Western Michigan University ScholarWorks at WMU

Honors Theses

Lee Honors College

4-18-2006

Off Campus Furniture Retail Development

Dan E. White Western Michigan University, dwhite@craworld.com

Richard D. McCarthy Western Michigan University

Christopher T. Cowgill Western Michigan University

Follow this and additional works at: https://scholarworks.wmich.edu/honors_theses

Part of the Construction Engineering and Management Commons

Recommended Citation

White, Dan E.; McCarthy, Richard D.; and Cowgill, Christopher T., "Off Campus Furniture Retail Development" (2006). *Honors Theses*. 1839. https://scholarworks.wmich.edu/honors_theses/1839

This Honors Thesis-Open Access is brought to you for free and open access by the Lee Honors College at ScholarWorks at WMU. It has been accepted for inclusion in Honors Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact wmu-scholarworks@wmich.edu.





IICHIGAN UNIVERSI



The Carl and Winifred Lee Honors College

THE CARL AND WINIFRED LEE HONORS COLLEGE

CERTIFICATE OF ORAL EXAMINATION

Dan White, having been admitted to the Carl and Winifred Lee Honors College in Fall 2003, successfully presented the Lee Honors College Thesis on April 18, 2006.

The title of the paper is:

"Proposed Department Store Development"

Vhit Yehin

Dr. Sherif Yehia, Civil & Construction Engineering

Dr. Jun-Seok Oh, Civil & Construction Engineering

Jose Shil.

TRAFFIC IMPACT STUDY RETAIL DEVELOPMENT

Dan E. White Richard D. McCarthy Christopher T. Cowgill

TABLE OF CONTENTS

I.	Cur	Current Roadway and Traffic Conditions							
	A)	Location and Land Use							
	B)	Roadway Characteristics	3						
	C)	Traffic Volumes	5						
	D)	Analysis of Current Traffic Conditions	5						
II.	Fore	ecast of Background (Year 2007) Traffic							
	A)	Background Traffic Volumes							
	B)	Background Intersection Capacity Analysis	11						
III.	Fore	ecast of Opening Day (Year 2007) Traffic	16						
	A)	5110 S. Westnedge Development and Generated Traffic	16						
	B)	Directional Distribution of Development Generated Traffic Volumes	17						
	C)	Opening Day Traffic Volumes							
	D)	Opening Day Capacity Analysis							
IV.	Acc	ident History	24						
V.	Traf	fic Summary and Suggestions	25						
	A)	Summary of Traffic Conditions							
	B)	Suggestions For Improvements							
VI.	APF	PENDIX							
	A \	Contract Traffic Conditions IICC Data its 1 Days sty							

- A) Current Traffic Conditions HCS Detailed Reports
- B) Background Traffic Conditions HCS Detailed Reports
- C) Opening Day Traffic Conditions HCS Detailed Reports

Scope of Report

The Traffic Impact study required by the City of Portage, Kalamazoo County, Michigan for the proposed site development of a 57,500 sq. ft. furniture store at 5110 S. Westnedge Avenue will focuses on the area surrounding the site.

Description of Project

A 57,500 sq. ft. retail store is being proposed for development at 5110 S. Westnedge Avenue. The store will specialize in the sale of furniture and will operate between the hours of 9:00 am to 8:00 pm. Construction for the site is proposed to begin in the summer of 2006 and opening in 2007. The building will be constructed with reinforced concrete and will be constructed in accordance to the City of Portage Building Code.

Limits of Study

The study will analyze the surrounding areas traffic conditions in their current, background and opening day traffic conditions with the emphasis of the analysis being on the intersection capacities of the surrounding critical intersections. Accident history along with geometric road design will also be looked at. This study will include summaries of each critical intersection analyzed along with the traffic volumes and turn counts at each respected time. Recommendations will also be provided if necessary or feasible.

Methodology of the Analysis

Current traffic software along with <u>ITE Trip Generation Manual</u> will be used in analyzing the traffic conditions. Traffic counts will be gathered from prior analysis of the area. Software to be used will be SYNCHRO 6 along with HCS 2000 highway capacity software.

Figure 1



I. Current Roadway and Traffic Conditions

Current traffic conditions were analyzed in the surrounding area of 5110 South Westnedge Avenue to analyze the effects of the proposed site development.

A. <u>LOCATION AND LAND USE</u>

The proposed site development is directly east of Lowe's bordering Westnedge Avenue, south of Kilgore Road and North of Marketplace Avenue in the City of Portage, Michigan.

Site access is proposed off Kilgore Road and off Marketplace Avenue along with southbound Westnedge traffic being able to access as well. All site accesses will route traffic to Lowe's Driveway that connects with Westnedge Avenue. Traffic entering off Kilgore will travel south to Lowe's drive then will enter the site. Marketplace traffic will enter the site off West Fork Crossing to Lowe's drive.

Land uses in the area mainly consist of commercial development.

B. <u>ROADWAY CHARACTERISTICS</u>

<u>Kilgore Road</u> – Kilgore Road currently exists as rolling terrain roadway with unsignalized intersections controlling intersections west of Westnedge Avenue. The intersection of Kilgore and Westnedge is controlled with a fully actuated turn signal. For eastbound Kilgore traffic, there are two through lanes and one left hand turn lane. Kilgore Road has five lanes west of Westnedge Avenue and drops to three lanes closer to Oakland. Kilgore Avenue is 1000 feet from the east-west site boundary. Kilgore has a 35 mph posted speed limit.

<u>Westnedge Avenue</u> – Westnedge Avenue currently has five lanes with a center left-turn lane stretching the entire way. Westnedge-Kilgore intersection is a controlled with a fully actuated signal, and has protected left hand turn phases for all left hand turn movements. Westnedge is the eastern site boundary for the proposed development. Westnedge currently has a 35 mph posted speed limit.

<u>Market Place</u>– Market Place is west of Westnedge, the street currently exists as a three-lane roadway with a right and left turn lanes at Westnedge Avenue westbound. Eastbound traffic has two lanes with one lane being for left turns. The intersection of Marketplace and Westnedge is controlled with a fully actuated turn signal. With Westnedge traffic having protected left hand turn phases. Market place is 550 feet south of the proposed site developments southern boundary. Market place has a 25 mph posted speed limit.

The Existing transportation system can be seen in Figure 2.

Existing Traffic System – Figure 2



C. <u>TRAFFIC VOLUMES</u>

Traffic counts were conducted by CESO on Friday, October 11, 2002 and on Saturday, October 12, 2002 at the following intersections:

- Kilgore Road & Lowe's Driveway
- Kilgore Road & Westnedge Avenue

Other traffic counts used in the analysis were received from Dr. Jun-Seok Oh, CCE 4300 fall 2005 class.

- Marketplace and Westnedge
- Lowe's Drive and Westnedge

Weekday P.M. peak hour traffic volumes occurred between 4:15 P.M. and 5:15 P.M. and the Saturday P.M. peak hour was between 3:00 P.M. and 4:00 P.M.

Current traffic peak hour traffic volumes are shown in Figures 3 and 4.

D. <u>ANALYSIS OF CURRENT TRAFFIC CONDITIONS</u>

Analyses of current weekday and Saturday peak hour traffic conditions shown in Figures 3 and 4 were used to complete intersection capacity analysis. Current (Year 2006) traffic volumes were calculated by increasing 2002 traffic volumes by a two percent yearly growth factor applied to all volumes. This factor was derived from the increasing traffic that has occurred within the study area. All calculations were performed using HCS2000 and SYNCHRO 9 traffic data.

Intersections are described according to their corresponding Level of Service (LOS). Level of Services can range from LOS "A" to LOS "F." A LOS "A" is an ideal condition with few traffic delays, where LOS "F" will have extreme delays with large approach delays. The LOS in signalized intersections corresponds to the average delay per vehicle. Cycle lengths and green times also affect delay.

In unsignalized intersections, the Level of Service details are only computed using average delay per vehicle. Total delay is defined as the time it takes a vehicle to go from last in line in a queue to first in line. Level of Service and their appropriate delays are shown in Tables (1 and 2).

The critical intersections analyzed for all traffic conditions are:

- Market Place & Westnedge
- Kilgore & Westnedge
- Kilgore & Lowe's Drive
- Lowe's Exit Drive & Westnedge

Summary reports can be seen in tables 3 and 4 for current weekday and Saturday peak hour traffic volumes.

Table 1							
Level of S	Level of Service Criteria (unsignalized intersections)						
Level of Service	Delay per Vehicle (sec.)	Effects					
Α	less than 10	Little to no delay					
В	Between 10 and 15	Short Delays					
С	Between 15 and 25	Average Delays					
D	Between 25 and 35	Long Delays					
E	Between 35 and 50	Real Long Delays					
F	Larger than 50.0	Hardly any movement					

Level of Service Summary

Table 2								
Level of S	Level of Service Criteria (signalized intersections)							
Level of Service	Delay per Vehicle (sec.)	Effects						
Α	less than 10	Most vehicles don't stop						
В	Between 10 and 20	Few vehicles stop						
С	Between 20 and 35	Vehicles stop but many pass through						
D	Between 35 and 55	Most vehicles stop. Individual cycle failures are noticeable						
E	Between 55 and 80	Limit of acceptable delay						
F	Larger than 80.0	Unacceptable delay						

Current Weekday Peak Hour Traffic Volumes - Figure 3



Current Saturday Peak Hour Traffic Volumes - Figure 4



Week Day	Peak Hour	Traffic	Conditions	- Current
(2006)				

Table 3				
Signalized Inte				
Market Place	Approach	Approach		
& Westnedge	Direction	Delay (sec)	LOS	
	Eastbound	41.6	D	Intersection LOS
	Westbound	113.3	F	В
	Northbound	17.5	В	Intersection Delay (sec)
	Southbound	2.8	Α	18.5
Westnedge & Kilgore				
	Eastbound	51.5	D	Intersection LOS
	Westbound	56.7	E	E
	Northbound	38.7	D	Intersection Delay (sec)
	Southbound	76.1	E	57.2
Unsignalized I	ntersections			
Kilgore &	Approach	Approach		
Lowe's Drive	Direction	Delay (sec)	LOS	Intersection LOS
	Westbound			
	Left	8.5	Α	C
	Northbound			
	Left	26.2	D	Intersection Delay (sec)
	Northbound			
	Right	10.1	В	17.0
Westnedge &				
Lowe's Exit				
Drive				
	Eastbound			
	Right	11.7	В	

Saturday F (2006)	Peak Hour	Traffic Co	ondi	tions - Current
Table 4				
Signalized Inter	sections			
Market Place & Westnedge	Approach Direction	Approach Delay (sec)	LOS	
	Eastbound	26.7	С	Intersection LOS
	Westbound	29.3	С	В
	Northbound	23.7	С	Intersection Delay (sec)
	Southbound	10.3	В	18.1
Westnedge & Kilgore				_
	Eastbound	49.9	D	Intersection LOS
	Westbound	37.4	D	D
	Northbound	44.0	D	Intersection Delay (sec)
	Southbound	56.6	E	47.4
Unsignalized In	tersections			
Kilgore & Lowe's Drive	Approach Direction	Approach Delay (sec)	LOS	Intersection LOS
	Westbound Left	8.3	A	В
	Northbound Left	16.5	С	Intersection Delay (sec)
	Northbound Right	9.9	A	12.3
Westnedge & Lowe's Exit Drive				
	Eastbound Right	11.0	В	

The current (Year 2006) capacity analyses HCS summary sheets are contained in Appendix A.

II. Forecast of Background (Year 2007) Traffic

A. BACKGROUND (YEAR 2007) TRAFFIC VOLUMES

Background (Year 2007) traffic volumes were calculated by increasing current (2006) traffic volumes (Figures 3 and 4) by a two percent growth factor. This factor was derived from the increasing traffic that has occurred within the study area. The background (Year 2007) Weekday and Saturday P.M. peak hour traffic volumes are shown on Figures 5 and 6.

B. BACKGROUND (YEAR 2007) CAPACITY ANALYSIS

Using background (Year 2007) traffic volumes intersection capacity analysis was done at the four critical intersections affecting the proposed site development. Summary reports can be seen in tables 5 and 6 for background weekday and Saturday peak hour traffic volumes.

The Background (Year 2007) capacity analyses HCS summary sheets are contained in Appendix B.

Weekday Background Traffic Volumes - Figure 5



Saturday Background Traffic Volumes - Figure 6



Week Day Backgr <u>ou</u>	ν Peak Ηοι nd (200 <u>7)</u>	Ir Traffic	Cor	nditions -
Table 5				
Signalized Inte	ersections			
Market Place & Westnedge	Approach Direction	Approach Delay (sec)	LOS	
	Eastbound	35	D	Intersection LOS
	Westbound	54.8	D	С
	Northbound	32.6	С	Intersection Delay (sec)
	Southbound	8.2	Α	23.2
Westnedge & Kilgore				L
	Eastbound	63	E	Intersection LOS
	Westbound	70.6	E	E
	Northbound	32.4	С	Intersection Delay (sec)
	Southbound	71.3	E	56.6
Unsignalized I	ntersections			
Kilgore & Lowe's Drive	Approach Direction	Approach Delay (sec)	LOS	Intersection LOS
	Westbound Left	8.5	A	С
	Northbound Left	26.9	D	Intersection Delay (sec)
	Northbound Right	10.2	В	17.3
Westnedge & Lowe's Exit Drive				
	Eastbound Right	12.1	в	

Saturday Peak Hour Traffic Conditions - Background (2007)						
Table 6						
Signalized Inte	ersections					
Market Place & Westnedge	Approach Direction	Approach Delay (sec)	LOS			
	Eastbound	34.7	<u> </u>	Intersection LOS		
	Westbound	47.8	D	В		
	Northbound	22.1	С	Intersection Delay (sec)		
	Southbound	9.2	A	18.4		
Westnedge & Kilgore						
	Eastbound	60.1	Е	Intersection LOS		
	Westbound	53.2	D	D		
	Northbound	57.8	Е	Intersection Delay (sec)		
	Southbound	43.4	D	52.4		
Unsignalized I	ntersections					
Kilgore & Lowe's Drive	Approach Direction	Approach Delay (sec)	LOS	Intersection LOS		
	Westbound Left	8.3	А	В		
	Northbound Left	16.5	С	Intersection Delay (sec)		
	Northbound Right	10	А	12.3		
Westnedge & Lowe's Exit Drive						
	Eastbound Right	11	в			

The Background (Year 2007) capacity analyses HCS summary sheets are contained in Appendix B.

