Traffic Impact Analysis

TRI-COUNTY COUNCIL MULTI-PURPOSE CENTER

Wicomico County, *Maryland*

October 26, 2010

Prepared for:

Salisbury-Wicomico Metropolitan Planning Organization

Merging Innovation and Excellence®

Prepared in cooperation with the United States Department of Transportation, Federal Highway Administration and Federal Transit Administration.

The Traffic Group

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INTRODUCTION AND SUMMARY OF FINDINGS

Traffic Impact Analysis

TRI-COUNTY COUNCIL MULTI-PURPOSE CENTER
Wicomico County, Maryland

Prepared for
Salisbury-Wicomico Department of Planning and Zoning

STUDY PURPOSE

The Traffic Group, Inc. has conducted a Traffic Impact Analysis for the Salisbury/Wicomico County Metropolitan Organization to determine the impact on the surrounding road system of the proposed relocation of the Tri-County Council, Shore Transit, One Stop, and other agencies to a multi-purpose center located in the northwest quadrant of the intersection of US Route 50 and Walston Switch Road in Wicomico County, Maryland.

For the purpose of this Traffic Impact Analysis, the Tri-County Council Multi-Purpose Center will consist of a 72,670 square foot facility. It was assumed that Shore Transit will operate eleven bus routes during the weekdays from this facility. Greyhound will also utilize the facility. Access will be via the existing Comteck Drive on Walston Switch Road.

STUDY CRITERIA/METHODOLOGY

This study was conducted in accordance with the requirements established by the Maryland State Highway Administration, specifically as outlined in the State Highway Access Manual, Engineering Access Permits Division dated January 2004. The parameters of this study were identified and adhere to the criteria stated in the Maryland State Highway Administration Guidelines.

SCOPE OF SERVICES

The principal scope of services undertaken as part of this study was as follows.

- *CONDUCT A FIELD INSPECTION TO COLLECT PHYSICAL INFORMATION CONCERNING THE NEARBY ROAD SYSTEM, INCLUDING CONDITION DIAGRAMS AND PHOTO SURVEYS AT THE FOLLOWING STUDY INTERSECTIONS.*
  - *WALSTON SWITCH ROAD AND COMTEK LANE/BEAVER RUN DRIVE*
  - *WALSTON SWITCH ROAD AND US 50*

- *Traffic Counts*

    - *Obtain turning movement counts between the hours of 7 AM and 7 PM for the intersection of US 50 and Walston Switch Road from the Maryland State Highway Administration which were collected by SHA on April 30, 2009.*
    - *From these counts, determine the peak hours of study which will capture peak hours associated with Wor-Wic Community College and those associated with the Tri-County Council/Shore Transit.*
    - *Conduct turning movement counts at the intersection of Walston Switch Road and Beaver Run Drive during the selected peak hours of study.*

- *Obtain information from SHA regarding traffic signal timing and phasing at the intersection of US 50 and Walston Switch Road.*

- *Identify approved developments in the area to be included in the analysis of background conditions.*

- *Conduct trip generation and trip distribution analyses for the approved developments and for the proposed facility.*

- *Develop total future traffic volume forecasts for the study intersections.*

- *Conduct intersection capacity analyses for the selected peak hours of study.*

- *Conduct queuing analyses for the following movements*

    - *Eastbound US Route 50 left turn onto northbound Walston Switch Road*
    - *Northbound Walston Switch Road left turn into the site.*

- *Evaluate the existing traffic signal timing and phasing*

- *Identify and evaluate needed improvements to address level of service deficiencies and queuing deficiencies, if any.*

- *Prepare a report detailing the study methodology, findings, recommendations, and conclusions.*

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Utilizing the Critical Lane Methodology (CLV) all of the study intersections have and are projected to have sufficient capacity for morning and evening peak hour traffic conditions. Utilizing the Highway Capacity Manual Methodology (HCM), which provides results by approach and movement, all of the study intersections operate and are projected to operate at acceptable Levels of Service for the morning and evening peak hour periods.

Queuing analyses were conducted for the left turns on US Route 50 and for the northbound left from Walston Switch Road into the site. In the field, excessive queuing was noted in the median at US Route 50; therefore, queuing analyses were conducted for the northbound and southbound left turns as well.

The results of the queuing analyses indicate that sufficient storage capacity exists and is projected for the eastbound and westbound left turns on US Route 50 for morning and evening peak hour traffic conditions. The queuing analysis for the northbound left turn from Walston Switch Road into the site indicates that less than one vehicle will be in the queue during the morning and evening total peak hour traffic conditions.

Excessive queuing was observed in the field for the northbound movement in the median on Walston Switch Road. The 95th percentile queue for this movement is presently greater than the storage capacity provided in the median, utilizing the HCM methodology and SHA methodology. There is sufficient capacity on the south leg of Walston Switch Road. However, both the northbound and southbound movements receive a green at the same time. When the queue exceeds the length of the median, vehicles may wait behind the stop bar on Walston Switch Road. An opposing left turning vehicle is either delayed unnecessarily or makes the turn in front of the vehicle waiting behind the stop bar for the queue to be reduced, while having a green indication,. Or, when the queue exceeds the length of the median, vehicles may queue into the through lanes of US Route 50, which is, of course, undesirable.

To resolve this situation, it is recommended that the northbound and southbound movements be split. A CLV analysis was conducted to determine the effect of this recommendation on capacity and sufficient capacity will be realized even if these movements are split for existing traffic volumes and for projected traffic volumes to include those generated by the Tri-County Council Multi-Purpose Center.

The data and methodology used to undertake this study is detailed in the sections that follow.

EXISTING TRAFFIC CONDITIONS

SITE INFORMATION

The Traffic Group, Inc. has conducted a Traffic Impact Analysis for the Salisbury/Wicomico County Metropolitan Organization to determine the impact on the surrounding road system of the proposed relocation of the Tri-County Council, Shore Transit, One Stop, and other agencies to a multi-purpose center located in the northwest quadrant of the intersection of US Route 50 and Walston Switch Road in Wicomico County, Maryland. The site location is provided in Exhibit 1.

STUDY AREA

The following intersections were identified to be evaluated in this study.

- US Route 50 and Walston Switch Road
- Walston Switch Road and Comtek Lane/Beaver Run Drive

US Route 50 and Walston Switch Road: US Route 50 is a divided highway consisting of two through lanes, one left turn lane, and one right turn lane in each direction. The speed limit on US Route 50 is 55 mph. Northbound Walston Switch Road consists of a left turn lane, a through lane, and a right turn lane. Southbound Walston Switch Road consists of a shared left/through lane and a right turn lane.

Walston Switch Road and Comtek Lane/Beaver Run Drive: This intersection is STOP controlled with the free movement on Walston Switch Road. The Northbound Walston Switch Road consists of a single lane and southbound Walston Switch Road, at this intersection, consists of a shared left/thru and a right turn lane. Both Comteck Lane and Beaver Run Drive consist of 2 lanes with a median separating the eastbound and westbound traffic.

The existing lane use and intersection control is depicted on Exhibit 2.

TRAFFIC VOLUMES

Intersection turning movement counts were collected by the Maryland State Highway Administration at the intersection of US 50 and Walston Switch Road on a weekday in April, 2009 when Wor-Wic Community College was in session. From this 12 hour count (between the hours of 7 AM and 7 PM) it was determined that the morning peak hour is between 7:15 and 8:15 AM and the evening peak hour is between 4:45 and 5:45 PM. Therefore, turning movement counts were collected at the intersection of Walston Switch Road and Comteck Lane/Beaver Run Drive during these time periods. These

peak hour traffic volumes are depicted on Exhibit 3. Condition diagrams and photo surveys are included in Appendix A of this report.

ANALYSIS OF EXISTING TRAFFIC CONDITIONS

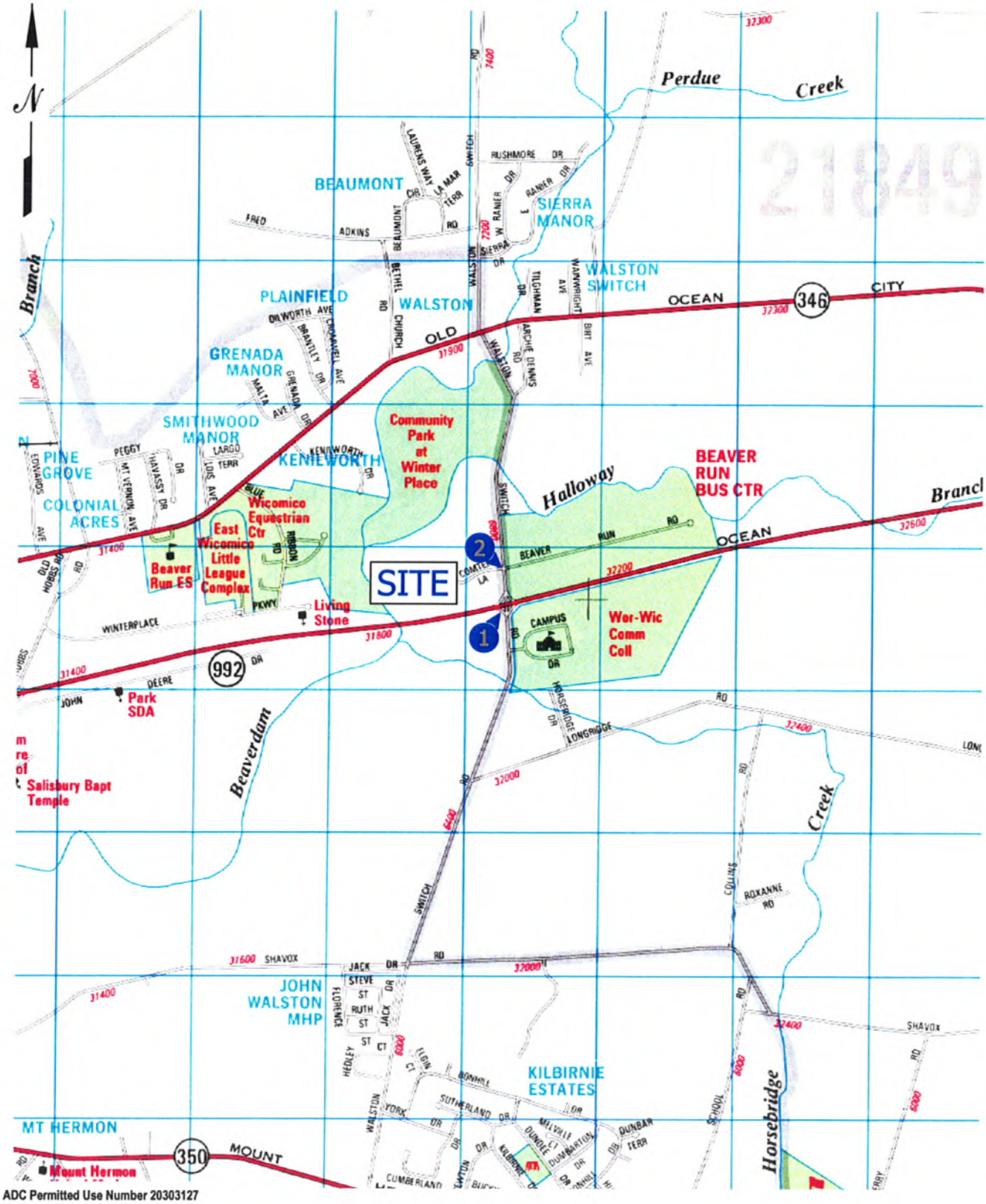
Utilizing the Critical Lane Methodology (CLV) all of the study intersections have sufficient capacity. Utilizing the Highway Capacity Manual Methodology (HCM), which provides results by approach and movement, all of the study intersections are operating at acceptable Levels of Service for the morning and evening peak hour periods. The results of the capacity analyses are summarized in Exhibit 7.

Queuing analyses were conducted for the left turns on US Route 50 and for the northbound left from Walston Switch Road into the site. In the field, excessive queuing was noted on Walston Switch Road at US Route 50; therefore, queuing analyses were conducted for the northbound and southbound left turns as well.

The results of the queuing analyses are provided in Exhibit 8, utilizing the HCM Methodology, and in Exhibit 9, utilizing SHA methodology for signalized intersections. Sufficient storage capacity exists for the eastbound and westbound left turns on US Route 50 for morning and evening existing peak hour traffic conditions.

However, the northbound 95th percentile queues are greater than the storage capacity provided in the median, utilizing the HCM methodology and the SHA methodology. There is sufficient capacity on the south leg of Walston Switch Road to meet the entire queue. However, both the northbound and southbound movements receive a green at the same time. When the queue exceeds the length of the median, vehicles may wait behind the stop bar on Walston Switch Road. An opposing left turning vehicle is either delayed unnecessarily or makes the turn in front of the vehicle waiting behind the stop bar for the queue to be reduced. Or, when the queue exceeds the length of the median, vehicles may queue into the through lanes of US Route 50, which is, of course, undesirable.

To resolve this situation, it is recommended that the northbound and southbound movements be split. A CLV analysis was conducted to determine the effect of this recommendation on capacity. As can be seen in Exhibit 7, sufficient capacity remains even if these movements are split.



ADC Permitted Use Number 20303127

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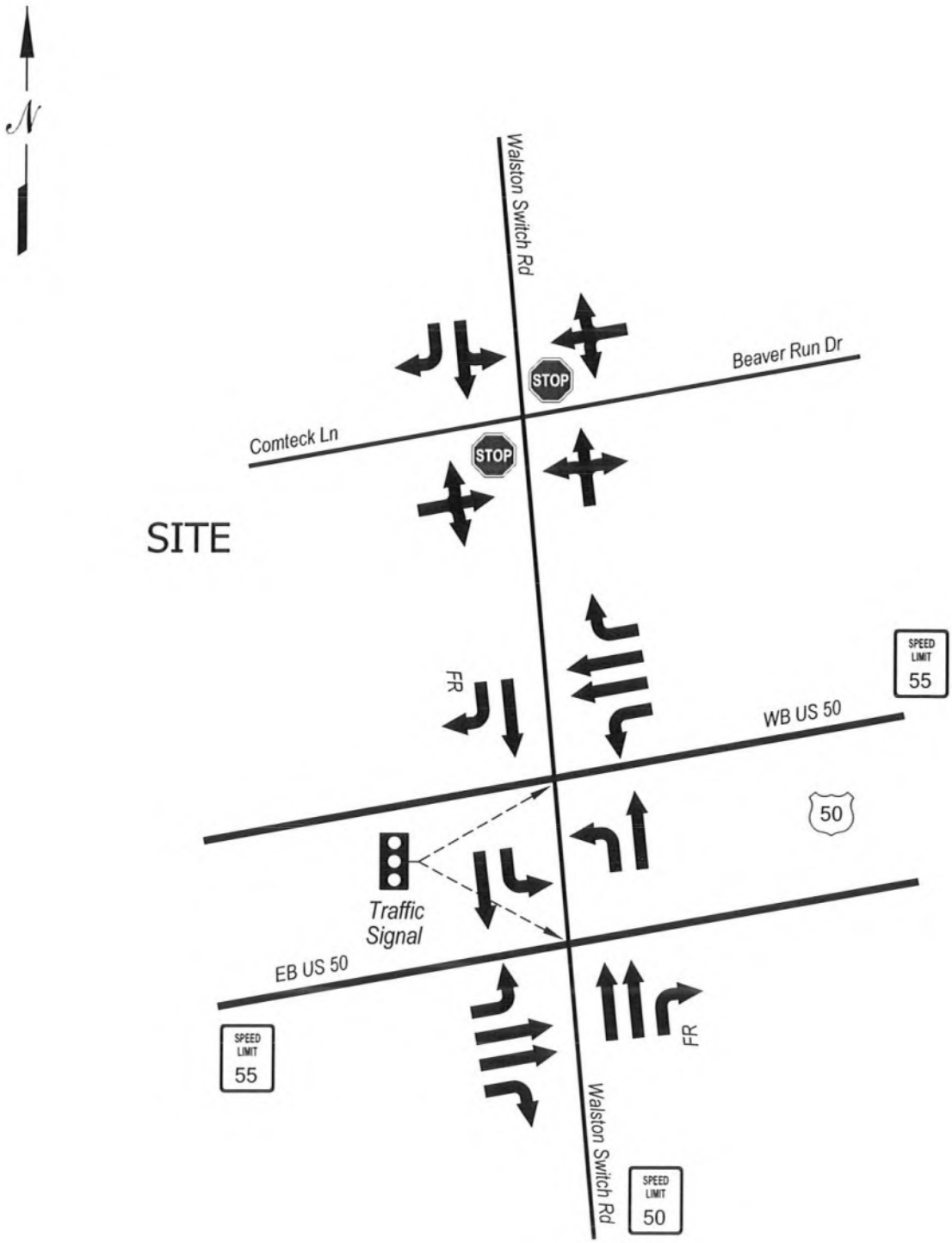
SCALE 1" = 2000'

