E. BEAVER CREEK RESIDENTIAL
City of Knoxville

TRAFFIC IMPACT STUDY

Prepared For:

BATSON, HIMES, NORVELL, & POE

Prepared By:

ENGINEERS
PLANNERS
ECONOMISTS

Wilbur Smith Associates

January 2002

E. BEAVER CREEK
RESIDENTIAL DEVELOPMENT
CITY OF KNOXVILLE, TENNESSEE

TRAFFIC IMPACT STUDY
(Revised)

Prepared for

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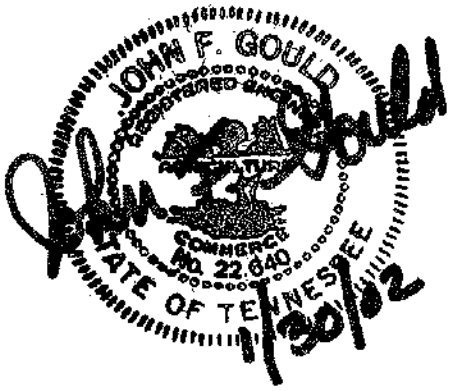

January 2002

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCTION

This traffic impact study was commissioned to address the impact of a proposed residential development within the city limits of Knoxville in Knox County. The study of this development required the collection of traffic data, generation of anticipated traffic volumes from the proposed site, development of future traffic volumes from both normal growth and the site, analysis of the resulting traffic conditions, and the development of measures necessary to mitigate traffic impacts of normal traffic growth and the proposed development. Methods and procedures utilized in the study are those required for a Level 1 traffic impact study as adopted by the Knoxville/Knox County Metropolitan Planning Commission.

Project Description

The proposed project is a residential development adjacent to East Beaver Creek Drive. The site is a total of 33.54 acres, zoned R-2 and C-4. The development will subdivide the property into 238 single family unit lots. Access is from a proposed street from E. Beaver Creek Drive. Figure 1 is the proposed site plan.

Site Location

The location of the site is north of E. Beaver Creek Drive adjacent to Interstate 75 to the west. The site is within the city limits of Knoxville in the north area of Knox County and north of the Knoxville central business district (CBD). The adjacent land use is residential in character. North of the site is East Emery Road, State Route 131. Figure 2 illustrates this location relative to local and regional access.

LOCAL AND REGIONAL ACCESS

Local Access

Local access to this site is using E. Beaver Creek Drive. Adjacent to the proposed site, E. Beaver Creek Drive is an 18-foot two-lane road, currently classified a minor collector in the Knox County Major Road Plan. The 2002 average weekday traffic (AWT) traveling E. Beaver Creek Road is approximately 6,995. East Beaver Creek Drive intersects Dry Gap Pike to the east and Central Avenue Pike to the south. These two facilities are classified as major collectors with ADT's

SITE PLAN
E. Beaver Creek Residential

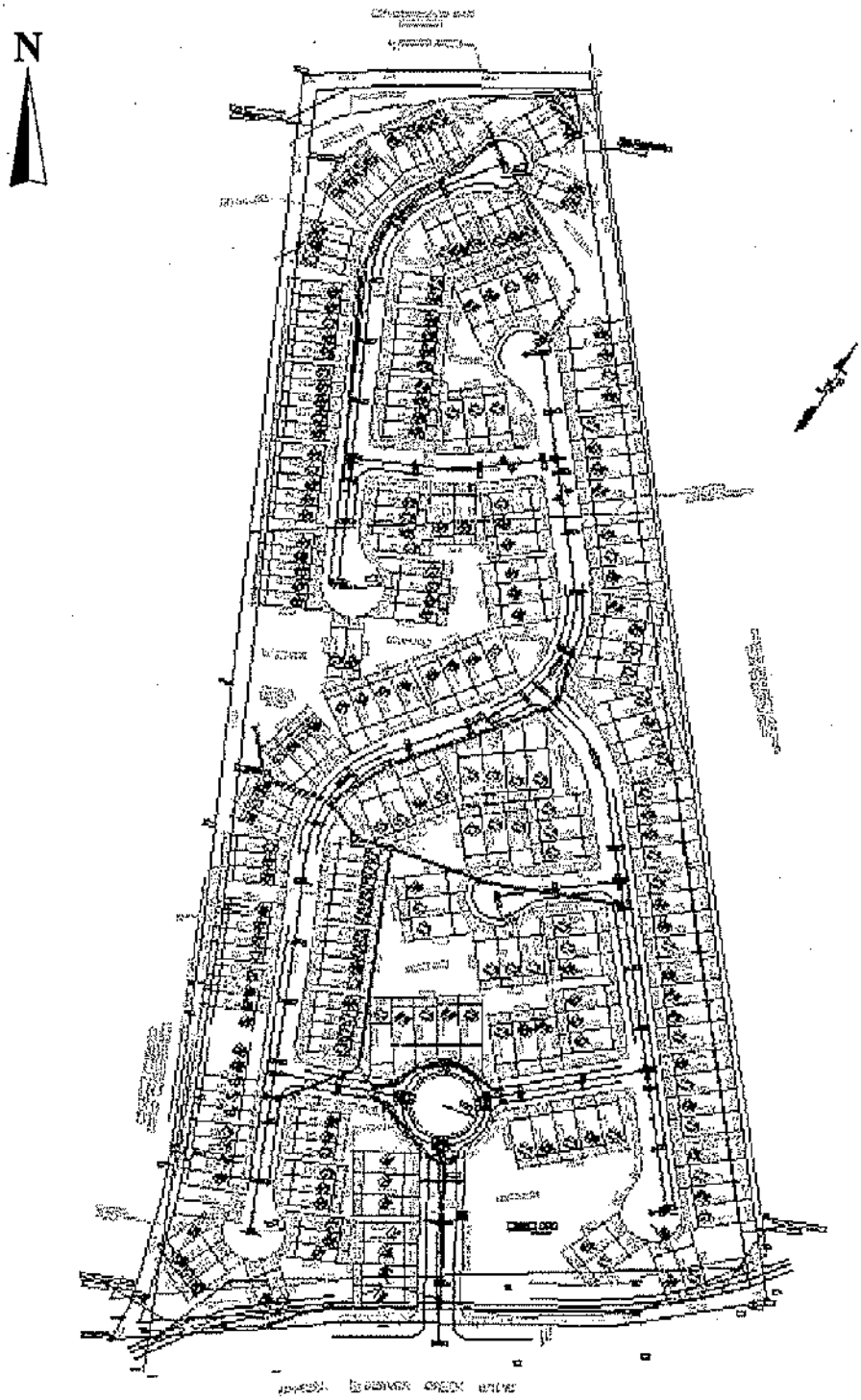

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Figure 1

VICINITY MAP

E. Beaver Creek Residential

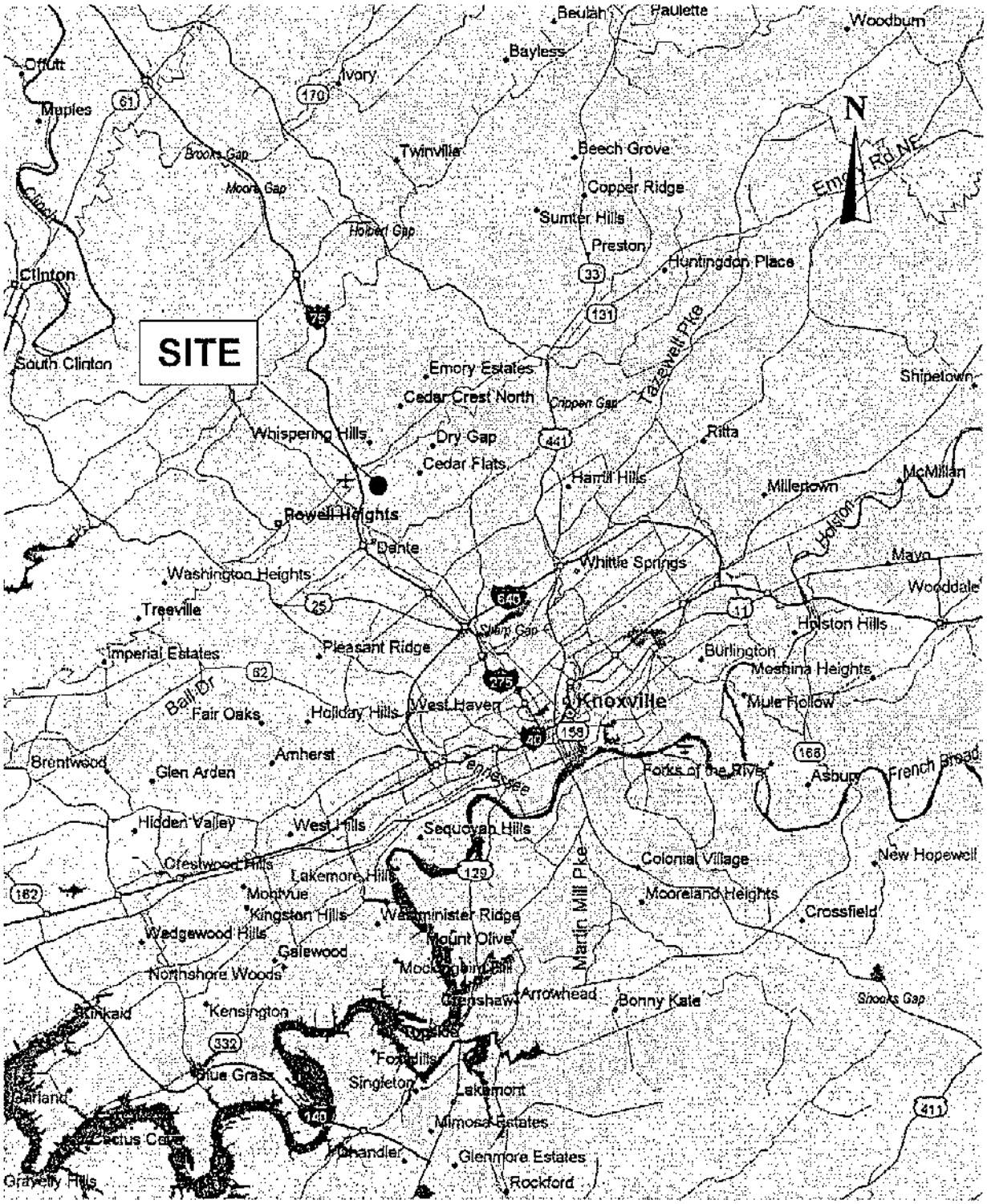

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Figure 2

of 4,580 and an estimated 6,530 for Dry Gap Pike and Central Avenue Pike, respectively. Central Avenue Pike extends north under I-75 and south intersecting Dante Road.

Regional Access

Dry Gap Pike intersects Emory Road (S.R. 131) to the north. Emory Road is currently a three-lane facility classified as a secondary state route and as a minor arterial in the Knox County Major Street and Road Plan. Its posted speed limit is 40mph. The 2000 ADT traveling this facility is 16,890. Extending northeast and southwest adjacent to the proposed development, Emory Road provides extensive access to primarily residential land use east of the project site and commercial land use to the west in North Knox County. The Tennessee Department of Transportation is currently constructing a five-lane urban section for Emory Road from I-75 to Dry Gap Pike.

Dante Road, south of the site, is an east and west facility. Dante Road is classified as a minor arterial and becomes Callahan Road east of I-75. Callahan Road extends east to Clinton Highway (U.S. 25 W.), and Dante Road extends west to Dry Gap Pike. Dante Road and Callahan Road have ADT's of 6,290 and 13,070, respectively.

Interstate access is provided by Interstate 75, extending north and south near the proposed project site. The 2000 ADT on Interstate 75, south of Emory Road, is approximately 48,630. This facility is designated as part of the federal interstate system intersecting Interstate 40 to the south, which is an east and west facility running through Knoxville. Interchanges are available from Emery Road, north of the site, and Dante Road, south of the site.

EXISTING TRAFFIC CONDITIONS

Existing Traffic Control

Currently traffic control within the study vicinity consists of a stop controlled intersections of E. Beaver Creek Drive at Dry Gap Pike and Central Avenue Pike.

Existing Traffic Volumes

This traffic impact study addresses the intersections of E. Beaver Creek Drive at Central Avenue Pike and the site access. A peak-hour turning-movement count was conducted for the intersection of E. Beaver Creek Drive and Central Avenue Pike. The peak-hours were identified from 7:30 to 8:30 and 4:30 to 5:30 for the AM and PM peaks, respectively. A 24-hour directional traffic count was also conducted on E. Beaver Creek Drive adjacent to the site. Adjacent to the site,

the average weekday traffic is counted at 6,995. Figure 3 illustrates the traffic volumes for the AM and PM peaks at the study intersections.

Signal Warrants for Existing Conditions

The intersection of E. Beaver Creek Drive and Central Avenue Pike was examined for traffic signal warrants. There are eight warrants published in the updated **Manual on Uniform Traffic Control Devices, 2000 Edition**. For prevailing speeds of 40mph or less, signal warrants were evaluated. Three traffic volume warrants were examined with the first having three separate criteria. Warrants include the Minimum Volume (Warrant 1A), Interruption to Continuous Traffic Flow (Warrant 1B), Combination (Warrant 1A & B), Four-hour (Warrant 2), and Peak-hour Volume (Warrant 3B). Each of these warrants examines the varying traffic volume conditions for E. Beaver Creek Drive and Central Avenue Pike. Any part of Warrant 1 must be met for a minimum of eight hours. Warrant 2 must be met for four hours, and one hour must be met for the Peak-Hour Warrant (Warrant 3B).

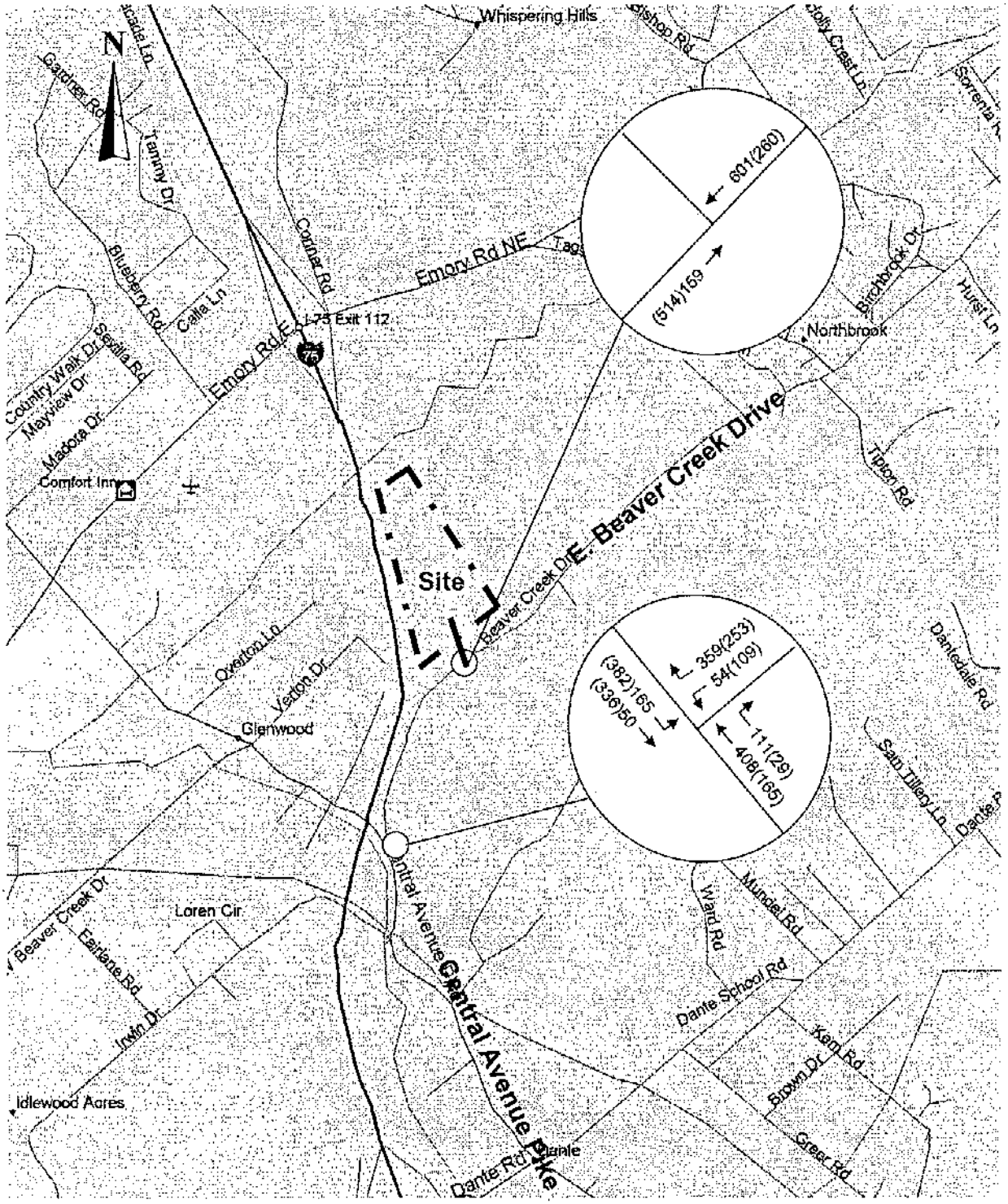
For existing conditions, a traffic signal is warranted. Minimum Volume is essentially met for 6 hours. Further analysis of hours not counted could possibly find additional hours meeting the Minimum Volume warrant. The Four-hour and Peak-hour warrants are fully satisfied. A signal design will require consideration of limited sight-distances. Plans may require near- and far-side auxiliary signal heads and possibly an advance signal-ahead flasher.

