

**To:** Rich Vetter

The Dover/Kent MPO

From: Shilpa Mallem, TYLI

**Date:** 6/14/2017

**Re:** Garrison Oak Traffic Study – Technical Memorandum

#### **Introduction:**

The Dover/ Kent County Metropolitan Organization (Dover/ Kent MPO) has tasked T.Y. Lin International (TYLI) to conduct a traffic study along the roadways and intersections surrounding the Garrison Oak Technology Park (Tech Park) in Dover, DE. The purpose of this Technical Memorandum (Tech Memo) is to document the process and results of the traffic study including the existing and future traffic conditions in the study area in relation to the development of the Tech Park.

# Study Area:

The Garrison Oak Tech Park is located just east of SR 1, with its access located along White Oak Road. It is a 389 acre property comprising of 15 lots slated for development. At the time of this study, there are three developed lots in the park, Dover Sun Park (103.4 acres), Garrison Energy Center (86.4 acres) and the Uzin Utz manufacturing facility. One additional lot (Advantech) is expected to be developed during 2017, creating 60 jobs on site. The rest of the lot sizes range between 10-14 acres each.

The Tech Park is currently located just north and east of the SR 8 interchange along SR 1. Most of the Tech Park traffic is assumed to use this interchange and the local roads on the west side of SR 1 to access the Tech Park. Traffic accessing the Tech Park is expected to increase in the near future as additional tenants occupy the vacant lots. The State of Delaware owns several parcels of land along the east side of SR 1 that may be used to construct a roadway that would connect the Tech Park with the SR 8 interchange. **Figure 1** shows the location of the study area.

White Oak Road: The section of White Oak Road in the study area is an east-west roadway, located east of US 13 in the City of Dover, DE. According to DelDOT's Vehicle Volume Summary 2015, White Oak Road is classified as an urban local street carrying an Average Annual Daily Traffic (AADT) of 2,374 vehicles per day (vpd). It is a two-lane roadway carrying one 11' travel lane and 8' shoulder in each direction.

**Acorn Lane:** Acorn Lane is a north-south roadway extending between White Oak Road and North Little Creek Road, east of Dover, DE. It is classified as an urban collector carrying an AADT of 1,149 vpd. It is a two lane road with one 11' travel lane in each direction. There is an existing bike lane along the east side of the roadway that extends about 2000' north of its intersection with North Little Creek Road. Acorn Lane currently acts as an access road for vehicles traveling along northbound (NB) and southbound (SB) State Route (SR) 1 to access the Tech Park through North Little Creek Road and White Oak Road.

**North Little Creek Road:** North Little Creek Road (Little Creek Rd) in the study area is a part of the SR 8 corridor, east of Dover, DE. It is classified as a rural major collector with an AADT of 4,351 vpd. It is also a two lane roadway with one 11' travel lane and 8' shoulder in each direction.

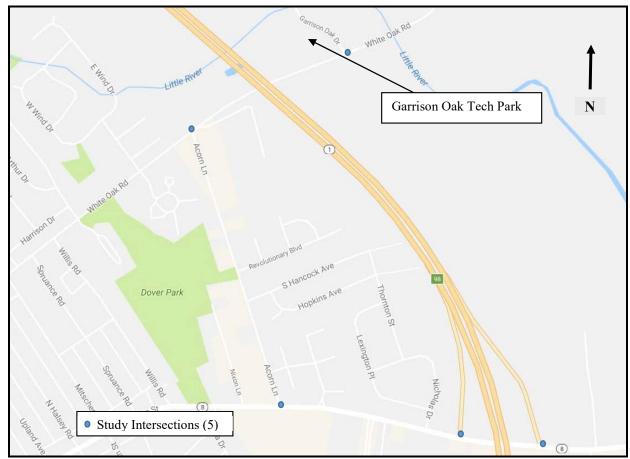


Figure 1: Study Area

## **Study Intersections:**

White Oak Road at Garrison Oak Drive: White Oak Road intersects Garrison Oak Dr., the access roadway to the Tech Park as a three-legged intersection, just east of SR 1 in Dover. White Oak Road comprises the east and west legs of the intersection, while Garrison Oak Dr. comprises the north leg of the intersection. There are no turn lanes or traffic control devices at this intersection. Field visits showed that the traffic exiting Garrison Oak stops for the traffic traveling through on White Oak Road.

White Oak Road at Acorn Lane: White Oak Road also intersects Acorn Lane as a three-legged intersection, with White Oak Road comprising the east and west legs of the intersection and Acorn Lane comprising the south leg of the intersection. There are no existing turn lanes at this intersection. The traffic along Acorn Lane approaching White Oak Road is controlled by a STOP sign.

Little Creek Rd at Acorn Lane: Little Creek Rd intersects Acorn Lane as a three-legged intersection with Little Creek Rd comprising the east and west legs of the intersection, while Acorn Lane comprises the north leg of the intersection. Westbound (WB) Little Creek Rd has one through lane and one right turn lane, while eastbound (EB) Little Creek Rd has one shared through/left turn lane and one bypass lane. Acorn Lane at this intersection has one shared through/left/ right turn lane, and is controlled by a STOP sign.

<u>Little Creek Rd at SR 1 ramps</u>: Little Creek Rd intersects the SR 1 SB off-ramp as well as SR 1 NB on-ramp as three-legged intersections on either side of the SR 1 overpass over Little Creek Rd (see **Figure 1**).

At both these intersections, Little Creek Rd comprises the east and west legs of the intersections, while the one-way ramps comprise the north legs of the intersections. The SB SR 1 off-ramp comprises of a left turn lane and a right turn lane, and is controlled by a STOP sign. At its intersection with SR 1 NB on-ramp, EB Little Creek Rd has one left turn lane and one through lane, and WB Little Creek Rd has one shared through/right turn lane.

#### **Data Collection:**

TYLI collected turning movement counts at the following five intersections in the vicinity of the Tech Park:

- 1. Tech Park entrance at White Oak Road
- 2. White Oak Road at Acorn Lane
- 3. Little Creek Road at Acorn Lane
- 4. Little Creek Road at SR 1 SB off-ramp
- 5. Little Creek Road at SR 1 NB on-ramp

The turning movement counts were collected between October 4, 2016 and October 13, 2016 during the AM and PM peak hours on weekdays under clear weather conditions. These counts included car and truck traffic traveling along the study roadways and intersections. No traffic issues or backups were noticed at these intersections, or along the study area roadways during the field observations. **Figure 2** shows the existing turning movement counts at all five study intersections during the AM and PM peak hours.

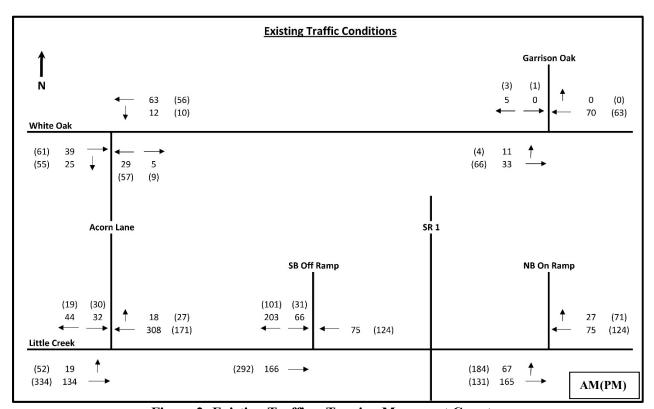


Figure 2: Existing Traffic – Turning Movement Counts

# **Existing Traffic Conditions:**

The Tech Park currently has three developments, the Dover Sun Park, Garrison Oak Energy Company and Uzin Utz facility that are operational and contribute to the existing field traffic counts. According to information received from the City of Dover, an additional development, Advantech is scheduled to be operational in 2017. This development will include office space for 60 employees. According to ITE's Trip

Generation Manual, 9<sup>th</sup> Edition, the Trip Generation information for a General Office Building (710) with 60 employees is:

### Weekday AM Peak Hour:

Average rate of trips:	0.48*60 = 29  trips
% Entering:	0.88*29 = 25  trips
% Exiting:	0.12*29 = 4  trips

## Weekday PM Peak Hour:

Average rate of trips:	0.46*60 = 28  trips
% Entering:	0.17*28 = 5  trips
% Exiting:	0.83*25 = 23  trips

This trip generation information was combined with the existing counts, and distributed proportionately through the study intersections to generate the baseline conditions for the traffic analysis. **Figure 3** shows the baseline traffic conditions, which include all known development in the Tech Park at the time of the study.

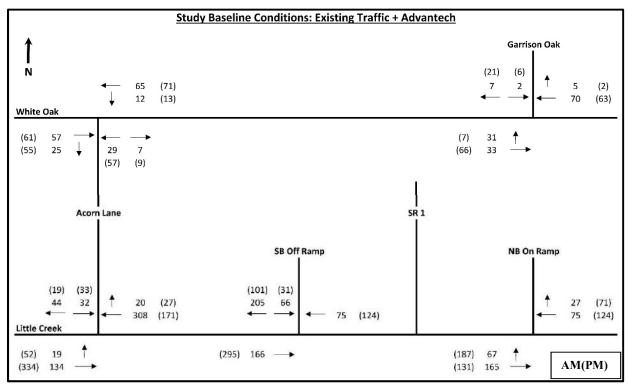


Figure 3: Study Baseline Traffic – Turning Movement Counts

The baseline traffic counts were analyzed using the Highway Capacity Software (HCS) 2010 for unsignalized intersections. **Table 1** shows the Level of Service (LOS) at each of the movements at the five study intersections under baseline conditions.

The HCS analysis and results show that there is no existing traffic congestion at any of the study intersections during both the AM and PM peak hours, validating the field observations. All HCS worksheets are included in **Appendix A**.

Table 1: Baseline Traffic Conditions – AM and PM hour LOS and delay

Intersection	Approach	<b>Baseline Conditions</b>				
	•	AM Delay (LOS)	PM Delay (LOS)			
White Oak R	oad at Garrison Oak Dr					
	Eastbound (Left/Through)	7.6 (A)	7.5 (A)			
	Southbound (Left/Right)	9.0 (A)	9.1 (A)			
White Oak R	load at Acorn Lane					
	Westbound (Left/ Through)	7.4 (A)	7.5 (A)			
	Northbound (Left/ Right)	9.8 (A)	10.5 (B)			
N Little Cree	k at Acorn Lane					
	Eastbound (Left/Through)	8.2 (A)	7.9 (A)			
	Southbound (Left/Right)	13.2 (B)	15.2 (C)			
N Little Cree	k at SR 1 SB Ramp					
	Southbound (Left/Right)	12.9 (B)	11.3 (B)			
N Little Cree	k at SR 1 NB Ramp					
	Eastbound (Left/Through)	7.7 (A)	8.5 (A)			

### **Proposed Development:**

After the development of the Advantech property, the Tech Park is expected to have 11 additional lots that would be available for development in the future. The square footage of the office/ working area for the existing developments show that approximately 3.5% of the total lot area was used as office space. Therefore, for the purpose of this study, it was assumed that 4% of the proposed lot area(s) would be developed into office/ working space.

Applying factors provided by the ITE's Trip Generation Manual, 9<sup>th</sup> Edition, the Trip Generation information for an Industrial Park (130), the proposed AM and PM peak hour traffic was calculated as shown in **Table 2**.

### **Proposed Traffic Conditions:**

In order to study the traffic impacts throughout the development of the Tech Park, the proposed traffic was analyzed for three future conditions:

- 1. Traffic impacts when 50% of the proposed lots have been developed (50% Build)
- 2. Traffic impacts when 75% of the proposed lots have been developed (75% Build)
- 3. Traffic impacts when all the proposed lots have been developed (100% Build)

The trip generation information for all three future conditions was adjusted accordingly and distributed through the traffic network as shown in **Figures 4**, **5 and 6**. The detailed trip distribution for each of the future conditions is included in **Appendix B**.

**Table 2: Trip Generation information – Proposed Development** 

Garrison Oak Tech Park - Pro	oosed Development		
# of proposed lots:		11	
Area of each lot:		~10	acres
Office space in each lot = 4%:	= 0.04 * 43,560*10	17,424	sq. ft.
Total proposed office area	=17,424 * 11	191,664	sq. ft.
Weekday AM Peak Hour:			
Average rate of trips:	0.82 *191.664 =	158	vehicles
% Entering:	0.82*158 =	130	vehicles
% Exiting:	0.18*158=	28	vehicles
Weekday PM Peak Hour:			
Average rate of trips:	0.85*191.664 =	163	vehicles
% Entering:	0.21*163	34	vehicles
% Exiting:	0.79*163	129	vehicles

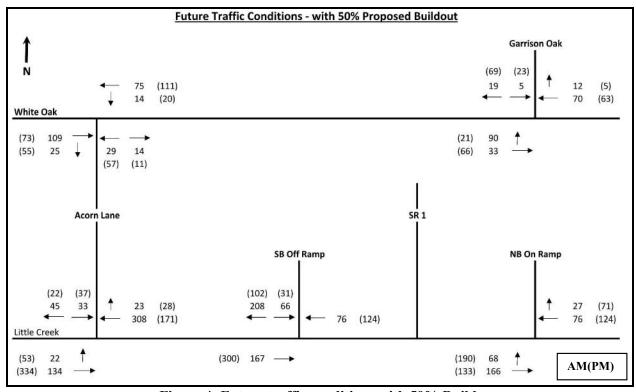


Figure 4: Future traffic conditions with 50% Build

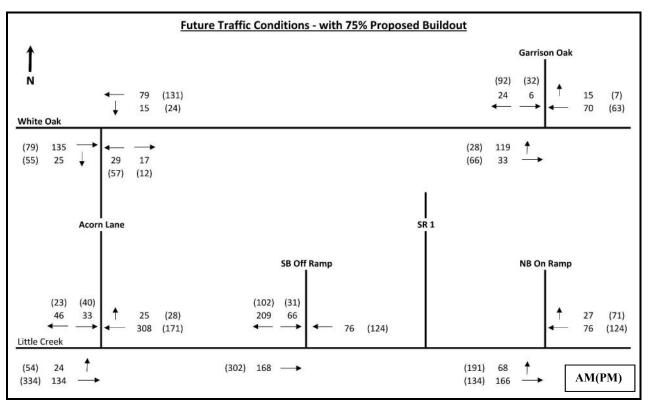


Figure 5: Future traffic conditions with 75% Build

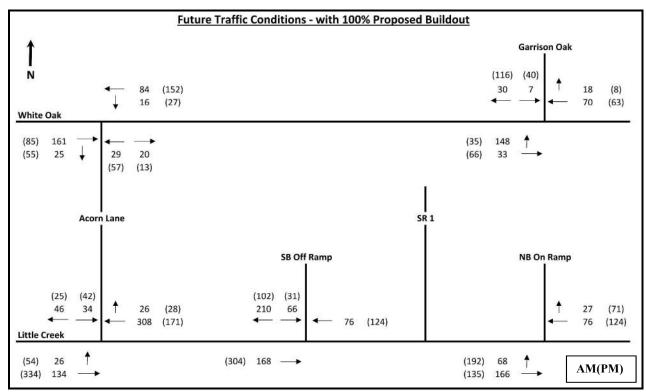


Figure 6: Future traffic conditions with 100% Build

Similar to the study baseline traffic conditions, the three future traffic conditions were analyzed using HCS 2010 to determine the critical movement LOS at each of the study intersections. **Table 3** shows the LOS at the critical movements at each of the study intersections under baseline conditions as well as the three future traffic conditions. All HCS worksheets are included in **Appendix A.** 

Table 3: HCS LOS under baseline and future traffic conditions

Intersection	Intersection Approach		Baseline Conditions		50% Build		75% Build		100% Build	
	PASASSA.	AM	PM	AM	PM	AM	PM	AM	PM	
		Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	
White Oak Road at Garrison Oak Dr								*		
[1	Eastbound (Left/Through)	7.6 (A)	7.5 (A)	7.7 (A)	7.5 (A)	7.8 (A)	7.5 (A)	7.9 (A)	7.6 (A)	
	Southbound (Left/Right)	9.0 (A)	9.1 (A)	9.5 (A)	9.6 (A)	9.7 (A)	9.8 (A)	10.0 (A)	10.3 (B)	
White Oak Ro	White Oak Road at Acorn Lane									
· ·	Westbound (Left/ Through)	7.4 (A)	7.5 (A)	7.6 (A)	7.6 (A)	7.7 (A)	7.6 (A)	7.8 (A)	7.6 (A)	
[	Northbound (Left/ Right)	9.8 (A)	10.5 (B)	10.4 (B)	11.3 (B)	10.8 (B)	11.7 (B)	11.1 (B)	12.2 (B)	
N Little Creek	at Acorn Lane		,							
I	Eastbound (Left/Through)	8.2 (A)	7.9 (A)	8.2 (A)	7.9 (A)	8.2 (A)	7.9 (A)	8.2 (A)	7.9 (A)	
	Southbound (Left/Right)	13.2 (B)	15.2 (C)	13.3 (B)	15.6 (C)	13.4 (B)	15.8 (C)	13.5 (B)	15.9 (C)	
N Little Creek	at SR 1 SB Ramp									
9	Southbound (Left/Right)		11.3 (B)	13.0 (B)	11.3 (B)	12.9 (B)	11.3 (B)	12.9 (B)	11.3 (B)	
N Little Creek	N Little Creek at SR 1 NB Ramp					700 100 0	200.000			
I	Eastbound (Left/Through)	7.7 (A)	8.5 (A)	7.7 (A)	8.6 (A)	7.7 (A)	8.6 (A)	7.7 (A)	8.6 (A)	

The results show that the delay gradually increases with the additional traffic at each stage of development. However, as seen in **Table 3**, the delay would still be under acceptable conditions (below LOS D), provided the rate of the future growth in development is consistent with the current trend.

## **Area development – L.D. Shank Property:**

The City of Dover provided information on a potential development that is expected along White Oak Road, to the east of the Tech Park, Triad Farms, LLC (L.D. Shank). The property is zoned as a residential development and is expected to house approximately 400 equivalent dwelling units (EDU). According to ITE's Trip Generation Manual, 9<sup>th</sup> Edition, the trip generation information for a Residential Planned Unit Development (270) with 400 EDUs is:

#### Weekday AM Peak Hour:

Average rate of trips: 0.51\*400 = 204 trips% Entering: 0.22\*204 = 45 trips% Exiting: 0.78\*204 = 159 trips

### Weekday PM Peak Hour:

Average rate of trips: 0.62\*400 = 248 trips % Entering: 0.65\*248 = 161 trips % Exiting: 0.35\*248 = 87 trips

Since most of this traffic is expected to use White Oak Road and the two study intersections of Garrison Oak and Acorn Lane, these traffic volumes were added to the volumes along White Oak Road during the AM and PM peak hours, and distributed proportionately as shown in **Figure 7** to determine the traffic impacts on the study intersections. **Table 4** shows the LOS at the study intersections for this potential future scenario.