STUDY INTERSECTION

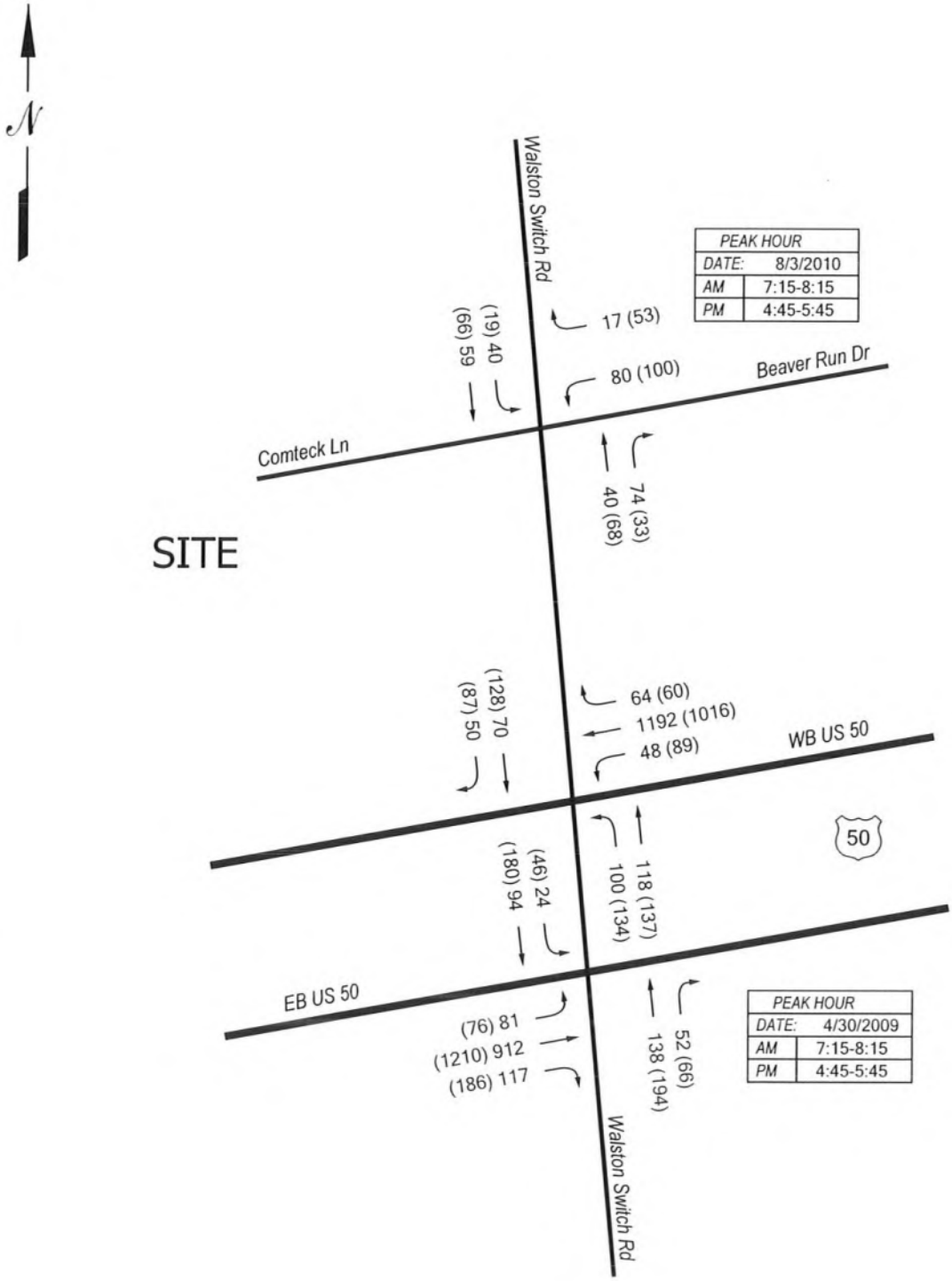
EXHIBIT 1
SITE LOCATION MAP



NOT TO SCALE

EXHIBIT 2
EXISTING LANE USE

myc, 100603\exhibits.dwg-lu-ex, f08/26/10



NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

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EXHIBIT 3
EXISTING PEAK HOUR TRAFFIC VOLUMES

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TOTAL TRAFFIC CONDITIONS

SITE INFORMATION

The Traffic Group, Inc. has conducted a Traffic Impact Analysis for the Salisbury/Wicomico County Metropolitan Organization to determine the impact on the surrounding road system of the proposed relocation of the Tri-County Council, Shore Transit, One Stop, and other agencies to a multi-purpose center located in the northwest quadrant of the intersection of US Route 50 and Walston Switch Road in Wicomico County, Maryland..

For the purpose of this Traffic Impact Analysis, the Tri-County Council Multi-Purpose Center will consist of a 72,670 square foot facility. It was assumed that Shore Transit will operate eleven bus routes during the weekdays from this facility. Greyhound will also utilize the facility. Access will be via the existing Comteck Drive on Walston Switch Road.

TRIP GENERATION/DISTRIBUTION

It is anticipated that the various agencies will move into the facility within one year. Therefore, no regional growth was applied to the traffic volumes. There are no known approved developments in the area.

Various agencies will occupy the 72,670 square foot facility. Utilizing information from the Institute of Transportation Engineer's (ITE) Trip Generation, 8th Edition, trip generation rates were selected for the general office land use category, ITE-710. It is likely that some employees will arrive at the facility via transit; however, it was assumed that all will arrive by private vehicle, thus generating a "worse-case scenario" for analysis.

It was assumed that Shore Transit will operate eleven bus routes during the weekdays and that one bus would arrive and depart for each route during both the morning and evening peak hour periods. Given that this is a transfer facility and our knowledge of the surrounding area, it was assumed that all Shore Transit passengers would arrive by bus. Greyhound will also operate from this facility, however, none of the buses will arrive nor depart during the morning or evening peak hour period.

The peak hour traffic volumes generated by the site are summarized in Exhibit 4. These volumes were distributed to the roadway network as shown in Exhibit 5 and 5A. The peak hour traffic volumes generated by the site were then added to the existing peak hour traffic volumes to obtain the total peak hour traffic volumes as shown in Exhibit 6.

ANALYSIS OF TOTAL TRAFFIC CONDITIONS

Utilizing the Critical Lane Methodology (CLV) all of the study intersections have sufficient capacity. Utilizing the Highway Capacity Manual Methodology (HCM), which provides results by approach and movement, all of the study intersections are projected to operate at acceptable Levels of Service for the morning and evening peak hour periods. The results of the capacity analyses are summarized in Exhibit 7.

The results of the queuing analyses are provided in Exhibit 8, utilizing the HCM Methodology, and in Exhibit 9, utilizing SHA methodology for signalized intersections. For total traffic conditions, sufficient storage capacity is projected for the eastbound and westbound left turns on US Route 50 for morning and evening total peak hour traffic conditions. As discussed in the analysis for Existing Traffic Conditions, the excessive queuing in the northbound direction would be resolved by modifying the signal phasing to provide for a split phase in these directions.

A queuing analysis was also conducted for the northbound left turn from Walston Switch Road into the site. As can be seen in Exhibit 8, the HCM methodology projects that less than one vehicle will be in the queue during the morning and evening total peak hour traffic conditions. The SHA queuing analysis methodology applies only to signalized intersections.

TRIP GENERATION FOR SUBJECT SITE

TRIP RATES / FORMULAE	IN/OUT
General Office (ksf, ITE-710)	
Morning Trips = 1.55 x ksf	88/12
Evening Trips = 1.49 x ksf	17/83

TRIP TOTALS

		MORNING PEAK HOUR			EVENING PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Tri-County Council/Shore Transit							
General Office (ksf, ITE-710)							
72,670	sq.ft.	99	14	113	18	90	108
	Buses	11	11	22	11	11	22

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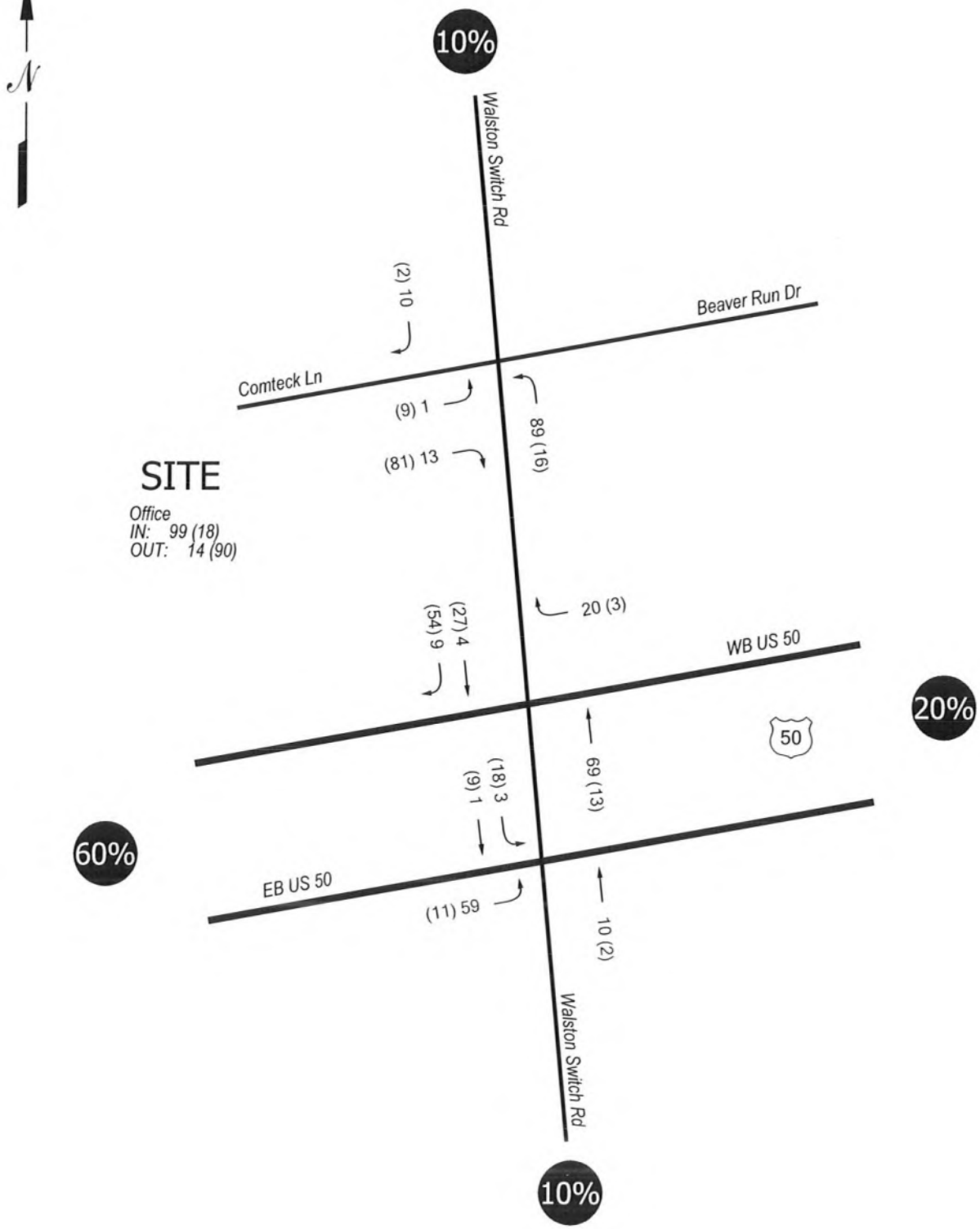
EXHIBIT 4
TRIP GENERATION FOR
SUBJECT SITE



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NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 5
TRIP ASSIGNMENT
FOR SUBJECT SITE
(OFFICE)

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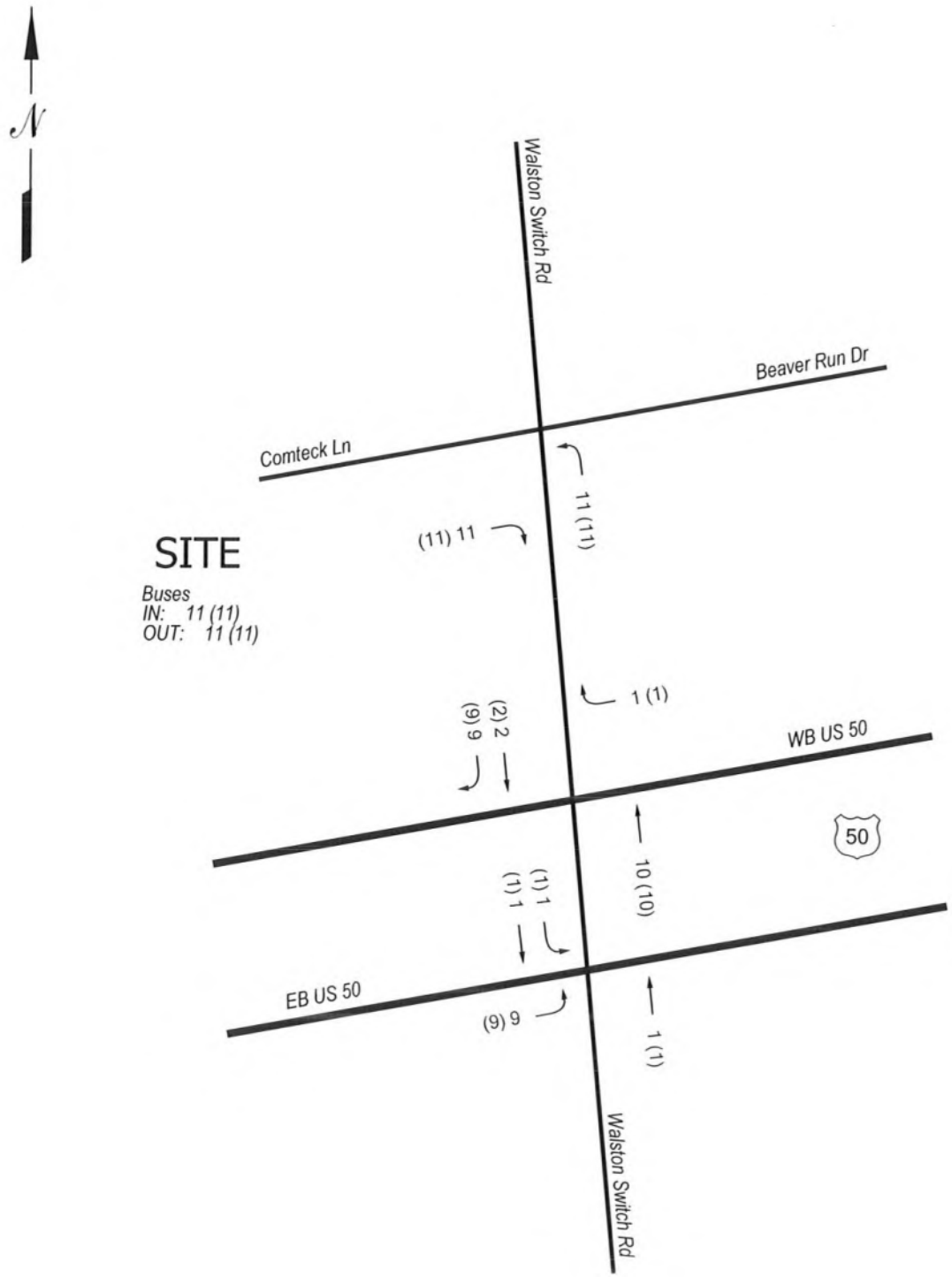

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 5A
TRIP ASSIGNMENT FOR SUBJECT SITE (BUSES)