Existing Capacity and Level of Service

In order to evaluate the current operations of the traffic control devices, capacity and level of service were calculated using the **2000 Highway Capacity Manual, Special Report 209** published by the Transportation Research Board. Signalized and unsignalized intersections are evaluated based on estimated intersection delays, which may be related to level of service (LOS). Level of service and capacity are the measurements of an intersection's ability to accommodate traffic volumes. Levels of service for intersections range from A to F. A LOS of A is the best, and LOS F is failing.

For signalized intersections, a LOS of A has an average estimated intersection delay of less than 10 seconds, and LOS F has estimated delay of greater than 80 seconds. A LOS of C and D are typical design values. Within urban areas, a LOS D, delay between 35 and 55 seconds, is considered acceptable by the Institute of Transportation Engineers (ITE) for signalized intersections. Unsignalized intersection levels of service have lower thresholds of delays. A LOS

2002 EXISTING TRAFFIC
E. Beaver Creek Residential



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LEGEND

XXX AM PEAK

(XXX) PM PEAK

Figure 3

of F exceeds estimated delays of 45 seconds. For urban arterials, minor approaches mayfrequently experience levels of service E. A full level of service description for unsignalized and signalized intersections is presented in Tables 1 and 2, respectively.

TABLE-1

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

LOS	AVERAGE CONTROL DELAY PER VEHICLE (seconds)	DESCRIPTION
A	≤10.0	No conflicting traffic for the minor movement.
B	>10.0 and ≤15.0	
C	>15.0 and ≤25.0	
D	>25.0 and ≤35.0	
E	>35.0 and ≤50.0	
F	>50.0	

SOURCE: 2000 Highway Capacity Manual, TRB Special Report 209

TABLE-2

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

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

SOURCE: 2000 Highway Capacity Manual, TRB Special Report 209

Analyses were conducted using the Synchro Software, developed by Trafficware Synchro analyzes intersections for capacity and level of service. Table 3 presents the unsignalized and signalized analyses of the existing traffic conditions.

TABLE-3

2002 EXISTING LEVELS OF SERVICE

INTERSECTION		AM PEAK V/C	AM PEAK DELAY	AM PEAK LOS	PM PEAK V/C	PM PEAK DELAY	PM PEAK LOS
E. Beaver Creek &	WB-L/R[1]	-	53.3	F	-	240.9	F
Central Avenue Pike	SB-L[1]	-	7.6	A	-	6.3	A
	WB-L/R[1]	-	23.9/24.1[2]	C/C[2]	-	186.8/11.3[2]	F/B[2]
	SB-L[1]	-	9.3[2]	A[2]	-	8.8[2]	A[2]
	Signalized	0.64	5.8	A	0.89	15.5	B

Note: Average vehicle delay estimated in seconds
(1) Unsignalized intersection approach and movements.
(2) Separate left-turn lanes provided for unsignalized analyses.

The study intersection of E. Beaver Creek Road and Central Avenue Pike was determined to operate at an unacceptable level of service. The analyses assumes a single lane approach for E. Beaver Creek Drive because of the very limited storage provided for the right-turn lane. Due to traffic queues, the right-turn lane is inadequate. Additional unsignalized analyses were conducted with separate left-turn lanes provided for the intersection, resulting in reduced delays. Signalization of this intersection would result in LOS A and B for AM and PM peak hours, respectively.

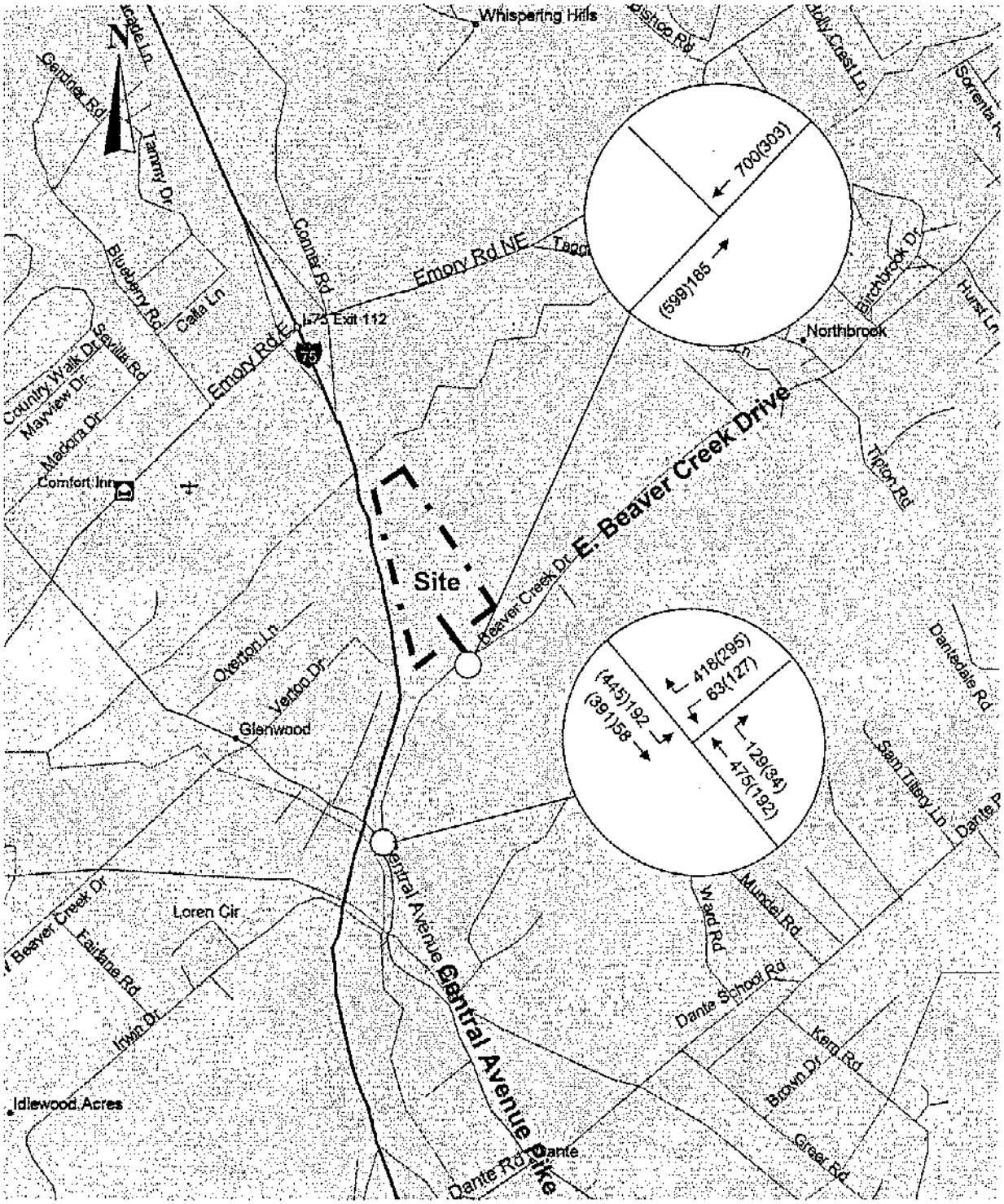
BACKGROUND TRAFFIC CONDITIONS

Background traffic is traffic that can be anticipated regardless of the proposed development. Traffic within the study area should continue to grow due to other developments and continued growth of Knox County. This traffic must be developed and analyzed for the purpose of establishing a baseline.

Background Traffic Volumes

Using the growth rate from historical traffic count data, an annual growth rate of 5.5 percent was estimated to project background traffic. For the purpose of this study, background traffic was projected for the year 2005. Completion of this development will depend largely upon market considerations; however, a three-year build-out seems reasonable. Figure 4 illustrates the resulting

2005 BACKGROUND TRAFFIC
E. Beaver Creek Residential



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LEGEND
XXX AM PEAK
(XXX) PM PEAK

Figure 4

2005 background traffic. This traffic is obtained growing existing traffic by a total of 16.5 percent

Background Signal Warrants

Another evaluation of the intersection of E. Beaver Creek Drive and Central Avenue Pike for signal warrants found that the two additional hours of the Minimum Volume warrant is essentially satisfied with traffic exceeding 90 percent of the required volume.

Background Capacity and Level of Service

Utilizing the projected background, unsignalized and signalized analyses were conducted for the AM and PM peak to determine the anticipated level of service prior to the proposed development.

TABLE-4

2005 BACKGROUND LEVELS OF SERVICE

INTERSECTION		AM PEAK V/C	AM PEAK DELAY	AM PEAK LOS	PM PEAK V/C	PM PEAK DELAY	PM PEAK LOS
E. Beaver Creek &	WB-L/R[1]	-	159.4	F	-	645.1	F
Central Avenue Pike	SB-L[1]	-	8.2	A	-	7.1	A
	WB-L/R[1]	-	34.1/46.1[2]	D/E[2]	-	555.4/12.3[2]	F/B[2]
	SB-L[1]	-	10.0[2]	A[2]	-	9.3[2]	A[2]
	Signalized	0.80	8.2	A	1.02	39.4	D

Note: Average vehicle delay estimated in seconds
(1) Unsignalized intersection approach and movements.
(2) Separate left-turn lanes provided for unsignalized analyses.

The resulting capacity and LOS analyses determined that the unsignalized delays continued to increase. Analyses with turn lanes did not result in acceptable LOS. Signalized analyses determined acceptable levels of service can be obtained; however, delays did significantly increase and LOS fell during the PM peak. The volume to capacity (V/C) ratio indicated that intersection capacity is exceeded, suggesting that additional intersection geometry is necessary to adequately accommodate the traffic volumes for critical movements.

DEVELOPMENT IMPACTS

Project conditions are developed by generating traffic based on the proposed land uses, distributing the trips to the transportation network, and conducting analyses for capacity and LOS.

Trip Generation

Project traffic for the single-family units was determined using the publication, **Trip Generation, 6th Edition**. The **Trip Generation** reference is published by the Institute of Transportation Engineers (ITE) and represents national data collected for many different land uses including industrial, residential, and commercial uses. **Trip Generation** is an essential tool in calculating the traffic, which may be generated by a proposed development. From the trip generation calculations, the proposed site may generate approximately 2,300 daily trips. Table 5 presents the trip generation of this proposed site.

TABLE-5

TRIP GENERATION

LAND USE	L.U.C.	Units	DAILY TRIPS	AM PEAK ENTER	AM PEAK EXIT	PM PEAK ENTER	PM PEAK EXIT
Single Family	210	238	2,302	44	132	150	84

Trip Distribution and Assignment

Using the count data and the character of the development, traffic was distributed to the street network. The 24-hour machine count conducted for E. Beaver Creek Drive suggests that approximately 30 percent of the residential trips will turn to the east and 70 percent to the west. To the south, trips were distributed with 55 and 15 percent to the north and south on Central Avenue Pike, respectively. Figures 5 illustrate this distribution and assignment.

Project Traffic Volumes

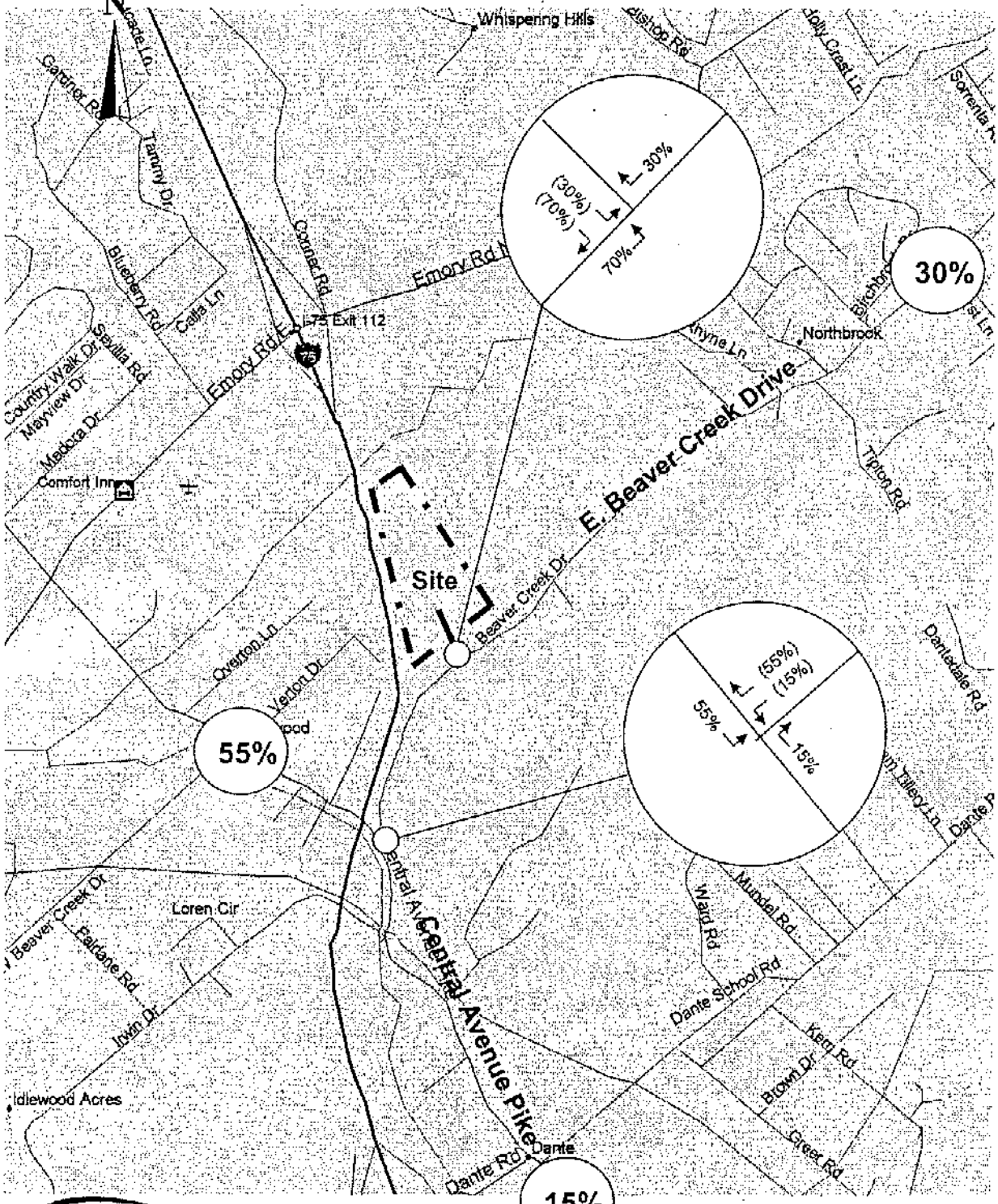
By multiplying the trips generated by the distribution percentages, the project traffic volumes were determined. Figure 6 illustrates the resulting project traffic volumes associated with the proposed project.

Total Projected Traffic Volumes

Background and project traffic volumes were added together to develop post-development traffic volumes for the year 2005. Figure 7 illustrates this 2005 projections. Using this projection, mitigation measures including traffic control devices and roadway and intersection geometry can be determined.