III. Forecast of Opening Day (2007) Traffic

Opening Day traffic volumes were calculated by adding the Development traffic volumes to the background peak hour traffic volumes (Figures 6 and 7). In order to analyze the impact of sitegenerated traffic volumes on the site access system and on the surrounding roads, capacity analyses were conducted at the key study intersections and site driveways.

A. <u>5110 S. WESTNEDGE AVENUE DEVELOPMENT GENERATED TRAFFIC</u> <u>VOLUMES</u>

Studies of similar developments throughout North America have shown that the amount of traffic generated will be related to some unit of activity (i.e. number of employees, gross floor area). In addition, site traffic fluctuates substantially on different days and hours throughout the year. Therefore, peak hourly volumes are a good estimate to add to the developments traffic volumes. If site access is adequate at peak hour, it will serve as a good model for the opening day conditions.

Gross Floor Area was used for analysis purposes in the opening day traffic counts. Using the average trip-generation rates given in the Institute of Transportation Engineers (ITE) <u>Trip</u> <u>Generation Manual</u>, 7th Edition, the inbound and outbound trips for the proposed development were calculated and added to the background peak hour volumes to get opening day traffic volumes.

Institute of Transportation Engineers (ITE) <u>Trip Generation Manual</u>, 7th Edition also gives pass by trips. Pass by trips are trips made into a site as intermediate stops along the route a driver is traveling. These trips are unplanned and create no diversion from another roadway. In the case of the proposed furniture store development pass by trips were neglected as they would not change the traffic volumes greatly and would not affect the intersection capacity analysis. This was assumed because trips to a furniture store are generally preconceived and people in general do not swing in and purchase a piece of furniture. In addition, the current traffic volumes are high enough on the surrounding area that it discourages motorist from getting off their desired path.

B. <u>DIRECTIONAL DISTRIBUTION OF DEVELOPMENT GENERATED TRAFFIC</u> VOLUMES

The directional distribution of site-generated traffic is related to several variables. The assumptions used to estimate the direction and way traffic will enter and exit the site is based on many conditions. Typically, drivers will chose the quickest safest direction to their next destination. This includes using traffic signals to turn left and traveling the shortest distance. Within that, existing traffic considerations are taken into account. With this proposed development, drivers will most likely turn left at signalized intersections and chose to turn right at unsignalized intersections since the traffic volumes are large on both Kilgore and Westnedge. The percentage of drivers that chose each alternative was taken from CESO, Inc's traffic report and is summarized in Table 7 and shown in Figures 7.

Directional Distribution For Opening Day Traffic					
Table 7					
Intersection					
Westnedge & Market Place	% Of Vehicles	Number of Vehicles			
NBTL	25%	8			
SBT	5%	2			
EBTL	10%	3			
Westnedge & Lowe's Drive					
NBT	5%	2			
SBTR	55%	17			
EBTR	20%	6			
Westnedge & Kilgore					
NBTL	5%	2			
SBT	40%	12			
WBTL	10%	5			
EBTL	40%	12			
EBTR	5%	2			
Kilgore & Lowe's	;				
WBTL	5%	2			
EBT	5%	2			
EBTR	10%	3			
NBTR	55%	17			
NBTL	15%	5			

Directional Distribution (%) - Figure 7



C. OPENING DAY (YEAR 2007) TRAFFIC VOLUMES

Directional distribution traffic volumes shown in Table 7 were added to the background weekday and Saturday peak hour traffic volumes (Figures 5 and 6) to create the Opening day traffic volumes shown in Figures 8 and 9.

D. <u>OPENING DAY (YEAR 2007) CAPACITY ANALYSIS</u>

Using the 2007 weekday and Saturday peak hour opening day traffic volumes illustrated on Figures 8 and 9, intersection capacity analysis was done for chosen intersections. Tables 8 and 9 summarize the Opening Day weekday and Saturday peak hour traffic conditions.

Weekday Opening Day Traffic Volumes – Figure 8



Saturday Opening Day Traffic Volumes – Figure 9



Week Day Day (2007	/ Peak Ho /)	ur Traffio	c Co	nditions - Opening
Table 8				
Signalized Inte	ersections			
Market Place & Westnedge	Approach Direction	Approach Delay (sec)	LOS	
	Eastbound	34.6	С	Intersection LOS
	Westbound	56.4	E	0
	Northbound	33.2	С	Intersection Delay (sec)
	Southbound	8.8	Α	23.6
Westnedge & Kilgore				
	Eastbound	59.4	E	Intersection LOS
	Westbound	56.7	Е	D
	Northbound	60.3	Е	Intersection Delay (sec)
	Southbound	44.9	D	54.4
Unsignalized I	ntersections			
Kilgore & Lowe's Drive	Approach Direction	Approach Delay (sec)	LOS	Intersection LOS
	Westbound Left	8.5	А	с
	Northbound	28.1	D	Intersection Delay (sec)
	Northbound Right	10.3	В	17.4
Westnedge & Lowe's Exit Drive				
	Eastbound Right	11.2	В	

Saturday Day (2007	Peak Hour)	Traffic C	Cond	ditions - Opening
Table 9				
Signalized Inte	rsections			
Market Place & Westnedge	Approach Direction	Approach Delay (sec)	LOS	
	Eastbound	34.6	D	Intersection LOS
	Westbound	47.4	D	В
	Northbound	22.8	С	Intersection Delay (sec)
	Southbound	10.3	В	19.2
Westnedge & Kilgore				
	Eastbound	64.3	E	Intersection LOS
	Westbound	75.3	E	E
	Northbound	32.8	С	Intersection Delay (sec)
	Southbound	73.8	E	58.7
Unsignalized Ir	itersections			
Kilgore & Lowe's Drive	Approach Direction	Approach Delay (sec)	LOS	Intersection LOS
	Westbound Left	8.4	А	В
	Northbound Left	17.2	С	Intersection Delay (sec)
	Northbound Right	10.2	В	12.4
Westnedge & Lowe's Exit Drive				
	Eastbound Right	12.2	В	

The opening day (Year 2007) capacity summary sheets are contained in Appendix C.

IV. Accident History

Accident History for the Westnedge & Kilgore intersection was obtained from CESO, Inc report that obtained the information from the City of Portage and from the City of Kalamazoo. The Accident history summary report can be seen in Table 10.

Kilgore Westnedge Accident History Summary						
Table 10						
Year 2000						
Approach						
Direction	Total	Head On-Lt	Angle Str	Rear End	Other	
E	3		1	1	1	
N	2			1		
S	3			2	1	
W	0	1				
Total	8	1	1	4	2	
Year 2001						
Approach Direction	Total	Head On-Lt	Angle Str	Rear End	Other	
E						
N	6			3	3	
S	4	2		2		
W	1				1	
Total	11	2		5	4	
Year 2002						
Approach Direction	Total	Head On-Lt	Angle Str	Rear End	Other	
E	5			3	2	
N	5			4	1	
S	15			14	1	
W						
Total	25			21	4	
Year 2003						
Approach Direction	Total	Head On-Lt	Angle Str	Rear End	Other	
E	1		1			
N						
S	2			1	1	
W	1				1	
Total	4	_	1	1	2	

V. Traffic Summary and Suggestions

Based on the results of the analysis of Current (year 2006), Background (year 2007) and Opening Day (year 2007), the following summaries and suggestions have been made.

A. <u>SUMMARY OF TRAFFIC CONDITIONS</u>

Currently the intersection of Westnedge and Kilgore is the only intersection that has a failing Level of Service. It has a LOS of E with an intersection delay of 57.2 seconds on weekday peak and LOS D with a 47.4-second delay on Saturday peak hour. The westbound and southbound traffic both have LOS E. These intersections currently have large delays due to both streets having large traffic volumes.

The background traffic had similar results with Kilgore and Westnedge being the only intersection with a high LOS. Market and Westnedge intersection increased its LOS to C, but it still is operating smoothly with small delays for westbound and eastbound traffic.

With opening day traffic added to the peak hour volumes Kilgore and Westnedge continued to have a failing LOS. All directions yielded a LOS of E at one time or the other. Weekday traffic had three failing LOS and Saturday also having three failing LOS. The intersection delay was 58.7 seconds on weekday and 54.4 on Saturday. These are the limit of acceptable delay but still restrict the flow of traffic.

With the addition of the opening day traffic to the current conditions, the intersection delay had a small increase. The problem is that the entire intersection has delays that are at the limit of acceptance. This shows that the proposed site will not affect the current traffic conditions as they are near failure currently.

The accident history report only showed signs of trouble in 2002 with twenty-five accidents, with twenty-one of them being rear-end accidents in the southbound direction. The accident data was not consistent enough to make any design suggestions as the other three years only had minimal accidents at the Kilgore – Westnedge intersection. Rear-end accidents were the most common with most accidents occurring on southbound Westnedge.

B. <u>SUGGESTIONS FOR IMPROVEMENTS</u>

Since the traffic volumes are so high on Westnedge and Kilgore changes to the traffic structure will be very difficult. Space limitations also hinder any geometric design changes as this area is already developed and it just is not feasible to add lanes to Westnedge and Kilgore. By increasing the length of storage lanes, the level of service also showed no improvements. The critical intersections continued to have failing LOS of E.

With the high volume of traffic already traveling on Westnedge and Kilgore there is not a quick simple fix to improve the conditions. It will take major changes to gain any major improvements to the areas roadway capacity, and small changes will only be temporary fixes as the Westnedge area continues to grow. The small amount of traffic that the proposed development will add will not break an already congested roadway system.

APPENDIX A

CURRENT TRAFFIC CONDITIONS HCS DETAILED REPOTS

.

	TWC	-WAY STOP	CONTR	ROL S	UM	IMARY					
General Informati		Site	Site Information								
Analyst			Inters	Intersection			Kilgore Lowes				
Agency/Co.	Cowgill a	and Associates	Juriso	Jurisdiction							
Date Performed	11/17/20	005	Analy	Analysis Year			Curent(2006)				
Analysis Time Period	y Peak Hour										
Project Description I	Proposed Furr	niture Store Dev	elopement					-			
East/West Street: Kilg	jore		North/	North/South Street: Lowes							
Intersection Orientatior	n: East-West	۴	Study	Study Period (hrs): 0.25							
Vehicle Volumes a	and Adjust	ments									
Major Street		Eastbound	Eastbound				Westbou				
Movement	1	2	3			_4	5		6		
	L		R				T		<u>R</u>		
Volume (ven/n) Beek heur fester, BHE	1.00	414	20	, —		0.02	507		0		
Hourly Flow Pato	1.00	0.92	0.92			0.92	0.92		1.00		
(veh/h)	0	449	21			57	609		0		
Proportion of heavy											
vehicles, P _{HV}	0					2					
Median type				Undiv	videa	1					
RT Channelized?			0	0					0		
Lanes	0	2	0	0		1	1		0		
Configuration		T	TR	TR L		L	T				
Upstream Signal		0			1						
Minor Street		Northbound					Southbo	und			
Movement	7	8	9			10	11		12		
	L	Т	R			L	Т		R		
Volume (veh/h)	44	0	58			0	0		0		
Peak-hour factor, PHF	0.92	1.00	0.92	?		1.00	1.00		1.00		
Hourly Flow Rate (veh/h)	47	0	63			0	0		0		
Proportion of heavy vehicles, P _{HV}	2	0	2			0	0		0		
Percent grade (%)		0					0				
Flared approach		N		+			N				
Storage		0					0				
RT Channelized?	+		0				, v		0		
Lanes	1		1			0			0		
Configuration	L		R								
Control Delay, Queue	Length, Leve	of Service			-	_					
Approach	EB	WB		Northbo	ound	k	S	outhbour	nd		
Movement	1	4	7	8		9	10	11	12		
Lane Configuration		L	L			R					
Volume, v (vph)		57	47			63					
Capacity, c _m (vph)		1088	216		-	767			1		
v/c ratio		0.05	0.22		\neg	0.08					
Queue length (95%)		0.17	0.80		\neg	0.27			1		
Control Delay (s/veh)		8.5	26.2		\neg	10.1					
					\rightarrow						

LOS		A	D		В		1	
Approach delay (s/veh)	_	-		17.0				•
Approach LOS				С				
	0	14 @ 3003 II :			1			NT - 11

 $HCS2000^{\rm TM}$

Copyright © 2003 University of Florida, All Rights Reserved

Version 4.1d

	TWO	D-WAY STOP	CONTR		UMN	IARY					
General Information	on		Site	Site Information							
Analyst			Inters	Intersection			Kilgore Lowes				
Agency/Co.	Cowgill	and Associates	Juriso	Jurisdiction							
Date Performed 11/1		005	Analy	Analysis Year			Curent(2006)				
Analysis Time Period	Saturda	y Peak Hour									
Project Description F	Proposed Furi	niture Store Dev	ure Store Developement								
East/West Street: Kilg	lore		North/	North/South Street: Lowes							
Intersection Orientatior	t	Study Period (hrs): 0.25									
Vehicle Volumes a	and Adjust	ments									
Major Street		Eastbound					Westbound				
Movement	1	2	3			4	5		6		
Valuma (uah/h)		247			6		004		<u></u>		
Peak bour factor PHE	1.00	347	25	,	0	02	281		1.00		
Hourly Flow Rate	1.00	0.92	0.92		υ.	92	0.92	<u> </u>	1.00		
(veh/h)	0	377	27		6	67	305		0		
Proportion of heavy						~					
vehicles, P _{HV}	0				4	2					
Median type				Undiv	vided		<u> </u>				
RT Channelized?			0						0		
Lanes	0	2	0			1	1		0		
Configuration		Т	TR		l	L	Т				
Upstream Signal		0					1				
Minor Street		Northbound						und			
Movement	7	8	9	9 10		10	11		12		
	L	Т	R			L	Т		R		
Volume (veh/h)	37	0	69		(0	0		0		
Peak-hour factor, PHF	0.92	1.00	0.92	?	1.	00	1.00		1.00		
Hourly Flow Rate (veh/h)	40	0	74		(0	0		0		
Proportion of heavy vehicles, P _{HV}	2	0	2		(0	0		0		
Percent grade (%)		0					. 0				
Flared approach		N					N				
Storage		0			_		0				
RT Channelized?			0						0		
Lanes	1	0	1		(2	0		0		
Configuration	L		R			-					
Control Delay, Queue	Length, Lev	el of Service									
Approach	EB	WB		Northbo	ound		S	outhbo	und		
Movement	1	4	7	8		9	10	11	12		
Lane Configuration		L	L			R					
Volume, v (vph)		67	40			74					
Capacity, c _m (vph)		1151	350		\neg	805					
v/c ratio		0.06	0.11		+	0.09		<u> </u>			
Queue length (95%)		0.19	0.38	<u> </u>	+	0.30					
Control Delav (s/veh)		8.3	16.6			9.9					
								<u> </u>			