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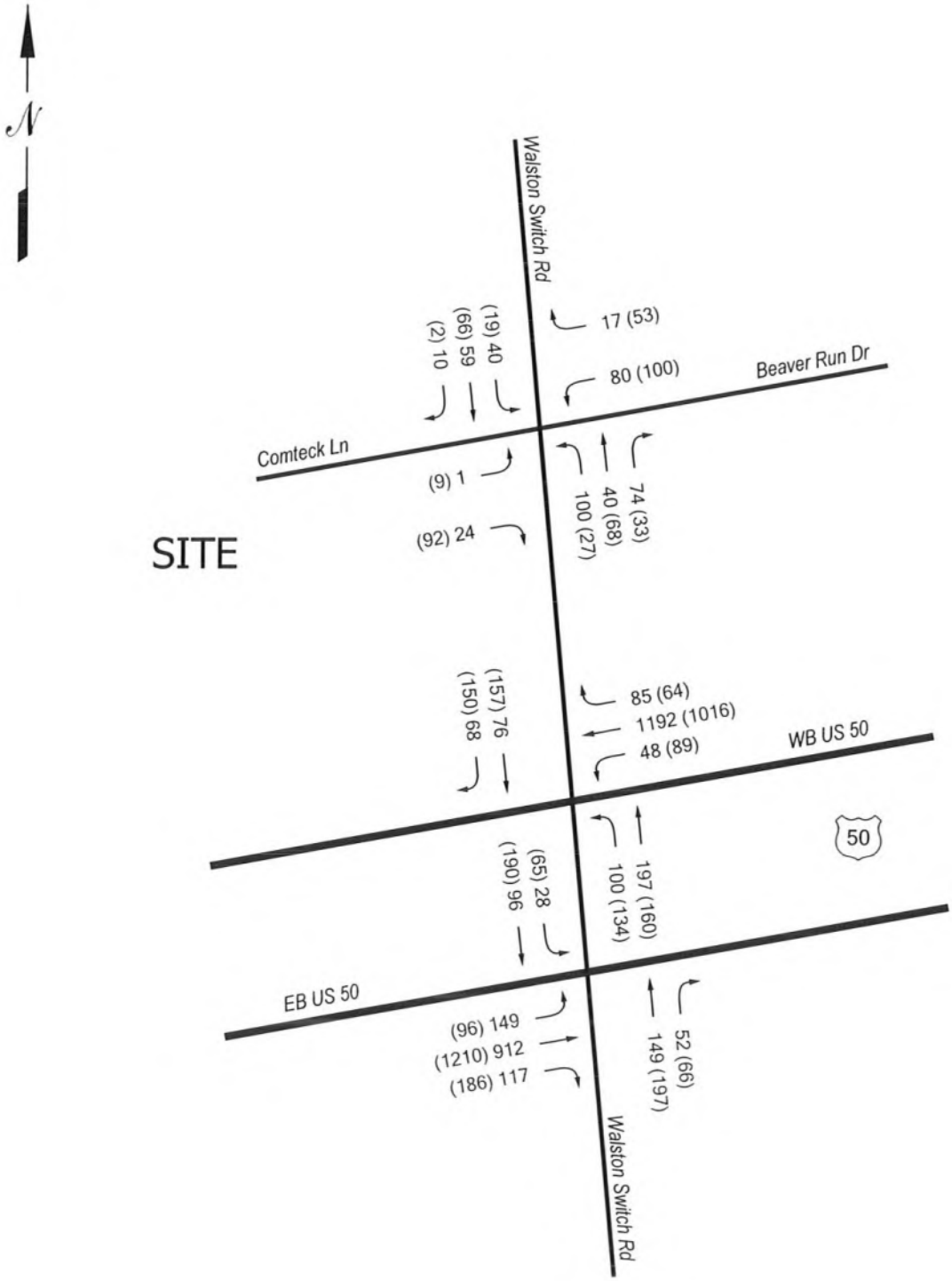

NOT TO SCALE

00 - MORNING PEAK HOUR
(00) - EVENING PEAK HOUR

EXHIBIT 6
TOTAL PEAK HOUR TRAFFIC VOLUMES

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	Existing Traffic		Total Traffic	
	AM	PM	AM	PM
CLV Analysis	**LOS / CLV**	**LOS / CLV**	**LOS / CLV**	**LOS / CLV**
1. US 50 & Walston Switch Rd	A / 878	A / 970	A / 948	A / 980
- Change to N/S Split Phasing	-	-	A / 948	A / 980
2. Walston Switch Rd & Beaver Run Dr	A / 251	A / 273	A / 370	A / 352
HCM Analysis	**LOS / Delay (sec)**	**LOS / Delay (sec)**	**LOS / Delay (sec)**	**LOS / Delay (sec)**
1. US 50 & Walston Switch Rd	B / 16.7	C / 20.5	B / 19.4	C / 21.3
2. Walston Switch Rd & Beaver Run Dr				
NB LTR	A / 7.4	A / 7.4	A / 7.6	A / 7.4
SB LT	A / 7.6	A / 7.5	A / 7.6	A / 7.5
WB LTR	B / 11.0	B / 10.6	C / 15.5	B / 12.3
EB LTR	-	-	A / 8.9	A / 9.3

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EXHIBIT 7
RESULTS OF INTERSECTION
CAPACITY ANALYSES

Intersection	Storage Length (ft)	Existing Traffic		Total Traffic	
		AM	PM	AM	PM
		95% Queue Length		95% Queue Length	
		No. of Veh. / Feet	No. of Veh. / Feet	No. of Veh. / Feet	No. of Veh. / Feet
1. US 50 & Walston Switch Rd					
EB US 50 Left	365	5.9 / 148	5.4 / 135	10.5 / 263	7.1 / 178
WB US 50 Left	402	3.6 / 90	6.8 / 170	3.6 / 90	6.8 / 170
NB Walston Switch Rd Left	100[1]	7.0 / 175	9.0 / 225	7.0 / 175	9.1 / 228
SB Walston Switch Rd Left	100[1]	1.6 / 40	3.0 / 75	1.8 / 45	4.2 / 105
2. Walston Switch Rd & Beaver Run Dr					
NB Walston Switch Rd LTR	-	-	-	0.26 / <25	0.06 / <25

Note:
1. The 100 feet storage length for both the NB and SB left turn reflect the length of the left turn lanes at the median. For NB left turn, there is another 220 feet of storage length on Walston Switch Rd.
2. The distance between the stop line on north leg Walston Switch Rd and Comtek Dr is 370 feet.
3. An average vehicle length of 25 feet was assumed to obtain the 95% queue length.

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EXHIBIT 8
SUMMARY OF QUEUE LENGTHS
(HCM ANALYSIS)

Intersection	Storage Length (ft)	Existing Traffic		Total Traffic	
		AM	PM	AM	PM
		95% Queue Length (ft)			
1. US 50 & Walston Switch Rd					
EB US 50 Left	365	87	81	159	103
WB US 50 Left	402	51	95	51	95
NB Walston Switch Rd Left	100	102	133	102	133
SB Walston Switch Rd Left	100	26	49	30	70

Note:
1. The 100 feet storage length for both the NB and SB left turn reflect the length of the left turn lanes at the median. For NB left turn, there is another 220 feet of storage length on Walston Switch Rd.
2. The distance between the stop line on north leg Walston Switch Rd and Comtek Dr is 370 feet.

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EXHIBIT 9
SUMMARY OF QUEUE LENGTHS
(SHA QUEUING ANALYSIS)

myc, 100603\queuesummary.xls-queue-sha, f09/03/10

RESULTS, RECOMMENDATIONS, and CONCLUSIONS

The Traffic Group, Inc. has conducted a Traffic Impact Analysis for the Salisbury/Wicomico County Metropolitan Organization to determine the impact on the surrounding road system of the proposed relocation of the Tri-County Council, Shore Transit, One Stop, and other agencies to a multi-purpose center located in the northwest quadrant of the intersection of US Route 50 and Walston Switch Road in Wicomico County, Maryland.

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Queuing analyses were conducted for the left turns on US Route 50 and for the northbound left from Walston Switch Road into the site. In the field, excessive queuing was noted in the median on Walston Switch Road at US Route 50; therefore, queuing analyses were conducted for the northbound and southbound left turns as well.

The results of the queuing analyses indicate that sufficient storage capacity exists and is projected for the eastbound and westbound left turns on US Route 50 for morning and evening peak hour traffic conditions. The queuing analysis for the northbound left turn from Walston Switch Road into the site indicates that less than one vehicle will be in the queue during the morning and evening total peak hour traffic conditions.

Excessive queuing was observed in the field for the northbound movement on Walston Switch Road. The 95th percentile queue for this movement is presently greater than the storage capacity provided in the median, utilizing the HCM methodology and SHA methodology. There is sufficient capacity on the south leg of Walston Switch Road to meet the left turn storage demand. However, both the northbound and southbound movements receive a green at the same time. When the queue exceeds the length of the median, vehicles may wait behind the stop bar on Walston Switch Road. An opposing left turning vehicle is either delayed unnecessarily or makes the turn in front of the vehicle waiting behind the stop bar for the queue to be reduced, which has a green indication,. Or, when the queue exceeds the length of the median, vehicles may queue into the through lanes of US Route 50, which is, of course, undesirable.

To resolve this situation, it is recommended that the northbound and southbound movements be split. A CLV analysis was conducted to determine the effect of this recommendation on capacity and sufficient capacity will be realized even if these movements are split for existing traffic volumes and for projected traffic volumes to include those generated by the Tri-County Council Multi-Purpose Center.

Please be aware the road improvements that are detailed above have not been designed. Our recommendation for these road improvements are conceptual in nature and are based upon the mathematical computations/capacity analyses that are provided in this report. It is unlikely, at this point in the process, that The Traffic Group, Inc. has undertaken sufficient field work/design to determine the impact of the recommended road improvements on either above ground or below ground utilities, drainage conditions, or right-of-way conditions that would impact the feasibility or cost of making the improvements that we have recommended. The feasibility and cost of making these improvements will be undertaken in the next phase of our studies.

APPENDIX A

Intersection Turning Movement Counts,

Condition Diagrams and Photos

Maryland State Highway Administration
Highway Information Services Division
Turning Movement Count Study - Field Sheet

Station ID: S2002220013 **County:** Wicomico **Comments:** LOS AM:A PM:A

Date: Thursday 04/30/2009 **Town:** none

Location: US 50 at WALSTON SWITCH RD (EASTBOUND) **Weather:**

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:15	08:15	1418		16:45	17:45	1958

Hour	Walston Switch Road From North				Walston Switch Road From South				US 50 From East				US 50 From West				Grand Total
Begin	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	
7:00	5	9	0	14	0	18	11	29	0	0	0	0	15	176	8	199	242
7:15	**5**	**22**	**0**	**27**	**0**	**21**	**11**	**32**	**0**	**0**	**0**	**0**	**22**	**286**	**12**	**320**	**379**
7:30	**6**	**17**	**0**	**23**	**0**	**51**	**17**	**68**	**0**	**0**	**0**	**0**	**18**	**235**	**27**	**280**	**371**
7:45	**8**	**29**	**0**	**37**	**0**	**37**	**9**	**46**	**0**	**0**	**0**	**0**	**26**	**188**	**48**	**262**	**345**
8:00	**5**	**26**	**0**	**31**	**0**	**29**	**15**	**44**	**0**	**0**	**0**	**0**	**15**	**203**	**30**	**248**	**323**
8:15	7	22	0	29	0	19	16	35	0	0	0	0	17	177	23	217	281
8:30	6	23	0	29	0	25	11	36	0	0	0	0	21	207	33	261	326
8:45	6	28	0	34	0	19	11	30	0	0	0	0	27	168	33	228	292
9:00	5	26	0	31	0	26	14	40	0	0	0	0	13	150	36	199	270
9:15	7	21	0	28	0	26	11	37	0	0	0	0	15	171	41	227	292
9:30	3	54	0	57	0	29	16	45	0	0	0	0	10	140	93	243	345
9:45	2	69	0	71	0	35	10	45	0	0	0	0	13	126	139	278	394
10:00	7	21	0	28	0	28	11	39	0	0	0	0	14	124	34	172	239
10:15	5	11	0	16	0	30	8	38	0	0	0	0	14	135	16	165	219
10:30	3	16	0	19	0	68	6	74	0	0	0	0	20	129	24	173	266
10:45	5	11	0	16	0	99	21	120	0	0	0	0	6	160	11	177	313
11:00	3	15	0	18	0	75	11	86	0	0	0	0	15	115	18	148	252
11:15	7	15	0	22	0	81	8	89	0	0	0	0	16	139	13	168	279
11:30	9	15	0	24	0	60	10	70	0	0	0	0	12	158	18	188	282
11:45	6	15	0	21	0	66	10	76	0	0	0	0	23	143	26	192	289
12:00	3	16	0	19	0	47	9	56	0	0	0	0	15	156	31	202	277
12:15	6	15	0	21	0	43	12	55	0	0	0	0	19	186	25	230	306
12:30	5	12	0	17	0	40	5	45	0	0	0	0	11	168	24	203	265
12:45	6	20	0	26	0	31	15	46	0	0	0	0	16	172	32	220	292
13:00	3	13	0	16	0	36	8	44	0	0	0	0	18	188	31	237	297
13:15	3	16	0	19	0	25	2	27	0	0	0	0	23	150	40	213	259
13:30	9	33	0	42	0	30	6	36	0	0	0	0	13	122	62	197	275
13:45	2	22	0	24	0	37	7	44	0	0	0	0	9	197	69	275	343
14:00	5	14	0	19	0	23	6	29	0	0	0	0	17	178	29	224	272
14:15	1	12	0	13	0	25	2	27	0	0	0	0	11	209	25	245	285
14:30	7	10	0	17	0	53	19	72	0	0	0	0	10	195	15	220	309
14:45	4	19	0	23	0	63	12	75	0	0	0	0	16	229	22	267	365
15:00	5	13	0	18	0	58	9	67	0	0	0	0	15	217	20	252	337
15:15	9	23	0	32	0	46	18	64	0	0	0	0	16	253	19	288	384
15:30	4	21	0	25	0	40	9	49	0	0	0	0	19	247	24	290	364
15:45	3	22	0	25	0	29	10	39	0	0	0	0	12	244	14	270	334
16:00	3	27	0	30	0	39	14	53	0	0	0	0	34	276	33	343	426
16:15	6	31	0	37	0	47	12	59	0	0	0	0	14	303	34	351	447
16:30	12	36	0	48	0	68	24	92	0	0	0	0	23	213	31	267	407
16:45	**11**	**34**	**0**	**45**	**0**	**53**	**24**	**77**	**0**	**0**	**0**	**0**	**24**	**306**	**37**	**367**	**489**
17:00	**9**	**55**	**0**	**64**	**0**	**43**	**13**	**56**	**0**	**0**	**0**	**0**	**12**	**331**	**46**	**389**	**509**
17:15	**14**	**52**	**0**	**66**	**0**	**54**	**12**	**66**	**0**	**0**	**0**	**0**	**24**	**302**	**55**	**381**	**513**
17:30	**12**	**39**	**0**	**51**	**0**	**44**	**17**	**61**	**0**	**0**	**0**	**0**	**16**	**271**	**48**	**335**	**447**
17:45	6	34	0	40	0	44	11	55	0	0	0	0	15	220	52	287	382
18:00	4	36	0	40	0	34	12	46	0	0	0	0	9	202	50	261	347
18:15	3	23	0	26	0	33	15	48	0	0	0	0	7	218	54	279	353
18:30	5	23	0	28	0	39	2	41	0	0	0	0	16	167	14	197	266
18:45	1	19	0	20	0	42	18	60	0	0	0	0	6	159	21	186	266
TOTAL	**271**	**1155**	**0**	**1426**	**0**	**2008**	**560**	**2568**	**0**	**0**	**0**	**0**	**772**	**9409**	**1640**	**11821**	**15815**
AM Peak	**24**	**94**	**0**	**118**	**0**	**138**	**52**	**190**	**0**	**0**	**0**	**0**	**81**	**912**	**117**	**1110**	**1418**
PM Peak	**46**	**180**	**0**	**226**	**0**	**194**	**66**	**260**	**0**	**0**	**0**	**0**	**76**	**1210**	**186**	**1472**	**1958**

Station ID: S2002220013 **County:** Wicomico **Comments:** LOS AM:A PM:A

Date: Thursday 04/30/2009 **Town:** none

Location: US 50 at WALSTON SWITCH RD (EASTBOUND) **Weather:**

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:15	08:15	1418		16:45	17:45	1958

Hour	Walston Switch Road North Leg			Walston Switch Road South Leg			US 50 East Leg			US 50 West Leg		
Ending	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
7:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
7:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:15	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
9:45	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	1	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
16:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:45	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
AM Peak	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PM Peak	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Station ID: S2002220013 **County:** Wicomico **Comments:** LOS AM:A PM:A