PRIMARY TRIP DISTRIBUTION AND ASSIGNMENT

E. Beaver Creek Residential



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LEGEND

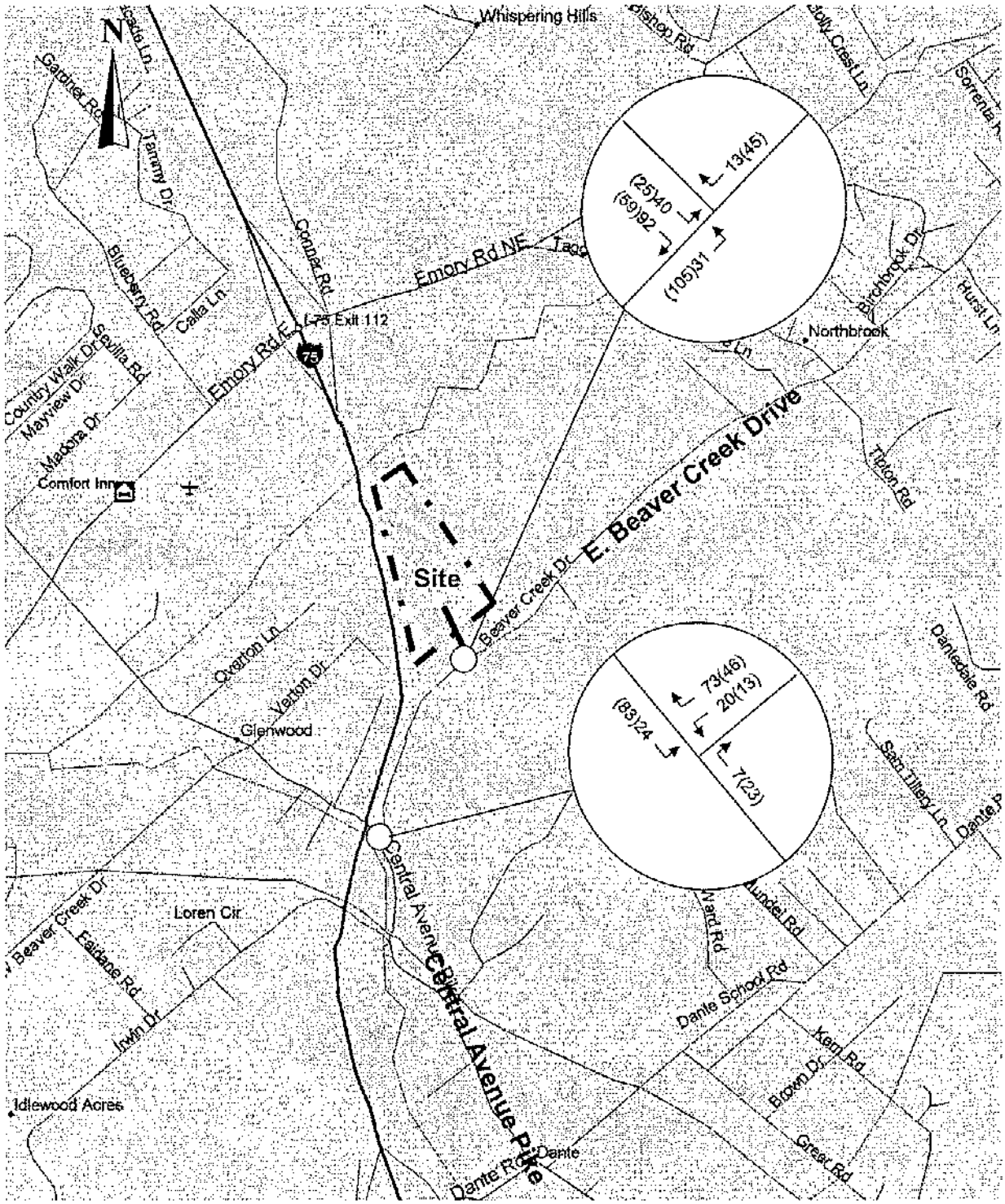
XXX ENTERINGTRIPS

(XXX) EXITING TRIPS

Figure 5

PROJECT TRIPS

E. Beaver Creek Residential



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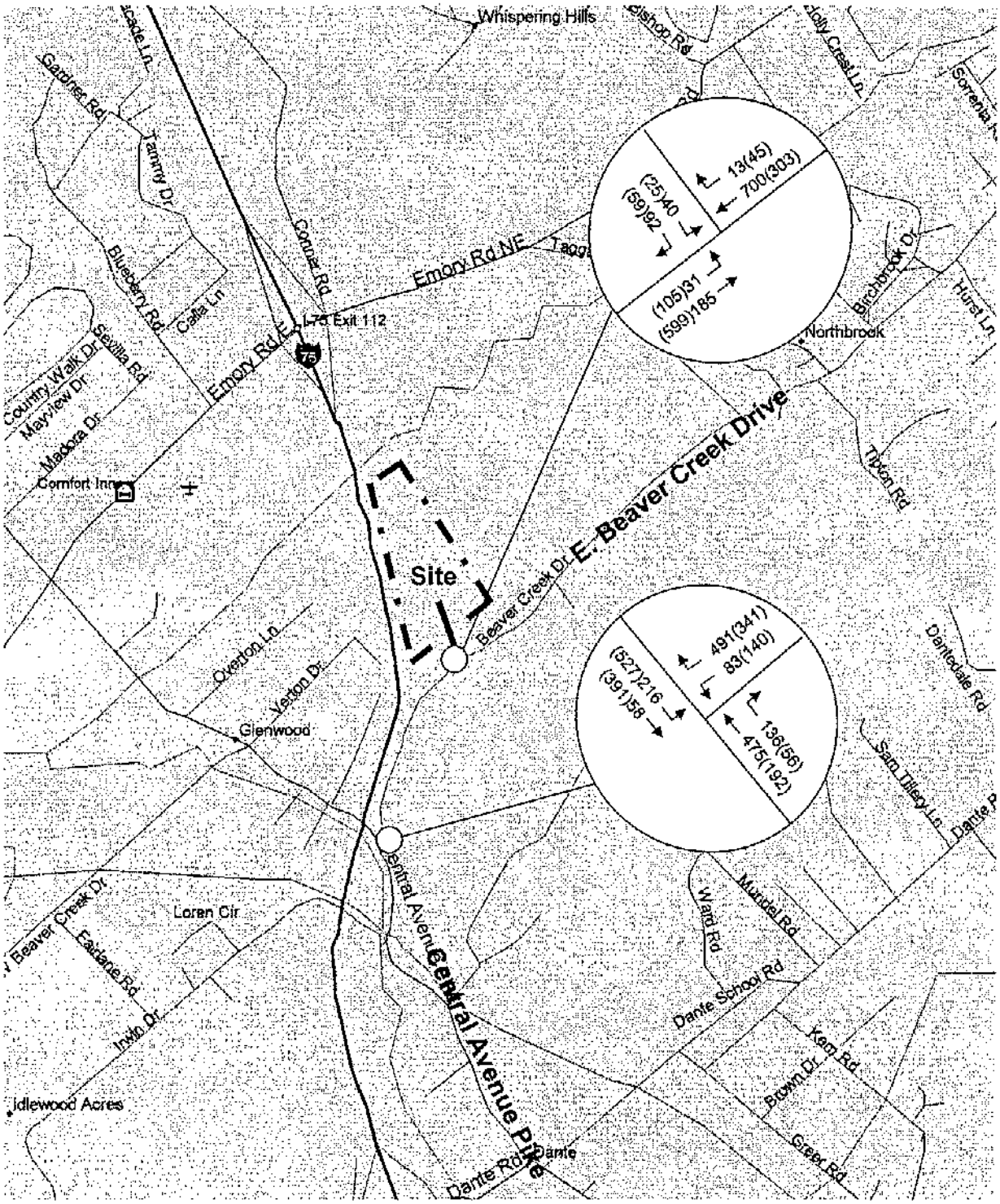
LEGEND

XXX AM PEAK

(XXX) PM PEAK

Figure 6

2005 PROJECTED TRAFFIC
E. Beaver Creek Residential



LEGEND
XXX AM PEAK
(XXX) PM PEAK

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Figure 7

be evaluated. The projected 2005 average weekday traffic (AWT) on E. Beaver Creek Drive may become approximately 8,840 to the east and 9,760 to the west.

Using the Knox County and AASHTO criteria for the requirement of left- and right-turn lanes, the resulting left-turning and right-turning volume on E. Beaver Creek Drive to the site access will require turn lanes.

Signal Warrant Analysis

Analysis of signal warrants for the intersection of E. Beaver Creek Drive and Central Avenue Pike determined that one additional hour of the Minimum Volume is fully satisfied. No additional warrants are met.

Projected Capacity and Level of Service

Analyses for the projected background plus project conditions were conducted. Tables 6 presents the results of the capacity and LOS analyses of the 2005 traffic conditions with the proposed development. Unsignalized conditions continue to have increasing estimated delays and unacceptable LOS. With signalization, delays do increase and LOS may be lowered to an E during the PM peak. The V/C ratio is increased to 1.15. In order to mitigate this ratio, the provision of left-tun lanes for Central Avenue Pike and E. Beaver Creek Drive were analyzed and found to result in very good level of service.

TABLE-6

2005 PROJECTED LEVELS OF SERVICE

INTERSECTION		AM PEAK V/C	AM PEAK DELAY	AM PEAK LOS	PM PEAK V/C	PM PEAK DELAY	PM PEAK LOS
E. Beaver Creek & Central Avenue Pike	WB-L/R[1]	-	299.4	F	-	>999	F
	SB-L[1]	-	8.6	A	-	8.2	A
	WB-L/R[1]	-	48.0/82.9[2]	E/F[2]	-	>999/13.3[2]	F/B[2]
	SB-L[1]	-	10.2[2]	B	-	10.0[2]	A[2]
	Signalized	0.89	14.2	B	1.15	76.4	E
	Signalized	0.83[3]	7.0[3]	A[3]	0.80[3]	9.4[3]	A[3]
E. Beaver Creek & Site Access	SB-L/R[1]	-	22.5/16.8	C/C	-	28.1/10.6	C
	EB-L[1]	-	1.7	A	-	2.4	A

Note: Average vehicle delay estimated in seconds
(1) Unsignalized intersection approach and movements.
(2) Separate left-turn lanes provided for unsignalized analyses.
(3) Separate left-turn lanes provided for signalized analyses.

Table 7 presents a summary of the capacity and LOS analyses conducted for this study. With signalization and improved geometry, the proposed development has a minimal impact on the intersection delays and LOS is A for the peak hours of the day for both background and background plus project traffic conditions.

Sight Distance

The project access is proposed along E. Beaver Creek Drive, with a roadway width of approximately 18 feet. The road's speed limit is currently posted for 40mph. Measured sight-distance to the southwest is approximately 350 feet and less than 200 feet to the east. The required distance is 305 feet to meet the minimum stopping sight-distance for American Association of State Highway and Transportation Officials (AASHTO) and 400 feet to meet the Knox County minimum corner sight-distance standard. The sight distances are restricted by horizontal geometry, trees, and other vegetation. The sight distance may be increase to the southwest with some clearance of the vegetation on the south side of the E. Beaver Creek Drive through the horizontal curve. The grading and clearing of the site should result with 400 feet of sight distance to the east. The proposed site access, therefore, should meet both criteria and should be acceptable for safe operations.

RECOMMENDATIONS

The analyses conducted and the review of the traffic volumes identified the following recommendations:

- Minimize landscaping, using low growing vegetation, and signing at the street access to insure that safe sight distance is maintained.
- Use a minimum intersection radius of 25-foot for the efficient and safe ingress and egress of the site.
- Provide separate left- and right-turn lanes for the site access.
- Provide a 100-foot left-turn and 50-foot right-turn lanes on E. Beaver Creek Drive at the site access street.
- Post the proposed street with a STOP sign (R1-1) at E. Beaver Creek Drive.
- Intersection design should conform to the recommended standards and practices of the

TABLE-7
CAPACITY AND LEVEL OF SERVICE
SUMMARY

INTERSECTION	PERIOD	2002 TRAFFIC V/C	2002 TRAFFIC DELAY	2002 TRAFFIC LOS	2005 BACKGROUND V/C	2005 BACKGROUND DELAY	2005 BACKGROUND LOS	2005 PROJECTED V/C	2005 PROJECTED DELAY	2005 PROJECTED LOS
E. Beaver Creek Dr. & Central Avenue Pike	AM	-	53.3	F*	-	159.4	F*	-	299.4	F*
	PM	-	240.9	F*	-	645.1	F*	-	>999	F*
	AM	*0.64*	*5.8*	*A*	*0.80*	*8.2*	*A*	*0.89*	*14.0*	*B*
	PM	*0.89*	*15.5*	*B*	*1.02*	*39.4*	*D*	*1.15*	*76.4*	*E*
E. Beaver Creek Dr. & Central Avenue Pike with improved geometry	AM	-	24.1	C*	-	44.5	E*	-	77.8	F*
	PM	-	64.1	F*	-	175.7	F*	-	2919.8	F*
	AM	*0.60*	*5.3*	*A*	*0.69*	*6.6*	*A*	*0.83*	*7.0*	*A*
	PM	*0.56*	*5.5*	*A*	*0.71*	*6.3*	*A*	*0.80*	*9.4*	*A*
Site Access & E. Beaver Creek Dr.	AM	-	-	-	-	-	-	-	18.5	C*
	PM	-	-	-	-	-	-	-	15.8	C*

* Minor Street Approach Level of Service

NOTE: Average vehicle delay estimated in seconds
Unsignalized Analysis / *Signalized Analysis.*

American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and the City of Knoxville Public Works Department.

- Provide signalization and left-turn lanes for the intersection of E. Beaver Creek Drive and Central Avenue Pike. Left-turn storage on E. Beaver Creek should be approximately 250 feet and approximately 500 feet on Central Avenue Pike. The signal design must consider any sight-distance limitations.

CONCLUSION

The study of this proposed residential development evaluated existing, background, and project traffic conditions. Background traffic was determined using a 5.5 percent annual growth rate until the year 2005. Traffic associated with the proposed project was then generated and distributed to the existing transportation system. Using the identified turning movements for the existing and projected traffic conditions, unsignalized and signalized capacity and level of service analyses were conducted using the **2000 Highway Capacity Manual**. Capacities and delays, for the intersection of E. Beaver Creek Drive and Central Avenue Pike were found to be unacceptable with and without the proposed project. Signalization of the intersection should be considered. The signalization of the intersection will require the addition of left-turn lanes. With signalization and improved geometry, the proposed development would have a minimal impact on the intersection's delay and resulting LOS.

The proposed development will require left- and right-turn lanes on E. Beaver Creek Drive at the site access street. Resulting access LOS is C. With the recommendations of this report, the efficient and safe flow of traffic should be provided.

APPENDIX

TRIP GENERATION
CAPACITY AND LOS ANALYSES
SIGNAL WARRANT EVALUATIONS
TRAFFIC COUNTS

TRIP GENERATION

14-Dec-01

			AVERAGE						
			DAILY	AM PEAK			PM PEAK		
LAND USE	L.U.C.	SIZE	TRAFFIC	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
SINGLE FAMILY	210.00	238	2,278	45	134	179	154	87	240
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			2,278	45	134	179	154	87	240

			REGRESSION						
			DAILY	AM PEAK			PM PEAK		
LAND USE	L.U.C.	SIZE	TRAFFIC	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
SINGLE FAMILY	210.00	238	2,302	44	132	176	150	84	235
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			0	0	0	0	0	0	0
			2,302	44	132	176	150	84	235

			SATURDAY				SUNDAY			
			DAILY	PEAK			DAILY	PEAK		
LAND USE	L.U.C.	SIZE	TRAFFIC	ENTER	EXIT	TOTAL	TRAFFIC	ENTER	EXIT	TOTAL
SINGLE FAMILY	210.00	238	2,401	121	103	224	2,090	102	102	205
0.00	0.00	0	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0	0
0.00	0.00	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0
			2,401	121	103	224	2,090	102	102	205

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	54	359	408	111	165	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	59	390	443	121	179	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	917	504			564	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	31			82	
cM capacity (veh/h)	248	568			1007	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	449	564	234
Volume Left	59	0	179
Volume Right	390	121	0
cSH	486	1700	1007
Volume to Capacity	0.92	0.33	0.18
Queue Length (ft)	271	0	16
Control Delay (s)	53.3	0.0	7.6
Lane LOS	F		A
Approach Delay (s)	53.3	0.0	7.6
Approach LOS	F		

Intersection Summary			
Average Delay	20.6		
Intersection Capacity Utilization	80.8%	ICU Level of Service	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	601	0	0	159
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	0	0	653	0	0	173
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	826	653			653	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	342	467			934	

Direction, Lane #	NB 1	SB 1
Volume Total	653	173
Volume Left	0	0
Volume Right	0	0
cSH	1700	1700
Volume to Capacity	0.38	0.10
Queue Length (ft)	0	0
Control Delay (s)	0.0	0.0
Lane LOS		
Approach Delay (s)	0.0	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	109	253	165	29	382	336
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	118	275	179	32	415	365
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1391	195			211	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	68			69	
cM capacity (veh/h)	109	846			1360	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	393	211	780
Volume Left	118	0	415
Volume Right	275	32	0
cSH	278	1700	1360
Volume to Capacity	1.41	0.12	0.31
Queue Length (ft)	533	0	33
Control Delay (s)	240.9	0.0	6.3
Lane LOS	F		A
Approach Delay (s)	240.9	0.0	6.3
Approach LOS	F		

Intersection Summary			
Average Delay	72.0		
Intersection Capacity Utilization	87.0%	ICU Level of Service	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	260	0	0	514
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	0	0	283	0	0	559
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	841	283			283	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	335	756			1280	

Direction, Lane #	NB 1	SB 1
Volume Total	283	559
Volume Left	0	0
Volume Right	0	0
cSH	1700	1700
Volume to Capacity	0.17	0.33
Queue Length (ft)	0	0
Control Delay (s)	0.0	0.0
Lane LOS		
Approach Delay (s)	0.0	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	32.7%	ICU Level of Service	A

