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April 12, 2010

Anthony Hood
Chairperson
District of Columbia Zoning Commission
441 4th Street NW, Suite 210S
Washington, DC 20001

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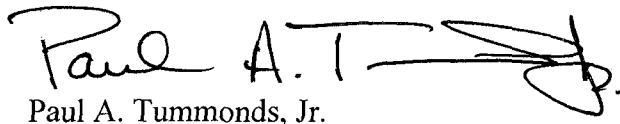
Re: **Consolidated PUD and Zoning Map Amendment Application**
Case No. 09-03 – Response to Materials Submitted by the Ft. Baker Drive
Neighbors on March 29, 2010

Dear Chairperson Hood and Members of the Zoning Commission:

Skyland Holdings, LLC (the “**Applicant**”) hereby submits a Technical Memorandum, dated April 12, 2010, prepared by Gorove/Slade Associates, Inc. This Technical Memorandum responds to the summary report prepared by MCV Associates, Inc. filed with the Zoning Commission on March 29, 2010.

The Applicant looks forward to presenting rebuttal testimony to the Zoning Commission on April 21, 2010.

Sincerely


Paul A. Tummonds, Jr.

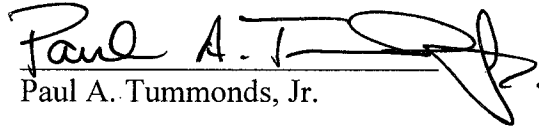
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ZONING COMMISSION
District of Columbia

CASE NO. 09-03
EXHIBIT NO. 104

Certificate of Service

I certify that on April 12, 2010, a copy of the foregoing document was hand-delivered, sent via E-Mail, or mailed to the addresses listed below.


Paul A. Tummonds, Jr.

Ft. Baker Drive Residents
c/o Martin Sullivan, Esq.
25830 Collins Avenue
Chestertown, MD 21620 (Via E-Mail and Standard Mail)

ANC 7B
c/o Yvonne Moore, Chairperson ANC 7B
3200 S Street, SE
Washington, DC 20020 (Via Hand Delivery)

And

Robert Richards, Vice Chair, ANC 7B
3524 Carpenter Street, SE
Washington, DC 20020 (Via Hand Delivery)

ANC 8B
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Washington, DC 20030 (Via Standard Mail)

D.C. Office of Planning
c/o Maxine Brown-Roberts
2000 14th Street, NW
4th Floor
Washington, DC 20009 (Via Standard Mail)



TECHNICAL MEMORANDUM

TO: Paul A. Tummonds, Jr., Esq. Goulston & Storrs

FROM: Cullen E. Elias, PTP, TOPS
Erwin N. Andres, P.E.

CC: Gary Rappaport The Rappaport Companies
Larry Spott The Rappaport Companies
Sam Rank The Rappaport Companies
Steve Green William C. Smith & Co.
Matthew Ritz William C. Smith & Co.

DATE: April 12, 2010

SUBJECT: Response to MCV Associates Traffic Report – Skyland Town Center
Planned Unit Development Zoning Commission Hearing (Case No. 09-03)

Gorove Slade Associates (G/SA) has reviewed the traffic report dated March 29, 2010 which was prepared by MCV Associates, Inc and filed by the Fort Baker Drive Party for the Zoning Commission Hearing of Case No. 09-03 for Skyland Town Center. The MCV Associates report refers to the G/SA Traffic Impact Study (dated September 2009) submitted in support of the proposed development. For ease of reference, a copy of the MCV report is included as Attachment 1. G/SA's responses to key comments are presented below, in the order of their presentation in the MCV report.

A. Study Area Intersections

MCV Comment: *"The study analyzed intersections that are adjacent to the site and included only one intersection farther away from the site (Alabama Avenue/Branch Avenue)..... 35% of the site traffic (more than a third) will be coming on Naylor Road, to and from the north. However, Gorove/Slade did not include a single intersection on this approach route for analysis. The intersection of Naylor Road/Minnesota Avenue should have been included in the analysis. Similarly, 25% of the site traffic will be coming on Good Hope Road, to and from the northwest. However, Gorove/Slade did not include a single intersection on this approach route for analysis. The intersection of Good Hope Road/Minnesota Avenue should have been included in the analysis. DDOT had similar concerns, as noted in their report. Fort Baker Drive is a good candidate for cut-through traffic. The intersection of Fort Baker Drive and 30th Street should have been included in the analysis" (Pages 1-2).*

G/SA Response: The study area roadway network was defined based on several meetings held with DDOT staff as noted on page 2, paragraph 2 of the DDOT report to the DC Office of Zoning (dated December 7, 2009). This section of the DDOT report also notes that the meetings "revealed

the need for the evaluation of intersections further away from the site” (page 2). As such, the intersection of Branch Avenue at Alabama Avenue was identified by DDOT to satisfy that need. The G/SA September 2009 traffic report analyzed this intersection to address DDOT’s requirement.

B. Traffic Data

MCV Comment: *“All traffic analysis is based on traffic data collected in the year 2006. The data is three years old. This data was used by Gorove/Slade in the Synchro model in December 2008.....Gorove/Slade should have collected traffic data at a typical intersection in the year 2008 and compared with the older data to show that the traffic volumes have not changed significantly since the data was collected three years ago and the use of such data would not result in erroneous results” (Page 2).*

G/SA Response: Traffic turning movement counts were conducted at the Branch Avenue/Alabama Avenue intersection in October 2007. As noted in the response for Item A above, this intersection was added to the initial study area roadway network following several meeting held with DDOT staff. Based on these counts and field observations done concurrently at key locations and subsequently in 2008, it was determined that there was no measurable growth in traffic between 2006 and 2008. Therefore, the 2006 traffic counts for the other intersections were considered to be still appropriate for the 2008 capacity analyses.

This conclusion is also confirmed with the DDOT Average Annual Weekday Volume Maps for the period 2006 – 2008. The maps indicate that traffic volumes along the study area roadways remained stable during that period. These volumes are shown in the Table 1 below:

Table 1
Average Annual Weekday Traffic Volumes
(Taken from DDOT Traffic Volume Maps)

Year	DDOT Average Annual Weekday Traffic Volumes		
	Good Hope Road	Naylor Road	Alabama Avenue
2006	15,000	14,900	11,800
2007	15,100	15,000	11,900
2008	15,000	14,900	11,800

C. Levels of Service

MCV Comment: *“Gorove/Slade used the Synchro model to compute levels of service during the AM and PM peak hours....A comparison of the worksheets and the summary results.....show several discrepancies....The Synchro Model was used to compute levels of service in the background conditions similar to the existing conditions....It seems that Gorove/Slade has changed traffic signal timings at several intersections in the*

background conditions in comparison to existing conditions. The signal timing changes has actually resulted in the background conditions operating better than the existing conditions due to individual intersection signal timing change, even though there is an increase in traffic volumes....The traffic study as well as DDOT has emphasized the need to accommodate pedestrian crossings and pedestrian safety in the traffic analysis. The level of service analysis does not incorporate an increased level of pedestrian activity. The incorporation of the increased pedestrian activity can reduce the intersection levels of service” (Pages 2-4).

G/SA Response: The worksheets which correspond with the existing levels of service results (shown in Table 3 on page 13 of the submitted traffic report) are included as Attachment 2. The analysis worksheets included for the background and total traffic situations assume the provision of optimized signal phasing/timing operations. The Applicant will coordinate with DDOT to implement the proposed optimized signal phasing/timing improvements, as determined necessary upon build-out of the proposed development. Those improvements will include appropriate signal timing adjustments to accommodate any increased pedestrian activity. The Applicant is also working with DDOT to provide additional pedestrian improvements to minimize potential pedestrian-vehicular conflicts along the site.

D. Trip Generation

MCV Comment: *“Gorove/Slade used the ITE Trip Generation Report to compute AM and PM peak hour trips and reduced them to account for passer-by trips, synergy reductions and Alternate mode reductions. The 25% reduction in passer-by trips is reasonable. In terms of the reduction due to synergy, Table 6 (attached here as Exhibit 6) shows that almost 46 percent of the vehicle trips leaving the apartments in the PM peak hour are going to the on-site retail. There is no justification for using such a high synergy factor. A 25 percent synergy would be an acceptable number. Table 6 also shows that the vehicle trips to and from the site were further reduced by 30 percent due to the Naylor Road Metrorail station, located approximately one mile from the site. Further, Gorove/Slade refers to the WMATA 2005 Development-Related Ridership Survey II as the source for this percentage reduction....The WMATA data clearly shows that using 30% mode share for a Metrorail station located one mile away is too high. The use of reasonable and acceptable reduction factors for synergy trips and mode share trips will result in an increase of vehicular trip generation shown in Table 6 of Gorove/Slade report....” (Pages 2-3).*

G/SA Response: The synergy factors were calculated based on the ITE Synergy Worksheet (*ITE Trip Generation Handbook*, 2nd Edition, June 2004). Copy of this worksheet is included as Attachment 3.

