COUNCIL COMMITTEE OF THE WHOLE

AGENDA



APRIL 24, 2018 - 6:00 P.M.

CITY HALL COUNCIL CHAMBERS, 15 LOOCKERMAN PLAZA, DOVER, DELAWARE

PUBLIC COMMENTS ARE WELCOMED ON ANY ITEM AND WILL BE PERMITTED AT APPROPRIATE TIMES. WHEN POSSIBLE, PLEASE NOTIFY THE CITY CLERK (736-7008 OR E-MAIL AT <u>CITYCLERK@dover.de.us</u>) should you wish to be RECOGNIZED.

LEGISLATIVE, FINANCE, AND ADMINISTRATION COMMITTEE

AGENDA ADDITIONS/DELETIONS

1. DOWNTOWN DOVER BUSINESS IMPROVEMENT DISTRICT (BID) BUDGET AND ASSESSMENT (TAX) RATES FOR FISCAL YEAR 2018-2019

(STAFF RECOMMENDS APPROVAL OF THE PROPOSED BUDGET AND ASSESSMENT (TAX) RATES FOR FISCAL YEAR 2018-19, AS PRESENTED)

2. ADJOURNMENT OF LEGISLATIVE, FINANCE, AND ADMINISTRATION COMMITTEE MEETING

SAFETY ADVISORY AND TRANSPORTATION COMMITTEE

AGENDA ADDITIONS/DELETIONS

- 1. <u>Delaware Department of Transportation (DelDOT) Project Updates</u> A. Senator Bikeway
 - **B.** BRADFORD STREET STREETSCAPE
- 2. PRESENTATION BY THE DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION (MPO) DOVER CAPITAL GATEWAY PLAN AND DESIGN BOOK
- 3. REQUEST FOR LETTER DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION (MPO) SUPPORT FOR A SERVICE ROAD TO THE GARRISON TECHNOLOGY PARK AND ADEQUATE A FULL CONNECTION WITH ROUTE 1 (MR. ANDERSON)
- **4.** UPDATE SAFETY ISSUES AT THE LIBRARY (MR. LINDELL) (THIS ITEM WAS DEFERRED DURING THE MEETING OF MARCH 27, 2018 DUE TO TIME CONSTRAINTS)
- 5. OFFICIAL REQUEST FOR COMPARISON ANALYSIS OF NATURE AND STATUS UPDATE: 2015, 2016 AND 2017 COMMUNITY COMPLAINTS AGAINST DOVER POLICE OFFICERS (MR. SUDLER)
- 6. DOVER POLICE CADET PROGRAM DISCUSSION OF OFFICIAL CADET DUTIES REQUIRED UNDER THE GRANT (MR. SUDLER)
- 7. ADJOURNMENT OF SAFETY ADVISORY AND TRANSPORTATION COMMITTEE MEETING

ADJOURNMENT OF COUNCIL COMMITTEE OF THE WHOLE MEETING

 $/TM\ s: \texttt{AGENDAS-MINUTES-PACKETS-PRESENTATIONS-ATT&EXH \verb|COMMITTEE-AGENDAS|2018|04-24-2018|CCW|AGENDA.wpd|} \\$

CITY OF DOVER LEGISLATIVE FINANCE AND ADMINISTRATION COMMITTEE April 24, 2018

BUSINESS IMPROVEMENT DISTRICT -ASSESSMENT (TAX) RATES FOR FISCAL YEAR 2018-2019

Submitted by: Cheryl A. Bundek, AAS

INTRODUCTION

The Business Improvement District (BID) Ordinance adopted by City Council requires that Council must adopt a BID budget and assessment every year. This report presents the proposed budget and assessment for fiscal year 2018-19.

ORDINANCE REQUIREMENT AND BUDGET

(A) Appendix D, Article III, Section 9(f) requires that a budget be submitted to City Council for consideration and approval.

For your consideration, we have attached the FY 2018-2019 budget showing BID tax revenue and the expenses charged against this revenue (Attachment A).

(B) For your consideration, we have also provided the tax calculation worksheet with recommended rates (Attachment B).

REQUEST FOR ACTION

We request Council to approve the following budget for fiscal year 2018-19 Attachment A, and Assessment (Tax) Rate for 2018-19 - Attachment B.

BUSINESS IMPROVEMENT DISTRICT

CASH RECEIPTS BUDGET FOR 2018-19

BID TAX REVENUE AND EXPENSES CHARGED AGAINST THIS REVENUE ADMINISTERED THROUGH CITY OF DOVER

BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF DOVER, IN COUNCIL MET:

1. The amount hereinafter named aggregating Zero dollars, (\$0.00) or so much thereof as may be necessary is hereby appropriated from current revenues and other funds for economic development purposes for the fiscal year beginning July 1, 2018, and ending June 30, 2019:

REVENUE	PROPOSED
Tax Revenue	<u>\$0.00</u>
EXPENSES	

Personnel & Administration Expenses <u>\$0.00</u>

ATTACHMENT B

CITY OF DOVER LEGISLATIVE FINANCE AND ADMINISTRATION COMMITTEE April 24, 2018 BUSINESS IMPROVEMENT DISTRICT -ASSESSMENT (TAX) RATES FOR FISCAL YEAR 2018-2019

BUSINESS IMPROVEMENT DISTRICT

TAX CALCULATION WORKSHEET

JULY 1, 2018 TO JUNE 30, 2019

Zone are per the City of Dover Code Appendix D-Article III, Section 9(e).

	<u>ZONE 1</u>	<u>ZONE 2</u>	<u>ZONE 3</u>	TOTAL
Aggregate Assessments	\$42,311,100	\$70,449,900	\$40,519,500	\$153,280,500
Assessment Tax Rate per \$100	-	-	-	
Revenue Raised	\$0	\$0	\$0	\$0
% Revenue Raised	0%	0%	0%	0%
Number of Parcels	133	135	45	313
Average Assessment	\$0	\$0	\$0	\$0

NOTE: These figures were estimated per the 2015 reassessed values. The revenue percentages by Zone are per the City of Dover Code Appendix D-Article III, Section 9(e).