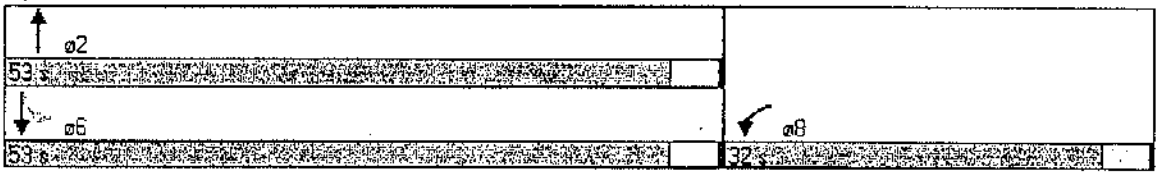
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50		50	50
Trailing Detector (ft)	0		0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.883		0.971			
Flt Protected	0.993					0.963
Satd. Flow (prot)	1633	0	1809	0	0	1794
Flt Permitted	0.993					0.390
Satd. Flow (perm)	1633	0	1809	0	0	726
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	390		27			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	54	359	408	111	165	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	390	443	121	179	54
Lane Group Flow (vph)	449	0	564	0	0	233
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phases	8		2		6	6
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	32.0	0.0	53.0	0.0	53.0	53.0
Total Split (%)	38%	0%	62%	0%	62%	62%
Maximum Green (s)	28.0		49.0		49.0	49.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	5.0		5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	9.1		18.4			18.4
Actuated g/C Ratio	0.25		0.50			0.50
v/c Ratio	0.64		0.61			0.64
Uniform Delay, d1	13.4		5.6			6.0
Delay	13.6		6.5			8.0
LOS	A		A			A
Approach Delay	13.6		6.5			8.0
Approach LOS	A		A			A
90th %ile Green (s)	19.3		38.7		38.7	38.7

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Gap		Hold		Gap	Gap
70th %ile Green (s)	10.3		20.9		20.9	20.9
70th %ile Term Code	Gap		Hold		Gap	Gap
50th %ile Green (s)	6.7		13.8		13.8	13.8
50th %ile Term Code	Gap		Hold		Gap	Gap
30th %ile Green (s)	5.5		10.4		10.4	10.4
30th %ile Term Code	Gap		Gap		Hold	Hold
10th %ile Green (s)	5.5		11.9		11.9	11.9
10th %ile Term Code	Gap		Dwell		Dwell	Dwell
Stops (vph)	80		241			133
Fuel Used(gal)	10		8			6
CO Emmisions (g/hr)	714		586			387
NOx Emmisions (g/hr)	139		114			75
VOC Emmisions (g/hr)	165		136			90
Dilemma Vehicles (#)	0		0			0
Queue Length 50th (ft)	7		33			21
Queue Length 95th (ft)	87		166			116
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 36.6
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 5.8 Intersection LOS: A
Intersection Capacity Utilization 80.8% ICU Level of Service D
90th %ile Actuated Cycle: 66
70th %ile Actuated Cycle: 39.2
50th %ile Actuated Cycle: 28.5
30th %ile Actuated Cycle: 23.9
10th %ile Actuated Cycle: 25.4

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



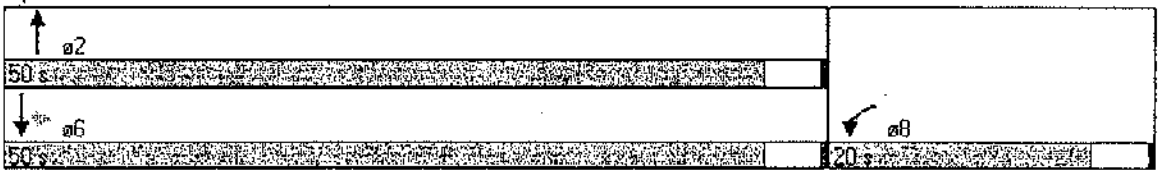
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50		50	50
Trailing Detector (ft)	0		0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.906		0.980			
Flt Protected	0.985					0.974
Satd. Flow (prot)	1662	0	1825	0	0	1814
Flt Permitted	0.985					0.724
Satd. Flow (perm)	1662	0	1825	0	0	1349
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	155		27			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	109	253	165	29	382	336
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	275	179	32	415	365
Lane Group Flow (vph)	393	0	211	0	0	780
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phases	8		2		6	6
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	20.0	0.0	50.0	0.0	50.0	50.0
Total Split (%)	29%	0%	71%	0%	71%	71%
Maximum Green (s)	16.0		46.0		46.0	46.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	5.0		5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	12.8		38.9			38.9
Actuated g/C Ratio	0.21		0.65			0.65
v/c Ratio	0.83		0.18			0.89
Uniform Delay, d1	13.2		3.5			8.6
Delay	19.7		4.0			16.5
LOS	B		A			B
Approach Delay	19.7		4.0			16.5
Approach LOS	B		A			B
90th %ile Green (s)	16.0		46.0		46.0	46.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max		Hold		Max	Max
70th %ile Green (s)	16.0		46.0		46.0	46.0
70th %ile Term Code	Max		Hold		Max	Max
50th %ile Green (s)	16.0		46.0		46.0	46.0
50th %ile Term Code	Max		Hold		Max	Max
30th %ile Green (s)	11.3		32.6		32.6	32.6
30th %ile Term Code	Gap		Hold		Gap	Gap
10th %ile Green (s)	6.3		24.8		24.8	24.8
10th %ile Term Code	Gap		Dwell		Dwell	Dwell
Stops (vph)	204		59			548
Fuel Used(gal)	11		3			20
CO Emmisions (g/hr)	760		200			1426
NOx Emmisions (g/hr)	148		39			277
VOC Emmisions (g/hr)	176		46			331
Dilemma Vehicles (#)	0		0			0
Queue Length 50th (ft)	96		0			232
Queue Length 95th (ft)	#232		42			#509
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 60.2
Natural Cycle: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 15.5 Intersection LOS: B
Intersection Capacity Utilization 87.0% ICU Level of Service D
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 70
50th %ile Actuated Cycle: 70
30th %ile Actuated Cycle: 51.9
10th %ile Actuated Cycle: 39.1
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



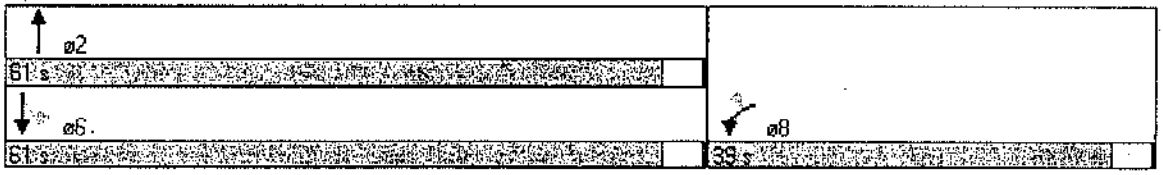
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.971			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1809	0	1770	1863
Flt Permitted	0.950				0.329	
Satd. Flow (perm)	1770	1583	1809	0	613	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		390	23			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	54	359	408	111	165	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	390	443	121	179	54
Lane Group Flow (vph)	59	390	564	0	179	54
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phases	8	8	2		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	39.0	39.0	61.0	0.0	61.0	61.0
Total Split (%)	39%	39%	61%	0%	61%	61%
Maximum Green (s)	35.0	35.0	57.0		57.0	57.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	7.9	7.9	17.7		17.7	17.7
Actuated g/C Ratio	0.23	0.23	0.51		0.51	0.51
v/c Ratio	0.14	0.59	0.60		0.57	0.06
Uniform Delay, d1	10.1	0.0	5.2		5.3	3.9
Delay	12.7	2.5	5.9		7.0	4.4
LOS	B	A	A		A	A
Approach Delay	3.9		5.9			6.4
Approach LOS	A		A			A
90th %ile Green (s)	15.1	15.1	34.3		34.3	34.3

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Gap	Gap	Hold		Gap	Gap
70th %ile Green (s)	8.0	8.0	18.4		18.4	18.4
70th %ile Term Code	Gap	Gap	Hold		Gap	Gap
50th %ile Green (s)	6.3	6.3	12.9		12.9	12.9
50th %ile Term Code	Gap	Gap	Gap		Hold	Hold
30th %ile Green (s)	5.7	5.7	10.5		10.5	10.5
30th %ile Term Code	Gap	Gap	Gap		Hold	Hold
10th %ile Green (s)	5.5	5.5	15.5		15.5	15.5
10th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
Stops (vph)	39	49	236		99	20
Fuel Used(gal)	2	9	8		4	1
CO Emmisions (g/hr)	111	607	580		295	84
NOx Emmisions (g/hr)	22	118	113		57	16
VOC Emmisions (g/hr)	26	141	134		68	19
Dilemma Vehicles (#)	0	0	0		0	0
Queue Length 50th (ft)	6	0	31		15	3
Queue Length 95th (ft)	39	55	136		79	17
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 34.4
Natural Cycle: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 5.3 Intersection LOS: A
Intersection Capacity Utilization 61.5% ICU Level of Service B
90th %ile Actuated Cycle: 57.4
70th %ile Actuated Cycle: 34.4
50th %ile Actuated Cycle: 27.2
30th %ile Actuated Cycle: 24.2
10th %ile Actuated Cycle: 29

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



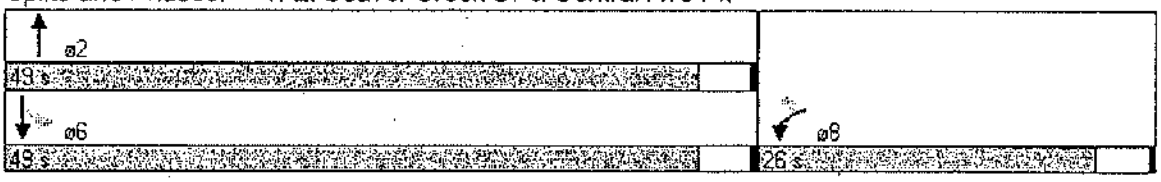
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.980			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1825	0	1770	1863
Flt Permitted	0.950				0.626	
Satd. Flow (perm)	1770	1583	1825	0	1166	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		275	21			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	109	253	165	29	382	336
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	118	275	179	32	415	365
Lane Group Flow (vph)	118	275	211	0	415	365
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phases	8	8	2		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	26.0	26.0	49.0	0.0	49.0	49.0
Total Split (%)	35%	35%	65%	0%	65%	65%
Maximum Green (s)	22.0	22.0	45.0		45.0	45.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	8.6	8.6	25.3		25.3	25.3
Actuated g/C Ratio	0.21	0.21	0.64		0.64	0.64
v/c Ratio	0.32	0.51	0.18		0.56	0.31
Uniform Delay, d1	14.2	0.0	3.0		4.6	3.7
Delay	14.7	3.2	3.9		6.1	4.6
LOS	B	A	A		A	A
Approach Delay	6.7		3.9			5.4
Approach LOS	A		A			A
90th %ile Green (s)	13.2	13.2	37.5		37.5	37.5

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Gap	Gap	Hold		Gap	Gap
70th %ile Green (s)	9.1	9.1	23.0		23.0	23.0
70th %ile Term Code	Gap	Gap	Hold		Gap	Gap
50th %ile Green (s)	7.4	7.4	16.3		16.3	16.3
50th %ile Term Code	Gap	Gap	Hold		Gap	Gap
30th %ile Green (s)	6.3	6.3	12.4		12.4	12.4
30th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
10th %ile Green (s)	0.0	0.0	37.1		37.1	37.1
10th %ile Term Code	Skip	Skip	Dwell		Dwell	Dwell
Stops (vph)	82	40	67		213	140
Fuel Used(gal)	3	6	3		10	8
CO Emmisions (g/hr)	229	432	203		672	565
NOx Emmisions (g/hr)	45	84	39		131	110
VOC Emmisions (g/hr)	53	100	47		156	131
Dilemma Vehicles (#)	0	0	0		0	0
Queue Length 50th (ft)	16	0	0		42	30
Queue Length 95th (ft)	73	51	37		135	82
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 39.7
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 5.5 Intersection LOS: A
Intersection Capacity Utilization 50.9% ICU Level of Service A
90th %ile Actuated Cycle: 58.7
70th %ile Actuated Cycle: 40.1
50th %ile Actuated Cycle: 31.7
30th %ile Actuated Cycle: 26.7
10th %ile Actuated Cycle: 41.1

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	63	418	475	129	192	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	68	454	516	140	209	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1067	586			657	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	11			78	
cM capacity (veh/h)	191	510			931	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	523	657	272
Volume Left	68	0	209
Volume Right	454	140	0
cSH	418	1700	931
Volume to Capacity	1.25	0.39	0.22
Queue Length (ft)	550	0	21
Control Delay (s)	159.4	0.0	8.2
Lane LOS	F		A
Approach Delay (s)	159.4	0.0	8.2
Approach LOS	F		

Intersection Summary			
Average Delay	59.0		
Intersection Capacity Utilization	92.4%	ICU Level of Service	E

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	700	0	0	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	0	0	761	0	0	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	962	761			761	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	284	405			851	

Direction, Lane #	NB 1	SB 1
Volume Total	761	201
Volume Left	0	0
Volume Right	0	0
cSH	1700	1700
Volume to Capacity	0.45	0.12
Queue Length (ft)	0	0
Control Delay (s)	0.0	0.0
Lane LOS		
Approach Delay (s)	0.0	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	127	295	192	34	445	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	138	321	209	37	484	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1620	227			246	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	61			63	
cM capacity (veh/h)	72	812			1320	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	459	246	909
Volume Left	138	0	484
Volume Right	321	37	0
cSH	198	1700	1320
Volume to Capacity	2.31	0.14	0.37
Queue Length (ft)	930	0	43
Control Delay (s)	645.1	0.0	7.1
Lane LOS	F		A
Approach Delay (s)	645.1	0.0	7.1
Approach LOS	F		

Intersection Summary			
Average Delay	187.4		
Intersection Capacity Utilization	99.7%	ICU Level of Service	E

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑			↑
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	303	0	0	599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	0	0	329	0	0	651
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	980	329			329	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	277	712			1230	

Direction, Lane #	NB 1	SB 1
Volume Total	329	651
Volume Left	0	0
Volume Right	0	0
cSH	1700	1700
Volume to Capacity	0.19	0.38
Queue Length (ft)	0	0
Control Delay (s)	0.0	0.0
Lane LOS		
Approach Delay (s)	0.0	0.0
Approach LOS		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	37.6%	ICU Level of Service	A

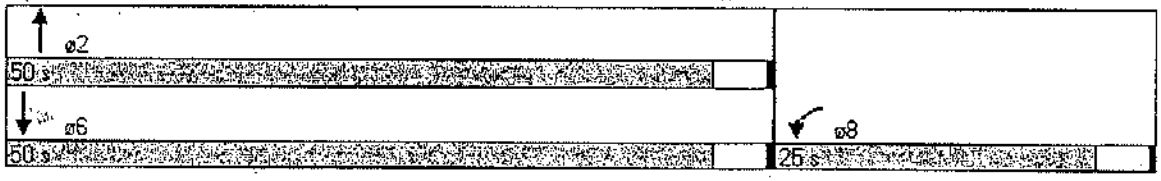
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50		50	50
Trailing Detector (ft)	0		0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.883		0.971			
Flt Protected	0.994					0.963
Satd. Flow (prot)	1635	0	1809	0	0	1794
Flt Permitted	0.994					0.344
Satd. Flow (perm)	1635	0	1809	0	0	641
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	368		34			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	63	418	475	129	192	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	454	516	140	209	63
Lane Group Flow (vph)	522	0	656	0	0	272
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phases	8		2		6	6
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	25.0	0.0	50.0	0.0	50.0	50.0
Total Split (%)	33%	0%	67%	0%	67%	67%
Maximum Green (s)	21.0		46.0		46.0	46.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	5.0		5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	11.8		24.7			24.7
Actuated g/C Ratio	0.25		0.53			0.53
v/c Ratio	0.76		0.67			0.80
Uniform Delay, d1	4.0		6.4			7.6
Delay	6.9		7.4			12.5
LOS	A		A			B
Approach Delay	6.9		7.4			12.5
Approach LOS	A		A			B
90th %ile Green (s)	21.0		46.0		46.0	46.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max		Hold		Max	Max
70th %ile Green (s)	18.2		39.0		39.0	39.0
70th %ile Term Code	Gap		Hold		Gap	Gap
50th %ile Green (s)	10.1		22.1		22.1	22.1
50th %ile Term Code	Gap		Hold		Gap	Gap
30th %ile Green (s)	6.3		13.6		13.6	13.6
30th %ile Term Code	Gap		Hold		Gap	Gap
10th %ile Green (s)	5.5		9.8		9.8	9.8
10th %ile Term Code	Gap		Dwell		Dwell	Dwell
Stops (vph)	147		296			174
Fuel Used(gal)	12		10			7
CO Emmisions (g/hr)	873		696			476
NOx Emmisions (g/hr)	170		135			93
VOC Emmisions (g/hr)	202		161			110
Dilemma Vehicles (#)	0		0			0
Queue Length 50th (ft)	28		64			40
Queue Length 95th (ft)	170		219			#215
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 46.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 8.2 Intersection LOS: A
Intersection Capacity Utilization 92.4% ICU Level of Service E
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 65.2
50th %ile Actuated Cycle: 40.2
30th %ile Actuated Cycle: 27.9
10th %ile Actuated Cycle: 23.3
#: 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