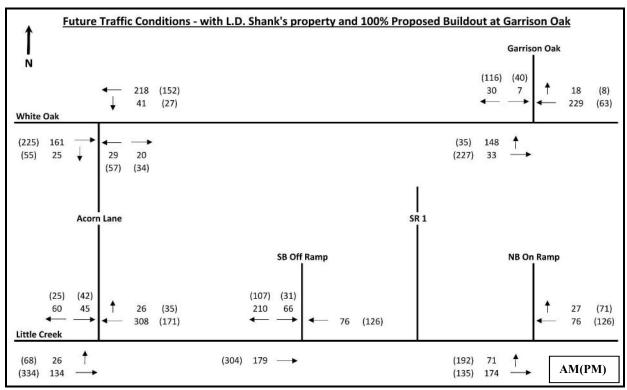


Figure 7: Future Traffic Conditions with L.D. Shank's property

Table 4: HCS LOS under baseline, future 100% build and LD Shank Development

Intersection	Intersection Approach		Baseline Conditions		Build	100%Build + LD Shank Development		
l		AM	PM	AM	PM	AM	PM	
		Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	
White Oak R	oad at Garrison Oak Dr							
	Eastbound (Left/Through)	7.6 (A)	7.5 (A)	7.9 (A)	7.6 (A)	8.6 (A)	7.6 (A)	
	Southbound (Left/Right)	9.0 (A)	9.1 (A)	10.0 (A)	10.3 (B)	11.6 (B)	11.7 (B)	
White Oak R	White Oak Road at Acorn Lane							
	Westbound (Left/ Through)	7.4 (A)	7.5 (A)	7.8 (A)	7.6 (A)	7.9 (A)	7.9 (A)	
	Northbound (Left/ Right)	9.8 (A)	10.5 (B)	11.1 (B)	12.2 (B)	13.3 (B)	14.0 (B)	
N Little Cree	k at Acorn Lane							
	Eastbound (Left/Through)	8.2 (A)	7.9 (A)	8.2 (A)	7.9 (A)	8.2 (A)	8.0 (A)	
	Southbound (Left/Right)	13.2 (B)	15.2 (C)	13.5 (B)	15.9 (C)	14.3 (B)	16.8 (C)	
N Little Cree	k at SR 1 SB Ramp							
	Southbound (Left/Right)	12.9 (B)	11.3 (B)	12.9 (B)	11.3 (B)	13.0 (B)	11.4 (B)	
N Little Creek at SR 1 NB Ramp								
	Eastbound (Left/Through)	7.7 (A)	8.5 (A)	7.7 (A)	8.6 (A)	7.7 (A)	8.6 (A)	

#### **Conclusions and Results:**

Traffic analysis shows that assuming the Tech Park grows at the current rate, all study intersections in the vicinity of the Tech Park are expected to operate at acceptable LOS when the Tech Park is completely occupied and operational. However, if any of the proposed developments in the future expect to accommodate a significantly higher number of workers than the current rate, a further traffic study would be necessary to quantify the traffic impacts and mitigation measures. The traffic conditions along Acorn Lane should also be studied at that time to determine the increase in volumes and the effects on the surrounding communities. This study also recommends adding a STOP sign along the SB approach of Garrison Oak Dr. at its intersection with White Oak Road.

While this report recognizes that a new connector road connecting North Little Creek Road to the Garrison Oak Industrial Park is not required at this time based on current knowledge, it recommends that the City of Dover include an alignment study (conducted by DelDOT) as a transportation component of their upcoming Comprehensive Plan update. The report recommends that the study determine the feasibility of constructing the connector roadway, and initiate preliminary design to reserve a corridor so the alignment is in place if the roadway is warranted in the future.

# APPENDIX A HCS WORKSHEETS

		O-WAY STOP			•			
General Information	າ		Site Information					
Analyst	Shilpa Ma		Intersecti	on	White Oa	White Oak at Garrison Oak		
Agency/Co.		nternational	Jurisdicti			City of Dover, DE		
Date Performed	12/27/201		- Analysis		2016			
Analysis Time Period	Peak	Conditions - AM						
	rrison Oak Traf	fic Study						
East/West Street: Whot					rrison Oak Drive	9		
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.2	5			
ehicle Volumes ar	nd Adjustme	nts						
/lajor Street		Eastbound			Westbou	ınd		
Movement	1	2	3	4	5		6	
	L	T	R	L	T		R	
/olume (veh/h)	11	33	2.70	2.00	70		0	
Peak-Hour Factor, PHF	0.69	0.42	0.78	0.60	0.79		1.00	
lourly Flow Rate, HFR veh/h)	15	78	0	0	88		0	
Percent Heavy Vehicles	10			2				
Median Type		<u>,                                      </u>	1	Individed	ı	Ti Ti		
RT Channelized			0				0	
anes	0	1	0	0	1		0	
Configuration	LT					TR		
Jpstream Signal		0			0			
/linor Street		Northbound			Southboo	Southbound		
Movement	7	8	9	10	11		12	
	L	Т	R	L	Т	T R		
/olume (veh/h)				0		5		
Peak-Hour Factor, PHF	0.60	1.00	0.40	1.00	1.00	(	0.92	
lourly Flow Rate, HFR veh/h)	0	0	0	0	0		5	
Percent Heavy Vehicles	2	0	2	2	0		0	
Percent Grade (%)		0			0			
lared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
_anes	0	0	0	0	0		0	
Configuration					LR			
Delay, Queue Length, a	nd Level of Se	rvice	•		•	*		
Approach	Eastbound	Westbound	No	rthbound	5	Southbound		
Movement	1	4	7	8 9		11	12	
ane Configuration	<u>LT</u>		- +	-   -	1 .,	LR		
(veh/h)	15		<del></del>			5	<del>                                     </del>	
	1459		+		-	<del>                                     </del>		
C (m) (veh/h)						976		
//c	0.01					0.01		
95% queue length	0.03					0.02		
Control Delay (s/veh)	7.5					8.7		
.OS	Α					Α		
Approach Delay (s/veh)						8.7		
Approach LOS						Α		

	I VV	O-WAY STOP	CONTR	JE SUIVI	WARI					
General Information	1		Site Ir	Site Information						
Analyst	Shilpa Ma		Interse	ction		M/hita Oc	k at Acorn	Lana		
Agency/Co.		nternational	Jurisdi			White Oak at Acorn Land City of Dover, DE				
Date Performed	12/27/20 <sup>-</sup>			Analysis Year			2016			
Analysis Time Period	Existing ( Peak	Conditions - AM								
Project Description Ga		fic Study								
East/West Street: White					et: <i>Acorn</i>	Lane				
ntersection Orientation:	East-West		Study F	Period (hrs	s): 0.25					
/ehicle Volumes ar	d Adjustme	nts								
Major Street		Eastbound				Westbou	ınd			
Movement	1	2	3		4	5		6		
	L	Т	R		L	Т		R		
/olume (veh/h)		39	25		12	63				
Peak-Hour Factor, PHF	1.00	0.75	0.78		0.60	0.69		1.00		
Hourly Flow Rate, HFR veh/h)	0	52	32		19	91		0		
Percent Heavy Vehicles	0				2					
Median Type			1	Undivide	d		1			
RT Channelized			0					0		
₋anes	0	1	0		0	1		0		
Configuration			TR		LT					
Jpstream Signal		0				0				
Minor Street		Northbound				Southboo	Southbound			
Movement	7	8	9		10	11		12		
	L	T	R		L	Т		R		
/olume (veh/h)	29		5							
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00	1.00 1.00			
Hourly Flow Rate, HFR veh/h)	48	0	12		0	0	0 0			
Percent Heavy Vehicles	2	0	2		0	0		0		
Percent Grade (%)		0				0				
Flared Approach		N				N				
Storage		0				0				
RT Channelized			0					0		
_anes	0	0	0		0	0		0		
Configuration		LR								
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound	1	Northboun	d	5	Southbound	t		
Movement	1	4	7	8	9	10	11	12		
_ane Configuration		LT		LR				1		
/ (veh/h)		19		60		†	<u> </u>	1		
C (m) (veh/h)		1513		817		+		+		
//C		0.01		0.07		+	<del> </del>	1		
		<del> </del>				+	<del>                                     </del>	+		
95% queue length		0.04		0.24		1		+		
Control Delay (s/veh)		7.4		9.8			<u> </u>	+		
_OS		Α		Α		4				
Approach Delay (s/veh)				9.8						
Approach LOS				A						

	I VV	O-WAY STOP	CONTRO	L 20 MIN	/IAR I					
General Information	า		Site Information							
Analyst		Shilpa Mallem						N Little Creek at Acorn Lane		
Agency/Co.		nternational	Jurisdict			City of Dover, DE				
Date Performed	12/27/20					2016				
Analysis Time Period	Existing ( Peak	Conditions - AM								
	rrison Oak Trat	fic Study								
East/West Street: N Litt				uth Street		Lane				
ntersection Orientation:	East-West		Study Pe	eriod (hrs):	: 0.25					
/ehicle Volumes ar	nd Adjustme	nts								
//////////////////////////////////////		Eastbound				Westbou	nd			
Movement	1	2	3		4	5		6		
	L	Т	R		L	Т		R		
/olume (veh/h)	19	134				308		18		
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82	(	0.68		
lourly Flow Rate, HFR veh/h)	24	167	0		0	375		26		
Percent Heavy Vehicles	2				2					
/ledian Type				Undivided						
RT Channelized			0					0		
_anes	0	1	0		0	1		0		
Configuration	LT						TR			
Jpstream Signal		0				0	0			
Minor Street		Northbound				Southbou	Southbound			
Movement	7	8	9		10	11	12			
	L	Т	R		L	Т		R		
/olume (veh/h)					32		44			
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00	(	0.85		
Hourly Flow Rate, HFR veh/h)	0	0	0		47	0	51			
Percent Heavy Vehicles	2	0	2		2	0		3		
Percent Grade (%)		0				0				
-lared Approach		N				N				
Storage		0	1			0				
RT Channelized			0			1		0		
_anes	0	0	0		0	0		0		
Configuration	1		<del>                                     </del>		-	LR		-		
Delay, Queue Length, a	nd Level of Se	rvice	1							
Approach	Eastbound	Westbound	Nr	orthbound			outhbound			
Movement	1	4	7	8	9	10	11	12		
	LT	<del> </del>	'	J	3	10	LR	'2		
_ane Configuration						+				
/ (veh/h)	24					+	98			
C (m) (veh/h)	1158						540			
r/c	0.02						0.18			
95% queue length	0.06						0.66			
Control Delay (s/veh)	8.2						13.1			
.OS	Α						В			
Approach Delay (s/veh)			<u> </u>				13.1			
·· / [						13.1 B				

12/27/2016

		O-WAY STOP						
General Information			Site Information					
Analyst	Shilpa Ma		Intersect	Intersection		reek at SR	1 NB	
Agency/Co.		nternational	Jurisdicti		Ramp			
Date Performed	12/27/201	Conditions - AM	Analysis		2016	City of Dover, DE		
Analysis Time Period	Peak	CONTUILIONS - AIVI	Allalysis	i Cai	2010			
Project Description Ga	rrison Oak Traf	fic Study	<u> </u>		•			
East/West Street: N Litt		·	North/So	uth Street: SR1	NB On-Ramp			
ntersection Orientation:	East-West		Study Pe	riod (hrs): 0.25				
/ehicle Volumes ar	nd Adjustme	nts						
Major Street		Eastbound			Westbou	ınd		
Movement	1	2	3	4	5		6	
	L	T	R	L	T		R	
Volume (veh/h)	67	165	0.70		75		27	
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.62	0.77	0.78	0.60	0.79		0.75	
veh/h)	108	214	0	0	94		36	
Percent Heavy Vehicles	2			2				
Median Type			(	Jndivided				
RT Channelized			0				0	
_anes	0	1	0	0	1		0	
Configuration	LT					T		
Jpstream Signal		0			0	0		
Minor Street		Northbound				Southbound		
Movement	7	8	9	10	11		12	
	L	Т	R	L	T		R	
Volume (veh/h)	0.00	1.00	0.40	0.74	1.00			
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.60	1.00	0.40	0.71	1.00	1.00 0.59		
veh/h)	0	0	0	0	0	0 0		
Percent Heavy Vehicles	2	0	2	2	0		8	
Percent Grade (%)		0			0	•		
-lared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
_anes	0	0	0	0	0		0	
Configuration								
Delay, Queue Length, a	nd Level of Se	rvice						
Approach	Eastbound	Westbound	No	orthbound	S	Southbound		
Movement	1	4	7	8 9	10	11	12	
_ane Configuration	LT							
/ (veh/h)	108							
C (m) (veh/h)	1455						T	
//c	0.07						T	
95% queue length	0.24					<u> </u>		
Control Delay (s/veh)	7.7			<del>                                     </del>				
OS	A			<del></del>	+	<del>                                     </del>	$\vdash$	
Approach Delay (s/veh)	A			I		<u> </u>	1	
					1			

	TW	O-WAY STOP	CONTROL	SUMMARY				
General Information	1		Site Information					
Analyst	Shilpa Ma		Intersecti			reek at SR	1 SB	
Agency/Co.		nternational			Ramp			
Date Performed	12/27/201		Jurisdiction		City of Dover, DE			
Analysis Time Period	Existing 0 Peak	Conditions - AM	Analysis	Analysis Year 2016				
Project Description Ga	arrison Oak Traf	fic Study			•			
East/West Street: N Litt		•	North/Sou	th Street: SR1 S	SB Off-Ramp			
ntersection Orientation:	East-West		Study Per	iod (hrs): 0.25				
/ehicle Volumes ar	nd Adjustme	nts						
Major Street		Eastbound			Westbou	nd		
Movement	1	2	3	4	5		6	
	L	Т	R	L	Т		R	
/olume (veh/h)	1	166	<u> </u>		75		0.00	
Peak-Hour Factor, PHF	0.79	0.90	0.78	0.60	0.78		0.68	
Hourly Flow Rate, HFR veh/h)	0	184	0	0	96		0	
Percent Heavy Vehicles	2			2				
Median Type			U	Individed				
RT Channelized			0				0	
₋anes	0	1	0	0	1		0	
Configuration		T			Т			
Jpstream Signal		0				0		
Minor Street		Northbound			Southbou	ınd		
Movement	7	8	9	10	11			
	L	Т	R	L	Т		R	
Volume (veh/h)	0.00	1.00	0.40	66	1.00	1.00 203		
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.60	1.00	0.40	0.71	1.00			
veh/h)	0	0	0	92	0		344	
Percent Heavy Vehicles	2	0	2	2	0		3	
Percent Grade (%)		0			0			
-lared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
_anes	0	0	0	0	0		0	
Configuration					LR			
Delay, Queue Length, a		r r						
Approach	Eastbound	Westbound	i -	rthbound	S	outhbound		
Movement	1	4	7	8 9	10	11	12	
_ane Configuration						LR		
/ (veh/h)						436		
C (m) (veh/h)						892		
ı/c						0.49		
95% queue length				<u> </u>		2.74		
Control Delay (s/veh)					1	12.8		
OS				<u> </u>		B		
Approach Delay (s/veh)				I	+	12.8		
Approach LOS						B		
Appluacii LOO								