TYLININTERNATIONAL

engineers | planners | scientists

To: Rich Vetter The Dover/ Kent MPOFrom: 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:

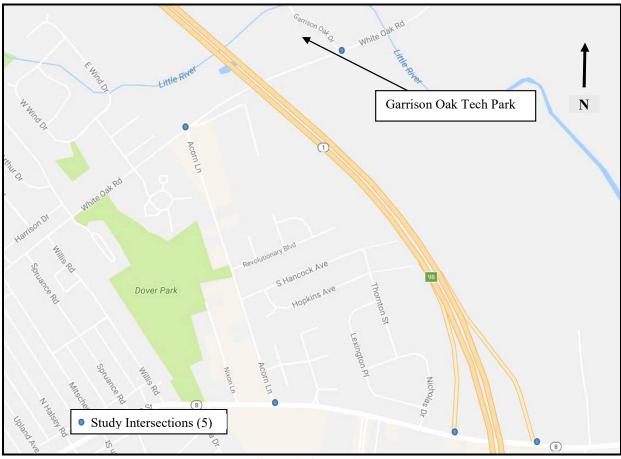
The Garrison Oak Tech Park is located just east of SR 1, with its access located along White Oak Road. It is a 389 acre property comprising of 15 lots slated for development. At the time of this study, there are three developed lots in the park, Dover Sun Park (103.4 acres), Garrison Energy Center (86.4 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.



Study Intersections:

Figure 1: Study Area

<u>White Oak Road at Garrison Oak Drive</u>: 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.

<u>White Oak Road at Acorn Lane</u>: 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.

Little Creek Rd at SR 1 ramps: Little Creek Rd intersects the SR 1 SB off-ramp as well as SR 1 NB onramp 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.

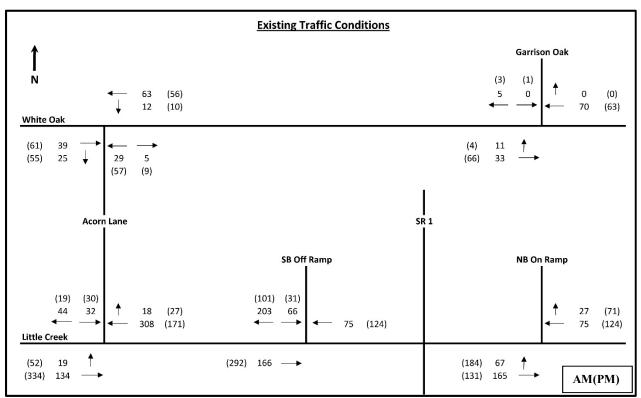


Figure 2: Existing Traffic – Turning Movement Counts

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, 9th 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.

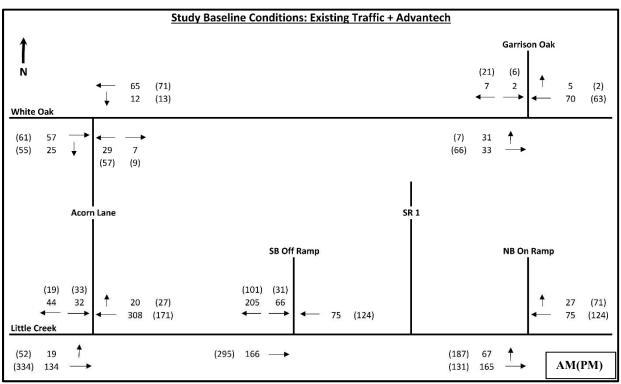


Figure 3: Study Baseline Traffic – Turning Movement Counts

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**.

Intersection	Approach	Baseline Conditions			
		AM	PM		
		Delay (LOS)	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	oad 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		12		
	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)		

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

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, 9th 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 - Prop	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				

Table 2: Trip Generation information – Proposed Development

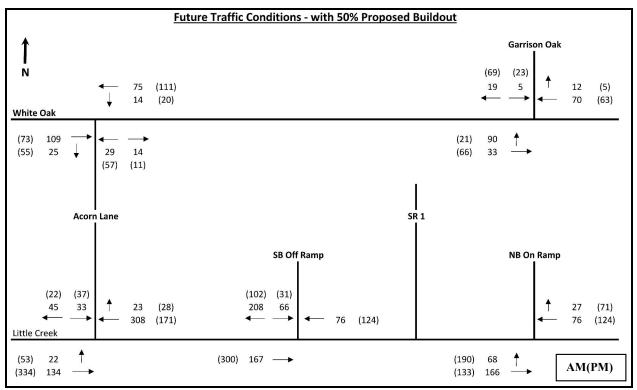
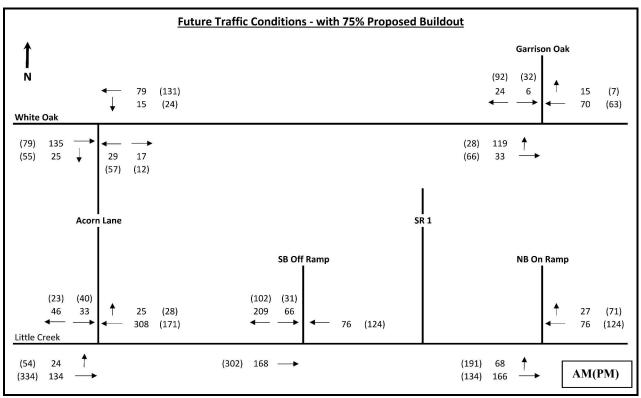
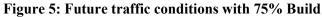


Figure 4: Future traffic conditions with 50% Build





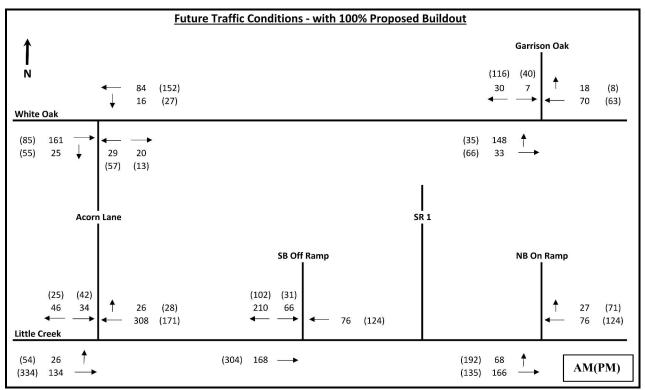


Figure 6: Future traffic conditions with 100% Build

Garrison Oak Traffic Study

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**.