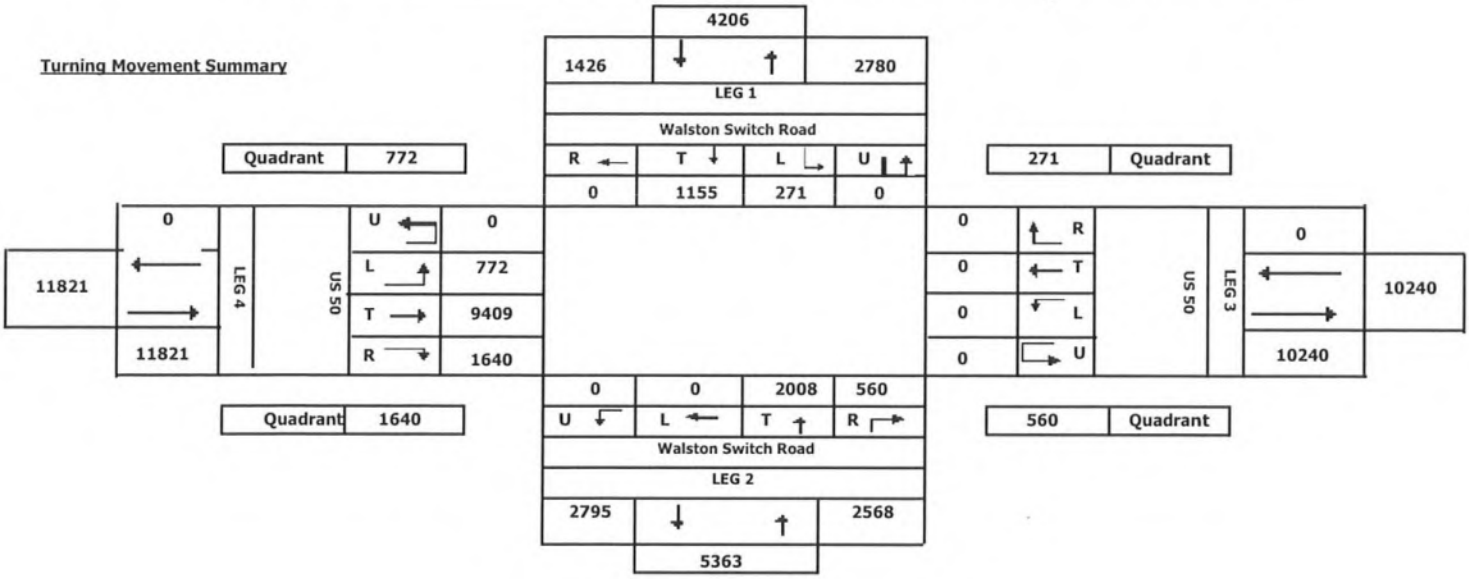
Date: Thursday 04/30/2009 **Town:** none

Location: US 50 at WALSTON SWITCH RD (EASTBOUND) **Weather:**

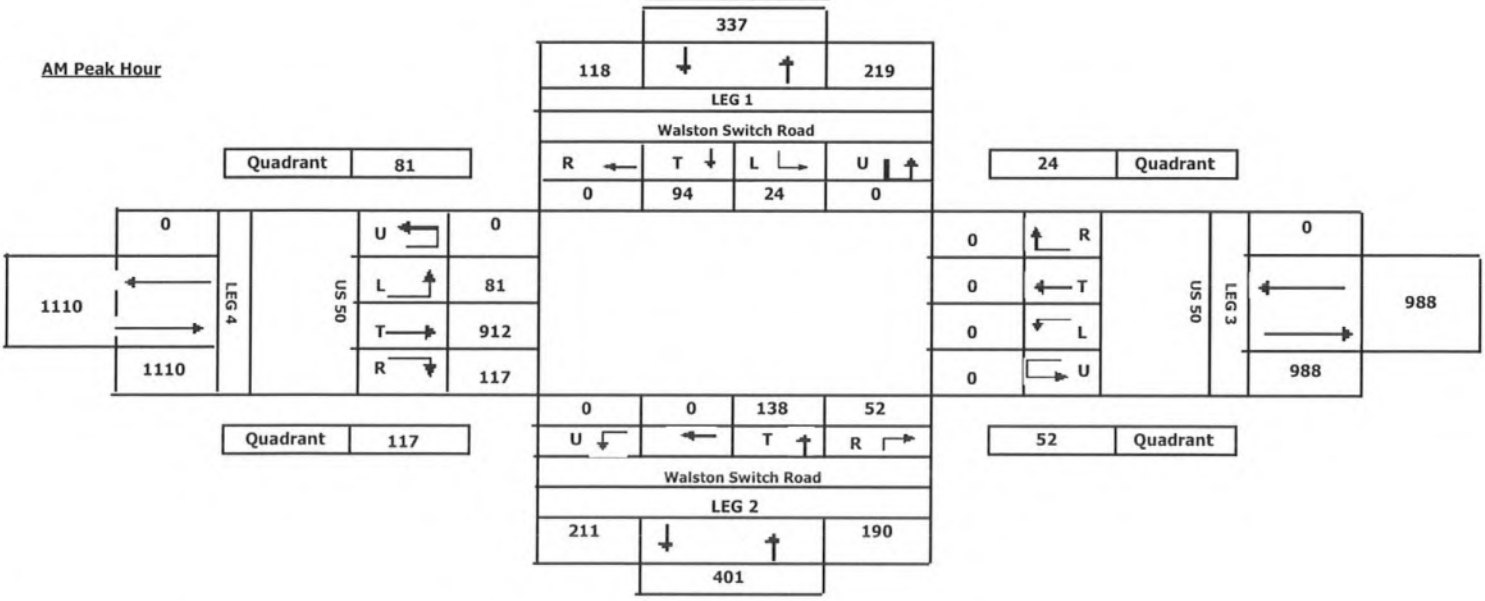
Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:15	08:15	1418		16:45	17:45	1958

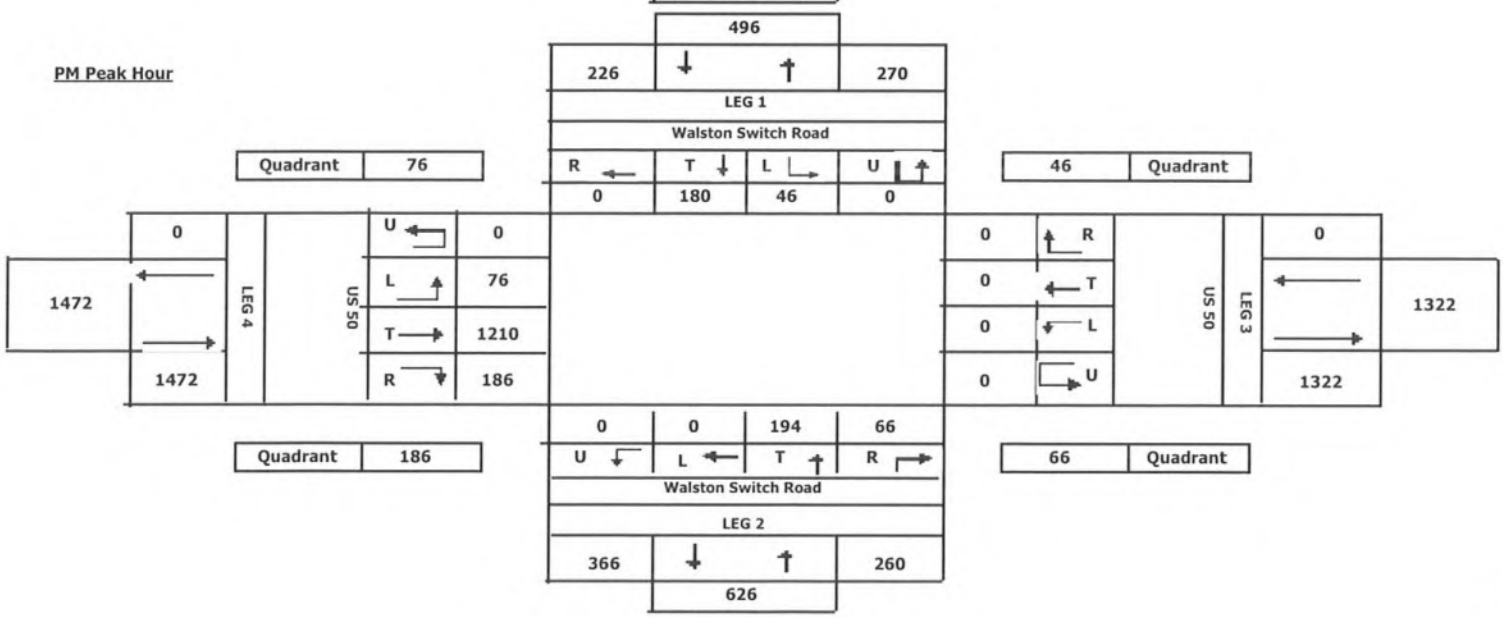
Turning Movement Summary



AM Peak Hour



PM Peak Hour



Maryland State Highway Administration
Highway Information Services Division
Turning Movement Count Study - Field Sheet

Station ID: S2002220014 **County:** Wicomico **Comments:** LOS AM:A PM:A (no pedestrians)

Date: Thursday 04/30/2009 **Town:** none

Location: US 50 at WALSTON SWITCH RD (WESTBOUND **Weather:**

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:15	08:15	1642		16:30	17:30	1664

Hour	Walston Switch Road From North				Walston Switch Road From South				US 50 From East				US 50 From West				Grand Total
Begin	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	
7:00	0	10	6	16	13	20	0	33	4	171	6	181	0	0	0	0	230
7:15	**0**	**19**	**14**	**33**	**12**	**30**	**0**	**42**	**8**	**267**	**13**	**288**	**0**	**0**	**0**	**0**	**363**
7:30	**0**	**15**	**9**	**24**	**37**	**32**	**0**	**69**	**9**	**328**	**19**	**356**	**0**	**0**	**0**	**0**	**449**
7:45	**0**	**19**	**16**	**35**	**27**	**36**	**0**	**63**	**17**	**341**	**18**	**376**	**0**	**0**	**0**	**0**	**474**
8:00	**0**	**17**	**11**	**28**	**24**	**20**	**0**	**44**	**14**	**256**	**14**	**284**	**0**	**0**	**0**	**0**	**356**
8:15	0	15	7	22	13	23	0	36	14	236	19	269	0	0	0	0	327
8:30	0	20	14	34	15	31	0	46	9	231	9	249	0	0	0	0	329
8:45	0	21	25	46	17	29	0	46	13	223	8	244	0	0	0	0	336
9:00	0	15	13	28	19	20	0	39	16	193	9	218	0	0	0	0	285
9:15	0	15	21	36	20	21	0	41	13	201	7	221	0	0	0	0	298
9:30	0	16	11	27	21	18	0	39	41	183	10	234	0	0	0	0	300
9:45	0	25	8	33	25	24	0	49	46	178	9	233	0	0	0	0	315
10:00	0	11	15	26	23	19	0	42	17	178	5	200	0	0	0	0	268
10:15	0	6	15	21	25	19	0	44	5	188	7	200	0	0	0	0	265
10:30	0	14	17	31	52	36	0	88	5	198	6	209	0	0	0	0	328
10:45	0	10	20	30	81	24	0	105	6	181	9	196	0	0	0	0	331
11:00	0	12	18	30	62	28	0	90	6	157	9	172	0	0	0	0	292
11:15	0	16	18	34	52	43	0	95	6	176	9	191	0	0	0	0	320
11:30	0	17	18	35	47	26	0	73	7	170	4	181	0	0	0	0	289
11:45	0	12	23	35	56	33	0	89	9	159	7	175	0	0	0	0	299
12:00	0	11	29	40	36	26	0	62	8	189	12	209	0	0	0	0	311
12:15	0	16	20	36	32	30	0	62	5	185	9	199	0	0	0	0	297
12:30	0	13	23	36	31	20	0	51	5	211	8	224	0	0	0	0	311
12:45	0	15	15	30	28	19	0	47	10	190	6	206	0	0	0	0	283
13:00	0	7	19	26	25	29	0	54	6	175	13	194	0	0	0	0	274
13:15	0	13	13	26	20	28	0	48	6	158	8	172	0	0	0	0	246
13:30	0	27	21	48	24	19	0	43	14	186	6	206	0	0	0	0	297
13:45	0	15	17	32	32	14	0	46	9	172	11	192	0	0	0	0	270
14:00	0	11	18	29	17	23	0	40	8	165	5	178	0	0	0	0	247
14:15	0	7	23	30	21	15	0	36	6	199	7	212	0	0	0	0	278
14:30	0	9	13	22	45	18	0	63	5	195	5	205	0	0	0	0	290
14:45	0	13	12	25	53	26	0	79	10	189	12	211	0	0	0	0	315
15:00	0	15	21	36	56	18	0	74	4	231	11	246	0	0	0	0	356
15:15	0	20	19	39	37	26	0	63	12	219	5	236	0	0	0	0	338
15:30	0	14	13	27	29	30	0	59	11	236	10	257	0	0	0	0	343
15:45	0	11	19	30	22	19	0	41	14	255	8	277	0	0	0	0	348
16:00	0	19	28	47	31	42	0	73	11	241	5	257	0	0	0	0	377
16:15	0	20	20	40	32	29	0	61	19	257	20	296	0	0	0	0	397
16:30	**0**	**28**	**27**	**55**	**56**	**35**	**0**	**91**	**20**	**234**	**17**	**271**	**0**	**0**	**0**	**0**	**417**
16:45	**0**	**26**	**14**	**40**	**32**	**45**	**0**	**77**	**17**	**263**	**17**	**297**	**0**	**0**	**0**	**0**	**414**
17:00	**0**	**32**	**32**	**64**	**30**	**25**	**0**	**55**	**24**	**237**	**15**	**276**	**0**	**0**	**0**	**0**	**395**
17:15	**0**	**41**	**25**	**66**	**38**	**41**	**0**	**79**	**26**	**254**	**13**	**293**	**0**	**0**	**0**	**0**	**438**
17:30	0	29	16	45	34	26	0	60	22	262	15	299	0	0	0	0	404
17:45	0	23	22	45	33	24	0	57	16	215	7	238	0	0	0	0	340
18:00	0	19	11	30	27	16	0	43	21	141	10	172	0	0	0	0	245
18:15	0	9	8	17	23	17	0	40	17	184	14	215	0	0	0	0	272
18:30	0	15	19	34	20	35	0	55	14	159	10	183	0	0	0	0	272
18:45	0	10	9	19	31	17	0	48	10	144	10	164	0	0	0	0	231
TOTAL	**0**	**793**	**825**	**1618**	**1536**	**1244**	**0**	**2780**	**615**	**9961**	**486**	**11062**	**0**	**0**	**0**	**0**	**15460**
AM Peak	**0**	**70**	**50**	**120**	**100**	**118**	**0**	**218**	**48**	**1192**	**64**	**1304**	**0**	**0**	**0**	**0**	**1642**
PM Peak	**0**	**127**	**98**	**225**	**156**	**146**	**0**	**302**	**87**	**988**	**62**	**1137**	**0**	**0**	**0**	**0**	**1664**

Station ID: S2002220014 **County:** Wicomico **Comments:** LOS AM:A PM:A (no pedestrians)

Date: Thursday 04/30/2009 **Town:** none

Location: US 50 at WALSTON SWITCH RD (WESTBOUND **Weather:**

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:15	08:15	1642		16:30	17:30	1664

Hour	Walston Switch Road North Leg			Walston Switch Road South Leg			US 50 East Leg			US 50 West Leg		
Ending	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
7:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
7:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:15	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:15	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
9:45	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0
16:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
17:30	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
AM Peak	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
PM Peak	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Station ID: S2002220014 **County:** Wicomico **Comments:** LOS AM:A PM:A (no pedestrians)

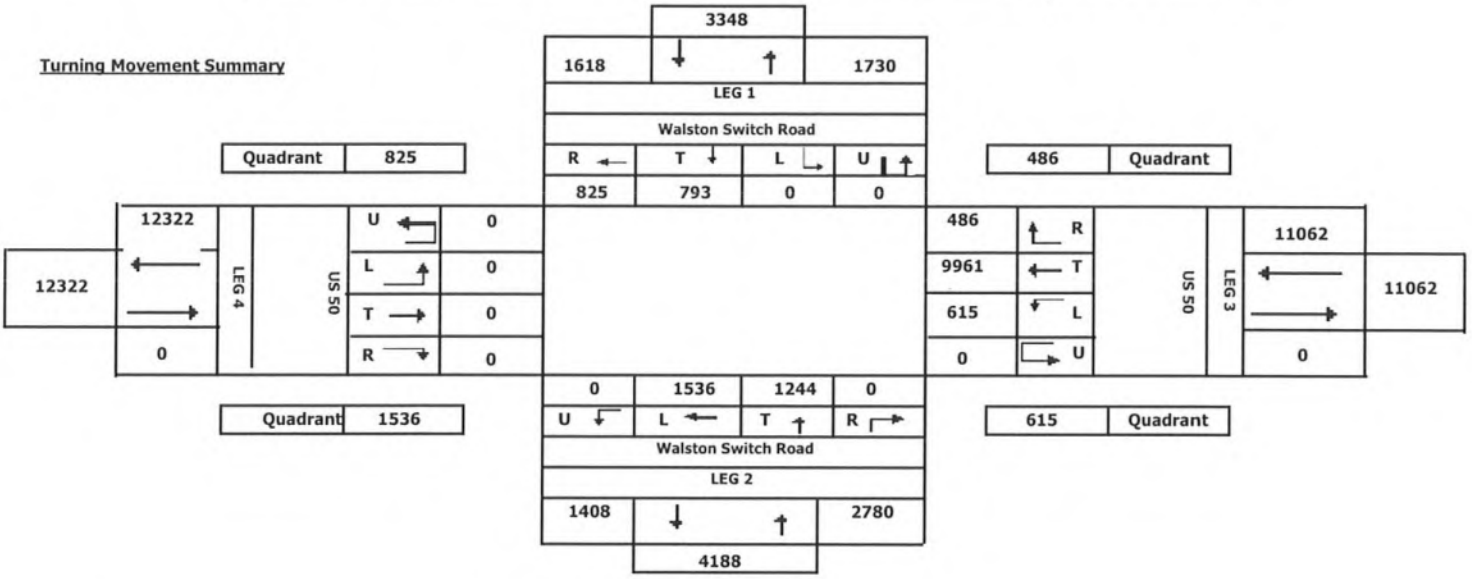
Date: Thursday 04/30/2009 **Town:** none