As noted in Table 6 (Projected Site Trip Generation) of the G/SA traffic study, the 30% factor relates to "alternative mode" (transit, walk, bike) trip reduction and not only to "transit" trip reduction. The other considerations regarding this trip reduction factor are presented below:

- a) The adjacent land uses include single- and multi-family developments within easy walking distance from the site. The location of significant retail uses adjacent to the site (including the McDonalds and the Good Hope Market Place shopping center with a Safeway store situated opposite the site) would also produce multi-purpose shopping trips via walking/biking.
- b) The 2000 Census records indicate the following:
 - Approximately 40% of the households within the site's Zip Code (20020) use alternate modes of transportation to work
 - Approximately 28% of the households within the site's Census Tract (76.04) use alternate modes of transportation to work
 - Approximately 32% of the households within the adjacent/surrounding Census Tracts (75.02, 76.04, 76.05 and 99.01) use alternate modes of transportation to work.
- c) The adjacent residential areas are heavily transit dependent. The site is served by nine Metrobus routes.
- d) The development plan proposes the implementation of an effective Transportation Management Program which will include maintaining bus routes on the site and the provision of transit subsidies, ZipCar spaces, a bus transit/commuter store and other enhanced transit and pedestrian facilities.
- e) The proposed development has been considered a "Transit Oriented Development" and confirmed with discussions with DDOT.

The above factors support the alternative mode trip reduction assumptions used in the traffic study.

E. Traffic Simulation

MCV Comment: *"SIMULATION – Due to the close proximity of the various intersections, queuing will result in spillbacks and block adjacent intersections. This will further deteriorate the levels of service. MCV developed the AM peak hour Synchro Model using traffic data and signal timing from the Gorove/Slade Report for the total conditions with the site developed. At the February 17 hearing, we presented the simulation of traffic flow through the roadway network. This simulation model is used widely in the industry. The time period that you saw was approximately 8:00 AM. Pursuant to this simulation, the queues on all critical roadways are extensive and in almost all cases extend in to adjacent intersections. Exhibit 9 presents a summary of the queues in the number of vehicles per lane and in feet..." (Page 4).*

G/SA Response: The simulation performed by MCV does not account for any field calibration of their Synchro model that should have been performed to accurately reflect existing traffic flow conditions. Field observations indicate that while there is some queuing along Branch Avenue northbound at Alabama Avenue due primarily to regional traffic, the queues in the remainder of the study area network are discharged efficiently by the existing traffic signals. As noted earlier, the G/SA traffic study has determined that signal optimization improvements would be needed to accommodate future traffic growth including the additional vehicular and pedestrian trips generated by the proposed development. The Applicant is committed to working with DDOT to implement those improvements, if identified as necessary after build-out and full occupancy of the proposed development.

In addition, Exhibit 9 (of the MCV report) includes information which is inaccurate as noted below:

- 1) The Exhibit provides queuing results for “26th Street SE NB at Alabama Ave SE”. This intersection does not exist and was not evaluated in the submitted G/SA traffic study.
- 2) The Exhibit’s representation of the length of several queues is inaccurate based on both map and field measurements.

The key issues identified by the MCV report are addressed by the responses provided above. These responses support the general conclusion (of the submitted G/SA traffic study) that the proposed development would be accommodated with the implementation of identified roadway improvements and a Transportation Management Plan including measures to encourage increased use of transit and other alternative modes (walk and bike). The proposed development would not be objectionable from the perspectives of traffic and parking.

MATTER-OF-RIGHT TRIP GENERATION COMPARISON

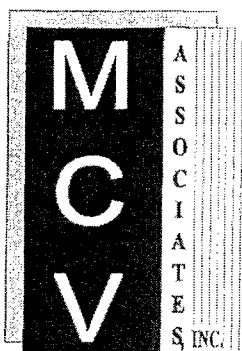
In conjunction with the above responses, the projected trip generation for the proposed Skyland Town Center (as presented in Table 6 on page 18 of the submitted G/SA traffic study) was compared with the projected trip generation for two potential matter-of-right development scenarios. The comparison results are shown in Table 2.

Table 2
Proposed Development vs. Matter-of-Right Trip Generation Comparison

Development Scenario	Comparative Trip Generation		
	AM Peak Hour Total	PM Peak Hour Total	Total
<i>Proposed Skyland Town Center Development</i> 448 Apartment Units 20 Townhouses 315,520 SF Retail	549	1,616	2,165
<i>Potential Matter-of-Right Development (Option 1)</i> 452 Apartment Units 123,975 SF Retail 1,115,775 SF Office	1,692	2,329	4,021
<i>Potential Matter-of-Right Development (Option 2)</i> 2,890 Apartment Units	1,420	1,607	3,027

The data presented in Table 2 above clearly demonstrates that the proposed development would generate significantly lower peak hour trips compared with any of the two potential matter-of-right development scenarios. With the improvements noted above and in the submitted G/SA Traffic study, it is anticipated that the proposed development would be accommodated without significant traffic and parking impacts.

**Attachment 1 – Memorandum from Joe Mehra to Martin Sullivan,
Dated March 29, 2010.**



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MEMORANDUM

TO: Martin P. Sullivan
FROM: Joe Mehra, P.E. PTOE
SUBJECT: Skyland Town Center
DATE: March 29, 2010

JOB: J-710

REVIEW OF "TRAFFIC IMPACT STUDY FOR THE SKYLAND TOWN CENTER PUD,
prepared by Gorove/Slade Associates, Inc., dated September 2009.

The traffic study follows the generally accepted industry guidelines for conducting a traffic impact study. However, several assumptions that were made to arrive at the conclusions are not valid or have not been confirmed. Some of the discrepancies and shortcomings of the traffic analysis are presented.

STUDY AREA INTERSECTIONS – The study analyzed intersections that are adjacent to the site and included only one intersection farther away from the site (Alabama Avenue/Branch Avenue). Figure 8 (attached here as Exhibit 1) shows that 35% of the site traffic (more than a third) will be coming on Naylor Road, to and from the north. However, Gorove/Slade did not include a single intersection on this approach route for analysis. The intersection of Naylor Road/Minnesota Avenue should have been included in the analysis. Similarly, 25% of the site traffic will be coming on Good Hope Road, to and from the northwest. However, Gorove/Slade did not include a single intersection on this approach route for analysis. The intersection of Good Hope Road/Minnesota Avenue should have been included in the analysis. DDOT had similar concerns, as noted in their report.

Fort Baker Drive is a good candidate for cut-through traffic. The intersection of Fort Baker Drive and 30th Street should have been included in the analysis.

EXISTING CONDITIONS TRAFFIC DATA – All traffic analysis is based on traffic data collected in the year 2006. The data is three years old. This data was used by Gorove/Slade in the Synchro model in December 2008 (more than two years after the data was collected). The Institute of Transportation Engineers (ITE) Recommended Practice for Traffic Impact Analysis for Site development states, that traffic volume data should be no older than one year. Gorove/Slade should have collected traffic data at a typical intersection in the year 2008 and compared with the older data to show that the traffic volumes have not changed significantly since the data was collected three years ago and the use of such data would not result in erroneous results.

EXISTING CONDITIONS LEVELS OF SERVICE – Gorove/Slade used the Synchro model to compute levels of service during the AM and PM peak hours. The Synchro Model worksheets with limited information was provided. Critical information, such as queue lengths, have not been reported. A comparison of the worksheets and the summary results included in Table 1 (attached here as Exhibit 2) show several discrepancies. For example, the vehicle delay for the intersection of Good Hope Road/Naylor Road/25th Street is reported as 60.2 seconds per vehicle, whereas the model shows 76.6 seconds (attached here as Exhibit 3), almost 27 percent higher. Similarly, the vehicle delay for the intersection of Alabama Avenue/Naylor Road is shown as 39.1 seconds per vehicle, whereas the model shows 50.2 seconds (attached here as Exhibit 4), almost 28 percent higher.