Intersection	Approach	Baseline (Conditions	50%	Build	75%	Build	100%	Build
		AM	PM	AM	PM	AM	PM	AM	PM
		Delay (LOS)							
White Oak R	oad at Garrison Oak Dr								
	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 R	oad 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 Cree	k at Acorn Lane					_			
	Eastbound (Left/Through)	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 Cree	k at SR 1 SB Ramp								
	Southbound (Left/Right)	12.9 (B)	11.3 (B)	13.0 (B)	11.3 (B)	12.9 (B)	11.3 (B)	12.9 (B)	11.3 (B)
N Little Creel	k 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)	7.7 (A)	8.6 (A)

 Table 3: HCS LOS under baseline and future traffic conditions

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, 9th 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.

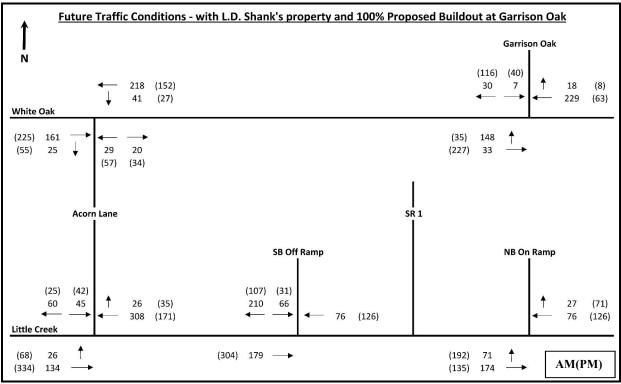


Figure 7: Future Traffic Conditions with L.D. Shank's property

Table 4: HCS LOS under baseline.	future 100% build and LD Shank Development
Tuble II Hes Los under sustine,	future 10070 bund und ED Shunk Development

Intersection	Intersection Approach		Baseline Conditions		Build	100%Build + LD Shank Development		
		AM	PM	AM	PM	AM	PM	
		Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	Delay (LOS)	
White Oak R	White Oak Road at Garrison Oak Dr					1		
	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 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 Cree	k 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

	1 99	O-WAY STOP	CONTRO						
General Information			Site Information						
Analyst	Shilpa Ma	allem		ation			Is at Carrie	an Oak	
Agency/Co.		nternational		Intersection			<u>k at Garris</u>	on Oak	
Date Performed	12/27/201	16	Jurisdiction Analysis Year			City of Do 2016	over, DE		
Analysis Time Period	Existing (Peak	Conditions - AM	Analys	is rear		2016			
Project Description Ga	rrison Oak Traf	fic Study							
East/West Street: Whote			North/S	outh Stree	et: Garriso	on Oak Drive)		
Intersection Orientation:	East-West		Study F	Period (hrs	s): 0.25				
Vehicle Volumes an	d Adiustme	nts							
Major Street	j	Eastbound				Westbou	nd		
Movement	1	2	3		4	5		6	
	L	Т	R		L	T		R	
Volume (veh/h)	11	33	1			70		0	
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00	
Hourly Flow Rate, HFR	15				0			0	
(veh/ĥ)		78	0		-	88		U	
Percent Heavy Vehicles	10		2						
Median Type				Undivide	d				
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			11		12	
	L	T	R		L	Т		R	
Volume (veh/h)					0			5	
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		0	0		5	
Percent Heavy Vehicles	2	0	2		2	0		0	
Percent Grade (%)		0				0		-	
Flared Approach		N				N			
Storage		0				0	<u> </u>		
RT Channelized			0					0	
Lanes	0	0			0	0		0	
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Configuration	<u> </u>	<u> </u>							
Delay, Queue Length, a		r i				-			
Approach	Eastbound	Westbound	Ĩ	lorthboun	1		outhbound	1	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LT						LR		
/ (veh/h)	15						5		
C (m) (veh/h)	1459						976		
//c	0.01	i i			1		0.01		
95% queue length	0.03				1	+	0.02		
		┨────┤			+	+			
Control Delay (s/veh)	7.5				┨────		8.7	<u> </u>	
LOS	A						A		
Approach Delay (s/veh)							8.7		
Approach LOS						1	Α		

HCS+TM Version 5.6

Generated: 12/27/2016 12:28 PM

1 4 4	O-WAY STOP	CONTR							
1		Site I	Site Information						
Shilpa Ma	allem	Interec	otion		W/hite Oa	14/hite Oak at Acarm Lana			
							i Lane		
12/27/201	16					iver, DE			
Existing C Peak	Conditions - AM	Analysis Year			2010				
rrison Oak Traf	fic Study								
Oak Road		North/S	South Stree	et: Acorn	Lane				
East-West		Study F	Period (hrs): 0.25					
d Adjustme	nts								
	Eastbound				Westbou	nd			
1	2	3		4	5		6		
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-		0					0		
0	0	_		0	0		0		
		Ť			Ť,				
nd Level of Se									
	ir		Northbound	4	Southbound		d		
				1	_	1	12		
<u> </u>				, j			+		
					_				
					_				
	0.01		0.07						
			0.24	1					
	0.04					1	1		
	0.04 7.4		9.8						
	7.4		9.8						
	T.Y. Lin I 12/27/20 Existing C Peak mrison Oak Traf 2 Oak Road East-West nd Adjustme 1 1 1 1 1 0<	Shilpa Mallem T.Y. Lin International 12/27/2016 Existing Conditions - AM Peak mrison Oak Traffic Study a Oak Road East-West DAdjustments Ind Adjustments Image: Ind I	Shilpa Mallem International 12/27/2016 Jurisdi Existing Conditions - AM Peak prison Oak Traffic Study Study F Oak Road North/S East-West Study F Data Road North/S East-West Study F Data Road North/S Data Road N Data Road Data Road Data Road Data Road Data Road Data Road Data Road	Shilpa MallemIntersectionT.Y. Lin InternationalJurisdiction12/27/2016Analysis YearExisting Conditions - AMAnalysis YearPeakNorth/South Street2 Oak RoadNorth/South Streeta AdjustmentsStudy Period (hrs123LT39251.000.750523200101070101011.000.750.7800101101011<	Shilpa Mallem International 12/27/2016 Jurisdiction Existing Conditions - AM Peak Peak Study Pear 0 Oak Road North/South Street: Acom Coak Road North/South Street: Acom East-West Study Period (hrs): 0.25 DA Adjustments Intersection 1 2 3 4 L T R L 39 25 12 1.00 0.75 0.78 0.60 0 52 32 19 0 2 100 0 1 0 0 1	Shilpa Mallem Intersection White Oa T.Y. Lin International Jurisdiction City of Dc 12/27/2016 Jurisdiction City of Dc Existing Conditions - AM Peak Parlson City of Dc Peak Study Period (hrs): 0.25 D addiustments Eastbound Westbout North/South Street: Acom Lane East-West Study Period (hrs): 0.25 D D 1 2 3 4 5 L T R L T 39 25 12 63 1.00 0.75 0.78 0.60 0.69 0 52 32 19 91 0 - 2 Undivided 0 1 0 1 0 1 0 0 1 1 1.00 1.00 0.40 1.00 1.00 1.00 1 0 <	Shilpa Mallem White Oak at Acorr T.Y. Lin International Unisdiction City of Dover, DE 12/27/2016 Analysis Year 2016 Existing Conditions - AM Peak 2016 Peak North/South Street: Acorr Lane 2016 Pack Study Period (hrs): 0.25 0.25 dd Adjustments Study Period (hrs): 0.25 0.60 1 2 3 4 5 L T R L T 39 25 12 63 1 0 0.75 0.78 0.60 0.69 1 0 52 32 19 91 1 0 2 Undivided 0 1 0 1 1 0 1 0 11 1 1 1.00 0.40 1.00 1.00 1 1 0 1 0 0 1 <t< td=""></t<>		

