

**America First Credit Union
Cedar Hills
Traffic Impact Analysis**

4800 West and Cedar Hills Drive

Cedar Hills, Utah

March 2014

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**America First Credit Union
Cedar Hills
Traffic Study**

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<p>America First Credit Union Cedar Hills Traffic Study</p>
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**America First Credit Union
Cedar Hills
Traffic Study**

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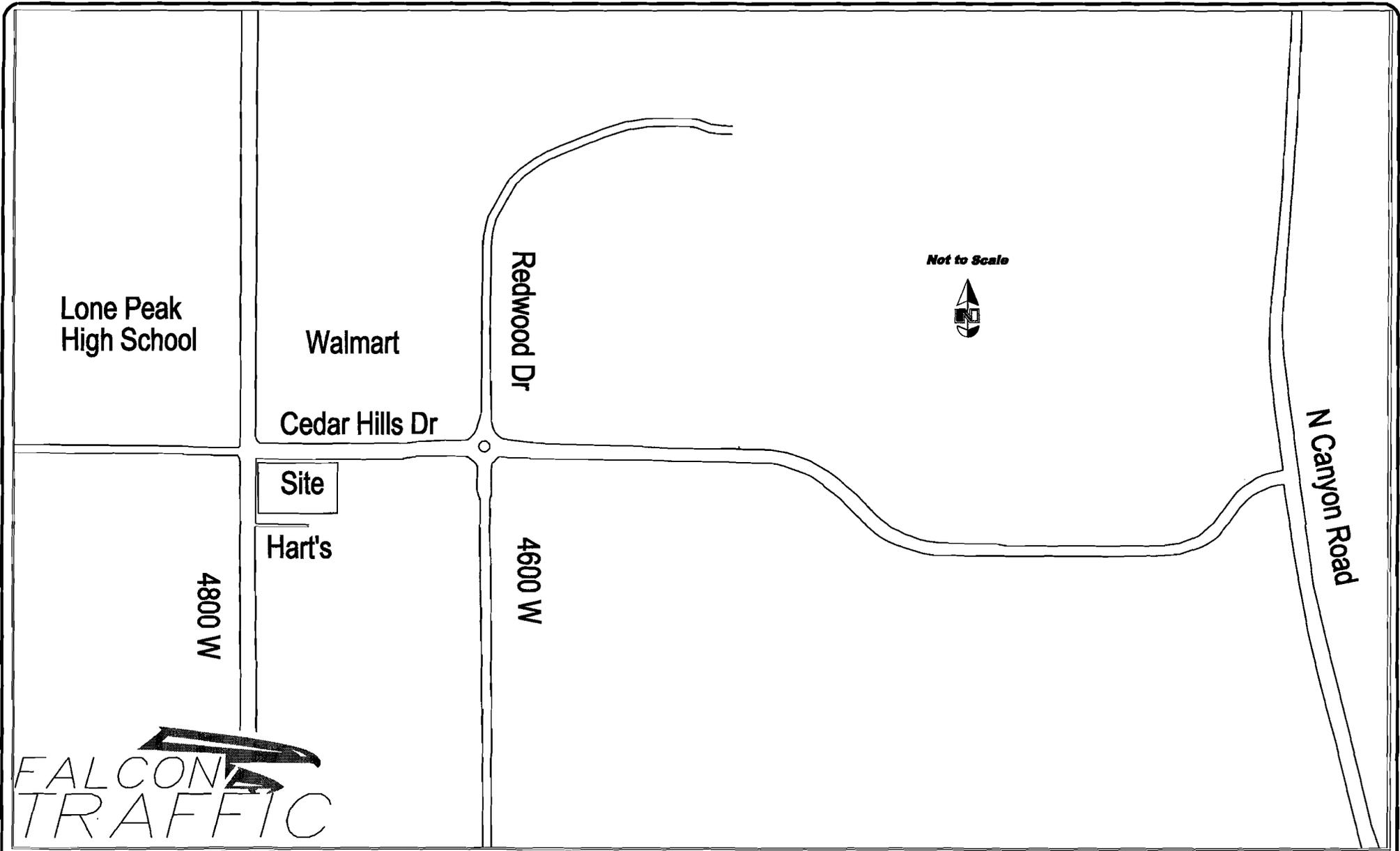
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I. Introduction

The proposed site is planned to develop as a 4,948 square foot America First Credit Union with six drive-through bays. In addition to this, two retail buildings are planned for the east portion of the site: 4,400 square feet and 8,800 square feet. The site is located on the southeast corner of 4800 West and Cedar Hills Drive in Cedar Hills, Utah. The proposed site is currently vacant. The site has approximately 300 feet of frontage along 4800 West and 470 feet along Cedar Hills Drive. 4800 West is a five-lane facility (two lanes in each direction with a center turn lane) and Cedar Hills Drive being a three-lane facility (one lane in each direction with a center turn lane). A local street exists immediately south of the site. This street, hereafter known as Hart's street, is between the America First Credit Union and the existing Hart's Gas Station and Convenience Store. Another road will be constructed to the east of the site to line up with the main Walmart Access (approximately 4700 West). The peak hour of traffic was analyzed for the PM Peak Hour (one hour between 4:00 and 6:00 p.m.). The AM Peak Hour was not analyzed as it occurs before the America First Credit Union opens.

A full movement access is proposed for Hart's Street (Access A), a right-in/right-out access is proposed for Cedar Hills Drive (Access B) and a full access is proposed for 4700 West (Access C). A second access to Hart's Street is proposed for the rear retail (Access D). Figure One shows the location of the proposed development and Figure Two shows the conceptual site plan of the proposed development.

Traffic Counts were made for all movements at the 4800 West and Cedar Hills Drive during the PM Peak Hour on Tuesday, March 4th. Turning movement counts for the Hart's Street intersection with 4800 West and for the Walmart Access with Cedar Hills Drive were made for the PM Peak Hour on Wednesday, March 5th. Through movements for these intersections were based on balancing traffic from the 4800 West and Cedar Hills Drive intersection. The PM Peak Hour was 5:00 p.m. to 6:00 p.m. Figure Three shows the existing 2014 traffic counts for the study intersections and accesses in the area. Full traffic counts are provided in Appendix A.