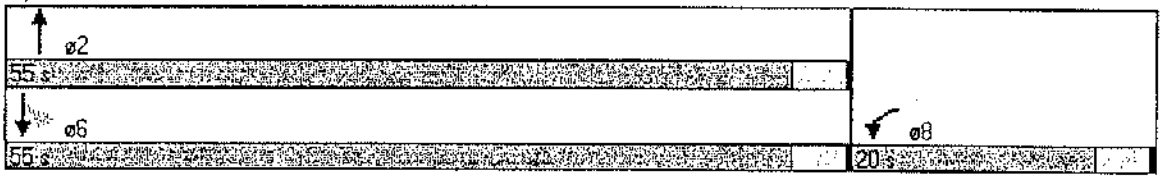
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50		50	50
Trailing Detector (ft)	0		0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.906		0.980			
Flt Protected	0.985					0.974
Satd. Flow (prot)	1662	0	1825	0	0	1814
Flt Permitted	0.985					0.706
Satd. Flow (perm)	1662	0	1825	0	0	1315
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	142		27			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	127	295	192	34	445	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	321	209	37	484	425
Lane Group Flow (vph)	459	0	246	0	0	909
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phases	8		2		6	6
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	20.0	0.0	55.0	0.0	55.0	55.0
Total Split (%)	27%	0%	73%	0%	73%	73%
Maximum Green (s)	16.0		51.0		51.0	51.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	5.0		5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	16.0		51.0			51.0
Actuated g/C Ratio	0.21		0.68			0.68
v/c Ratio	0.98		0.20			1.02
Uniform Delay, d1	20.2		3.9			12.0
Delay	52.0		4.0			42.7
LOS	D		A			D
Approach Delay	52.0		4.0			42.7
Approach LOS	D		A			D
90th %ile Green (s)	16.0		51.0		51.0	51.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max		Hold		Max	Max
70th %ile Green (s)	16.0		51.0		51.0	51.0
70th %ile Term Code	Max		Hold		Max	Max
50th %ile Green (s)	16.0		51.0		51.0	51.0
50th %ile Term Code	Max		Hold		Max	Max
30th %ile Green (s)	16.0		51.0		51.0	51.0
30th %ile Term Code	Max		Hold		Max	Max
10th %ile Green (s)	16.0		51.1		51.1	51.1
10th %ile Term Code	Max		Dwell		Dwell	Dwell
Stops (vph)	404		65			910
Fuel Used(gal)	16		3			30
CO Emmisions (g/hr)	1144		232			2077
NOx Emmisions (g/hr)	223		45			404
VOC Emmisions (g/hr)	265		54			481
Dilemma Vehicles (#)	0		0			0
Queue Length 50th (ft)	153		27			~389
Queue Length 95th (ft)	#341		48			#672
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 39.4 Intersection LOS: D
Intersection Capacity Utilization 99.7% ICU Level of Service E
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 75
50th %ile Actuated Cycle: 75
30th %ile Actuated Cycle: 75
10th %ile Actuated Cycle: 75.1
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



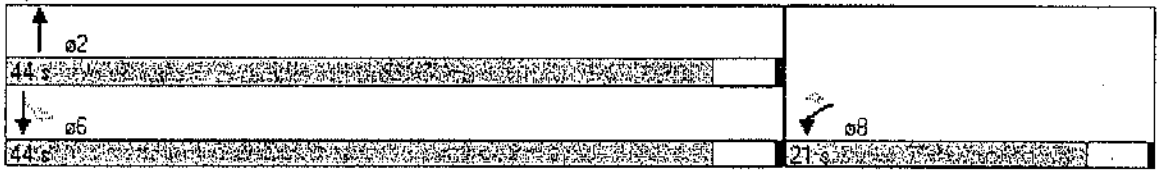
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.971			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1809	0	1770	1863
Flt Permitted	0.950				0.308	
Satd. Flow (perm)	1770	1583	1809	0	574	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		369	39			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	63	418	475	129	192	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	454	516	140	209	63
Lane Group Flow (vph)	68	454	656	0	209	63
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phases	8	8	2		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	21.0	21.0	44.0	0.0	44.0	44.0
Total Split (%)	32%	32%	68%	0%	68%	68%
Maximum Green (s)	17.0	17.0	40.0		40.0	40.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	9.5	9.5	20.6		20.6	20.6
Actuated g/C Ratio	0.24	0.24	0.52		0.52	0.52
v/c Ratio	0.16	0.68	0.68		0.69	0.06
Uniform Delay, d1	11.1	2.2	5.8		6.3	4.2
Delay	14.7	4.7	6.6		8.7	4.8
LOS	B	A	A		A	A
Approach Delay	6.0		6.6			7.8
Approach LOS	A		A			A
90th %ile Green (s)	17.0	17.0	40.0		40.0	40.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max	Max	Hold		Max	Max
70th %ile Green (s)	13.2	13.2	27.1		27.1	27.1
70th %ile Term Code	Gap	Gap	Hold		Gap	Gap
50th %ile Green (s)	7.5	7.5	16.1		16.1	16.1
50th %ile Term Code	Gap	Gap	Gap		Hold	Hold
30th %ile Green (s)	5.8	5.8	11.7		11.7	11.7
30th %ile Term Code	Gap	Gap	Gap		Hold	Hold
10th %ile Green (s)	5.5	5.5	12.4		12.4	12.4
10th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
Stops (vph)	45	99	296		130	23
Fuel Used(gal)	2	11	10		5	1
CO Emmisions (g/hr)	132	736	689		354	97
NOx Emmisions (g/hr)	26	143	134		69	19
VOC Emmisions (g/hr)	30	170	160		82	23
Dilemma Vehicles (#)	0	0	0		0	0
Queue Length 50th (ft)	9	11	46		22	4
Queue Length 95th (ft)	49	109	182		116	21
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 65
Actuated Cycle Length: 39.3
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 6.6 Intersection LOS: A
Intersection Capacity Utilization 70.5% ICU Level of Service C
90th %ile Actuated Cycle: 65
70th %ile Actuated Cycle: 48.3
50th %ile Actuated Cycle: 31.6
30th %ile Actuated Cycle: 25.5
10th %ile Actuated Cycle: 25.9

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



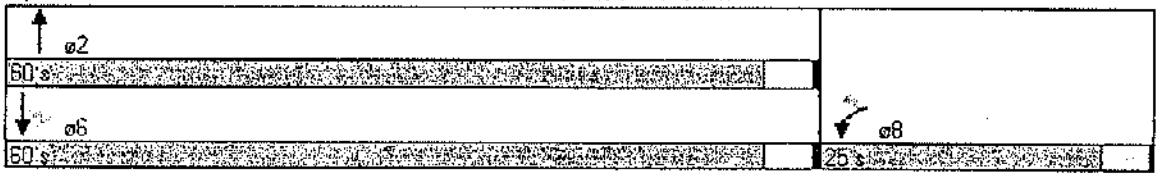
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.980			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1825	0	1770	1863
Flt Permitted	0.950				0.600	
Satd. Flow (perm)	1770	1583	1825	0	1118	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		321	22			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	127	295	192	34	445	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	138	321	209	37	484	425
Lane Group Flow (vph)	138	321	246	0	484	425
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phases	8	8	2		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	25.0	25.0	60.0	0.0	60.0	60.0
Total Split (%)	29%	29%	71%	0%	71%	71%
Maximum Green (s)	21.0	21.0	56.0		56.0	56.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	9.4	9.4	28.2		28.2	28.2
Actuated g/C Ratio	0.20	0.20	0.61		0.61	0.61
v/c Ratio	0.39	0.56	0.22		0.71	0.38
Uniform Delay, d1	15.6	0.0	3.4		5.8	4.3
Delay	19.1	3.6	3.8		7.0	4.7
LOS	B	A	A		A	A
Approach Delay	8.3		3.8			5.9
Approach LOS	A		A			A
90th %ile Green (s)	16.1	16.1	51.7		51.7	51.7

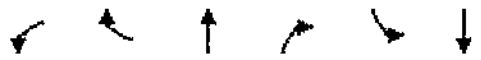
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Gap	Gap	Hold		Gap	Gap
70th %ile Green (s)	10.6	10.6	31.4		31.4	31.4
70th %ile Term Code	Gap	Gap	Hold		Gap	Gap
50th %ile Green (s)	8.2	8.2	21.9		21.9	21.9
50th %ile Term Code	Gap	Gap	Hold		Gap	Gap
30th %ile Green (s)	6.7	6.7	15.1		15.1	15.1
30th %ile Term Code	Gap	Gap	Hold		Gap	Gap
10th %ile Green (s)	5.5	5.5	24.6		24.6	24.6
10th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
Stops (vph)	97	40	77		267	161
Fuel Used(gal)	4	7	3		11	9
CO Emmisions (g/hr)	275	503	236		796	658
NOx Emmisions (g/hr)	54	98	46		155	128
VOC Emmisions (g/hr)	64	117	55		184	152
Dilemma Vehicles (#)	0	0	0		0	0
Queue Length 50th (ft)	25	0	0		61	39
Queue Length 95th (ft)	106	62	49		203	109
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 46.4
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 6.3 Intersection LOS: A
Intersection Capacity Utilization 57.7% ICU Level of Service A
90th %ile Actuated Cycle: 75.8
70th %ile Actuated Cycle: 50
50th %ile Actuated Cycle: 38.1
30th %ile Actuated Cycle: 29.8
10th %ile Actuated Cycle: 38.1

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk





Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	83	491	475	136	216	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	90	534	516	148	235	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1123	590			664	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	0			75	
cM capacity (veh/h)	170	507			925	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	624	664	298
Volume Left	90	0	235
Volume Right	534	148	0
cSH	394	1700	925
Volume to Capacity	1.58	0.39	0.25
Queue Length (ft)	884	0	25
Control Delay (s)	299.4	0.0	8.6
Lane LOS	F		A
Approach Delay (s)	299.4	0.0	8.6
Approach LOS	F		

Intersection Summary			
Average Delay	119.4		
Intersection Capacity Utilization	100.4%	ICU Level of Service	F

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	40	92	700	13	31	185
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	43	100	761	14	34	201
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1029	761			775	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	75			96	
cM capacity (veh/h)	248	405			841	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	43	100	761	14	235
Volume Left	43	0	0	0	34
Volume Right	0	100	0	14	0
cSH	248	405	1700	1700	841
Volume to Capacity	0.17	0.25	0.45	0.01	0.04
Queue Length (ft)	16	24	0	0	3
Control Delay (s)	22.5	16.8	0.0	0.0	1.7
Lane LOS	C	C			A
Approach Delay (s)	18.5		0.0		1.7
Approach LOS	C				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	140	341	192	56	527	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	152	371	209	61	573	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1810	239			270	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	54			56	
cM capacity (veh/h)	48	800			1294	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	523	270	998
Volume Left	152	0	573
Volume Right	371	61	0
cSH	144	1700	1294
Volume to Capacity	3.62	0.16	0.44
Queue Length (ft)	Err	0	58
Control Delay (s)	Err	0.0	8.2
Lane LOS	F		A
Approach Delay (s)	Err	0.0	8.2
Approach LOS	F		

Intersection Summary			
Average Delay	2924.8		
Intersection Capacity Utilization	110.0%	ICU Level of Service	G

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	25	59	303	45	105	599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	27	64	329	49	114	651
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1209	329			378	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	85	91			90	
cM capacity (veh/h)	182	712			1180	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	27	64	329	49	765
Volume Left	27	0	0	0	114
Volume Right	0	64	0	49	0
cSH	182	712	1700	1700	1180
Volume to Capacity	0.15	0.09	0.19	0.03	0.10
Queue Length (ft)	13	7	0	0	8
Control Delay (s)	28.1	10.6	0.0	0.0	2.4
Lane LOS	D	B			A
Approach Delay (s)	15.8		0.0		2.4
Approach LOS	C				

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	71.2%	ICU Level of Service	C

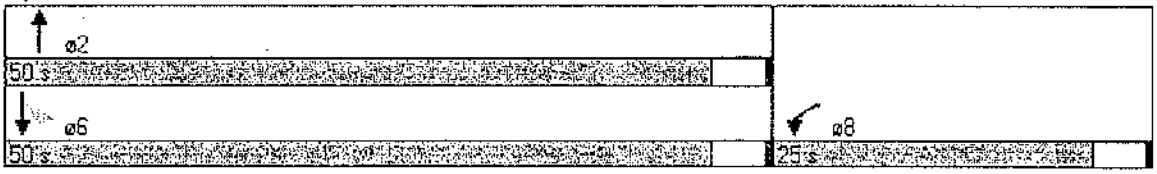
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50		50	50
Trailing Detector (ft)	0		0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.884		0.970			
Flt Protected	0.993					0.962
Satd. Flow (prot)	1635	0	1807	0	0	1792
Flt Permitted	0.993					0.317
Satd. Flow (perm)	1635	0	1807	0	0	590
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	367		36			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	83	491	475	136	216	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	534	516	148	235	63
Lane Group Flow (vph)	624	0	664	0	0	298
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phases	8		2		6	6
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	25.0	0.0	50.0	0.0	50.0	50.0
Total Split (%)	33%	0%	67%	0%	67%	67%
Maximum Green (s)	21.0		46.0		46.0	46.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	5.0		5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	16.5		33.9			33.9
Actuated g/C Ratio	0.28		0.57			0.57
v/c Ratio	0.87		0.64			0.89
Uniform Delay, d1	17.8		7.5			10.4
Delay	15.7		8.3			23.0
LOS	B		A			C
Approach Delay	15.7		8.3			23.0
Approach LOS	B		A			C
90th %ile Green (s)	21.0		46.0		46.0	46.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max		Hold		Max	Max
70th %ile Green (s)	21.0		46.0		46.0	46.0
70th %ile Term Code	Max		Hold		Max	Max
50th %ile Green (s)	21.0		45.1		45.1	45.1
50th %ile Term Code	Max		Hold		Gap	Gap
30th %ile Green (s)	12.5		25.0		25.0	25.0
30th %ile Term Code	Gap		Hold		Gap	Gap
10th %ile Green (s)	7.7		13.0		13.0	13.0
10th %ile Term Code	Gap		Hold		Gap	Gap
Stops (vph)	250		295			221
Fuel Used(gal)	16		10			8
CO Emmisions (g/hr)	1145		710			574
NOx Emmisions (g/hr)	223		138			112
VOC Emmisions (g/hr)	265		164			133
Dilemma Vehicles (#)	0		0			0
Queue Length 50th (ft)	111		139			96
Queue Length 95th (ft)	#316		222			#262
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 59.7
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 100.4% ICU Level of Service F
90th %ile Actuated Cycle: 75
70th %ile Actuated Cycle: 75
50th %ile Actuated Cycle: 74.1
30th %ile Actuated Cycle: 45.5
10th %ile Actuated Cycle: 28.7
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



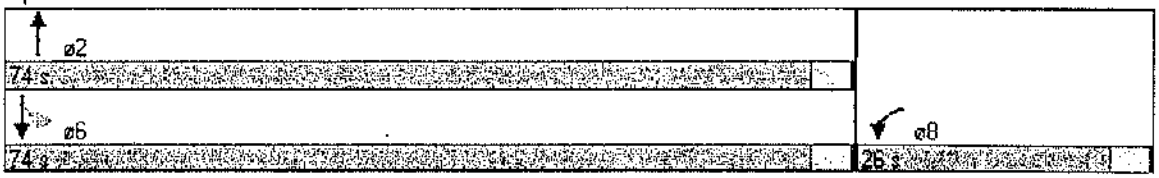
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50		50		50	50
Trailing Detector (ft)	0		0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.904		0.970			
Flt Protected	0.986					0.972
Satd. Flow (prot)	1660	0	1807	0	0	1811
Flt Permitted	0.986					0.666
Satd. Flow (perm)	1660	0	1807	0	0	1241
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)	113		35			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	140	341	192	56	527	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	371	209	61	573	425
Lane Group Flow (vph)	523	0	270	0	0	998
Turn Type					Perm	
Protected Phases	8		2			6
Permitted Phases					6	
Detector Phases	8		2		6	6
Minimum Initial (s)	4.0		4.0		4.0	4.0
Minimum Split (s)	20.0		20.0		20.0	20.0
Total Split (s)	26.0	0.0	74.0	0.0	74.0	74.0
Total Split (%)	26%	0%	74%	0%	74%	74%
Maximum Green (s)	22.0		70.0		70.0	70.0
Yellow Time (s)	3.5		3.5		3.5	3.5
All-Red Time (s)	0.5		0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Recall Mode	None		Min		Min	Min
Walk Time (s)	5.0		5.0		5.0	5.0
Flash Dont Walk (s)	11.0		11.0		11.0	11.0
Pedestrian Calls (#/hr)	0		0		0	0
Act Effct Green (s)	22.0		70.0			70.0
Actuated g/C Ratio	0.22		0.70			0.70
v/c Ratio	1.15		0.21			1.15
Uniform Delay, d1	29.2		4.5			15.0
Delay	100.2		4.6			83.4
LOS	F		A			F
Approach Delay	100.2		4.6			83.4
Approach LOS	F		A			F
90th %ile Green (s)	22.0		70.0		70.0	70.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max		Hold		Max	Max
70th %ile Green (s)	22.0		70.0		70.0	70.0
70th %ile Term Code	Max		Hold		Max	Max
50th %ile Green (s)	22.0		70.0		70.0	70.0
50th %ile Term Code	Max		Hold		Max	Max
30th %ile Green (s)	22.0		70.0		70.0	70.0
30th %ile Term Code	Max		Hold		Max	Max
10th %ile Green (s)	22.0		70.0		70.0	70.0
10th %ile Term Code	Max		Hold		Max	Max
Stops (vph)	637		66		1269	
Fuel Used(gal)	24		4		42	
CO Emmisions (g/hr)	1703		254		2916	
NOx Emmisions (g/hr)	331		49		567	
VOC Emmisions (g/hr)	395		59		676	
Dilemma Vehicles (#)	0		0		0	
Queue Length 50th (ft)	~336		40		~752	
Queue Length 95th (ft)	#542		66		#993	
Internal Link Dist (ft)	2340		1493		2592	
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.15
Intersection Signal Delay: 76.4 Intersection LOS: E
Intersection Capacity Utilization 110.0% ICU Level of Service G
90th %ile Actuated Cycle: 100
70th %ile Actuated Cycle: 100
50th %ile Actuated Cycle: 100
30th %ile Actuated Cycle: 100
10th %ile Actuated Cycle: 100
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