LOS		A	С		A		
Approach delay (s/veh)		_		12.3	-		
Approach LOS	_	-		В			
				_			

HCS2000TM

Copyright © 2003 University of Florida, All Rights Reserved

Version 4.1d

	TWO	-WAY STOP	CONTR	OL S	UM	MARY					
General Information			Site I	Site Information							
Analyst Agency/Co. Data Barformad	Cowgill a	nd Associates	Interse Jurisdi	Intersection Westnedge Ave. & Lowes Jurisdiction Applysis Year Current (2006)							
Analysis Time Period Weekday Peak Hour											
Project Description F	Proposed Furni	iture Store Deve	elopement								
East/West Street: Low	ves Dr.		North/	North/South Street: Westnedge Avenue							
Intersection Orientation: North-South				Study Period (hrs): 0.25							
Vehicle Volumes a	nd Adjustn	nents									
Major Street		Northbound					Southbo	und			
Movement	1	2	3			4	5		6		
	L	Т	R			L	Т		R		
Volume	0	1527	0			0	1867		14		
Peak-Hour Factor, PHF	0.92	0.92	1.00			1.00	0.92		0.9	2	
Hourly Flow Rate, HFR	0	1659	0			0	2029		15		
Percent Heavy Vehicles	s 2					0					
Median Type				Undiv	/idec	1					
RT Channelized			0						0		
Lanes	0	2	0			0	2		1		
Configuration		Т					Т		R		
Upstream Signal		1					1				
Minor Street	Westbound						Eastbou	nd			
Movement	7	8	9			10	11		12	2	
	L	Т	R			L	Т		R		
Volume	0	0	0			0	0		17		
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00		0.92	1.00		0.92	2	
Hourly Flow Rate, HFR	0	0	0			0	0		18		
Percent Heavy Vehicles	s 0	0	0			2	0		2		
Percent Grade (%)		0					0				
Flared Approach		N					N				
Storage		0					0				
RT Channelized			0						0		
Lanes	0	0	0		0		0		1		
Configuration									R		
Delay, Queue Length,	and Level of	Service									
Approach	NB	SB	1	Westbound			Eastbound				
Movement	1	4	7	8		9	10	11		12	
Lane Configuration										R	
v (vph)										18	
C (m) (vph)										553	
v/c).03	
95% queue length										10	
Control Delay										11.7	
				<u> </u>					-+-'	B	
Approach Dolay								117			
Approach LOC							11.7				
Approach LOS											

Rights Reserved
	TWO	WAY STOP	CONTR	OL S	UM	MARY				
General Informatio	n		Site I	nforr	nati	ion				
Analyst Agency/Co. Data Borformod	Cowgill ai	nd Associates	Interse Jurisdi	ction			Westned	ge Av	′e. &	Lowes
Date Performed Analysis Time Period	Saturday	io Peak Hour	Analys	is rea	ar -		Currenii (2006)		
Project Description P	roposed Depa	rtment Store De	evelopeme	ent						
Fast/West Street: Low	es		North/	South	Stre	et: Westi	nedae			
Intersection Orientation:	North-Sout	h	Study	Period	l (hrs	s): 0.25				
Vehicle Volumes a	nd Adjustr		1							
Major Street		Northbound					Southbo	und		
Movement	1	2	3			4	5	T		6
	Ĺ	<u>т</u>	R			L	T			R
Volume	0	1308	0			0	1550			19
Peak-Hour Factor, PHF	0.92	0.92	1.00			1.00	0.92		(0.92
Hourly Flow Rate, HFR	0	1421	0			0	1684			20
Percent Heavy Vehicles	2					0				
Median Type		-	•	Undi	video	d				
RT Channelized			0							0
Lanes	0	2	0			0	2			1
Configuration		Т					Т			R
Upstream Signal		1					1			
Minor Street		Westbound					Eastbou	nd		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume	0	0	0			0	0			24
Peak-Hour Factor, PHF	1.00	1.00	1.00			0.92	1.00		0	0.92
Hourly Flow Rate, HFR	0	0	0			0	0			26
Percent Heavy Vehicles	0	0	0			2	0			2
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			0	0			1
Configuration										R
Delay, Queue Length,	and Level of	Service								
Approach	NB	SB	١	Nestb	ound	t t	E	Eastbo	ound	
Movement	1	4	7	8		9	10	1.	1	12
Lane Configuration										R
v (vph)										26
C (m) (vph)										630
v/c										0.04
95% aueue lenath										0.13
Control Delav										11.0
LOS										В
Approach Delav		_					11.0			
Approach LOS		_						В		

				ŀ	ICS	200	0™	DE1	AILE	Đ	REF	20	ORT					
General Inf	formation								Site	Ini	forma	tio	on _					
Analyst Agency or C Date Perfor	Co. <i>Cowgill</i> med <i>04/10/</i> 2	ana 006	l Asso	ciat	es				Inters Area Juriso	seo Ty dic	ction ype ction		Kilgo All o	bre Wes ther are	tnedg as	e		
Time Period	Weekda	ay P	eak H	our	,				Analy Proje	/SI	ID	I	Prop Deve	osed Fi elopeme	») urnitui ent	e Store		
Volume an	d Timing In	out					_				·	_						
		ŀ	IT	ь Тт	<u>:В</u> -Н	RT	+	IT		Т	RT	+	IT		RT		SB TH	RT
Number of I	anes, N ₁	1	1	2	2	0	╈	1	1	1	1	t	1	2	0	1	2	0
Lane group	· · ·		L	TI	R		╈	L	Т	1	R	t	L	TR		L	TR	
Volume, V ((vph)		128	19	90	133	; ,	364	325	T	163		156	1171	129	110	1383	57
% Heavy ve	hicles, %HV	′	2	1	2	2	Ť	2	2	1	2	T	2	2	2	2	2	2
Peak-hour f	actor, PHF		0.92	0.	92	0.92	2 (0.92	0.92	Τ	0.92	C	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed (P (A)) or actuated	k	A	1	4	A	Τ	A	A		A	Τ	A	Р	Р	A	Р	Р
Start-up los	t time, I ₁		2.0	2	.0			2.0	2.0		2.0	1	2.0	2.0		2.0	2.0	
Extension o green, e	f effective		3.0	3.	.0		Τ	3.0	3.0		3.0		3.0	3.0		3.0	3.0	
Arrival type	, AT		3	1	3		Τ	3	3		3	Т	4	5		3	3	
Unit extensi	ion, UE		3.0	3.	0		Т	3.0	3.0	٦	3.0	Т	3.0	3.0		3.0	3.0	
Filtering/me	tering, I		1.000	1.0	000		1	1.000	1.000	,	1.000	0	0.577	0.577		1.000	1.000	
Initial unme	t demand, Q	ь	0.0	0.	.0			0.0	0.0		0.0	4	0.0	0.0		0.0	0.0	
Ped / Bike / volumes	RTOR		0	C)	120		0	0		133		0	о	7	0	о	3
Lane width			12.0	12	2.0			12.0	12.0		12.0	1	12.0	12.0		12.0	12.0	
Parking / G	rade / Parkin	g	Ν	1	2	N		Ν	0		Ν		Ν	0	N	N	0	N
Parking ma	neuvers, N _m						\downarrow											
Buses stop	oing, N _B	$ \rightarrow$	0	0)		\downarrow	0	0		0	\downarrow	0	0		0	0	
Min. time fo G _p	r pedestrian:	S,		3.	.2				3.2					3.2			3.2	
Phasing	EB Only	W	/B Onl	y		03		()4		SB O	only	у Т	nru & R	TN	B Only	0	8
Timing	G = 11.4	G :	= 25.6 - 5	\$	G =		_	G =			G = 7	.0	G	= 33.0		= 8.0 - 5	G =	
Duration of	Analvsis. T :	= 0.2	25	\neg	T -			T			r – J			- J vcle Ler	nath. ($\frac{-5}{2} = 110$	<u> </u>	
Lane Grou	p Capacity,	Cor	25 ntrol Delay, and LOS Deter					rmina	tio	on 🗌				. <u>g</u> , .				
							WB					NB			SB			
Adjusted flo	w rate v	L]		TH 24	F	<u> 175</u>			TH	م	RT	L	.T	TH	RT	LT	TH	RT
	capacity c	201	9 221 396 3				151	3	22 22	11	15	1400		120	1472			
V/c ratio X		200		3J 56	+		+20 0 0		78	0	00	14	17	0.04		129	1412	
10100, X		0.0		50	+		0.9		.70	0.0		1.1		0.94		0.93	1.00	

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k1427.tmp

Total green ratio, g/C	0.11	0.11	0.24	0.24	0.24	0.08	0.43		0.07	0.42	
Uniform delay, d ₁	47.0	46.2	40.7	39.0	32.3	50.5	30.2		50.7	32.0	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	0.503		1.000	1.000	
Delay calibration, k	0.26	0.16	0.44	0.33	0.11	0.50	0.50		0.45	0.50	
Incremental delay, d ₂	10.0	1.8	26.0	8.7	0.1	111.5	8.6		58.1	41.6	
Initial queue delay, d ₃											
Control delay	57.0	48.0	66.7	47.7	32.4	162.0	23.8		108.9	73.6	
Lane group LOS	E	D	Е	D	С	F	С		F	Е	
Approach delay	51	.5	5	6.7		3	8.7			76.1	
Approach LOS	Ľ	2		E			D			Е	
Intersection delay	57	7.2	$X_{c} =$	0.99		Interse	ction LO	S		Е	

Copyright © 2000 University of Florida, All Rights Reserved

				НС	S2000	[™] D	ET/	AILE	D RE	P	ORT						
General Inf	ormation							Site	nform	nat	ion						
Analyst Agency or C Date Perfor Time Perioc	Co. Cowgill med 04/11/20 I Weekda	and A)06 y Pea	ssoci k	iates				Inters Area Juriso Analy Proje	ection Type diction vsis Ye ct ID	ear	Ma Av All Cu	erket Plac e. other ar rrent (20	ce & eas 106)	: We	estnedg	<i>j</i> e	
Volume an	d Timing Inp	ut	_				1										
			тΤ	EB TH	I RT	$\frac{1}{1}$	тТ	WB TH	RT		ΙT	NB T TH	R	┯╋	LT	SB TH	RT
Number of I	anes, N ₁		2	1	1	0	,	1	1		1	2	0	<u> </u>	1	2	0
Lane group				LT	R	\top		LT	R		L	TR		1	L	TR	
Volume, V (vph)	5	0	6	116	21	6	10	22		95	1456	56	5	9	1637	17
% Heavy ve	hicles, %HV	2	2	2	2	2	2	2	2		2	0	4		20	0	15
Peak-hour f	actor, PHF	0.8	82 (0.60	0.78	0.8	39	0.83	0.60		0.78	0.95	0.6	5	0.60	0.95	0.67
Pretimed (P (A)) or actuated	A	A	A	A	P	,	Ρ	Р		A	A	A		A	A	A
Start-up los	t time, l ₁			2.0	2.0	Τ		2.0	2.0		2.0	2.0			2.0	2.0	
Extension o green, e	f effective			3.0	3.0	Γ		3.0	3.0		3.0	3.0			3.0	3.0	
Arrival type,	, AT			3	3			3	3	٦	3	3			4	6	
Unit extensi	on, UE			3.0	3.0			3.0	3.0		3.0	3.0			3.0	3.0	
Filtering/me	tering, I		1	.000	1.000			1.000	1.00	0	1.000	1.000		0	0.090	0.090	
Initial unme	t demand, Q _t	,		0.0	0.0			0.0	0.0		0.0	0.0			0.0	0.0	
Ped / Bike / volumes	RTOR	0	,	0	116	0	,	0	0		0	0	3		0	0	0
Lane width			1	11.0	11.0			11.0	11.0		11.0	13.0			11.0	13.0	
Parking / G	rade / Parking		V	-1	N	٨	/	1	N		N	1	N	'	Ν	-1	N
Parking ma	neuvers, N _m																
Buses stop	bing, N _B			0	0			0	0		0	0		$ \downarrow$	0	0	
Min. time fo G _p	r pedestrians	,		3.2				3.2				3.2				3.2	
Phasing	EW Perm	0	2		03		04	4	NB	On	ily T	۲hru & R	Т	SB	Only	0	8
Timing	G = 23.0	G =		G =	=	G	=		G =	9.7	7 (G = 54.1		G =	3.2	G =	
Duration of	Y = 5 Analysis T =	Y =		Y =	-	Y	=		Y = ;	5		r = 5	<u></u>	Y =	$\frac{5}{= 110}$	Y =	
Lane Grou	n Canacity	0.25					oter	minaf	ion		<u> </u>	ycie Lei	igin	, 0	- 110		
Lune orou	EB					V	NB				NB				SB		
		LT	TH		RT	LT	Tł	Н	RT	L	Т	TH	R	Г	LT	TH	RT
Adjusted flo	w rate, v		71		0		25	5	37	12	22	1615			15	1748	
Lane group	capacity, c		136	3	36		23	6 3	332	16	66	2333			56	2148	
v/c ratio, X			0.52	2 0.	.00		1.0	8 0	.11	0.	73	0.69		(0.27	0.81	