BACKGROUND CONDITIONS LEVELS OF SERVICE – The Synchro Model was used to compute levels of service in the background conditions similar to the existing conditions. The industry practice is to use the same signal timings and phasings as the existing conditions, unless the signal phasings are being changed. Further, since the signals are generally on a coordinated system, changing of signal timing at one intersection can impact the overall system. Changes should not be made unless DDOT concurs with the changes. It seems that Gorove/Slade has changed traffic signal timings at several intersections in the background conditions in comparison to the existing conditions. The signal timing changes has actually resulted in the background conditions operating better than the existing conditions due to individual intersection signal timing change, even though there is an increase in traffic volumes. An example is the intersection of Alabama Avenue/Naylor Road, the 50.2 seconds per vehicle delay in existing conditions decreases to 39.8 seconds per vehicle in the background conditions (Table 3 attached here as Exhibit 5).

SITE TRAFFIC GENERATION – Gorove/Slade used the ITE Trip Generation Report to compute AM and PM peak hour trips and reduced them to account for passer-by

trips, synergy reductions and Alternate mode reductions. The 25% reduction in passer-by trips is reasonable. In terms of the reduction due to synergy, Table 6 (attached here as Exhibit 6) shows that almost 46 percent of the vehicle trips leaving the apartments in the PM peak hour are going to the on-site retail. There is no justification for using such a high synergy factor. A 25 percent synergy would be an acceptable number.

Table 6 also shows that the vehicle trips to and from the site were further reduced by 30 percent due to the Naylor Road Metrorail station, located approximately one mile from the site. Further, Gorove/Slade refers to the WMATA 2005 Development-Related Ridership Survey II as the source for this percentage reduction and a quote from the traffic report, "Using the models provided in the study and given the distance from the Naylor Road Metrorail, a 30% reduction was applied to the residential and commercial trips." A review of this WMATA study shows that all residential and commercial sites that were studied were within approximately one-half mile of a metrorail station. No sites were one mile away from the station. Further, the study showed that the metrorail mode share for residential uses was 31% for one-half mile distance from the station (Table 11, Page 32 of the WMATA Report, (attached here as Exhibit 7)). Further, the WMATA report shows that the average Metrorail mode share for all retail sites surveyed was 29%, See Table 15 (attached here as Exhibit 8) of WMATA Report (all sites were within 1,700 feet of a Metrorail station). The WMATA data clearly shows that using 30% mode share for a Metrorail station located one mile away is too high.

The use of reasonable and acceptable reduction factors for synergy trips and mode share trips will result in an increase of vehicular trip generation shown in Table 6 of Gorove/Slade report. On a daily basis, approximately 13,000 vehicles will be entering and exiting this site. This is more than the total traffic that is currently traveling on Good Hope Road or Alabama Avenue.

TOTAL CONDITIONS LEVELS OF SERVICE – As noted earlier, the signal timing should be the same as in the existing conditions and background conditions. Gorove/Slade changed the signal timing at most of the intersections in analyzing the levels of service with the site traffic. The intersection of Alabama Avenue/Branch Avenue is projected to operate at better levels of service than the background conditions without any roadway improvements but with a significant increase in traffic. In some cases the clearance intervals have been reduced when analyzing the levels of service. This results in a better level of service than otherwise. The clearance intervals are a major safety issue. The clearance intervals cannot be changed unless roadway geometry changes. Due to these reasons the computed levels of service are erroneous and cannot be used to evaluate the impact of the project.

The traffic study as well as DDOT has emphasized the need to accommodate pedestrian crossings and pedestrian safety in the traffic analysis. The levels of service analysis does not incorporate an increased level of pedestrian activity. The incorporation of the increased pedestrian activity can reduce the intersection levels of service.

CONCLUSIONS – The traffic analysis has the following shortcomings:

1. Did not incorporate critical intersections in the analysis even though a significant portion of the site traffic would be passing by these intersections
2. Made some assumptions that are clearly invalid in terms of vehicle trip generation. Correcting for these assumptions would result in an increase in site trip generation.
3. The levels of service analysis has not used the signal timing consistently, with the consequence, that background conditions are projected to be better than the existing conditions even though there is an increase in traffic and no intersection improvements were included. Further, the conditions with the site developed are also projected to be better than the background conditions without any intersection improvements but including a significant increase in traffic.
4. The clearance intervals have been reduced in comparison to the existing conditions data.
5. The use of the correct data in trip generation, pedestrian activity and levels of service analysis may result in several more intersections failing with the site traffic.
6. Due to the above listed shortcomings, the traffic study results are invalid and cannot be used to assess the site impacts.

SIMULATION - Due to the close proximity of the various intersections, queuing will result in spillbacks and block adjacent intersections. This will further deteriorate the levels of service. MCV developed the AM peak hour Synchro Model using traffic data and signal timing from the Gorove/Slade Report for the total conditions with the site developed. At the February 17 hearing, we presented the simulation of traffic flow through the roadway network. This simulation model is used widely in the industry. The time period that you saw was approximately 8:00 AM. Pursuant to this simulation, the queues on all critical roadways are extensive and in almost all cases extend in to adjacent intersections. Exhibit 9 presents a summary of the queues in number of vehicles per lane and in feet. Queues of over 2,000 feet or approximately one half of a mile is projected on Branch Avenue, Good Hope Road and Naylor Road.

The average speed in the network is simulated to be four (4) miles per hour during the morning peak hour.