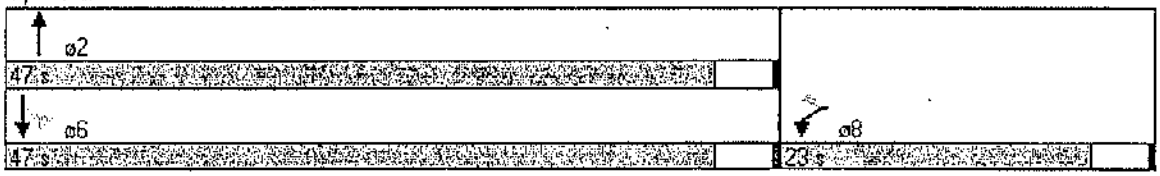
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.970			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1807	0	1770	1863
Flt Permitted	0.950				0.299	
Satd. Flow (perm)	1770	1583	1807	0	557	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		368	38			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	83	491	475	136	216	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	534	516	148	235	63
Lane Group Flow (vph)	90	534	664	0	235	63
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phases	8	8	2		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	23.0	23.0	47.0	0.0	47.0	47.0
Total Split (%)	33%	33%	67%	0%	67%	67%
Maximum Green (s)	19.0	19.0	43.0		43.0	43.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	12.6	12.6	25.0		25.0	25.0
Actuated g/C Ratio	0.27	0.27	0.53		0.53	0.53
v/c Ratio	0.19	0.77	0.68		0.80	0.06
Uniform Delay, d1	12.6	4.3	6.8		8.0	4.8
Delay	17.2	8.9	7.6		14.1	5.4
LOS	B	A	A		B	A
Approach Delay	10.1		7.6			12.3
Approach LOS	B		A			B
90th %ile Green (s)	19.0	19.0	43.0		43.0	43.0

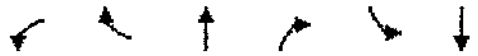
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max	Max	Hold		Max	Max
70th %ile Green (s)	19.0	19.0	40.7		40.7	40.7
70th %ile Term Code	Max	Max	Hold		Gap	Gap
50th %ile Green (s)	12.8	12.8	24.5		24.5	24.5
50th %ile Term Code	Gap	Gap	Hold		Gap	Gap
30th %ile Green (s)	7.2	7.2	14.1		14.1	14.1
30th %ile Term Code	Gap	Gap	Hold		Gap	Gap
10th %ile Green (s)	6.1	6.1	9.7		9.7	9.7
10th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
Stops (vph)	58	159	310		153	22
Fuel Used(gal)	3	13	10		6	1
CO Emmisions (g/hr)	176	910	709		417	97
NOx Emmisions (g/hr)	34	177	138		81	19
VOC Emmisions (g/hr)	41	211	164		97	23
Dilemma Vehicles (#)	0	0	0		0	0
Queue Length 50th (ft)	17	34	82		42	7
Queue Length 95th (ft)	63	#216	204		#186	22
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 47.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 9.4 Intersection LOS: A
Intersection Capacity Utilization 75.9% ICU Level of Service C
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 67.7
50th %ile Actuated Cycle: 45.3
30th %ile Actuated Cycle: 29.3
10th %ile Actuated Cycle: 23.8
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk





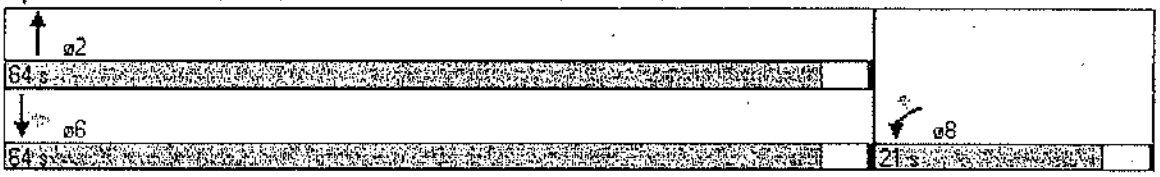
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50
Trailing Detector (ft)	0	0	0		0	0
Turning Speed (mph)	15	9		9	15	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850	0.970			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	1583	1807	0	1770	1863
Flt Permitted	0.950				0.589	
Satd. Flow (perm)	1770	1583	1807	0	1097	1863
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		371	42			
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)	30		30			30
Link Distance (ft)	2420		1573			2672
Travel Time (s)	55.0		35.8			60.7
Volume (vph)	140	341	192	56	527	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	152	371	209	61	573	425
Lane Group Flow (vph)	152	371	270	0	573	425
Turn Type		Perm			Perm	
Protected Phases	8		2			6
Permitted Phases		8			6	
Detector Phases	8	8	2		6	6
Minimum Initial (s)	4.0	4.0	4.0		4.0	4.0
Minimum Split (s)	20.0	20.0	20.0		20.0	20.0
Total Split (s)	21.0	21.0	64.0	0.0	64.0	64.0
Total Split (%)	25%	25%	75%	0%	75%	75%
Maximum Green (s)	17.0	17.0	60.0		60.0	60.0
Yellow Time (s)	3.5	3.5	3.5		3.5	3.5
All-Red Time (s)	0.5	0.5	0.5		0.5	0.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Min		Min	Min
Walk Time (s)	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0	0		0	0
Act Effct Green (s)	10.4	10.4	33.7		33.7	33.7
Actuated g/C Ratio	0.20	0.20	0.63		0.63	0.63
v/c Ratio	0.44	0.61	0.23		0.83	0.36
Uniform Delay, d1	18.2	0.0	3.1		6.8	4.2
Delay	23.5	3.8	3.4		8.3	4.5
LOS	C	A	A		A	A
Approach Delay	9.6		3.4			6.7
Approach LOS	A		A			A
90th %ile Green (s)	17.0	17.0	60.0		60.0	60.0

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
90th %ile Term Code	Max	Max	Hold		Max	Max
70th %ile Green (s)	13.6	13.6	45.9		45.9	45.9
70th %ile Term Code	Gap	Gap	Hold		Gap	Gap
50th %ile Green (s)	9.2	9.2	29.3		29.3	29.3
50th %ile Term Code	Gap	Gap	Hold		Gap	Gap
30th %ile Green (s)	7.1	7.1	18.9		18.9	18.9
30th %ile Term Code	Gap	Gap	Hold		Gap	Gap
10th %ile Green (s)	5.5	5.5	19.7		19.7	19.7
10th %ile Term Code	Gap	Gap	Dwell		Dwell	Dwell
Stops (vph)	110	43	71		352	145
Fuel Used(gal)	4	8	4		14	9
CO Emmisions (g/hr)	314	582	252		966	651
NOx Emmisions (g/hr)	61	113	49		188	127
VOC Emmisions (g/hr)	73	135	58		224	151
Dilemma Vehicles (#)	0	0	0		0	0
Queue Length 50th (ft)	36	0	0		94	43
Queue Length 95th (ft)	129	72	52		309	112
Internal Link Dist (ft)	2340		1493			2592
50th Up Block Time (%)						
95th Up Block Time (%)						
Turn Bay Length (ft)						
50th Bay Block Time %						
95th Bay Block Time %						
Queuing Penalty (veh)						

Intersection Summary

Area Type: Other
Cycle Length: 85
Actuated Cycle Length: 53.2
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 7.0 Intersection LOS: A
Intersection Capacity Utilization 64.9% ICU Level of Service B
90th %ile Actuated Cycle: 85
70th %ile Actuated Cycle: 67.5
50th %ile Actuated Cycle: 46.5
30th %ile Actuated Cycle: 34
10th %ile Actuated Cycle: 33.2

Splits and Phases: 1: E. Beaver Creek Dr & Central Ave Pk



Residential Site 15-Hour Generator

Inbound Traffic	Inbound Traffic'	Inbound Traffic"	Outbound Traffic	Redevelopment Entering Trip Distribution	Inbound Traffic	Inbound Traffic'	Inbound Traffic"	Redevelopment Exiting Trip Distribution	Development Exiting Trips	Outbound Traffic
0	0	0	0	1.0%	2	6	0	5.0%	40	40
492	219	0	389	3.0%	578	274	0	13.0%	105	558
339	137	0	256	3.0%	400	179	0	9.0%	73	371
0	0	0	0	3.0%	1	19	0	5.0%	40	40
0	0	0	0	3.0%	5	19	0	4.0%	32	32
169	231	0	194	4.0%	204	294	0	4.0%	32	258
153	265	0	225	4.0%	185	334	0	4.0%	32	294
0	0	0	0	4.0%	7	25	0	4.0%	32	32
157	354	0	276	4.0%	190	438	0	4.0%	32	354
156	412	0	269	5.0%	190	512	0	4.0%	32	346
177	510	0	301	7.0%	218	638	0	5.0%	40	391
198	683	0	382	11.0%	250	865	0	7.0%	56	501
0	0	0	0	11.0%	19	70	0	8.0%	64	64
0	0	0	0	9.0%	16	57	0	6.0%	48	48
0	0	0	0	8.0%	14	51	0	5.0%	40	40
				6.0%	10	38	0	4.0%	32	32
1841	2811	0	2292	86.0%	2,293	3,819	0	91%	733	3,403

117%	117%	100%	117%				
	Assignment			Pass-by	Internal	Daily Trips	1,151
15%	55%	0%	70%	0%	0%	Primary Trips	1,151
0%	0%	0%	0%			Pass-by Trips	0

INTERSECTION: [illegible] Central Avenue Pike & E. Beaver Creek Drive (2002)
JOB NUMBER: [illegible]
DATE: [illegible] 01/15/02

		PEDESTRIANS GAPS/HOUR:	28
		SCHOOL CROSSING, 20 Xing (YES/NO):	NO
85TH PERCENTILE SPEED:	40	NEAREST SIGNALIZED INTERSECTION:	0
POPULATION:	10,000	IMPROVE PROGRESSION (YES/NO):	NO
NUMBER OF APPROACHES:	3	MAJOR ROUTES (YES/NO):	NO
LANES ON MAIN STREET:	1	WARRANTS IN 5 YRS (YES/NO):	NO
LANES ON MINOR STREET:	1		
		ALTERNATIVES TO A SIGNAL EXPLORED:	YES
		NUMBER OF ACCIDENTS:	0
		PEAK HOUR DELAY (VEH-HR):	0

	MAIN STREET			MINOR STREET			WARRANT 1			WARRANT 2	WARRANT 3
HOUR	MAIN STREET VOLUME	PERCENT OF WARRANT 1A 500	PERCENT OF WARRANT 1B 750	MINOR STREET VOLUME	PERCENT OF WARRANT 1A 150	PERCENT OF WARRANT 1B 75	VOLUME WARRANT Condition A	INTER-RUPTION WARRANT Condition B	COMBI-NATION WARRANT Condition A&B	4-HOUR WARRANT	PEAK HOUR WARRANT Condition B
24-1	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
1-2	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
2-3	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
3-4	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
4-5	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
5-6	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
6-7	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
7-8	711	142%	95%	389	259%	519%	YES	YES/NO	YES	YES	YES
8-9	476	95%	63%	256	171%	341%	YES/NO	NO	NO	NO	NO
9-10	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
10-11	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
11-12	400	80%	53%	194	129%	259%	NO	NO	NO	NO	NO
12-13	418	84%	56%	225	150%	300%	NO	NO	NO	NO	NO
13-14	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
14-15	511	102%	68%	276	184%	368%	YES	NO	NO	YES	NO
15-16	568	114%	76%	269	179%	359%	YES	NO	NO	YES	NO
16-17	687	137%	92%	301	201%	401%	YES	YES/NO	YES	YES	NO
17-18	881	176%	117%	382	255%	509%	YES	YES	YES	YES	YES
18-19	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
19-20	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
20-21	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
21-22	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
22-23	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
23-24	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO

SUMMARY

	COND. WARRANT		DESCRIPTION	WARRANT OBTAINED?	90% HOURS	80% HOURS	PRIORITY POINTS
	1	A	MINIMUM VOLUME:	NO	5	1	50
		B	INTERUPTION:	NO	1	2	9
		A & B	COMBINATION:	NO	3	N/A	24
	2		FOUR-HOUR:	YES	5	N/A	70
	3	A	PEAK HOUR DELAY:	NO	N/A	N/A	0
		B	PEAK HOUR VOLUME:	YES	7	N/A	96
	4	[No data collected]	MINIMUM PED. VOLUMES:	N/A	24	24	N/A
	5		SCHOOL CROSSING:	NO	N/A	N/A	0
	6		CORD. SIGNAL SYSTEM:	NO	N/A	N/A	0
	7		ACCIDENT EXPERIENCE:	NO	8	N/A	0
	8		ROADWAY NETWORK:	NO	0	N/A	0

MUTCD 2000-Signal Warrant Analysis

INTERSECTION: Central Avenue Pike & Beaver Creek Drive (2005)
JOB NUMBER: 37270
DATE: 01/15/02

		PEDESTRIANS GAPS/HOUR:	28
		SCHOOL CROSSING, 20 Xing (YES/NO):	NO
85TH PERCENTILE SPEED:	40	NEAREST SIGNALIZED INTERSECTION:	0
POPULATION:	10,000	IMPROVE PROGRESSION (YES/NO):	NO
NUMBER OF APPROACHES:	3	MAJOR ROUTES (YES/NO):	NO
LANES ON MAIN STREET:	1	WARRANTS IN 5 YRS (YES/NO):	NO
LANES ON MINOR STREET:	1		
		ALTERNATIVES TO A SIGNAL EXPLORED:	YES
		NUMBER OF ACCIDENTS:	0
		PEAK HOUR DELAY (VEH-HR):	0

	MAIN STREET			MINOR STREET			WARRANT 1			WARRANT 2	WARRANT 3
HOUR	MAIN STREET VOLUME	PERCENT OF WARRANT 1A 500	PERCENT OF WARRANT 1B 750	MINOR STREET VOLUME	PERCENT OF WARRANT 1A 150	PERCENT OF WARRANT 1B 75	VOLUME WARRANT Condition A	INTER-RUPTION WARRANT Condition B	COMBI-NATION WARRANT Condition A&B	4-HOUR WARRANT	PEAK HOUR WARRANT Condition B
24-1	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
1-2	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
2-3	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
3-4	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
4-5	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
5-6	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
6-7	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
7-8	828	166%	110%	453	302%	604%	YES	YES	YES	YES	YES
8-9	555	111%	74%	298	199%	398%	YES	NO	NO	YES	NO
9-10	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
10-11	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
11-12	466	93%	62%	226	151%	301%	YES/NO	NO	NO	NO	NO
12-13	487	97%	65%	262	175%	350%	YES/NO	NO	NO	NO	NO
13-14	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
14-15	595	119%	79%	322	214%	429%	YES	NO	NO	YES	NO
15-16	662	132%	88%	313	209%	418%	YES	NO	YES	YES	NO
16-17	800	160%	107%	351	234%	468%	YES	YES	YES	YES	YES
17-18	1,026	205%	137%	445	297%	593%	YES	YES	YES	YES	YES
18-19	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
19-20	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
20-21	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
21-22	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
22-23	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
23-24	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO

SUMMARY

WARRANT	COND-ITION	DESCRIPTION	WARRANT OBTAINED	HOURS	80% HOURS	PRIORITY POINTS
1	A	MINIMUM VOLUME:	NO	6	2	60
	B	INTERUPTION:	NO	3	0	27
	A & B	COMBINATION:	NO	4	N/A	32
2		FOUR-HOUR:	YES	6	N/A	84
3	A	PEAK HOUR DELAY:	NO	N/A	N/A	0
	B	PEAK HOUR VOLUME:	YES	3	N/A	144
4	(No data collected)	MINIMUM PED. VOLUMES:	N/A	24	24	N/A
5		SCHOOL CROSSING:	NO	N/A	N/A	0
6		CORD. SIGNAL SYSTEM:	NO	N/A	N/A	0
7		ACCIDENT EXPERIENCE:	NO	8	N/A	0
8		ROADWAY NETWORK:	NO	0	N/A	0

INTERSECTION: Central Avenue Pike & E. Beaver Creek Drive (2005 Proj.)
JOB NUMBER: 37700
DATE: 10/15/02