FALCON TRAFFIC ENGINEERING
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Figure One

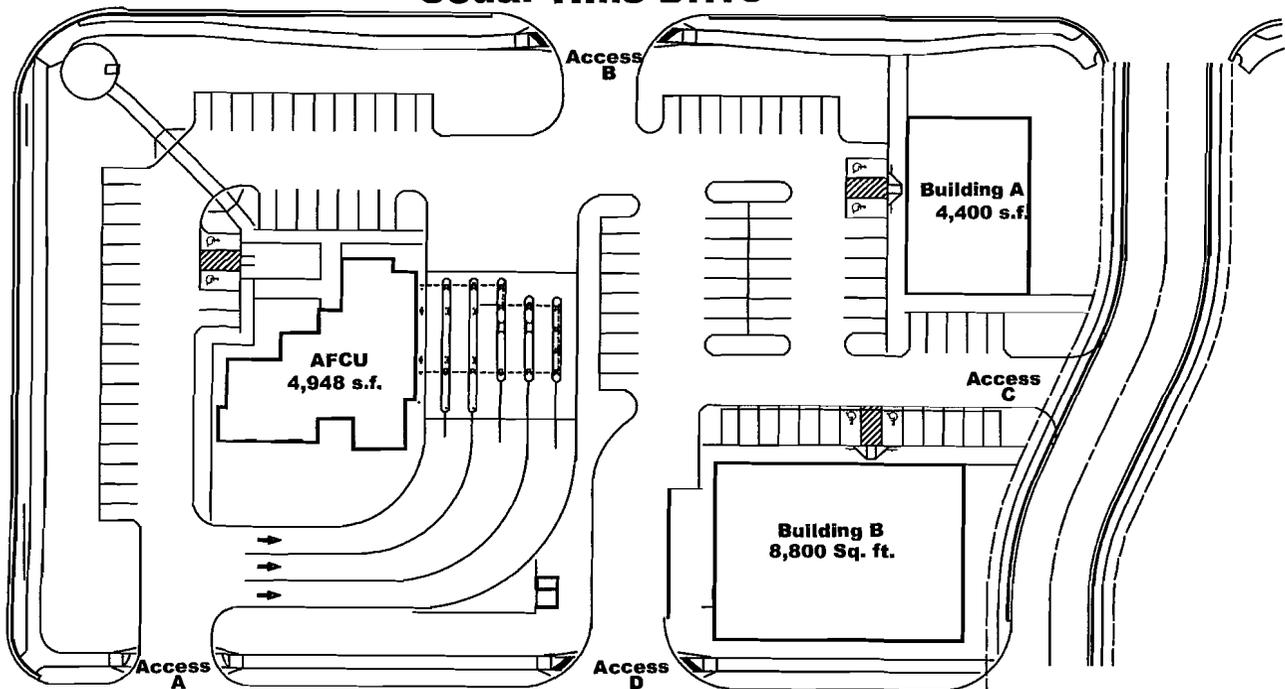
**America First Credit Union TIS
 Project Site Location**



Not to Scale

Cedar Hills Drive

4800 West Street



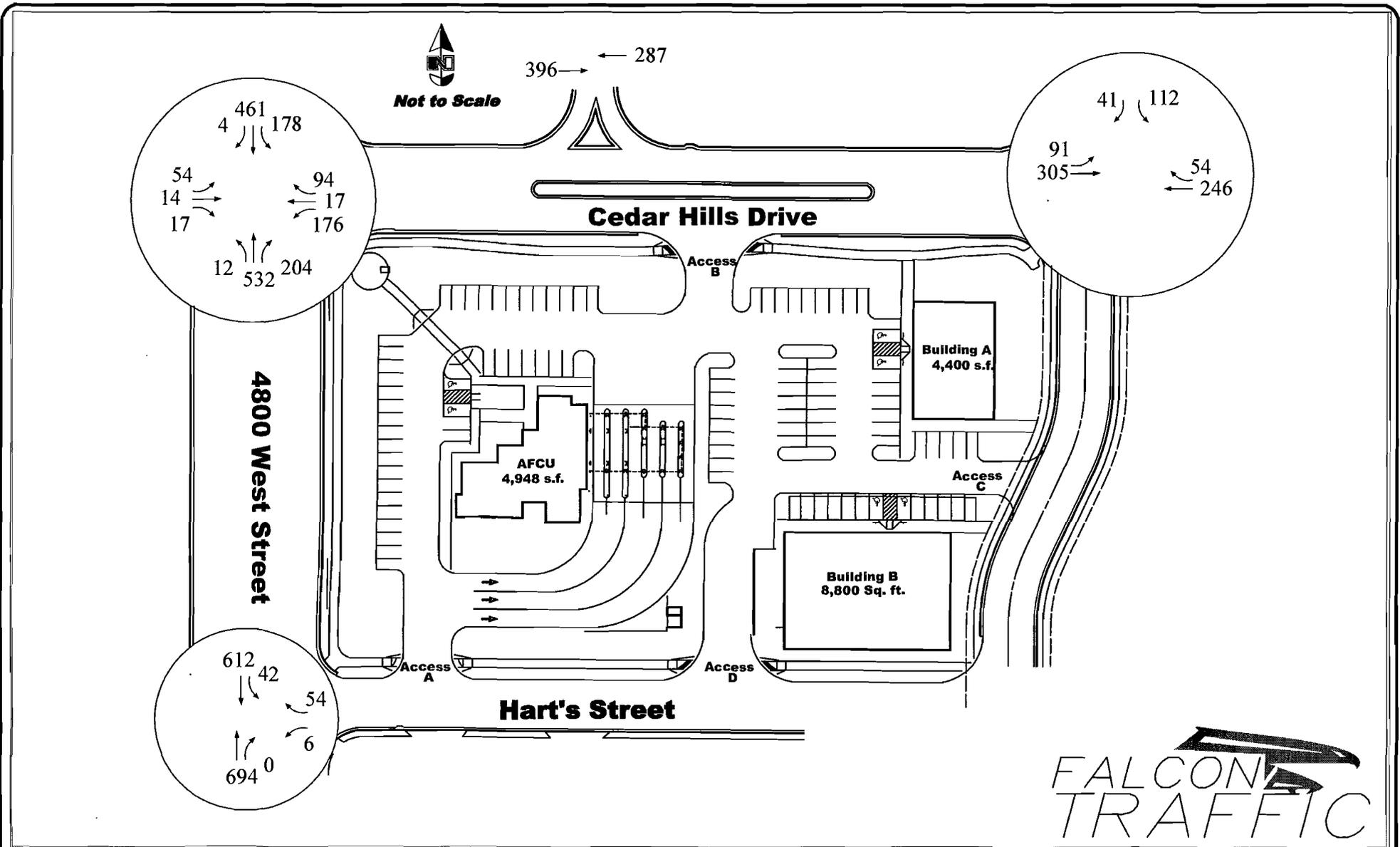
Hart's Street



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 Phone: 801-395-4054 Fax: 801-942-7552

Figure Two

**America First Credit Union TIS
 Conceptual Site Plan**



II. Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation (9th Edition) handbook was used to estimate trips. Table One shows the PM Peak Hour Trips and Daily Trips as taken from ITE.

<i>Cedar Hills America First Credit Union Traffic Study</i>				
Table One				
PM Peak Hour Trip Generation				
Facility	Size (1,000 sf)	ITE Land Use	Peak Hour Trip Rate	Total Trips
America First Credit Union	4.5	912	25.82	116
Retail Building A	4.4	820	3.73	16
Retail Building B	8.8	820	3.73	33

<i>Cedar Hills America First Credit Union Traffic Study</i>					
Table Two					
PM Peak Hour Trip Distribution					
Facility	Total Trips	% In	% Out	Inbound	Outbound
America First Credit Union	116	50%	50%	58	58
Retail Building A	16	49%	51%	8	8
Retail Building B	33	49%	51%	16	17

Pass-by traffic reductions could be taken along 4800 West and along Cedar Hills Drive, but these reductions would not affect the turning movements. The pass-by traffic has not been considered separately and therefore, this analysis is conservative.