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k1433.tmp

Total green ratio, g/C	0.22	0.22		0.22	0.22	0.10	0.63		0.04	0.58	
Uniform delay, d ₁	37.9	33.6		43.0	34.5	48.3	13.1		51.4	18.6	
Progression factor, PF	1.000	1.000		1.000	1.000	1.000	1.000		1.000	0.118	
Delay calibration, k	0.13	0.11		0.50	0.50	0.29	0.26		0.11	0.35	
Incremental delay, d ₂	3.6	0.0		81.6	0.7	15.6	0.9		0.2	0.2	
Initial queue delay, d ₃											
Control delay	41.6	33.6		124.6	35.1	63.9	14.0		51.6	2.4	
Lane group LOS	D	С		F	D	E	В		D	A	
Approach delay	41.6			113.3		1	7.5			2.8	
Approach LOS	D			F			В			A	
Intersection delay	18.5		X _c	= 0.87		Interse	ction LO	S		В	

Copyright © 2000 University of Florida, All Rights Reserved

					нс	520	00"	DE	ΤΑΙ	ILEI	D RE	PC	ORT					
General In	formation				_				S	ite lı	nform	atio	on					
Analyst Agency or 0 Date Perfor Time Period	Co. Cowgili med 04/10/2 d Saturda	l an 2000 ay F	d Ass 5 Peak	socia Hou	ntes r				ln Ai Ju Ai Pi	nterse rea T urisd nalys rojec	ection Type iction sis Yea t ID	ar	Wes All o Cure Prop Dev	thedge ther are ent(2000 bosed F elopem	Kilgor eas 5) urnitur ent	re re Store		
Volume an	d Timing In	put	L.		<i>`</i>								-			* * *		
					EB		_		1	WB		_		NB			SB	
Number of	lanes, N			+	<u>1H</u> 2		,	 	╋	<u>IH</u> 1		╉	LI 1	2 2	RT 0	1 LT	2 TH	RT 0
Lane group	<u>1</u>		L	+	 TR				+	T	R	+	L	TR			TR	
Volume, V	(vph)		80		179	14	1	443	1	80	25	╈	142	1002	142	89	984	17
% Heavy ve	ehicles, %H\	/	2	╈	2	2		2	╀	2	2	\dagger	2	2	2	2	2	2
Peak-hour f	factor, PHF		0.92		.92	0.9	2	0.92	0.	.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92
Pretimed (F (A)) or actuate	d	A		A	A		A	1	A	A	†	A	Р	Р	A	Р	Р
Start-up los	t time, I ₁		2.0		2.0	┢		2.0	2	2.0	2.0	\uparrow	2.0	2.0		2.0	2.0	
Extension o green, e	of effective		3.0		3.0	Γ		3.0	3	8.0	3.0	T	3.0	3.0		3.0	3.0	
Arrival type	, AT		3	╈	3			3	1	3	3	╋	4	5		3	3	
Unit extensi	ion, UE		3.0	1	3.0			3.0	3	3.0	3.0	Ť	3.0	3.0		3.0	3.0	
Filtering/me	etering, I		1.00	0 1	.000			1.000	1.1	000	1.000	, c	0.710	0.710		1.000	1.000	
Initial unme	t demand, Q	b	0.0	1	0.0			0.0	0	0.0	0.0	T	0.0	0.0		0.0	0.0	
Ped / Bike / volumes	RTOR		0		0	13	4	0		0	17		0	0	10	0	0	1
Lane width			12.0	1	2.0			12.0	12	2.0	12.0		12.0	12.0		12.0	12.0	
Parking / G	rade / Parkir	g	N		0	Ν	'	N	-	0	N	T	Ν	0	N	N	0	N
Parking ma	neuvers, N _m	I										Ι						
Buses stop	ping, N _B		0		0			0		0	0		0	0		0	0	
Min. time fo G _P	r pedestrian	s,			3.2				3	3.2				3.2			3.2	
Phasing	EB Only	٧	VB O	nly		03			04		SB C	nly	у Т	nru & R	ΤN	B Only	0	8
Timing	G = 9.8	G	= 35	5.9	G =			G =		-+	G = 5	5.3	G	= 25.0	G	= 9.0	G =	
Duration of	Analysis, T :	= 0.	- 5 25		T =			Y =			Y = 0	}		= ⊃ vcle ler	orth C	= 5	Y =	
Lane Grou	p Capacity.	Co	ntrol	Del	av. a	nd L	.05	Dete	ermi	inati	on							
				EB					WE	3				NB			SB	
		L	T	TH	_	RT	Ľ	T	TH		RT	L	.Τ	ТН	RT	LT	TH	RT
Adjusted flo	w rate, v	87		203	-		48.	2	196	\perp	9	15	54	1232		97	1087	
Lane group	capacity, c	17	4	345			59	4	625	5	31	16	51	1265		101	1165	
v/c ratio, X		0.5	0	0.59			0.8	1 (0.31	0	.02	0.9	96	0.97		0.96	0.93	$\left - \right $

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k144C.tmp

Total green ratio, g/C	0.10	0.10	0.34	0.34	0.34	0.09	0.36		0.06	0.33	
Uniform delay, d ₁	47.0	47.5	33.4	27.1	24.4	49.8	34.5		51.7	35.7	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	0.619		1.000	1.000	
Delay calibration, k	0.11	0.18	0.35	0.11	0.11	0.47	0.50		0.47	0.50	
Incremental delay, d ₂	2.3	2.6	8.4	0.3	0.0	47.5	16.0		76.6	14.5	
Initial queue delay, d ₃											
Control delay	49.3	50.1	41.8	27.4	24.4	97.3	37.3		128.3	50.2	
Lane group LOS	D	D	D	С	С	F	D		F	D	
Approach delay	49	9.9	3	7.4		4	4.0			56.6	
Approach LOS	Ľ	2		D			D			Е	
Intersection delay	47	7.4	X _c =	0.86		Interse	ction LO	S		D	

Copyright © 2000 University of Florida, All Rights Reserved

		HCS	2000"	DET.		REP	ORT					
General Information					Site In	forma	tion		_			
Analyst Agency or Co. Cowill and Date Performed 04/11/2006 Time Period 5:00 pm	Associa	ates			Interse Area T Jurisdi Analys Projec	ection Type ction sis Year t ID	Mai Ave All c r Cur	rket Pla p. other ar rent (20	ce & W eas 006)	/estned	lge	
Volume and Timing Input		_										
		EB			WB			NB		1	SB	
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N ₁	0	1	1	1	1	1	1	2	0	1	2	0
Lane group		LT	R	L	LT	R	L	TR		L	TR	
Volume, V (vph)	43	5	99	188	9	19	81	1246	48	8	1402	14
% Heavy vehicles, %HV	2	2	2	2	2	2	2	0	4	20	0	15
Peak-hour factor, PHF	0.82	0.60	0.78	0.89	0.83	0.60	0.78	0.95	0.65	0.60	0.95	0.67
Pretimed (P) or actuated (A)	A	А	А	Р	Р	Р	A	A	A	A	A	А
Start-up lost time, I ₁		2.0	2.0	2.0	2.0				_		_	

APPENDIX B

BACKGROUND TRAFFIC CONDITIONS HCS DETAILED REPOTS

	тwo	D-WAY STOP	CONTR	OL S	UN	IMARY			
General Information	on		Site	nforr	nat	ion			
Analyst			Inters	ection			Kilgore L	owes	
Agency/Co.	Cowgill	and Associates	Juriso	liction					
Date Performed	11/17/2	005	Analy	sis Ye	ar		Backgro	und (20	007)
Analysis Time Period	Saturda	y Peak Hour		_					
Project Description I	Proposed Furi	niture Store Dev	elopement						
East/West Street: Kilg	jore		North/	South	Stre	et: Lowe	S		
Intersection Orientatior	n: East-Wes	<u>t</u>	Study	Period	l (hr	s): 0.25			
Vehicle Volumes a	an <mark>d Adj</mark> ust	ments							
Major Street		Eastbound					Westbou	und	
Movement	1	2	3			4	5		6
		<u>T</u>	R				T	-+	<u> </u>
Volume (ven/n)	0	354	25			63	28/		0
Peak-nour lactor, PHF	1.00	0.92	0.92			0.92	0.92		1.00
(veh/h)	0	384	27			68	311		0
Proportion of heavy	0					2			
vehicles, P _{HV}	0					2			
Median type				Undiv	<i>ride</i> (d			
RT Channelized?			0						0
Lanes	0	2	0			1	1		0
Configuration		Т	TR			L	T		
Upstream Signal		0					1		
Minor Street		Northbound					Southbo	und	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)	38	0	70			0	0		0
Peak-hour factor, PHF	0.92	1.00	0.92	?		1.00	1.00		1.00
Hourly Flow Rate (veh/h)	41	0	76			0	0		0
Proportion of heavy vehicles, P _{HV}	2	0	2			0	0		0
Percent grade (%)		0			_	-	0		
Flared approach				_			N		
Storage	+	0	+				0		
RT Channelized?	1		0						
l anes	1		1			0	0		0
Configuration			R			0			
Control Delay, Queue	Length, Leve	el of Service			_				
Approach	EB	WB		Northbo	oun	d	S	outhbo	und
Movement	1	4	7	8		9	10	11	12
Lane Configuration		L	L			R			
Volume, v (vph)		68	41			76			
Capacity, c _m (vph)		1144	353			800			
v/c ratio		0.06	0.12	-		0.09			
Queue length (95%)		0.19	0.39			0.31			
Control Delay (s/veh)		83	16.5			10.0			
						10.0			

LOS		A	C		A		
Approach delay (s/veh)				12.3			
Approach LOS	-			В			
HCS2000 TM	C	opyright © 2003 Unive	rsity of Florida, Al	l Rights Reserved			Version 4.1d

		TWO	-WAY STOP	CONTR	OL S	SUN	IMARY			
General Informati	on			Site	nfor	mat	ion			
Analyst	T			Inters	ection			Kilgore L	owes	
Agency/Co.		Cowgill a	nd Associates	Juriso	liction					
Date Performed	1	1/17/20	05	Analy	sis Ye	ar		Backgro	und (20	07)
Analysis Time Period	5	:00 pm					_			
Project Description	Propos	ed Furn	iture Store Deve	elopement						
East/West Street: Kilg	jore			North/	South	Stre	et: Lowe	S		
Intersection Orientation	n: <i>Ea</i>	st-West		Study	Регіос	d (hr	s): 0.25			
Vehicle Volumes	and A	djustn	nents							
Major Street			Eastbound	_				Westbou	und	
Movement		1	2	3			4	5	-+	6
(aluma - (T	R				T		R
Volume (ven/n)		<u> </u>	422	20		<u> </u>	54	5/2	\rightarrow	0
Hourly Flow Pate		1.00	0.92	0.92	:	<u> </u>	0.92	0.92		1.00
(veh/h)		0	458	21			58	621		0
Proportion of heavy							-			
vehicles, P _{HV}		0					2			
Median type					Undi	vide	d			
RT Channelized?				0						0
Lanes		0	2	0			1	1		0
Configuration			Т	TR			L	T		
Upstream Signal			0					1		
Minor Street			Northbound					Southbo	und	
Movement		7	8	9			10	11		12
		L	Т	R			L	Т		R
Volume (veh/h)		45	0	59			0	0		0
Peak-hour factor, PHF		0.92	1.00	0.92	·		1.00	1.00		1.00
Hourly Flow Rate (veh/h)		48	0	64			0	0		0
Proportion of heavy vehicles, P _{HV}		2	0	2			0	0		0
Percent grade (%)		_	0					0		
Flared approach			N					N		
Storage			0					0		
RT Channelized?				0						0
Lanes		1	0	1			0	0		0
Configuration		L		R						
Control Delay, Queue	Lengt	h, Leve	l of Service							
Approach	E	В	WB	1	Vorthb	oun	d	S	outhbou	und
Movement	1	1	4	7	8		9	10	11	12
Lane Configuration			L	L			R			
Volume, v (vph)			58	48			64			
Capacity, c _m (vph)			1080	212			761			
v/c ratio			0.05	0.23			0.08			
Queue length (95%)			0.17	0.84			0.27			
Control Delay (s/veh)			8.5	26.9			10.2			

file://C:\Documents and Settings\Dan\Local Settings\Temp\u2k1457.tmp

4/17/2006

LOS		A	D		В		1	
Approach delay (s/veh)	_			17.3				
Approach LOS				С				
		: 1. G 2002 II :	1. CT1 1.1					

Copyright © 2003 University of Florida, All Rights Reserved

,

	TWO-	WAY STOP	CONTROL	SUMMARY								
General Information	า		Site Infor	mation								
Analyst Agency/Co.	Cowgill an	d Associates	Intersection Jurisdiction		Westnedge A	ve. & Lowes						
Date Performed Analysis Time Period	11/17/2003 Weekday I	5 Peak Hour	Analysis Ye	ar	Background ((2007)						
Project Description Pro	oposed Furniti	ure Store Devel	opement			-						
East/West Street: Lowe	\$		North/South	Street: West	nedge							
Intersection Orientation:	North-South		Study Perio	d (hrs): 0.25								
Vehicle Volumes ar	id Adjustm	ents										
Major Street		Northbound			Southbound							
Movement 1 2 3 4 5 L T R L T Volume 0 1558 0 0 1904 Peak-Hour Factor, PHF 0.92 0.92 1.00 1.00 0.92												
	jor Street Northbound vement 1 2 3 L T R ume 0 1558 0 ak-Hour Factor, PHF 0.92 0.92 1.00 urly Flow Rate, HFR 0 1693 0 cent Heavy Vehicles 2				Т	R						
Volume	0	1558	0	0	1904	14						
Peak-Hour Factor, PHF	0.92	0.92	1.00	1.00	0.92	0.92						
Hourly Flow Rate, HFR	0	1693	0	0	2069	15						
Percent Heavy Vehicles	2			0								
Median Type	0.92 0.92 1.00 1.00 0.92 0. 0 1693 0 0 2069 1 2 0 Undivided											
RT Channelized			0			0						
Lanes	0	2	0	0	2	1						
Configuration		T			Т	R						
Upstream Signal		1			1							
Minor Street		Westbound			Eastbound							
Movement	7	8	9	10	11	12						
	L	Т	R	L	Т	R						
Volume	0	0	0	0	0	17						
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.92	1.00	0.92						
Hourly Flow Rate, HFR	0	0	0	0	0	18						
Percent Heavy Vehicles	0	0	0	2	0	2						
Percent Grade (%)		0			0							
Flared Approach		N			N							
Storage		0			0							
RT Channelized			0			0						
Lanes	0	0	0	0	0	1						
Configuration												