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	1 4 4 4	D-WAY STOP	CONTRO					
General Information			Site Ir	nformati	on			
Analyst	Shilpa Mal	llem						
Agency/Co.		ternational	Interse				reek at Aco	orn Lane
Date Performed	12/27/201		Jurisdi			City of Do	over, DE	
Analysis Time Period	Existing Co Peak	onditions - AM	Analys	is year		2016		
Project Description Gar	rrison Oak Traffi	c Study						
East/West Street: N Little		•	North/S	outh Stree	et: Acorn	Lane		
Intersection Orientation:	East-West		Study F	Period (hrs	s): 0.25			
Vehicle Volumes an	d Adiustmer	nts						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)	19	134				308		18
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82		0.68
Hourly Flow Rate, HFR	24	167	0		0	375		26
(veh/h)	24	107	0		-	375		20
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	Ind	
Movement	7	8	9		10	11		12
	L	T	R		L	Т		R
Volume (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		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration	0	0	- ·		0			0
Delay, Queue Length, ar								
		Westbound		lowthe bound				1
Approach	Eastbound		1	Northboun	1		outhbound	1
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT					4	LR	Į
v (veh/h)	24						98	
C (m) (veh/h)	1158						540	
v/c	0.02						0.18	
95% queue length	0.06					1	0.66	1
Control Delay (s/veh)	8.2					+	13.1	1
								ł
LOS	Α						B	
Approach Delay (s/veh)							13.1	
Approach LOS						1	В	

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	1 4 4	O-WAY STOP	CONTRO					
General Information			Site In	formati	on			
Analyst	Shilpa Ma	allem				N Little Cr	eek at Si	R 1 NB
Agency/Co.		nternational	-Intersed	ction		Ramp		
Date Performed	12/27/201		Jurisdic	ction		City of Do	ver, DE	
Analysis Time Period	Existing (Peak	Conditions - AM	Analysi	s Year		2016		
Project Description Gar	rison Oak Traf	fic Study	— I			*		
East/West Street: N Little			North/S	outh Stree	et: SR1 N	B On-Ramp		
ntersection Orientation:	East-West		Study P	eriod (hrs	s): 0.25	•		
Vehicle Volumes and	d ∆diustme	nts		•				
Major Street		Eastbound				Westbour	nd	
Movement	1	2	3		4	5		6
	L		R		L	T T		R
Volume (veh/h)	67	165			-	75		27
Peak-Hour Factor, PHF	0.62	0.77	0.78		0.60	0.79		0.75
Hourly Flow Rate, HFR							1	
(veh/ĥ)	108	214	0		0	94		36
Percent Heavy Vehicles	2				2			
Median Type				Undivide	d			
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
	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 (veh/h)	0	0	0		0	0		0
Percent Heavy Vehicles	2	0	2		2	0		8
Percent Grade (%)	_	0			_	0		•
Flared Approach		Ň				N		
Storage		0	<u> </u>			0		
RT Channelized	1		0					0
Lanes	0	0	0		0	0		0
∟anes Configuration	0	0	0		U	U U		0
						1		
Delay, Queue Length, ar		i				1 -		
Approach	Eastbound	Westbound	l.	lorthboun	1		outhbour	1
Vovement	1	4	7	8	9	10	11	12
Lane Configuration	LT							
/ (veh/h)	108							
C (m) (veh/h)	1455							
//c	0.07							
95% queue length	0.24							
Control Delay (s/veh)	7.7	<u> </u>				+		+
, ,								
LOS	A					_ _		
Approach Delay (s/veh)								
Approach LOS								

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		WO-WAY STOP							
General Information	n		Site Ir	nforma	tion				
Analyst	Shilpa I		Interse	ction			reek at SR	1 SB	
Agency/Co.		International				Ramp			
Date Performed	12/27/2		Jurisdio			City of Do	over, DE		
Analysis Time Period	Existing Peak	g Conditions - AM	Analysi	is Year		2016	2016		
Project Description Ga		affic Study							
East/West Street: N Litt			North/S	outh Str	reet: SR1 S	B Off-Ramp			
ntersection Orientation:	East-West		Study F	Period (h	rs): 0.25				
Vehicle Volumes ar	nd Adjustm	ients							
Major Street		Eastbound				Westbou	nd		
Movement	1	2	3		4	5		6	
	L	Т	R		L	Т		R	
Volume (veh/h)		166				75			
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		•		Undivid	ded				
RT Channelized			0					0	
Lanes	0	1	0		0	1		0	
Configuration		Т				Т			
Jpstream Signal		0				0			
Minor Street		Northbound		Ī		Southbou	ind		
Movement	7	8	9		10	11		12	
	L	Т	R		L	Т		R	
Volume (veh/h)					66			203	
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		92	0		344	
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			- ·		0			0	
						LN			
Delay, Queue Length, a		i i		I				1	
Approach	Eastbound	Westbound	i	Northbou		_	outhbound	1	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration					_		LR		
/ (veh/h)							436		
C (m) (veh/h)							892		
//c							0.49		
95% queue length							2.74		
Control Delay (s/veh)						1	12.8		
		1					B		
Approach Delay (s/veh)							12.8	I	
Approach LOS	 orida. All Rights R		нс				B ted: 12/27/207		