III. Origin/Destination and Trip Distribution

The origin/destination assumptions were made with an understanding of roadways in the area and patterns from the existing counts. The counts showed more traffic coming from the west. Of the traffic that travels from the east, the majority was from the south. Based on these assumptions, it was assumed that the Origin/Destination Assumptions would be as follows:

- 10% West
- 30% East
- 30% North
- 30% South

It was estimated from previous Credit Union studies that 70 percent of the trips were drive-in related trips. For the purposes of this study, it was simply assumed that the drive-in related trips were the main pattern of credit union traffic.

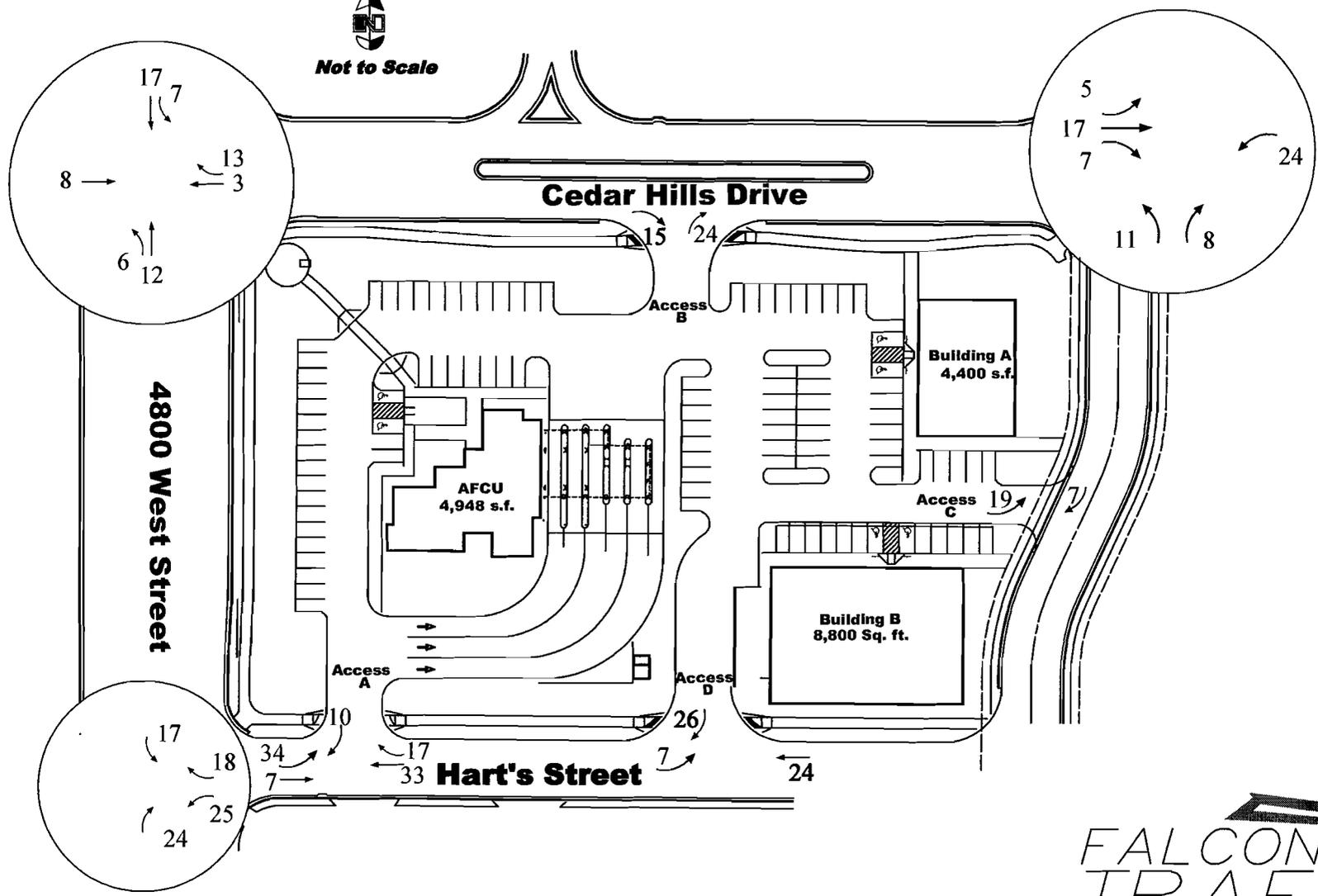
Table Three shows the detailed trip distribution assumptions for traffic to the site.