	TW	O-WAY STOP	CONTRO	OL SI	UMM	ARY					
General Information	n		Site Information								
Analyst	Shilpa Ma	allem	Interse	otion			White Oo	k at Carri	on Ook		
Agency/Co.		nternational	Jurisdi				White Oak at Garrison ( City of Dover, DE				
Date Performed	12/27/20 <sup>-</sup>			lysis Year			2016	VCI, DL			
Analysis Time Period	Peak	Conditions - PM									
	arrison Oak Trat	fic Study									
East/West Street:							n Oak Drive	!			
ntersection Orientation:	East-West		Study F	Period	(hrs):	0.25					
Vehicle Volumes ar	nd Adjustme	nts									
Major Street		Eastbound					Westbou	nd			
Movement	1	2	3			4	5		6		
	L	T	R			L	T		R		
Volume (veh/h)	4	66	0.70		ļ ,	2.60	63		0		
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.69	0.42	0.78		(	0.60	0.79		1.00		
veh/h)	5	157	0			0	79		0		
Percent Heavy Vehicles	10					2					
Median Type				Undi	vided						
RT Channelized			0						0		
anes	0	1	0			0	1		0		
Configuration	LT							TR			
Jpstream Signal		0						0			
Minor Street		Northbound					Southbou	ınd			
Movement	7	8	9			10	11		12		
	L	Т	R			L	Т		R		
/olume (veh/h)	0.00	100	0.40			1	1.00		3		
Peak-Hour Factor, PHF	0.60	1.00	0.40			1.00	1.00				
Hourly Flow Rate, HFR veh/h)	0	0	0			1	0		3		
Percent Heavy Vehicles	2	0	2			2	0		0		
Percent Grade (%)		0					0	ű.			
lared Approach		N					N				
Storage		0					0				
RT Channelized			0						0		
anes	0	0	0			0	0		0		
Configuration							LR				
Delay, Queue Length, a									_		
Approach	Eastbound	Westbound		Northb			_	outhboun	1		
Movement	1	4	7	8		9	10	11	12		
_ane Configuration	LT							LR	<del> </del>		
v (veh/h)	5							4			
C (m) (veh/h)	1470							911			
//c	0.00							0.00			
95% queue length	0.01							0.01			
Control Delay (s/veh)	7.5							9.0			
_OS	Α							Α			
Approach Delay (s/veh)					1			9.0			
Approach LOS								Α			
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	TW	O-WAY STOP	CONTR	OL SUM	MARY			
General Information	1		Site I	nformati	on			
Analyst	Shilpa Ma	allem	Interse	ection		White Oa	k at Acorr	Lane
Agency/Co.	T.Y. Lin I	nternational	Jurisdi			City of Dover, DE		
Date Performed	12/27/20	16	Analys	sis Year		2016		
Analysis Time Period	Existing -	PM Peak						
Project Description Ga		ffic Study						
East/West Street: White					et: <i>Acorn</i>	Lane		
ntersection Orientation:	East-West		Study F	Period (hrs	s): 0.25			
/ehicle Volumes ar	nd Adjustme	ents						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
/olume (veh/h)		61	55		10	56		1.55
Peak-Hour Factor, PHF	1.00	1.00	0.78		0.60	0.69		1.00
Hourly Flow Rate, HFR veh/h)	0	61	70		16	81		0
Percent Heavy Vehicles	0				2			
Median Type	1	Undivided						
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration			TR	TR LT				
Jpstream Signal	<u></u>	0	<u> </u>		0			
/linor Street		Northbound				Southbou	ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)	57		9					
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.40 1.0		1.00		1.00
lourly Flow Rate, HFR veh/h)	94	0	22		0	0		0
Percent Heavy Vehicles	2	0	2		0	0		0
Percent Grade (%)		0				0		
lared Approach		N				N		
Storage		0				0		
RT Channelized	1		0					0
_anes	0	0	0		0	0		0
Configuration	1	LR	1					
Delay, Queue Length, a	nd Level of Se	ervice	•			•		
Approach	Eastbound	Westbound	ı	Northboun	d	S	outhboun	<del></del> d
Movement	1	4	7	8	9	10	11	12
ane Configuration	1	LT	<del>- '</del> -	LR	<del>                                     </del>	10	- ''	+ '2
·		16			+	+		+-
/ (veh/h)		-		116	+	+		+-
C (m) (veh/h)		1454		800	-			+
r/c		0.01		0.14	ļ			
5% queue length		0.03		0.51				
Control Delay (s/veh)		7.5		10.3				
_OS		Α		В				
Approach Delay (s/veh)				10.3	-			
Approach LOS				В		†		
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	1 44	O-WAY STOP	CONTROL	_ SUIVIIVIAR	<u> </u>				
General Information	า		Site Info	ormation					
Analyst	Shilpa Ma		Intersecti	ion		N Little C	reek at Acc	rn I ane	
Agency/Co.		nternational	Jurisdiction			City of Dover, DE			
Date Performed	12/27/20			Analysis Year			2016		
Analysis Time Period	Existing ( Peak	Conditions - PM							
	rrison Oak Trat	fic Study	-						
ast/West Street: N Litt				uth Street: A		пе			
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.	25				
/ehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound				Westbou	nd		
Movement	1	2	3	4		5		6	
	L	Т	R	L		Т		R	
/olume (veh/h)	52	334				171		27	
Peak-Hour Factor, PHF	0.79	0.80	0.78	0.60	<u> </u>	0.82	(	0.68	
lourly Flow Rate, HFR veh/h)	65	417	0	0		208		39	
Percent Heavy Vehicles	2			2					
/ledian Type			l	Undivided					
RT Channelized			0					0	
anes	0	1	0	0		1		0	
Configuration	LT						TR		
Jpstream Signal		0				0			
Minor Street		Northbound				Southbou	ınd		
Movement	7	8	9	10		11		12	
	L	Т	R	L		Т		R	
/olume (veh/h)				30				19	
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.67	7	1.00	(	0.85	
Hourly Flow Rate, HFR veh/h)	0	0	0	44		0		22	
Percent Heavy Vehicles	2	0	2	2		0		3	
Percent Grade (%)		0				0			
-lared Approach		N				Ν			
Storage		0				0			
RT Channelized			0		$\overline{}$			0	
_anes	0	0	0	0	<del>-  </del>	0		0	
Configuration		-		$\top$	$\overline{}$	LR		-	
Delay, Queue Length, a	nd Level of Se	rvice	1		1				
Approach	Eastbound	Westbound	Nο	rthbound	1	S	outhbound		
Movement	1	4	7	8	9	10	11	12	
ane Configuration	LT	T -	'		<del>-</del> +	10	LR	12	
·								<del>                                     </del>	
/ (veh/h)	65				<del></del>		66		
C (m) (veh/h)	1319						430	<u> </u>	
r/c	0.05						0.15	<u> </u>	
95% queue length	0.16						0.54		
Control Delay (s/veh)	7.9						14.9		
.OS	Α						В		
Approach Delay (s/veh)				-			14.9		
Approach LOS		<del>                                     </del>	+			В			

	TW	O-WAY STOP	CONTRO	LSUMMARY			
General Information	1		Site Inf	ormation			
Analyst	Shilpa Ma		Intersec	tion		reek at SR	1 NB
Agency/Co.		nternational			Ramp		
Date Performed	12/27/201		Jurisdict		City of Dover, DE		
Analysis Time Period	Existing ( Peak	Conditions - PM	Analysis	Year	2016		
Project Description Ga	rrison Oak Traf	fic Study	<u>I</u>				
East/West Street: N Litt		·	North/So	uth Street: SR1	NB On-Ramp		
ntersection Orientation:	East-West		Study Pe	eriod (hrs): 0.25			
Vehicle Volumes an	d Adjustme	nts					
Major Street		Eastbound			Westbou	nd	
Movement	1	2	3	4	5		6
	L	T	R	<u> </u>	T 101		R
Volume (veh/h)	184	131	0.70	0.60	124		71
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.62	0.77	0.78	0.60	0.79		0.75
veh/h)	296	170	0	0	156		94
Percent Heavy Vehicles	2			2			
Median Type		·	n	Undivided		ı	
RT Channelized			0				0
_anes	0	1	0	0	1		0 TR
Configuration	LT						
Jpstream Signal		0			0		
Minor Street	_	Northbound		- 10	Southbou	ınd	
Movement	7	8	9	10	11		12
	L	T	R	L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40	0.71	1.00		0.59
Hourly Flow Rate, HFR						1	
(veh/h)	0	0	0	0	0		0
Percent Heavy Vehicles	2	0	2	2	0		8
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
_anes	0	0	0	0	0		0
Configuration							
Delay, Queue Length, a	nd Level of Se	rvice					
Approach	Eastbound	Westbound	No	orthbound	S	outhbound	
Movement	1	4	7	8 9	10	11	12
_ane Configuration	LT						
/ (veh/h)	296						
C (m) (veh/h)	1316						
//c	0.22						
95% queue length	0.86						
Control Delay (s/veh)	8.5						
OS	A		<del>-  </del>	<u> </u>			
					_		
Approach Delay (s/veh)							

	1 44	O-WAY STOP	CONTRO	L GOIVIIVIAI	<u> </u>				
General Information	1		Site Inf	ormation					
Analyst	Shilpa Ma		Intersect	ion			reek at SR	1 SB	
Agency/Co.		nternational				Ramp			
Date Performed	12/27/201			Jurisdiction			City of Dover, DE		
Analysis Time Period	Existing ( Peak	Conditions - PM	Analysis	Year		2016			
	rrison Oak Traf	fic Study	-						
East/West Street: N Litt				uth Street: S		Off-Ramp			
ntersection Orientation:			Study Pe	riod (hrs): 0	.25				
/ehicle Volumes ar	<u>nd Adjustme</u>								
Major Street		Eastbound				Westbou	nd		
Movement	1	2 T	3	4		5 		6	
/olume (veh/h)		292	R			124		R	
Peak-Hour Factor, PHF	0.79	0.90	0.78	0.60	<del>,  </del>	0.78	<del>-   ,</del>	0.68	
Hourly Flow Rate, HFR veh/h)	0	324	0	0		158		0	
Percent Heavy Vehicles	2			2					
Median Type	<del>                                     </del>			Undivided					
RT Channelized			0	1			$\neg$	0	
_anes	0	1	0	0		1		0	
Configuration		T		<u> </u>		T			
Jpstream Signal		0				0			
Minor Street		Northbound	•	i		Southbou	nd		
Movement	7	8	9	10	)	11		12	
	L	Т	R	L		Т		R	
/olume (veh/h)				31				101	
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.7	1	1.00	(	0.59	
Hourly Flow Rate, HFR veh/h)	0	0	0	43		0		171	
Percent Heavy Vehicles	2	0	2	2		0		3	
Percent Grade (%)		0	1			0	ľ		
-lared Approach		N				Ν			
Storage		0				0			
RT Channelized			0					0	
Lanes	0	0	0	0		0		0	
Configuration						LR			
Delay, Queue Length, a									
Approach	Eastbound	Westbound		rthbound			outhbound	i-	
Movement	1	4	7	8	9	10	11	12	
_ane Configuration							LR		
v (veh/h)							214		
C (m) (veh/h)							786		
r/c							0.27		
95% queue length							1.11		
Control Delay (s/veh)							11.3		
_OS							В		
Approach Delay (s/veh)							11.3		
Approach LOS			+			В			

	TW	O-WAY STOP	CONTR	OL S	UMI	MARY				
General Information	<u> </u>		Site I	nform	natio	on				
Analyst	Shilpa Ma	allem	lusts us	- 4!			14//-24- 0-	14.0-		0-1-
Agency/Co.		nternational	Interse				White Oa			n Oak
Date Performed	12/27/201		Analys		r		City of Dover, DE 2016			
Analysis Time Period	Proposed Peak	l - 50% Build - AN	1	Analysis Year			2016			
Project Description Ga	arrison Oak Traf	fic Study								
East/West Street: Whot	e Oak Road		North/S	South S	Stree	t: <i>Garriso</i> i	n Oak Drive	)		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5			6
	L	Т	R			L	Т			R
Volume (veh/h)	79	33					70			9
Peak-Hour Factor, PHF	0.69	0.42	0.78	}		0.60	0.79		1	.00
Hourly Flow Rate, HFR (veh/h)	114	78	0			0	88			9
Percent Heavy Vehicles	10				<u> </u>	2				
Median Type		<u> </u>	Undivided			ı			_	
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LT									TR
Upstream Signal		0					0			
Minor Street		Northbound	1 .			Southbou	ınd		10	
Movement	7	8	9			10	11			12
\/al.unaa /.uah /h\	L	T	R			4	Т			R 18
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40	)		1.00	1.00	-		).92
Hourly Flow Rate, HFR (veh/h)	0	0	0.40			4	0			19
Percent Heavy Vehicles	2	0	2			2	0			0
Percent Grade (%)	<del></del>	0					0			
Flared Approach		T N					l N			
Storage		0					0			
RT Channelized		<del>-</del> -	0				<del>  </del>			0
Lanes	0	0	0			0	0			0
Configuration	<del>                                       </del>	<del>-                                    </del>	+ <u>`</u>				LR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound		Northb	ound	]	S	outhbo	und	
Movement	1	4	7	8		9	10	11		12
Lane Configuration	LT	7		╁			<del>                                     </del>	LR		12
v (veh/h)	114			1			+	23		
C (m) (veh/h)	1448						-	861		
v/c	0.08							0.03		
	0.06						<del>                                     </del>	0.08		
95% queue length							-			
Control Delay (s/veh)	7.7			-				9.3		
LOS	A							A		
Approach Delay (s/veh)								9.3		
Approach LOS								A		

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	I VV	O-WAY STOP	CONTRO	JE SUM	WART						
General Information	1		Site Ir	Site Information							
Analyst	Shilpa Ma		Interse	ction		White Oa	k at Acorn	Lane			
Agency/Co.		nternational	Jurisdie			White Oak at Acorn Land City of Dover, DE					
Date Performed	12/27/20 <sup>-</sup>	-		is Year		2016					
Analysis Time Period	Proposed Peak	l - 50% Build - AM									
Project Description Ga		fic Study									
ast/West Street: White					et: <i>Acorn</i>	Lane					
ntersection Orientation:	East-West		Study F	Period (hrs	s): 0.25						
/ehicle Volumes ar	nd Adjustme	nts									
/lajor Street		Eastbound				Westbou	nd				
Movement	1	2	3		4	5		6			
	L	Т	R		L	Т		R			
/olume (veh/h)		91	25		14	73					
Peak-Hour Factor, PHF	1.00	0.75	0.78		0.60	0.69		1.00			
lourly Flow Rate, HFR veh/h)	0	121	32		23	105		0			
Percent Heavy Vehicles	0				2						
Median Type				Undivide	ed						
RT Channelized			0					0			
₋anes	0	1	0		0	1		0			
Configuration			TR		LT						
Jpstream Signal		0				0					
Minor Street		Northbound				Southboo	ınd				
Movement	7	8	9		10	11		12			
	L	T	R		L	T		R			
/olume (veh/h)	29		12								
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		1.00			
Hourly Flow Rate, HFR veh/h)	48	0	29		0	0		0			
Percent Heavy Vehicles	2	0	2		0	0		0			
Percent Grade (%)		0				0					
Flared Approach		N				N					
Storage		0				0					
RT Channelized			0					0			
_anes	0	0	0		0	0		0			
Configuration		LR									
Delay, Queue Length, a	nd Level of Se	rvice									
Approach	Eastbound	Westbound	N	Northboun	d	S	outhboun	d			
Movement	1	4	7	8	9	10	11	12			
ane Configuration		LT		LR	1	1					
/ (veh/h)		23		77	1	1		†			
C (m) (veh/h)		1428		760	1	+					
//c		0.02		0.10	+	+		+			
					+	+		+			
95% queue length		0.05		0.34	1	+		+			
Control Delay (s/veh)		7.6		10.3	1	-		-			
_OS		Α		В	1						
Approach Delay (s/veh)				10.3							
Approach LOS			В			1					

12/29/2016

	TW	O-WAY STOP	CONTROL	SUMMARY						
General Information	1		Site Information							
Analyst	Shilpa Ma	allem	Intersection	an .	N Little C	reek at Acc	orn Lane			
Agency/Co.		nternational	Jurisdiction		N Little Creek at Acorn La City of Dover, DE					
Date Performed	12/27/20 <sup>-</sup>	-	Analysis \		2016					
Analysis Time Period	Proposed Peak	l - 50% Build - AM	randiyolo	1 0 0 1	20.0					
Project Description Ga		fic Study								
East/West Street: N Litt			_	th Street: Acor	n Lane					
ntersection Orientation:	East-West		Study Per	iod (hrs): 0.25						
/ehicle Volumes ar	nd Adjustme	nts								
/lajor Street		Eastbound			Westbou	nd				
Movement	1	2	3	4	5		6			
	L	Т	R	L	Т		R			
/olume (veh/h)	22	134			308		21			
Peak-Hour Factor, PHF	0.79	0.80	0.78	0.60	0.82		0.68			
lourly Flow Rate, HFR veh/h)	27	167	0	0	375		30			
Percent Heavy Vehicles	2			2						
Median Type				ndivided						
RT Channelized			0				0			
₋anes	0	1	0	0	1		0			
Configuration	LT					TR				
Jpstream Signal		0			0					
Minor Street		Northbound			Southbou	ınd				
Movement	7	8	9	10	11		12			
	L	T	R	L	Т		R			
/olume (veh/h)				33			45			
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.67	1.00		0.85			
Hourly Flow Rate, HFR veh/h)	0	0	0	49	0		52			
Percent Heavy Vehicles	2	0	2	2	0		3			
Percent Grade (%)		0			0					
Flared Approach		N			N					
Storage		0			0					
RT Channelized			0				0			
_anes	0	0	0	0	0		0			
Configuration					LR					
Delay, Queue Length, a	nd Level of Se	rvice		•	•					
Approach	Eastbound	Westbound	Nor	thbound	S	outhbound				
Movement	1	4	7	8 9	10	11	12			
ane Configuration	LT	<del>                                     </del>	<del>'</del>	<del>-                                    </del>	<del>-   ' ' -  </del>	LR	<del>- '-</del>			
/ (veh/h)	27					101				
<u> </u>	1154				_					
C (m) (veh/h)					_	534				
//c	0.02					0.19				
95% queue length	0.07					0.69				
Control Delay (s/veh)	8.2					13.3				
_OS	Α					В				
Approach Delay (s/veh)						13.3				
Approach LOS				В						

		O-WAY STOP (	-					
General Information			Site Inf	ormatio	<u>n</u>			
Analyst	Shilpa Ma		Intersect	ion			reek at SR	1 NB
Agency/Co.		nternational	Jurisdicti			Ramp City of Dover, DE		
Date Performed	12/27/201	16 I - 50% Build - AM	Analysis			2016	over, DE	
Analysis Time Period	Peak		Ariarysis	Toai		2010		
	rrison Oak Traf	fic Study						
East/West Street: N Litt						IB On-Ramp		
ntersection Orientation:			Study Pe	riod (hrs):	0.25			
/ehicle Volumes ar	<u>ıd Adjustme</u>							
Major Street		Eastbound				Westbou	nd	
Movement	1 1	2 T	3 R		4	5 T		6 R
/olume (veh/h)	68	166	ĸ		L	76	-	27
Peak-Hour Factor, PHF	0.62	0.77	0.78	(	0.60	0.79	_	0.75
Hourly Flow Rate, HFR veh/h)	109	215	0		0	96		36
Percent Heavy Vehicles	2				2			
Median Type	1		Undivided					
RT Channelized			0					0
_anes	0	1	0		0	1	$\neg \uparrow$	0
Configuration	LT						TR	
Jpstream Signal		0				0		
Minor Street		Northbound				Southbound		
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)								
Peak-Hour Factor, PHF	0.60	1.00	0.40	(	0.71	1.00	1.00	
Hourly Flow Rate, HFR veh/h)	0	0	0		0	0		
Percent Heavy Vehicles	2	0	2		2	0		8
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
_anes	0	0	0		0	0		0
Configuration								
Delay, Queue Length, a						1		
Approach	Eastbound	Westbound	1	orthbound		_	outhbound	1
Movement	1	4	7	8	9	10	11	12
₋ane Configuration	LT							┞
/ (veh/h)	109							<u> </u>
C (m) (veh/h)	1453							
//c	0.08							
95% queue length	0.24							
Control Delay (s/veh)	7.7							
_OS	Α							
Approach Delay (s/veh)								*
Approach LOS								

	1 44	O-WAY STOP	CONTROL	_ OCIVITAL	<u> </u>			
General Information	1		Site Info	ormatio	<u> </u>			
Analyst	Shilpa Ma		Intersecti	on			reek at SR	1 SB
Agency/Co.	T.Y. Lin II	nternational				Ramp		
Date Performed	12/27/201		Jurisdiction			City of Do	ver, DE	
Analysis Time Period	Peak	l - 50% Build - AM	Analysis	Year		2016		
	rrison Oak Traf	fic Study						
East/West Street: N Litt						B Off-Ramp		
ntersection Orientation:			Study Per	riod (hrs):	0.25			
/ehicle Volumes ar	nd Adjustme							
Major Street	Eastbound					Westbou	nd	
Movement	1	2	3		4	5		6
/olumo (voh/h)	L L	167	R	_	L	76	-	R
/olume (veh/h) Peak-Hour Factor, PHF	0.79	0.90	0.78	<del>-                                     </del>	0.60	0.78	<del>-   ,</del>	0.68
Hourly Flow Rate, HFR veh/h)	0.79	185	0.78		0	97		0
Percent Heavy Vehicles	2				2	<del></del>	_	
Median Type	<del>-</del> -		Undivided					
RT Channelized			0	1				0
anes	0	1	0	+	0	1		0
Configuration		T		- v - v		T		
Jpstream Signal		0				0		
Minor Street		Northbound		<u> </u>		Southbou	ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)					66			206
Peak-Hour Factor, PHF	0.60	1.00	0.40	C	).71	1.00	(	).59
Hourly Flow Rate, HFR veh/h)	0	0	0		92	0	,	349
Percent Heavy Vehicles	2	0	2		2	0		3
Percent Grade (%)		0				0		
Flared Approach		Ν				N		
Storage		0				0		
RT Channelized			0					0
_anes	0	0	0		0	0		0
Configuration						LR		
Delay, Queue Length, a	nd Level of Se	rvice						
Approach	Eastbound	Westbound	No	rthbound		S	outhbound	
Movement	1	4	7	8	9	10	11	12
ane Configuration							LR	
/ (veh/h)							441	
C (m) (veh/h)							891	
//c							0.49	
95% queue length							2.80	
Control Delay (s/veh)						1	12.9	
OS						+	12.9 B	
						+	12.9	
Approach Delay (s/veh)								
Approach LOS						В		