		PEDESTRIANS GAPS/HOUR:	28
		SCHOOL CROSSING, 20 Xing (YES/NO):	NO
85TH PERCENTILE SPEED:	40	NEAREST SIGNALIZED INTERSECTION:	0
POPULATION:	10,000	IMPROVE PROGRESSION (YES/NO):	NO
NUMBER OF APPROACHES:	3	MAJOR ROUTES (YES/NO):	NO
LANES ON MAIN STREET:	1	WARRANTS IN 5 YRS (YES/NO):	NO
LANES ON MINOR STREET:	2		
		ALTERNATIVES TO A SIGNAL EXPLORED:	YES
		NUMBER OF ACCIDENTS:	0
		PEAK HOUR DELAY (VEH-HR):	0

	MAIN STREET			MINOR STREET			WARRANT 1			WARRANT 2	WARRANT 3
HOUR	MAIN STREET VOLUME	PERCENT OF WARRANT 1A 500	PERCENT OF WARRANT 1B 750	MINOR STREET VOLUME	PERCENT OF WARRANT 1A 200	PERCENT OF WARRANT 1B 100	VOLUME WARRANT Condition A	INTER-RUPTION WARRANT Condition B	COMBI-NATION WARRANT Condition A&B	4-HOUR WARRANT	PEAK HOUR WARRANT Condition B
24-1	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
1-2	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
2-3	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
3-4	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
4-5	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
5-6	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
6-7	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
7-8	852	170%	114%	558	279%	558%	YES	YES	YES	YES	YES
8-9	579	116%	77%	371	186%	371%	YES	NO	NO	YES	NO
9-10	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
10-11	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
11-12	498	100%	66%	258	129%	258%	YES/NO	NO	NO	NO	NO
12-13	519	104%	69%	294	147%	294%	YES	NO	NO	NO	NO
13-14	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
14-15	628	126%	84%	354	177%	354%	YES	NO	YES	YES	NO
15-16	702	140%	94%	346	173%	346%	YES	YES/NO	YES	YES	NO
16-17	856	171%	114%	391	196%	391%	YES	YES	YES	YES	YES
17-18	1,115	223%	149%	501	251%	501%	YES	YES	YES	YES	YES
18-19	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
19-20	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
20-21	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
21-22	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
22-23	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO
23-24	0	0%	0%	0	0%	0%	NO	NO	NO	NO	NO

SUMMARY

	WARRANT	COND.	DESCRIPTION	OBTAINED	HOURS	>=90% HOURS	PRIORITY POINTS
	1	A	MINIMUM VOLUME:	NO	7	1	70
		B	INTERUPTION:	NO	3	1	27
		A & B	COMBINATION:	NO	5	N/A	40
	2		FOUR-HOUR:	YES	6	N/A	84
	3	A	PEAK HOUR DELAY:	NO	N/A	N/A	0
		B	PEAK HOUR VOLUME:	YES	3	N/A	144
	4	(No data collected)	MINIMUM PED. VOLUMES:	N/A	24	24	N/A
	5		SCHOOL CROSSING:	NO	N/A	N/A	0
	6		CORD. SIGNAL SYSTEM:	NO	N/A	N/A	0
	7		ACCIDENT EXPERIENCE:	NO	8	N/A	0
	8		ROADWAY NETWORK:	NO	0	N/A	0

WILBUR SMITH ASSOCIATES
INTERSECTION: E.Beaver Creek & Central

DATE: 1-8-02
DAY OF WEEK: Tuesday
JOB NUMBER:
COUNTED BY: Jack Tatham

File Name : E.Beaver Creek & Central
Site Code : 00000001
Start Date : 01/08/2002
Page No : 1

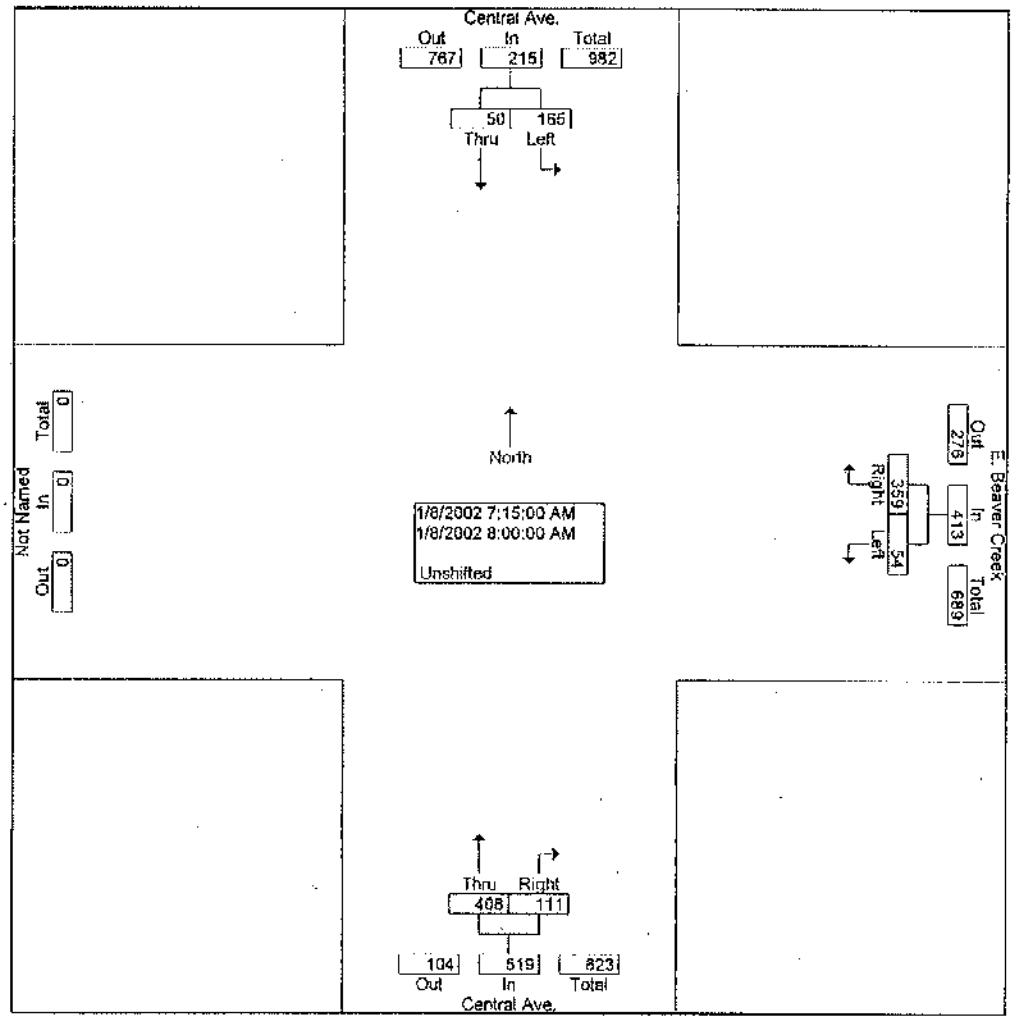
Groups Printed- Unshifted

	Central Ave. Southbound		E. Beaver Creek Westbound		Central Ave. Northbound		
Start Time	Left	Thru	Left	Right	Thru	Right	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	
07:00 AM	22	7	8	45	79	21	182
07:15 AM	44	19	12	87	113	18	293
07:30 AM	36	17	14	95	137	47	346
07:45 AM	65	9	17	111	69	8	279
Total	167	52	51	338	398	94	1100
08:00 AM	20	5	11	66	89	38	229
08:15 AM	17	12	9	76	56	8	178
08:30 AM	24	25	5	49	73	15	191
08:45 AM	24	10	4	36	48	12	134
Total	85	52	29	227	266	73	732
11:00 AM	30	21	6	50	41	11	159
11:15 AM	37	25	5	36	28	8	139
11:30 AM	37	24	7	37	37	3	145
11:45 AM	34	23	13	40	32	9	151
Total	138	93	31	163	138	31	594
12:00 PM	50	28	12	45	30	8	173
12:15 PM	22	26	5	47	26	7	133
12:30 PM	43	17	9	50	36	5	160
12:45 PM	55	24	10	47	33	8	177
Total	170	95	36	189	125	28	643
02:00 PM	46	31	8	41	34	11	171
02:15 PM	50	23	6	46	26	10	161
02:30 PM	51	47	32	60	24	10	224
02:45 PM	72	34	20	63	31	11	231
Total	219	135	66	210	115	42	787
03:00 PM	58	41	13	51	32	6	201
03:15 PM	74	29	26	53	37	11	230
03:30 PM	72	59	29	49	26	12	247
03:45 PM	52	27	13	35	25	7	159
Total	256	156	81	188	120	36	837
04:00 PM	68	49	32	54	37	7	247
04:15 PM	67	57	12	43	29	8	216
04:30 PM	64	47	20	71	38	5	245
04:45 PM	84	74	23	46	46	7	280
Total	283	227	87	214	150	27	988
05:00 PM	93	101	30	63	31	7	325
05:15 PM	106	99	22	74	46	10	357
05:30 PM	99	62	34	70	42	5	312
05:45 PM	63	60	19	70	50	7	269
Total	361	322	105	277	169	29	1263
Grand Total	1679	1132	486	1806	1481	360	6944
Apprch %	59.7	40.3	21.2	78.8	80.4	19.6	
Total %	24.2	16.3	7.0	26.0	21.3	5.2	

WILBUR SMITH ASSOCIATES
INTERSECTION: E.Beaver Creek & Central

File Name : E.Beaver Creek & Central
Site Code : 00000001
Start Date : 01/08/2002
Page No : 2

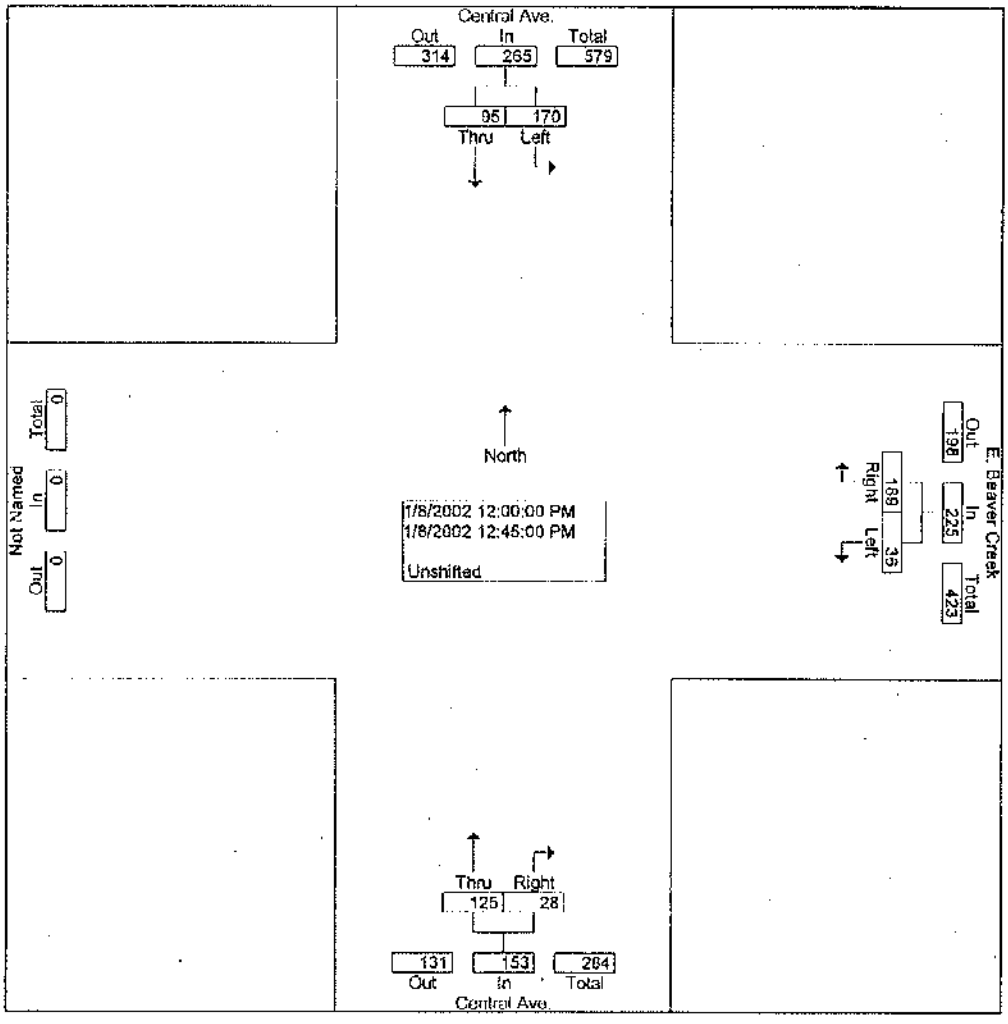
	Central Ave. Southbound			E. Beaver Creek Westbound			Central Ave. Northbound				
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 07:00 AM to 09:45 AM - Peak 1 of 1											
Intersection	07:15 AM										
Volume	165	50	215	54	359	413	408	111	519	0	1147
Percent	76.7	23.3		13.1	86.9		78.6	21.4			
07:30 Volume	36	17	53	14	95	109	137	47	184	0	346
Peak Factor											0.829
High Int.	07:45 AM			07:45 AM			07:30 AM			6:45:00 AM	
Volume	65	9	74	17	111	128	137	47	184		
Peak Factor			0.726			0.807			0.705		



WILBUR SMITH ASSOCIATES
INTERSECTION: E.Beaver Creek & Central

File Name : E.Beaver Creek & Central
Site Code : 00000001
Start Date : 01/08/2002
Page No : 3

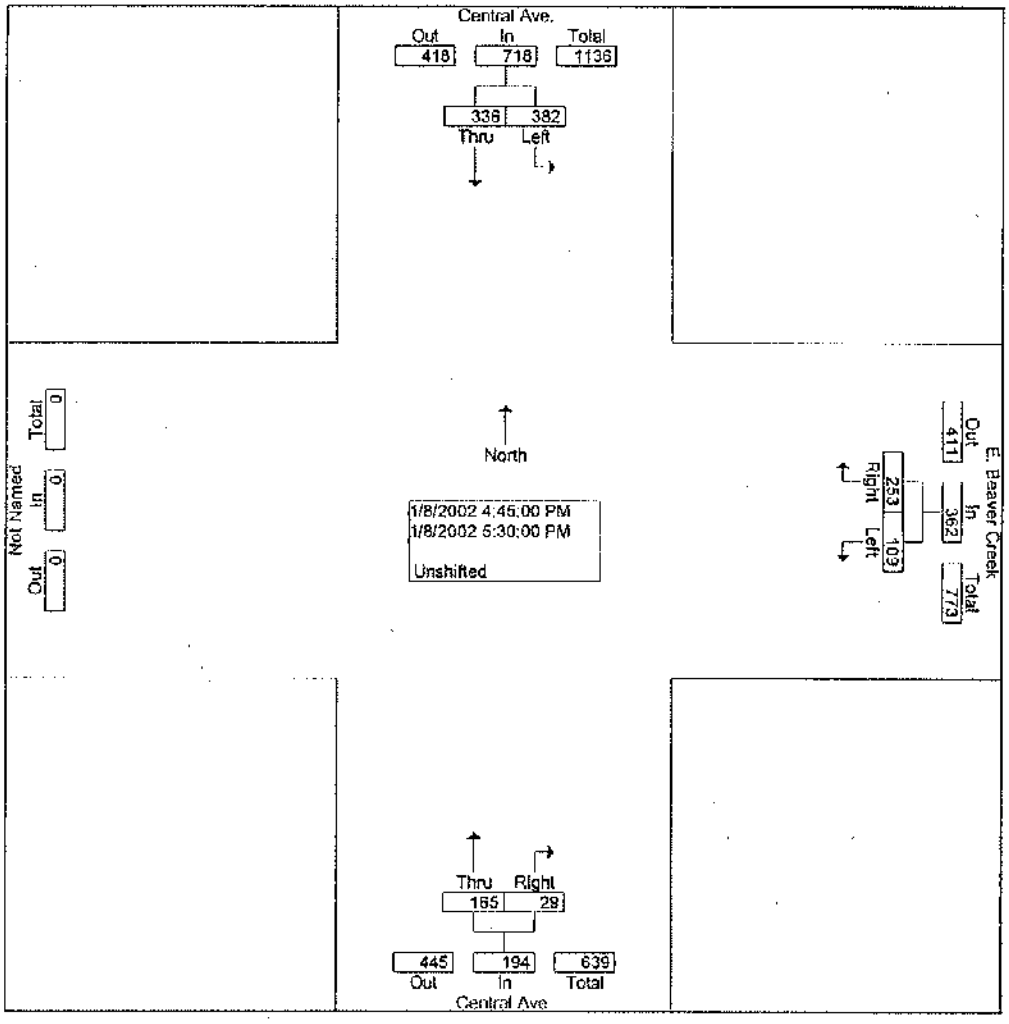
	Central Ave. Southbound			E. Beaver Creek Westbound			Central Ave. Northbound				
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 10:00 AM to 01:45 PM - Peak 1 of 1											
Intersection	12:00 PM										
Volume	170	95	265	36	189	225	125	28	153	0	643
Percent	64.2	35.8		16.0	84.0		81.7	18.3			
12:45 Volume	55	24	79	10	47	57	33	8	41	0	177
Peak Factor											0.908
High Int.	12:45 PM			12:30 PM			12:30 PM				
Volume	55	24	79	9	50	59	36	5	41		
Peak Factor			0.839			0.953			0.933		