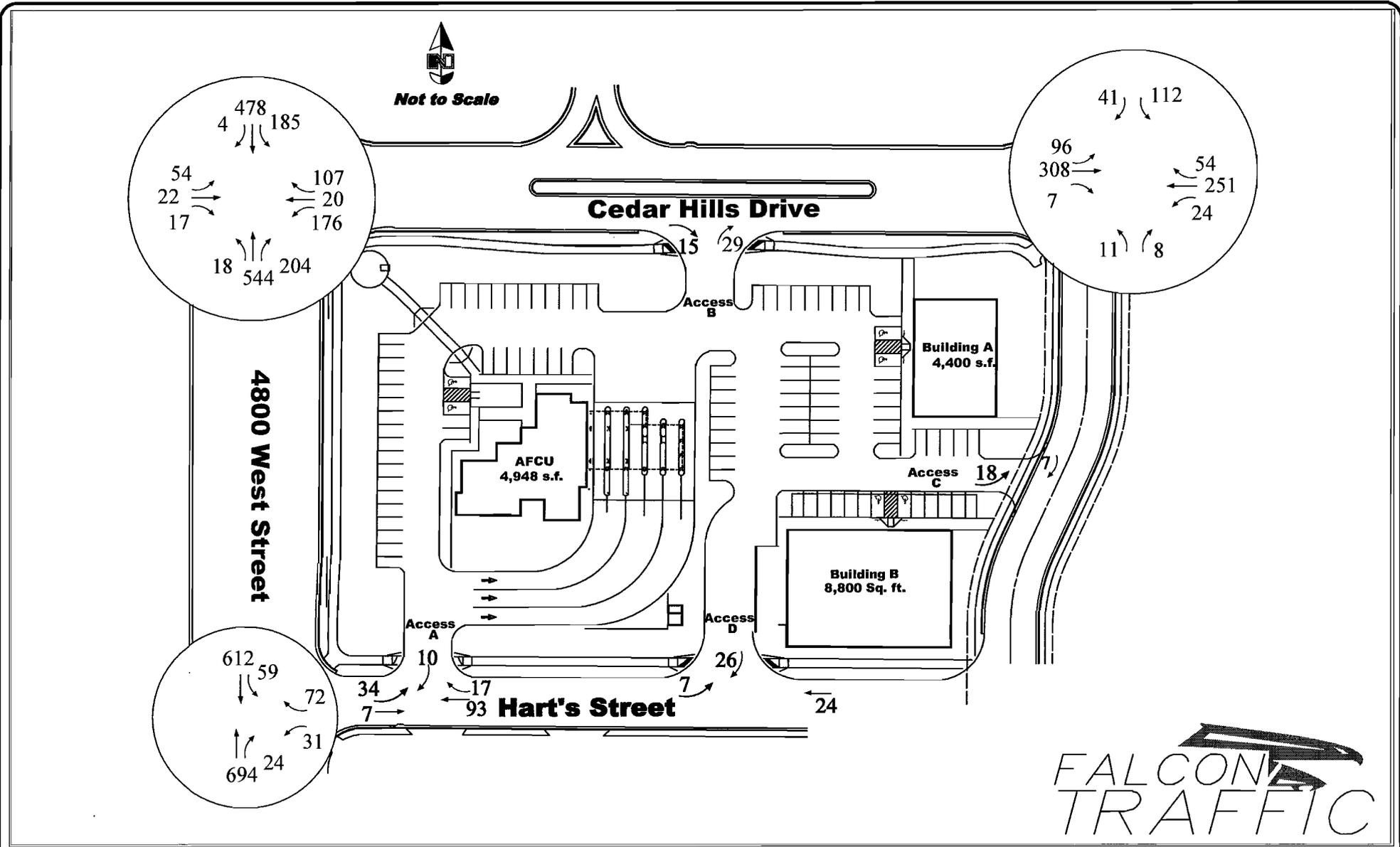
<i>Cedar Hills America First Credit Union Traffic Study</i>											
Table Three											
Origin Destination and Trip Distribution Access Assumptions											
	Access A (Hart's Street West)			Access D (Hart' Street East)		Access B (Cedar Hills Drive)		Access C (4700 West)			
	In		Out	In	Out	In	Out	In		Out	
	EB Left	WB Right	SB Right	EB Left	SB Right	EB Right	NB Right	NB Left	SB Right	EB Left	EB Right
America First											
10% West					10%	10%					
30% East		30%					30%				
30% North	30%				8%		22%				
30% South	30%		17%		13%						
Retail Pads											
10% West						10%				10%	
30% East									30%	30%	
30% North						30%				30%	
30% South				30%	30%						

<i>Cedar Hills America First Credit Union Traffic Study</i>											
Table Four											
Origin Destination and Trip Distribution Access Projections (PM Peak)											
	Access A (Hart's Street West)			Access D (Hart' Street East)		Access B (Cedar Hills Drive)		Access C (4700 West)			
	In		Out	In	Out	In	Out	In		Out	
	EB Left	WB Right	SB Right	EB Left	SB Right	EB Right	NB Right	NB Left	SB Right	EB Left	EB Right
America First (58 in, 58 Out)											
10% West					6	6					
30% East		17					17				
30% North	17				5		12				
30% South	17		10		7						
America First Total	34	17	10		18	6	29				
Retail Pads (24 in, 24 Out)											
10% West						2				3	
30% East									7	8	
30% North						7				8	
30% South				7	8						
Retail Pads Total				7	8	9			7	19	
Total For Site	34	17	10	7	26	15	29		7	19	

The above tables show the projections for the accesses to the site. The figures also show the site generated movements for the nearby intersections.

Figure Four shows the site projected traffic. Figure Five shows the existing plus site generated traffic.





IV. Traffic Analysis

The unsignalized accesses and intersections are analyzed using HCS software to evaluate the impacts of the project on the surrounding traffic network. Table Five shows the Level of Service delay ranges for intersections as defined by the 2000 Highway Capacity Manual.

A. Unsignalized Accesses and Intersections

<i>Cedar Hills America First Credit Union Traffic Study</i> Table Five Intersection LOS-Delay Relationship		
Level of Service	Unsignalized	Signalized
	Total Delay per Vehicle (sec)	Total Delay per Vehicle (sec)
A	≤ 10.0	≤ 10.0
B	> 10.0 and ≤ 15.0	> 10.0 and ≤ 20.0
C	> 15.0 and ≤ 25.0	> 20.0 and ≤ 35.0
D	> 25.0 and ≤ 35.0	> 35.0 and ≤ 55.0
E	> 35.0 and ≤ 50.0	> 55.0 and ≤ 80.0
F	> 50.0	> 80.0

Table Six shows the HCM Delay / LOS Evaluation for the PM Peak Period for the Hart's Street and 4800 West intersection. The center median along 4800 West was modeled as a two-way left turn.

<i>Cedar Hills America First Credit Union Traffic Study</i> Table Six HCM PM Peak Period Intersection Analysis - Delay/LOS Evaluation Hart's and 4800 West		
Delay / LOS (in sec)	2014 Existing	2014 with Site
Southbound Left	9.5/A	9.7/A
Westbound Left	17.3/C	17.9/C
Westbound Right	11.5/B	11.6/B

The results indicate that this intersection will have LOS levels of C or better. The unsignalized intersection HCM analyses are included in Appendix B.

Table Seven shows the analysis for the Walmart and Cedar Hills Drive intersection, with and without the proposed development.

<i>Cedar Hills America First Credit Union Traffic Study</i> <i>Table Seven</i> HCM PM Peak Period Intersection Analysis - Delay/LOS Evaluation Walmart and Cedar Hills Drive		
Delay / LOS (in sec)	2014 Existing	2014 with Site
Eastbound Left	8.2/A	8.2/A
Westbound Left	N/A	8.1/A
Northbound Left	N/A	23.5/C
Northbound Thru/Right	N/A	10.3/B
Southbound Left	24.1/C	39.3/E
Southbound Thru/Right	10.2/B	10.2/B

The table shows that the addition of the fourth leg of the intersection impacts the southbound left turn (this is because it introduces opposing traffic with impacts the level of service). While the southbound left turn has a fairly high volume that is generated from the Walmart Store, the new development will not have high volumes. Detailed HCM analyses are included in Appendix B.

<i>Cedar Hills America First Credit Union Traffic Study</i> <i>Table Eight</i> HCM PM Peak Period Intersection Analysis - Delay/LOS Evaluation Access A (America First Access on Hart Street)	
Delay / LOS (in sec)	2014 with Site
Eastbound Left	7.5/A
Westbound Left	7.3/A
Northbound Approach	9.2/A
Southbound Approach	8.8/A

The Hart's accesses were not counted, but it was assumed that traffic would use the east access. This shows that this access is LOS A or better and there is little to no queuing.

The other minor accesses to the site were not analyzed as they were either right-in/right-out or such low volumes that the analysis was not necessary.