	TW	O-WAY STOP	CONTR	OL S	UMN	//ARY			
General Information	n		Site I	nform	natio	on			
Analyst	Shilpa Ma	allem	1	- 4!			14//-:4- 0-	l4 O	O-/-
Agency/Co.		nternational	Interse				White Oa		son Oak
Date Performed	12/27/201		Analys		r		City of Dover, DE 2016		
Analysis Time Period	Proposed Peak	l - 50% Build - PN	Analysis Year				2010		
Project Description Ga	arrison Oak Traf	fic Study							
East/West Street: White	e Oak Road		North/S	South S	Stree	t: <i>Garriso</i> i	n Oak Drive	!	
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)	20	66					63		4
Peak-Hour Factor, PHF	0.69	0.42	0.78	}		0.60	0.79		1.00
Hourly Flow Rate, HFR (veh/h)	28	157	0			0	79		4
Percent Heavy Vehicles	10					2			
Median Type			Undivided						
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0				0			
Minor Street		Northbound				Southbou	ınd		
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)						21			59
Peak-Hour Factor, PHF	0.60	1.00	0.40	)		1.00	1.00		0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0			21	0		64
Percent Heavy Vehicles	2	0	2			2	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	nd Level of Se	rvice							
Approach	Eastbound	Westbound		Northb	ound		S	outhbour	ıd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	1
v (veh/h)	28							85	1
C (m) (veh/h)	1465							888	+
v/c	0.02						<del>                                     </del>	0.10	+
	0.02			$\vdash$				0.10	+
95% queue length							-		+
Control Delay (s/veh)	7.5			-			-	9.5	+
LOS	Α							A	
Approach Delay (s/veh)								9.5	
Approach LOS								Α	

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	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY			
General Information	n		Site I	nform	natio	on			
Analyst	Shilpa Ma	allem	<u> </u>				li4#:''- O-	1 - 1 0	1
Agency/Co.		nternational	Interse				White Oa		
Date Performed	12/27/20 <sup>-</sup>	16	Analys		<u></u>		City of Dover, DE 2016		
Analysis Time Period	Proposed Peak	1 - 50% Build - PN	1 Arranys	ois rea	ı		2016		
Project Description Ga		ffic Study	<u> </u>						
East/West Street: White		no oludy	North/S	South S	Stree	t: Acorn L	ane		
Intersection Orientation:						: 0.25			
Vehicle Volumes ar	nd Adiustme	nts							
Major Street	1	Eastbound					Westbou	ınd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)		73	55			17	96		
Peak-Hour Factor, PHF	1.00	1.00	0.78	}		0.60	0.69		1.00
Hourly Flow Rate, HFR (veh/h)	0	73	70			28	139		0
Percent Heavy Vehicles	0					2			
Median Type				Undi	/idea	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration			TR			LT			
Upstream Signal		0			<u> </u>		0		
Minor Street		Northbound				Southboo	und		
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)	57		11						
Peak-Hour Factor, PHF	0.60	1.00	0.40	)		1.00	1.00		1.00
Hourly Flow Rate, HFR (veh/h)	94	0	27			0	0		0
Percent Heavy Vehicles	2	0	2			0	0		0
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration		LR							
Delay, Queue Length, a	ind Level of Se	rvice					•		
Approach	Eastbound	Westbound		Northb	ound		5	Southbou	ınd
Movement	1	4	7	8		9	10	11	12
Lane Configuration		LT		LR					
v (veh/h)		28		121	1				
C (m) (veh/h)		1440		722	2				
v/c		0.02		0.1					
95% queue length		0.06		0.6				İ	
Control Delay (s/veh)		7.5		11.0					
LOS		A A		В	-		<del>                                     </del>		
Approach Delay (s/veh)				11.0	<u> </u>	<u> </u>		<u> </u>	
,							<del>                                     </del>		
Approach LOS		erved		B CS+TM					9/2016 1:25

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	TW	O-WAY STOP	CONTR	OL SI	UMI	MARY			
General Information	n		Site I	nform	natio	on			
Analyst	Shilpa Ma	allem					IN 1 1111 - O		N
Agency/Co.		nternational	Interse						Acorn Lane
Date Performed	12/27/201	16			r		City of Dover, DE 2016		
Analysis Time Period	Proposed Peak	l - 50% Build - PM	Analysis Year				2016		
Project Description Ga	arrison Oak Traf	fic Study							
East/West Street: N Litt		·	North/S	South S	Stree	t: Acorn L	ane		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street	T .	Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)	53	334					171		28
Peak-Hour Factor, PHF	0.79	0.80	0.78	}		0.60	0.82		0.68
Hourly Flow Rate, HFR (veh/h)	67	417	0			0	208		41
Percent Heavy Vehicles	2					2			
Median Type				Undivided					
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	ınd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)						34			22
Peak-Hour Factor, PHF	0.60	1.00	0.40	)		0.67	1.00		0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0			50	0		25
Percent Heavy Vehicles	2	0	2			2	0		3
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0					Î	0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	nd Level of Se	rvice	•				•		
Approach	Eastbound	Westbound		Northb	ound		S	outhbou	nd
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT	·	•	Ť				LR	<del></del>
v (veh/h)	67							75	
	1317								
C (m) (veh/h)								427	
v/c	0.05							0.18	
95% queue length	0.16							0.63	
Control Delay (s/veh)	7.9							15.2	
LOS	Α							С	
Approach Delay (s/veh)								15.2	
Approach LOS								С	
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	TW	O-WAY STOP	CONTR	OL SI	JMMAF	RY				
General Information	n		Site Information							
Analyst	Shilpa Ma	allem	Interse	otion			N Little Creek at SR 1		1 NB	
Agency/Co.		nternational					Ramp			
Date Performed	12/27/201		Jurisdi				City of Dover, D			
Analysis Time Period	Proposed Peak	l - 50% Build - PM	Analysis Year			2016				
Project Description Ga		fic Study								
East/West Street: N Lit							3 On-Ramp			
Intersection Orientation:	East-West		Study I	Period	(hrs): <i>0.</i>	25				
Vehicle Volumes a	nd Adjustme	nts								
Major Street		Eastbound					Westbou	ınd		
Movement	1	2	3		4		5			6
\	L 107	T	R		L		T 404			R
Volume (veh/h) Peak-Hour Factor, PHF	187 0.62	133 0.77	0.78	,	0.60	<u> </u>	124 0.79			71 ).75
Hourly Flow Rate, HFR	301	172	0.78	<u>'</u>	0.00	<u>,                                      </u>	156	寸		94
(veh/h) Percent Heavy Vehicles	2			_	2			-		
Median Type			Undivided 2							
RT Channelized			0	i i		1			0	
Lanes	0	1	0	$\overline{}$	0		1			0
Configuration	LT	<del>'</del>	Ť				<u>'</u>			TR
Upstream Signal		0		$\neg$			0			
Minor Street	ì	Northbound		<del>- 1</del>			Southbound			
Movement	7	8	9		10	)	11			12
	L	Т	R		L		Т			R
Volume (veh/h)										
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.71	1	1.00		(	).59
Hourly Flow Rate, HFR (veh/h)	0	0	0		0		0			0
Percent Heavy Vehicles	2	0	2		2		0			8
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0		0		0			0
Configuration										
Delay, Queue Length, a	and Level of Se	rvice								
Approach	Eastbound	Westbound		Northbo	ound		S	outhb	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LT									
v (veh/h)	301									
C (m) (veh/h)	1316				ĺ					
v/c	0.23				j					
95% queue length	0.88				İ					
Control Delay (s/veh)	8.5									
LOS	A						1			
Approach Delay (s/veh)								I		
Approach LOS										
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	TW	O-WAY STOP	CONTR	OL SI	JMN	//ARY				
General Information	n		Site I	nform	natio	on .				
Analyst	Shilpa Ma	allem	Intoro	ation.			N Little C	reek at SR	1 SB	
Agency/Co.	T.Y. Lin II	nternational	Interse				Ramp			
Date Performed	12/27/201	-	Jurisdi				City of Dover, DE		DE	
Analysis Time Period	Proposed Peak	l - 50% Build - PM	Analys	Analysis Year		2016				
	arrison Oak Traf	fic Study								
East/West Street: N Litt						t: SR1 SB	Off-Ramp			
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5		6	
	L	Т	R			L	Т		R	
Volume (veh/h)		297	<u> </u>				124			
Peak-Hour Factor, PHF	0.79	0.90	0.78			0.60	0.78		0.68	
Hourly Flow Rate, HFR (veh/h)	0	330	0			0	158		0	
Percent Heavy Vehicles	2					2				
Median Type				Undivided						
RT Channelized			0						0	
Lanes	0	1	0			0	1		0	
Configuration		Т					Т			
Upstream Signal		0					0			
Minor Street		Northbound					Southbou	ınd		
Movement	7	8	9			10	11		12	
	L	Т	R			L	Т		R	
Volume (veh/h)			2.40			31	4.00		102	
Peak-Hour Factor, PHF	0.60	1.00	0.40	1		0.71	1.00		0.59	
Hourly Flow Rate, HFR (veh/h)	0	0	0			43	0		172	
Percent Heavy Vehicles	2	0	2			2	0		3	
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0						0	
Lanes	0	0	0			0	0		0	
Configuration							LR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound	ı	Northb	ound		S	outhbound	ł	
Movement	1	4	7	8		9	10	11	12	
Lane Configuration								LR	1	
v (veh/h)								215	1	
C (m) (veh/h)								784	1	
v/c								0.27	<del>                                     </del>	
95% queue length								1.12		
									<del>                                     </del>	
Control Delay (s/veh)								11.3	-	
LOS								B		
Approach Delay (s/veh)								11.3		
Approach LOS								В		
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	IW	O-WAY STOP	CONTROL	SUMMARY					
General Information	1		Site Information						
Analyst	Shilpa Ma		Intersecti	on	White Oak at Garrison Oak				
Agency/Co.		nternational	Jurisdiction		City of Dover, DE				
Date Performed	12/27/201	-	Analysis		2016		<i>, D</i> L		
Analysis Time Period	Proposed Peak	l - 75% Build - AM			2370				
Project Description Ga		fic Study							
East/West Street: Whot				ith Street: Garris	son Oak Drive	)			
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.25					
/ehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound			Westbou	nd			
Movement	1	2	3	4	5		6		
	L	Т	R	L	Т		R		
/olume (veh/h)	108	33			70		12		
Peak-Hour Factor, PHF	0.69	0.42	0.78	0.60	0.79		1.00		
lourly Flow Rate, HFR veh/h)	156	78	0	0	88		12		
Percent Heavy Vehicles	10			2					
Median Type				Individed	_				
RT Channelized			0				0		
₋anes	0	1	0	0	1		0		
Configuration	LT						TR		
Jpstream Signal		0			0				
Minor Street		Northbound				Southbound			
Movement	7	8	9	10	11		12 R		
	L	Т	R	L	Т	T			
/olume (veh/h)				5			23		
Peak-Hour Factor, PHF	0.60	1.00	0.40	1.00	1.00		0.92		
Hourly Flow Rate, HFR veh/h)	0	0	0	5	0		24		
Percent Heavy Vehicles	2	0	2	2	0		0		
Percent Grade (%)		0			0				
Flared Approach		N			N				
Storage		0			0				
RT Channelized			0				0		
_anes	0	0	0	0	0		0		
Configuration					LR				
Delay, Queue Length, a	nd Level of Se	rvice	i						
Approach	Eastbound	Westbound	No	rthbound	.9	outhbound			
Movement	1	4	7	8 9	10	11	12		
_ane Configuration	LT	· ·	<del>'</del> +	<u> </u>	10	LR	<del>                                     </del>		
	156		<del>-  </del>		_	29			
/ (veh/h)									
C (m) (veh/h)	1444					825			
//c	0.11					0.04			
95% queue length	0.36					0.11			
Control Delay (s/veh)	7.8					9.5			
_OS	Α					Α			
Approach Delay (s/veh)				•		9.5			
					_	Α			

	I VV	O-WAY STOP	CONTRO	DE 2014	WARY					
General Information	1		Site Information							
Analyst	Shilpa Ma		Interse	Intersection			White Oak at Acorn Lane			
Agency/Co.		nternational	Jurisdie			City of Dover, D		Luile		
Date Performed	12/27/20	-		is Year		2016				
Analysis Time Period	Proposed Peak	l - 75% Build - AM				2070				
Project Description Ga		fic Study								
East/West Street: White					et: <i>Acorn</i>	Lane				
ntersection Orientation:	East-West		Study F	Period (hrs	): 0.25					
/ehicle Volumes ar	d Adjustme	nts								
Major Street		Eastbound				Westbou	ınd			
Movement	1	2	3		4	5		6		
	L	Т	R		L	Т		R		
/olume (veh/h)		117	25		15	77		1		
Peak-Hour Factor, PHF	1.00	0.75	0.78		0.60	0.69		1.00		
Hourly Flow Rate, HFR veh/h)	0	156	32		24	111		0		
Percent Heavy Vehicles	0				2					
Median Type				Undivide	d	1				
RT Channelized			0					0		
₋anes	0	1	0		0	1		0		
Configuration			TR		LT					
Jpstream Signal		0				0		0		
Minor Street		Northbound				Southbound				
Movement	7	8	9		10	11		12		
	L	T	R		L	Т		R		
/olume (veh/h)	29		15							
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		1.00		
Hourly Flow Rate, HFR veh/h)	48	0	37		0	0		0		
Percent Heavy Vehicles	2	0	2		0	0		0		
Percent Grade (%)		0				0				
Flared Approach		N				Ν				
Storage		0				0				
RT Channelized			0					0		
_anes	0	0	0		0	0		0		
Configuration		LR								
Delay, Queue Length, a	nd Level of Se	rvice					•			
Approach	Eastbound	Westbound	١	Northboun	d		Southboun	d		
Movement	1	4	7	8	9	10	11	12		
_ane Configuration		LT		LR	<u> </u>	1				
/ (veh/h)		24		85	†	+		+		
C (m) (veh/h)		1386		733	+					
· ' ` '					<del>                                     </del>	+				
//C		0.02		0.12	+					
95% queue length		0.05		0.39	1			-		
Control Delay (s/veh)		7.6		10.6	ļ					
_OS		Α		В						
Approach Delay (s/veh)				10.6						
Approach LOS				В						

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	I VV	O-WAY STOP (	CONTROL	SUMMARY						
General Information	1		Site Information							
Analyst	Shilpa Ma		Intersecti	on	N Little C	N Little Creek at Acorn Lan				
Agency/Co.		nternational	Jurisdiction		City of Do	nn Lan				
Date Performed	12/27/20 <sup>-</sup>		Analysis		2016	7701, 22				
Analysis Time Period	Proposed Peak	1 - 75% Build - AM				2070				
Project Description Ga		fic Study								
East/West Street: N Litt				ıth Street: Acoi	n Lane					
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.25						
/ehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound			Westbou	nd				
Movement	1	2	3	4	5		6			
	L	Т	R	L	Т		R			
/olume (veh/h)	24	134			308		23			
Peak-Hour Factor, PHF	0.79	0.80	0.78	0.60	0.82		0.68			
lourly Flow Rate, HFR veh/h)	30	167	0	0	375		33			
Percent Heavy Vehicles	2			2						
Median Type				Individed						
RT Channelized			0				0			
anes	0	1	0	0	1		0			
Configuration	LT						TR			
Jpstream Signal		0			0	0				
Minor Street		Northbound			Southbound					
Movement	7	8	9	10	11	11				
	L	Т	R	L	Т		R			
/olume (veh/h)				33						
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.67	1.00		0.85			
Hourly Flow Rate, HFR veh/h)	0	0	0	49	0		54			
Percent Heavy Vehicles	2	0	2	2	0		3			
Percent Grade (%)		0			0					
Flared Approach		Ν			N					
Storage		0			0					
RT Channelized			0				0			
_anes	0	0	0	0	0	$\neg \vdash$	0			
Configuration					LR	<u> </u>				
Delay, Queue Length, a	nd Level of Se	rvice		-	-	•				
Approach	Eastbound	Westbound	Noi	rthbound	5	Southbound				
Movement	1	4	7	8 9	10	11	12			
_ane Configuration	LT	· ·	-	-   -	<u> </u>	LR	<u> </u>			
/ (veh/h)	30		<del>-  </del>	<del></del>		103				
C (m) (veh/h)	1151		<del></del>	<del> </del>	<del>-  </del>	531				
· / · /										
//C	0.03					0.19				
95% queue length	0.08					0.71				
Control Delay (s/veh)	8.2					13.4				
_OS	Α					В				
Approach Delay (s/veh)						13.4				
Approach LOS						В				

