

**WATT ROAD
OLD DOMINION FREIGHT
DISTRIBUTION
Knox County**

TRAFFIC IMPACT STUDY

*Prepared for :
SITE, INC.*

Prepared By:



June 2017
Revised July 31, 2017

**WATT ROAD
OLD DOMINION FREIGHT
DISTRIBUTION
KNOX COUNTY, TENNESSEE
TRAFFIC IMPACT STUDY**

Prepared for

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June 2017
Revised July 31, 2017

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Project No. 220084

TABLE OF CONTENTS

INTRODUCTION	1
Site Location	1
Project Description	1
EXISTING TRAFFIC CONDITIONS	4
Existing Traffic Control	4
Existing Traffic Volumes	4
Existing Capacity and Level of Service	5
Intersection Accident History	8
BACKGROUND TRAFFIC CONDITIONS	9
Background Traffic Volume	9
Background Capacity and Level of Service	9
PROJECT IMPACTS	11
Trip Generation	11
Trip Distribution and Assignment	12
Total Projected Traffic Volumes	12
Projected 2020 Capacity and Level of Service	12
Site Access Sight Distance	19
RECOMMENDATIONS	21
CONCLUSION	22
APPENDIX	23

LIST OF FIGURES

Figure 1: Vicinity Map.....	2
Figure 2: Site Plan.....	3
Figure 3: 2017 Existing Traffic.....	6
Figure 4: 2020 Background Traffic	10
Figure 5A: Non-Truck Trip Distribution.....	13
Figure 5B: Truck Trip Distribution.....	14
Figure 6A: Non-Truck Trips.....	15
Figure 6B: Truck Trips	16
Figure 7: Site Trips.....	17
Figure 8: 2020 Projected Traffic	18

LIST OF TABLES

Table 1	Level-Of-Service (LOS) Criteria Description.....	5
Table 2	2017 Existing Traffic Capacity and Level of Service	7
Table 3	2020 Background Traffic Capacity and Level of Service.....	9
Table 4	Trip Generation.....	11
Table 5	2020 Projected Traffic Capacity and Level of Service.....	12
Table 6	Summary of Capacity and Level of Service.....	20

INTRODUCTION

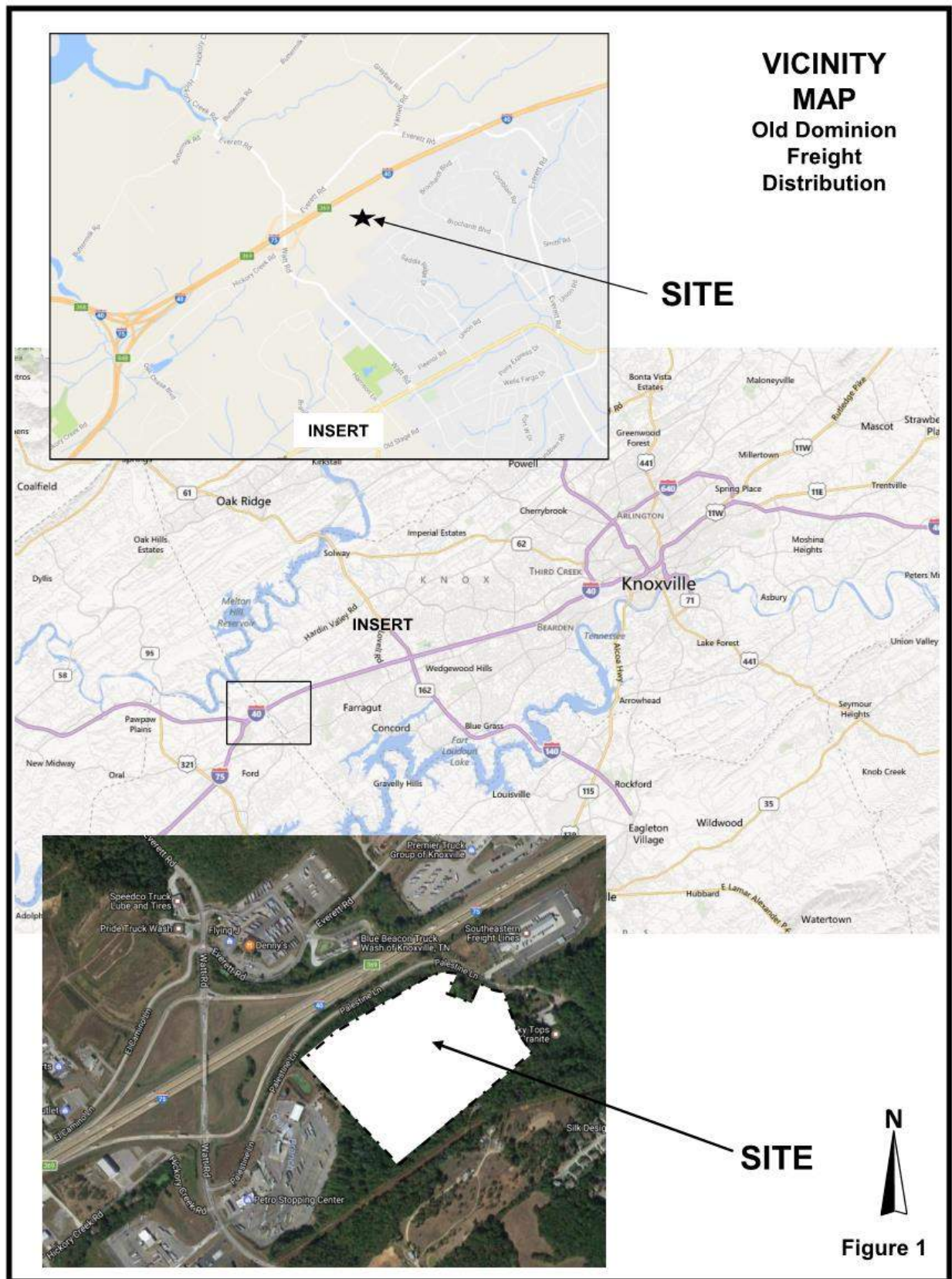
CDM Smith Inc. is pleased to submit this report to address traffic impact and access issues related to the development of a proposed trucking freight distribution terminal in West Knox County, Tennessee. The basis for this study required the collection of traffic data, generation of anticipated traffic volumes for the proposed site and development of projected traffic volumes for normal growth from the potential site. Analyses of the resulting traffic projections were conducted to determine the levels of service for the study intersection of Watt Road and Palestine Lane. This study will determine any mitigation measures necessary to minimize the traffic impact including improved roadway geometrics and/or traffic control devices.

Site Location

This proposed Old Dominion Freight distribution site is proposed on Palestine Lane, southeast of the Watt Road interchange with I-40/75 in West Knox County. **Figure 1** illustrates the site location and its vicinity.

Project Description

The study site is proposed for an Old Dominion Freight distribution terminal with access to Palestine Lane which intersects Watt Road to the west. The facility will encompass approximately 40 acres, disturbing less than 15 acres. The facility will initially be approximately 43,430 square feet with an approximate 47,830 square feet proposed at its buildout including 28 tractor spaces and 145 van/pup spaces. Old Dominion Freight has indicated that its facility should generate approximately 90 trucks each day. **Figure 2** illustrates the proposed site plan for the facility.