B. Signalized Analysis

A similar HCM analysis was performed for the 4800 West and Cedar Hills Drive signalized intersection. The signal timing was based on a 60 second cycle length. Signal phases were estimated assuming efficient flow with a one minute cycle length. This was based on permitted phasing only, although the intersection also includes protected/permitted phasing if necessary. Therefore, the analysis is conservative.

Table Nine shows the results of the analysis.

<i>Cedar Hills America First Credit Union Traffic Study</i>		
<i>Table Nine</i>		
PM Peak Hour HCM Delay / LOS Analysis for Signalized Intersection		
Delay / LOS (in sec)	4800 West and Cedar Hills Street	
Period	2014 Existing	2014 with Site
Eastbound Left	13.7/B	13.7/B
Eastbound Thru	12.8/B	12.9/B
Eastbound Right	0.0/A	0.0/A
Eastbound Approach	11.6/B	11.7/B
Westbound Left	17.0/B	17.1/B
Westbound Thru	12.9/B	12.9/B
Westbound Right	0.1/A	0.1/A
Westbound Approach	12.5/B	12.0/B
Northbound Left	7.2/A	7.4/A
Northbound Thru	8.8/A	8.9/A
Northbound Right	0.1/A	0.1/A
Northbound Approach	6.9/A	7.0/A
Southbound Left	14.0/B	14.9/B
Southbound Thru	8.5/A	8.6/A
Southbound Right	0.0/A	0.0/A
Southbound Approach	10.0/B	10.3/B
Intersection	9.2/A	9.3/A

The results of the analysis indicate that the development will have no significant impact on the 4800 West and Cedar Hills Drive signal.

C. Queue Analysis

For this portion of the report, only critical queuing was reviewed.

For unsignalized intersections a two minute storage requirement (the projected movement divided by 60 minutes x 2 minutes has been assumed x 25 feet per car) has been assumed. The queue lengths are rounded to the next nearest 25-foot interval and represent a minimum that should be provided.

For the Hart's Street and 4800 West intersection, the southbound left turn queue is of interest because of the short distance between this intersection and the traffic signal to the north (approximately 280 feet of left turn storage space between the two intersections). Based on the southbound left turn, 50 feet of storage would be required (59 left turns per hour/60 minutes x 2 minutes x 25 feet).

For the northbound left turn at 4800 West and Cedar Hills Drive, the signalized HCS software was used to calculate the queuing. The software showed that the 95 percentile queue was .5 cars or 15 feet. This was based on permitted phasing only, although the intersection also includes protected/permitted phasing if necessary. Therefore, the analysis is conservative.

Therefore, the available distance between these two intersections is sufficient for back to back left turn storage. This analysis only considers the PM Peak hour. The AM Peak hour should not be at issue as the America First Credit Union is not open. There may be hours of the day, future growth, changes in traffic patterns or trip distributions that are different that have been assumed in this report. Therefore, it is recommended that these turns/intersections be monitored for conflicts between the left turn movements, by the City. Due to the short distance available between intersections, future mitigation should be considered if necessary.

V. Conclusions/Recommendations

The results of the highway capacity analysis show that the existing intersections and proposed accesses will continue to operate at acceptable levels of service with the addition of the America First Credit Union. As per the queue analysis, there is sufficient storage to accommodate the back to back left turns on 4800 West (northbound left at Cedar Hills Drive and Southbound left at Hart Street).

The accesses, streets, signing and striping should be constructed to Cedar Hills standards and MUTCD standards.

APPENDICES

Appendix A
Appendix B

Traffic Counts
Access and Intersection Analyses

WEEKDAY PEAK HOUR VOLUMES

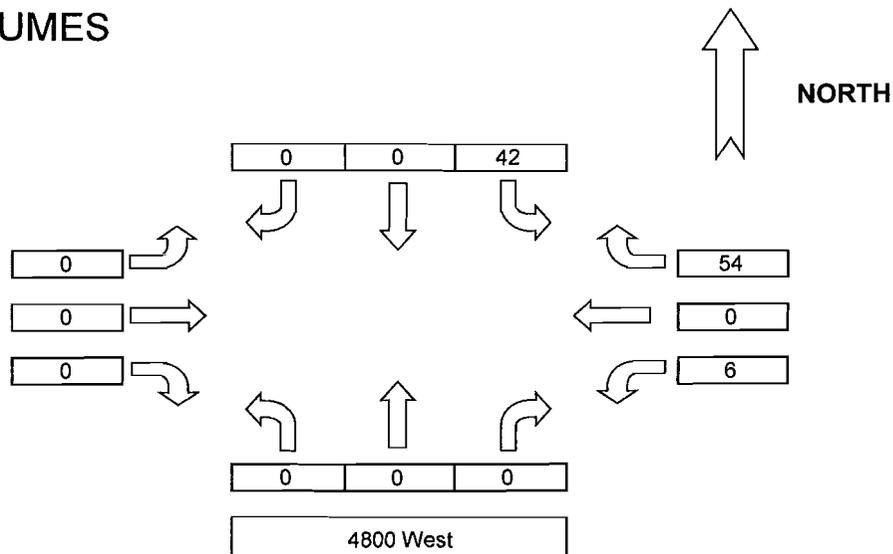
INTERSECTION:
 N-S STREET: 4800 West
 E-W STREET: Convenience Store

PK HR VOLUME:	113
PHF:	0.81
PEAK HOUR:	
FROM: 5:00 PM	TO: 6:00 PM

COUNT DATE: 1/20/2009
 NOTES:

COUNT TIME:
 FROM: 4:00 PM
 TO: 6:00 PM

Convenience Store



Weekday Traffic

COUNT DATA INPUT:

TIME PERIOD		Southbound			Westbound			Northbound			Eastbound			TOTAL VOLUMES
FROM:	TO:	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	4:15 PM	11			4		18			0				33
4:15 PM	4:30 PM	12			2		15			1				30
4:30 PM	4:45 PM	10			1		16			0				27
4:45 PM	5:00 PM	7			2		12			0				21
5:00 PM	5:15 PM	13			2		20			0				35
5:15 PM	5:30 PM	10			1		8			0				19
5:30 PM	5:45 PM	9			1		14			0				24
5:45 PM	6:00 PM	10			2		12			0				24

WEEKDAY HOURLY TOTALS:

TIME PERIOD		Southbound			Westbound			Northbound			Eastbound			TOTAL VOLUMES
FROM:	TO:	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	5:00 PM	40	0	0	9	0	61	0	0	1	0	0	0	111
4:15 PM	5:15 PM	42	0	0	7	0	63	0	0	1	0	0	0	113
4:30 PM	5:30 PM	40	0	0	6	0	56	0	0	0	0	0	0	102
4:45 PM	5:45 PM	39	0	0	6	0	54	0	0	0	0	0	0	99
5:00 PM	6:00 PM	42	0	0	6	0	54	0	0	0	0	0	0	102

NOTE PHF IS BASED ON 15 MIN. PEAK WITHIN THE PEAK HOUR.