	TW	O-WAY STOP (	CONTROL	SUMMARY					
General Information	1		Site Information						
Analyst	Shilpa Ma		Intersecti		N Little Creek at SR 1 NB				
Agency/Co.		nternational			Ramp				
Date Performed	12/27/201		Jurisdiction		City of Dover, DE		DE		
Analysis Time Period	Proposed Peak	l - 75% Build - AM	Analysis	Year	2016				
Project Description Ga		fic Study							
East/West Street: N Litt				ith Street: SR1 N	IB On-Ramp				
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.25					
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound			Westbou	nd			
Movement	1	2	3	4	5		6		
/olume (yoh/h)	68	T	R	L	76		R 27		
Volume (veh/h) Peak-Hour Factor, PHF	0.62	166 0.77	0.78	0.60	0.79		<u>27</u> 0.75		
Hourly Flow Rate, HFR	109	215	0.78	0.00	96		36		
veh/h) Percent Heavy Vehicles	2	<del></del>		2					
Median Type				 Individed					
RT Channelized		<u> </u>	0	arviaca	1		0		
_anes	0	1	0	0	1		0		
Configuration	LT	<u>'</u>		<del>                                     </del>	+ '-		TR		
Jpstream Signal		0			0				
Minor Street	1	Northbound			Southbou				
Movement	7	8	9	10	11		12		
	L	Т	R	L	Т		R		
/olume (veh/h)									
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.71	1.00		0.59		
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0		0		0
Percent Heavy Vehicles	2	0	2	2	0		8		
Percent Grade (%)		0			0				
Flared Approach		Ν			N				
Storage		0			0				
RT Channelized			0				0		
Lanes	0	0	0	0	0		0		
Configuration									
Delay, Queue Length, a	nd Level of Se	rvice							
Approach	Eastbound	Westbound	No	rthbound	S	outhbound			
Movement	1	4	7	8 9	10	11	12		
_ane Configuration	LT								
v (veh/h)	109								
C (m) (veh/h)	1453								
ı/c	0.08								
95% queue length	0.24								
Control Delay (s/veh)	7.7			1					
LOS	A								
Approach Delay (s/veh)				1		<u> </u>			
					_1				

	I VV	O-WAY STOP	CONTROL	. SUIVIIVIAR	<u> </u>			
General Information	1		Site Info	ormation				
Analyst	Shilpa Ma		Intersection			N Little Creek at SR 1 SB		
Agency/Co.		nternational			Ramp	5.=		
Date Performed	12/27/201		Jurisdictio		City of Do	over, DE		
Analysis Time Period	Peak	I - 75% Build - AM	Analysis Year		2016	2016		
	rrison Oak Traf	fic Study	ı.					
East/West Street: N Litt					R1 SB Off-Ramp			
ntersection Orientation:			Study Per	iod (hrs): 0.2	5			
/ehicle Volumes ar	<u>ıd Adjustme</u>							
Major Street		Eastbound			Westbou	nd		
Movement	1	2 T	3 R	4	5 		6 R	
/olume (veh/h)	+	168	K		76			
Peak-Hour Factor, PHF	0.79	0.90	0.78	0.60	0.78		2.68	
Hourly Flow Rate, HFR veh/h)	0	186	0	0	97		0	
Percent Heavy Vehicles	2			2				
Median Type	1	•	Ra	aised curb	<b>I</b>			
RT Channelized	1		0				0	
_anes	0	1	0	0	1		0	
Configuration		Т			T			
Jpstream Signal		0			0			
Minor Street		Northbound			Southbou	ınd		
Movement	7	8	9	10	11		12	
	L	Т	R	L	T	Т		
/olume (veh/h)				66		2		
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.71	1.00	1.00		
Hourly Flow Rate, HFR veh/h)	0	0	0	92	0		350	
Percent Heavy Vehicles	2	0	2	2	0		3	
Percent Grade (%)		0			0			
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0				0	
anes	0	0	0	0	0		0	
Configuration					LR			
Delay, Queue Length, a								
Approach	Eastbound	Westbound	Tr -	thbound		outhbound	1	
Movement	1	4	7	8 9	9 10	11	12	
₋ane Configuration						LR		
v (veh/h)						442		
C (m) (veh/h)						896		
ı/c						0.49		
95% queue length						2.78		
Control Delay (s/veh)						12.9		
.OS						В		
Approach Delay (s/veh)						12.9		
Approach LOS		<del>.                                      </del>				В		

	TW	O-WAY STOP	CONTRO	OL SI	JMMARY			
General Information	n		Site Ir	nform	ation			
Analyst	Shilpa Ma	allem	Interse	otion		M/hito Oc	k at Garris	on Ook
Agency/Co.	T.Y. Lin I	nternational	Jurisdi			City of Do		on Oak
Date Performed	12/27/20	-	Analys		<u> </u>	2016	JVCI, DL	
Analysis Time Period	Proposed Peak	l - 75% Build - PM		10 100		2070		
Project Description Ga		fic Study						
East/West Street: White						rison Oak Drive	<del>)</del>	
ntersection Orientation:	East-West		Study F	Period	(hrs): 0.25			
Vehicle Volumes ar	nd Adjustme	nts						
Major Street		Eastbound				Westbou	ınd	
Movement	1	2	3		4	5		6
	L	Т	R		L	T		R
/olume (veh/h)	27	66				63		6
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00
Hourly Flow Rate, HFR veh/h)	39	157	0		0	79		6
Percent Heavy Vehicles	10				2			
Median Type		<u> </u>	1	Undi	vided			
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT							TR
Jpstream Signal		0				0		
Minor Street		Northbound				Southboo	ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)			2 12		30			82
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		0.92
Hourly Flow Rate, HFR veh/h)	0	0	0		30	0		89
Percent Heavy Vehicles	2	0	2		2	0		0
Percent Grade (%)		0				0		
Flared Approach		Ν				N		
Storage		0				0		
RT Channelized			0					0
_anes	0	0	0		0	0		0
Configuration						LR		
Delay, Queue Length, a	nd Level of Se	rvice						
Approach	Eastbound	Westbound	1	Northb	ound	S	Southboun	d
Movement	1	4	7	8	9	10	11	12
_ane Configuration	LT						LR	1
/ (veh/h)	39						119	
C (m) (veh/h)	1462						874	1
//c	0.03						0.14	1
95% queue length	0.08						0.47	+
Control Delay (s/veh)	7.5						9.8	+
, , ,							1	+
OS	Α						A	1
Approach Delay (s/veh)							9.8	
Approach LOS							A	

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	TW	O-WAY STOP	CONTR	OL S	UMN	MARY				
General Information	<u> </u>		Site I	nform	natio	on				
Analyst	Shilpa Ma	allem	Interse	ti			14/hita Oa	li at Aai	- wa 1	
Agency/Co.	T.Y. Lin I	nternational	Jurisdi				White Oak at Acorn City of Dover, DE			arie
Date Performed	12/27/20 <sup>-</sup>		Analys		r		2016			
Analysis Time Period	Proposed Peak	l - 75% Build - PN	1	515 T CC			2010			
Project Description Ga	arrison Oak Trat	fic Study								
East/West Street: White		•	North/S	South S	Stree	t: Acorn L	ane.			
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	ınd		
Movement	1	2	3			4	5			6
	L	Т	R			L	Т			R
Volume (veh/h)		79	55			21	116			
Peak-Hour Factor, PHF	1.00	1.00	0.78	}		0.60	0.69		1.	00
Hourly Flow Rate, HFR (veh/h)	0	79	70			34	168		(	0
Percent Heavy Vehicles	0					2				-
Median Type				Undi	vided	1	1			
RT Channelized			0							0
Lanes	0	1	0			0	1		(	0
Configuration			TR			LT				
Upstream Signal		0					0			
Minor Street		Northbound					Southboo	und		
Movement	7	8	9			10	11			12
	L	Т	R			L	Т			R
Volume (veh/h)	57		12							
Peak-Hour Factor, PHF	0.60	1.00	0.40	)		1.00	1.00		1.	00
Hourly Flow Rate, HFR (veh/h)	94	0	29			0	0			0
Percent Heavy Vehicles	2	0	2			0	0		(	0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0						(	0
Lanes	0	0	0			0	0		(	0
Configuration		LR								
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound		Northb	ound	I	5	Southbo	und	
Movement	1	4	7	8		9	10	11		12
Lane Configuration		LT		LR	)				$\neg$	
v (veh/h)		34		123						
C (m) (veh/h)		1432		685					$\neg$	
v/c		0.02		0.1		1			$\neg$	
95% queue length		0.07		0.6					$\dashv$	
Control Delay (s/veh)		7.6		11.4				<del> </del>	$\dashv$	
LOS				_	7				-	
		Α		<u>B</u>	1	<u> </u>		<u> </u>		
Approach Delay (s/veh)				11.	4					
Approach LOS				B CS+TM						

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	TW	O-WAY STOP	CONTR	OL S	UMI	MARY				
General Information	<u> </u>		Site I	nform	natio	on				
Analyst	Shilpa Ma	allem	luto ro	ation.			N 1 :#4 C	waals at A		
Agency/Co.		nternational	Interse Jurisdi				N Little Co		corn Lane	
Date Performed	12/27/20		Analys		r		2016			
Analysis Time Period	Proposed Peak	l - 75% Build - PN	1 Allalys	513 1 60	ll		2010			
Project Description Ga	arrison Oak Trai	fic Study								
East/West Street: N Litt	le Creek		North/S	South S	Stree	t: Acorn L	ane			
Intersection Orientation:	East-West		Study F	Period	(hrs)	: 0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5		6	
	L	Т	R			L	Т		R	
Volume (veh/h)	54	334					171		28	
Peak-Hour Factor, PHF	0.79	0.80	0.78	1		0.60	0.82		0.68	
Hourly Flow Rate, HFR (veh/h)	68	417	0			0	208		41	
Percent Heavy Vehicles	2					2				
Median Type		•		Undi	vided	<u> </u>				
RT Channelized			0						0	
Lanes	0	1	0			0	1		0	
Configuration	LT								TR	
Upstream Signal		0					0			
Minor Street		Northbound	1 -				Southbou	ınd		
Movement	7	8	9			10	11		12	
	L	Т	R				Т		R	
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40			37 0.67	1.00	_	23 0.85	
Hourly Flow Rate, HFR			0.40				1.00	_		
(veh/h)	0	0	0			55	0		27	
Percent Heavy Vehicles	2	0	2			2	0		3	
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0						0	
Lanes	0	0	0			0	0		0	
Configuration							LR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound	- 1	Northb	ound		S	outhboun	ıd	
Movement	1	4	7	8		9	10	11	12	
Lane Configuration	LT							LR		
v (veh/h)	68							82		
C (m) (veh/h)	1317							424		
v/c	0.05							0.19	1	
95% queue length	0.16							0.71		
Control Delay (s/veh)	7.9							15.5	1	
LOS	A							С	1	
Approach Delay (s/veh)						<u> </u>		15.5	1	
Approach LOS							<del>                                     </del>	C		
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	TW	O-WAY STOP	CONTR	OL SI	JMN	IARY				
General Information	n		Site I	nform	atio	n				
Analyst	Shilpa Ma	allem					N Little C	reek a	t SR	1 NB
Agency/Co.		nternational	Interse				Ramp			
Date Performed	12/27/201		Jurisd				City of Dover, DE			
Analysis Time Period	Proposed Peak	l - 75% Build - PM	Analys	sis Yea	r		2016			
Project Description Ga		fic Study	•							
East/West Street: N Litt							3 On-Ramp			
Intersection Orientation:	East-West		Study	Period	(hrs):	0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5			6
	L	T	R			L	T			R
Volume (veh/h)	188	134	0.70				124			71
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.62 303	0.77 174	0.78	5		0.60 0	0.79 156	_		).75 94
(veh/h)		1/4	, ·				130			J7
Percent Heavy Vehicles	2					2				
Median Type		<u> </u>		Undiv	/ided					
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration	LT									TR
Upstream Signal		0					0			
Minor Street	_	Northbound					Southbound			
Movement	7	8	9			10	11			12
M. I	L L	T	R			L	Т			R
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40	,		0.71	1.00	-		0.59
Hourly Flow Rate, HFR	0.60			<del>'  </del>		0.71	1.00			
(veh/ȟ)	0	0	0			0	0			0
Percent Heavy Vehicles	2	0	2			2	0			8
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			0	0			0
Configuration										
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound		Northbo	ound		S	outhb	ound	
Movement	1	4	7	8		9	10	1	1	12
Lane Configuration	LT									
v (veh/h)	303									
C (m) (veh/h)	1316									
v/c	0.23									
95% queue length	0.89									
Control Delay (s/veh)	8.6							t		
LOS	A									
Approach Delay (s/veh)										
Approach LOS										
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	TW	O-WAY STOP	CONTR	OL SI	JMN	MARY			
General Information	n		Site I	nform	atio	on			
Analyst	Shilpa Ma	allem	Intoro	ation.			N Little C	reek at SR	1 SB
Agency/Co.	T.Y. Lin II	nternational	Interse				Ramp		
Date Performed	12/27/201		Jurisdi				City of Do	ver, DE	
Analysis Time Period	Proposed Peak	l - 75% Build - PM	Analys	sis Yea	r		2016		
	arrison Oak Traf	fic Study							
East/West Street: N Litt						t: SR1 SB	Off-Ramp		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)		299	<b>_</b>				124		
Peak-Hour Factor, PHF	0.79	0.90	0.78			0.60	0.78		0.68
Hourly Flow Rate, HFR (veh/h)	0	332	0			0	158		0
Percent Heavy Vehicles	2					2			
Median Type				Undi	/idec	1			
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration		T					Т		
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	ind	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)			2.10			31	4.00		102
Peak-Hour Factor, PHF	0.60	1.00	0.40			0.71	1.00		0.59
Hourly Flow Rate, HFR (veh/h)	0	0	0			43	0		172
Percent Heavy Vehicles	2	0	2			2	0		3
Percent Grade (%)		0	_				0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	nd Level of Se	rvice							
Approach	Eastbound	Westbound	I	Vorthb	ound		S	outhbound	ł
Movement	1	4	7	8		9	10	11	12
Lane Configuration								LR	
v (veh/h)								215	1
C (m) (veh/h)								783	1
v/c								0.27	<del>                                     </del>
95% queue length				<del>                                     </del>				1.12	
									<del>                                     </del>
Control Delay (s/veh)				<del>                                     </del>				11.3	-
LOS								B	
Approach Delay (s/veh)								11.3	
Approach LOS								В	
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		O-WAY STOP C	ONTINOL		AIX I			
General Information	า		Site Info	ormation	1			
Analyst	Shilpa Ma		Intersection	on		White Oa	k at Garriso	on Oak
Agency/Co.		nternational	Jurisdiction			City of Dover, DE		
Date Performed	12/27/20		Analysis `			2016	,	
Analysis Time Period	Proposed Peak	l -100% Build - AM						
	rrison Oak Trat	fic Study						
ast/West Street: Whot						on Oak Drive	)	
ntersection Orientation:	East-West		Study Per	iod (hrs):	0.25			
/ehicle Volumes ar	nd Adjustme	nts						
/lajor Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
/olume (veh/h)	137	33				70		15
Peak-Hour Factor, PHF	0.69	0.42	0.78	1 0	.60	0.79		1.00
lourly Flow Rate, HFR veh/h)	198	78	0		0	88		15
Percent Heavy Vehicles	10				2			
/ledian Type			U	Individed				
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT							TR
Jpstream Signal		0				0		
/linor Street		Northbound				Southbou	ınd	
Movement	7	8	9		10	11		
	L	Т	R		L	Т		R
/olume (veh/h)					6			29
Peak-Hour Factor, PHF	0.60	1.00	0.40	1	.00	1.00	(	0.92
lourly Flow Rate, HFR veh/h)	0	0	0		6	0		31
Percent Heavy Vehicles	2	0	2		2	0		0
Percent Grade (%)		0				0		
-lared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
_anes	0	0	0	1	0	0		0
Configuration	1		-	$\neg$		LR		
Delay, Queue Length, a	nd Level of Se	rvice				-		
Approach	Eastbound	Westbound	Nor	rthbound		l s	outhbound	
Novement	1	4	7	8	9	10	11	12
ane Configuration	LT	7	<u>'</u>	<del>-                                    </del>		1 10	LR	<del></del>
			<del></del>			+		$\vdash$
(veh/h)	198						37	
C (m) (veh/h)	1440					+	796	
/c	0.14						0.05	
5% queue length	0.48						0.15	
Control Delay (s/veh)	7.9						9.7	
.OS	Α						Α	
Approach Delay (s/veh)							9.7	
Approach LOS							A	

		O-WAY STOP O	ONIRO	JE SUIVI	WARI			
General Information	າ		Site Ir	nformati	ion			
Analyst	Shilpa Ma		Interse	ction		White Oa	k at Acorn	Lane
Agency/Co.		nternational	Jurisdie			City of Dover, DE		
Date Performed	12/27/201		Analys			2016		
Analysis Time Period	Proposed Peak	l -100% Build - AM						
	rrison Oak Traf	fic Study						
East/West Street: White					et: Acorn	Lane		
ntersection Orientation:	East-West		Study F	Period (hrs	s): <i>0.2</i> 5			
/ehicle Volumes ar	nd Adjustme	nts						
/lajor Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	T		R
/olume (veh/h)		143	25		16	82		1.55
Peak-Hour Factor, PHF	1.00	0.75	0.78		0.60	0.69		1.00
lourly Flow Rate, HFR veh/h)	0	190	32		26	118		0
Percent Heavy Vehicles	0				2			
/ledian Type				Undivide	ed	•		
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
/linor Street		Northbound				Southbou	ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)	29		18					
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		1.00
lourly Flow Rate, HFR veh/h)	48	0	44		0	0		0
Percent Heavy Vehicles	2	0	2		0	0		0
Percent Grade (%)		0				0		
lared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
_anes	0	0	0		0	0		0
Configuration		LR				1		
Delay, Queue Length, a	nd Level of Se					-		
Approach	Eastbound	Westbound	N	Northboun	d	S	Southbound	<u></u>
Novement	1	4	7	8	9	10	11	12
ane Configuration	•	LT	<u> </u>	LR	<del>                                     </del>	+	<del>                                     </del>	<del>  ''</del>
·		26		92	1	+		1
(veh/h)					+	+		
C (m) (veh/h)		1347		702	+	-		1
/c		0.02		0.13	1			1
5% queue length		0.06		0.45	1			
Control Delay (s/veh)		7.7		10.9				
.OS		Α		В				
Approach Delay (s/veh)				10.9				
- ` /		<del>.                                      </del>		В		_		

