0	0	0	0
Volume Right	0	0	0	80	40
cSH	1700	1700	1700	1700	73
Volume to Capacity	0.59	0.59	1.35	0.72	0.55
Queue Length (ft)	0	0	0	0	58
Control Delay (s)	0.0	0.0	0.0	0.0	102.2
Lane LOS					F
Approach Delay (s)	0.0		0.0		102.2
Approach LOS					F

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	107.9%	ICU Level of Service	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-5%			0%			-4%			0%	
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	0.97	1.00	1.00		1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85		0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	3519	3627		1770	3539	1583	3502	1900	1615		1795	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	3519	3627		1770	3539	1583	3502	1900	1615		1795	
Volume (vph)	135	1682	2	11	2678	308	1343	15	539	9	5	1
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	150	1869	2	12	2976	342	1492	17	599	10	6	1
Lane Group Flow (vph)	150	1871	0	12	2976	342	1492	17	599	0	17	0
Turn Type	Prot			Prot		pm+ov	Split		pm+ov	Split		
Protected Phases	5	2		1	6	4	4	4	5	8	8	
Permitted Phases						6			4			
Actuated Green, G (s)	6.0	74.1		2.9	71.0	105.1	34.1	34.1	40.1		3.0	
Effective Green, g (s)	8.0	76.1		4.9	73.0	109.1	36.1	36.1	44.1		5.0	
Actuated g/C Ratio	0.06	0.55		0.04	0.53	0.79	0.26	0.26	0.32		0.04	
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0		6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0	
Lane Grp Cap (vph)	204	1999		63	1871	1296	915	497	516		65	
v/s Ratio Prot	0.04	c0.52		0.01	c0.84	0.07	c0.43	0.01	c0.07		c0.01	
v/s Ratio Perm						0.15			0.30			
v/c Ratio	0.74	0.94		0.19	1.59	0.26	1.63	0.03	1.16		0.26	
Uniform Delay, d1	64.0	28.7		64.7	32.6	3.8	51.0	38.0	47.0		64.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2	12.9	8.9		1.5	268.3	0.1	288.8	0.0	92.2		2.1	
Delay (s)	76.9	37.7		66.1	300.9	4.0	339.8	38.0	139.2		66.9	
Level of Service	E	D		E	F	A	F	D	F		E	
Approach Delay (s)		40.6			269.5			280.3			66.9	
Approach LOS		D			F			F			E	

Intersection Summary

HCM Average Control Delay	210.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.56		
Actuated Cycle Length (s)	138.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	145.8%	ICU Level of Service	H

c Critical Lane Group