**SITE
PLAN**
Old Dominion
Freight Distribution

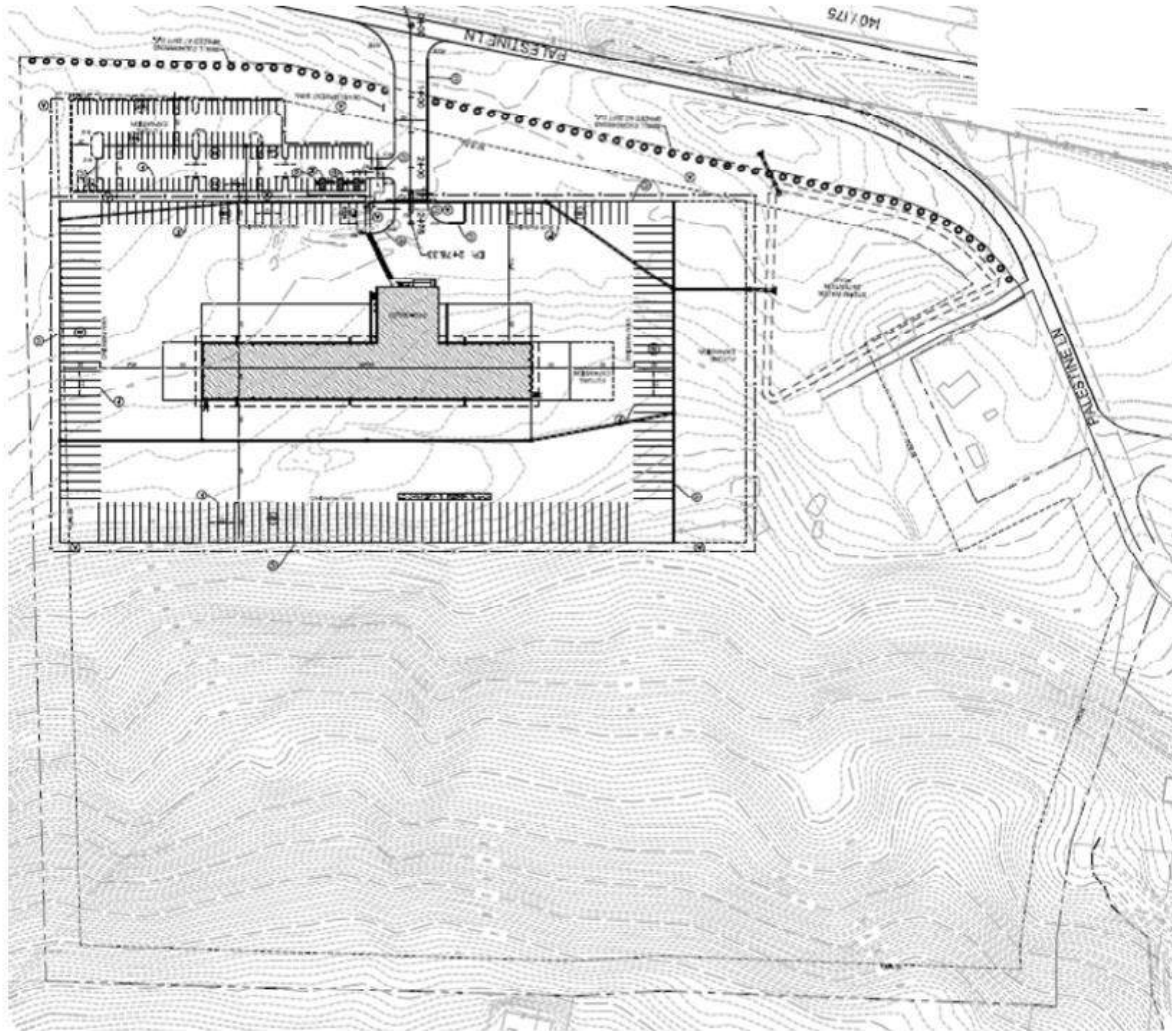


Figure 2

EXISTING TRAFFIC CONDITIONS

Existing Traffic Control

Watt Road is classified as a Major Arterial in the north of the I-40/75 interchange. Watt Road is a 2-lane facility extending south to Kingston Pike (US 11/70). The interchange is signalized with left-turn lanes provided to the interstate. The Palestine Lane approach to Watt Road is a single lane with a STOP control. A left-turn lane is provided southbound from Watt Road to Palestine Lane with an available storage of 175 feet. The markings for the Palestine Lane approach are very worn due to the truck traffic and should be improved to delineate and guide traffic in and out of the intersection .

The posted speed for Watt Road to the south of the interstate is 45mph and 30mph north of the interstate. The speed limit posting to the south is limited and should have signs posted for traffic exiting the interstate to the south on Watt Road.

Existing Traffic Volumes

The 2015 TDOT AADT for Watt Road is approximately 10,000 south of the site, and a 24-hour mechanical traffic count found the average daily traffic for Palestine Lane, adjacent to the site, is 425. A turning movement count was conducted by CDM Smith for a Tuesday, June 13, 2017. The intersection was counted from 7:00 to 9:00 AM and 4:00 to 6:00 PM. The peak hours were determined between 7:15-8:15 and 4:45-5:45 for the AM and PM peaks, respectively. Using the peak hour TMC, an estimation of the average daily traffic (ADT) on Watt Road, north of the Palestine Lane intersection, is approximately 20,500. The traffic count included a vehicle classification so that the number and percentage of large trucks could be identified. The TMC and classification count found that truck traffic accounts for approximately 10- and 9-percent of the intersection traffic with turning vehicles to and from Palestine Lane much higher. The primary truck traffic movements are southbound from Watt Road to Palestine Lane and westbound right turns from Palestine Lane to northbound Watt Road. Southbound left-turning vehicles from Watt Road to Palestine Lane accounts for approximately 40-percent trucks during the AM and 60-percent during the PM peak hours, respectively. Turning from Palestine Lane, more than 50-percent of the vehicles are trucks, 56- and 52-percent for the AM and PM peak hours, respectively.

Figure 3 illustrates AM and PM peak hour turning movements for the intersection of Palestine Lane at Watt Road. With the current truck traffic volume and the Watt Road thru traffic, the existing left-turn lane on Watt Road is deficient and should be lengthened to provide additional storage.

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 methodology from the **2010 Highway Capacity Manual, Special Report 209** published by the Transportation Research Board (TRB). Signalized and unsignalized intersections are evaluated based on estimated intersection delays, which may be related to level of service (LOS).

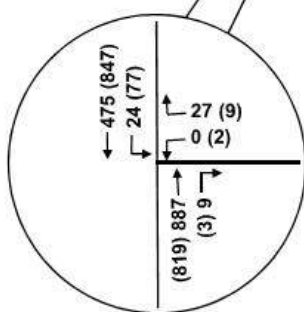
Level of service and capacity are the measurements of an intersection's ability to accommodate traffic volumes. Levels of service for intersections range from A to F. LOS A is the best, and LOS F is failing. For signalized intersections, a LOS of A has an average estimated intersection delay of less than 10 seconds, and LOS F has an 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 of F exceeds estimated delays of 50 seconds. For urban arterials, minor approaches may frequently experience levels of service E. A full level of service description for signalized and unsignalized intersections is presented in **Table 1**.

**TABLE 1
LEVEL-OF-SERVICE (LOS) CRITERIA DESCRIPTION**

Level of Service	Average Control Delay in seconds per vehicle	
	Signalized Intersections	Stop-controlled Intersections
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

2017 EXISTING TRAFFIC Old Dominion Freight Distribution



LEGEND
XXX AM PEAK
(XXX) PM PEAK



Figure 3

Analyses were conducted using the Synchro Software, developed by Trafficware. **Table 2** presents the capacity and levels of service for the study intersection. It should be noted that for stop-controlled operations, LOS is reported for minor approach (Palestine Lane) and the main street left-turn (Southbound) movements that must wait on opposing through traffic. The capacity analysis worksheets are contained in the Appendix.

**TABLE 2
2017 EXISTING
CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	V/C	DELAY	LOS
Watt Road & Palestine Lane	STOP WB/SBLT	AM	0.097 / 0.039	19.3 / 11.1	C / B
			- -	33.8 / 5.7	D / A
		PM	0.056 / 0.117	24.4 / 11.2	C / B
			- -	19.0 / 7.3	C / A

Note: Average vehicle delay estimated in seconds. Observed delays and LOS are represented in **RED**.

In addition to the analyzed capacity and LOS, CDM Smith conducted an intersection delay study. This delay is represented in the table in red. The analysis conducted did not use peak-hour factors for purpose of calibration with the observed delay. The analyses have overestimated the left-turn delay and varies for the Palestine Lane approach. These differences may be gap acceptance values used with the unsignalized analysis, and these values may vary with the truck traffic. Therefore, the analyses conducted for this study should be limited to comparative purposes.

Both the HCM analyses and the delay study indicates that the intersection is currently operating at acceptable levels of service, delays not exceeding that associated with a LOS of D; however, the observed delay is approaching a LOS E for the Palestine Lane approach. The analyzed unsignalized (STOP controlled) approach identifies a LOS C for the intersection.

Intersection Accident History

Accident diagram prepared by the Knox County Department of Engineering and Public Works was reviewed by CDM Smith to ascertain any patterns or concerns for the operation of the intersection of Watt Road and Palestine Lane. Ten accidents have been reported between the beginning of January of 2013 and end of May of 2017 for the intersection or to the approach to the intersection. These accidents are as follows:

2013 - 5
2014 - 2
2015 - 2
2016 - 1
2017 - 0

The crash diagram is provided in the Appendix. Half of the accidents occurred in 2013 and another 5 occurred during the past few years. No accidents have occurred during the current year of 2017. Several sideswipes have occurred on the Watt Road approaches to the intersection. One right-angle collision, several left-turning collisions, and one turnover are the other collisions. None of the reported accidents resulted in a fatality or injury. A distinguishable pattern may be the four left-turning collisions, but these are over a period of four years (1/yr), thereby not a significant pattern.

From the accident history and the estimated ADT, the crash rate for the intersection of Watt Road and Palestine Lane is 0.301acc/MEV (accidents/million entering vehicles). This rate is below the Tennessee statewide average of 0.384acc/MEV and reflects a critical ratio of 0.649. The critical rate yields the accident rate with a 99.5-percent confidence and is used to evaluate the significance of the intersection's average accident rate. The accident rate for the intersection of Watt Road and Palestine Lane is, therefore, not found significant. The ratio of the average to critical rate is 0.46, identifying the average rate as not significant.

BACKGROUND TRAFFIC CONDITIONS

Background traffic is traffic that can be anticipated regardless of the proposed development and is projected for the purpose of establishing a baseline.

Background Traffic Volume

In order to estimate future traffic without the proposed Old Dominion Freight site, historic traffic count data was reviewed from the TDOT count station on Watt Road, located about ¼-mile south of the intersection with Palestine Lane. Over the last 10 years, traffic at those stations has grown at a rate of 2.4 percent per year. Therefore, it is assumed that for this study that traffic may increase for the intersection of Watt Road and Palestine Lane at an average compounded annual rate of 2.5-percent to the horizon year of 2020, a total growth of 7.7-percent. **Figure 4** shows the projected Year 2020 traffic at the study intersection without the proposed site development.

Background Capacity and Level of Service

The projected 2020 traffic in Figure 6 were analyzed for levels of service. The results are presented in **Table 3**.

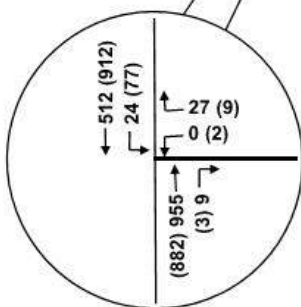
TABLE 3
2020 BACKGROUND TRAFFIC
CAPACITY AND LEVEL OF SERVICE

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	V/C	DELAY	LOS
Watt Road & Palestine Lane	STOP WB/SBLT	AM	0.107 / 0.042	21.0 / 11.5	C / B
		PM	0.095 / 0.141	39.3 / 12.7	E / B

Note: Average vehicle delay estimated in seconds.

The analysis determined that the intersection may experience a reduction in the LOS as traffic grows on Watt Road. The Palestine Lane approach may experience a LOS E during the PM peak hour.

2020 BACKGROUND TRAFFIC Old Dominion Freight Distribution



LEGEND
XXX AM PEAK
(XXX) PM PEAK



Figure 4

PROJECT IMPACTS

Project conditions are developed by generating traffic based on the proposed land use, distributing the trips to the transportation network, and again conducting analyses for capacity and level of service.