WILBUR SMITH ASSOCIATES
INTERSECTION: E.Beaver Creek & Central

File Name : E.Beaver Creek & Central
Site Code : 00000001
Start Date : 01/08/2002
Page No : 4

	Central Ave. Southbound			E. Beaver Creek Westbound			Central Ave. Northbound				
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	App. Total	Int. Total
Peak Hour From 02:00 PM to 05:45 PM - Peak 1 of 1											
Intersection	04:45 PM										
Volume	382	336	718	109	253	362	165	29	194	0	1274
Percent	53.2	46.8		30.1	69.9		85.1	14.9			
05:15 Volume	106	99	205	22	74	96	46	10	56	0	357
Peak Factor											0.892
High Int.	05:15 PM			05:30 PM			05:15 PM				
Volume	106	99	205	34	70	104	46	10	56		
Peak Factor			0.876			0.870			0.866		



NU-METRICS CDM FRAME STUDY -- CDM Version 2.3 01/09/2002

[Report #1 DATE/TIME/VOLUME Report]

Survey #: 444
Route: E.Beaver Creek
Loc/Sta Going Toward Halls
City: Knoxville, TN
County: Knox

Begin: 01/08/2002 10:00
Lane: EB
Oper: BSG AdjF: 1.000
Posted: 40 mph
AADT Factor: 1.00

End:01/09/2002 10:00
Hours : 24 hrs
Period: 15 min
Raw Count: 3375
AADT Count: 3375

Day	Date	Time	Count
Tue	01/08/2002	10:00	26
Tue	01/08/2002	10:15	39
Tue	01/08/2002	10:30	19
Tue	01/08/2002	10:45	29
Tue	01/08/2002	11:00	20
Tue	01/08/2002	11:15	30
Tue	01/08/2002	11:30	27
Tue	01/08/2002	11:45	33
Tue	01/08/2002	12:00	45
Tue	01/08/2002	12:15	43
Tue	01/08/2002	12:30	23
Tue	01/08/2002	12:45	28
Tue	01/08/2002	13:00	43
Tue	01/08/2002	13:15	35
Tue	01/08/2002	13:30	26
Tue	01/08/2002	13:45	48
Tue	01/08/2002	14:00	46
Tue	01/08/2002	14:15	36
Tue	01/08/2002	14:30	47
Tue	01/08/2002	14:45	80
Tue	01/08/2002	15:00	58
Tue	01/08/2002	15:15	61
Tue	01/08/2002	15:30	77
Tue	01/08/2002	15:45	98
Tue	01/08/2002	16:00	88
Tue	01/08/2002	16:15	102
Tue	01/08/2002	16:30	105
Tue	01/08/2002	16:45	108
Tue	01/08/2002	17:00	129
Tue	01/08/2002	17:15	131
Tue	01/08/2002	17:30	150
Tue	01/08/2002	17:45	104
Tue	01/08/2002	18:00	115
Tue	01/08/2002	18:15	81
Tue	01/08/2002	18:30	68
Tue	01/08/2002	18:45	48
Tue	01/08/2002	19:00	52
Tue	01/08/2002	19:15	61
Tue	01/08/2002	19:30	42
Tue	01/08/2002	19:45	56
Tue	01/08/2002	20:00	46
Tue	01/08/2002	20:15	40
Tue	01/08/2002	20:30	36
Tue	01/08/2002	20:45	16

514

NU-METRICS CDM FRAME STUDY -- CDM Version 2.3 01/09/2002

[Report #1 DATE/TIME/VOLUME Report]

Survey #: 444 Begin: 01/08/2002 10:00 End:01/09/2002 10:00
Route: E.Beaver Creek Lane: EB Hours : 24 hrs
Loc/Sta Going Toward Halls Oper: BSG AdjF: 1.000 Period: 15 min
City: Knoxville, TN Posted: 40 mph Raw Count: 3375
County: Knox AADT Factor: 1.00 AADT Count: 3375

Day	Date	Time	Count
Tue	01/08/2002	21:00	35
Tue	01/08/2002	21:15	53
Tue	01/08/2002	21:30	38
Tue	01/08/2002	21:45	34
Tue	01/08/2002	22:00	36
Tue	01/08/2002	22:15	32
Tue	01/08/2002	22:30	15
Tue	01/08/2002	22:45	20
Tue	01/08/2002	23:00	12
Tue	01/08/2002	23:15	22
Tue	01/08/2002	23:30	20
Tue	01/08/2002	23:45	14
Wed	01/09/2002	00:00	13
Wed	01/09/2002	00:15	6
Wed	01/09/2002	00:30	4
Wed	01/09/2002	00:45	6
Wed	01/09/2002	01:00	3
Wed	01/09/2002	01:15	4
Wed	01/09/2002	01:30	1
Wed	01/09/2002	01:45	5
Wed	01/09/2002	02:00	2
Wed	01/09/2002	02:15	3
Wed	01/09/2002	02:30	1
Wed	01/09/2002	02:45	3
Wed	01/09/2002	03:00	2
Wed	01/09/2002	03:15	3
Wed	01/09/2002	03:30	0
Wed	01/09/2002	03:45	9
Wed	01/09/2002	04:00	2
Wed	01/09/2002	04:15	2
Wed	01/09/2002	04:30	1
Wed	01/09/2002	04:45	1
Wed	01/09/2002	05:00	2
Wed	01/09/2002	05:15	2
Wed	01/09/2002	05:30	0
Wed	01/09/2002	05:45	1
Wed	01/09/2002	06:00	7
Wed	01/09/2002	06:15	10
Wed	01/09/2002	06:30	7
Wed	01/09/2002	06:45	7
Wed	01/09/2002	07:00	13
Wed	01/09/2002	07:15	27
Wed	01/09/2002	07:30	43
Wed	01/09/2002	07:45	40

159

NU-METRICS CDM FRAME STUDY -- CDM Version 2.3 01/09/2002

[Report #1 DATE/TIME/VOLUME Report]

Survey #: 444	Begin: 01/08/2002 10:00		End:01/09/2002 10:00
Route: E.Beaver Creek	Lane: EB		Hours : 24 hrs
Loc/Sta Going Toward Halls	Oper: BSG	AdjF: 1.000	Period: 15 min
City: Knoxville, TN	Posted: 40 mph		Raw Count: 3375
County: Knox	AADT Factor: 1.00		AADT Count: 3375

Day	Date	Time	Count
Wed	01/09/2002	08:00	49
Wed	01/09/2002	08:15	25
Wed	01/09/2002	08:30	30
Wed	01/09/2002	08:45	27
Wed	01/09/2002	09:00	19
Wed	01/09/2002	09:15	23
Wed	01/09/2002	09:30	23
Wed	01/09/2002	09:45	23

3375

NU-METRICS CDM FRAME STUDY -- CDM Version 2.3 01/09/2002

[Report #1 DATE/TIME/VOLUME Report]

Survey #: 445 Begin: 01/08/2002 10:00 End:01/09/2002 10:00
Route: E.Beaver Creek Lane: WB Hours : 24 hrs
Loc/Sta Going Toward Powell Oper: BSG AdjF: 1.000 Period: 15 min
City: Knoxville, TN Posted: 40 mph Raw Count: 3620
County: Knox AADT Factor: 1.00 AADT Count: 3620

Day	Date	Time	Count
Tue	01/08/2002	10:00	51
Tue	01/08/2002	10:15	48
Tue	01/08/2002	10:30	38
Tue	01/08/2002	10:45	36
Tue	01/08/2002	11:00	39
Tue	01/08/2002	11:15	43
Tue	01/08/2002	11:30	40
Tue	01/08/2002	11:45	43
Tue	01/08/2002	12:00	47
Tue	01/08/2002	12:15	38
Tue	01/08/2002	12:30	43
Tue	01/08/2002	12:45	42
Tue	01/08/2002	13:00	37
Tue	01/08/2002	13:15	38
Tue	01/08/2002	13:30	42
Tue	01/08/2002	13:45	37
Tue	01/08/2002	14:00	49
Tue	01/08/2002	14:15	48
Tue	01/08/2002	14:30	37
Tue	01/08/2002	14:45	47
Tue	01/08/2002	15:00	66
Tue	01/08/2002	15:15	42
Tue	01/08/2002	15:30	49
Tue	01/08/2002	15:45	43
Tue	01/08/2002	16:00	59
Tue	01/08/2002	16:15	37
Tue	01/08/2002	16:30	43
Tue	01/08/2002	16:45	47
Tue	01/08/2002	17:00	58
Tue	01/08/2002	17:15	61 260
Tue	01/08/2002	17:30	63
Tue	01/08/2002	17:45	78
Tue	01/08/2002	18:00	49
Tue	01/08/2002	18:15	42
Tue	01/08/2002	18:30	62
Tue	01/08/2002	18:45	49
Tue	01/08/2002	19:00	38
Tue	01/08/2002	19:15	22
Tue	01/08/2002	19:30	35
Tue	01/08/2002	19:45	25
Tue	01/08/2002	20:00	24
Tue	01/08/2002	20:15	19
Tue	01/08/2002	20:30	25
Tue	01/08/2002	20:45	15

NU-METRICS CDM FRAME STUDY -- CDM Version 2.3 01/09/2002

[Report #1 DATE/TIME/VOLUME Report]

Survey #: 445 Begin: 01/08/2002 10:00 End:01/09/2002 10:00
Route: E.Beaver Creek Lane: WB Hours : 24 hrs
Loc/Sta Going Toward Powell Oper: BSG AdjF: 1.000 Period: 15 min
City: Knoxville, TN Posted: 40 mph Raw Count: 3620
County: Knox AADT Factor: 1.00 AADT Count: 3620

Day	Date	Time	Count
Tue	01/08/2002	21:00	25
Tue	01/08/2002	21:15	20
Tue	01/08/2002	21:30	23
Tue	01/08/2002	21:45	15
Tue	01/08/2002	22:00	18
Tue	01/08/2002	22:15	13
Tue	01/08/2002	22:30	15
Tue	01/08/2002	22:45	6
Tue	01/08/2002	23:00	12
Tue	01/08/2002	23:15	9
Tue	01/08/2002	23:30	3
Tue	01/08/2002	23:45	5
Wed	01/09/2002	00:00	6
Wed	01/09/2002	00:15	3
Wed	01/09/2002	00:30	0
Wed	01/09/2002	00:45	4
Wed	01/09/2002	01:00	2
Wed	01/09/2002	01:15	2
Wed	01/09/2002	01:30	1
Wed	01/09/2002	01:45	1
Wed	01/09/2002	02:00	0
Wed	01/09/2002	02:15	0
Wed	01/09/2002	02:30	2
Wed	01/09/2002	02:45	0
Wed	01/09/2002	03:00	6
Wed	01/09/2002	03:15	2
Wed	01/09/2002	03:30	3
Wed	01/09/2002	03:45	9
Wed	01/09/2002	04:00	4
Wed	01/09/2002	04:15	5
Wed	01/09/2002	04:30	9
Wed	01/09/2002	04:45	8
Wed	01/09/2002	05:00	14
Wed	01/09/2002	05:15	14
Wed	01/09/2002	05:30	31
Wed	01/09/2002	05:45	44
Wed	01/09/2002	06:00	40
Wed	01/09/2002	06:15	64
Wed	01/09/2002	06:30	57
Wed	01/09/2002	06:45	73
Wed	01/09/2002	07:00	99
Wed	01/09/2002	07:15	143
Wed	01/09/2002	07:30	168
Wed	01/09/2002	07:45	155

601

NU-METRICS CDM FRAME STUDY -- CDM Version 2.3 01/09/2002

[Report #1 DATE/TIME/VOLUME Report]

Survey #: 445	Begin: 01/08/2002 10:00		End:01/09/2002 10:00
Route: E.Beaver Creek	Lane: WB		Hours : 24 hrs
Loc/Sta Going Toward Powell	Oper: BSG	AdjF: 1.000	Period: 15 min
City: Knoxville, TN	Posted: 40 mph		Raw Count: 3620
County: Knox	AADT Factor: 1.00		AADT Count: 3620

Day	Date	Time	Count
Wed	01/09/2002	08:00	135
Wed	01/09/2002	08:15	117
Wed	01/09/2002	08:30	80
Wed	01/09/2002	08:45	85
Wed	01/09/2002	09:00	40
Wed	01/09/2002	09:15	43
Wed	01/09/2002	09:30	53
Wed	01/09/2002	09:45	40

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	54	359	408	111	165	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	59	390	443	121	179	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	917	504			564	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	31			82	
cM capacity (veh/h)	248	568			1007	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	59	390	564	179	54
Volume Left	59	0	0	179	0
Volume Right	0	390	121	0	0
cSH	248	568	1700	1007	1700
Volume to Capacity	0.24	0.69	0.33	0.18	0.03
Queue Length (ft)	22	133	0	16	0
Control Delay (s)	23.9	24.1	0.0	9.3	0.0
Lane LOS	C	C		A	
Approach Delay (s)	24.1		0.0	7.2	
Approach LOS	C				

Intersection Summary			
Average Delay	10.0		
Intersection Capacity Utilization	61.5%	ICU Level of Service	B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	109	253	165	29	382	336
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	118	275	179	32	415	365
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1391	195			211	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	68			69	
cM capacity (veh/h)	109	846			1360	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	118	275	211	415	365
Volume Left	118	0	0	415	0
Volume Right	0	275	32	0	0
cSH	109	846	1700	1360	1700
Volume to Capacity	1.09	0.32	0.12	0.31	0.21
Queue Length (ft)	182	35	0	33	0
Control Delay (s)	186.8	11.3	0.0	8.8	0.0
Lane LOS	F	B		A	
Approach Delay (s)	64.1		0.0	4.7	
Approach LOS	F				

Intersection Summary			
Average Delay	20.9		
Intersection Capacity Utilization	50.9%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	63	418	475	129	192	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	68	454	516	140	209	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1067	586			657	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	11			78	
cM capacity (veh/h)	191	510			931	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	68	454	657	209	63
Volume Left	68	0	0	209	0
Volume Right	0	454	140	0	0
cSH	191	510	1700	931	1700
Volume to Capacity	0.36	0.89	0.39	0.22	0.04
Queue Length (ft)	38	251	0	21	0
Control Delay (s)	34.1	46.1	0.0	10.0	0.0
Lane LOS	D	E		A	
Approach Delay (s)	44.5		0.0	7.7	
Approach LOS	E				

Intersection Summary			
Average Delay	17.5		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	127	295	192	34	445	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	138	321	209	37	484	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1620	227			246	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	61			63	
cM capacity (veh/h)	72	812			1320	

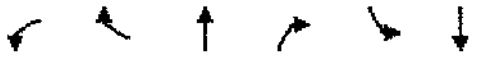
Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	138	321	246	484	425
Volume Left	138	0	0	484	0
Volume Right	0	321	37	0	0
cSH	72	812	1700	1320	1700
Volume to Capacity	1.92	0.39	0.14	0.37	0.25
Queue Length (ft)	311	47	0	43	0
Control Delay (s)	555.4	12.3	0.0	9.3	0.0
Lane LOS	F	B		A	
Approach Delay (s)	175.7		0.0	4.9	
Approach LOS	F				

Intersection Summary			
Average Delay	52.8		
Intersection Capacity Utilization	57.7%	ICU Level of Service	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	83	491	475	136	216	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	90	534	516	148	235	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1123	590			664	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	47	0			75	
cM capacity (veh/h)	170	507			925	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	90	534	664	235	63
Volume Left	90	0	0	235	0
Volume Right	0	534	148	0	0
cSH	170	507	1700	925	1700
Volume to Capacity	0.53	1.05	0.39	0.25	0.04
Queue Length (ft)	67	397	0	25	0
Control Delay (s)	48.0	82.9	0.0	10.2	0.0
Lane LOS	E	F		B	
Approach Delay (s)	77.8		0.0	8.1	
Approach LOS	F				

Intersection Summary			
Average Delay	32.1		
Intersection Capacity Utilization	75.9%	ICU Level of Service	C



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	140	341	192	56	527	391
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	152	371	209	61	573	425
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
vC, conflicting volume	1810	239			270	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	54			56	
cM capacity (veh/h)	48	800			1294	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	152	371	270	573	425
Volume Left	152	0	0	573	0
Volume Right	0	371	61	0	0
cSH	48	800	1700	1294	1700
Volume to Capacity	3.16	0.46	0.16	0.44	0.25
Queue Length (ft)	Err	62	0	58	0
Control Delay (s)	Err	13.3	0.0	10.0	0.0
Lane LOS	F	B		A	
Approach Delay (s)	2919.8		0.0	5.7	
Approach LOS	F				

Intersection Summary			
Average Delay	855.9		
Intersection Capacity Utilization	64.9%	ICU Level of Service	B