	I VV	O-WAY STOP (	ONTROL	. SUMMARY			
General Information	1		Site Info	ormation			
Analyst	Shilpa Ma		Intersection	on	N Little C	reek at Acc	rn I and
Agency/Co.		nternational	Jurisdiction		City of Do	nn Lan	
Date Performed	12/27/20 <sup>-</sup>		Analysis `		2016		
Analysis Time Period	Proposed Peak	l -100% Build - AM					
Project Description Ga		fic Study					
East/West Street: N Litt			_	th Street: Acorr	Lane		
ntersection Orientation:	East-West		Study Per	iod (hrs): 0.25			
/ehicle Volumes ar	nd Adjustme	nts					
Major Street		Eastbound			Westbou	nd	
Movement	1	2	3	4	5		6
	L	Т	R	L	Т		R
/olume (veh/h)	26	134			308		24
Peak-Hour Factor, PHF	0.79	0.80	0.78	0.60	0.82	- (	0.68
lourly Flow Rate, HFR veh/h)	32	167	0	0	375		35
Percent Heavy Vehicles	2			2			
Median Type				Individed			
RT Channelized			0				0
₋anes	0	1	0	0	1		0
Configuration	LT						
Jpstream Signal		0			0		
Minor Street		Northbound			Southboo	ınd	
Movement	7	8	9	10	11		12
	L	Т	R	L	Т		R
/olume (veh/h)				34			46
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.67	1.00	(	0.85
Hourly Flow Rate, HFR veh/h)	0	0	0	50	0		54
Percent Heavy Vehicles	2	0	2	2	0		3
Percent Grade (%)		0			0		
Flared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
_anes	0	0	0	0	0		0
Configuration					LR		
Delay, Queue Length, a	nd Level of Se	rvice		•	•		
Approach	Eastbound	Westbound	Nor	thbound	S	outhbound	
Movement	1	4	7	8 9	10	11	12
_ane Configuration	LT	<del>                                     </del>	•	<del>-                                     </del>	<del>                                     </del>	LR	<u> </u>
/ (veh/h)	32	<del>                                     </del>		<del></del>	+	104	
C (m) (veh/h)		<del>                                     </del>		+		528	
· / · /		<del>                                     </del>					-
//C	0.03	<del>                                     </del>				0.20	
95% queue length	0.09					0.73	
Control Delay (s/veh)	8.2					13.5	
_OS	Α					В	
Approach Delay (s/veh)						13.5	
Approach LOS						В	

	TW	O-WAY STOP C	ONTROL	SUMMARY			
General Information	1		Site Info	ormation			
Analyst	Shilpa Ma		Intersecti			reek at SR	1 NB
Agency/Co.		nternational			Ramp		
Date Performed	12/27/201	· ·	Jurisdiction		City of Dover, DE		
Analysis Time Period	Proposed Peak	l -100% Build - AM	Analysis	Year	2016		
Project Description Ga		fic Study					
East/West Street: N Litt				th Street: SR1	NB On-Ramp		
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.25			
Vehicle Volumes ar	nd Adjustme	nts					
Major Street		Eastbound			Westbou	nd	
Movement	1	2	3	4	5		6
1.1	L	T	R	LL	T 70		R
Volume (veh/h)	68	166	0.70	0.60	76		27
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.62	0.77	0.78	0.60	0.79	-	0.75
veh/h)	109	215	0	0	96		36
Percent Heavy Vehicles	2			2			
Median Type				Individed		<u>,                                      </u>	
RT Channelized			0				0
anes	0	1	0	0	1		0
Configuration	LT						TR
Jpstream Signal		0			0	<del>                                     </del>	
Minor Street		Northbound			Southbou	ınd	
Movement	7	8	9	10	11		12
	L	Т	R	L	T		R
Volume (veh/h)	0.00	1.00	0.40	0.74	1.00		0.50
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.71	1.00		0.59
Hourly Flow Rate, HFR veh/h)	0	0	0	0	0		0
Percent Heavy Vehicles	2	0	2	2	0		8
Percent Grade (%)		0			0	-	
-lared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration							
Delay, Queue Length, a	nd Level of Se	rvice					
Approach	Eastbound	Westbound	No	rthbound	S	outhbound	
Movement	1	4	7	8 9	10	11	12
_ane Configuration	LT						
/ (veh/h)	109						
C (m) (veh/h)	1453						
//c	0.08					<u> </u>	1
95% queue length	0.24						1
Control Delay (s/veh)	7.7		<del>-  </del>			<del>                                     </del>	<del>                                     </del>
LOS							$\vdash$
	Α						
Approach Delay (s/veh)							
Approach LOS							

	TW	O-WAY STOP C	ONTROL	SUMMARY			
General Information	1		Site Info	rmation			
Analyst	Shilpa Ma		Intersectio			reek at SR	1 SB
Agency/Co.		nternational			Ramp		
Date Performed	12/27/201	· ·	Jurisdictio		City of Dover, DE		
Analysis Time Period	Proposed Peak	l -100% Build - AM	Analysis Y	ear	2016		
Project Description Ga	arrison Oak Traf	fic Study					
East/West Street: N Litt	le Creek	•	North/Sout	h Street: SR1 S	B Off-Ramp		
ntersection Orientation:	East-West		Study Peri	od (hrs): 0.25			
/ehicle Volumes ar	nd Adjustme	nts					
Major Street		Eastbound			Westbou	nd	
Movement	1	2	3	4	5		6
7.1	L	T	R	<u> </u>	T 70		R
Volume (veh/h)	0.70	168	0.70	0.60	76		0.60
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.79	0.90	0.78	0.60	0.78		0.68
veh/h)	0	186	0	0	97		0
Percent Heavy Vehicles	2			2			
Median Type				sed curb		,	
RT Channelized			0				0
anes	0	1	0	0	1		0
Configuration		T			T		
Jpstream Signal		0			0		
Minor Street		Northbound			Southbou	ınd	
Movement	7	8	9	10	11		12
	L	T	R	L	T		R
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40	66 0.71	1.00		208 0.59
Hourly Flow Rate, HFR		1					
veh/h)	0	0	0	92	0		352
Percent Heavy Vehicles	2	0	2	2	0		3
Percent Grade (%)		0			0		
-lared Approach		N			N		
Storage		0			0		
RT Channelized			0				0
Lanes	0	0	0	0	0		0
Configuration					LR		
Delay, Queue Length, a	nd Level of Se	rvice					
Approach	Eastbound	Westbound	Nort	hbound	S	outhbound	
Movement	1	4	7	8 9	10	11	12
_ane Configuration						LR	
/ (veh/h)						444	
C (m) (veh/h)						896	
//c					1	0.50	
95% queue length				1		2.81	
Control Delay (s/veh)					†	12.9	
_OS					1	В	
Approach Delay (s/veh)				I	+	12.9	
Approach LOS					+	B	
appidadii EOO						ט	

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	TW	O-WAY STOP	CONTR	OL S	UMI	MARY				
General Information	n		Site I	nform	natio	on .				
Analyst	Shilpa Ma	allem	Interse	otion			White Oa	k at Carri	oon Ook	
Agency/Co.		nternational	Jurisdi				City of Do		on Oak	
Date Performed	12/27/20		Analys		ır		2016			
Analysis Time Period	Proposed Peak	d -100% Build - PM	, range	100						
Project Description Ga	arrison Oak Trai	ffic Study	•							
East/West Street: White							า Oak Drive	ļ		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25				
Vehicle Volumes ar	nd Adjustme	nts								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5		6	
	L	T	R			L	T		R	
Volume (veh/h)	34	66	0.70			0.00	63		7	
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.69	0.42	0.78			0.60	0.79		1.00	
(veh/h)	49	157	0			0	79		7	
Percent Heavy Vehicles	10					2				
Median Type			•	Undi	vided	1	1			
RT Channelized			0						0	
Lanes	0	1	0			0	1		0	
Configuration	LT								TR	
Upstream Signal		0					0			
Minor Street		Northbound					Southbou	ınd		
Movement	7	8	9			10	11		12	
	L	T	R			L	Т		R	
Volume (veh/h)	0.00	1.00	0.40			38	4.00		106	
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.60	1.00	0.40			1.00	1.00		0.92	
(veh/h)	0	0	0			38	0		115	
Percent Heavy Vehicles	2	0	2			2	0		10	
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0						0	
Lanes	0	0	0			0	0		0	
Configuration							LR			
Delay, Queue Length, a	nd Level of Se	rvice								
Approach	Eastbound	Westbound		Northb	ound		S	outhboun	d	
Movement	1	4	7	8		9	10	11	12	
Lane Configuration	LT							LR		
v (veh/h)	49							153		
C (m) (veh/h)	1461							850		
v/c	0.03							0.18		
95% queue length	0.10							0.65		
Control Delay (s/veh)	7.5							10.2		
LOS	Α							В		
Approach Delay (s/veh)								10.2	•	
Approach LOS								В		
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	ΤV	VO-WAY STOP	CONTR	OL SI	JMM	ARY				
General Information	n		Site I	nform	atio	n				
Analyst	Shilpa M		Interse	oction			White Oa	k at Ac	orn	Lane
Agency/Co.		International	Jurisdi							Lane
Date Performed	12/27/20		Analys	is Year	r		City of Dover, DE 2016			
Analysis Time Period	Propose Peak	d -100% Build - PN	1	70 1001						
Project Description Ga		affic Study								
East/West Street: White						Acorn I	Lane			
Intersection Orientation:	East-West		Study I	Period (	(hrs):	0.25				
Vehicle Volumes ar	nd Adjustm	ents								
Major Street		Eastbound					Westbou	ınd		
Movement	1	2	3			4	5			6
	L	Т	R			L	Т			R
Volume (veh/h)		85	55			24	137			
Peak-Hour Factor, PHF	1.00	1.00	0.78		(	0.60	0.69			1.00
Hourly Flow Rate, HFR (veh/h)	0	85	70			39	198			0
Percent Heavy Vehicles	0					2				
Median Type			1	Undivided			1			
RT Channelized			0							0
Lanes	0	1	0			0	1			0
Configuration			TR			LT				
Upstream Signal		0					0			
Minor Street		Northbound					Southbound			
Movement	7	8	9			10	11			12
	L	T	R			L	Т			R
Volume (veh/h)	57		13							
Peak-Hour Factor, PHF	0.60	1.00	0.40	)		1.00	1.00			1.00
Hourly Flow Rate, HFR (veh/h)	94	0	32			0	0			0
Percent Heavy Vehicles	2	0	2			0	0			0
Percent Grade (%)		0					0			
Flared Approach		N					N			
Storage		0					0			
RT Channelized			0							0
Lanes	0	0	0			0	0	$\neg \uparrow$		0
Configuration		LR						$\neg \uparrow$		
Delay, Queue Length, a	nd Level of S	ervice	•	-			•			
Approach	Eastbound	Westbound		Northbo	ound		5	Southbo	ound	
Movement	1	4	7	8		9	10	11		12
Lane Configuration		LT	-	LR	$\dashv$	-	1			<del></del>
v (veh/h)		39		126	;					
C (m) (veh/h)		1425		652						
v/c		0.03		0.19	_		1			
95% queue length		0.08		0.71			+	$\vdash$		<del>                                     </del>
		7.6					+	1		<del>                                     </del>
Control Delay (s/veh)				11.8	<del>'</del>		+	<del>                                     </del>		<u> </u>
LOS		Α		B	${\leftarrow}$		+	<u> </u>		
Approach Delay (s/veh)				11.8	5		1			
Approach LOS				В						

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	TW	O-WAY STOP	CONTR	OL SI	JMN	//ARY			
General Information	<u> </u>		Site I	nform	natio	n			
Analyst	Shilpa Ma	allem					IN 1 111 - 0		
Agency/Co.		nternational	Interse				N Little C		orn Lane
Date Performed	12/27/201		Analys	sis Yea	r		2016	iver, DE	
Analysis Time Period	Proposed Peak	l -100% Build - PN	1 Trianys	515 T C G	'		2070		
Project Description Ga		fic Study	•						
East/West Street: N Litt	le Creek		North/S	South S	Street	t: Acorn L	ane		
Intersection Orientation:	East-West		Study I	Period	(hrs)	: 0.25			
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound					Westbou	nd	
Movement	1	2	3			4	5		6
	L	Т	R	R		L	Т		R
Volume (veh/h)	54	334					171		28
Peak-Hour Factor, PHF	0.79	0.80	0.78			0.60	0.82		0.68
Hourly Flow Rate, HFR (veh/h)	68	417	0			0	208		41
Percent Heavy Vehicles	2					2			
Median Type				Undi	<u> vided</u>			- I	
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration	LT								TR
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	nd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)						39			25
Peak-Hour Factor, PHF	0.60	1.00	0.40			0.67	1.00		0.85
Hourly Flow Rate, HFR (veh/h)	0	0	0			58	0		29
Percent Heavy Vehicles	2	0	2			2	0		3
Percent Grade (%)		0					0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	nd Level of Se	rvice							
Approach	Eastbound	Westbound		Northbo	ound		S	outhboun	d
Movement	1	4	7	8		9	10	11	12
Lane Configuration	LT							LR	
v (veh/h)	68						<u> </u>	87	1
C (m) (veh/h)	1317							426	+
v/c	0.05							0.20	+
	0.05							0.76	+
95% queue length									
Control Delay (s/veh)	7.9							15.6	+
LOS	Α							C	
Approach Delay (s/veh)								15.6	
Approach LOS								С	

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	TW	O-WAY STOP	CONTR	OL SI	JMMARY				
General Information	<u> </u>		Site I	nform	ation				
Analyst	Shilpa Ma	allem	1			N Little C	reek at S	R 1 NB	
Agency/Co.		nternational	Interse			Ramp			
Date Performed	12/27/201		Jurisdi			City of Do	over, DE		
Analysis Time Period	Proposed Peak	l -100% Build - PM	Analysis Year			2016	2016		
Project Description Ga		fic Study	•						
East/West Street: N Litt						NB On-Ramp			
Intersection Orientation:	East-West		Study I	Period	(hrs): 0.25				
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound		Westbound					
Movement	1	2	3		4	5		6	
	L	T 105	R		L	T 101		R	
Volume (veh/h) Peak-Hour Factor, PHF	189	135	0.70		0.60	124		71	
Hourly Flow Rate, HFR	0.62 304	0.77 175	0.78 0	'	0.60 0	0.79 156		0.75 94	
(veh/h)						_			
Percent Heavy Vehicles	2			Undiv	2 vided				
Median Type RT Channelized		<u> </u>	0	Unall	nueu	<del></del>	<u> </u>	0	
	0	1	0		0	1		0	
Lanes Configuration	LT	/	0		0			TR	
Upstream Signal		0				0		IK	
•	<del> </del>					Southbou			
Minor Street  Movement	7	Northbound 8	9		10	Southbot 11	una 1	12	
iviovement	L	T	R		l			R	
Volume (veh/h)	+	<del>-</del>	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			<del>-   '</del>	-	11	
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.71	1.00		0.59	
Hourly Flow Rate, HFR (veh/h)	0	0	0.70		0	0		0	
Percent Heavy Vehicles	2	0	2		2	0		8	
Percent Grade (%)	_	0		$\overline{}$		0			
Flared Approach						N N			
Storage		0		_		0			
RT Channelized			0					0	
Lanes	0	0	0		0	0	<del></del>	0	
Configuration	<del>-</del>	<del>                                     </del>	<del>l </del>	$\dashv$		<del>-                                    </del>	-+		
Delay, Queue Length, a	nd Level of So	rvice	<u> </u>						
Approach	Eastbound	Westbound		Northbo	ound		Southbour	nd	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LT	7		<del>                                     </del>	3	10	''	12	
	304	<del>                                     </del>						+	
v (veh/h)							1		
C (m) (veh/h)	1316								
V/C	0.23						-	+	
95% queue length	0.89						ļ		
Control Delay (s/veh)	8.6								
LOS	Α								
Approach Delay (s/veh)									
Approach LOS									

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	TW	O-WAY STOP	CONTR	OL SI	JMN	//ARY			
General Information	n		Site I	nform	natio	n			
Analyst	Shilpa Ma	allem	Intoro	ati a sa			N Little C	reek at SR	1 SB
Agency/Co.		nternational	Interse				Ramp		
Date Performed	12/27/201		Jurisdi				City of Do	ver, DE	
Analysis Time Period	Proposed Peak	l -100% Build - PN	// Analys	sis Yea	r		2016		
	arrison Oak Traf	fic Study							
East/West Street: N Litt						t: SR1 SB	Off-Ramp		
Intersection Orientation:	East-West		Study F	Study Period (hrs): 0.25					
Vehicle Volumes ar	nd Adjustme	nts							
Major Street		Eastbound			Westbound				
Movement	1	2	3			4	5		6
	L	Т	R			L	Т		R
Volume (veh/h)	0.70	301	0.70			0.00	124		0.00
Peak-Hour Factor, PHF	0.79	0.90	0.78			0.60	0.78		0.68
Hourly Flow Rate, HFR (veh/h)	0	334	0			0	158		0
Percent Heavy Vehicles	2					2			
Median Type				Undi	vided	<u> </u>	1		
RT Channelized			0						0
Lanes	0	1	0			0	1		0
Configuration		T					T		
Upstream Signal		0					0		
Minor Street		Northbound					Southbou	ınd	
Movement	7	8	9			10	11		12
	L	Т	R			L	Т		R
Volume (veh/h)	0.00	1.00	0.40			31	4.00		102
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.60	1.00	0.40			0.71	1.00		0.59
(veh/h)	0	0	0			43	0		172
Percent Heavy Vehicles	2	0	2			2	0		3
Percent Grade (%)		0	1				0		
Flared Approach		N					N		
Storage		0					0		
RT Channelized			0						0
Lanes	0	0	0			0	0		0
Configuration							LR		
Delay, Queue Length, a	ind Level of Se	rvice							
Approach	Eastbound	Westbound	Ī	Northb <sub>e</sub>	ound		S	outhbound	d
Movement	1	4	7	8		9	10	11	12
Lane Configuration								LR	
v (veh/h)								215	
C (m) (veh/h)								783	1
v/c								0.27	<del>                                     </del>
95% queue length								1.12	<del>                                     </del>
Control Delay (s/veh)								11.3	<del>                                     </del>
, , , ,				<del>                                     </del>					<del>                                     </del>
LOS								B	
Approach Delay (s/veh)								11.3	
Approach LOS								В	
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General Information			Site In	formatio	n			
Analyst	Shilpa Ma	ıllem	¬1					
Agency/Co.		nternational	Intersed				k at Garriso	on Oak
Date Performed	12/27/201		Jurisdio Analysi			City of Do	over, DE	
Analysis Time Period	Prop_100 Peak	% Build_LDS_AM	Allalysi	s real		2010		
Project Description Gai		ic Study						
East/West Street: Whote						n Oak Drive		
ntersection Orientation:			Study P	eriod (hrs)	: 0.25			
Vehicle Volumes and	<u>Adjustments</u>			T W II				
Major Street	1	Eastbound			4	Westbou	nd I	•
Movement	1 1	2 T	3 R		4 I	5 T		6 R
Volume (veh/h)	148	33	IX.		L	229		18
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00
Hourly Flow Rate, HFR veh/h)	214	78	0		0	289		18
Percent Heavy Vehicles	10				2			
Median Type				Undivided	d	<u>u</u>	<u>!</u>	
RT Channelized			0					0
_anes	0	1	0		0	1		0
Configuration	LT	1					TF	
Jpstream Signal		0				0		
Minor Street		Northbound	orthbound				ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)					7	1.00		30
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00			0.92
Hourly Flow Rate, HFR veh/h)	0	0	0		7	0	32	
Percent Heavy Vehicles	2	0	2		2	0		0
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized	-		0					0
Lanes	0	0	0		0	0		0
Configuration	1	<u> </u>				LR		
Delay, Queue Length, a		1		ا جالم ا		1 -	N= 1.41-1- :	1
Approach	Eastbound	Westbound		Northbound	1		Southbound	_
Movement	1	4	7	8	9	10	11	12
_ane Configuration	LT						LR	1
/ (veh/h)	214						39	
C (m) (veh/h)	1210						582	
//c	0.18						0.07	
95% queue length	0.64						0.21	
Control Delay (s/veh)	8.6						11.6	
_OS	Α						В	1
Approach Delay (s/veh)							11.6	
Approach LOS						В		