Location: US 50 at WALSTON SWITCH RD (WESTBOUND **Weather:**

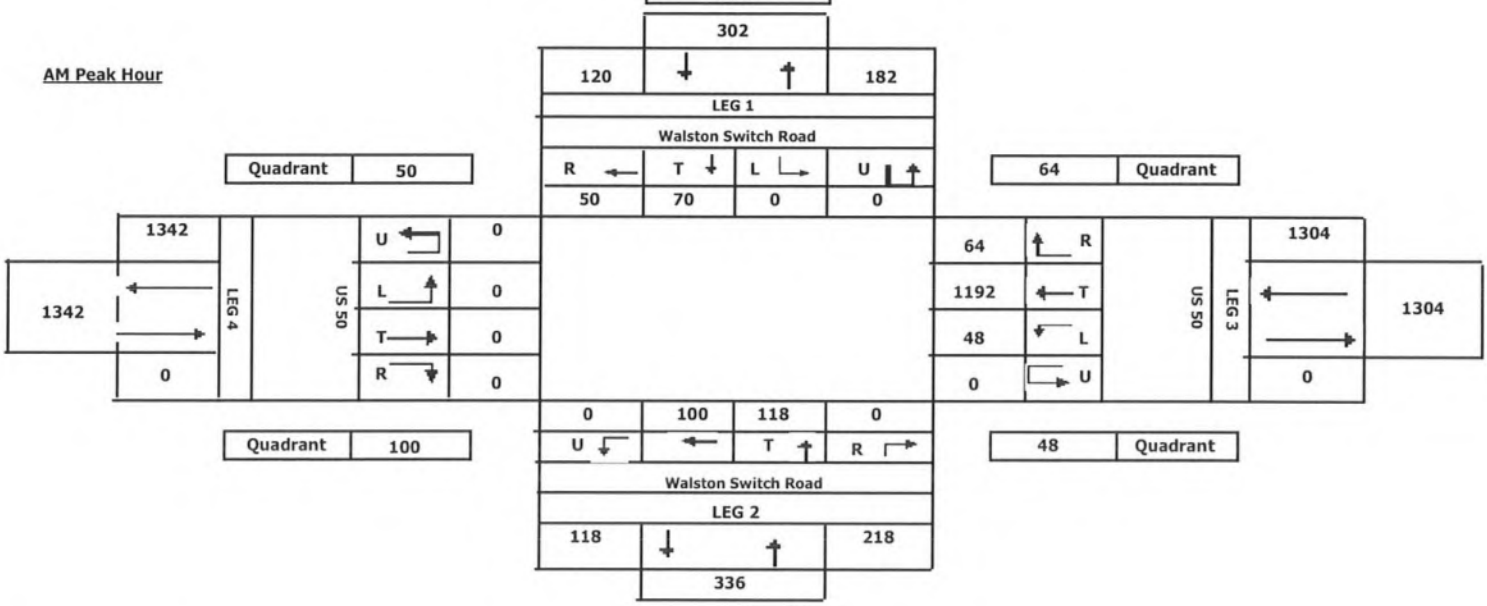
Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:15	08:15	1642		16:30	17:30	1664

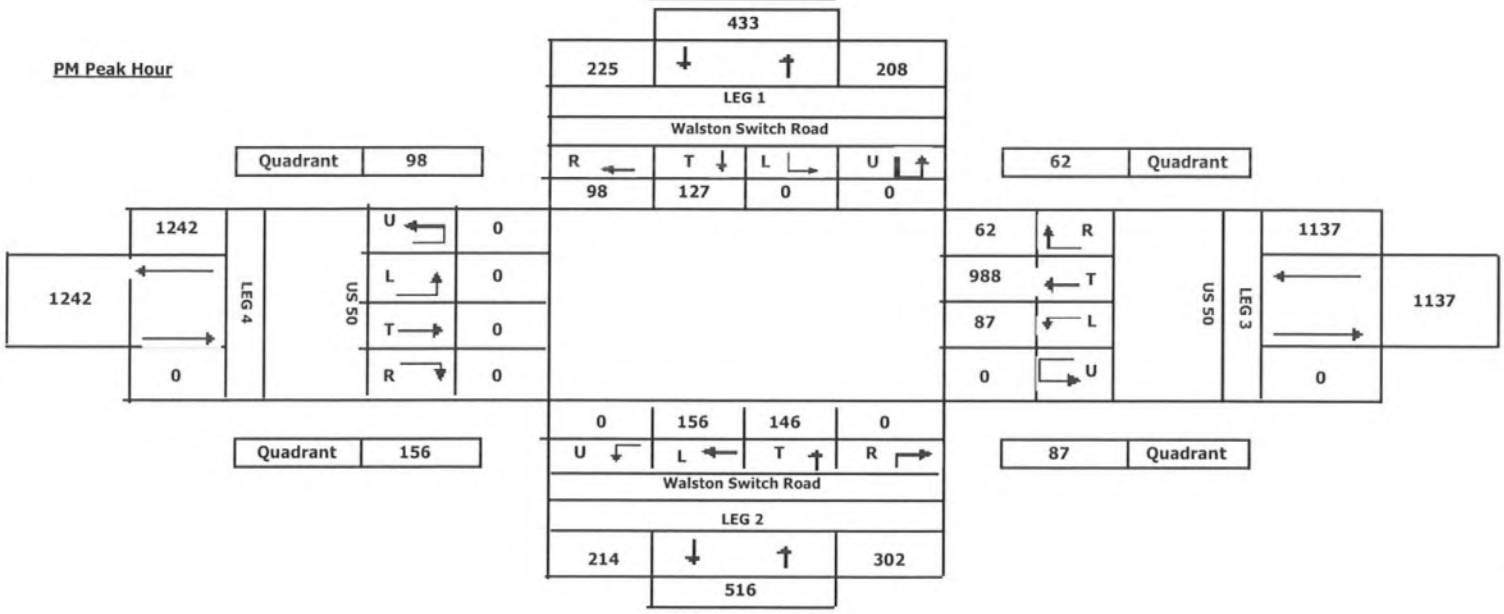
Turning Movement Summary

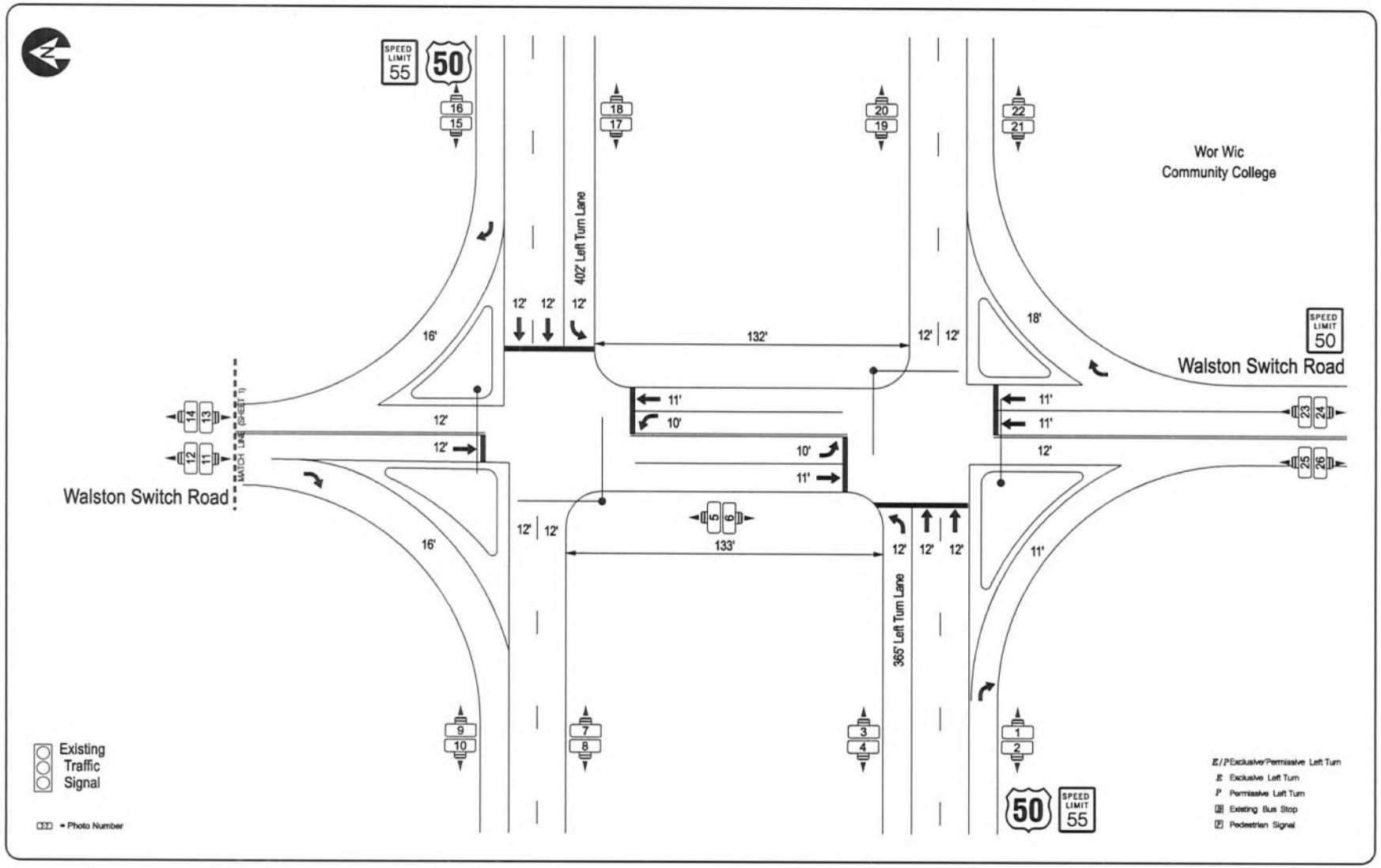


AM Peak Hour



PM Peak Hour





The Traffic Group

Tri County Council

US 50
at
Walston Switch Road

FIELD WORK BY: K. Tustin
DRAWN BY: M. Vallati
DATE: August, 2010
SCALE: N/A

JOB NO.: 2010-0603
DWG NAME: US 50 at Walston Switch Rd.dgn
LOCATION: Wicomico County, MD
SHEET NO.: 2 OF 2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VEHICLE TURNING MOVEMENT COUNT - SUMMARY

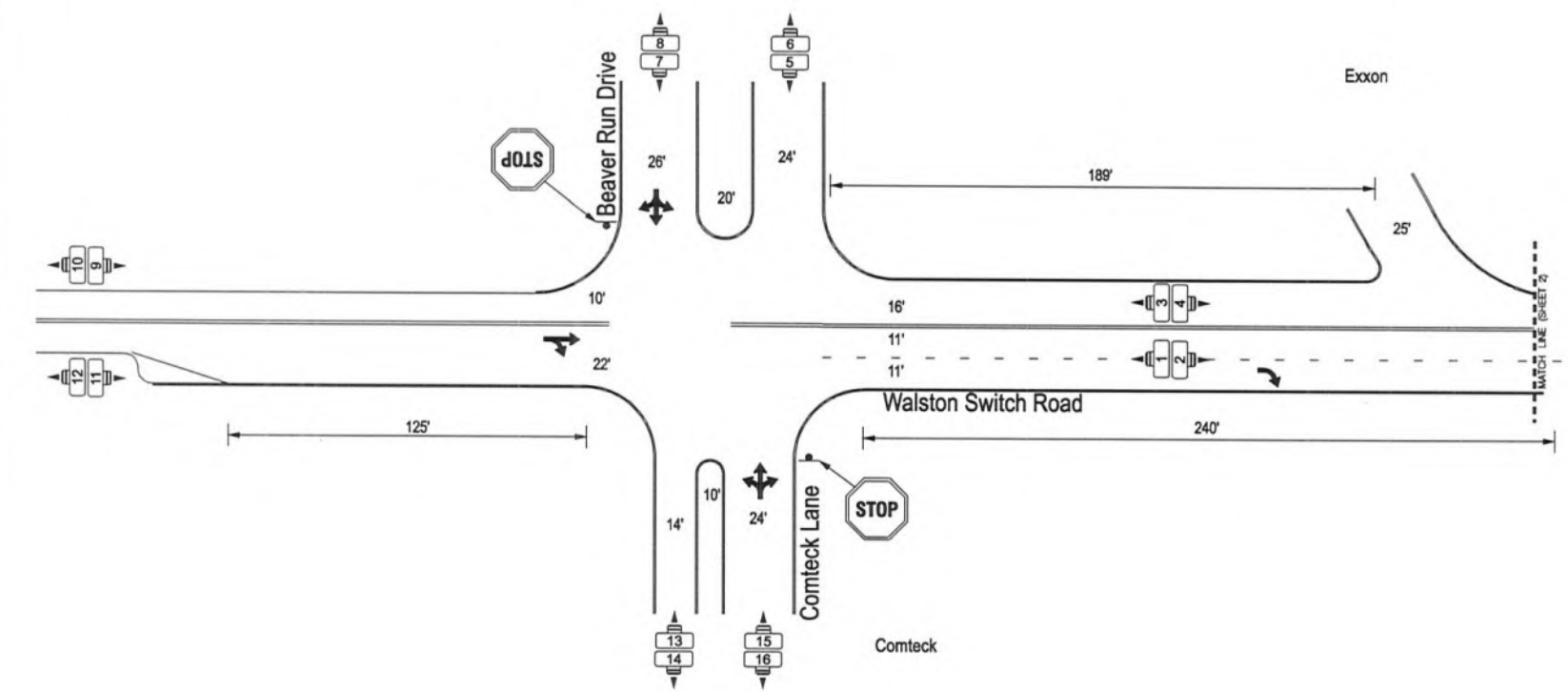
Intersection of: Walston Switch Road
and: Beaver Run Drive
Location: Wicomico County, MD

Counted by: EL
Date: August 3, 2010
Weather: Clear, 70s to 90s
Entered by: KT

Day: Tuesday

The Traffic Group

TIME	TRAFFIC FROM NORTH on: Walston Switch Road					TRAFFIC FROM SOUTH on: Walston Switch Road					TRAFFIC FROM EAST on: Beaver Run Drive					TRAFFIC FROM WEST on: Beaver Run Drive					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
07:0-15					0					0					0					0	0
15-30	0	12	9	0	21	22	5	0	0	27	5	0	19	0	24	0	0	0	0	0	72
30-45	0	9	8	0	17	10	13	0	0	23	6	0	24	0	30	0	0	0	0	0	70
45-00	0	23	14	0	37	23	12	0	0	35	4	0	17	0	21	0	0	0	0	0	93
08:0-15	0	15	9	0	24	19	10	0	0	29	2	0	20	0	22	0	0	0	0	0	75
15-30					0					0					0					0	0
30-45					0					0					0					0	0
45-00					0					0					0					0	0
2 Hr Totals	0	59	40	0	99	74	40	0	0	114	17	0	80	0	97	0	0	0	0	0	310
1 Hr Totals																					
07-08																					0
715-815	0	59	40	0	99	74	40	0	0	114	17	0	80	0	97	0	0	0	0	0	310
730-830																					0
745-845																					0
08-09																					0
PEAK HOUR																					
715-815	0	59	40	0	99	74	40	0	0	114	17	0	80	0	97	0	0	0	0	0	310
PM																					
04:0-15					0					0					0					0	0
15-30					0					0					0					0	0
30-45					0					0					0					0	0
45-00	0	11	6	0	17	12	5	0	0	17	11	0	30	0	41	0	0	0	0	0	75
05:0-15	0	14	2	0	16	7	17	0	0	24	19	0	24	0	43	0	0	0	0	0	83
15-30	0	22	5	0	27	10	19	0	0	29	12	0	24	0	36	0	0	0	0	0	92
30-45	0	19	6	0	25	4	27	0	0	31	11	0	22	0	33	0	0	0	0	0	89
45-00					0					0					0					0	0
2 Hr Totals	0	66	19	0	85	33	68	0	0	101	53	0	100	0	153	0	0	0	0	0	339
1 Hr Totals																					
04-05																					0
415-515																					0
430-530																					0
445-545	0	66	19	0	85	33	68	0	0	101	53	0	100	0	153	0	0	0	0	0	339
05-06																					0
PEAK HOUR																					
445-545	0	66	19	0	85	33	68	0	0	101	53	0	100	0	153	0	0	0	0	0	339