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	тw	O-WAY STOP	CONTRO	JL SUM	MARY			
General Information	1		Site In	nformati	on			
Analyst	Shilpa Ma	allem		otion		M/hite Oo	k at Garris	an Oak
Agency/Co.	T.Y. Lin II	nternational	Interse					on Oak
Date Performed	12/27/201		Analysi			City of Do 2016	iver, DE	
Analysis Time Period	Existing C Peak	Conditions - PM				2010		
Project Description Ga	rrison Oak Traf	fic Study						
East/West Street:			North/S	outh Stree	et: G <i>arris</i> o	on Oak Drive		
Intersection Orientation:	East-West		Study P	Period (hrs): 0.25			
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)	4	66				63		0
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00
Hourly Flow Rate, HFR	5	157	0		0	79		0
(veh/h)		107	, v		-	73		<u> </u>
Percent Heavy Vehicles	10				2			
Median Type				Undivide	d			
RT Channelized			0					0
_anes	0	1	0		0	1		0
Configuration	LT							TR
Jpstream Signal		0				0		
Minor Street		Northbound				Southbou	Ind	
Vovement	7	8	9		10	11		12
	L	Т	R		L	Т		R
Volume (veh/h)					1			3
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		1	0		3
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			l ů		•	LR		•
Delay, Queue Length, a	nd Lovel of Se	rvice	1					
Approach	Eastbound	Westbound	N	Jorthboun	4		outhbound	
Novement		4	7	8	9	10	11	12
		4	'	0	9			12
_ane Configuration	LT					+	LR	
/ (veh/h)	5						4	<u> </u>
C (m) (veh/h)	1470						911	
//c	0.00						0.00	
95% queue length	0.01						0.01	
Control Delay (s/veh)	7.5					1	9.0	
LOS	A					+	A	
		├				+		L
Approach Delay (s/veh)							9.0	
Approach LOS						1	A	

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		O-WAY STOP	CONTR		IMARY			
General Information	n		Site I	nformat	ion			
Analyst	Shilpa Ma	allem	Interse	ection		White Oa	k at Acor	n Lane
Agency/Co.	T.Y. Lin I	nternational	Jurisdi	ction		City of Do	over, DE	
Date Performed	12/27/201	16	Analys	is Year		2016	2016	
Analysis Time Period	Existing -	PM Peak						
Project Description Ga		ffic Study						
East/West Street: White					et: Acorn	Lane		
ntersection Orientation:	East-West		Study F	Period (hr	s): 0.25			
Vehicle Volumes ar	nd Adjustme	ents						
Major Street		Eastbound	Eastbound We			Westbou	ind	
Vovement	1	2	3		4	5		6
	L	Т	R		L	Т		R
/olume (veh/h)		61	55		10	56		
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			
/ledian Type				Undivide	ed			
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
Minor Street		Northbound				Southbou	und	
Novement	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		1.00	1.00		1.00
Hourly 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			0					0
_anes	0	0	0		0	0		0
Configuration		LR	-		-			-
Delay, Queue Length, a	and Level of Se		1	I			1	
Approach	Eastbound	Westbound	1	Northbour	nd		outhboun	d
Novement	1	4	7	8	9	10	11	12
ane Configuration	I	LT	· ·	LR				12
-						+		
/ (veh/h)		16		116		+		
C (m) (veh/h)		1454		800				
//c		0.01		0.14				
95% queue length		0.03		0.51				
Control Delay (s/veh)		7.5		10.3				
_OS		А		В				
Approach Delay (s/veh)				10.3	-		-	-
Approach LOS				В		1		
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	1 4 4 6	D-WAY STOP	CONTRO					
General Information	1		Site Ir	nformati	ion			
Analyst	Shilpa Ma	llem		-4			waals at Aas	
Agency/Co.		ternational	Interse				reek at Acc	orn Lane
Date Performed	12/27/201	6	Jurisdie			City of Do 2016	over, DE	
Analysis Time Period	Existing C Peak	onditions - PM	Analys	is real		2010		
Project Description Ga	rrison Oak Traff	ic Study						
East/West Street: N Littl	e Creek		North/S	outh Stree	et: Acorn	Lane		
Intersection Orientation:	East-West		Study F	Period (hrs	s): 0.25			
Vehicle Volumes an	d Adiustmer	nts						
Major Street	1	Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)	52	334				171		27
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82	(0.68
Hourly Flow Rate, HFR (veh/h)	65	417	0		0	208		39
Percent Heavy Vehicles	2				2			
Median Type				Undivide	d	•		
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration	LT		Ť		<u> </u>	· · ·		TR
Jpstream Signal		0				0		11
Minor Street		Northbound				Southbou		
Movement	7	8	9		10	11		12
viovement	/	<u>т</u>	R R		10	Т		R
Volume (veh/h)		- I			30	· ·		19
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00).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		
Flared Approach		N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration	0	0	<u> </u>		0			0
Delay, Queue Length, a	ir	i i		la rtha hau un				
Approach	Eastbound	Westbound	i i	Northboun	1		outhbound	n-
Movement	1	4	7	8	9	10	11	12
_ane Configuration	LT				1	4	LR	
/ (veh/h)	65						66	
C (m) (veh/h)	1319						430	
//c	0.05						0.15	
95% queue length	0.16				1		0.54	
Control Delay (s/veh)	7.9				1	+	0.04 14.9	
					-			
	A						B	
Approach Delay (s/veh)							14.9	
Approach LOS							В	