Trip Generation

The Old Dominion Freight Distribution traffic was estimated using a 24-hour mechanical count on Palestine Lane which collected traffic count and vehicle classifications from the existing Southeastern Freight terminal. The Southeastern Freight facility, approximately 46,020 square feet, is a similar use. **Trip Generation, 9th Edition**, a reference published by the Institute of Transportation Engineers (ITE) represents national data collected for many different land uses including industrial, residential and commercial uses. Trip rates for Truck Terminals (LUC 030) are very limited thereby justifying the use of observed rates determined from an adjacent and similar use to the proposed site. The determined trip rates from the data collected for Southern Freight compares relatively well with the ITE published rates using the square-footage variable. From the classification report, traffic having more than 2 axles was considered heavy vehicles or trucks which represented 42-percent of the traffic counted. The count and analysis is provided in the Appendix of this report.

Tables 4 presents the trip generation for the proposed Old Dominion Freight site. The development, at buildout, may generate approximately 441 daily trips with 31 trips during the AM peak hour and 32 during the PM peak hour. Of the daily trips generated, approximately 185 may be truck trips.

**TABLE 4
TRIP GENERATION**

Land Use	LUC	Density (sqft)	Weekday				
			Daily	AM PEAK Enter Exit		PM PEAK Enter Exit	
Truck Distribution Terminal	030 (Local)	47,830	441	19	12	16	16
Passenger/Single Unit Trips	58%		256	11	7	9	9
Truck Trips	42%		185	8	5	7	7

Note: Trips generated using local data collected for the existing Southeastern Freight.

Trip Distribution and Assignment

The trip generation values from Table 4 were assigned to the Palestine Lane intersection with Watt Road. Trip distributions were developed for two-axle and multi-axles vehicles. **Figures 5A and 5B** illustrate the distribution and assignments for these vehicles, respectively. From the south on Watt Road, it is assumed that approximately 30-percent of the passenger or two-axle vehicle trips and no trucks would enter and exit to Palestine Lane. From the north, it is assumed that 70-percent passenger vehicles and 100-percent trucks would enter and exit to Palestine Ln.

Trip assignments for the site are illustrated in **Figures 6A and 6B**. Total trips for the proposed site are illustrated in **Figure 7**.

Total Projected Traffic Volumes

Background and project traffic volumes from the proposed Old Dominion Freight Distribution site were combined to develop post-development traffic volumes for the year 2020. **Figure 8** illustrates the AM and PM peak hour total traffic. Using these projections, mitigation measures including traffic control devices and intersection geometry can be evaluated.

Projected 2020 Capacity and Level of Service

The traffic volumes in Figure 8 were again analyzed for level of service. The analysis did not indicate any changes in the LOS. **Table 5** presents the results of the post development analysis and the analysis of the intersection is summarized in **Table 6**.

**TABLE 5
2020 PROJECTED TRAFFIC
CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	V/C	DELAY	LOS
Watt Road & Palestine Lane	STOP WB/SBLT	AM PM	0.164 / 0.068 0.199 / 0.166	23.1 / 11.7 37.9 / 12.9	C / B E / B

Note: Average vehicle delay estimated in seconds.

From the HCM Synchro analysis, the background LOS is maintained for the intersection of Watt Road and Palestine Lane. A LOS E is maintained for the intersection as it is the Watt Road traffic growth that results in the increased delay for the intersection and not necessarily the proposed development traffic.

NON-TRUCK TRIP DISTRIBUTION Old Dominion Freight Distribution

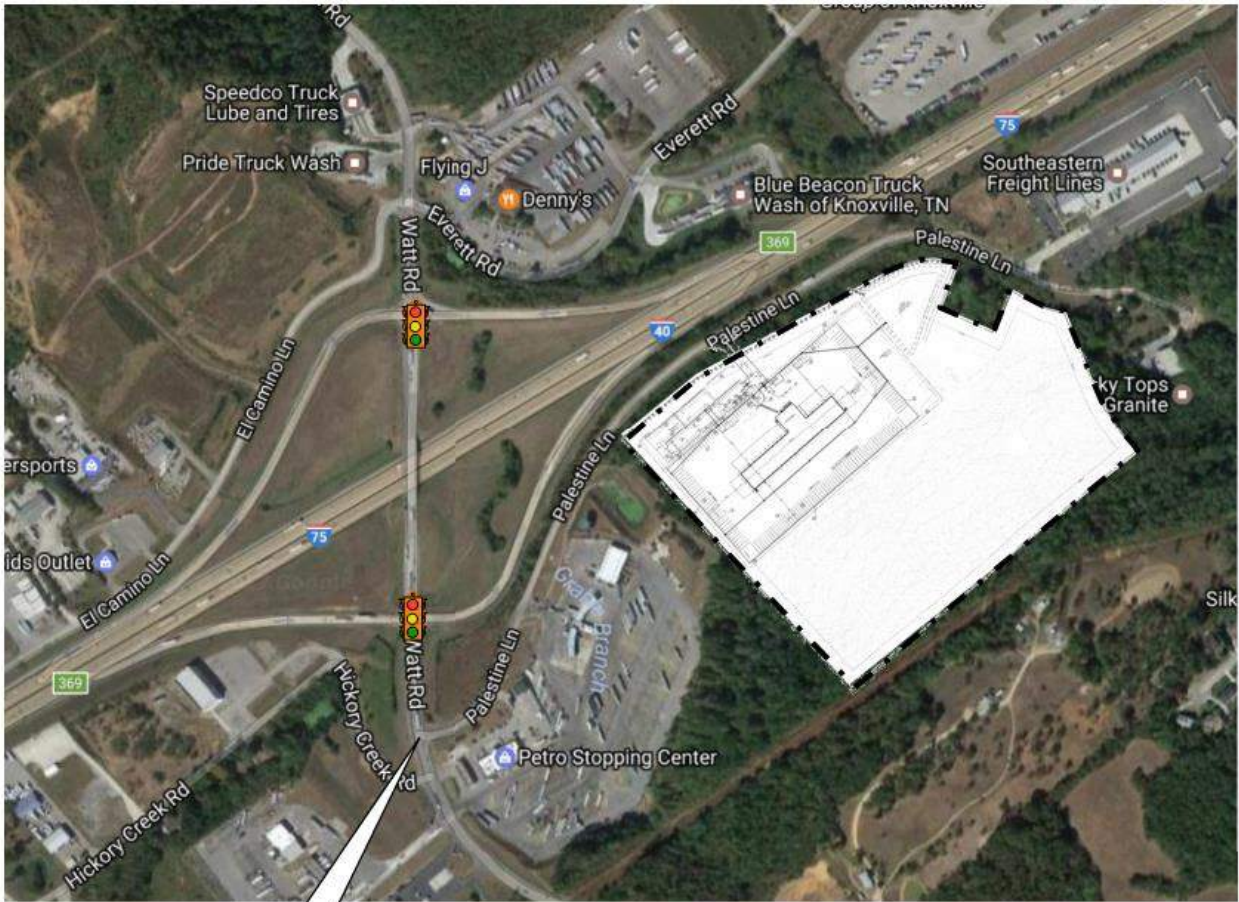
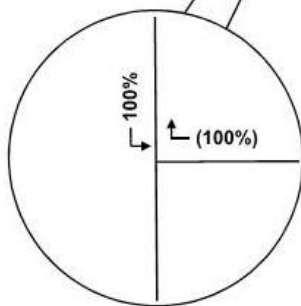


Figure 5A

TRUCK TRIP DISTRIBUTION Old Dominion Freight Distribution

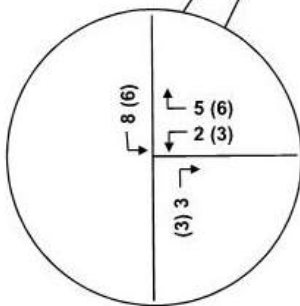


LEGEND
XXX ENTERING TRIPS
(XXX) EXITING TRIPS



Figure 5B

NON-TRUCK TRIPS Old Dominion Freight Distribution



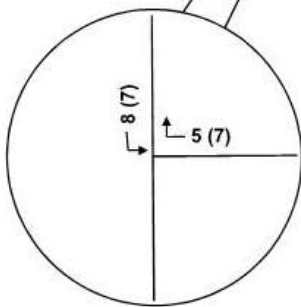
LEGEND
XXX AM PEAK
(XXX) PM PEAK



Figure 6A

TRUCK TRIPS

Old Dominion Freight Distribution



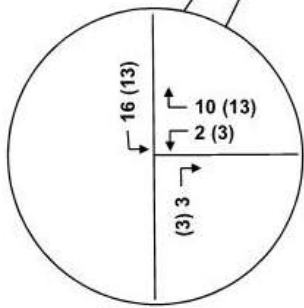
LEGEND
 XXX AM PEAK
 (XXX) PM PEAK



Figure 6B

SITE TRIPS

Old Dominion Freight Distribution



LEGEND
 XXX AM PEAK
 (XXX) PM PEAK



Figure 7

2020 PROJECTED TRAFFIC Old Dominion Freight Distribution

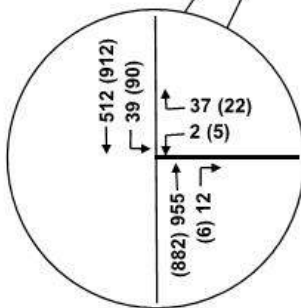


Figure 8

The analyses conducted are based on the **2010 HCM**, but the delay study conducted suggests some variation from the HCM delay algorithm. Based on the observed turning movement delays, the projected delay calculated may overestimate the delay for the left-turn movement and the Palestine Lane approach during the PM peak hour but perhaps underestimate the delay for the Palestine Lane approach during the AM peak hour. From the analyses and the delay study conducted (summarized in Table 6), it is believed that the Palestine Lane approach should operate at a minimum LOS E and the left-turn movement at a minimum LOS B.