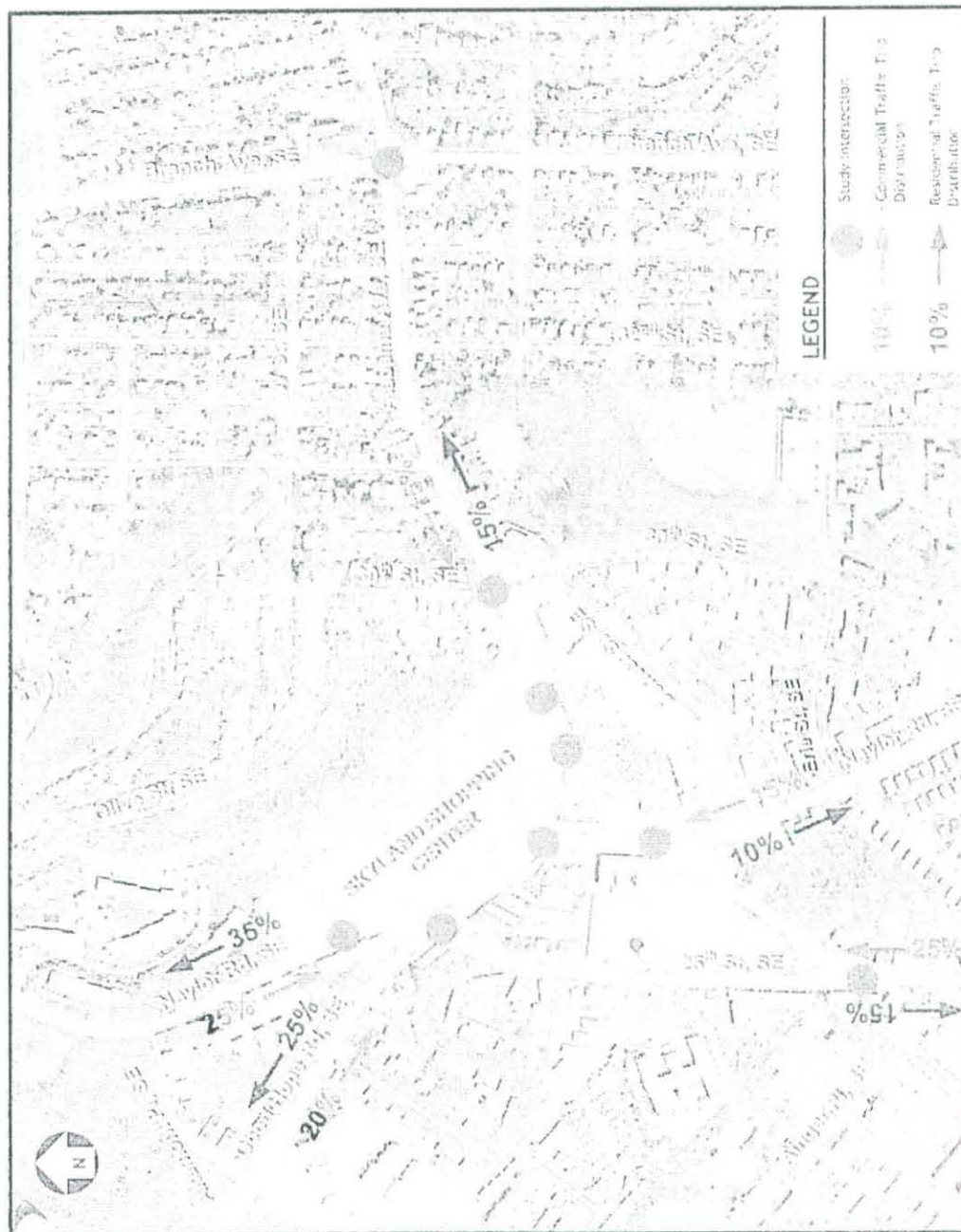


Figure 8 – Directional Trip Distributions



Table 1 – Existing Levels of Service

Intersection (Approach)	Existing Conditions	
	AM Peak Hour Level of Service	PM Peak Hour Level of Service
Good Hope Road & Naylor Road/25th Street SE		
Overall	E (60.2)	C (22.8)
Eastbound	C (23.1)	C (27.1)
Westbound	C (34.1)	C (23.4)
Northbound	F (123.3)	C (27.7)
Southbound	B (15.0)	C (17.5)
Alabama Avenue & Naylor Road SE		
Overall	D (39.1)	C (24.2)
Eastbound	C (25.9)	C (29.1)
Westbound	D (33.2)	D (32.6)
Northbound	D (51.9)	B (12.2)
Southbound	B (13.7)	B (18.7)
Alabama Avenue & 30th Street SE		
Overall	B (12.8)	B (14.1)
Eastbound	B (13.1)	A (5.3)
Westbound	A (5.2)	A (6.1)
Northbound	D (41.9)	D (35.5)
Southbound	D (36.1)	D (45.2)
25th Street & Alabama Avenue SE		
Overall	C (34.4)	B (17.3)
Eastbound		
Westbound	B (18.5)	B (19.5)
Northbound	D (49.6)	B (16.6)
Southbound	B (16.1)	B (14.8)
Good Hope Road/Naylor Road SE		
Overall	B (19.2)	B (11.6)
Eastbound	C (23.4)	A (6.7)
Westbound	C (31.9)	A (6.3)
Northbound	A (9.7)	C (32.7)
Southbound	A (9.9)	D (45.5)
Good Hope Road/Skyland Entrance & Alabama Avenue SE		
Overall	C (30.6)	C (21.3)
Eastbound	B (19.8)	C (20.9)
Westbound	C (22.4)	C (25.0)
Northbound	C (20.9)	B (15.1)
Southbound	D (37.2)	C (34.6)
Branch Avenue/Alabama Avenue SE		
Overall	F (111.5)	F (221.1)
Eastbound	E (61.0)	F (81.5)
Westbound	D (48.6)	F (96.6)
Northbound	F (209.5)	C (29.1)
Southbound	D (50.0)	F (510.4)

Exhibit 2

Skyland Shopping Center
2: 25th Street SE & Good Hope Road SE

Existing AM Peak Hour
5/11/2007

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
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	
Lane Util. Factor		1.00			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			0.99			0.98	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.98			0.97	
Flt Protected		0.99			0.97			1.00			1.00	
Satd. Flow (prot)		1821			3428			3410			3384	
Flt Permitted		0.77			0.53			0.80			0.95	
Satd. Flow (perm)		1418			1869			2742			3218	
Volume (vph)	197	542	55	209	181	12	11	176	32	12	838	170
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	589	60	227	197	13	12	191	35	13	911	185
RTOR Reduction (vph)	0	3	0	0	2	0	0	14	0	0	17	0
Lane Group Flow (vph)	0	860	0	0	435	0	0	224	0	0	1092	0
Confl. Peds. (#/hr)			1			26			39			30
Turn Type	Perm			D.P+P			Perm			Perm		
Protected Phases		3		2	2 3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		47.0			51.0			34.0			34.0	
Effective Green, g (s)		48.0			53.0			35.0			35.0	
Actuated g/C Ratio		0.48			0.53			0.35			0.35	
Clearance Time (s)		5.0						5.0			5.0	
Lane Grp Cap (vph)		681			1069			960			1126	
v/s Ratio Prot					c0.02							
v/s Ratio Perm		c0.61			0.20			0.08			c0.34	
v/c Ratio		1.26			0.41			0.23			0.97	
Uniform Delay, d1		26.0			14.1			23.0			32.0	
Progression Factor		1.17			1.00			1.00			1.00	
Incremental Delay, d2		122.7			1.1			0.6			20.5	
Delay (s)		153.2			15.2			23.6			52.5	
Level of Service		F			B			C			D	
Approach Delay (s)		153.2			15.2			23.6			52.5	
Approach LOS		F			B			C			D	

Intersection Summary			
HCM Average Control Delay	76.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	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	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			0.99	
Frt		1.00			0.98			1.00			1.00	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		1856			1795			3499			3499	
Flt Permitted		1.00			0.98			0.73			0.91	
Satd Flow (perm)		1854			1755			2567			3194	
Volume (vph)	3	1029	15	5	195	44	73	258	1	23	367	3
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1118	16	5	212	48	79	280	1	25	399	3
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	1137	0	0	257	0	0	360	0	0	426	0
Confl. Peds. (#/hr)			64			27			21	76		
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		49.0			49.0			27.0			27.0	
Effective Green, g (s)		57.0			57.0			35.0			35.0	
Actuated g/C Ratio		0.57			0.57			0.35			0.35	
Clearance Time (s)		12.0			12.0			12.0			12.0	
Lane Grp Cap (vph)		1057			1000			898			1118	
v/s Ratio Prot												
v/s Ratio Perm		0.61			0.15			0.14			0.13	
v/c Ratio		1.08			0.26			0.40			0.38	
Uniform Delay, d1		21.5			10.8			24.6			24.4	
Progression Factor		1.00			1.22			1.00			1.43	
Incremental Delay, d2		50.3			0.6			1.3			0.9	
Delay (s)		71.8			13.8			25.9			35.7	
Level of Service		E			B			C			D	
Approach Delay (s)		71.8			13.8			25.9			35.7	
Approach LOS		E			B			C			D	
Intersection Summary												
HCM Average Control Delay		50.2										
HCM Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		100.0										
Intersection Capacity Utilization		90.9%										
Analysis Period (min)		15										
c Critical Lane Group												



Table 3 – Background Levels of Service

Intersection (Approach)	Background Conditions		Background Conditions with Improvements	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
	Level of Service	Level of Service	Level of Service	Level of Service
Good Hope Road/Naylor Road/25th Street				
Overall	F (110.3)	C (30.7)	D (42.8)	C (20.2)
Eastbound	C (28.4)	C (23.9)	C (28.4)	C (23.9)
Westbound	D (48.2)	B (18.6)	C (24.0)	B (13.2)
Northbound	F (288.1)	F (87.0)	D (50.4)	C (30.9)
Southbound	C (27.6)	C (21.1)	D (48.2)	B (18.6)
Alabama Avenue/Naylor Road				
Overall	D (39.8)	C (23.5)	D (39.8)	C (23.5)
Eastbound	E (70.2)	C (33.0)	E (70.2)	C (33.0)
Westbound	C (29.7)	C (22.2)	C (29.7)	C (22.2)
Northbound	D (36.0)	B (11.2)	D (36.0)	B (11.2)
Southbound	A (8.5)	C (21.4)	A (8.5)	C (21.4)
Alabama Avenue/30th Street				
Overall	C (21.1)	B (13.8)	C (21.1)	B (13.8)
Eastbound	A (9.7)	A (5.4)	A (9.7)	A (5.4)
Westbound	C (22.2)	A (6.4)	C (22.2)	A (6.4)
Northbound	D (42.0)	D (35.6)	D (42.0)	D (35.6)
Southbound	D (36.2)	D (45.7)	D (36.2)	D (45.7)
25th Street SE/Alabama Avenue				
Overall	C (30.6)	B (19.5)	C (30.6)	B (19.5)
Eastbound				
Westbound	B (19.1)	C (22.1)	B (19.1)	C (22.1)
Northbound	D (43.8)	B (18.0)	D (43.8)	B (18.0)
Southbound	B (15.3)	B (17.0)	B (15.3)	B (17.0)
Good Hope Road SE & Naylor Road SE				
Overall	C (22.8)	B (13.7)	C (22.8)	B (13.7)
Eastbound	C (23.9)	A (7.4)	C (23.9)	A (7.4)
Westbound	C (31.0)	A (7.3)	C (31.0)	A (7.3)
Northbound	B (17.4)	D (42.4)	B (17.4)	D (42.4)
Southbound	A (9.9)	D (50.2)	A (9.9)	D (50.2)
Good Hope Road SE/Skyland Entrance & Alabama Avenue SE				
Overall	D (39.3)	C (24.7)	D (39.3)	C (24.7)
Eastbound	B (19.8)	C (33.3)	B (19.8)	C (33.3)
Westbound	C (22.4)	C (29.6)	C (22.4)	C (29.6)
Northbound	C (22.1)	B (15.1)	C (22.1)	B (15.1)
Southbound	D (52.3)	C (34.6)	D (52.3)	C (34.6)
Branch Avenue/Alabama Avenue				
Overall	F (120.2)	F (155.9)	F (120.2)	F (155.9)
Eastbound	D (54.5)	D (54.9)	D (54.5)	D (54.9)
Westbound	F (161.0)	F (305.9)	F (161.0)	F (305.9)
Northbound	F (142.8)	C (22.0)	F (142.8)	C (22.0)
Southbound	D (45.6)	F (189.5)	D (45.6)	F (189.5)