□□ = Photo Number

Tri County Council
US 50
at
Walston Switch Road

FIELD WORK BY: K. Tustin
DRAWN BY: M. Vallati
DATE: August, 2010
SCALE: N/A

JOB NO.: 2010-0603
DWG NAME: US 50 at Walston Switch Rd.dgn
LOCATION: Wicomico County, MD
SHEET NO.: 1 OF 2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STOP
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APPENDIX B

Intersection Capacity Analysis

CLV Methodology

HCM Methodology

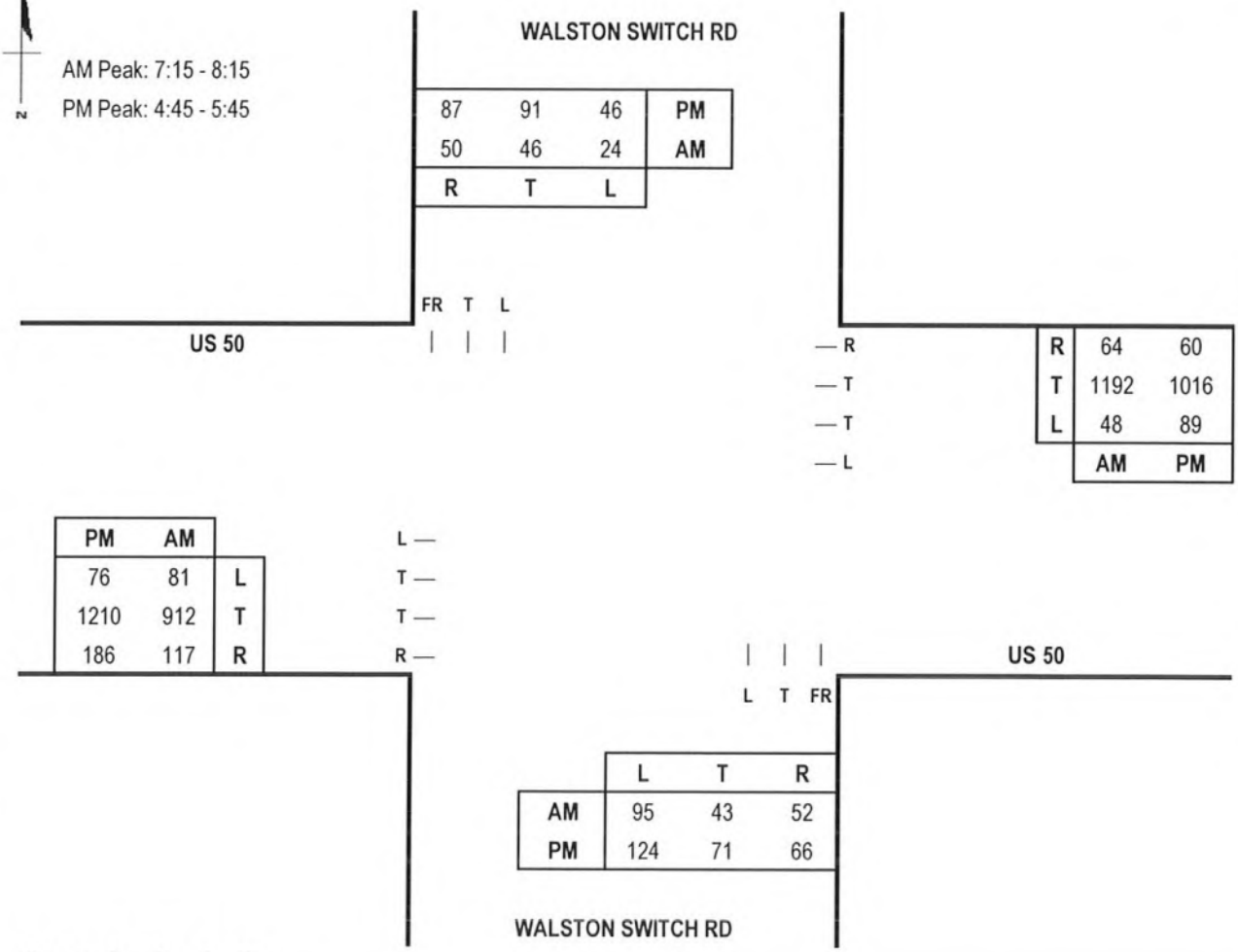
CRITICAL LANE VOLUME (CLV) METHODOLOGY
for MSHA

E/W Road: US 50
N/S Road: Walston Switch Rd
Conditions: Existing Traffic

Date of Count: 4/30/2009
Day of Count: Thursday
Analyst: Ming-Yu Chien

The Traffic Group®

AM Peak: 7:15 - 8:15
PM Peak: 4:45 - 5:45



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	43	1.00	43	24	1.00	24	141
SB	46	1.00	46	95	1.00	95	
EB	912	0.55	502	48	1.00	48	737
WB	1192	0.55	656	81	1.00	81	
						CLV TOTAL=	878
						Level of Service (LOS)=	A

AM V/C =0.55

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	71	1.00	71	46	1.00	46	215
SB	91	1.00	91	124	1.00	124	
EB	1210	0.55	666	89	1.00	89	755
WB	1016	0.55	559	76	1.00	76	
						CLV TOTAL=	970
						Level of Service (LOS)=	A

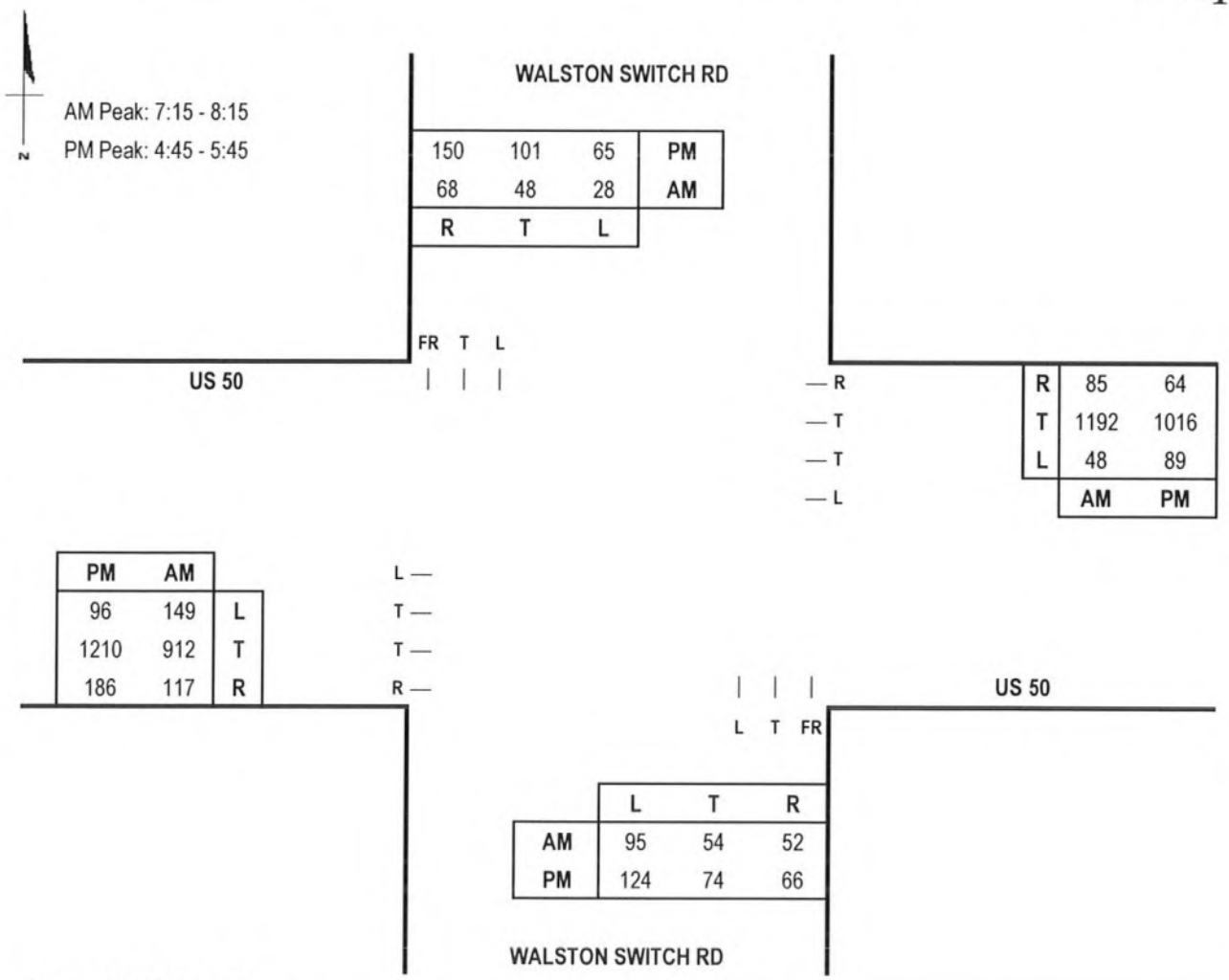
PM V/C =0.61

CRITICAL LANE VOLUME (CLV) METHODOLOGY
for MSHA

E/W Road: US 50
N/S Road: Walston Switch Rd
Conditions: Total Traffic

Date of Count: 4/30/2009
Day of Count: Thursday
Analyst: Ming-Yu Chien

The Traffic Group®



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	54	1.00	54	28	1.00	28	143
SB	48	1.00	48	95	1.00	95	
EB	912	0.55	502	48	1.00	48	805
WB	1192	0.55	656	149	1.00	149	

CLV TOTAL= **948**
Level of Service (LOS)= **A**
AM V/C =0.59

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	74	1.00	74	65	1.00	65	225
SB	101	1.00	101	124	1.00	124	
EB	1210	0.55	666	89	1.00	89	755
WB	1016	0.55	559	96	1.00	96	

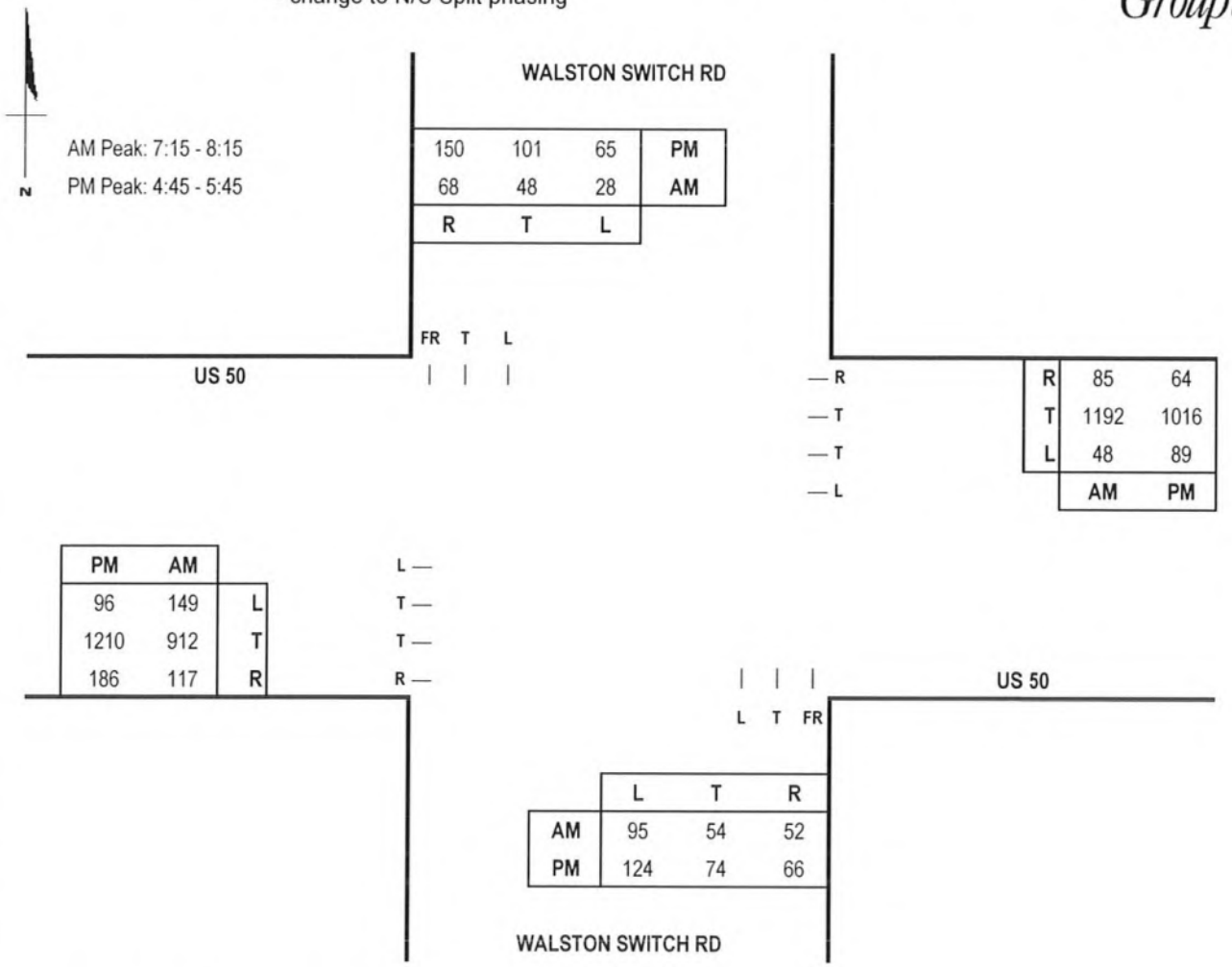
CLV TOTAL= **980**
Level of Service (LOS)= **A**
PM V/C =0.61

CRITICAL LANE VOLUME (CLV) METHODOLOGY

for Prince Georges County

E/W Road: US 50
N/S Road: Walston Switch Rd
Conditions: Total Traffic
- change to N/S Split phasing

Date of Count: 4/30/2009
Day of Count: Thursday
Analyst: Ming-Yu Chien



Capacity Analysis - North/South Split

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	95	1.00	95				95
SB	48	1.00	48				48
EB	912	0.55	502	48	1.00	48	805
WB	1192	0.55	656	149	1.00	149	

CLV TOTAL= 948
Level of Service (LOS)= A
AM V/C =0.59

Evening Peak Hour

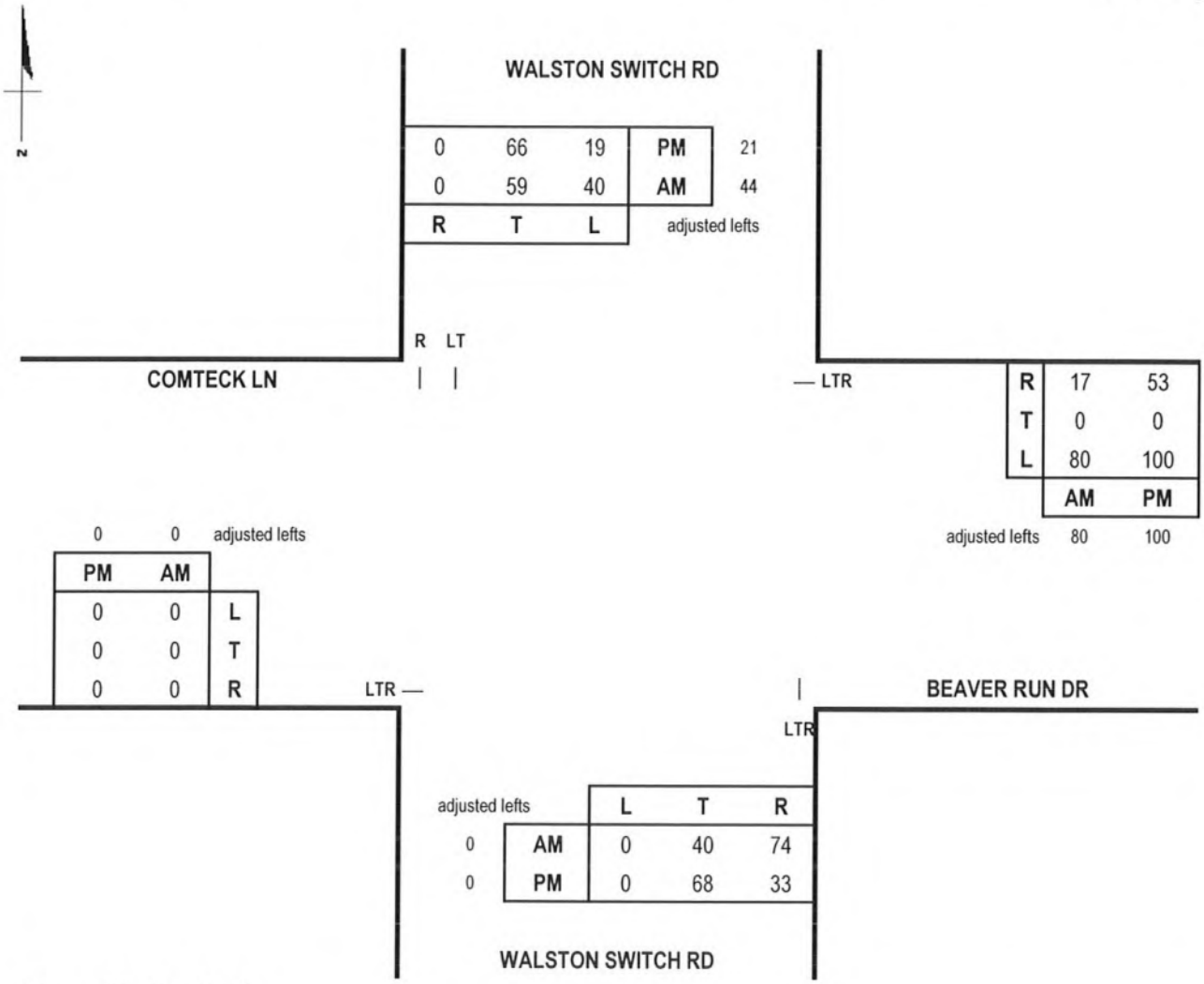
Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	124	1.00	124				124
SB	101	1.00	101				101
EB	1210	0.55	666	89	1.00	89	755
WB	1016	0.55	559	96	1.00	96	