Estimated queues from the Synchro analysis are as follows:

WATT ROAD & PALESTINE LANE		
Vehicle Queues		
MOVEMENT	AM PEAK	PM PEAK
SB Left	0.2	0.6
WB Left/Right	0.6	0.7

From the estimated queues, the left-turning vehicles from southbound Watt Road to Palestine Lane are nominal and will not require added left-turn storage; however, with the increased number of trucks and the available additional storage that can be provided, a recommendation is made to modify the striping on Watt Road to extend the existing left-turn lane in order to maximize storage and minimize potential impacts on southbound thru traffic and the eastbound interchange off-ramp.

Site Access Sight Distance

The proposed access, located on Palestine Lane, will experience low traffic volume during the day and over 40-percent will be trucks having a 7.6-foot visual height. The access is on a deadend road, located between a gentle horizontal curve to the west and vertical curve (hill) to the east. The current line of sight restriction for this proposed access is the existing vegetation along the southside of Palestine Lane. A speed limit for Palestine Lane is currently not posted. For a speed of 30mph, the minimum stopping sight-distance is 200 feet and the Knox County required corner sight-distance is 300 feet. The vertical and horizontal curves do not restrict the required line of sight. The clearing and grading of the site will remove the adjacent vegetation which should provide a line of sight for passenger vehicles that exceeds the minimum required by the County for a 30mph speed.

**TABLE 6
SUMMARY OF
CAPACITY AND LEVEL OF SERVICE**

INTERSECTION	TRAFFIC CONTROL	PEAK PERIOD	2017 EXISTING TRAFFIC			2020 BACKGROUND TRAFFIC			2020 BUILDOUT TRAFFIC		
			V/C	DELAY	LOS	V/C	DELAY	LOS	V/C	DELAY	LOS
Watt Road & Palestine Lane	STOP WB/SBLT	AM	0.097 / 0.039	19.3 / 11.1	C / B	0.107 / 0.042	21.0 / 11.5	C / B	0.164 / 0.068	23.1 / 11.7	C / B
		PM	- / 0.056 / 0.117	33.8 / 5.7 / 24.4 / 11.2	D / A / C / B	0.095 / 0.141	39.3 / 12.7	E / B	0.199 / 0.166	37.9 / 12.9	E / B

Note: Average vehicle delay estimated in seconds. Observed delays and LOS are represented in **RED**.

RECOMMENDATIONS

For mitigation of the existing traffic conditions and improve access for the proposed Old Dominion Freight development, the following are recommendations:

- Restripe the southbound left-turn lane from Watt Road to Palestine Lane to provide 275-300 feet of storage. A concept of this turn lane can be found in the Appendix.
- Improve pavement markings for the Palestine Lane approach to Watt Road to delineate the entering and the exiting lanes as the current markings are worn and not visible. The concept plan included in the Appendix shows improved pavement markings which will adequately facilitate left turns for a WB-67 interstate semi-trailer.
- Clear the adjacent vegetation along the site frontage with Palestine Lane and provide a minimum line of sight of 300 feet. Minimize landscaping, using low growing vegetation and signing at the planned access to insure safe sight-distance is maintained.

Roadway and intersection design should conform to the recommended standards and practices adopted by the Institute of Transportation Engineers (ITE), American Association of State and Highway Officials (AASHTO), Tennessee Department of Transportation (TDOT), and Knox County.

CONCLUSION

The proposed site is a freight distribution facility located in West Knoxville, Tennessee. The facility will encompass approximately 40 acres, disturbing less than 15 acres. The facility will be approximately 47,830 square feet at its buildout including 28 tractor spaces and 145 van spaces. Old Dominion Freight has indicated that its facility should generate approximately 90 trucks each day. Background traffic, which may be anticipated regardless of the proposed development, was determined using a 2.5-percent annual compounded growth rate until the horizon year 2020.

Trips for the proposed site were generated using a trip generation rate determined from an adjacent site, Southern Freight, a very similar type use. The study generated and distributed trips for a 47,830 square-foot distribution facility. The proposed site may generate approximately 441 daily trips with 31 trips during the AM peak hour and 32 during the PM peak hour. Of the daily trips generated, approximately 185 may be truck trips. Trips generated were distributed to the intersection of Watt Road and Palestine Lane. From these projected traffic volumes, the proposed site has less than a 2-percent impact on the adjacent study intersection but would increase the turning movements to and from Watt Road.

Using the projected turning movements for the existing and projected traffic conditions, with and without the proposed development, capacity and level of service analyses were conducted using the **2010 Highway Capacity Manual**. From the analyses and the delay study conducted, it is believed that the Palestine Lane approach should operate at a minimum LOS E and the left-turn movement at a minimum LOS B during the peak hours. Delays for the Palestine approach will increase for 2020 with background traffic growth on Watt Road.

With the recommendations of this study, the impact of this site is manageable providing acceptable traffic conditions.

APPENDIX

Site Trip Generation
Synchro Reports
Collision History
Palestine Lane Line of Sight
Traffic Count Data
Left-turn Storage Concept

SITE TRIP GENERATION

Land Use: 030 Intermodal Truck Terminal

Independent Variables with One Observation





The following trip generation data are for independent variables with only one observation. This information is shown in this table only; there are no related plots for these data.





Users are cautioned to use data with care because of the small sample size.





<u>Independent Variable</u>	<u>Trip Generation Rate</u>	<u>Size of Independent Variable</u>	<u>Number of Studies</u>	<u>Directional Distribution</u>
1,000 Square Feet Gross Floor Area				
Weekday	9.89 9.213	131	1	50% entering, 50% exiting
Weekday A.M. Peak Hour of Adjacent Street Traffic	0.90 0.652	131 46.02	1	40% entering, 60% exiting 60% entering, 40% exiting
Weekday P.M. Peak Hour of Adjacent Street Traffic	0.83 0.652	131 46.02	1	43% entering, 57% exiting 50% entering, 50% exiting
Weekday A.M. Peak Hour of Generator	0.90	131	1	40% entering, 60% exiting
Weekday P.M. Peak Hour of Generator	0.83	131	1	43% entering, 57% exiting
Saturday	1.90	131	1	50% entering, 50% exiting
Saturday Peak Hour of Generator	0.29	131	1	39% entering, 61% exiting
Sunday	1.03	131	1	50% entering, 50% exiting
Sunday Peak Hour of Generator	0.11	131	1	47% entering, 53% exiting





**SOUTHEASTERN FREIGHT TRIP GENERATION RATES,
JUNE 2017**





SYNCHRO REPORTS





Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	27	887	9	24	475
Future Vol, veh/h	0	27	887	9	24	475
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	52	8	11	42	6
Mvmt Flow	0	27	887	9	24	475
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1415	892	0	0	896	0
Stage 1	892	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Critical Hdwy	6.42	6.72	-	-	4.52	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.768	-	-	2.578	-
Pot Cap-1 Maneuver	151	278	-	-	614	-
Stage 1	400	-	-	-	-	-
Stage 2	595	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	145	278	-	-	614	-
Mov Cap-2 Maneuver	145	-	-	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	19.3		0		0.5	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 278	614	-		
HCM Lane V/C Ratio	-	- 0.097	0.039	-		
HCM Control Delay (s)	-	- 19.3	11.1	-		
HCM Lane LOS	-	- C	B	-		
HCM 95th %tile Q(veh)	-	- 0.3	0.1	-		

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	9	819	3	77	847
Future Vol, veh/h	2	9	819	3	77	847
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	52	8	11	42	6
Mvmt Flow	2	9	819	3	77	847
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1822	821	0	0	822	0
Stage 1	821	-	-	-	-	-
Stage 2	1001	-	-	-	-	-
Critical Hdwy	6.42	6.72	-	-	4.52	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.768	-	-	2.578	-
Pot Cap-1 Maneuver	85	308	-	-	658	-
Stage 1	432	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	75	308	-	-	658	-
Mov Cap-2 Maneuver	75	-	-	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	313	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	24.4		0		0.9	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 197	658	-		
HCM Lane V/C Ratio	-	- 0.056	0.117	-		
HCM Control Delay (s)	-	- 24.4	11.2	-		
HCM Lane LOS	-	- C	B	-		
HCM 95th %tile Q(veh)	-	- 0.2	0.4	-		

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	27	955	9	24	512
Future Vol, veh/h	0	27	955	9	24	512
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	52	8	11	42	6
Mvmt Flow	0	27	955	9	24	512
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1520	960	0	0	964	0
Stage 1	960	-	-	-	-	-
Stage 2	560	-	-	-	-	-
Critical Hdwy	6.42	6.72	-	-	4.52	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.768	-	-	2.578	-
Pot Cap-1 Maneuver	131	252	-	-	576	-
Stage 1	372	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	126	252	-	-	576	-
Mov Cap-2 Maneuver	126	-	-	-	-	-
Stage 1	372	-	-	-	-	-
Stage 2	548	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	21		0		0.5	
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 252	576	-		
HCM Lane V/C Ratio	-	- 0.107	0.042	-		
HCM Control Delay (s)	-	- 21	11.5	-		
HCM Lane LOS	-	- C	B	-		
HCM 95th %tile Q(veh)	-	- 0.4	0.1	-		

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	9	882	3	77	912
Future Vol, veh/h	2	9	882	3	77	912
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	56	6	33	69	6
Mvmt Flow	2	9	882	3	77	912
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1950	884	0	0	885	0
Stage 1	884	-	-	-	-	-
Stage 2	1066	-	-	-	-	-
Critical Hdwy	7.6	6.76	-	-	4.79	-
Critical Hdwy Stg 1	6.6	-	-	-	-	-
Critical Hdwy Stg 2	6.6	-	-	-	-	-
Follow-up Hdwy	3.95	3.804	-	-	2.821	-
Pot Cap-1 Maneuver	36	277	-	-	545	-
Stage 1	282	-	-	-	-	-
Stage 2	219	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	32	277	-	-	545	-
Mov Cap-2 Maneuver	32	-	-	-	-	-
Stage 1	282	-	-	-	-	-
Stage 2	188	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	39.3		0		1	
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 116	545	-		
HCM Lane V/C Ratio	-	- 0.095	0.141	-		
HCM Control Delay (s)	-	- 39.3	12.7	-		
HCM Lane LOS	-	- E	B	-		
HCM 95th %tile Q(veh)	-	- 0.3	0.5	-		