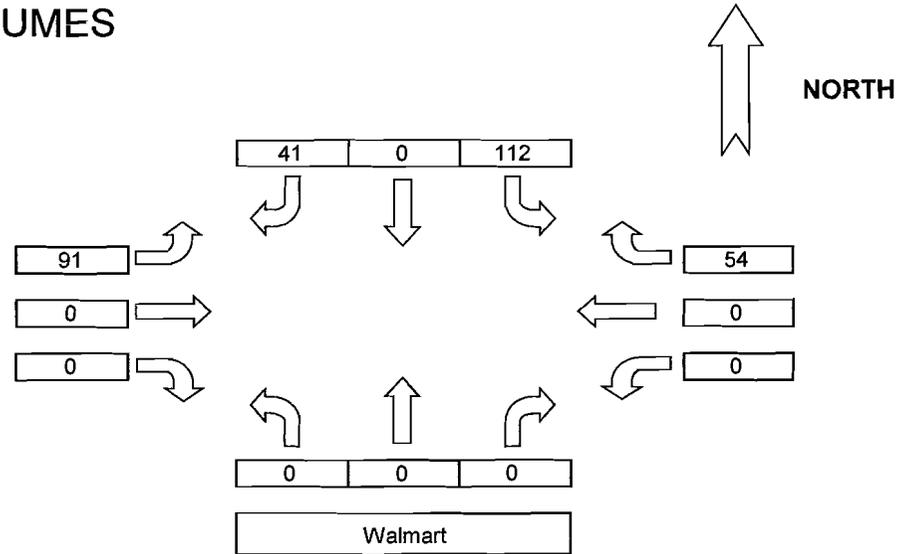
WEEKDAY PEAK HOUR VOLUMES

INTERSECTION: Walmart
 N-S STREET: Cedar Hills Parkway
 E-W STREET: Cedar Hills Parkway

PK HR VOLUME:	318
PHF:	1.01
PEAK HOUR:	
FROM: 5:00 PM	TO: 6:00 PM

COUNT DATE: 1/20/2009
 NOTES:

COUNT TIME: Cedar Hills Parkway
 FROM: 4:00 PM
 TO: 6:00 PM



Weekday Traffic

COUNT DATA INPUT:

TIME PERIOD		Southbound			Westbound			Northbound			Eastbound			TOTAL VOLUMES
FROM:	TO:	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	4:15 PM	32		11			13				24			80
4:15 PM	4:30 PM	36		10			15				16			77
4:30 PM	4:45 PM	19		14			15				21			69
4:45 PM	5:00 PM	33		12			13				29			87
5:00 PM	5:15 PM	24		13			12				29			78
5:15 PM	5:30 PM	31		13			13				22			79
5:30 PM	5:45 PM	27		10			17				20			74
5:45 PM	6:00 PM	30		5			12				20			67

WEEKDAY HOURLY TOTALS:

TIME PERIOD		Southbound			Westbound			Northbound			Eastbound			TOTAL VOLUMES
FROM:	TO:	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	5:00 PM	120	0	47	0	0	56	0	0	0	90	0	0	313
4:15 PM	5:15 PM	112	0	49	0	0	55	0	0	0	95	0	0	311
4:30 PM	5:30 PM	107	0	52	0	0	53	0	0	0	101	0	0	313
4:45 PM	5:45 PM	115	0	48	0	0	55	0	0	0	100	0	0	318
5:00 PM	6:00 PM	112	0	41	0	0	54	0	0	0	91	0	0	298

NOTE PHF IS BASED ON 15 MIN. PEAK WITHIN THE PEAK HOUR.

WEEKDAY PEAK HOUR VOLUMES

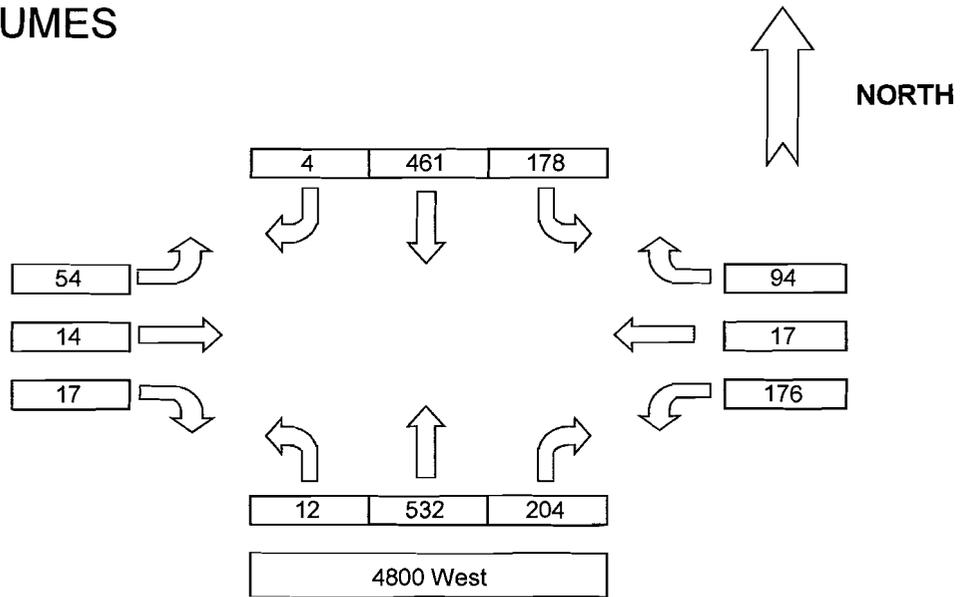
INTERSECTION:
N-S STRE 4800 West
E-W STRE Cedar Hills Parkway

PK HR VOLUME:	1,763
PHF:	0.84
PEAK HOUR:	
FROM:	TO:
4:45 PM	5:45 PM

COUNT D/ 1/30/1995
NOTES:

COUNT TIME:
FROM: 4:00 PM
TO: 6:00 PM

Cedar Hills Parkway



Weekday Traffic

COUNT DATA INPUT:

TIME PERIOD		Southbound			Westbound			Northbound			Eastbound			TOTAL VOLUMES
FROM:	TO:	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	4:15 PM	26	116	0	34	0	36	3	98	36	6	2	9	366
4:15 PM	4:30 PM	45	136	2	39	5	23	2	126	54	13	4	3	452
4:30 PM	4:45 PM	26	128	0	40	1	36	1	108	55	6	3	4	408
4:45 PM	5:00 PM	40	121	2	32	2	29	0	116	38	6	4	2	392
5:00 PM	5:15 PM	42	105	0	46	2	20	3	119	43	5	1	1	387
5:15 PM	5:30 PM	46	109	1	41	9	26	3	144	56	9	1	7	452
5:30 PM	5:45 PM	54	139	3	45	1	30	4	148	66	23	6	3	522
5:45 PM	6:00 PM	36	108	0	44	5	18	2	121	39	17	6	6	402

WEEKDAY HOURLY TOTALS:

TIME PERIOD		Southbound			Westbound			Northbound			Eastbound			TOTAL VOLUMES
FROM:	TO:	L	T	R	L	T	R	L	T	R	L	T	R	
4:00 PM	5:00 PM	137	501	4	145	8	124	6	448	183	31	13	18	1,618
4:15 PM	5:15 PM	153	490	4	157	10	108	6	469	190	30	12	10	1,639
4:30 PM	5:30 PM	154	463	3	159	14	111	7	487	192	26	9	14	1,639
4:45 PM	5:45 PM	182	474	6	164	14	105	10	527	203	43	12	13	1,753
5:00 PM	6:00 PM	178	461	4	176	17	94	12	532	204	54	14	17	1,763

NOTE PHF IS BASED ON 15 MIN. PEAK WITHIN THE PEAK HOUR.