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	1 VV	O-WAY STOP	CONTRU						
General Information			Site In	formati	on				
Analyst	Shilpa Ma	allem		- 4 ¹		N Little Cr	eek at S	R 1 NB	
Agency/Co.	T.Y. Lin I	nternational	Intersed	ction		Ramp			
Date Performed	12/27/201	16	Jurisdic	ction		City of Do	ver, DE		
Analysis Time Period	Existing (Peak	Conditions - PM	Analysi	s Year		2016			
Project Description Gar	rison Oak Traf	fic Study							
East/West Street: N Little			North/S	outh Stree	et: SR1 N	B On-Ramp			
Intersection Orientation:	East-West		Study P	eriod (hrs): 0.25				
Vehicle Volumes and	d Adiustme	nts							
Major Street]	Eastbound				Westbour	nd		
Movement	1	2	3		4	5		6	
	L	Т	R		L	Т		R	
Volume (veh/h)	184	131				124		71	
Peak-Hour Factor, PHF	0.62	0.77	0.78		0.60	0.79		0.75	
Hourly Flow Rate, HFR (veh/h)	296	170	0		0	156		94	
Percent Heavy Vehicles	2				2				
Median Type			•	Undivide					
RT Channelized			0					0	
Lanes	0	1	0		0	1		0	
Configuration	LT				•			TR	
Jpstream Signal		0				0			
Minor Street		Northbound Southbound							
Movement	7	8	9		10	11		12	
Novement	,	Т	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 (veh/h)	0	0	0		0	0		0	
Percent Heavy Vehicles	2	0	2		2	0		8	
Percent Grade (%)	-	0	-		_	0		<u> </u>	
Flared Approach		N N				N			
Storage	1	0	<u> </u>			0			
		U	<u> </u>			0			
RT Channelized			0		0			0	
Lanes	0	0	0		0	0		0	
Configuration									
Delay, Queue Length, ar		i i							
Approach	Eastbound	Westbound	l.	lorthbound	i i		outhbour	í.	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LT								
/ (veh/h)	296								
C (m) (veh/h)	1316								
//c	0.22								
95% queue length	0.86								
Control Delay (s/veh)	8.5	+							
, ,		}			+				
LOS	A								
Approach Delay (s/veh)									
Approach LOS									

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	TW	O-WAY STOP	CONTRO	DL SU	MMARY			
General Information	า		Site Ir	nforma	ation			
Analyst	Shilpa Ma	allem	Interse	otion		N Little C	reek at SR	1 SB
Agency/Co.	T.Y. Lin I	nternational	Interse	CLION		Ramp		
Date Performed	12/27/20 ⁻		Jurisdiction		City of Do	over, DE		
Analysis Time Period	Existing (Peak	Conditions - PM	Analys	is Year		2016		
Project Description Ga		fic Study				R		
East/West Street: N Litt		no olday	North/S	South St	reet: SR1 S	B Off-Ramp		
ntersection Orientation:					nrs): 0.25			
Vehicle Volumes ar	nd Adjustme	nts			/			
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	<u>т</u>	R		L	T T		R
Volume (veh/h)		292				124		
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78		0.68
Hourly Flow Rate, HFR (veh/h)	0	324	0		0	158		0
Percent Heavy Vehicles	2				2			
Vedian Type	2			Undivi				
RT Channelized	-		0					0
Lanes	0	1	0		0	1		0
Configuration		T	- ·		0	Т		0
Jpstream Signal		0				0		
Minor Street	-	Northbound				Southbou	I	
Movement	7	8	9		10	11		12
Novement	, L	т	R		I	Т		R
Volume (veh/h)					31	'		101
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.71	1.00		0.59
Hourly Flow Rate, HFR	0	0	0		43	0		171
Percent Heavy Vehicles	2	0	2		2	0		3
Percent Grade (%)		0	-		-	0		<u> </u>
Flared Approach	-	N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration	0	0			0			0
Delay, Queue Length, a		1		lorthhou	und		outhhound	1
Approach Movement	Eastbound	Westbound		Northbou 8		_	outhbound	1
Novement	1	4	7	Ŏ	9	10	11	12
Lane Configuration							LR	
v (veh/h)							214	
C (m) (veh/h)							786	
//c							0.27	
95% queue length							1.11	
Control Delay (s/veh)							11.3	
LOS							В	
Approach Delay (s/veh)					•		11.3	•
Approach LOS						1	В	
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	TWO	D-WAY STOP C	CONTRO		MARY			
General Informatior	1		Site In	formatio	on			
Analyst	Shilpa Ma	llem		- 4! - ·-			le at O amia	
Agency/Co.		ternational	Intersec				k at Garris	on Oak
Date Performed	12/27/201		Jurisdic			City of Do	over, DE	
Analysis Time Period	Proposed Peak	- 50% Build - AM	Analysi	s rear		2016		
Project Description Ga	rrison Oak Traff	ïc Study						
East/West Street: Whot		•	North/So	outh Stree	t: Garriso	on Oak Drive)	
Intersection Orientation:	East-West		Study P	eriod (hrs)	: 0.25			
Vehicle Volumes an	d Adjustmer	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				2			
Median Type				Undivided	1			
RT Channelized			0	1				0
Lanes	0	1	0		0	1		0
Configuration	LT							TR
Upstream Signal		0				0		
Minor Street		Northbound				Southbou	ind	
Movement	7	8	9		10	11		12
	L	T	R			Т		R
Volume (veh/h)					4			18
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		4	0		19
Percent Heavy Vehicles	2	0	2		2	0		0
Percent Grade (%)		0				0		-
Flared Approach		N I				N		
Storage		0				0		
RT Channelized	-		0					0
Lanes	0	0			0	0		0
	0	0	0		0	-		0
Configuration		<u> </u>				LR		
Delay, Queue Length, a	1							
Approach	Eastbound	Westbound	ir -	lorthbound	ì	-	outhbound	ii.
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT				ļ	4	LR	
v (veh/h)	114						23	
C (m) (veh/h)	1448						861	
//c	0.08						0.03	
95% queue length	0.26						0.08	
Control Delay (s/veh)	7.7						9.3	
LOS	A					+	3.5 A	
						+	9.3	I
Approach Delay (s/veh)								
Approach LOS							A	

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	ТМ	O-WAY STOP	CONTRO	OL SUM	MARY			
General Information	1		Site Ir	nformati	on			
Analyst	Shilpa M	allem	Interse	etion		White Oa	k at Acor	nlana
Agency/Co.		International	Jurisdi			City of Do		II Lane
Date Performed	12/27/20			is Year		2016		
Analysis Time Period	Propose Peak	d - 50% Build - AM				2010		
Project Description Ga	rrison Oak Tra	ffic Study						
East/West Street: White			North/S	South Stree	et: Acorn	Lane		
Intersection Orientation:	East-West		Study F	Period (hrs): 0.25			
Vehicle Volumes an	d Adjustme	ents						
Major Street	-	Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)		91	25		14	73		
Peak-Hour Factor, PHF	1.00	0.75	0.78		0.60	0.69		1.00
Hourly Flow Rate, HFR (veh/h)	0	121	32		23	105		0
Percent Heavy Vehicles	0				2			
Median Type				Undivide	d	-		
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
Minor Street		Northbound Southbound						
Movement	7	8	9		10	11		12
	L L	T	R		 L	T T		R
Volume (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		Ň				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR			0			0
Delay, Queue Length, a	nd Level of S							
	Eastbound	Westbound		Northbound	4		outhbour	nd
Approach Novement	Eastbound	++	7	Nortinbound 8	9	10	11	10
	1	4	1		9			- 12
Lane Configuration		LT		LR 77			 	
v (veh/h)		23		77				_
C (m) (veh/h)		1428		760				
//c		0.02		0.10				
95% queue length		0.05		0.34				
Control Delay (s/veh)		7.6		10.3				
LOS		A		В	İ	1	İ 👘	
Approach Delay (s/veh)				10.3	1			
Approach LOS		+ +		B				
Approach LOS								0016 11.50