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	37	955	12	39	512
Future Vol, veh/h	2	37	955	12	39	512
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	52	8	11	42	6
Mvmt Flow	2	37	955	12	39	512
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1551	961	0	0	967	0
Stage 1	961	-	-	-	-	-
Stage 2	590	-	-	-	-	-
Critical Hdwy	6.42	6.72	-	-	4.52	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.768	-	-	2.578	-
Pot Cap-1 Maneuver	125	252	-	-	575	-
Stage 1	371	-	-	-	-	-
Stage 2	554	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	117	252	-	-	575	-
Mov Cap-2 Maneuver	117	-	-	-	-	-
Stage 1	371	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	23.1	0		0.8		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 238	575	-		
HCM Lane V/C Ratio	-	- 0.164	0.068	-		
HCM Control Delay (s)	-	- 23.1	11.7	-		
HCM Lane LOS	-	- C	B	-		
HCM 95th %tile Q(veh)	-	- 0.6	0.2	-		

Intersection						
Int Delay, s/veh	1.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	22	882	6	90	912
Future Vol, veh/h	5	22	882	6	90	912
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	385	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	50	56	6	33	69	6
Mvmt Flow	5	22	882	6	90	912
Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1977	885	0	0	888	0
Stage 1	885	-	-	-	-	-
Stage 2	1092	-	-	-	-	-
Critical Hdwy	6.9	6.76	-	-	4.79	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.804	-	-	2.821	-
Pot Cap-1 Maneuver	50	276	-	-	543	-
Stage 1	334	-	-	-	-	-
Stage 2	261	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	42	276	-	-	543	-
Mov Cap-2 Maneuver	42	-	-	-	-	-
Stage 1	334	-	-	-	-	-
Stage 2	218	-	-	-	-	-
Approach	WB		NB		SB	
HCM Control Delay, s	37.9		0		1.2	
HCM LOS	E					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	- 136	543	-		
HCM Lane V/C Ratio	-	- 0.199	0.166	-		
HCM Control Delay (s)	-	- 37.9	12.9	-		
HCM Lane LOS	-	- E	B	-		
HCM 95th %tile Q(veh)	-	- 0.7	0.6	-		

COLLISION HISTORY

Knox County Department of Engineering and Public Works

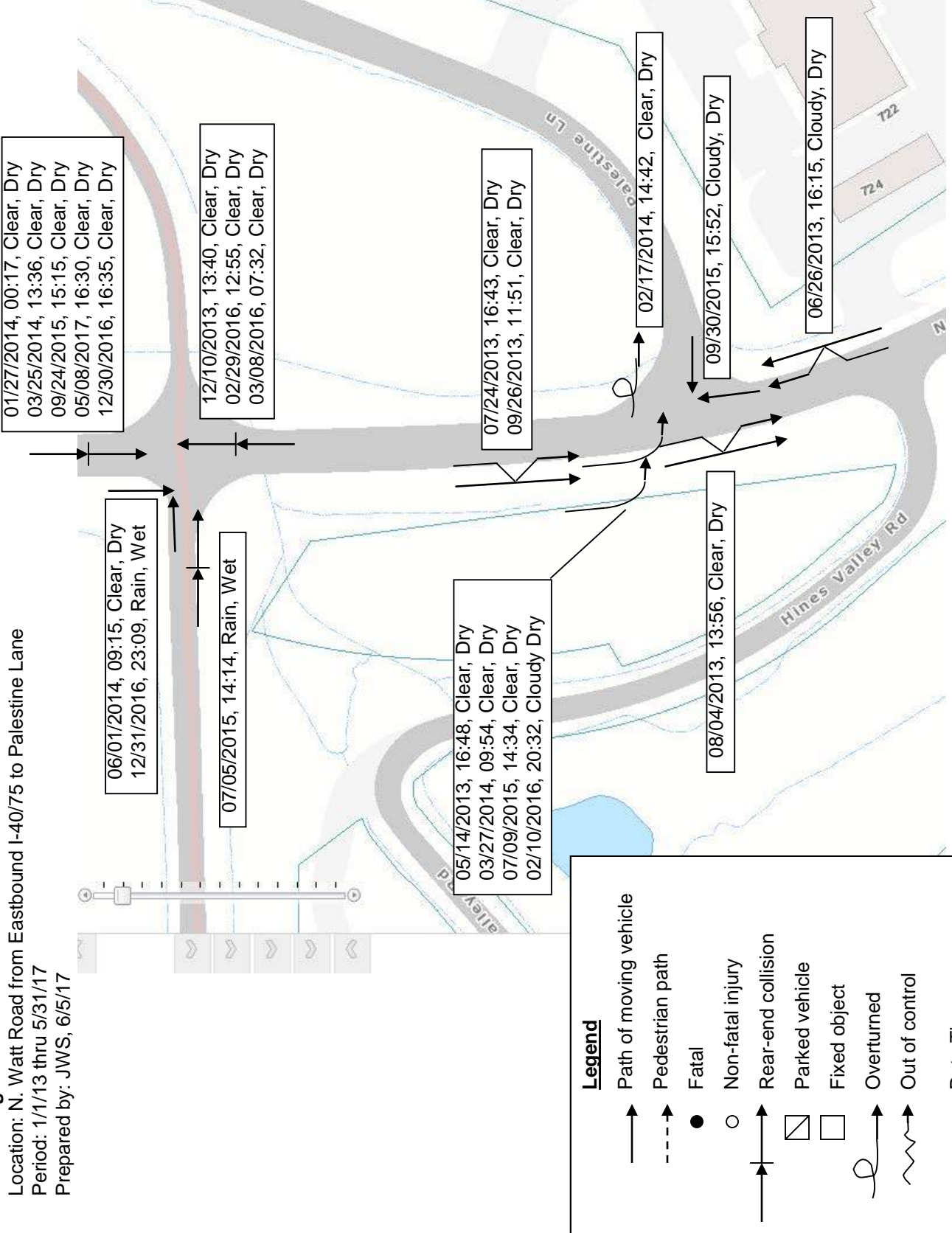
Crash Diagram

Location: N. Watt Road from Eastbound I-40/75 to Palestine Lane

Period: 1/1/13 thru 5/31/17

Prepared by: JWS, 6/5/17

North



COUNTY	=	KNOX	Date:	7/31/2017
Route	=	Watt Road		
Location	=	Palestine Lane		
		Spot Location		
Highway Type	=	2 LANE		
FUNCTIONAL CLASS	=	Major Arterial		
DATA YEARS	=	1/1/2013-5/30/2017		
ADT YEARS USED	=	TMC Factored		
COMMENTS	=			
ANALYZED BY	=	C D L		

SECTION = MORE THAN 0.10 MILE / SPOT = LESS THAN 0.10 MILE				
BLM	ELM	Length	Average AADT	VMT
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
0.00	0.00	0.00	0	0
		0.00	0	0

INTERSECTION	Leg	Traffic AADT
Log Mile = 0	North =	20,500
	East =	155
	South =	20,500
	West =	0
	Entering AADT =	20,578
	Tmc Factored	
2 Lane		
1/1/2013-5/30/2017		

	Total	Fatal	Incap. Injury	*Severe Crashes	Other Injury
No. of Crashes	= 10	0	0	0	0
No. of Years	= 4				
SW avg. rate	= 0.384	0.002	0.013	0.015	0.098
03-05 S/W Rates					
Exposure (E)	= 33.1729				
Crash Rate (A)	= 0.301	0.000	0.000	0.000	0.000
Critical Rate (C)	= 0.649				
Severity Index (SI)	= 0.0000				
Actual Rate/SW Average	= 0.79	0.00	0.00	0.00	0.00
Ratio of A/C	= 0.46				