General Information			Site In	formatio	n					
Analyst	Shilpa Ma	allem	<b>-1</b>			h				
Agency/Co.		nternational		Intersection Jurisdiction			White Oak at Acorn Lane City of Dover, DE			
Date Performed	12/27/201	16	-	is Year		2016	ver, DE			
Analysis Time Period	Prop_100 Peak	% Build_LDS_ AN	1 Allalys							
Project Description Ga	rrison Oak Traffi	ic Study	•							
ast/West Street: White					et: <i>Acorn l</i>	Lane				
ntersection Orientation:	East-West		Study F	eriod (hrs	): 0.25					
/ehicle Volumes and	<b>Adjustments</b>									
Major Street		Eastbound				Westbou	nd			
Movement	1	2	3		4	5		6		
/ala.a. ()a.b./b.)	L	T 164	R		L	T 240		R		
/olume (veh/h) Peak-Hour Factor, PHF	1.00	161 0.75	25 0.78		<i>41</i> 0.60	218 0.69		1.00		
Hourly Flow Rate, HFR										
veh/h)	0	214	32		68	315		0		
Percent Heavy Vehicles	0				2					
Median Type			<u> </u>	Undivide	a	1	ı			
RT Channelized	1		0			1		0		
anes	0	1	0		0	1		0		
Configuration			TR		LT					
Jpstream Signal		0				0				
Minor Street		Northbound				Southbou	ınd			
Movement	7	8	9		10	11		12		
	L	Т	R			Т		R		
/olume (veh/h)	29		20			<b>_</b>				
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.40 1.		1.00		1.00		
Hourly Flow Rate, HFR veh/h)	48	0	49		0	0				
Percent Heavy Vehicles	2	0	2		0	0		0		
Percent Grade (%)		0				0				
Flared Approach		Ν				N				
Storage		0				0				
RT Channelized			0					0		
₋anes	0	0	0		0	0		0		
Configuration		LR								
Delay, Queue Length, a	nd Level of Ser	vice								
Approach	Eastbound	Westbound	ı	Northboun	d	S	outhbound	<u> </u>		
Movement	1	4	7	8	9	10	11	12		
ane Configuration		LT		LR						
/ (veh/h)		68		97						
C (m) (veh/h)		1320		533						
ı/c		0.05		0.18						
95% queue length		0.16		0.66				1		
Control Delay (s/veh)		7.9		13.3	1			+		
OS		A A		B				+		
Approach Delay (s/veh)				13.3	1					
Approach LOS			13.3 B			+				

General Information			Site In	formatio	n			
Analyst	Shilpa Ma	allem	<b>-1</b>					
Agency/Co.		nternational	Intersed				reek at Acc	rn Lane
Date Performed	12/27/201		<ul><li>Jurisdio</li><li>Analysi</li></ul>			City of Do	ver, DE	
Analysis Time Period	Prop_100 Peak	% Build_LDS_AM	Allalysi	s real		2010		
	rrison Oak Traffi	ic Study						
East/West Street: N Little					t: Acorn L	.ane		
ntersection Orientation:			Study P	eriod (hrs)	: 0.25			
Vehicle Volumes and	<u>Adjustments</u>							
Major Street		Eastbound				Westbou	nd	
Movement	1 1	2 T	3 R		4 I	5 T		6 R
Volume (veh/h)	26	134	K		<u>L</u>	308		26
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82		0.68
Hourly Flow Rate, HFR	32	167	0		0	375		38
Percent Heavy Vehicles	2				2			
Median Type		-		Undivided	d	<u>.                                      </u>	<u> </u>	
RT Channelized	1		0					0
_anes	0	1	0		0	1		0
Configuration	LT						TF	
Jpstream Signal		0				0		
Minor Street		Northbound So					ınd	
Movement	7	8	9		10	11	1	12
	L	Т	R		L	Т		R
/olume (veh/h)					45			60
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00		0.85
Hourly Flow Rate, HFR veh/h)	0	0	0		67	0	70	
Percent Heavy Vehicles	2	0	2		2	0		3
Percent Grade (%)		0				0		
-lared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration						LR		
Delay, Queue Length, a	nd Level of Ser	vice						
Approach	Eastbound	Westbound	N	Northbound	<u></u>	S	Southbound	l
Movement	1	4	7	8	9	10	11	12
_ane Configuration	LT						LR	
v (veh/h)	32						137	ĺ
C (m) (veh/h)	1146						525	
//c	0.03						0.26	
95% queue length	0.09						1.04	
Control Delay (s/veh)	8.2					1	14.3	
LOS	Α					1	В	1
Approach Delay (s/veh)							14.3	-
Approach LOS			+			В		

General Information			Site In	formatio					
Analyst	Shilpa Ma	ıllem	1			N Little C	reek at SR	1 NR	
Agency/Co.		nternational	Interse	ction		Ramp			
Date Performed	12/27/201	6		Jurisdiction			City of Dover, DE		
Analysis Time Period	Prop_100 Peak	% Build_LDS_AM	Analysi	s Year		2016			
	rrison Oak Traffi	ic Study							
East/West Street: N Littl						3 On-Ramp			
ntersection Orientation:			Study P	eriod (hrs)	: 0.25				
Vehicle Volumes and	Adjustments								
Major Street Movement	1	Eastbound 2	3		4	Westbou 5	nd I	6	
vioveilleilt	<u> </u>	T	R		<del>-4</del>	T		R	
Volume (veh/h)	71	174				76		27	
Peak-Hour Factor, PHF	0.62	0.77	0.78		0.60	0.79		0.75	
Hourly Flow Rate, HFR (veh/h)	114	225	0		0	96		36	
Percent Heavy Vehicles	2				2				
Median Type				Undivided					
RT Channelized			0					0	
_anes	0	1	0		0	1		0	
Configuration	LT							TR	
Jpstream Signal		0				0			
Minor Street		Northbound				Southbou	ınd		
Movement	7	8	9		10	11		12	
/-l /l-/l-\	L	T	R		L	Т		R	
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40 0.71		1.00		0.59		
Hourly Flow Rate, HFR		1 1							
(veh/h)	0	0	0		0	0		0	
Percent Heavy Vehicles	2	0	2		2	0		8	
Percent Grade (%)		0				0			
Flared Approach		N				N			
Storage		0				0			
RT Channelized			0					0	
Lanes	0	0	0		0	0		0	
Configuration									
Delay, Queue Length, a									
Approach	Eastbound	Westbound	r	lorthbound			outhboun		
Movement	1	4	7	8	9	10	11	12	
_ane Configuration	LT								
v (veh/h)	114								
C (m) (veh/h)	1453								
//c	0.08								
95% queue length	0.26								
Control Delay (s/veh)	7.7							1	
OS	A				<del>                                     </del>				
Approach Delay (s/veh)									
Approach LOS									

General Information			Site In	formatio	n			
Analyst	Shilpa Ma	llem	1			N Little C	reek at SR	1 SB
Agency/Co.		nternational	Interse	ction		Ramp	con at on	7 00
Date Performed	12/27/201	6	Jurisdio			City of Do	ver, DE	
Analysis Time Period	Prop_100 Peak	% Build _LDS_AM	Analysi	is Year		2016		
	rison Oak Traffi	c Study						
East/West Street: N Little			North/South Street: SR1 SB Off-Ramp Study Period (hrs): 0.25					
ntersection Orientation:			Study P	eriod (hrs)	: 0.25			
Vehicle Volumes and	Adjustments					111 (1		
Major Street Movement	1	Eastbound 2	3		4	Westbou 5	nd I	6
viovement	<del>+ ;</del>	T	R			T		R
Volume (veh/h)	_	179	- 11			76		- 1
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78		0.68
Hourly Flow Rate, HFR veh/h)	0	198	0		0	97		0
Percent Heavy Vehicles	2				2			
Median Type				Raised cui	rb			
RT Channelized			0					0
_anes	0	1	0		0	1		0
Configuration		T				Т		
Jpstream Signal		0				0		
Minor Street		Northbound				Southbou	ınd	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40 66 0.71		1.00	<del></del>	210 0.59	
Hourly Flow Rate, HFR								
veh/h)	0	0	0		92	0		355
Percent Heavy Vehicles	2	0	2		2	0		3
Percent Grade (%)		0				0		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration						LR		
Delay, Queue Length, ar								
Approach	Eastbound	Westbound	N	Northbound	t e	S	Southbound	
Vovement	1	4	7	8	9	10	11	12
_ane Configuration							LR	
/ (veh/h)							447	
C (m) (veh/h)							894	1
//c							0.50	1
95% queue length							2.85	+
						+		
Control Delay (s/veh)							13.0	
_OS						<u> </u>	В	
Approach Delay (s/veh)							13.0	
Approach LOS							В	

General Information			Site In	formatio	n				
Analyst	Shilpa Ma	allem	1						
Agency/Co.		nternational	Interse				k at Garriso	on Oak	
Date Performed	12/27/201		<ul><li>Jurisdio</li><li>Analysi</li></ul>			City of Dover, DE 2016			
Analysis Time Period	Prop_100 Peak	% Build_LDS_PM	Arialysi	s real		2010			
Project Description Gai		ic Study							
East/West Street: White						n Oak Drive			
ntersection Orientation:			Study P	eriod (hrs)	: 0.25				
Vehicle Volumes and	<u>Adjustments</u>								
Major Street	4	Eastbound			4	Westbou	nd I		
Movement	1	2 T	3 R		4 I	5 T		6 R	
Volume (veh/h)	35	227	Γ		L	63		8	
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00	
Hourly Flow Rate, HFR veh/h)	50	540	0		0	79		8	
Percent Heavy Vehicles	10				2				
Median Type				Undivided	d	<u> </u>	<u> </u>		
RT Channelized			0					0	
_anes	0	1	0		0	1		0	
Configuration	LT						TF		
Jpstream Signal		0				0			
Minor Street		Northbound				Southbou	ınd		
Movement	7	8	9		10	11		12	
	L	T	R		L	Т		R	
/olume (veh/h)					40			116	
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		0.92	
Hourly Flow Rate, HFR	0	0	0		40	0	126		
Percent Heavy Vehicles	2	0	2		2	0		10	
Percent Grade (%)		0				0			
Flared Approach		N				N			
Storage		0				0			
RT Channelized			0					0	
Lanes	0	0	0		0	0		0	
Configuration	1					LR			
Delay, Queue Length, ar		· · · · · · · · · · · · · · · · · · ·		ا جالم ا		1 -	\4I-I	1	
Approach	Eastbound	Westbound		Northbound		+	Southbound		
Movement	1	4	7	8	9	10	11	12	
_ane Configuration	LT						LR	1	
/ (veh/h)	50						166		
C (m) (veh/h)	1460						700		
//c	0.03						0.24		
95% queue length	0.11						0.92		
Control Delay (s/veh)	7.6						11.7	1	
_OS	Α						В	<del>                                     </del>	
Approach Delay (s/veh)							11.7		
Approach LOS			11.7 B						

General Information			Site In	formatio	n			
Analyst	Shilpa Ma	ıllem	<b>-1</b>		••	•		
Agency/Co.		nternational	Interse			White Oak at Acorn Lane		
Date Performed	12/27/201		Jurisdi	ction is Year		City of Dover, DE 2016		
Analysis Time Period	Prop_100 Peak	% Build_LDSPM	Analys	is real		2016		
Project Description Gar		ic Study						
East/West Street: White					et: Acorn I	Lane		
ntersection Orientation:	East-West		Study F	Period (hrs	): 0.25			
/ehicle Volumes and	Adjustments							
Major Street	<u> </u>	Eastbound				Westbou	nd	
Movement	1 1	2 T	3		4	5		6
/olume (veh/h)	L	225	R 55		L 27	T 152		R
Peak-Hour Factor, PHF	1.00	1.00	0.78		0.60	0.69		1.00
Hourly Flow Rate, HFR veh/h)	0	225	70		44	220		0
Percent Heavy Vehicles	0				2			
Median Type	1		1	Undivide		1	<u> </u>	
RT Channelized	†		0					0
anes	0	1	0		0	1		0
Configuration	<del>                                     </del>	,	TR	_	LT	<del>- '</del> -		
Jpstream Signal	+	0	111			0		
Minor Street	<del> </del>	Northbound				Southbou	ınd	
Movement	7	8	9		10	11	ind	12
VIOVEITICITE	<del>† '</del>	T	R		L	T		R
Volume (veh/h)	57	· ·	34			<del>                                     </del>		. `
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.40 1.00		1.00		1.00
Hourly Flow Rate, HFR veh/h)	94	0	84		0	0		0
Percent Heavy Vehicles	2	0	2		0	0		0
Percent Grade (%)		0				0		
-lared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
_anes	0	0	0		0	0		0
Configuration		LR						
Delay, Queue Length, ar	nd Level of Ser	vice						
Approach	Eastbound	Westbound	1	Northboun	 d	S	outhboun	d
Movement	1	4	7	8	9	10	11	12
₋ane Configuration		LT		LR				
/ (veh/h)		44		178				
C (m) (veh/h)		1266		576				
//c		0.03		0.31				
95% queue length		0.11		1.31				
Control Delay (s/veh)		7.9		14.0	1			
_OS		Α		В	1			1
Approach Delay (s/veh)				14.0				
Approach LOS			В			1		

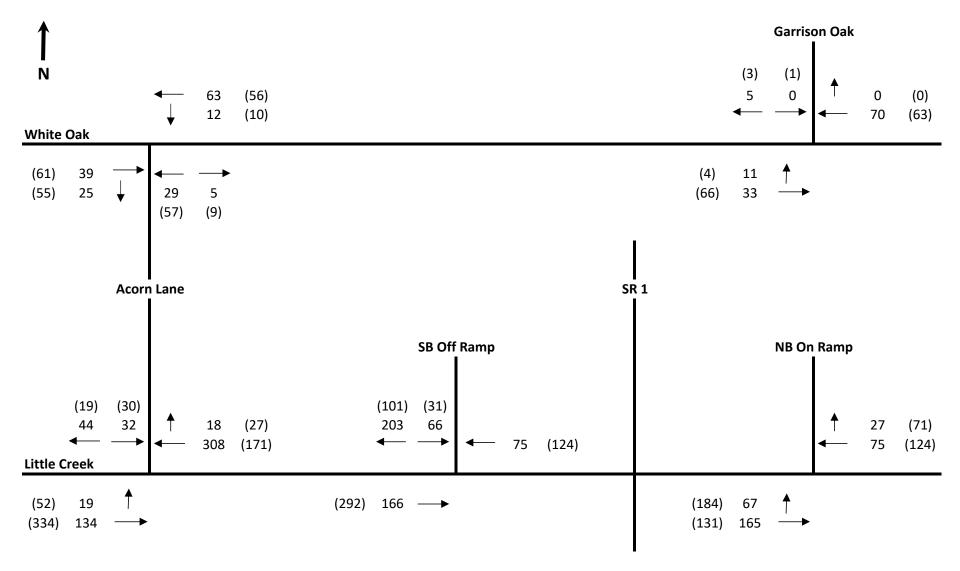
General Information			Site In	formatio	n				
Analyst	Shilpa Ma	llem	┪						
Agency/Co.		nternational	Interse				reek at Acc	orn Lane	
Date Performed	12/27/201		Jurisdic			City of Dover, DE 2016			
Analysis Time Period	Prop_100 Peak	% Build_LDS_PM	Analysi	s rear		2016			
Project Description Ga	rrison Oak Traffi	ic Study	•						
East/West Street: N Littl					t: Acorn L	.ane			
ntersection Orientation:	East-West		Study P	eriod (hrs)	: 0.25				
Vehicle Volumes and	Adjustments								
Major Street		Eastbound				Westbou	nd		
Movement	1	2	3		4	5		6	
	L	T	R		L	T 474		R	
Volume (veh/h) Peak-Hour Factor, PHF	68 0.79	334	0.78		0.60	171 0.82	_	35	
Hourly Flow Rate, HFR	86	0.80 417	0.78		0.00	208		0.68 51	
Percent Heavy Vehicles	2				2				
Median Type				Undivided		1			
RT Channelized	1	1							
_anes	0	1	0		0	1		0	
Configuration	LT	,	- 0					TR	
Upstream Signal		0				0	_	11	
Minor Street		Northbound	Southbou				ınd		
Movement	7	Northbound 8	9		10	Southbot 11	ina	12	
viovement	1 1	T	R		L	T T	_	R	
Volume (veh/h)	<del>                                     </del>	<del>'</del>			42			25	
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.40 0.67		1.00		0.85	
Hourly Flow Rate, HFR veh/h)	0	0	0		62	0	29		
Percent Heavy Vehicles	2	0	2		2	0		3	
Percent Grade (%)		0				0			
Flared Approach		N				N			
Storage		0				0			
RT Channelized			0					0	
Lanes	0	0	0		0	0		0	
Configuration						LR			
Delay, Queue Length, a	nd Level of Ser	vice							
Approach	Eastbound	Westbound	١	Northbound	t	S	outhbound	I	
Movement	1	4	7	8	9	10	11	12	
_ane Configuration	LT						LR		
/ (veh/h)	86						91		
C (m) (veh/h)	1306						396		
//c	0.07						0.23		
95% queue length	0.21						0.88		
Control Delay (s/veh)	8.0	<del>                                     </del>					16.8		
OS	A					1	70.0		
Approach Delay (s/veh)							16.8	1	
Approach LOS									
πρρισαστί ΕΟΟ						С			