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	Falcon Traffic			Intersection	Hart's and 4800 W			
Agency/Co.				Jurisdiction	Cedar Hills			
Date Performed	3/10/2014			Analysis Year	2014			
Analysis Time Period	PM Peak							
Project Description <i>America First Credit Union</i>								
East/West Street: <i>Hart's Street</i>				North/South Street: <i>4800 West</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	694	0	42	612	0		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	0	771	0	46	680	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	Two Way Left Turn Lane							
RT Channelized			0				0	
Lanes	0	2	0	1	2	0		
Configuration		T	TR	L	T			
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	6	0	54	0	0	0		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	6	0	60	0	0	0		
Percent Heavy Vehicles	0	0	0	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					
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		46	6		60			
C (m) (vph)		853	299		618			
v/c		0.05	0.02		0.10			
95% queue length		0.17	0.06		0.32			
Control Delay		9.5	17.3		11.5			
LOS		A	C		B			
Approach Delay	--	--	12.0					
Approach LOS	--	--	B					

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TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	<i>Falcon Traffic</i>			Intersection	<i>Hart's and 4800 W</i>			
Agency/Co.				Jurisdiction	<i>Cedar Hills</i>			
Date Performed	<i>3/10/2014</i>			Analysis Year	<i>2014 with Site</i>			
Analysis Time Period	<i>PM Peak</i>							
Project Description <i>America First Credit Union</i>								
East/West Street: <i>Hart's Street</i>				North/South Street: <i>4800 West</i>				
Intersection Orientation: <i>North-South</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Northbound			Southbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	694	24	59	612	0		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	0	771	26	65	680	0		
Percent Heavy Vehicles	0	--	--	0	--	--		
Median Type	<i>Two Way Left Turn Lane</i>							
RT Channelized			0				0	
Lanes	0	2	0	1	2		0	
Configuration		T	TR	L	T			
Upstream Signal		0			0			
Minor Street	Westbound			Eastbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	6	0	54	0	0	0		
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	6	0	60	0	0	0		
Percent Heavy Vehicles	0	0	0	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					
Delay, Queue Length, and Level of Service								
Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L	L		R			
v (vph)		65	6		60			
C (m) (vph)		834	285		607			
v/c		0.08	0.02		0.10			
95% queue length		0.25	0.06		0.33			
Control Delay		9.7	17.9		11.6			
LOS		A	C		B			
Approach Delay	--	--	12.2					
Approach LOS	--	--	B					

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TWO-WAY STOP CONTROL SUMMARY							
General Information				Site Information			
Analyst	Falcon Traffic			Intersection	Cedar Hills and Walmart		
Agency/Co.	Cedar Hills			Jurisdiction			
Date Performed	3/10/2014			Analysis Year	2014		
Analysis Time Period	PM Peak						
Project Description							
East/West Street: Cedar Hills Drive				North/South Street: Walmart Access			
Intersection Orientation: East-West				Study Period (hrs): 0.25			
Vehicle Volumes and Adjustments							
Major Street	Eastbound			Westbound			
Movement	1	2	3	4	5	6	
	L	T	R	L	T	R	
Volume (veh/h)	91	305	0	0	246	54	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly Flow Rate (veh/h)	101	338	0	0	273	60	
Proportion of heavy vehicles, P _{HV}	0	--	--	0	--	--	
Median type	Undivided						
RT Channelized?			0			0	
Lanes	1	1	0	0	1	0	
Configuration	L	T				TR	
Upstream Signal		0			0		
Minor Street	Northbound			Southbound			
Movement	7	8	9	10	11	12	
	L	T	R	L	T	R	
Volume (veh/h)	0	0	0	112	0	41	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	
Hourly Flow Rate (veh/h)	0	0	0	124	0	45	
Proportion of heavy vehicles, P _{HV}	0	0	0	0	0	0	
Percent grade (%)	0			0			
Flared approach		N			N		
Storage		0			0		
RT Channelized?			0			0	
Lanes	0	0	0	1	0	1	
Configuration				L		R	
Control Delay, Queue Length, Level of Service							
Approach	EB	WB	Northbound			Southbound	
Movement	1	4	7	8	9	10	11
Lane Configuration	L					L	R
Volume, v (vph)	101					124	45
Capacity, c _m (vph)	1238					310	741
v/c ratio	0.08					0.40	0.06
Queue length (95%)	0.27					1.85	0.19
Control Delay (s/veh)	8.2					24.1	10.2
LOS	A					C	B
Approach delay (s/veh)	--	--				20.4	
Approach LOS	--	--				C	

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	Falcon Traffic			Intersection	Cedar Hills and Walmart			
Agency/Co.	Cedar Hills			Jurisdiction				
Date Performed	3/10/2014			Analysis Year	2014			
Analysis Time Period	PM Peak							
Project Description								
East/West Street: Cedar Hills Drive				North/South Street: Walmart Access				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	96	322	7	24	251	54		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate (veh/h)	106	357	7	26	278	60		
Proportion of heavy vehicles, P _{HV}	0	--	--	0	--	--		
Median type	Undivided							
RT Channelized?			0				0	
Lanes	1	1	0	1	1	0		
Configuration	L		TR	L		TR		
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	11	0	8	112	0	41		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate (veh/h)	12	0	8	124	0	45		
Proportion of heavy vehicles, P _{HV}	0	0	0	0	0	0		
Percent grade (%)	0			0				
Flared approach		N			N			
Storage		0			0			
RT Channelized?			0			0		
Lanes	1	1	0	1	1	0		
Configuration	L		TR	L		TR		
Control Delay, Queue Length, Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	L		TR	L		TR
Volume, v (vph)	106	26	12		8	124		45
Capacity, c _m (vph)	1232	1206	207		689	224		737
v/c ratio	0.09	0.02	0.06		0.01	0.55		0.06
Queue length (95%)	0.28	0.07	0.18		0.04	3.00		0.19
Control Delay (s/veh)	8.2	8.1	23.5		10.3	39.3		10.2
LOS	A	A	C		B	E		B
Approach delay (s/veh)	--	--	18.2			31.6		
Approach LOS	--	--	C			D		