* Severe Crashes are the sum of fatal and incapacitating injury crashes

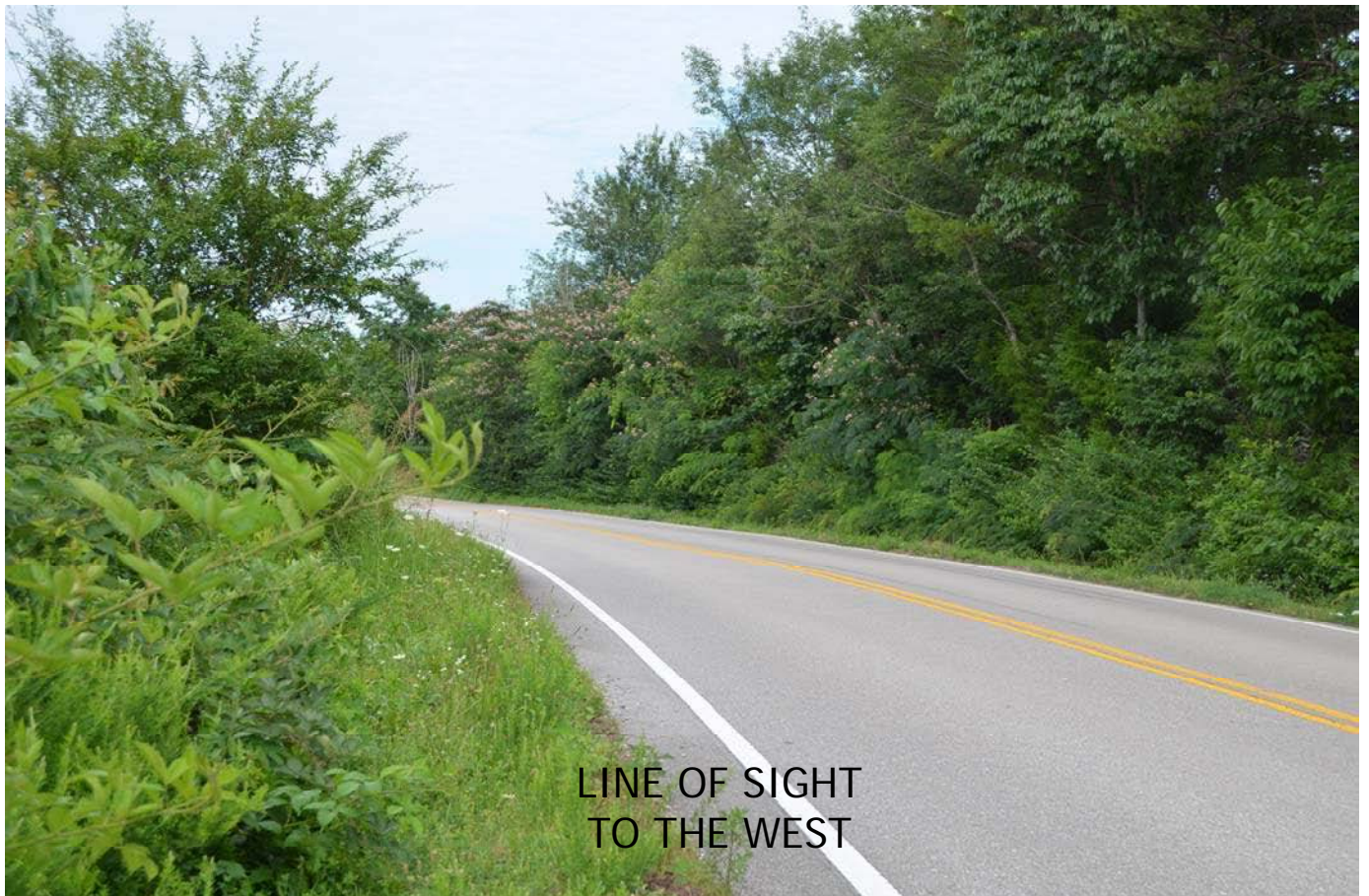
Revised 4/3/2007

T.D.O.T. PROJECT PLANNING DIVISION (SAFETY PLANNING SECTION)	C D L
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PALESTINE LANE
LINES OF SIGHT



LINE OF SIGHT
TO THE EAST



LINE OF SIGHT
TO THE WEST

TRAFFIC COUNT DATA

CDM SMITH Inc.
1100 Marion Street, Suite 300
Knoxville, TN 37921
(865) 963-4300

File Name : watt rd_palestine In
Site Code : 00000001
Start Date : 6/13/2017
Page No : 1

Groups Printed- Cars - Trucks

	WATT RD Southbound				PALESTINE LN Westbound				WATT RD Northbound				PALESTINE LN Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	73	0	78	0	0	4	4	0	169	0	169	0	0	0	0	251
07:15 AM	8	75	0	83	0	0	5	5	0	186	4	190	0	0	0	0	278
07:30 AM	4	113	0	117	0	0	4	4	0	265	2	267	0	0	0	0	388
07:45 AM	2	164	0	166	0	0	15	15	0	220	2	222	0	0	0	0	403
Total	19	425	0	444	0	0	28	28	0	840	8	848	0	0	0	0	1320
08:00 AM	10	123	0	133	0	0	3	3	0	216	1	217	0	0	0	0	353
08:15 AM	7	93	0	100	0	0	4	4	0	151	0	151	0	0	0	0	255
08:30 AM	14	127	0	141	0	0	3	3	0	205	1	206	0	0	0	0	350
08:45 AM	20	94	0	114	0	0	5	5	0	139	1	140	0	0	0	0	259
Total	51	437	0	488	0	0	15	15	0	711	3	714	0	0	0	0	1217

*** BREAK ***

04:00 PM	16	149	0	165	0	0	5	5	0	149	1	150	0	0	0	0	320
04:15 PM	15	219	0	234	0	0	3	3	0	211	1	212	0	0	0	0	449
04:30 PM	23	170	0	193	0	0	1	1	0	173	0	173	0	0	0	0	367
04:45 PM	22	246	0	268	0	0	3	3	0	167	0	167	0	0	0	0	438
Total	76	784	0	860	0	0	12	12	0	700	2	702	0	0	0	0	1574
05:00 PM	25	199	0	224	0	0	1	1	0	214	0	214	0	0	0	0	439
05:15 PM	15	224	0	239	0	0	2	2	0	213	1	214	0	0	0	0	455
05:30 PM	15	178	0	193	2	0	3	5	0	225	2	227	0	0	0	0	425
05:45 PM	9	219	0	228	0	0	3	3	0	182	2	184	0	0	0	0	415
Total	64	820	0	884	2	0	9	11	0	834	5	839	0	0	0	0	1734
Grand Total	210	2466	0	2676	2	0	64	66	0	3085	18	3103	0	0	0	0	5845
Apprch %	7.8	92.2	0		3	0	97		0	99.4	0.6		0	0	0		
Total %	3.6	42.2	0	45.8	0	0	1.1	1.1	0	52.8	0.3	53.1	0	0	0	0	
Cars	85	2295	0	2380	1	0	28	29	0	2853	15	2868	0	0	0	0	5277
% Cars	40.5	93.1	0	88.9	50	0	43.8	43.9	0	92.5	83.3	92.4	0	0	0	0	90.3
Trucks	125	171	0	296	1	0	36	37	0	232	3	235	0	0	0	0	568
% Trucks	59.5	6.9	0	11.1	50	0	56.2	56.1	0	7.5	16.7	7.6	0	0	0	0	9.7

	WATT RD Southbound				PALESTINE LN Westbound				WATT RD Northbound				PALESTINE LN Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	8	75	0	83	0	0	5	5	0	186	4	190	0	0	0	0	278
07:30 AM	4	113	0	117	0	0	4	4	0	265	2	267	0	0	0	0	388
07:45 AM	2	164	0	166	0	0	15	15	0	220	2	222	0	0	0	0	403
08:00 AM	10	123	0	133	0	0	3	3	0	216	1	217	0	0	0	0	353
Total Volume	24	475	0	499	0	0	27	27	0	887	9	896	0	0	0	0	1422
% App. Total	4.8	95.2	0		0	0	100		0	99	1		0	0	0		
PHF	.600	.724	.000	.752	.000	.000	.450	.450	.000	.837	.563	.839	.000	.000	.000	.000	.882
Cars	14	445	0	459	0	0	13	13	0	815	8	823	0	0	0	0	1295
% Cars	58.3	93.7	0	92.0	0	0	48.1	48.1	0	91.9	88.9	91.9	0	0	0	0	91.1
Trucks	10	30	0	40	0	0	14	14	0	72	1	73	0	0	0	0	127
% Trucks	41.7	6.3	0	8.0	0	0	51.9	51.9	0	8.1	11.1	8.1	0	0	0	0	8.9

CDM SMITH Inc.
1100 Marion Street, Suite 300
Knoxville, TN 37921
(865) 963-4300

File Name : watt rd_palestine In
Site Code : 00000001
Start Date : 6/13/2017
Page No : 2

	WATT RD Southbound				PALESTINE LN Westbound				WATT RD Northbound				PALESTINE LN Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	22	246	0	268	0	0	3	3	0	167	0	167	0	0	0	0	438
05:00 PM	25	199	0	224	0	0	1	1	0	214	0	214	0	0	0	0	439
05:15 PM	15	224	0	239	0	0	2	2	0	213	1	214	0	0	0	0	455
05:30 PM	15	178	0	193	2	0	3	5	0	225	2	227	0	0	0	0	425
Total Volume	77	847	0	924	2	0	9	11	0	819	3	822	0	0	0	0	1757
% App. Total	8.3	91.7	0		18.2	0	81.8		0	99.6	0.4		0	0	0		
PHF	.770	.861	.000	.862	.250	.000	.750	.550	.000	.910	.375	.905	.000	.000	.000	.000	.965
Cars	24	794	0	818	1	0	4	5	0	769	2	771	0	0	0	0	1594
% Cars	31.2	93.7	0	88.5	50.0	0	44.4	45.5	0	93.9	66.7	93.8	0	0	0	0	90.7
Trucks	53	53	0	106	1	0	5	6	0	50	1	51	0	0	0	0	163
% Trucks	68.8	6.3	0	11.5	50.0	0	55.6	54.5	0	6.1	33.3	6.2	0	0	0	0	9.3

Start Time	05-Jun-17		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound
12:00 AM	*	*	*	*	5	14	*	*	*	*	*	*	*	*	5	14
01:00	*	*	*	*	4	13	*	*	*	*	*	*	*	*	4	13
02:00	*	*	*	*	3	2	*	*	*	*	*	*	*	*	3	2
03:00	*	*	*	*	10	6	*	*	*	*	*	*	*	*	10	6
04:00	*	*	*	*	10	7	*	*	*	*	*	*	*	*	10	7
05:00	*	*	*	*	7	11	*	*	*	*	*	*	*	*	7	11
06:00	*	*	*	*	10	22	*	*	*	*	*	*	*	*	10	22
07:00	*	*	*	*	15	11	*	*	*	*	*	*	*	*	15	11
08:00	*	*	*	*	7	10	*	*	*	*	*	*	*	*	7	10
09:00	*	*	*	*	12	18	*	*	*	*	*	*	*	*	12	18
10:00	*	*	*	*	21	12	*	*	*	*	*	*	*	*	21	12
11:00	*	*	*	*	14	8	*	*	*	*	*	*	*	*	14	8
12:00 PM	*	*	*	*	8	10	*	*	*	*	*	*	*	*	8	10
01:00	*	*	*	*	10	4	*	*	*	*	*	*	*	*	10	4
02:00	*	*	*	*	9	7	*	*	*	*	*	*	*	*	9	7
03:00	*	*	*	*	6	2	*	*	*	*	*	*	*	*	6	2
04:00	*	*	*	*	4	3	*	*	*	*	*	*	*	*	4	3
05:00	*	*	*	*	4	9	*	*	*	*	*	*	*	*	4	9
06:00	*	*	*	*	15	15	*	*	*	*	*	*	*	*	15	15
07:00	*	*	*	*	9	14	*	*	*	*	*	*	*	*	9	14
08:00	*	*	*	*	14	6	*	*	*	*	*	*	*	*	14	6
09:00	*	*	9	6	*	*	*	*	*	*	*	*	*	*	9	6
10:00	*	*	1	4	*	*	*	*	*	*	*	*	*	*	1	4
11:00	*	*	1	3	*	*	*	*	*	*	*	*	*	*	1	3
Lane	0	0	11	13	197	204	0	0	0	0	0	0	0	0	208	217
Day	0	0	24	13	401	401	0	0	0	0	0	0	0	0	425	425
AM Peak Vol.					10:00						10:00				10:00	
					21						21				21	
PM Peak Vol.			21:00		18:00						18:00				18:00	
			9		15						15				15	