	TWO	-WAY STOP	CONTR	OL S	SUN	IMARY		_		
General Informati	on		Site I	nfori	mat	ion				
Analyst Agency/Co.	Cowgill a	nd Associates	Interse Jurisdi	ection iction			Westned	lge Av	/e. &	Lowes
Date Performed	11/17/20	05	Analys	sis Yea	ar		Backgrou	und (2	2007)	
Analysis Time Period	Saturday	Peak Hour		_						
Project Description /	roposea rum	ure Store Deve	North/	South	Ctro	at: Mast	nodao			
Intersection Orientation	Ves North-Sout	th	Study	Dorior		$\frac{1}{2}$	leuye			
			Study	renou	1 (III)	5). 0.25				
Venicie volumes a	and Adjustn	nents					0 11			
Mayomont	1		T			4		una		6
wovernent						4				0
Volumo		1224					1591			10
Peak Hour Factor DHE	0.02	0.02	1.00	,		1.00	0.02			19
Hourly Flow Rate HER	0.92	1449	1.00			0	1718			20
Percent Heavy Vehicle	s 2					0				
Median Type				Undi	vider					
RT Channelized			0	Dildi						0
Lanes	0	2	0			0	2			1
Configuration							Ť	R		
Upstream Signal	T 1								_	
Minor Street	<u> </u>	Westbound		_			Fastbou	Ind		
Movement	7	8	9			10	11			12
	L	T	R	_		L	Т			R
Volume	0	0	0			0	0	\rightarrow		24
Peak-Hour Factor, PHI	1.00	1.00	1.00)		0.92	1.00		0	.92
Hourly Flow Rate, HFF	0	0	0			0	0	- T		26
Percent Heavy Vehicle	s 0	0	0		_	2	0			2
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			0	0			1
Configuration										R
Delay, Queue Length,	and Level of	Service								
Approach	NB	SB	1	Westb	ound	t	E	Eastbo	ound	
Movement	1	4	7	8		9	10	1'	1	12
Lane Configuration										R
v (vph)									_	26
C (m) (vph)										631
v/c										0.04
95% queue length										0.13
Control Delay										11.0
LOS										В
Approach Delay	_							11.0)	
Approach LOS								В		

Rights Reserved

				н	CS200	ס™ C)ET	AILE	DR	ΞP	ORT											
General Inf	ormation							Site	Inforn	na	tion											
Analyst Agency or 0 Date Perfor Time Perioc	Co. med 04/11/20 5:00 pm	006						Inters Area Juris Analy Proje	section Type dictior ysis Y ect ID	n n eai	Ar An Al r Bá	ndy Ave /e. I other aseline	e. & area	Wesi	tnedge							
Volume an	d Timing Inp	out						<u> </u>														
			- 1	EE	3	<u> </u>	т		Тот			NB		DT		SB	БТ					
Number of I	anes, N		0	1	1		- I)	1	1		1	2	+	0	1	2	0					
Lane group	1	+		LT	R	+		LT	R		L	TR	╈		L	TR						
Volume, V ((vph)	4	4	5	106	11	88	9	19	_	96	1274	¢ 1	49	8	1433	14					
% Heavy ve	hicles, %HV		2	2	2		2	2	2		2	0		4	20	0	15					
Peak-hour f	actor, PHF	0.	82	0.60	0.78	0.	89	0.83	0.60)	0.78	0.95	0	.65	0.60	0.95	0.67					
Pretimed (P) or actuated (A)AAAPPPAAAAAStart-up lost time, I, 2.0							A	A														
Start-up los	t time, I ₁			2.0	2.0	\top		2.0	2.0	96 1274 49 0 1433 14 2 0 4 20 0 15 0 0.78 0.95 0.65 0.60 0.95 0.67 A A A A A A A A 2.0 2.0 2.0 2.0 2.0 2.0 2.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3 3 4 5 5 5 5 5 5 0.00 1.000 0.472 0.472 0.472 5 5 5 0.0 0.0 3 0 0.0 0.0 5 5 5												
Start-up lost time, I, 2.0 2																						
Arrival type	Arrival type, AT 3.0 <td></td>																					
Unit extensi	ion, UE			3.0	3.0			3.0	3.0)	3.0	3.0			3.0	3.0						
Filtering/me	tering, I			1.00	0 1.000	,		1.000	1.00	0	1.00	.0 3.0 3.0 3.0 3.0 3 3 4 5 .0 3.0 3.0 3.0 000 1.000 0.472 0.472 0 0.0 0.0 0.0										
Initial unme	t demand, Q _t	,		0.0	0.0			0.0	0.0		0.0	0.0			2.0 2.0 3.0 3.0 4 5 3.0 3.0 0.472 0.472 0.0 0.0 0.0 0.0 11.0 13.0 N -1							
Ped / Bike / volumes	RTOR	(2	0	96		0	0	0		0	0		3	0	SB LT TH 1 2 L TR 8 1433 20 0 0.60 0.95 0 A A 2.0 2.0 1 3.0 3.0 1 3.0 3.0 1 3.0 3.0 1 0.472 0.472 1 0.0 0.0 1 0.0 0.0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 3.2 G = 5 Y = 5 Y = 13 1529 47 1890 0.28						
Lane width				11.0	11.0	Τ		11.0	11.0)	11.0	13.0			11.0	13.0						
Parking / G	rade / Parkin	g /	v	-1	N	1	V	1	N		N	1		N	N	-1	N					
Parking ma	neuvers, N _m																					
Buses stop	bing, N _B			0	0	\perp		0	0		0	0			0	0						
Min. time fo G _p	r pedestrians	;, 		3.2	2			3.2				3.2				3.2						
Phasing	EW Perm	C)2		03		0	4	NB	Or	nly	Thru &	RT	S	B Only	0	8					
Timing	G = 37.1	G =		G) = 	- C	; = 		G =	13	8.1	G = 50	6.6	G =	= 3.2	G =						
Duration of	Analysis, T =	0.25		+'	-				<u> </u>	5	-+	Cycle I	ena	th, C	= 130).0						
Lane Grou	p Capacity,	Contr	ol D	elay,	, and L(DS D	eter	rminal	tion			- ,										
			E	EB	DT		т -	WB	DT			NB	_	DT	1 7	A A A 2.0 2.0 2.0 3.0 3.0 3.0 4 5 3.0 3.0 3.0 3.0 472 0.472 0.0 0 0 0 0 0 0 0 0 0 3.2 G = 5 Y = 130.0 3.2 SB T T TH (3 1529 47 1890						
Adjusted flo	w rate, v		62		13	LI	27	22	32	1	∟⊺ 23	1412	+	K I	13	SB T TH F 2 0 TR 1433 1 0 0.95 0.1 0 0.95 0.1 0 0.95 0.1 0 2.0 0 0 2.0 0 0 3.0 1 0 3.0 1 0 3.0 1 0 3.0 1 0 0.0 1 0 0.0 1 0 0.0 1 0 0.0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 130.0 1 1 SB TH F 13890 1 1 18900 1 1						
Lane group	capacity, c		299	,	451		34	11	446	1	85	2141	╋		47	SB LT TH F 1 2 0 L TR 1 20 0 1 20 0 1 20 0 1 60 0.95 0. A A A 2.0 2.0 1 3.0 3.0 1 4 5 1 3.0 3.0 1 472 0.472 1 0 0.0 1 0 0 0 1.0 13.0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 1.0 13.0 1 0 0 1 1.0 13.0 1 1.1 1 1 0 0 1 3.2 G = 1<						
v/c ratio, X			0.2	1	0.03		0.6	55 (0.07	0.	.66	0.66	+		0.28	0.81						
			1	\rightarrow	-		+			+		1	+			20 0 15 60 0.95 0.6 A						

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k146F.tmp

Total green ratio, g/C	0.29	0.29		0.29	0.29	0.11	0.58		0.03	0.51	
Uniform delay, d ₁	34.6	32.8		40.1	33.2	55.7	18.4		61.4	26.8	
Progression factor, PF	1.000	1.000		1.000	1.000	1.000	1.000		1.000	0.317	
Delay calibration, k	0.11	0.11		0.50	0.50	0.24	0.23		0.11	0.35	
Incremental delay, d ₂	0.3	0.0		9.3	0.3	8.7	0.8		1.5	1.3	
Initial queue delay, d ₃											
Control delay	34.9	32.8		49.4	33.5	64.4	19.2		62.9	9.8	
Lane group LOS	С	С		D	С	Е	В		Е	A	
Approach delay	34.6			47.4		2	2.8			10.3	
Approach LOS	С			D			С			В	
Intersection delay	19.2		X _c	= 0.74		Interse	ction LO	S		В	

Copyright © 2000 University of Florida, All Rights Reserved

				HCS	5200)0™	DET	AILE	D RE	P	ORT						
General Int	formation							Site	nform	at	ion						
Analyst Agency or 0 Date Perfor Time Perioc	Co. Cowgill med 04/10/2 Saturda	and As 006 ay Peal	soci Hou	ates ır				Inters Area Juriso Analy Proje	ection Type diction rsis Ye ct ID	ar	We All o Bac Pro, Dev	stnedge other are kground posed F velopem	Kilg eas I (20 urni ent	gore 207 iture	e Store		
Volume an	d Timing In	out						<u> </u>			Det	ciopenn					
				EB			-	WB				NB				SB	
Number of I	anes. N			2 7			LT 1	TH 1		_				2 <u>T</u>		TH 2	RT
Lane group	1	$-\frac{1}{7}$	+		Ť	+	,	$\frac{1}{\tau}$		-	-		\vdash		1	TR	Ŭ
Volume, V	(vph)	82	, – †	183	144	1	452	184	26	_	145	1022	14	15	91	1004	17
% Heavy ve	hicles, %HV	/ 2		2	2	+	2	2	2	-	2	2	2	2	2	2	2
Peak-hour f	actor, PHF	0.9	2 (0.92	0.92	$\frac{1}{2}$	0.92	0.92	0.92		-	0.92	0.9	92	0.92	0.92	- 0.92
Pretimed (P (A)) or actuated	A b		A	A		A	A	A		A	P	P	>	A	P	Р
Start-up los	t time, I ₁	2.0		2.0	\top		2.0	2.0	2.0		2.0	2.0			2.0	2.0	
Extension o green, e	f effective	3.0	,	3.0			3.0	3.0	3.0		3.0	3.0			3.0	3.0	
Arrival type	, AT	3		3			3	3	3		4	4			3	3	
(A)AAAAAAAAStart-up lost time, I12.02.02.02.02.02.02.0Extension of effective green, e 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Arrival type, AT33333 3 3 3 3 3 3 Unit extension, UE 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 Filtering/metering, I 1.000 1.000 1.000 1.000 1.000 0.0 Initial unmet demand, Q_b 0.0 0.0 0.0 0.0 0.0 0.0 Ped / Bike / RTOR volumes 0 0 114 0 0 19 0						3.0	3.0			3.0	3.0						
Volume and Timing Input EB WB NB LT TH RT LT TR L TR L TR L TR Volume, V (vph) 82 183 144 452 184 26 145 1022 145 % Heavy vehicles, %HV 2							1.000	1.000									
Initial unme	t demand, Q	EB WB NB Ste LT TH RT LT TR L D D D<						0.0									
Ped / Bike / volumes	RTOR	0		0	114	L	0	0	19		0	0	8	}	0	0	1
Lane width		12.	0	12.0		1	12.0	12.0	12.0		12.0	12.0			12.0	12.0	
Parking / G	rade / Parkin	g N		0	N		N	0	N		N	0	Λ	/	N	0	N
Parking ma	neuvers, N _m																
Buses stop	oing, N _B	0		0		\downarrow	0	0	0		0	0			0	0	
Min. time to	r pedestrian	s,		3.2				3.2				3.2				3.2	
Phasing	EB Only	WBO	Only	_	03		C)4	Thru	&	RT	Excl. Lef	ť		07	0	8
Timing	G = 12.1	G = 3	<u>89.1</u>	G =			G =		G = 4	49. 5	.3 G	3 = 9.5		G =	:	G =	
Duration of	Analysis, T :	= 0.25		11-			1		<u> </u>	_		ycle Ler	ngth	1	= 130	0.0	
Lane Grou	p Capacity,	Contro	ol De	lay, a	nd L	os	Dete	rminat	ion					., -			
			EE	3			- 1.	WB				NB		_		SB	
Adjusted flo	w rate. v	89	- 232	1 >	KI	LT 401	1 2		8	1	LI 58	1H 1260		1	00 0	RT	
Lane group	capacity. c	178	340	-	\dashv	- 546	, 2 5 .5	75	488	1	43	1345	\vdash	_	143		
v/c ratio, X		0.50	0.6	6		0.9/		Background (2007) Project ID Proposed Furniture Store Development WB NB SB TH RT LT TR Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q									
				-						<u>⊢</u>			-	_			

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k147B.tmp

Total green ratio, g/C	0.10	0.10	0.31	0.31	0.31	0.08	0.39		0.08	0.39	
Uniform delay, d ₁	55.3	56.3	43.0	34.8	31.2	59.8	38.3		58.2	35.6	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	0.908		1.000	1.000	
Delay calibration, k	0.11	0.24	0.42	0.11	0.11	0.50	0.50		0.26	0.50	
Incremental delay, d ₂	2.2	4.7	17.8	0.4	0.0	95.9	10.7		13.4	5.3	
Initial queue delay, d ₃				,							
Control delay	57.6	61.1	60.8	35.2	31.3	155.6	45.5		71.6	40.9	
Lane group LOS	Е	E	Е	D	С	F	D		Е	D	
Approach delay	60).1	5	3.2		5	7.8			43.4	
Approach LOS	E	Ē		D			E			D	
Intersection delay	52	2.4	X _c =	0.91		Interse	ction LO	S		D	