CLV TOTAL= 980
Level of Service (LOS)= A
PM V/C =0.61

CRITICAL LANE VOLUME (CLV) METHODOLOGY
for MSHA

E/W Road: Beaver Run Dr/Comteck Ln
N/S Road: Walston Switch Rd
Conditions: Existing Traffic

Date of Count: 8/3/2010
Day of Count: Tuesday
Analyst: Ming-Yu Chien



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	114	1.00	114	40	1.00	40	154
SB	103	1.00	103	0	1.00	0	
EB	0	1.00	0	80	1.00	80	97
WB	97	1.00	97	0	1.00	0	

CLV TOTAL= **251**
Level of Service (LOS)= **A**

AM V/C =0.16

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	101	1.00	101	19	1.00	19	120
SB	87	1.00	87	0	1.00	0	
EB	0	1.00	0	100	1.00	100	153
WB	153	1.00	153	0	1.00	0	

CLV TOTAL= **273**
Level of Service (LOS)= **A**

PM V/C =0.17

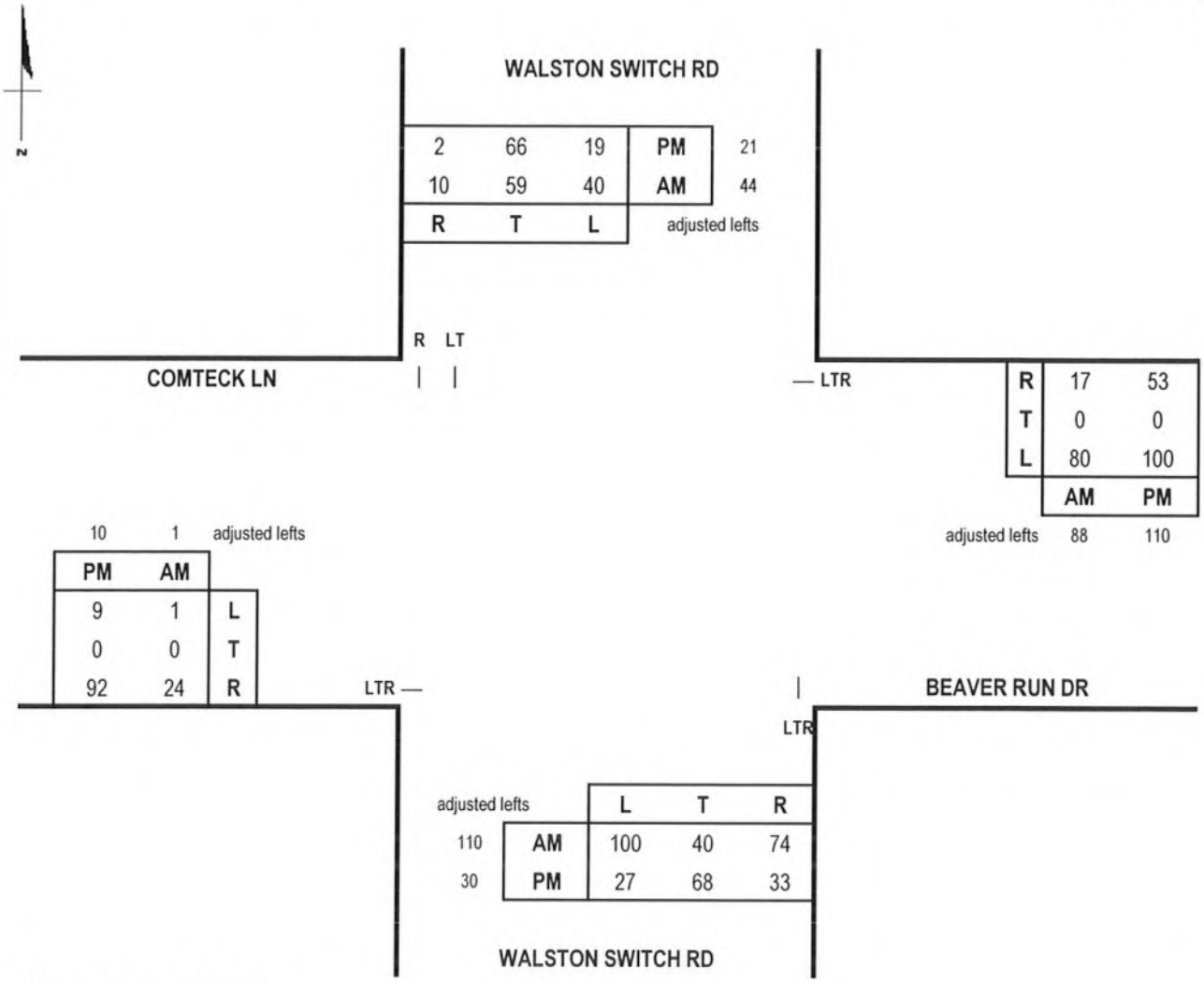
Scenario ID - EXIST3

CRITICAL LANE VOLUME (CLV) METHODOLOGY
for MSHA

E/W Road: Beaver Run Dr/Comteck Ln
N/S Road: Walston Switch Rd
Conditions: Total Traffic

Date of Count: 8/3/2010
Day of Count: Tuesday
Analyst: Ming-Yu Chien

The Traffic Group®



Capacity Analysis

Morning Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	AM CLV
NB	224	1.00	224	40	1.00	40	264
SB	103	1.00	103	100	1.00	100	
EB	25	1.00	25	80	1.00	80	106
WB	105	1.00	105	1	1.00	1	

CLV TOTAL= **370**
Level of Service (LOS)= **A**

Scenario ID - TOT3
AM V/C =0.23

Evening Peak Hour

Dir	Thru Volumes VOL	x LUF	= Total	+ Opposing Lefts VOL	x LUF	= Total	PM CLV
NB	131	1.00	131	19	1.00	19	150
SB	87	1.00	87	27	1.00	27	
EB	102	1.00	102	100	1.00	100	202
WB	163	1.00	163	9	1.00	9	

CLV TOTAL= **352**
Level of Service (LOS)= **A**

PM V/C =0.22

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	MYC	Intersection	US 50 & Walston Switch Rd
Agency or Co.	TTG	Area Type	All other areas
Date Performed	8/27/2010	Jurisdiction	Wicomico County, MD
Time Period	AM Peak	Analysis Year	Existing
		Project ID	Tri-County Council/Shore Transit

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1	1	2	1	1	2	1	1	1		1	1	
Lane Group	L	T	R	L	T	R	L	T		L	T	
Volume, V (vph)	81	912	117	48	1192	64	95	43		24	46	
% Heavy Vehicles, %HV	2	8	2	2	8	2	2	2		2	2	
Peak-Hour Factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93	
Pretimed (P) or Actuated (A)	A	A	A	A	A	A	A	A		A	A	
Start-up Lost Time, l_1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type, AT	3	3	3	3	3	3	3	3		3	3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Filtering/Metering, I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Initial Unmet Demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	0	0	0	0	0	0		0	0	
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	10.0	11.0		10.0	11.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N_m												
Buses Stopping, N_B	0	0	0	0	0	0	0	0		0	0	
Min. Time for Pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	NS Perm	06	07	08
Timing	G = 9.0	G = 55.0	G = 6.0	G = 0.0	G = 13.0	G = 0.0	G = 0.0	G = 0.0
	Y = 7.5	Y = 7.5	Y = 6	Y = 0	Y = 6	Y = 0	Y = 0	Y = 0
Duration of Analysis, T = 0.25						Cycle Length, C = 110.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	87	981	126	52	1282	69	102	46		26	49	
Lane Group Capacity, c	145	2177	1029	97	2086	986	149	213		149	213	
v/c Ratio, X	0.60	0.45	0.12	0.54	0.61	0.07	0.68	0.22		0.17	0.23	
Total Green Ratio, g/C	0.08	0.65	0.65	0.05	0.62	0.62	0.12	0.12		0.12	0.12	
Uniform Delay, d_1	48.8	9.5	7.3	50.6	12.7	8.2	46.5	43.9		43.7	44.0	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Delay Calibration, k	0.19	0.11	0.11	0.14	0.20	0.11	0.25	0.11		0.11	0.11	
Incremental Delay, d_2	6.7	0.1	0.1	5.8	0.5	0.0	12.3	0.5		0.6	0.6	
Initial Queue Delay, d_3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay	55.5	9.7	7.4	56.4	13.2	8.2	58.8	44.4		44.2	44.5	
Lane Group LOS	E	A	A	E	B	A	E	D		D	D	
Approach Delay	12.8			14.6			54.3			44.4		
Approach LOS	B			B			D			D		
Intersection Delay	16.7			X_C = 0.62			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	MYC	Intersection	US 50 & Walston Switch Rd
Agency or Co.	TTG	Area Type	All other areas
Date Performed	8/27/2010	Jurisdiction	Wicomico County, MD
Time Period	PM Peak	Analysis Year	Existing
		Project ID	Tri-County Council/Shore Transit

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1	1	2	1	1	2	1	1	1		1	1	
Lane Group	L	T	R	L	T	R	L	T		L	T	
Volume, V (vph)	76	1210	186	89	1016	60	124	71		46	91	
% Heavy Vehicles, %HV	2	8	2	2	8	2	2	2		2	2	
Peak-Hour Factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94		0.94	0.94	
Pretimed (P) or Actuated (A)	A	A	A	A	A	A	A	A		A	A	
Start-up Lost Time, l_1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type, AT	3	3	3	3	3	3	3	3		3	3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Filtering/Metering, I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Initial Unmet Demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	0	0	0	0	0	0		0	0	
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	10.0	11.0		10.0	11.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N_m												
Buses Stopping, N_B	0	0	0	0	0	0	0	0		0	0	
Min. Time for Pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	NS Perm	06	07	08
Timing	G = 9.0	G = 50.0	G = 8.0	G = 0.0	G = 16.0	G = 0.0	G = 0.0	G = 0.0
	Y = 7.5	Y = 7.5	Y = 6	Y = 0	Y = 6	Y = 0	Y = 0	Y = 0
Duration of Analysis, T = 0.25						Cycle Length, C = 110.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	81	1287	198	95	1081	64	132	76		49	97	
Lane Group Capacity, c	145	2025	957	129	1995	943	176	262		179	262	
v/c Ratio, X	0.56	0.64	0.21	0.74	0.54	0.07	0.75	0.29		0.27	0.37	
Total Green Ratio, g/C	0.08	0.60	0.60	0.07	0.60	0.60	0.15	0.15		0.15	0.15	
Uniform Delay, d_1	48.6	14.0	9.8	50.0	13.3	9.4	45.1	41.9		41.8	42.4	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Delay Calibration, k	0.16	0.22	0.11	0.29	0.14	0.11	0.31	0.11		0.11	0.11	
Incremental Delay, d_2	4.8	0.7	0.1	19.7	0.3	0.0	16.3	0.6		0.8	0.9	
Initial Queue Delay, d_3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay	53.4	14.6	9.9	69.7	13.6	9.4	61.4	42.5		42.7	43.3	
Lane Group LOS	D	B	A	E	B	A	E	D		D	D	
Approach Delay	16.0			17.7			54.5			43.1		
Approach LOS	B			B			D			D		
Intersection Delay	20.5			X_C = 0.67			Intersection LOS			C		

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	MYC	Intersection	US 50 & Walston Switch Rd
Agency or Co.	TTG	Area Type	All other areas
Date Performed	8/27/2010	Jurisdiction	Wicomico County, MD
Time Period	AM Peak	Analysis Year	Total
		Project ID	Tri-County Council/Shore Transit

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1	1	2	1	1	2	1	1	1		1	1	
Lane Group	L	T	R	L	T	R	L	T		L	T	
Volume, V (vph)	149	912	117	48	1192	85	95	54		28	48	
% Heavy Vehicles, %HV	2	8	2	2	8	2	2	2		2	2	
Peak-Hour Factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93		0.93	0.93	
Pretimed (P) or Actuated (A)	A	A	A	A	A	A	A	A		A	A	
Start-up Lost Time, l_1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type, AT	3	3	3	3	3	3	3	3		3	3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Filtering/Metering, I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Initial Unmet Demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	0	0	0	0	0	0		0	0	
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	10.0	11.0		10.0	11.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N_m												
Buses Stopping, N_B	0	0	0	0	0	0	0	0		0	0	
Min. Time for Pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	NS Perm	06	07	08
Timing	G = 14.0	G = 50.0	G = 6.0	G = 0.0	G = 13.0	G = 0.0	G = 0.0	G = 0.0
	Y = 7.5	Y = 7.5	Y = 6	Y = 0	Y = 6	Y = 0	Y = 0	Y = 0
Duration of Analysis, T = 0.25						Cycle Length, C = 110.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	160	981	126	52	1282	91	102	58		30	52	
Lane Group Capacity, c	225	2177	1029	97	1934	914	149	213		148	213	
v/c Ratio, X	0.71	0.45	0.12	0.54	0.66	0.10	0.68	0.27		0.20	0.24	
Total Green Ratio, g/C	0.13	0.65	0.65	0.05	0.58	0.58	0.12	0.12		0.12	0.12	
Uniform Delay, d_1	46.1	9.5	7.3	50.6	15.9	10.4	46.5	44.2		43.8	44.0	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Delay Calibration, k	0.27	0.11	0.11	0.14	0.24	0.11	0.25	0.11		0.11	0.11	
Incremental Delay, d_2	10.0	0.1	0.1	5.8	0.9	0.0	12.3	0.7		0.7	0.6	
Initial Queue Delay, d_3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay	56.1	9.7	7.4	56.4	16.8	10.5	58.8	44.9		44.5	44.6	
Lane Group LOS	E	A	A	E	B	B	E	D		D	D	
Approach Delay	15.3			17.8			53.7			44.6		
Approach LOS	B			B			D			D		
Intersection Delay	19.4			X_C = 0.67			Intersection LOS			B		

HCS+™ DETAILED REPORT

General Information		Site Information	
Analyst	MYC	Intersection	US 50 & Walston Switch Rd
Agency or Co.	TTG	Area Type	All other areas
Date Performed	8/27/2010	Jurisdiction	Wicomico County, MD
Time Period	PM Peak	Analysis Year	Total
		Project ID	Tri-County Council/Shore Transit

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes, N_1	1	2	1	1	2	1	1	1		1	1	
Lane Group	L	T	R	L	T	R	L	T		L	T	
Volume, V (vph)	96	1210	186	89	1016	64	124	74		65	101	
% Heavy Vehicles, %HV	2	8	2	2	8	2	2	2		2	2	
Peak-Hour Factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94		0.94	0.94	
Pretimed (P) or Actuated (A)	A	A	A	A	A	A	A	A		A	A	
Start-up Lost Time, I_1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green, e	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type, AT	3	3	3	3	3	3	3	3		3	3	
Unit Extension, UE	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Filtering/Metering, I	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Initial Unmet Demand, Q_b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Ped / Bike / RTOR Volumes	0	0	0	0	0	0	0	0		0	0	
Lane Width	12.0	12.0	12.0	12.0	12.0	12.0	10.0	11.0		10.0	11.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking Maneuvers, N_m												
Buses Stopping, N_B	0	0	0	0	0	0	0	0		0	0	
Min. Time for Pedestrians, G_p	3.2			3.2			3.2			3.2		