Comb. Total

0

24

401

0

0

425

ADT

ADT 301

AADT 301

Northbound

Report for Report From 6/6/2017 8:30:00 PM to 6/8/2017 10:45:00 AM

CLASS STATISTICS - Modified Scheme F

Class	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	No Class
Count	1	58	46	2	13	6	0	37	11	1	15	24	0	0
Percent	0.5	27.1	21.5	0.9	6.1	2.8	0.0	17.3	5.1	0.5	7.0	11.2	0.0	0.0

Southbound

Report for Report From 6/6/2017 8:30:00 PM to 6/8/2017 10:45:00 AM

CLASS STATISTICS - Modified Scheme F

Class	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	No Class
Count	3	57	52	2	13	5	0	34	11	0	14	19	0	0
Percent	1.4	27.1	24.8	1.0	6.2	2.4	0.0	16.2	5.2	0.0	6.7	9.0	0.0	0.0

COMBINED - Northbound, Southbound

Report for Report From 6/6/2017 8:30:00 PM to 6/8/2017 10:45:00 AM

CLASS STATISTICS - Modified Scheme F

Class	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	No Class
Count	4	115	98	4	26	11	0	71	22	1	29	43	0	0
Percent	0.9	27.1	23.1	0.9	6.1	2.6	0.0	16.7	5.2	0.2	6.8	10.1	0.0	0.0



Traffic History

Traffic History reflects the Annual Average Daily Traffic (AADT) count along specific locations on Tennessee's road network

View stations on map:

Non-Map Record Search: Station Number:

<https://maps.google.com/maps?ll=35.872572,-84.233653&z=15&t=m&hl=en>

Station Information	
Station	000244
Route	01248
Location	NEAR LOUDON CO
County	Knox
2015	9998
2014	8964
2013	8473
2012	9435
2011	8855
2010	8637
2009	8324
2008	8833
2007	8033
2006	7601
2005	8088
2004	7565
2003	7345
2002	7323
2001	7082
2000	6924
1999	6641
1998	7392
1997	6757

Download

File: (/Applications/Files/TrfcHist.kmz)

Open Google Earth

With: (<https://earth.google.com/>)

ESRI Geodatabase

(/Applications/Files/TrfcHistFGDB.zip)

ArcGIS Explorer

(<http://www.esri.com/software/arcgis/explorer/index.html>)

ESRI Shapefile

(/Applications/Files/TrfcHistSHP.zip)

Database 1

(/Applications/Files/T

MS Access o

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Knoxville, TN 37921
(865) 963-4300

Lane 1 = Palestine Ln WBL/R
Lane 2 = Watt Rd SBL

File Name : stop delay_am
Site Code : 00000002
Start Date : 6/13/2017
Page No : 1

L n.	No.	Joined Queue	Released From Queue	Delay	
1	1	7:20:18 AM	7:20:18 AM	0	
1	2	7:20:25 AM	7:20:25 AM	0	
1	3	7:20:33 AM	7:20:33 AM	0	
1	4	7:20:46 AM	7:20:52 AM	6	
1	5	7:21:03 AM	7:21:14 AM	11	
1	6	7:24:14 AM	7:24:30 AM	16	
1	7	7:27:27 AM	7:27:43 AM	16	
1	8	7:28:40 AM	7:28:45 AM	5	
1	9	7:35:34 AM	7:35:54 AM	20	
1	10	7:37:17 AM	7:37:17 AM	0	
1	11	7:40:10 AM	7:40:15 AM	5	
1	12	7:43:16 AM	7:43:28 AM	12	
1	13	7:45:50 AM	7:47:21 AM	91	
1	14	7:47:17 AM	7:47:45 AM	28	
1	15	7:47:45 AM	7:48:56 AM	71	
1	16	7:48:45 AM	7:49:30 AM	45	
1	17	7:49:16 AM	7:50:06 AM	50	
1	18	7:50:02 AM	7:50:33 AM	31	
1	19	7:50:05 AM	7:50:37 AM	32	
1	20	7:50:09 AM	7:52:44 AM	155	Deleted
1	21	7:52:20 AM	7:53:08 AM	48	
1	22	7:52:32 AM	7:55:57 AM	205	Deleted
1	23	7:55:55 AM	7:56:25 AM	30	
1	24	7:56:13 AM	7:57:49 AM	96	
1	25	7:57:36 AM	7:58:38 AM	62	
1	26	7:58:38 AM	7:58:46 AM	7	
1	27	8:03:40 AM	8:05:37 AM	117	
1	28	8:10:35 AM	8:11:20 AM	45	
1	29	8:10:46 AM	8:11:39 AM	53	
1	30	8:11:31 AM	8:12:40 AM	69	
1	31	8:12:35 AM	8:13:32 AM	57	
1	32	8:13:30 AM	8:14:44 AM	74	
2	1	7:16:01 AM	7:16:01 AM	0	
2	2	7:16:01 AM	7:16:02 AM	1	
2	3	7:16:19 AM	7:16:27 AM	8	
2	4	7:16:59 AM	7:16:59 AM	0	
2	5	7:17:05 AM	7:17:05 AM	0	
2	6	7:18:02 AM	7:18:04 AM	2	
2	7	7:18:54 AM	7:18:55 AM	1	
2	8	7:19:45 AM	7:19:45 AM	0	
2	9	7:20:06 AM	7:20:06 AM	0	
2	10	7:21:50 AM	7:21:50 AM	0	
2	11	7:22:10 AM	7:22:10 AM	0	
2	12	7:22:11 AM	7:22:11 AM	0	
2	13	7:22:20 AM	7:22:20 AM	0	
2	14	7:22:44 AM	7:22:44 AM	0	
2	15	7:22:46 AM	7:22:46 AM	0	
2	16	7:22:49 AM	7:22:49 AM	0	
2	17	7:22:51 AM	7:22:51 AM	0	
2	18	7:22:52 AM	7:22:53 AM	1	
2	19	7:24:53 AM	7:24:53 AM	0	
2	20	7:27:53 AM	7:27:53 AM	0	
2	21	7:28:01 AM	7:28:02 AM	1	
2	22	7:28:03 AM	7:28:06 AM	3	
2	23	7:28:32 AM	7:28:42 AM	10	
2	24	7:28:48 AM	7:29:19 AM	31	
2	25	7:29:45 AM	7:30:09 AM	24	
2	26	7:30:18 AM	7:30:26 AM	8	
2	27	7:30:29 AM	7:30:51 AM	22	
2	28	7:31:41 AM	7:31:41 AM	0	
2	29	7:36:18 AM	7:36:37 AM	19	

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Lane 1 = Palestine Ln WBL/R
 Lane 2 = Watt Rd SBL

File Name : stop delay_am
 Site Code : 00000002
 Start Date : 6/13/2017
 Page No : 2

L n.	No.	Joined Queue	Released From Queue	Delay	
2	30	7:36:50 AM	7:36:50 AM	0	
2	31	7:38:33 AM	7:38:33 AM	0	
2	32	7:49:25 AM	7:49:25 AM	0	
2	33	7:50:39 AM	7:50:39 AM	0	
2	34	7:51:35 AM	7:51:49 AM	14	
2	35	7:55:15 AM	7:55:15 AM	0	
2	36	7:56:44 AM	7:56:44 AM	0	
2	37	8:04:37 AM	8:04:42 AM	5	
2	38	8:05:45 AM	8:05:58 AM	13	
2	39	8:08:44 AM	8:08:53 AM	9	
2	40	8:12:17 AM	8:12:20 AM	3	
2	41	8:12:40 AM	8:12:40 AM	0	
2	42	8:12:43 AM	8:12:43 AM	0	
2	43	8:13:33 AM	8:14:00 AM	27	
2	44	8:14:00 AM	8:14:31 AM	31	
2	45	8:14:21 AM	8:14:45 AM	24	

Summary Information:

7:16:00 AM - 8:15:00 AM	Lane 1	Lane 2
Total Vehicle Count:	32	45
Delayed Vehicle Count:	32	45
Through Vehicle Count:	0	0
Average Stopped Time:	45.53 33.8	5.711
Maximum Stopped Time:	205	31
Min. Secs. for Delay:	0	0
Average Queue:	0.67	0.073
Queue Density:	1.20	1.041
Maximum Queue:	3	2
Delay in Vehicle Hour:	0.45	0.07
Total Delay:	1457	257

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Lane 1 = Palestine Ln WBL/R
Lane 2 = Watt Rd SBL

File Name : stop delay_pm
Site Code : 00000003
Start Date : 6/13/2017
Page No : 1