Table 6 – Projected Site Trip Generation

Skyland Component	ITE Code	Amount	AM Peak Hour			PM Peak Hour		
			in	Out	Total	in	Out	Total
<u>Residential</u>								
Apartment	220	448 Units	45	178	223	172	92	264
Retail Synergy			-	-	-	-46	-42	-88
Residential Subtotal			45	178	223	126	50	176
Alternate Mode red. (30%)			-14	-53	-67	-38	-15	-53
Residential Total			32	125	156	88	35	123
<u>Residential</u>								
Townhouse	230	20 Units	2	12	14	11	5	16
Retail Synergy			-	-	-	-3	-3	-6
Residential Subtotal			2	12	14	8	2	10
Alternate Mode red. (30%)			-1	-4	-4	-2	-1	-3
Residential Total			1	8	10	6	1	7
<u>Retail</u>								
Retail	820	315,520 SF	190	122	312	641	695	1,336
Residential Synergy			-	-	-	-45	-49	-94
Retail Subtotal			190	122	312	596	646	1,242
Alternate Mode red. (30%)			-57	-37	-94	-179	-194	-373
Retail Subtotal			133	85	218	417	452	869
Retail Pass-by Trips (25%)			-	-	-	-104	-113	-217
Retail Total			133	85	218	313	339	652
Total Future Site Trips (with reductions)			166	218	384	407	376	783
Existing Site Trips			39	28	67	125	89	214
Net New Site Trips			127	190	317	282	287	569

Exhibit 6

MCV Associates, Inc. - March 29, 2010

Table 11
Regression Equation Summary for All Residential and Residential Commute/School
Metrorail Trips by Distance from Station

Distance (mile)	Metrorail Mode Share	
	Overall	Commute/School
0	54%	65%
1/4	43%	54%
1/2	31%	44%

SOURCE: WMATA (2005 Development-Related Ridership Survey)



Table 11 from WMATA Report

Exhibit 7

Table 15
Mode Shares at Retail, Hotel and Entertainment Sites

Site Name	Site Type	Mode			
		Metro-rail ¹	Metrobus & Other Transit ¹	Auto ³	Walk & Other ⁴
Ballston Station Area					
Ballston Common	R	23%	7%	43%	27%
Holiday Inn Arlington	H	17%	0%	67%	17%
Regal Cinemas	E	35%	9%	39%	17%
Crystal City Station Area					
Crystal Plaza Shops	R	36%	5%	24%	36%
The Underground	R	31%	6%	27%	35%
Crystal Gateway Marriott	H	27%	7%	24%	42%
Crystal Hyatt Regency	H	48%	3%	21%	28%
Eisenhower Avenue Station Area					
AMC Hoffman Theaters	E	12%	1%	83%	4%
Friendship Heights Station Area					
Embassy Suites Chevy Chase Pavilion	H	33%	5%	25%	36%
Silver Spring Station Area					
Silver Spring Neighborhood Center	R	9%	10%	67%	14%
Holiday Inn Silver Spring	H	8%	4%	54%	33%
AFI Silver Theater	E	39%	2%	49%	10%
The Majestic 20	E	19%	13%	56%	13%
U Street/African American Civil War Memorial/Cardozo Station Area					
U St Main Street	R	44%	13%	19%	25%
Average Among Sites					
Retail Sites	R	29%	8%	36%	27%
Hotel Sites	H	27%	4%	38%	31%
Entertainment Sites	E	26%	6%	57%	11%

Notes: ¹ Includes multimodal trips that may have involved auto or bus use in combination with Metro-rail.

² Includes bus only trips, and commuter rail, such as MARC, VRE or Amtrak.

³ Includes trips as driver and passenger of a private automobile.

⁴ Includes cycling and any other form of transportation one may use.

R: Retail

H: Hotel

E: Entertainment (Movie Theater)

SOURCE: WMATA (2005 Development-Related Ridership Survey)



Table 15 from WMATA Report

Exhibit 8

Maximum Queues at about 8:00 AM

Street	at	Queue (ft)	Queue (vehicles)	Extends Upto
25th Street SE NB	Good Hope Rd SE	1663	67	Alabama Ave SE
26th Street SE NB	Alabama Ave SE	1261	50	Irving St SE
Good Hope Rd SE SE	25th Street SE NB	2217	89	22nd St SE
Alabama Ave SE WB	Branch Ave SE	1425	57	37th St SE
Branch Ave SE NB	Alabama Ave SE	2042	82	Erie St SE
Naylor Rd SE NB	Alabama Ave SE	1916	77	30th St SE
Naylor Rd SE SB	Site Access	1505	60	27th St SE



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Queue Summary from Model
Simulation

Exhibit 9

Attachment 2 – Existing Conditions Capacity Analysis Worksheets

Skyland Shopping Center
1: 25th Street SE & Good Hope Road SE

Existing AM Peak Hour
3/29/2010

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
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	
Lane Util. Factor		1.00			0.95			0.95			0.95	
Frbp, ped/bikes		1.00			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.98			1.00	
Flt Protected		0.99			0.97			1.00			1.00	
Satd. Flow (prot)		1818			3424			3403			3532	
Flt Permitted		0.76			0.53			0.89			0.95	
Satd. Flow (perm)		1407			1865			3036			3356	
Volume (vph)	197	493	55	209	166	12	11	165	32	12	823	5
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	536	60	227	180	13	12	179	35	13	895	5
RTOR Reduction (vph)	0	3	0	0	2	0	0	15	0	0	1	0
Lane Group Flow (vph)	0	807	0	0	418	0	0	211	0	0	912	0
Confl. Peds. (#/hr)			1			26			39			30
Turn Type	Perm			D.P+P			Perm			Perm		
Protected Phases		3		2	2 3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		47.0			51.0			34.0			34.0	
Effective Green, g (s)		48.0			53.0			35.0			35.0	
Actuated g/C Ratio		0.48			0.53			0.35			0.35	
Clearance Time (s)		5.0						5.0			5.0	
Lane Grp Cap (vph)		675			1066			1063			1175	
v/s Ratio Prot					c0.02							
v/s Ratio Perm		c0.57			0.19			0.07			c0.27	
v/c Ratio		1.20			0.39			0.20			0.78	
Uniform Delay, d1		26.0			13.9			22.7			29.0	
Progression Factor		1.16			1.00			1.00			1.00	
Incremental Delay, d2		93.1			1.1			0.4			5.1	
Delay (s)		123.3			15.0			23.1			34.1	
Level of Service		F			B			C			C	
Approach Delay (s)		123.3			15.0			23.1			34.1	
Approach LOS		F			B			C			C	
Intersection Summary												
HCM Average Control Delay		60.2			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		94.9%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	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	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		1.00			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			0.99	
Frt		1.00			0.97			1.00			1.00	
Flt Protected		1.00			1.00			0.99			1.00	
Satd. Flow (prot)		1855			1791			3499			3499	
Flt Permitted		1.00			0.98			0.73			0.91	
Satd. Flow (perm)		1854			1753			2567			3194	
Volume (vph)	3	966	15	5	182	44	73	258	1	23	367	3
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	3	1050	16	5	198	48	79	280	1	25	399	3
RTOR Reduction (vph)	0	0	0	0	9	0	0	0	0	0	1	0
Lane Group Flow (vph)	0	1069	0	0	242	0	0	360	0	0	426	0
Confl. Peds. (#/hr)			64			27			21	76		
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		49.0			49.0			27.0			27.0	
Effective Green, g (s)		57.0			57.0			35.0			35.0	
Actuated g/C Ratio		0.57			0.57			0.35			0.35	
Clearance Time (s)		12.0			12.0			12.0			12.0	
Lane Grp Cap (vph)		1057			999			898			1118	
v/s Ratio Prot												
v/s Ratio Perm		c0.58			0.14			c0.14			0.13	
v/c Ratio		1.01			0.24			0.40			0.38	
Uniform Delay, d1		21.5			10.7			24.6			24.4	
Progression Factor		1.00			1.22			1.00			1.32	
Incremental Delay, d2		30.4			0.6			1.3			1.0	
Delay (s)		51.9			13.7			25.9			33.2	
Level of Service		D			B			C			C	
Approach Delay (s)		51.9			13.7			25.9			33.2	
Approach LOS		D			B			C			C	