Copyright © 2000 University of Florida, All Rights Reserved

				нс	5200)0 ™	DET	AILE	D R	EP	OR ⁻	Г							
General Inf	ormation							Site	nfor	mat	tion								
Analyst Agency or 0 Date Perfor Time Period	Co. Cowgill med 04/10/2 I Weekda	and As 006 ay Peak	socia Hou	ntes Ir				Inters Area Juriso Analy	ectic Type dictio sis Y	on o n Year	W Al Ba Pi	les loi ack op	tnedge ther are (ground osed Fi	Kilgoi as (200 umitu	re 7) re Store				
								Proje	ct ID		D	eve	elopeme	ent					
Volume an	d Timing Inj	but		<u> </u>	_			14/22											
					R	┍┼	LT		T R	Т		-		RT			RT		
Number of I	anes, N ₁	1	╈	2	0		1	1	1		1		2	0	1	2	0		
Lane group		L	-	TR			L	Т	R	2	L		TR		L	TR			
Volume, V (vph)	131	1	194	136	3	371	332	16	6	159		1194	132	112	1411	58		
% Heavy ve	hicles, %HV	2		2	2		2	2	2		2		2	2	2	2	2		
Peak-hour f	actor, PHF	0.92	2 0	.92	0.9	2	0.92	0.92	0.9	92	0.92	2	0.92	0.92	0.92	0.92	0.92		
Pretimed (P) or actuated (A)AAA(A)AAAStart-up lost time, I12.02.02Extension of effective green, e3.03.03					A	A	A		A		Р	Р	A	Р	Р				
Start-up los	t time, I ₁	2.0	1	2.0		Т	2.0	2.0	2.0	0	2.0		2.0		2.0	2.0			
Extension o green, e	f effective	3.0		3.0			3.0	3.0	3.0	0	3.0		3.0		3.0	3.0			
Start-up lost une, I, 2.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.							4		5		3	3							
Arrival type, AT33Unit extension, UE3.03.0						3.0	3.0	3.	0	3.0)	3.0		3.0	3.0				
% Heavy vehicles, %HV22222Peak-hour factor, PHF 0.92					1.000	1.0	000	0.60	4	0.604		1.000	1.000						
Initial unme	t demand, Q	ь 0.0	4	0.0			0.0	0.0	0.	0	0.0		0.0		0.0	0.0			
Ped / Bike / volumes	RTOR	0		0	99		0	0	13	6	0		0	7	0	0	2		
Lane width		12.0) 1	2.0			12.0	12.0	12.	.0	12.0)	12.0		12.0	12.0			
Parking / G	rade / Parkin	g N		0	N		N	0	N	1	N		0	N	N	0	N		
Parking ma	neuvers, N _m																		
Buses stop	oing, N _B	0		0			0	0	0)	0		0		0	0			
Min. time fo G _p	r pedestrian	s,		3.2				3.2					3.2			3.2			
Phasing	EB Only	WB C	nly		03		0)4	SE	3 Or	nly	Tł	nru & R ⁻	ΓΝ	IB Only	0	8		
Timing	G = 13.3	G = 2	9.7	G =			G =		G =	9.0	0	G	= 42.0	G	= 11.0	G =			
Duration of	Y = 5	Y = 5		Y =			Y =		Y =	5			= 5	Y ath (= 5	Y =			
Lane Grou	n Canacity	Contro	l Del	av a	nd I	05	Dete	rminat	tion			<u> </u>		igui, v	/- 100				
Lune Grou	o oupucity,		EB	uy, u		00	Dette	WB					NB			SB			
		LT	TH		RT	Ľ	Г	ТН	RT	Ţ	LT	Ţ	TH	RT	LT	2 2 2 $.92$ 0.92 0.92 A P F 2.0 2.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 0.0 0.00 1.000 0.0 0.0 0.0 2 2.0 12.0 N 0 0 N 0 0 N 0 0 N 0 0 0 3.2 200 3.2 200 0.8 11.0 $G =$ 5 $Y =$ 130.0 SB LT TH F 22 1595 1595			
Adjusted flo	w rate, v	142	251			40	3 3	861	33	Ĺ	173	1	1434		122	SB LT TH F 1 2 0 12 1411 5 2 2 2 .92 0.92 0.9 .92 0.92 0.9 .0 2.0 2 .0 2.0 3.0 3.0 3.0 3 3.0 3.0 0 0 0 2 2.0 12.0 1 0 0 2 2.0 12.0 N 0 0 0 2.0 12.0 N 0 0 0 3.2 0 0 0 0 0 3.2 0 0 0 0 0 3.2 0 0 0 0 0 11.0 G = 130.0 SB 1.10 5 1595 36 1543			
Lane group	capacity, c	195	380			41	8 4	40	374		163		1583		136	SB LT TH F 1 2 0 112 1411 5 2 2 2 0.92 0.92 0.9 A P F 2.0 2.0 0.9 3.0 3.0 1 3.0 3.0 1 1.000 1.000 1 0 0.0 0 2 12.0 12.0 1 0 N 0 N 0 0 0 0 1 3 3.2 3 1 3.0 3.0 1 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 11.0 G = 5 Y = = 130.0 1 1 122 1595 1 1 136 1543 0 0 <tr< td=""></tr<>			
v/c ratio, X		0.73	0.66	\$ 		0.9	6 0	.82	0.09	1	.06		0.91		0.90	1.03			

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k1487.tmp

Total green ratio, g/C	0.11	0.11	0.24	0.24	0.24	0.09	0.45		0.08	0.44	
Uniform delay, d ₁	56.0	55.5	49.1	47.0	38.7	59.0	32.9		59.5	36.5	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	0.446		1.000	1.000	
Delay calibration, k	0.29	0.24	0.47	0.36	0.11	0.50	0.50		0.42	0.50	
Incremental delay, d ₂	12.9	4.2	34.7	11.7	0.1	71.9	5.8		47.7	32.1	
Initial queue delay, d ₃											
Control delay	68.9	59.7	83.8	58.8	38.8	130.9	20.5		107.2	68.6	
Lane group LOS	Е	Е	F	Е	D	F	С		F	Е	
Approach delay	63	8.0	7	0.6		3	2.4			71. 3	
Approach LOS	E	Ē		E			С			Е	
Intersection delay	56	5.6	$X_{c} =$	0.98		Interse	ction LO	S		Е	

Copyright © 2000 University of Florida, All Rights Reserved

		HCS	2000	DET.) REP	ORT					
General Information					Site Ir	nforma	tion					
Analyst Agency or Co. Date Performed 04/11/2006 Time Period 5:00 pm					Interse Area T Jurisdi Analys Projec	ection Type iction sis Yea t ID	And Ave All r Bas	dy Ave. e. other al seline	& Wes reas	tnedge		
Volume and Timing Input												
		EB			WB			NB			SB	
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N ₁	0	1	1	0	1	1	1	2	0	1	2	0
Lane group		LT	R		LT	R	L	TR		L	TR	
Volume, V (vph)	44	5	106	188	9	19	96	1274	49	8	1433	14
% Heavy vehicles, %HV	2	2	2	2	2	2	2	0	4	20	0	15
Peak-hour factor, PHF	0.82	0.60	0.78	0.89	0.83	0.60	0.78	0.95	0.65	0.60	0.95	0.67
Pretimed (P) or actuated (A)	A	A	A	Р	Р	Р	A	A	A	A	A	А
Start-up lost time, I ₁		2.0	2.0		2.0	2.0	2.0	2.0		2.0	2.0	
Extension of effective green, e		3.0			-	-	-	-	-	-		

				Н	ICS	<u> 20</u> 00	™ D	ЕТ	AILE	ED) RE	P	ORT						
General In	formation								Site	In	form	ati	on						
Analyst Agency or 0 Date Perfor Time Period	Co. Cowgill med 04/11/2 d Weekda	and A 006 ay Pea	lsso ak	ciate	98				Inter Area Juris Anal Proje	se T did ysi	ction ype ction is Ye t ID	ar	Mai Ave All d Bac Pro, Dev	ket Plac other are kgroun posed F relopem	:e (>as (2(:un en.	& W 5 007) nitur t	lestnedg re Store	<i>ye</i>	
Volume an	d Timing Inj	out									_				_				
				E	В		L.		WE	3				NB				SB	
Number of	lanes N	+			-			.		┥		+	LI 1		⊢				
Lane group	1	+	0	L_T		R	<u> </u>	, 	LT	┥	R	┥		TR	┢			Z TR	
Volume, V	(vph)		51	6		118	22	20	10	┥	22	╈	97	1485	$\frac{1}{2}$	57	9	1670	17
% Heavy ve	hicles, %HV		2	2		2	2	2	2	┥	2	┥	2	0	F	4	20	0	15
Peak-hour	factor, PHF	0.	82	0.6	0	0.78	0.8	39	0.83	1	0.60		0.78	0.95	0.	.65	0.60	0.95	0.67
Pretimed (F (A)	retimed (P) or actuated (A) A A A tart-up lost time, l_1 2.02.0xtension of effective3.03.0					F	,	Р		Р		A	A		A	А	A	A	
Start-up los	t time, I ₁			2.0)	2.0			2.0	Ι	2.0		2.0	2.0	Γ		2.0	2.0	
Extension o green, e	Start-up lost time, I1 2.0 2.0 Extension of effective green, e 3.0 3.0							3.0		3.0		3.0	3.0			3.0	3.0		
Arrival type	, AT			3		3			3	T	3		3	3	Γ		4	5	
Unit extens	ion, UE			3.0	,	3.0			3.0	1	3.0	╡	3.0	3.0	Γ		3.0	3.0	
Filtering/me	etering, I			1.00	00	1.000			1.000	7	1.000	2 I	1.000	1.000	Γ		0.233	0.233	
Initial unme	t demand, Q	,		0.0	,	0.0	 		0.0	1	0.0	╡	0.0	0.0	Γ		0.0	0.0	
Ped / Bike / volumes	RTOR		0	0		105	C	,	0	Τ	0		0	0		3	0	0	0
Lane width				11.	0	11.0			11.0	T	11.0	Ť	11.0	13.0	Γ		11.0	13.0	
Parking / G	rade / Parkin	g i	N	-1		N	۸	7	1	1	N	T	N	1	1	N	N	-1	N
Parking ma	neuvers, N _m									1		T			ſ				
Buses stop	oing, N _B			0		0			0	T	0	T	0	0	Γ		0	0	
Min. time fo G _p	r pedestrians	\$,		3.	2				3.2					3.2				3.2	
Phasing	EW Perm	()2			03		04	4	T	NB (Dnl	y T	hru & R	Т	S	B Only	0	8
Timing	G = 37.5 Y = 5	G = Y =			G = Y =		G	=			G = 9	9.0	G	= 57.1	_	G =	= 6.4	G =	
Duration of	Analysis, T =	0.25		+			<u> </u>			<u> </u>			Ċ	ycle Ler	 ngt	h, C	= 130).0	
Lane Grou	p Capacity,	Contr	rol D	ela j	y, ai	nd LOS	5 D	eter	mina	tio	on				Ť	_			
		$\left \right _{\tau \tau}$		EB		- -	T		NB		_		- T	NB		<u> </u>		SB	
Adjusted flo	w rate, v		72	2	17	7	_ 1	25	9	37	7	 12	24	1646	-	<u> </u>	LI 15		
Lane group	capacity, c		26	5	45	5		33	4	45	1	13	1	2039			83		
			0.2	7	0.0	94		0.7	8 (0.0	8	0.9	95	0.81			0.18	0.89	

v/c ratio, X											
Total green ratio, g/C	0.30	0.30		0.30	0.30	0.08	0.55		0.06	0.53	
Uniform delay, d ₁	35.0	32.6		41.8	33.0	59.7	23.3		58.4	26.9	
Progression factor, PF	1.000	1.000		1.000	1.000	1.000	1.000		1.000	0.234	
Delay calibration, k	0.11	0.11		0.50	0.50	0.46	0.35		0.11	0.42	
Incremental delay, d ₂	0.6	0.0		16.1	0.4	62.2	2.5		0.2	1.4	
Initial queue delay, d ₃											
Control delay	35.6	32.6		57.9	33.4	121.9	25.9		58.7	7.7	
Lane group LOS	D	С		Е	С	F	С		Е	A	
Approach delay	35.0			54.8		3	2.6			8.2	-
Approach LOS	D			D			С			А	
Intersection delay	23.2		X _c	= 0.86		Interse	ction LO	s		С	

Copyright © 2000 University of Florida, All Rights Reserved

APPENDIX C

OPENING DAY TRAFFIC CONDITIONS HCS DETAILED REPOTS

	TWC	-WAY STOP	CONTR		SUN	IMARY					
General Information	on		Site	nfor	nat	ion					
Analyst			Inters	ection	_		Kilgore L	.owes			
Agency/Co.	Cowgill	Site Information Site Information Intersection Kilg and Associates Jurisdiction Analysis Year Ope inture Store North/South Street: Lowes Drivit Study Period (hrs): 0.25 Intersection ments Eastbound West Vest Vest 2 3 4 T R L Intersection Vest 2 3 4 T R L Intersection Vest Vest									
Date Performed	11/17/20	005	Analy	sis Ye	ar		Opening	Southbound 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0			
Analysis Time Period	5:00 pm							ilgore Lowes pening Day (2007) rive Vestbound 5 6 T R 287 0 0.92 1.00 311 0 0 0 1 0 0 1 0 1 0 1 0 1 0 1			
Project Description A	Proposed Furr	niture Store									
East/West Street: Kilg	jore		North/	South	Stre	et: Lowe	s Drive				
Intersection Orientatior	n: East-West	t	Study	Period	l (hr	s): 0.25					
Vehicle Volumes a	and Adjust	ments									
Major Street		Eastbound					Westbou	und			
Movement	1	2	3			4	5		6		
			R				T		R		
Volume (ven/n)	0	357	30			00	287		0		
Hourty Flow Pato	1.00	0.92	0.92			0.92	0.92		1.00		
(veh/h)	0	388	32			71	311		0		
Proportion of heavy			<u> </u>								
vehicles, P _{HV}	0					2					
Median type			_	Undi	vide	d					
RT Channelized?			0			_			0		
Lanes	0	2	0			1	1	Dire Lowes ning Day (2007) e stbound 5 6 T R 287 0 0.92 1.00 311 0 0 0 1 0 7 0 0 1 0 7 0 0 1 12 T R 0 0 11 12 T R 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Configuration		Т	TR			L	Т				
Upstream Signal		0					1	0 1 0 7 1 hbound			
Minor Street		Northbound					Southbo	1 0 T 1 Duthbound			
Movement	7	8	9			10	11	_	12		
	L	<u> </u>	R			L	Т		R		
Volume (veh/h)	46	0	98			0	0		0		
Peak-hour factor, PHF	0.92	1.00	0.92			1.00	1.00		1.00		
Hourly Flow Rate (veh/h)	49	0	106			0	0		0		
Proportion of heavy vehicles, P _{HV}	2	0	2			0	0		0		
Percent grade (%)		0					0				
Flared approach		N			_		N				
Storage		0					0				
RT Channelized?			0						0		
Lanes	1	0	1			0	0		0		
Configuration	L		R								
Control Delay, Queue	Length, Leve	el of Service			_						
Approach	EB	WB		Northb	oun	d	S	outhbour	nd		
Movement	1	4	7	8		9	10	11	12		
Lane Configuration		L	L			R					
Volume, v (vph)		71	49			106					
Capacity, c _m (vph)		1136	345			796					
v/c ratio		0.06	0.14			0.13					
Queue length (95%)		0.20	0.49		_	0.46					
Control Delay (s/veh)		8.4	17.2			10.2			+		
				┝───					4		

file://C:\Documents and Settings\Dan\Local Settings\Temp\u2k14A9.tmp

LOS		A	С		В		- I	
Approach delay (s/veh)	-	_		12.4	-			
Approach LOS	—	-		В				
HCS2000 TM	С	opyright © 2003 Univer	rsity of Florida,	All Rights Res	erved			Version 4.1d