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	TWO	O-WAY STOP C	ONTRO		MARY			
General Informatior	า		Site In	formatio	on			
Analyst	Shilpa Ma	llem						
Agency/Co.		ternational	Interse				reek at Acc	orn Lane
Date Performed	12/27/201		Jurisdio			City of Do	over, DE	
Analysis Time Period	Proposed Peak	- 50% Build - AM	Analysi	IS Year		2016		
Project Description Ga	nrrison Oak Traff	ic Study						
East/West Street: N Litt	le Creek		North/S	outh Stree	t: Acorn	Lane		
Intersection Orientation:	East-West		Study P	Period (hrs)	: 0.25			
Vehicle Volumes an	nd Adjustmei	nts						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)	22	134				308		21
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82	(0.68
Hourly Flow Rate, HFR (veh/h)	27	167	0		0	375		30
Percent Heavy Vehicles	2				2			
Median Type				Undivided				
RT Channelized	_		0		•			0
Lanes	0	1	0		0	1		0
Configuration	LT		0		0	<u> </u>		TR
Upstream Signal	L/	0				0		IK
· •								
Minor Street		Northbound			10	Southbou		40
Movement	7	8 T	9		10	11 T		12
	L		R		L	Т		R
Volume (veh/h)					33	1.00		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
Lanes	0	0	0		0	0		0
Configuration						LR		
Delay, Queue Length, a	nd Level of Sei	vice				•		
Approach	Eastbound	Westbound	Ν	lorthbound	1	S	outhbound	
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT	· ·		-	-		LR	<u> </u>
v (veh/h)	27					+	101	
C (m) (veh/h)	1154					+	534	
	0.02						0.19	
95% queue length	0.07						0.69	
Control Delay (s/veh)	8.2						13.3	
LOS	A						В	
Approach Delay (s/veh)							13.3	
Approach LOS						1	В	
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General Information Site Information Analyst Agency/Co. T.Y. Lin International Date Performed Intersection N Little Creek et SR 1 N Analysis Year Date Performed 12/27/2016 Jurisdiction City of Dover, DE Analysis Year Project Description Garnison Oak Traffic Study Analysis Year 2016 EastWest Street NLIttle Creek North/South Street: SR1 NB On-Ramp Major Street East-West Study Period (hrs): 0.25 Wehicle Volumes and Adjustments Westbound Movement 1 2 3 4 5 6 Movement 1 2 3 4 5 6 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Percent Heavy Vehicles 2 - - 2 - - Morent Type Undivided 1 0 0 10 0 Configuration LT R L T R 0 0 Upstream Signal 0		TW	O-WAY STOP C					
Agency/Co. T.Y. Lin International Intersection Ramp Date Performed 12/27/2016 City of Dover, DE Analysis Time Period Proposed 50% Build - AM City of Dover, DE Analysis Time Period Proposed 50% Build - AM Analysis Year 2016 Project Description Garrison Oak Traffic Study EastWest Street: North/South Street: Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Major Street EastBound Westbound Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 77 78 27 Poak-Hour Factor, PHF 109 215 0 0 96 36 Percent Heavy Vehicles 2 - - 2 - - Moting Type Undivided 0 1 0 0 1 0 Reading Type 10 1 0 0 1 0 0 1 0 0 1 0	General Informatior	I		Site Info	ormation			
Agency(Co. [F.Y. Ln International Analysis Time Period [Fazi27/2016 [Proposed - 50% Build - AM] Jurisdiction City of Dover, DE Analysis Time Period Project Description Garrison Oak Traffic Study Analysis Year 2016 East/West Street: N. Liffic Creek North/South Street: Study Period (hrs): 0.25 Vehicle Volumes and Adjustments Westbound Westbound Morement 1 2 3 4 5 6 Volume (veh/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Houry IPlow Rate, HFR 109 215 0 0 10 0 10 0 10 0 10 0 10 0 10 0 10 <	Analyst	Shilpa Ma	allem	Interceptic			at SR 1 NB	
Instruction Proposed - 50% Build - AM Peak Analysis Treat 2016 Analysis Time Period Generation Color Traffic Study North/South Street: SR1 NB On-Ramp Intersection Orientation: East-West North/South Street: SR1 NB On-Ramp Intersection Orientation: East-West North/South Street: SR1 NB On-Ramp Intersection Orientation: East-West Maior Street Eastbound Westbound Westbound Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 - 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Heina Type 1 0 0 1 0 0 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Houry Flow Rate, HFR 109 215 0 0 96 36 Percent Heavy Vehicles 2 2 - - Upstream Signal 0 1 0 0 1 0 <t< td=""><td></td><td>T.Y. Lin I</td><td>nternational</td><td></td><td></td><td colspan="3"></td></t<>		T.Y. Lin I	nternational					
Analysis Irine Penol Peak Image: Additional and the additionaly additin additional and the additional and the additional and th	Date Performed						DE	
EastWest Street: Nurth/South Street: SR1 NB On-Ramp Intersection Orientation: East-West Study Period (hrs): 0.25 Wehicle Volumes and Adjustments Eastbound Westbound Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Houry Flow Rate, HFR 109 215 0 0 96 36 Percent Heavy Vehicles 2 - 2 - Median Type 0 1 0 0 1 0 Minor Street 0 1 0 0 1 0 0 Minor Street Northbound Southbound Southbound Movement 7 8 9 10 11 12 Volume (veh/h) L T	Analysis Time Period		d - 50% Build - AM	Analysis \	/ear	2016		