Intersection Summary

HCM Average Control Delay	39.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Skyland Shopping Center
3: Alabama Avenue SE & 30th Street SE

Existing AM Peak Hour
3/29/2010

												
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)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frbp, ped/bikes		1.00			1.00			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.99			1.00			0.93			0.94	
Flt Protected		1.00			1.00			0.98			0.99	
Satd. Flow (prot)		3509			3519			1692			1720	
Flt Permitted		0.93			0.87			0.86			0.96	
Satd. Flow (perm)		3284			3066			1482			1671	
Volume (vph)	9	371	17	68	731	6	56	12	81	10	32	39
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	403	18	74	795	7	61	13	88	11	35	42
RTOR Reduction (vph)	0	3	0	0	1	0	0	43	0	0	33	0
Lane Group Flow (vph)	0	428	0	0	875	0	0	119	0	0	55	0
Confl. Peds. (#/hr)			2			9	2					1
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		73.5			73.5			17.5			17.5	
Effective Green, g (s)		74.0			74.0			18.0			18.0	
Actuated g/C Ratio		0.74			0.74			0.18			0.18	
Clearance Time (s)		4.5			4.5			4.5			4.5	
Lane Grp Cap (vph)		2430			2269			267			301	
v/s Ratio Prot												
v/s Ratio Perm		0.13			0.29			0.08			0.03	
v/c Ratio		0.18			0.39			0.45			0.18	
Uniform Delay, d1		3.9			4.7			36.6			34.8	
Progression Factor		3.17			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.5			5.3			1.3	
Delay (s)		12.5			5.2			41.9			36.1	
Level of Service		B			A			D			D	
Approach Delay (s)		12.5			5.2			41.9			36.1	
Approach LOS		B			A			D			D	
Intersection Summary												
HCM Average Control Delay		12.8				HCM Level of Service				B		
HCM Volume to Capacity ratio		0.40										
Actuated Cycle Length (s)		100.0				Sum of lost time (s)			8.0			
Intersection Capacity Utilization		61.1%				ICU Level of Service			B			
Analysis Period (min)		15										
c Critical Lane Group												

						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations	↑			↑↑	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.97	
Frpb, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1863			3539	3416	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1863			3539	3416	
Volume (vph)	781	0	0	223	451	35
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	849	0	0	242	490	38
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	849	0	0	242	522	0
Confl. Peds. (#/hr)			190		5	
Turn Type						
Protected Phases	2			2	1	
Permitted Phases						
Actuated Green, G (s)	46.0			46.0	44.0	
Effective Green, g (s)	47.0			47.0	45.0	
Actuated g/C Ratio	0.47			0.47	0.45	
Clearance Time (s)	5.0			5.0	5.0	
Lane Grp Cap (vph)	876			1663	1537	
v/s Ratio Prot	c0.46			0.07	c0.15	
v/s Ratio Perm						
v/c Ratio	0.97			0.15	0.34	
Uniform Delay, d1	25.8			15.1	17.9	
Progression Factor	1.00			1.06	1.00	
Incremental Delay, d2	23.8			0.2	0.6	
Delay (s)	49.6			16.2	18.5	
Level of Service	D			B	B	
Approach Delay (s)	49.6			16.2	18.5	
Approach LOS	D			B	B	
Intersection Summary						
HCM Average Control Delay		34.4		HCM Level of Service		C
HCM Volume to Capacity ratio		0.66				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		68.7%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Skyland Shopping Center
5: Good Hope Road SE & Plaza Access

Existing AM Peak Hour
3/29/2010

												
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)		4.0	4.0		4.0		4.0	4.0		4.0		
Lane Util. Factor		1.00	1.00		0.95		0.95	0.95		1.00		
Frpb, ped/bikes		1.00	0.91		1.00		1.00	1.00		1.00		
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00		
Frt		1.00	0.85		1.00		1.00	1.00		1.00		
Flt Protected		1.00	1.00		1.00		0.95	0.95		0.95		
Satd. Flow (prot)		1862	1440		3535		1681	1685		1770		
Flt Permitted		1.00	1.00		0.95		0.95	0.95		0.32		
Satd. Flow (perm)		1859	1440		3374		1681	1685		591		
Volume (vph)	1	198	208	2	611	5	997	6	4	6	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	215	226	2	664	5	1084	7	4	7	0	0
RTOR Reduction (vph)	0	0	145	0	1	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	216	81	0	670	0	552	543	0	7	0	0
Confl. Peds. (#/hr)			23	2					9	1		
Turn Type	Perm		Perm	Perm			Perm			D.Pm		
Protected Phases		2			2			1				
Permitted Phases	2		2	2			1			1		
Actuated Green, G (s)		35.0	35.0		35.0		55.0	55.0		55.0		
Effective Green, g (s)		36.0	36.0		36.0		56.0	56.0		56.0		
Actuated g/C Ratio		0.36	0.36		0.36		0.56	0.56		0.56		
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0		
Lane Grp Cap (vph)		669	518		1215		941	944		331		
v/s Ratio Prot												
v/s Ratio Perm		0.12	0.06		c0.20		c0.33	0.32		0.01		
v/c Ratio		0.32	0.16		0.55		0.59	0.57		0.02		
Uniform Delay, d1		23.2	21.7		25.6		14.4	14.3		9.8		
Progression Factor		1.00	1.00		1.18		0.62	0.63		1.00		
Incremental Delay, d2		1.3	0.6		1.6		0.8	0.7		0.1		
Delay (s)		24.5	22.4		31.9		9.8	9.7		9.9		
Level of Service		C	C		C		A	A		A		
Approach Delay (s)		23.4			31.9			9.7			9.9	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM Average Control Delay			19.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			51.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Skyland Shopping Center
6: Good Hope Road SE & Alabama Avenue SE

Existing AM Peak Hour
3/29/2010

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	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	4.0	4.0	4.0
Lane Util. Factor	0.95	0.95			0.95		1.00	0.95	1.00	1.00	0.91	0.91
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99			0.99		1.00	1.00	0.85	1.00	0.92	0.85
Flt Protected	0.95	0.98			0.98		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1681	1699			3437		1770	3539	1583	1770	3130	1441
Flt Permitted	0.95	0.98			0.98		0.30	1.00	1.00	0.59	1.00	1.00
Satd. Flow (perm)	1681	1699			3437		561	3539	1583	1102	3130	1441
Volume (vph)	168	48	9	37	37	3	17	218	5	4	266	556
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	52	10	40	40	3	18	237	5	4	289	604
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	3	0	191	248
Lane Group Flow (vph)	121	121	0	0	81	0	18	237	2	4	400	54
Confl. Peds. (#/hr)			18									
Turn Type	Split			Split			Perm		Perm	Perm		Over
Protected Phases	1	1		3	3			2			2	1
Permitted Phases							2		2	2		
Actuated Green, G (s)	17.5	17.5			33.5		35.5	35.5	35.5	35.5	35.5	17.5
Effective Green, g (s)	18.0	18.0			34.0		36.0	36.0	36.0	36.0	36.0	18.0
Actuated g/C Ratio	0.18	0.18			0.34		0.36	0.36	0.36	0.36	0.36	0.18
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)	303	306			1169		202	1274	570	397	1127	259
v/s Ratio Prot	c0.07	0.07			c0.02			0.07			c0.13	0.04
v/s Ratio Perm							0.03		0.00	0.00		
v/c Ratio	0.40	0.39			0.07		0.09	0.19	0.00	0.01	0.36	0.21
Uniform Delay, d1	36.2	36.2			22.3		21.2	21.9	20.5	20.6	23.5	34.9
Progression Factor	0.45	0.44			1.00		0.91	0.94	1.12	1.04	1.40	1.21
Incremental Delay, d2	3.8	3.7			0.1		0.8	0.3	0.0	0.0	0.8	1.7
Delay (s)	20.1	19.4			22.4		20.1	20.9	22.9	21.4	33.8	44.0
Level of Service	C	B			C		C	C	C	C	C	D
Approach Delay (s)		19.8			22.4			20.9			37.2	
Approach LOS		B			C			C			D	
Intersection Summary												
HCM Average Control Delay			30.6			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			39.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Skyland Shopping Center
7: Alabama Avenue SE & Branch Avenue