TWO-WAY STOP CONTROL SUMMARY													
General Informati	on		Site	nfor	mat	ion							
Analyst Agency/Co.	Cowgill a	nd Associates	Interse Jurisd	ection iction			Westned	lge Av	e. &	Lowes			
Date Performed	11/17/200 Saturday	05 Peak Hour	Analys	sis Yea	аг		Opening	Day (2007	7)			
Project Description	Proposed Furn	iture Store Deve	elopement										
East/West Street: Low	ves Drive		North/	South	Stre	et: West	nedae						
Intersection Orientation	n: North-Sout	'h	Study	Period	d (hr	s): 0.25							
Vehicle Volumes	and Adiustn	nents				•							
Major Street		Northbound					Southbo	und					
Movement	1	2	3			4	5			6			
	L	Т	R			L	Т			R			
Volume	0	1337	0			0	1581			47			
Peak-Hour Factor, PH	= 0.92	0.92	1.00)		1.00	0.92		(0.92			
Hourly Flow Rate, HFR	2 0	1453	0			0	1718			51			
Percent Heavy Vehicle	s 2					0							
Median Type				Undi	vide	d							
			0					\rightarrow		0			
Lanes		2				0			_	1			
Conliguration		1			х. 			\rightarrow		<u> </u>			
Minor Street		///actheund					/ Faathar						
Minor Street	7	- vvestbound				10				12			
			9 0					\rightarrow		D			
Volume	0					0	0			34			
Peak-Hour Factor, PH	= 1.00	1.00	1.00)		0.92	1.00	-+	0) <u>9</u> 2			
Hourly Flow Rate, HFF	2 0	0	0			0	0	-+		36			
Percent Heavy Vehicle	s 0	0	0			2	0			2			
Percent Grade (%)		0					0						
Flared Approach		N					N						
Storage		0	-				0		_				
RT Channelized			0							0			
Lanes	0	0	0			0	0		_	1			
Configuration						_				R			
Delay, Queue Length,	and Level of	Service					• •		_				
Approach	NB	SB		Westb	ound		E	Eastbo	und				
Movement	1	4	7	8		9	10	11		12			
Lane Configuration										R			
v (vph)					_				_	36			
C (m) (vph)										615			
v/c										0.06			
95% queue length					_					0.19			
Control Delay							<u> </u>		11.2				
LOS									B				
Approach Delav					_			11 2	,				
Approach LOS		11.2											

Rights Reserved

TWO-WAY STOP CONTROL SUMMARY												
General Information	า		Site Infor	nation								
Analyst Agency/Co. Date Performed Analysis Time Period	Cowgill and 11/17/2005 Weekday F	l Associates Peak Hour	Intersection Jurisdiction Analysis Yea	ar	Westnedge A Opening Day	ve. & Lowes (2007)						
Project Description Pro	oposed Furnitu	re Store Devel	opement									
East/West Street: Lowe	S		North/South	Street: Westr	nedge							
Intersection Orientation:	North-South		Study Period	l (hrs): 0.25								
Vehicle Volumes an	nd Adjustme	ents										
Major Street		Northbound			Southbound							
Movement	1	2	3	4	5	6						
	L	Т	R	L	Т	R						
Volume	0	1560	0	0	1904	31						
Peak-Hour Factor, PHF	0.92	0.92	1.00	1.00	0.92	0.92						
Hourly Flow Rate, HFR	0	1695	0	0	2069	33						
Percent Heavy Vehicles	2			0								
Median Type			Undi	vided								
RT Channelized			0			0						
Lanes	0	2	0	0	2							

TWO-WAY STOP CONTROL SUMMARY General Information Site Information												
General Information	on		Site	nfor	mat	ion						
Analyst			Inters	ection			Kilgore L	owes				
Agency/Co.	Cowgill a	and Associates	Juriso	liction								
Date Performed	11/17/20	005	Analy	sis Ye	ar		Opening	day (20	07)			
Analysis Time Period	Weekda	y Peak Hour										
Project Description F	Proposed Furr	iture Store										
East/West Street: Kilg	ore		North/	South	Stre	et: Lowe	s Drive					
Intersection Orientation	: East-West	·	Study	Period	d (hr	s): 0.25						
Vehicle Volumes a	and Adjust	ments										
Major Street		Eastbound					Westbou	und				
Movement	1	2	3			4	5		6			
		T T	R				T		R			
Volume (veh/h)	0	424	23			56	5/2		0			
Peak-nour factor, PHF	1.00	0.92	0.92	<u>.</u>		0.92	0.92		1.00			
(veh/h)	0	460	24			60	621		0			
Proportion of heavy												
vehicles, P _{HV}	0					2						
Median type		- I	-	Undi	vide	d						
RT Channelized?			0						0			
Lanes	0	2	0			1	1		0			
Configuration		Т	TR			L	T					
Upstream Signal		0					1					
Minor Street		Northbound					Southbo	und				
Movement	7	8	9			10	11		12			
	L	Т	R			L	Т		R			
Volume (veh/h)	50	0	76			0	0		0			
Peak-hour factor, PHF	0.92	1.00	0.92	?		1.00	1.00		1.00			
Hourly Flow Rate (veh/h)	54	0	82			0	0		0			
Proportion of heavy vehicles, P _{HV}	2	0	2			0	0		0			
Percent grade (%)		0					0					
Flared approach		N	Τ				N					
Storage		0					0					
RT Channelized?			0						0			
Lanes	1	0	1			0	0		0			
Configuration	L		R									
Control Delay, Queue	Length, Leve	el of Service										
Approach	EB	WB		Northb	oun	d	S	outhbou	nd			
Movement	1	4	7	8		9	10	11	12			
Lane Configuration		L	L			R						
Volume, v (vph)		60	54			82						
Capacity, c _m (vph)		1075	209			759						
v/c ratio		0.06	0.26			0.11						
Queue length (95%)		0.18	0.99			0.36			1			
Control Delay (s/veh)		8.5	28.1		10.3				1			
			i — — —						+			

LOS		A	D		В		
Approach delay (s/veh)				17.4			
Approach LOS	-	-		С			

 $\mathit{HCS2000}^{\mathsf{TM}}$

Copyright © 2003 University of Florida, All Rights Reserved

				Н	ICS	2000	" DE	ETAIL	.EI	D RE	PO	RT					
General In	formation							Sit	e Ir	nforma	atio	n					_
Analyst Agency or 0 Date Perfor Time Period	Co. Cowgill med 04/11/2 d Saturda	and A 006 y Pea	Asso ak He	ciate our	9 5			Inte Are Jur Ana Pro	erse ea T isdi alys ojec	ection Type iction sis Yea t ID	ar	Mari All o Ope Prop	ket and ther are ning da posed F elopem	Westi eas y (200 urnitui ent	nedge 07) re Store		
Volume an	d Timing Inj	out															
				E	В			N	WB				NB			SB	
Number of	lanes. N	+	<u>רו</u> ה		-				-		+	LT	7H 2	RT 0		TH 2	
Lane group	· · · · · · · · · · · · · · · · · · ·	+		' 1 Т		R	Ŭ	$-\frac{1}{17}$	-	R	+	, ,	TR		' 	TR	
Volume, V	(vph)		44	5		106	188	3 9		19	g	- 96	1274	49	8	1433	14
% Heavy ve	ehicles, %HV	+	2	2	_	2	2	2		2		2	0	4	20	0	15
Peak-hour	factor, PHF	0.	.82	0.6	0	0.78	0.89	0.8	3	0.60	0.	78	0.95	0.65	0.60	0.95	0.67
Pretimed (F (A)) or actuated		A		A	Р		Р	,	A	А	А	A	A	A		
Start-up los	t time, I ₁			2.0	,	2.0		2.0)	2.0	2	2.0	2.0		2.0	2.0	
Extension o green, e	of effective		3.0 3.0					3.0)	3.0	3	9.0	3.0		3.0	3.0	
Arrival type	, AT	╈		3		3		3	3		3		3		4	5	
Unit extens	ion, UE			3.0	0 3.0			3.0)	3.0	3	3.0	3.0		3.0	3.0	
Filtering/me	etering, I			1.00	00	0 1.000		1.00	00	1.000	1.	000	1.000		0.472	0.472	
Initial unme	t demand, Q	,		0.0)	0.0		0.		0.0	0	0.0	0.0		0.0	0.0	
Ped / Bike / volumes	RTOR		0	0		96	0	0		0	-	0	0	3	0	0	0
Lane width				11.0	0	11.0		11.	0	11.0	11	1.0	13.0		11.0	13.0	
Parking / G	rade / Parkin	g i	N	-1		N	N	1		N	1	N	1	N	N	-1	N
Parking ma	neuvers, N _m																
Buses stop	ping, N _B			0		0		0		0		0	0		0	0	
Min. time fo G _p	r pedestrians	; ,		3.	2			3.	2				3.2			3.2	
Phasing	EW Perm	(02			03		04		NB C	nly	T	nru & R	T S	B Only	0	8
Timing	G = 37.1	G =			G =		G =	:	\downarrow	G = 1	3.1	G	= 56.6	G	= 3.2	G =	
Duration of	Y = 5 Analysis T =	Y = 0.25		+	Y =		Y =			Y = 5			= 5	Y =	= 5	Y =	
Lane Grou	p Capacity.	Cont	25				ermin	ati					igin, c	/= 150			
			EB					WB					NB			SB	
Adjusted fla	Adjusted flow rate, v 62 13 2					TH	H RT I		LT		TH	RT	LT	TH	RT		
		ale, v 62 13 2 pacity c 200 451 2				~~~	2 32 123			123 1412			73	1529			
Lane group capacity, c 299 451 34				341 	11 446 18		185		141		47	1890					
			0.21 0.03 0.6						10.0		0.00		00.00		0.28	0.81	

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k14C5.tmp

4/17/2006

Total green ratio, g/C	0.29	0.29		0.29	0.29	0.11	0.58		0.03	0.51	
Uniform delay, d ₁	34.6	32.8		40.1	33.2	55.7	18.4		61.4	26.8	
Progression factor, PF	1.000	1.000		1.000	1.000	1.000	1.000		1.000	0.317	
Delay calibration, k	0.11	0.11		0.50	0.50	0.24	0.23		0.11	0.35	
Incremental delay, d ₂	0.3	0.0		9.3	0.3	8.7	0.8		1.5	1.3	
Initial queue delay, d ₃											
Control delay	34.9	32.8		49.4	33.5	64.4	19.2		62.9	9.8	
Lane group LOS	С	С		D	С	E	В		Е	A	
Approach delay	34.6			47.4		2	2.8			10.3	
Approach LOS	С			D			С			В	
Intersection delay	19.2		X _c	= 0.74		Interse	ction LO	S		В	