L n.	No.	Joined Queue	Released From Queue	Delay	
1	1	4:47:32 PM	4:47:49 PM	17	
1	2	4:49:05 PM	4:49:15 PM	10	
1	3	4:50:40 PM	4:52:27 PM	107	
1	4	4:55:16 PM	4:55:29 PM	13	
1	5	4:55:40 PM	4:55:47 PM	7	
1	6	4:55:42 PM	4:55:47 PM	5	
1	7	4:57:10 PM	4:57:14 PM	4	
1	8	5:00:03 PM	5:00:14 PM	11	
1	9	5:09:48 PM	5:10:08 PM	20	
1	10	5:09:49 PM	5:10:08 PM	19	
1	11	5:11:54 PM	5:12:15 PM	21	
1	12	5:18:18 PM	5:18:26 PM	8	
1	13	5:20:23 PM	5:20:28 PM	5	
1	14	5:20:24 PM	5:20:49 PM	25	
1	15	5:29:32 PM	5:29:37 PM	5	
1	16	5:32:50 PM	5:33:19 PM	29	
1	17	5:34:34 PM	5:34:42 PM	8	
1	18	5:38:24 PM	5:38:58 PM	34	
1	19	5:43:52 PM	5:44:05 PM	13	
2	1	4:44:01 PM	4:44:14 PM	13	
2	2	4:44:33 PM	4:44:33 PM	0	
2	3	4:48:33 PM	4:48:39 PM	6	
2	4	4:49:55 PM	4:49:56 PM	1	
2	5	4:50:16 PM	4:50:32 PM	16	
2	6	4:50:51 PM	4:50:59 PM	8	
2	7	4:51:01 PM	4:51:06 PM	5	
2	8	4:51:32 PM	4:51:38 PM	6	
2	9	4:52:10 PM	4:52:29 PM	19	
2	10	4:52:13 PM	4:52:29 PM	16	
2	11	4:52:44 PM	4:52:45 PM	1	
2	12	4:53:12 PM	4:53:20 PM	8	
2	13	4:53:15 PM	4:53:28 PM	13	
2	14	4:53:28 PM	4:53:44 PM	16	
2	15	4:54:05 PM	4:54:08 PM	3	
2	16	4:54:53 PM	4:54:57 PM	4	
2	17	4:57:00 PM	4:57:07 PM	7	
2	18	4:58:23 PM	4:58:23 PM	0	
2	19	4:59:45 PM	4:59:45 PM	0	
2	20	4:59:53 PM	4:59:58 PM	5	
2	21	5:02:04 PM	5:02:07 PM	3	
2	22	5:02:22 PM	5:02:23 PM	1	
2	23	5:02:23 PM	5:02:24 PM	1	
2	24	5:02:26 PM	5:02:29 PM	3	
2	25	5:02:46 PM	5:02:47 PM	1	
2	26	5:04:11 PM	5:04:15 PM	4	
2	27	5:05:09 PM	5:05:12 PM	3	
2	28	5:05:31 PM	5:05:44 PM	13	
2	29	5:06:47 PM	5:06:55 PM	8	
2	30	5:07:13 PM	5:07:39 PM	26	
2	31	5:07:59 PM	5:08:04 PM	5	
2	32	5:08:56 PM	5:08:57 PM	1	
2	33	5:09:31 PM	5:09:31 PM	0	
2	34	5:09:50 PM	5:10:03 PM	13	
2	35	5:12:16 PM	5:12:28 PM	12	
2	36	5:12:17 PM	5:12:29 PM	12	
2	37	5:13:32 PM	5:13:32 PM	0	
2	38	5:14:28 PM	5:14:46 PM	18	
2	39	5:15:02 PM	5:15:03 PM	1	
2	40	5:15:33 PM	5:15:36 PM	3	
2	41	5:17:28 PM	5:17:31 PM	3	
2	42	5:18:03 PM	5:18:03 PM	0	

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Lane 1 = Palestine Ln WBL/R
 Lane 2 = Watt Rd SBL

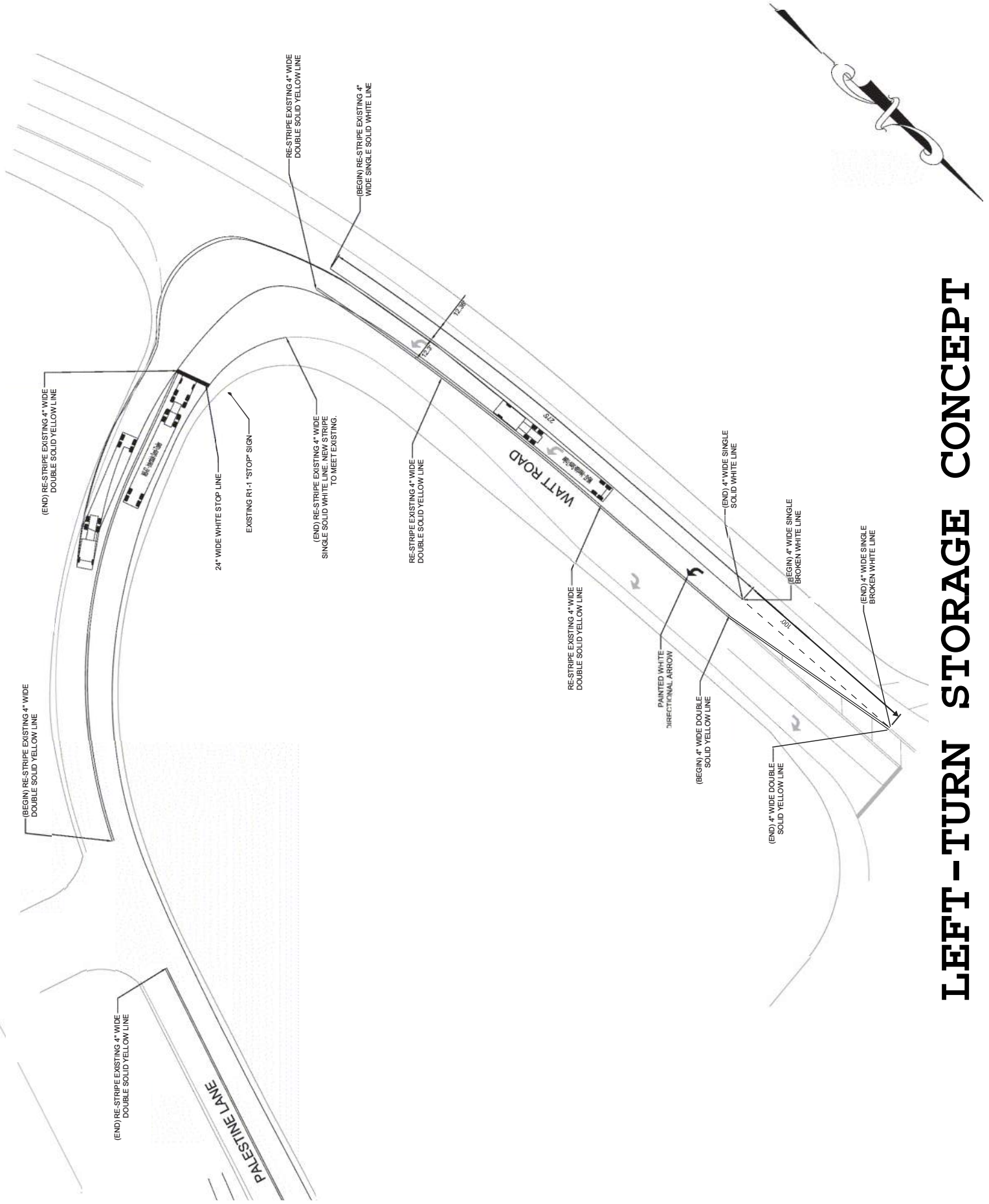
File Name : stop delay_pm
 Site Code : 00000003
 Start Date : 6/13/2017
 Page No : 2

L n.	No.	Joined Queue	Released From Queue	Delay	
2	43	5:18:19 PM	5:18:23 PM	4	
2	44	5:18:59 PM	5:19:00 PM	1	
2	45	5:19:47 PM	5:19:47 PM	0	
2	46	5:20:32 PM	5:20:42 PM	10	
2	47	5:21:44 PM	5:21:47 PM	3	
2	48	5:22:01 PM	5:22:01 PM	0	
2	49	5:23:28 PM	5:23:31 PM	3	
2	50	5:24:47 PM	5:24:47 PM	0	
2	51	5:24:53 PM	5:24:53 PM	0	
2	52	5:25:21 PM	5:25:46 PM	25	
2	53	5:26:06 PM	5:26:06 PM	0	
2	54	5:27:02 PM	5:27:11 PM	9	
2	55	5:27:27 PM	5:27:27 PM	0	
2	56	5:27:32 PM	5:27:32 PM	0	
2	57	5:28:19 PM	5:28:19 PM	0	
2	58	5:28:45 PM	5:28:49 PM	4	
2	59	5:28:56 PM	5:29:00 PM	4	
2	60	5:32:37 PM	5:32:37 PM	0	
2	61	5:32:59 PM	5:33:24 PM	25	
2	62	5:33:00 PM	5:33:39 PM	39	
2	63	5:33:01 PM	5:33:41 PM	40	
2	64	5:35:52 PM	5:35:52 PM	0	
2	65	5:38:33 PM	5:39:04 PM	31	
2	66	5:39:08 PM	5:39:08 PM	0	
2	67	5:39:54 PM	5:39:54 PM	0	
2	68	5:40:40 PM	5:40:40 PM	0	
2	69	5:41:11 PM	5:41:11 PM	0	
2	70	5:43:07 PM	5:43:37 PM	30	
2	71	5:43:50 PM	5:44:01 PM	11	

Summary Information:

4:44:00 PM - 5:45:00 PM	Lane 1	Lane 2
Total Vehicle Count:	19	71
Delayed Vehicle Count:	19	71
Through Vehicle Count:	0	0
Average Stopped Time:	19.00	7.282
Maximum Stopped Time:	107	40
Min. Secs. for Delay:	0	0
Average Queue:	0.11	0.143
Queue Density:	1.08	1.223
Maximum Queue:	2	3
Delay in Vehicle Hour:	0.11	0.14
Total Delay:	361	517

LEFT-TURN LANE CONCEPT



LEFT-TURN STORAGE CONCEPT



**CDM
Smith**