Existing AM Peak Hour
3/29/2010

												
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)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Fr _t		0.99			0.99		1.00	1.00		1.00	0.99	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3462			3509		1770	1861		1770	1841	
Flt Permitted		0.98			1.00		0.36	1.00		0.25	1.00	
Satd. Flow (perm)		3462			3509		669	1861		466	1841	
Volume (vph)	155	319	21	8	669	39	211	635	4	26	175	15
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	168	347	23	9	727	42	229	690	4	28	190	16
RTOR Reduction (vph)	0	3	0	0	4	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	535	0	0	774	0	229	694	0	28	203	0
Turn Type	Split			Split			D.P+P			pm+pt		
Protected Phases	5	5		1	1		2 3	3 4		2	4	
Permitted Phases							4			4		
Actuated Green, G (s)		17.0			25.0		38.0	25.0		33.0	16.0	
Effective Green, g (s)		17.0			25.0		38.0	25.0		33.0	16.0	
Actuated g/C Ratio		0.17			0.25		0.38	0.25		0.33	0.16	
Clearance Time (s)		4.0			4.0					4.0	4.0	
Lane Grp Cap (vph)		589			877		496	465		375	295	
v/s Ratio Prot		c0.15			c0.22		c0.10	c0.37		0.01	0.11	
v/s Ratio Perm							0.07			0.01		
v/c Ratio		0.91			0.88		0.46	1.49		0.07	0.69	
Uniform Delay, d1		40.7			36.1		22.4	37.5		35.0	39.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.2			12.5		3.1	232.8		0.4	12.3	
Delay (s)		61.0			48.6		25.4	270.3		35.4	51.9	
Level of Service		E			D		C	F		D	D	
Approach Delay (s)		61.0			48.6			209.5			50.0	
Approach LOS		E			D			F			D	
Intersection Summary												
HCM Average Control Delay		111.5					HCM Level of Service			F		
HCM Volume to Capacity ratio		0.98										
Actuated Cycle Length (s)		100.0					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		84.3%					ICU Level of Service		E			
Analysis Period (min)		15										
c Critical Lane Group												

Skyland Shopping Center
1: 25th Street SE & Good Hope Road SE

Existing PM Peak Hour
3/29/2010

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
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	
Lane Util. Factor		1.00			0.95			0.95			0.95	
Frpb, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			1.00			0.99			1.00	
Flt Protected		0.99			0.97			1.00			1.00	
Satd. Flow (prot)		1752			3406			3435			3512	
Flt Permitted		0.75			0.58			0.94			0.88	
Satd. Flow (perm)		1328			2040			3236			3119	
Volume (vph)	58	154	80	490	209	18	17	459	48	20	205	3
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	167	87	533	227	20	18	499	52	22	223	3
RTOR Reduction (vph)	0	14	0	0	2	0	0	8	0	0	1	0
Lane Group Flow (vph)	0	303	0	0	778	0	0	561	0	0	247	0
Confl. Peds. (#/hr)			20			11			80			34
Turn Type	Perm			D.P+P			Perm			Perm		
Protected Phases		3		2	2 3			1			1	
Permitted Phases	3			3			1			1		
Actuated Green, G (s)		31.5			52.0			34.0			34.0	
Effective Green, g (s)		32.0			53.0			35.0			35.0	
Actuated g/C Ratio		0.32			0.53			0.35			0.35	
Clearance Time (s)		4.5						5.0			5.0	
Lane Grp Cap (vph)		425			1368			1133			1092	
v/s Ratio Prot					c0.12							
v/s Ratio Perm		c0.23			0.18			c0.17			0.08	
v/c Ratio		0.71			0.57			0.50			0.23	
Uniform Delay, d1		30.0			15.8			25.6			22.9	
Progression Factor		0.61			1.00			1.00			1.00	
Incremental Delay, d2		9.6			1.7			1.5			0.5	
Delay (s)		27.7			17.5			27.1			23.4	
Level of Service		C			B			C			C	
Approach Delay (s)		27.7			17.5			27.1			23.4	
Approach LOS		C			B			C			C	
Intersection Summary												
HCM Average Control Delay		22.8			HCM Level of Service			C				
HCM Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		100.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		81.1%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

Skyland Shopping Center
2: Naylor Road SE & Alabama Avenue SE

Existing PM Peak Hour
3/29/2010

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	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	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			0.99	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.98			0.98			1.00			0.99	
Flt Protected		1.00			1.00			0.99			0.99	
Satd. Flow (prot)		1807			1803			3491			3464	
Flt Permitted		0.92			1.00			0.65			0.80	
Satd. Flow (perm)		1676			1796			2280			2782	
Volume (vph)	19	193	31	7	526	104	96	347	5	54	425	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	210	34	8	572	113	104	377	5	59	462	23
RTOR Reduction (vph)	0	5	0	0	7	0	0	1	0	0	3	0
Lane Group Flow (vph)	0	260	0	0	686	0	0	485	0	0	541	0
Confl. Peds. (#/hr)			31			26			42			117
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			2			1			1	
Permitted Phases	2			2			1			1		
Actuated Green, G (s)		47.0			47.0			27.0			27.0	
Effective Green, g (s)		56.0			56.0			36.0			36.0	
Actuated g/C Ratio		0.56			0.56			0.36			0.36	
Clearance Time (s)		13.0			13.0			13.0			13.0	
Lane Grp Cap (vph)		939			1006			821			1002	
v/s Ratio Prot												
v/s Ratio Perm		0.15			0.38			0.21			0.19	
v/c Ratio		0.28			0.68			0.59			0.54	
Uniform Delay, d1		11.5			15.7			26.0			25.4	
Progression Factor		1.00			0.97			1.00			1.20	
Incremental Delay, d2		0.7			3.6			3.1			2.1	
Delay (s)		12.2			18.7			29.1			32.6	
Level of Service		B			B			C			C	
Approach Delay (s)		12.2			18.7			29.1			32.6	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM Average Control Delay		24.2										
HCM Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		100.0							8.0			
Intersection Capacity Utilization		73.7%										
Analysis Period (min)		15										
c Critical Lane Group												

Skyland Shopping Center
3: Alabama Avenue SE & 30th Street SE

Existing PM Peak Hour
3/29/2010

												
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)		4.0			4.0			4.0			4.0	
Lane Util. Factor		0.95			0.95			1.00			1.00	
Frpb, ped/bikes		0.99			1.00			0.99			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frft		0.97			1.00			0.93			0.99	
Flt Protected		1.00			0.99			0.99			0.99	
Satd. Flow (prot)		3371			3497			1705			1837	
Flt Permitted		0.94			0.73			0.97			0.95	
Satd. Flow (perm)		3178			2572			1656			1751	
Volume (vph)	10	365	113	117	431	5	10	36	54	30	170	9
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	397	123	127	468	5	11	39	59	33	185	10
RTOR Reduction (vph)	0	27	0	0	1	0	0	40	0	0	2	0
Lane Group Flow (vph)	0	504	0	0	599	0	0	69	0	0	226	0
Confl. Peds. (#/hr)			10			7			1			2
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		1			1			2			2	
Permitted Phases	1			1			2			2		
Actuated Green, G (s)		74.0			74.0			21.0			21.0	
Effective Green, g (s)		75.0			75.0			22.0			22.0	
Actuated g/C Ratio		0.71			0.71			0.21			0.21	
Clearance Time (s)		5.0			5.0			5.0			5.0	
Lane Grp Cap (vph)		2270			1837			347			367	
v/s Ratio Prot												
v/s Ratio Perm		0.16			0.23			0.04			0.13	
v/c Ratio		0.22			0.33			0.20			0.62	
Uniform Delay, d1		5.1			5.6			34.2			37.7	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.2			0.5			1.3			7.6	
Delay (s)		5.3			6.1			35.5			45.2	
Level of Service		A			A			D			D	
Approach Delay (s)		5.3			6.1			35.5			45.2	
Approach LOS		A			A			D			D	
Intersection Summary												
HCM Average Control Delay		14.1					HCM Level of Service		B			
HCM Volume to Capacity ratio		0.39										
Actuated Cycle Length (s)		105.0					Sum of lost time (s)		8.0			
Intersection Capacity Utilization		56.3%					ICU Level of Service		B			
Analysis Period (min)		15										
c Critical Lane Group												