General Information			Site In	formatio	n				
Analyst	Shilpa Ma	allem	1			N I ittle C	reek at SR	1 NR	
Agency/Co.		nternational	Interse	ction		Ramp			
Date Performed	12/27/201		Jurisdi	ction		City of Dover, DE			
Analysis Time Period	Prop_100 Peak	% Build_LDS_PM	Analys	is Year		2016			
	rrison Oak Traffi	ic Study							
East/West Street: N Littl			North/South Street: SR1 NB On-Ramp Study Period (hrs): 0.25						
ntersection Orientation:			Study F	Period (hrs)	): 0.25				
Vehicle Volumes and	Adjustments					) A / ()			
Major Street Movement	1	Eastbound 2	3		4	Westbou 5	nd I	6	
viovement	<del> </del>	T	R		<del>4</del> 	T 5		R	
Volume (veh/h)	192	135	- 11			126		71	
Peak-Hour Factor, PHF	0.62	0.77	0.78		0.60	0.79		0.75	
Hourly Flow Rate, HFR veh/h)	309	175	0		0	159		94	
Percent Heavy Vehicles	2				2				
Median Type				Undivide	d				
RT Channelized			0					0	
_anes	0	1	0		0	1		0	
Configuration	LT						TF		
Jpstream Signal		0				0			
Minor Street		Northbound				Southbou	ınd		
Movement	7	8	9		10	11		12	
	L	Т	R		L	T		R	
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40		0.71	1.00		0.59	
Hourly Flow Rate, HFR									
veh/h)	0	0	0		0	0		0	
Percent Heavy Vehicles	2	0	2		2	0		8	
Percent Grade (%)		0				0			
Flared Approach		Ν				N			
Storage		0				0			
RT Channelized			0					0	
_anes	0	0	0		0	0		0	
Configuration						<u> </u>			
Delay, Queue Length, a		T T							
Approach	Eastbound	Westbound		Northbound	b	S	outhbound	<u></u>	
Movement	1	4	7	8	9	10	11	12	
_ane Configuration	LT								
/ (veh/h)	309								
C (m) (veh/h)	1312				1	1		1	
//c	0.24	<del>                                     </del>						+	
95% queue length	0.92				<del>                                     </del>			1	
								+	
Control Delay (s/veh)	8.6								
LOS	Α								
Approach Delay (s/veh)									
Approach LOS				. <u>.                                   </u>			<u> </u>		

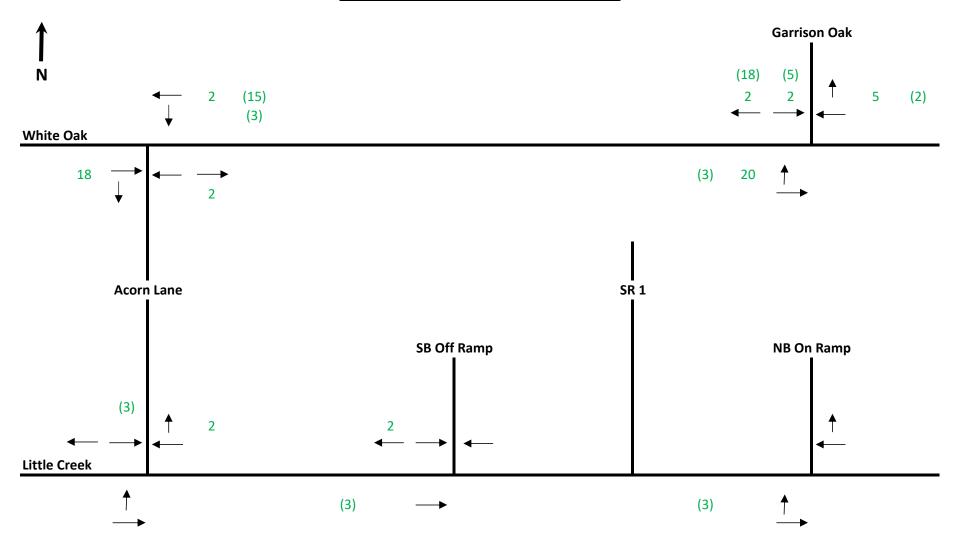
General Information				Site Information					
Analyst Shilpa Mallem						N Little Creek at SR 1 SB			
Agency/Co.	T.Y. Lin International		Intersection			Ramp			
Date Performed	e Performed 12/27/2016		Jurisdiction			City of Dover, DE			
Analysis Time Period	Prop_100 Peak	Prop_100% Build_LDS_PM Peak		Analysis Year			2016		
	rrison Oak Traffi	c Study							
East/West Street: N Little						3 Off-Ramp			
ntersection Orientation:			Study F	eriod (hrs)	): 0.25				
/ehicle Volumes and	Adjustments					<b>11</b> (1			
Major Street Movement	Eastbound 1 2		3 4		Westbound 5 6				
NOVEITHEITH	L	T	R		<u>4</u> 	T		R	
/olume (veh/h)		304	- 11			126		11	
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78		0.68	
lourly Flow Rate, HFR veh/h)	0	337	0		0	161		0	
Percent Heavy Vehicles	2				2				
Median Type	Undivided								
RT Channelized			0					0	
anes	0	1	0		0	1		0	
Configuration		Т				Т			
Jpstream Signal		0				0			
Minor Street					Southbound				
Movement	7	8	9		10	11		12	
	L	Т	R		L	Т		R	
/olume (veh/h)			31			+		107	
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.71	1.00 0.		0.59	
Hourly Flow Rate, HFR veh/h)	0	0	0		43	1		181	
Percent Heavy Vehicles	2	0	2		2 0			3	
Percent Grade (%)		0				0			
lared Approach		N			N				
Storage		0	_			0			
RT Channelized			0			<del>                                     </del>		0	
anes	0	0	0		0	0		0	
Configuration	<u> </u>					LR			
Delay, Queue Length, a									
Approach	Eastbound	Westbound		Northbound	<u> </u>	Southb			
Movement	1	4	7	8	9	10	11	12	
₋ane Configuration							LR		
(veh/h)							224		
C (m) (veh/h)							782	1	
//c		<del>                                     </del>			<del> </del>		0.29	1	
					+		1.18	+	
95% queue length					-				
Control Delay (s/veh)							11.4		
_OS							В		
Approach Delay (s/veh)						11.4			
Approach LOS	ach LOS					В			

# APPENDIX B TRIP DISTRIBUTION

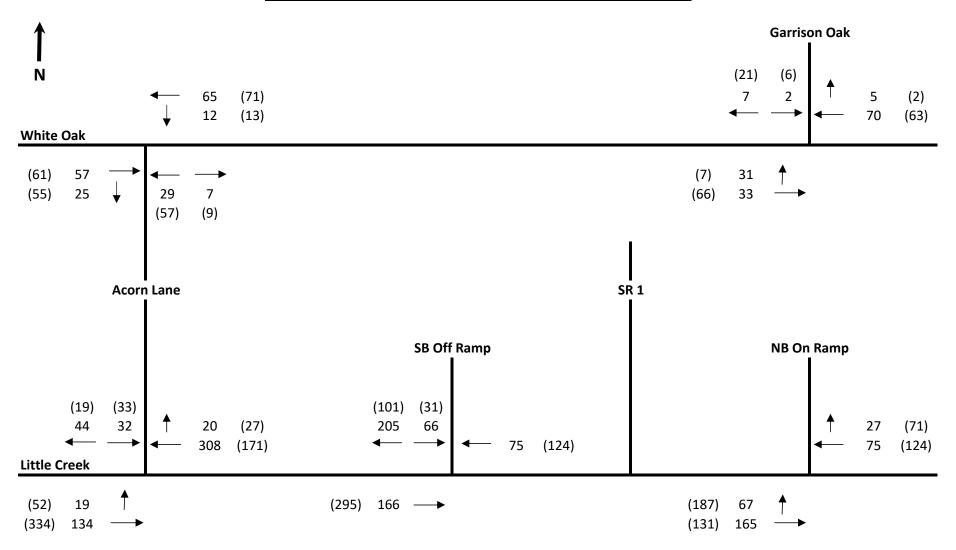
## **Existing Traffic Conditions**



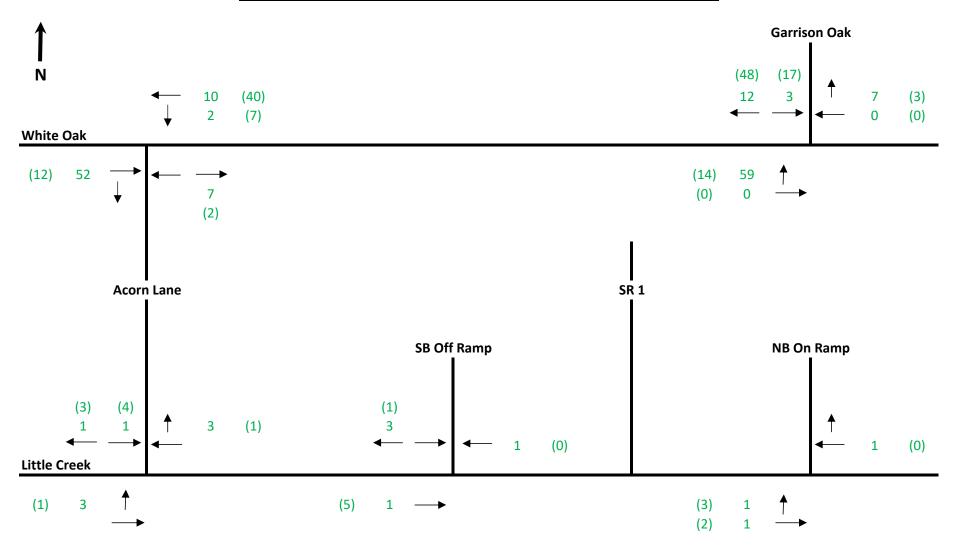
# **Proposed Development: Advantech**



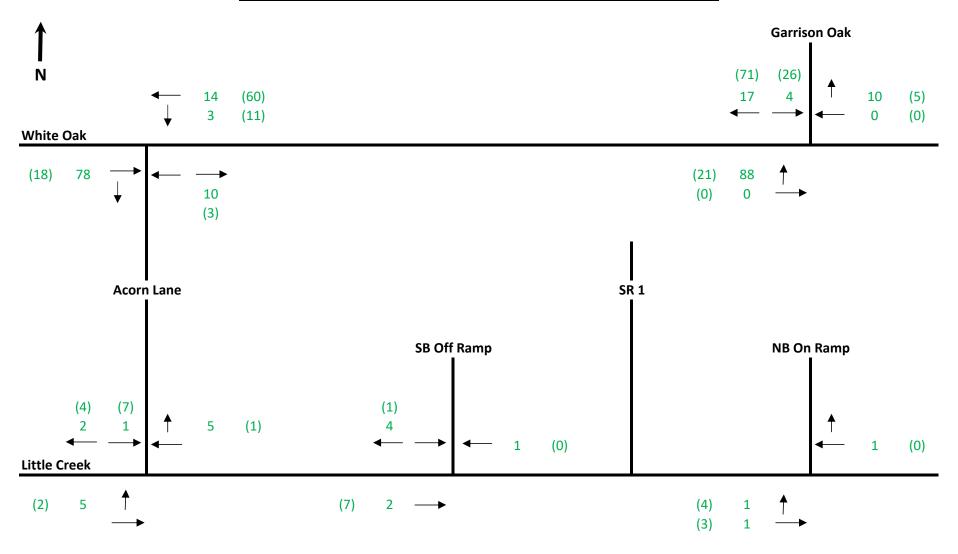
### **Study Baseline Conditions: Existing Traffic + Advantech**



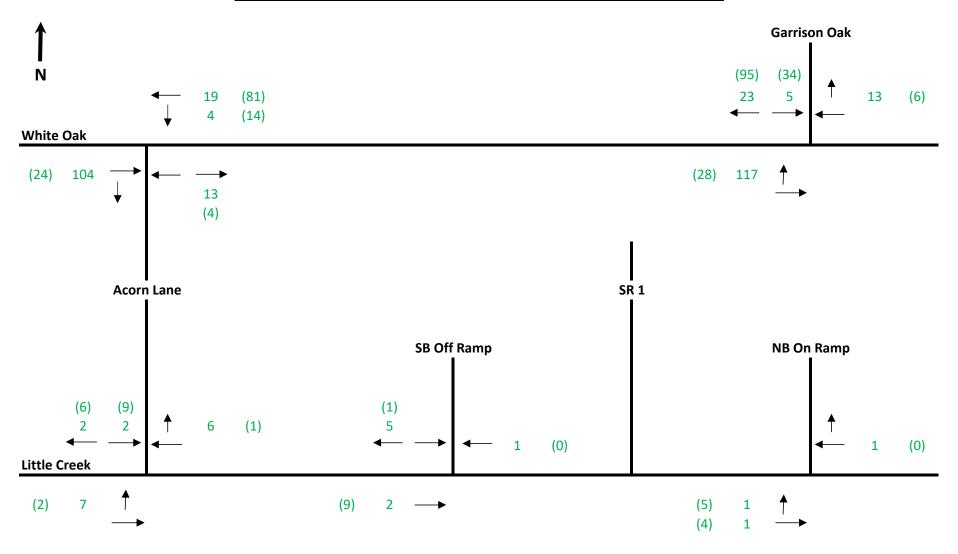
# **Garrison Oak Trip Generation and Distribution: 50% Build Out**



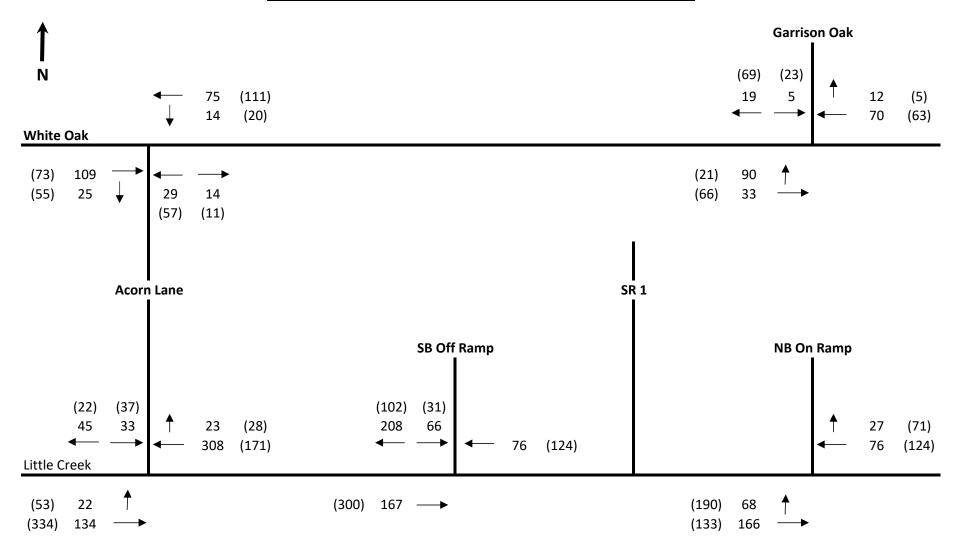
# **Garrison Oak Trip Generation and Distribution: 75% Build Out**



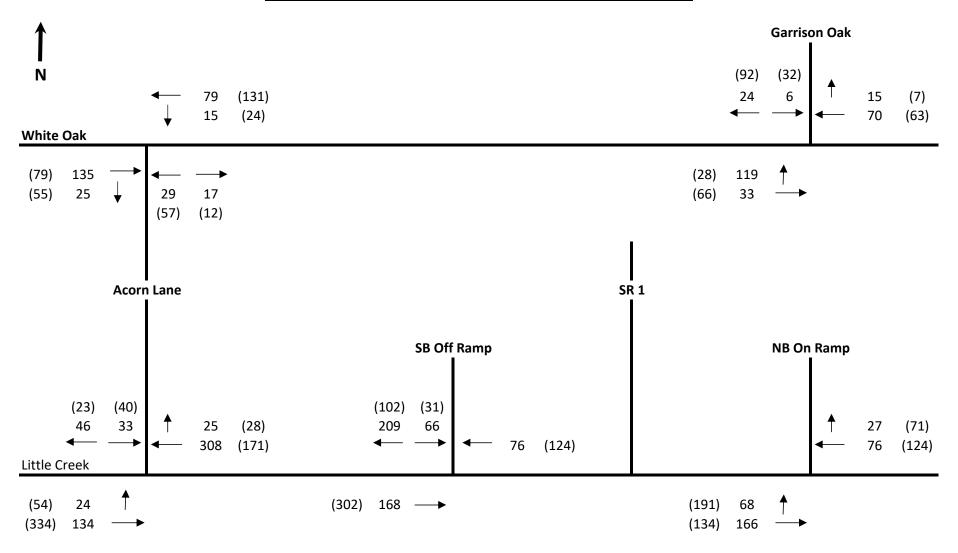
# **Garrison Oak Trip Generation and Distribution: 100% Build Out**



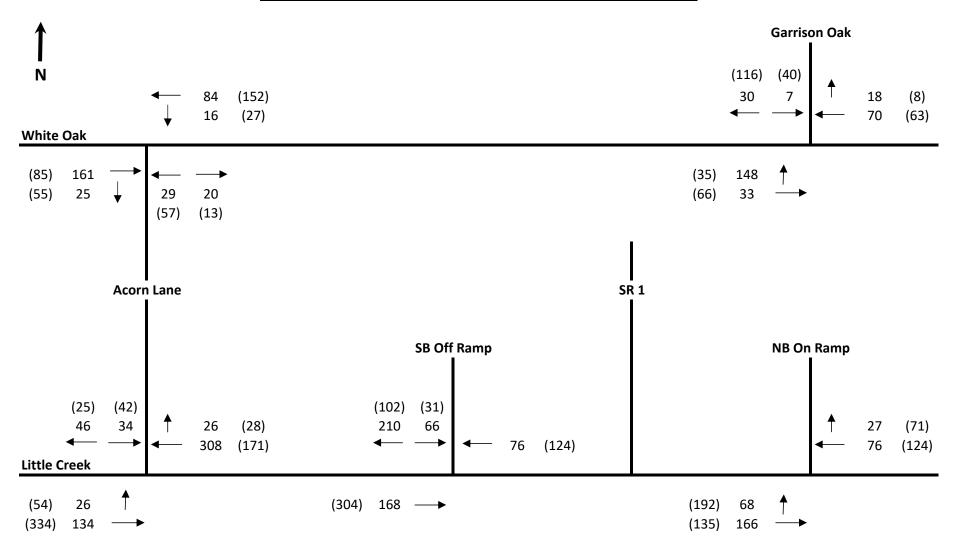
### **Future Traffic Conditions - with 50% Proposed Buildout**



### **Future Traffic Conditions - with 75% Proposed Buildout**



### **Future Traffic Conditions - with 100% Proposed Buildout**



**Trip Generation and Distribution: L.D. Shank Property** 