Copyright © 2000 University of Florida, All Rights Reserved

				Н	CS2	2000	" DE	TAIL	.El	D RE	PC	ORT						
General In	formation		Sit	e Ir	n form	atic	on					_						
Analyst Agency or 0 Date Perfor Time Perior	Co. Cowgill med 04/11/2 d Weekda	and A 006 ay Pe	Asso ak H	ciate our	\$			Inte Are Jur Ana Pro	erse ea T isdi alys ojec	ection Type iction sis Ye st ID	ar	Mai All d Ope Pro dev	ket and other are ening da posed F elopeme	Wes eas y (20 iurnit ent	stne 007, 'ure	edge) store		
Volume an	d Timing In	out		· · · ·							_				_			
		⊢	I T	E T TL	B	DT			/B		+	I T			-	1 T	SB	БТ
Number of	lanes, N ₁	+	0	1	<u>'</u>	1	0	1	1	1	╋	1	2	0	<u>'</u>	1	2	0
Lane group	•	+	LT R					LT		R	╈	L	TR		╡	L	TR	
Volume, V	(vph)		51	6	1	121	220	10		22		105	1487	57		9	1672	17
% Heavy ve	ehicles, %HV	'	2	2		2	2	2		2		2	0	4		20	0	15
Peak-hour	factor, PHF	0.	0.82 0.60 0.78 0.89					0.8	3	0.60	C).78	0.95	0.6	5 (0.60	0.95	0.67
Pretimed (F (A)	P) or actuated	1	A		Р		Р	Τ	Α	A	A		A	A	A			
Start-up los	t time, I ₁				2.0)	2.0	1	2.0	2.0		┓	2.0	2.0				
Extension o green, e	of effective			3.0		3.0		3.0)	3.0		3.0	3.0			3.0	3.0	
Arrival type	, AT		3 3					3	3 3			3	3		+	4	5	
Unit extens	ion, UE			3.0	3	3.0		3.0)	3.0		3.0	3.0		╈	3.0	3.0	
Filtering/me	etering, I			1.00	0 1.	.000		1.00	00	1.000	7 1	.000	1.000		-0	0.090	0.090	
Initial unme	t demand, Q _l	,		0.0	- (0.0		0.0)	0.0	1	0.0	0.0			0.0	0.0	
Ped / Bike / volumes	RTOR		0	0	1	08	0	0		22		0	0	3	Τ	0	0	0
Lane width				11.0) 1	1.0		11.0)	11.0	1	11.0	13.0		1	11.0	13.0	
Parking / G	rade / Parkin	g	N	-1		Ν	N	1		N		Ν	1	N		Ν	-1	N
Parking ma	neuvers, N _m																	
Buses stop	ping, N _B			0		0		0		0		0	0			0	0	
Min. time fo G _p	r pedestrians	\$,		3.2	2			3.2	2				3.2				3.2	
Phasing	EW Perm	()2		03	3		04	Ι	NB C	Only	/ T	hru & R	Т	SB	Only	0	8
Timing	G = 38.0	G =			G =		G =	:	+	G = 1	10.0) G	= 55.6	0) =	6.4	G =	
Duration of	Y = 5 Analysis T =	Y =		+	=	_	Y =			Y = 5)		= 5	Y Y	′ = 	5 - 130	Y =	
Lane Grou	p Capacity.	Cont	25				ermin	atio	<u></u>			YCIE LEI	igin,		- 150			
· · · · · · · · · · · · · · · · · · ·		EB						WB					NB				SB	
LT TH RT LT Adjusted flow rate, v 72 17 2					TH 259	H RT		L] 121	T 5	TH 1648	RT	-	LT 15	TH	RT			
Lane group capacity, c 272 461 3					330	9 0 13			2025		╉	83	1052					
v/c ratio, X 0.26 0.04 0.26).76	39 457 1 76 0.00 0		0 0	4	0.81) 18	0.91				
	0.26 0.04 0.										·			+				

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k14D2.tmp

Total green ratio, g/C	0.30	0.30		0.30	0.30	0.08	0.55		0.06	0.52	
Uniform delay, d ₁	34.6	32.2		41.3	31.8	59.2	23.8		58.4	28.3	
Progression factor, PF	1.000	1.000		1.000	1.000	1.000	1.000		1.000	0.269	
Delay calibration, k	0.11	0.11		0.50	0.50	0.45	0.35		0.11	0.43	
Incremental delay, d ₂	0.5	0.0		15.1	0.0	56.3	2.7		0.1	0.7	
Initial queue delay, d ₃											
Control delay	35.1	32.2		56.4	31.8	115.5	26.4		58.5	8.4	
Lane group LOS	D	С		Е	С	F	С		E	A	
Approach delay	34.6			56.4		3	3.2			8.8	
Approach LOS	С			E			С			A	
Intersection delay	23.6		X _c	= 0.87		Interse	ction LO	S		С	

Copyright © 2000 University of Florida, All Rights Reserved

Version 4.1d

.

			_		HCS	520	00"	" DE	<u>: T</u>	AILE	ED	RE	P	ORT						
General In	General Information												ati	ion						
Analyst Agency or 0 Date Perfor Time Period	Co. Cowgil. med 04/10/2 d Weekd	l and 2000 lay F	d Asso 5 Peak h	ocia Iour	tes					Inter Area Juris Anal Proje	se i T idi iys eci	ection Type ction is Yea t ID	ar	We All Op Pro	estned other other oposec	ge H area day I Fu	Kilgoi as (200 irnitu	re)7) re Store		
Volume an	d Timing In	put		_					_										-	
			<u> </u>		EB		-			WB	;	DT	\downarrow		NB	_			SB	
Number of	lanes. N		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							1H	┥		╉	<u>LI</u> 1		+	0			
Lane group	<u> </u>		$\frac{1}{1}$	$+\frac{1}{7}$	- 'R	+		'	┥	, Т	\neg	r R	╉	<u> </u>		╉		/ /		
Volume, V	(vph)		143	$\frac{1}{1}$	96	13	8	376	┥	332	┥	166	╉	161	1104	+	132	112	1423	58
% Heavy ve	hicles. %H	/	2	+·	2	2	,	2	┥	2	┥	2	╉	2	2	+	2	2	2	2
Peak-hour f	factor, PHF		0.92	10.	92	0.9)2	0.92		0.92	┥	0.92	╉	0.92	0.92	-	0.92	0.92	0.92	0.92
Pretimed (F (A)) or actuate	d	A			A	-	A	1	A		A	+	A	P		P	A	P	P
Start-up los	t time, I,		2.0	2	.0		-	2.0	┫	2.0	1	2.0	╈	2.0	2.0	┽		2.0	2.0	
Extension c green, e	of effective		3.0	3	.0	T		3.0	1	3.0	1	3.0	T	3.0	3.0	↑		3.0	3.0	
Arrival type	, AT		3		3	\vdash		3	1	3	1	3	╈	4	5	╈		3	3	
Unit extensi	ion, UE		3.0 3.0					3.0		3.0	3.0 3		╈	3.0	3.0			3.0	3.0	
Filtering/me	etering, I		1.000	1.	000	\square		1.000	0	1.000	,	1.000 0.		0.596	0.59	5		1.000	1.000	
Initial unme	t demand, Q	b	0.0	0	0.0			0.0	1	0.0 0.0		0.0	Ť	0.0	0.0	╈		0.0	0.0	
Ped / Bike / volumes	RTOR		0	(2	10	1	0	Τ	0		137		0	0		7	0	0	2
Lane width			12.0	12	2.0			12.0	Τ	12.0	T	12.0	12.0) 12.0			12.0	12.0	
Parking / G	rade / Parkir	ng	N		0	N	'	N	Τ	0	T	N	Т	N	0	Τ	N	N	0	N
Parking ma	neuvers, N _{rr}	1		Ι							Ι		Τ							
Buses stop	oing, N _B		0		0			0		0		0	Ι	0	0			0	0	
Min. time fo G _p	r pedestrian	s,		3	.2					3.2					3.2				3.2	
Phasing	EB Only	V	V B On	y		03			04	ŀ	L	SB C	nl	y T	"hru &	RT	N	B Only	0	88
Timing	G = 13.7	G	= 29 - 5	3	G =			G =			<u>t</u>	G = 9	0.0		3 = 42	.0	G =	= 11.0	G =	
Duration of	Analysis, T	= 0	25	_	1-			1 - 1			Ľ	<u>r – J</u>	_			ena	<u> </u>	= 130	<u> </u>	
Lane Grou	p Capacity,	Col	ntrol Delay, and LOS Dete						err	ninal	tio	n				<u> </u>				
										VB	_		_	_	NB				SB	
Adjusted flo	w rate, v	15	55 253 409 3						36		- <u>+</u> -3	2	 17	75	1H 1434	+	KI	LI 122	1608	
Lane group	capacity, c	20	00 391 413 4						43	4	369 163			163 1583		╉		136	1543	╂━─┤
v/c ratio, X		0.7	.77 0.65 0.99 0						0.8	33	0.0	09	1.0	07	0.91			0.90	1.04	╉──┤
		0.1	1 0	.11			0.2	3	0.2	23	0.2	23	0.0	09	0.45	\uparrow		0.08	0.44	

file://C:\Documents and Settings\Dan\Local Settings\Temp\s2k14EC.tmp
Total green ratio, g/C												
Uniform delay, d ₁	56.0	55.2		49.7	47.4	39.0	59.0	32.9		59.5	36.5	
Progression factor, PF	1.000	1.000		1.000	1.000	1.000	1.000	0.446		1.000	1.000	
Delay calibration, k	0.32	0.22		0.49	0.37	0.11	0.50	0.50		0.42	0.50	
Incremental delay, d ₂	17. 2	3.7		41.6	12.9	0.1	75.4	5.7		47.7	34.7	
Initial queue delay, d ₃												
Control delay	73.2	58.9		91.3	60.3	39.1	134.4	20.4		107.2	71.2	
Lane group LOS	Е	Е		F	E	D	F	С		F	Е	
Approach delay	64.3			7	5.3		32.8			73.8		
Approach LOS	E	_		E			С			E		
Intersection delay	58	3.7		X _c = 1.00			Interse	ction LO	S	E		

HCS2000TM

Copyright © 2000 University of Florida, All Rights Reserved

Version 4.1d

					HCS	<u>520</u>	00"	<u> DE</u>	TAIL	E	D RE	Ρ	ORT							
General Int	General Information									Site Information										
Analyst Agency or Co. Cowgill and Associates Date Performed 04/10/2006 Time Period Saturday Peak Hour								Inte Are Jur Ans Pro	IntersectionWestnedge KilgoreArea TypeAll other areasJurisdictionJurisdictionAnalysis YearOpening Day (2007)Project IDProposed Furniture Store											
Volume an	d Timing In	put												_						
					EB			1	W	'B			1 77	NB			SB			
Number of I	anes N			╉	2 2			<u></u>	- 1	1		\neg	 	1H 2			1H 2			
Lane group	1		, ,		 R	+		<u></u>	$\frac{1}{\tau}$		R	\neg	1							
Volume, V	(vph)		102	$\frac{1}{1}$	86	14	.7	460	18	1	26	┥	148	1022	145	91	1024	17		
% Heavy ve	hicles, %H\	/	2	+·	2		,	2	2	<u> </u>	2	\neg	2	2	2	2	2	2		
Peak-hour f	factor, PHF		-	0	- 92	0.9	2	0.92	0.9	2	0.92	┥	0.92	0.92	0.92	0.92	0.92	0.92		
Pretimed (P (A)) or actuate	d	A		A	A	-	A	A		A		A	P	P	A	P	P		
Start-up los	t time, I,		2.0	2	.0	\vdash		2.0	2.0)	2.0	1	2.0	2.0		2.0	2.0			
Extension o green, e	feffective		3.0	3	8.0	T		3.0	3.0)	3.0		3.0	3.0		3.0	3.0			
Arrival type	Arrival type, AT		3	3		İ		3	3		3		4	4		3	3			
Unit extension, UE			3.0	3.0		\square		3.0	3.0	2	3.0		3.0	3.0		3.0	3.0			
Filtering/me	Filtering/metering, I		1.000	1.000				1.000) 1.00	00	1.000	0	0.742	0.742		1.000	1.000			
Initial unme	Initial unmet demand, Q _b		0.0	0	0.0			0.0	0.0)	0.0		0.0	0.0		0.0	0.0			
Ped / Bike / volumes	RTOR		0	0	0	11.	3	0	0		19		0	0	8	0	0	1		
Lane width			12.0	12.0				12.0	12.0	0	12.0		12.0	12.0		12.0	12.0			
Parking / G	rade / Parkir	ng	N		0 N		1	N	0		N		Ν	0	N	N	0	N		
Parking ma	neuvers, N _m																			
Buses stop	bing, N _B		0		0			0	0	0 0			0 0			0	0			
Min. time fo G _P	r pedestrian	S,		3	3.2				3.2	2				3.2		3.2				
Phasing	EB Only	<u>v</u>	VB On	y		03			04	4T		& F	RT	Excl. Let	t 📃	07	08			
Timing	G = 13.0 Y = 5	G Y	= 38.1 = 5	7	G = Y =			G = Y =		\neg	G = 4 Y = 5	48. 5	.8 G	G = 9.5		=	G = Y =			
Duration of	Duration of Analysis, $T = 0.25$													ycle Lei	ngth, C	2 = 130).0			
Lane Group	o Capacity,	Co	ntrol [)ela	ıy, a	nd L	.os	Dete	ermin	ati	on									
		Ļ.		EB		H		- T	WB		DT	L		NB	DT		SB			
Adjusted flo	w rate, v	11	1 2	39		IX1	50	0	200	\dagger	8	1	61	1260		99	1130			
Lane group	capacity, c	19	1 3	72	+		54	1	569	4	183	1.	43	1332		143	1353	╞──┤		
v/c ratio, X		0.5	58 0.	64	+		0.9	2 (0.35	C	0.02	1.	13	0.95		0.69	0.84			
		0.1	1 0.	11			0.3	1 (0.31	0	.31	0.	08	0.38		0.08	0.38			

fife://C:\Documents and Settings\Dan\Local Settings\Temp\s2k14F9:tmp

Total green ratio, g/C											
Uniform delay, d ₁	55.2	55.6	43.7	35.1	31.5	59.8	38.8		58.2	36.4	
Progression factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	0.912		1.000	1.000	
Delay calibration, k	0.17	0.22	0.44	0.11	0.11	0.50	0.50		0.26	0.50	
Incremental delay, d ₂	4.4	3.8	21.8	0.4	0.0	102.7	11.8		13.4	6.2	
Initial queue delay, d ₃											
Control delay	59.6	59.4	65.5	35.5	31.5	162.5	47.2		71.6	42.6	
Lane group LOS	E	E	Е	D	С	F	D		Е	D	
Approach delay	59	.4	5	6.7		6	0.3			44.9	
Approach LOS	E			E			E			D	
Intersection delay	54	4.4	$X_{c} =$	0.92		Interse	ction LO	S		D	

 $HCS2000^{\mathrm{TM}}$

Copyright © 2000 University of Florida, All Rights Reserved

Version 4.1d

.

HCS2000 [™] DETAILED REPORT													
General Information	format	ntion											
Analyst Agency or Co. Date Performed 04/13/2006 Time Period 5:00 pm					Interse Area T Jurisdi Analys Project	ction ype ction is Year ID	Kilgore & Westnedge All other areas Baseline						
Volume and Timing Input													
		EB			WB			NB			SB		
	LT	TH	RT	LT	ТН	RT	LT	TH	RT	LT	TH	RT	
Number of lanes, N ₁	1	2	1	1	2	0	1	3	0	1	3	0	
Lane group	L	Т	R	L	TR		L	TR		L	TR		
Volume, V (vph)	143	196	138	376	332	166	161	1194	132	112	1423	58	
% Heavy vehicles, %HV	2								-		-		