						
Movement	NBT	NBR	SBL	SBT	SWL	SWR
Lane Configurations				 	  	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			0.95	0.97	
Frbp, ped/bikes	1.00			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	1.00			1.00	0.99	
Flt Protected	1.00			1.00	0.96	
Satd. Flow (prot)	1863			3539	3418	
Flt Permitted	1.00			1.00	0.96	
Satd. Flow (perm)	1863			3539	3418	
Volume (vph)	241	0	0	414	494	36
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	262	0	0	450	537	39
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	262	0	0	450	570	0
Confl. Peds. (#/hr)			131		5	
Turn Type						
Protected Phases	2			2	1	
Permitted Phases						
Actuated Green, G (s)	47.0			47.0	43.0	
Effective Green, g (s)	48.0			48.0	44.0	
Actuated g/C Ratio	0.48			0.48	0.44	
Clearance Time (s)	5.0			5.0	5.0	
Lane Grp Cap (vph)	894			1699	1504	
v/s Ratio Prot	c0.14			0.13	c0.17	
v/s Ratio Perm						
v/c Ratio	0.29			0.26	0.38	
Uniform Delay, d1	15.7			15.5	18.8	
Progression Factor	1.00			0.93	1.00	
Incremental Delay, d2	0.8			0.4	0.7	
Delay (s)	16.6			14.8	19.5	
Level of Service	B			B	B	
Approach Delay (s)	16.6			14.8	19.5	
Approach LOS	B			B	B	
Intersection Summary						
HCM Average Control Delay		17.3		HCM Level of Service		B
HCM Volume to Capacity ratio		0.33				
Actuated Cycle Length (s)		100.0		Sum of lost time (s)		8.0
Intersection Capacity Utilization		65.8%		ICU Level of Service		C
Analysis Period (min)		15				
c Critical Lane Group						

Skyland Shopping Center
5: Good Hope Road SE & Plaza Access

Existing PM Peak Hour
3/29/2010

												
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)		4.0	4.0		4.0		4.0	4.0		4.0		
Lane Util. Factor		1.00	1.00		0.95		0.95	0.95		1.00		
Frpb, ped/bikes		1.00	0.91		1.00		1.00	0.99		1.00		
Flpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00		
Frt		1.00	0.85		0.99		1.00	0.98		1.00		
Flt Protected		1.00	1.00		1.00		0.95	0.97		0.95		
Satd. Flow (prot)		1860	1440		3484		1681	1654		1763		
Flt Permitted		0.97	1.00		0.89		0.95	0.97		0.51		
Satd. Flow (perm)		1812	1440		3099		1681	1654		946		
Volume (vph)	14	556	445	46	759	41	257	24	21	90	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	604	484	50	825	45	279	26	23	98	0	0
RTOR Reduction (vph)	0	0	136	0	4	0	0	6	0	0	0	0
Lane Group Flow (vph)	0	619	348	0	916	0	167	155	0	98	0	0
Confl. Peds. (#/hr)			23	118					38	3		
Turn Type	Perm		Perm	Perm			Split			D.Pm		
Protected Phases		2			2		1	1				
Permitted Phases	2		2	2						1		
Actuated Green, G (s)		71.0	71.0		71.0		19.0	19.0		19.0		
Effective Green, g (s)		72.0	72.0		72.0		20.0	20.0		20.0		
Actuated g/C Ratio		0.72	0.72		0.72		0.20	0.20		0.20		
Clearance Time (s)		5.0	5.0		5.0		5.0	5.0		5.0		
Lane Grp Cap (vph)		1305	1037		2231		336	331		189		
v/s Ratio Prot							0.10	0.09				
v/s Ratio Perm		c0.34	0.24		0.30					c0.10		
v/c Ratio		0.47	0.34		0.41		0.50	0.47		0.52		
Uniform Delay, d1		6.0	5.2		5.6		35.5	35.3		35.7		
Progression Factor		1.00	1.00		1.04		0.80	0.79		1.00		
Incremental Delay, d2		1.2	0.9		0.6		4.8	4.4		9.8		
Delay (s)		7.2	6.0		6.3		33.2	32.2		45.5		
Level of Service		A	A		A		C	C		D		
Approach Delay (s)		6.7			6.3			32.7			45.5	
Approach LOS		A			A			C			D	
Intersection Summary												
HCM Average Control Delay			11.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			8.0			
Intersection Capacity Utilization			76.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.91	0.91	0.95	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	0.84	1.00	1.00	1.00	1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.97	0.85	1.00	0.99			0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.98	
Satd. Flow (prot)	1770	3539	1324	1770	3304	1441	1681	1698			3399	
Flt Permitted	0.54	1.00	1.00	0.64	1.00	1.00	0.95	0.97			0.98	
Satd. Flow (perm)	1015	3539	1324	1185	3304	1441	1681	1698			3399	
Volume (vph)	18	159	24	21	177	273	519	95	18	76	75	16
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	173	26	23	192	297	564	103	20	83	82	17
RTOR Reduction (vph)	0	0	21	0	16	137	0	2	0	0	8	0
Lane Group Flow (vph)	20	173	5	23	215	121	339	346	0	0	174	0
Confl. Peds. (#/hr)			47						1			15
Turn Type	Perm		Perm	Perm		Over	Split			Split		
Protected Phases		2			2	3	3	3		1	1	
Permitted Phases	2		2	2								
Actuated Green, G (s)	20.5	20.5	20.5	20.5	20.5	46.5	46.5	46.5			19.5	
Effective Green, g (s)	21.0	21.0	21.0	21.0	21.0	47.0	47.0	47.0			20.0	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.47	0.47	0.47			0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	
Lane Grp Cap (vph)	213	743	278	249	694	677	790	798			680	
v/s Ratio Prot		0.05			c0.07	0.08	0.20	c0.20			c0.05	
v/s Ratio Perm	0.02		0.00	0.02								
v/c Ratio	0.09	0.23	0.02	0.09	0.31	0.18	0.43	0.43			0.26	
Uniform Delay, d1	31.8	32.8	31.3	31.8	33.4	15.3	17.6	17.6			33.7	
Progression Factor	0.56	0.59	0.91	1.00	1.00	1.00	0.77	0.77			1.00	
Incremental Delay, d2	0.7	0.6	0.1	0.7	1.2	0.6	1.5	1.5			0.9	
Delay (s)	18.6	19.9	28.7	32.6	34.5	15.9	15.1	15.1			34.6	
Level of Service	B	B	C	C	C	B	B	B			C	
Approach Delay (s)		20.9			25.1			15.1			34.6	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM Average Control Delay			21.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			100.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			48.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

Skyland Shopping Center
7: Alabama Avenue, SE & Branch Avenue

Existing PM Peak Hour
3/29/2010

												
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)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00	1.00	
Frt		0.99			0.97		1.00	0.99		1.00	0.99	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3488			3427		1770	1840		1770	1853	
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		3488			3427		1770	1840		1770	1853	
Volume (vph)	92	372	17	49	402	100	77	338	29	146	595	22
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	404	18	53	437	109	84	367	32	159	647	24
RTOR Reduction (vph)	0	3	0	0	19	0	0	3	0	0	2	0
Lane Group Flow (vph)	0	519	0	0	580	0	84	396	0	159	669	0
Turn Type	Split			Split			Prot			Prot		
Protected Phases	5	5		1	1		2 3	3 4		2	4	
Permitted Phases												
Actuated Green, G (s)		16.0			16.0		32.0	36.0		16.0	16.0	
Effective Green, g (s)		16.0			16.0		32.0	36.0		16.0	16.0	
Actuated g/C Ratio		0.16			0.16		0.32	0.36		0.16	0.16	
Clearance Time (s)		4.0			4.0					4.0	4.0	
Lane Grp Cap (vph)		558			548		566	662		283	296	
v/s Ratio Prot		c0.15			c0.17		0.05	c0.22		c0.09	c0.36	
v/s Ratio Perm												
v/c Ratio		0.93			1.06		0.15	0.60		0.56	2.26	
Uniform Delay, d1		41.5			42.0		24.3	26.1		38.8	42.0	
Progression Factor		1.55			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		17.4			54.6		0.6	4.0		7.8	578.2	
Delay (s)		81.5			96.6		24.8	30.1		46.6	620.2	
Level of Service		F			F		C	C		D	F	
Approach Delay (s)		81.5			96.6			29.1			510.4	
Approach LOS		F			F			C			F	
Intersection Summary												
HCM Average Control Delay		221.1				HCM Level of Service		F				
HCM Volume to Capacity ratio		1.09										
Actuated Cycle Length (s)		100.0				Sum of lost time (s)		20.0				
Intersection Capacity Utilization		79.5%				ICU Level of Service		D				
Analysis Period (min)		15										
c Critical Lane Group												

Attachment 3 – Synergy Reduction Worksheet

Analyst PM
Date 3/29/10

**MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY**

Job Number 2134-001
Time Period PM Peak Hour