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	Falcon Traffic			Intersection	Hart's / America First			
Agency/Co.				Jurisdiction				
Date Performed	3/10/2014			Analysis Year	2014 With			
Analysis Time Period	PM Peak							
Project Description <i>America First Cedar Hills</i>								
East/West Street: <i>Hart's Street</i>				North/South Street: <i>America First</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume (veh/h)	34	7	42	0	93	17		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate (veh/h)	37	7	46	0	103	18		
Proportion of heavy vehicles, P _{HV}	0	--	--	0	--	--		
Median type	Undivided							
RT Channelized?			0				0	
Lanes	1	1	0	1	1		0	
Configuration	L		TR	L			TR	
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume (veh/h)	1	0	1	0	0	10		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly Flow Rate (veh/h)	1	0	1	0	0	11		
Proportion of heavy vehicles, P _{HV}	0	0	0	0	0	0		
Percent grade (%)	0			0				
Flared approach		N			N			
Storage		0			0			
RT Channelized?			0				0	
Lanes	0	1	0	0	1		0	
Configuration		LTR			LTR			
Control Delay, Queue Length, Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L	L	LTR			LTR		
Volume, v (vph)	37	0	2			11		
Capacity, c _m (vph)	1479	1566	851			947		
v/c ratio	0.03	0.00	0.00			0.01		
Queue length (95%)	0.08	0.00	0.01			0.04		
Control Delay (s/veh)	7.5	7.3	9.2			8.8		
LOS	A	A	A			A		
Approach delay (s/veh)	--	--	9.2			8.8		
Approach LOS	--	--	A			A		

HCS2000™ DETAILED REPORT												
General Information						Site Information						
Analyst	Falcon Traffic					Intersection	4800 West and Cedar Hills					
Agency or Co.						Area Type	All other areas					
Date Performed	3/10/2014					Jurisdiction	Cedar Hills					
Time Period	PM Peak					Analysis Year	2014					
						Project ID	America First					
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	1	1	1	1	1	1	1	2	1	1	2	1
Lane group	L	T	R	L	T	R	L	T	R	L	T	R
Volume, V (vph)	54	14	17	176	17	94	12	532	204	178	461	4
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed (P) or actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up lost time, l_1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of effective green, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Arrival type, AT	3	3	3	3	3	3	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	3.0	3.0	3.0
Filtering/metering, I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Initial unmet demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ped / Bike / RTOR volumes	0		5	0		30	0		50	0		1
Lane width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0	0	0	0	0	0	0	0	0	0	0
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 21.0	G =	G =	G =	G = 31.0	G =	G =	G =				
	Y = 4	Y =	Y =	Y =	Y = 4	Y =	Y =	Y =				
Duration of Analysis, T = 0.25							Cycle Length, C = 60.0					
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	60	16	13	196	19	71	13	591	171	198	512	3
Lane group capacity, c	496	665	1615	497	665	1615	439	1865	1615	393	1865	1615
v/c ratio, X	0.12	0.02	0.01	0.39	0.03	0.04	0.03	0.32	0.11	0.50	0.27	0.00

Total green ratio, g/C	0.35	0.35	1.00	0.35	0.35	1.00	0.52	0.52	1.00	0.52	0.52	1.00
Uniform delay, d_1	13.2	12.8	0.0	14.7	12.8	0.0	7.1	8.4	0.0	9.5	8.2	0.0
Progression factor, PF	1.000	1.000	0.950	1.000	1.000	0.950	1.000	1.000	0.950	1.000	1.000	0.950
Delay calibration, k	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Incremental delay, d_2	0.5	0.1	0.0	2.3	0.1	0.1	0.1	0.4	0.1	4.6	0.4	0.0
Initial queue delay, d_3												
Control delay	13.7	12.8	0.0	17.0	12.9	0.1	7.2	8.8	0.1	14.0	8.5	0.0
Lane group LOS	B	B	A	B	B	A	A	A	A	B	A	A
Approach delay	11.6			12.5			6.9			10.0		
Approach LOS	B			B			A			B		
Intersection delay	9.2			$X_c = 0.46$			Intersection LOS			A		

HCS2000™ DETAILED REPORT													
General Information						Site Information							
Analyst <i>Falcon Traffic</i>						Intersection <i>4800 West and Cedar Hills</i>							
Agency or Co.						Area Type <i>All other areas</i>							
Date Performed <i>3/10/2014</i>						Jurisdiction <i>Cedar Hills</i>							
Time Period <i>PM Peak</i>						Analysis Year <i>2014</i>							
						Project ID <i>America First</i>							
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	1	1	1	1	1	1	1	2	1	1	2	1	
Lane group	L	T	R	L	T	R	L	T	R	L	T	R	
Volume, V (vph)	54	22	17	176	20	107	18	544	204	185	478	4	
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Pretimed (P) or actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P	
Start-up lost time, l_1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Extension of effective green, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Arrival type, AT	3	3	3	3	3	3	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	3.0	3.0	3.0	
Filtering/metering, I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Initial unmet demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Ped / Bike / RTOR volumes	0		5	0		30	0		50	0		1	
Lane width	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N	
Parking maneuvers, N_m													
Buses stopping, N_B	0	0	0	0	0	0	0	0	0	0	0	0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2			
Phasing	EW Perm	02		03		04		NS Perm	06		07		08
Timing	G = 21.0	G =	G =	G =		G = 31.0		G =	G =		G =		
	Y = 4	Y =	Y =	Y =		Y = 4		Y =	Y =		Y =		
Duration of Analysis, T = 0.25							Cycle Length, C = 60.0						
Lane Group Capacity, Control Delay, and LOS Determination													
	EB			WB			NB			SB			
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
Adjusted flow rate, v	60	24	13	196	22	86	20	604	171	206	531	3	
Lane group capacity, c	494	665	1615	493	665	1615	427	1865	1615	386	1865	1615	
v/c ratio, X	0.12	0.04	0.01	0.40	0.03	0.05	0.05	0.32	0.11	0.53	0.28	0.00	

Total green ratio, g/C	0.35	0.35	1.00	0.35	0.35	1.00	0.52	0.52	1.00	0.52	0.52	1.00
Uniform delay, d_1	13.2	12.8	0.0	14.7	12.8	0.0	7.2	8.4	0.0	9.7	8.2	0.0
Progression factor, PF	1.000	1.000	0.950	1.000	1.000	0.950	1.000	1.000	0.950	1.000	1.000	0.950
Delay calibration, k	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Incremental delay, d_2	0.5	0.1	0.0	2.4	0.1	0.1	0.2	0.5	0.1	5.2	0.4	0.0
Initial queue delay, d_3												
Control delay	13.7	12.9	0.0	17.1	12.9	0.1	7.4	8.9	0.1	14.9	8.6	0.0
Lane group LOS	B	B	A	B	B	A	A	A	A	B	A	A
Approach delay	11.7			12.0			7.0			10.3		
Approach LOS	B			B			A			B		
Intersection delay	9.3			$X_c = 0.48$			Intersection LOS			A		