Phasing	EB Only	Thru & RT	WB Only	04	NS Perm	06	07	08
Timing	G = 9.0	G = 50.0	G = 8.0	G = 0.0	G = 16.0	G = 0.0	G = 0.0	G = 0.0
	Y = 7.5	Y = 7.5	Y = 6	Y = 0	Y = 6	Y = 0	Y = 0	Y = 0
Duration of Analysis, T = 0.25						Cycle Length, C = 110.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted Flow Rate, v	102	1287	198	95	1081	68	132	79		69	107	
Lane Group Capacity, c	145	2025	957	129	1995	943	174	262		178	262	
v/c Ratio, X	0.70	0.64	0.21	0.74	0.54	0.07	0.76	0.30		0.39	0.41	
Total Green Ratio, g/C	0.08	0.60	0.60	0.07	0.60	0.60	0.15	0.15		0.15	0.15	
Uniform Delay, d_1	49.2	14.0	9.8	50.0	13.3	9.4	45.1	42.0		42.6	42.7	
Progression Factor, PF	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Delay Calibration, k	0.27	0.22	0.11	0.29	0.14	0.11	0.31	0.11		0.11	0.11	
Incremental Delay, d_2	14.3	0.7	0.1	19.7	0.3	0.0	17.5	0.7		1.4	1.0	
Initial Queue Delay, d_3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay	63.5	14.6	9.9	69.7	13.6	9.4	62.6	42.7		44.0	43.7	
Lane Group LOS	E	B	A	E	B	A	E	D		D	D	
Approach Delay	17.2			17.6			55.1			43.8		
Approach LOS	B			B			E			D		
Intersection Delay	21.3			X_C = 0.67			Intersection LOS			C		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MYC*	Intersection	*Walston Switch Rd & Beaver Run*
Agency/Co.	*TTG*	Jurisdiction	*Wicomico County, MD*
Date Performed	*8/27/2010*	Analysis Year	*Existing*
Analysis Time Period	*AM Peak*		

Project Description	*Tri-County Council/Shore Transit*
East/West Street:	*Beaver Run/Comteck*
North/South Street:	*Walston Switch Rd*
Intersection Orientation:	*North-South*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*40*	*74*	*40*	*59*	*0*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR (veh/h)	*0*	*48*	*89*	*48*	*71*	*0*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*1*
Configuration	*LTR*			*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*80*	*0*	*17*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*96*	*0*	*20*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LT*		*LTR*			*LTR*	
v (veh/h)	*0*	*48*		*116*			*0*	
C (m) (veh/h)	*1529*	*1447*		*713*				
v/c	*0.00*	*0.03*		*0.16*				
95% queue length	*0.00*	*0.10*		*0.58*				
Control Delay (s/veh)	*7.4*	*7.6*		*11.0*				
LOS	*A*	*A*		*B*				
Approach Delay (s/veh)	--	--	*11.0*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MYC*	Intersection	*Walston Switch Rd & Beaver Run*
Agency/Co.	*TTG*	Jurisdiction	*Wicomico County, MD*
Date Performed	*8/27/2010*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak*		

Project Description	*Tri-County Council/Shore Transit*
East/West Street: *Beaver Run/Comteck*	North/South Street: *Walston Switch Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*68*	*33*	*19*	*66*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*73*	*35*	*20*	*71*	*0*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*1*
Configuration	*LTR*			*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*0*	*100*	*0*	*53*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*108*	*0*	*57*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LT*		*LTR*			*LTR*	
v (veh/h)	*0*	*20*		*165*			*0*	
C (m) (veh/h)	*1529*	*1483*		*813*				
v/c	*0.00*	*0.01*		*0.20*				
95% queue length	*0.00*	*0.04*		*0.76*				
Control Delay (s/veh)	*7.4*	*7.5*		*10.6*				
LOS	*A*	*A*		*B*				
Approach Delay (s/veh)	--	--	*10.6*					
Approach LOS	--	--	*B*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MYC*	Intersection	*Walston Switch Rd & Beaver Run*
Agency/Co.	*TTG*	Jurisdiction	*Wicomico County, MD*
Date Performed	*8/27/2010*	Analysis Year	*Total*
Analysis Time Period	*AM Peak*		

Project Description	*Tri-County Council/Shore Transit*
East/West Street: *Beaver Run/Comteck*	North/South Street: *Walston Switch Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*100*	*40*	*74*	*40*	*59*	*10*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR (veh/h)	*120*	*48*	*89*	*48*	*71*	*12*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*1*
Configuration	*LTR*			*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*1*	*0*	*24*	*80*	*0*	*17*
Peak-Hour Factor, PHF	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*	*0.83*
Hourly Flow Rate, HFR (veh/h)	*1*	*0*	*28*	*96*	*0*	*20*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LT*		*LTR*			*LTR*	
v (veh/h)	*120*	*48*		*116*			*29*	
C (m) (veh/h)	*1514*	*1447*		*458*			*947*	
v/c	*0.08*	*0.03*		*0.25*			*0.03*	
95% queue length	*0.26*	*0.10*		*0.99*			*0.09*	
Control Delay (s/veh)	*7.6*	*7.6*		*15.5*			*8.9*	
LOS	*A*	*A*		*C*			*A*	
Approach Delay (s/veh)	--	--	*15.5*			*8.9*		
Approach LOS	--	--	*C*			*A*		

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MYC*	Intersection	*Walston Switch Rd & Beaver Run*
Agency/Co.	*TTG*	Jurisdiction	*Wicomico County, MD*
Date Performed	*8/27/2010*	Analysis Year	*Total*
Analysis Time Period	*PM Peak*		

Project Description	*Tri-County Council/Shore Transit*
East/West Street:	*Beaver Run/Comteck*
North/South Street:	*Walston Switch Rd*
Intersection Orientation:	*North-South*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*27*	*68*	*33*	*19*	*66*	*2*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*29*	*73*	*35*	*20*	*71*	*2*
Percent Heavy Vehicles	*2*	--	--	*2*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*1*
Configuration	*LTR*			*LT*		*R*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*9*	*0*	*92*	*100*	*0*	*53*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*9*	*0*	*99*	*108*	*0*	*57*
Percent Heavy Vehicles	*2*	*2*	*2*	*2*	*2*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LT*		*LTR*			*LTR*	
v (veh/h)	*29*	*20*		*165*			*108*	
C (m) (veh/h)	*1527*	*1483*		*658*			*942*	
v/c	*0.02*	*0.01*		*0.25*			*0.11*	
95% queue length	*0.06*	*0.04*		*0.99*			*0.39*	
Control Delay (s/veh)	*7.4*	*7.5*		*12.3*			*9.3*	
LOS	*A*	*A*		*B*			*A*	
Approach Delay (s/veh)	--	--	*12.3*			*9.3*		
Approach LOS	--	--	*B*			*A*		

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Tri-County Council - US 50 & Walston Switch Rd - Existing AM*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*		*L*	*T*	
Initial Queue/Lane	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*		*0.0*	*0.0*	
Flow Rate/Lane Group	*87*	*981*	*126*	*52*	*1282*	*69*	*102*	*46*		*26*	*49*	
Satflow/Lane	*1770*	*1759*	*1583*	*1770*	*1759*	*1583*	*1261*	*1801*		*1264*	*1801*	
Capacity/Lane Group	*145*	*2177*	*1029*	*97*	*2086*	*986*	*149*	*213*		*149*	*213*	
Flow Ratio	*0.0*	*0.3*	*0.1*	*0.0*	*0.4*	*0.0*	*0.1*	*0.0*		*0.0*	0.0	
v/c Ratio	*0.60*	*0.45*	*0.12*	*0.54*	*0.61*	*0.07*	*0.68*	*0.22*		*0.17*	*0.23*	
I Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*		*1.000*	*1.000*	
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*		*3*	*3*	
Platoon Ratio	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
PF Factor	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
Q_1	*2.6*	*7.8*	*1.5*	*1.5*	*12.6*	*0.8*	*3.0*	*1.3*		*0.7*	*1.4*	
k_B	*0.2*	*0.8*	*0.8*	*0.2*	*0.8*	*0.8*	*0.2*	*0.3*		*0.2*	*0.3*	
Q_2	*0.3*	*0.7*	*0.1*	*0.2*	*1.3*	*0.1*	*0.5*	*0.1*		*0.1*	*0.1*	
Q Average	*2.9*	*8.5*	*1.6*	*1.8*	*13.8*	*0.9*	*3.5*	*1.4*		*0.8*	*1.4*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*	*1.9*	*2.0*	*2.0*	*1.8*	*2.1*	*2.0*	*2.1*		*2.1*	*2.1*	
Back of Queue	*5.9*	*15.9*	*3.2*	*3.6*	*24.6*	*1.8*	*7.0*	*2.8*		*1.6*	*3.0*	
Queue Storage Ratio												
Queue Spacing	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*		*25.0*	*25.0*	
Queue Storage	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*		*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Tri-County Council - US 50 & Walston Switch Rd - Existing PM*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*		*L*	*T*	
Initial Queue/Lane	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*		*0.0*	*0.0*	
Flow Rate/Lane Group	*81*	*1287*	*198*	*95*	*1081*	*64*	*132*	*76*		*49*	*97*	
Satflow/Lane	*1770*	*1759*	*1583*	*1770*	*1759*	*1583*	*1207*	*1801*		*1230*	*1801*	
Capacity/Lane Group	*145*	*2025*	*957*	*129*	*1995*	*943*	*176*	*262*		*179*	*262*	
Flow Ratio	*0.0*	*0.4*	*0.1*	*0.1*	*0.3*	*0.0*	*0.1*	*0.0*		*0.0*	0.1	
v/c Ratio	*0.56*	*0.64*	*0.21*	*0.74*	*0.54*	*0.07*	*0.75*	*0.29*		*0.27*	*0.37*	
I Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*		*1.000*	*1.000*	
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*		*3*	*3*	
Platoon Ratio	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
PF Factor	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
Q_1	*2.4*	*13.2*	*2.7*	*2.8*	*10.3*	*0.8*	*3.9*	*2.1*		*1.3*	*2.7*	
k_B	*0.2*	*0.8*	*0.8*	*0.2*	*0.8*	*0.8*	*0.3*	*0.3*		*0.3*	*0.3*	
Q_2	*0.3*	*1.4*	*0.2*	*0.6*	*0.9*	*0.1*	*0.7*	*0.1*		*0.1*	*0.2*	
Q Average	*2.7*	*14.6*	*2.9*	*3.4*	*11.3*	*0.9*	*4.6*	*2.2*		*1.4*	*2.9*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*	*1.8*	*2.0*	*2.0*	*1.8*	*2.1*	*2.0*	*2.0*		*2.1*	*2.0*	
Back of Queue	*5.4*	*25.8*	*5.9*	*6.8*	*20.5*	*1.8*	*9.0*	*4.5*		*3.0*	*5.8*	
Queue Storage Ratio												
Queue Spacing	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*		*25.0*	*25.0*	
Queue Storage	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*		*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Tri-County Council - US 50 & Walston Switch Rd - Total AM*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*		*L*	*T*	
Initial Queue/Lane	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*		*0.0*	*0.0*	
Flow Rate/Lane Group	*160*	*981*	*126*	*52*	*1282*	*91*	*102*	*58*		*30*	*52*	
Satflow/Lane	*1770*	*1759*	*1583*	*1770*	*1759*	*1583*	*1257*	*1801*		*1250*	*1801*	
Capacity/Lane Group	*225*	*2177*	*1029*	*97*	*1934*	*914*	*149*	*213*		*148*	*213*	
Flow Ratio	*0.1*	*0.3*	*0.1*	*0.0*	*0.4*	*0.1*	*0.1*	*0.0*		*0.0*	0.0	
v/c Ratio	*0.71*	*0.45*	*0.12*	*0.54*	*0.66*	*0.10*	*0.68*	*0.27*		*0.20*	*0.24*	
I Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*		*1.000*	*1.000*	
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*		*3*	*3*	
Platoon Ratio	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
PF Factor	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
Q_1	*4.7*	*7.8*	*1.5*	*1.5*	*14.1*	*1.2*	*3.0*	*1.6*		*0.8*	*1.4*	
k_B	*0.3*	*0.8*	*0.8*	*0.2*	*0.8*	*0.7*	*0.2*	*0.3*		*0.2*	*0.3*	
Q_2	*0.7*	*0.7*	*0.1*	*0.2*	*1.5*	*0.1*	*0.5*	*0.1*		*0.1*	*0.1*	
Q Average	*5.4*	*8.5*	*1.6*	*1.8*	*15.6*	*1.3*	*3.5*	*1.7*		*0.9*	*1.5*	

Percentile Back of Queue (95th percentile)

$f_{B\%}$	*1.9*	*1.9*	*2.0*	*2.0*	*1.8*	*2.1*	*2.0*	*2.0*		*2.1*	*2.1*	
Back of Queue	*10.5*	*15.9*	*3.2*	*3.6*	*27.3*	*2.7*	*7.0*	*3.5*		*1.8*	*3.2*	

Queue Storage Ratio

Queue Spacing	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*		*25.0*	*25.0*	
Queue Storage	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*		*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

BACK-OF-QUEUE WORKSHEET

General Information

Project Description *Tri-County Council - US 50 & Walston Switch Rd - Total PM*

Average Back of Queue

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Lane Group	*L*	*T*	*R*	*L*	*T*	*R*	*L*	*T*		*L*	*T*	
Initial Queue/Lane	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*		*0.0*	*0.0*	
Flow Rate/Lane Group	*102*	*1287*	*198*	*95*	*1081*	*68*	*132*	*79*		*69*	*107*	
Satflow/Lane	*1770*	*1759*	*1583*	*1770*	*1759*	*1583*	*1196*	*1801*		*1227*	*1801*	
Capacity/Lane Group	*145*	*2025*	*957*	*129*	*1995*	*943*	*174*	*262*		*178*	*262*	
Flow Ratio	*0.1*	*0.4*	*0.1*	*0.1*	*0.3*	*0.0*	*0.1*	*0.0*		*0.1*	0.1	
v/c Ratio	*0.70*	*0.64*	*0.21*	*0.74*	*0.54*	*0.07*	*0.76*	*0.30*		*0.39*	*0.41*	
I Factor	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*	*1.000*		*1.000*	*1.000*	
Arrival Type	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*		*3*	*3*	
Platoon Ratio	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
PF Factor	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*		*1.00*	*1.00*	
Q_1	*3.0*	*13.2*	*2.7*	*2.8*	*10.3*	*0.9*	*3.9*	*2.2*		*1.9*	*3.0*	
k_B	*0.2*	*0.8*	*0.8*	*0.2*	*0.8*	*0.8*	*0.3*	*0.3*		*0.3*	*0.3*	
Q_2	*0.5*	*1.4*	*0.2*	*0.6*	*0.9*	*0.1*	*0.7*	*0.1*		*0.2*	*0.2*	
Q Average	*3.6*	*14.6*	*2.9*	*3.4*	*11.3*	*0.9*	*4.6*	*2.3*		*2.1*	*3.2*	
Percentile Back of Queue (95th percentile)												
$f_{B\%}$	*2.0*	*1.8*	*2.0*	*2.0*	*1.8*	*2.1*	*2.0*	*2.0*		*2.0*	*2.0*	
Back of Queue	*7.1*	*25.8*	*5.9*	*6.8*	*20.5*	*1.9*	*9.1*	*4.7*		*4.2*	*6.4*	
Queue Storage Ratio												
Queue Spacing	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*	*25.0*		*25.0*	*25.0*	
Queue Storage	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*		*0*	*0*	
Average Queue Storage Ratio												
95% Queue Storage Ratio												

Maryland State Highway Administration Queuing Analysis Formula

$$\text{Maximum Calculated Queue (Feet)} = \frac{\text{Turning Volume (veh per hour) x Lane Use Factor x Cycle Length (Seconds)}}{\text{3600 (Seconds per hour)}} \times \text{25 Feet per Vehicle} \times \text{1.4 Surge Factor}$$

1. US 50 & Walston Switch Rd	Available Storage	Maximum Queue	Veh / Hour	Lane Use Factor	Cycle Length (seconds)	Seconds / Hour	Feet / Vehicle	Surge Factor
Existing AM								
EB US 50 Left	*400*	87	81	1	110	3600	25	1.4
WB US 50 Left	*440*	51	48	1	110	3600	25	1.4
NB Walston Switch Rd Left	*210*	102	95	1	110	3600	25	1.4
SB Walston Switch Rd Left	-	26	24	1	110	3600	25	1.4
Existing PM								
EB US 50 Left	*400*	81	76	1	110	3600	25	1.4
WB US 50 Left	*440*	95	89	1	110	3600	25	1.4
NB Walston Switch Rd Left	*210*	133	124	1	110	3600	25	1.4
SB Walston Switch Rd Left	-	49	46	1	110	3600	25	1.4
Total AM								
EB US 50 Left	*400*	159	149	1	110	3600	25	1.4
WB US 50 Left	*440*	51	48	1	110	3600	25	1.4
NB Walston Switch Rd Left	*210*	102	95	1	110	3600	25	1.4
SB Walston Switch Rd Left	-	30	28	1	110	3600	25	1.4
Existing PM								
EB US 50 Left	*400*	103	96	1	110	3600	25	1.4
WB US 50 Left	*440*	95	89	1	110	3600	25	1.4
NB Walston Switch Rd Left	*210*	133	124	1	110	3600	25	1.4
SB Walston Switch Rd Left	-	70	65	1	110	3600	25	1.4