Intersection Orientation: East-West Study Period (hrs): 0.25 Weitcle Volumes and Adjustments Eastbound Westbound Movement 1 2 3 4 5 6 Working L T R L T R L T R Volume (vel/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Houry Flow Rate, HFR 109 215 0 0 96 36 Percent Heavy Vehicles 2 2 Median Type Undivided T R L T R Upstream Signal 0 1 0 0 1 0 0 Monthbound Southbound Southbound Morthbound Southbound Movement 7 8 9 10 11 12 Percent Heavy Vehicles			ffic Study					
Vehicle Volumes and Adjustments Westbound Westbound Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 T R L T R Volume (veh/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Percent Heavy Vehicles 2 2 -				North/Sout	th Street: SR1 N	B On-Ramp		
Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 T 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Percent Heavy Vehicles 2 - - 2 - - Percent Heavy Vehicles 2 - - 2 - - Upstream Signal 0 1 0 0 1 0 More Street Northbound Southbound Southbound Movement 7 8 9 10 11 12 More Street Northbound 0 0 0 0 0 0 Percent Heavy Vehicles 2 0 <td>Intersection Orientation:</td> <td>East-West</td> <td></td> <td>Study Peri</td> <td>iod (hrs): 0.25</td> <td></td> <td></td>	Intersection Orientation:	East-West		Study Peri	iod (hrs): 0.25			
Major Street Eastbound Westbound Movement 1 2 3 4 5 6 Volume (veh/h) 68 166 T 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Percent Heavy Vehicles 2 - - 2 - - Percent Heavy Vehicles 2 - - 2 - - Upstream Signal 0 1 0 0 1 0 More Street Northbound Southbound Southbound Movement 7 8 9 10 11 12 More Street Northbound 0 0 0 0 0 0 Percent Heavy Vehicles 2 0 <td>Vehicle Volumes an</td> <td>d Adjustme</td> <td>ents</td> <td></td> <td></td> <td></td> <td></td>	Vehicle Volumes an	d Adjustme	ents					
L T R L T R Volume (veh/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Hourly Flow Rate, HFR 109 215 0 0 96 36 Percent Heavy Vehicles 2 2 Median Type Undivided 0 0 0 1 0 Lanes 0 1 0 0 1 0 Configuration LT 0 1 0 More Street Northbound Southbound Southbound Movement 7 8 9 10 11 12 Peak-Hour Factor, PHF 0.60 1.00 0.40 0.71 1.00 0.59 Percent Grade (%) 0 0 0 0 0 0 0 Percent Grade (%) 0 0 <t< td=""><td>Major Street</td><td></td><td>Eastbound</td><td></td><td></td><td>Westbound</td><td></td></t<>	Major Street		Eastbound			Westbound		
Volume (veh/h) 68 166 76 27 Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.73 Neutry Flow Rate, HFR 109 215 0 0 96 36 Velvh(h) Recent Heavy Vehicles 2 - 2 Median Type Undivided 0 1 0 0 1 0 Configuration LT 0 1 0 1 0 Upstream Signal 0 1 0 11 12 12 Minor Street Northbound Southbound Southbound 0 11 12 Volume (veh/h) L T R L T R 1 12 Peak-Hour Factor, PHF 0.60 1.00 0.40 0.71 1.00 0.59 Hourty Flow Rate, HFR 0 0 0 0 0 0 Percent Grade (%) 0	Movement	1	2	3	4	5	6	
Peak-Hour Factor, PHF 0.62 0.77 0.78 0.60 0.79 0.75 Hourly Flow Rate, HFR 109 215 0 0 96 36 Percent Heavy Vehicles 2 2 Median Type Undivided 0 0 10 0 0 RT Channelized 0 1 0 0 1 0 Lanes 0 1 0 0 1 0 Minor Street Northbound Southbound Southbound Percent Heavy Vehicles 2 0 11 12 Minor Street Northbound Southbound Southbound Percent Heavy Vehicles 2 0 11 12 Peak-Hour Factor, PHF 0.60 1.00 0.40 0.71 1.00 0.55 Hourly Flow Rate, HFR 0 0 0 0 0 0 Percent Heavy Vehicles 2 0 2 0 8		L	Т	R	L	Т	R	
Hourly Flow Rate, HFR (veh/h) 109 215 0 0 96 36 Percent Heavy Vehicles 2 2 Median Type 0 0 1 0 0 1 0 RT Channelized 0 1 0 0 1 0 Configuration LT 0 0 1 0 0 Upstream Signal 0 1 0 0 1 10 Morement 7 8 9 10 11 12 Mounty Flow Rate, HFR 0.60 1.00 0.40 0.71 1.00 0.59 Hourly Flow Rate, HFR 0 0 0 0 0 0 Veh/h) - - - - 0 0 0 Percent Heavy Vehicles 2 0 2 2 0 8 Percent Heavy Vehicles 2 0 0 0	Volume (veh/h)		166			76	27	
(veh/h) 109 213 0 0 90 30 Percent Heavy Vehicles 2 2 RT Channelized 0 1 0 0 1 0 Lanes 0 1 0 0 1 0 Configuration LT - - 0 TR Upstream Signal 0 1 0 0 TR Minor Street Northbound Southbound 11 12 Movement 7 8 9 10 11 12 Volume (veh/h) - - - 0 <td></td> <td>0.62</td> <td>0.77</td> <td>0.78</td> <td>0.60</td> <td>0.79</td> <td>0.75</td>		0.62	0.77	0.78	0.60	0.79	0.75	
VertinImage: constraint of the second s		109	215	0	0	96	36	
Undivided Undivided RT Channelized 0 1 0 1 0 Lanes 0 1 0 1 0 0 Configuration LT 0 0 1 0 0 Upstream Signal 0 0 11 12 0 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 Volume (veh/h) L T R L T R Volume (veh/h) 0					-	_	ļ	
RT Channelized0010Lanes01010ConfigurationLT0010Upstream Signal00000Winor StreetNorthboundSouthbound01112Movement789101112LTRLTR00.0Peak-Hour Factor, PHF0.601.000.400.711.000.59Hourly Flow Rate, HFR (veh/h)0000000Percent Heavy Vehicles202208Percent Grade (%)0000000Storage0000000Configuration147891011Lane ConfigurationLT147891011Lane ConfigurationLT147891011Lane ConfigurationLT1111111Lane ConfigurationLT111111Lane ConfigurationLT1111111Lane ConfigurationLT11111111Lane ConfigurationLT111111 <td></td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td>		2						
Lanes010010ConfigurationLT07RUpstream Signal007RWinor StreetNorthboundSouthboundMovement7891112LTRLTRVolume (veh/h)00.40Peak-Hour Factor, PHF0.601.000.4000.711.00Peak-Hour Factor, PHF0000000Percent Grade (%)0000100Percent Grade (%)00000010020 </td <td></td> <td>_</td> <td></td> <td></td> <td>ndivided</td> <td>1</td> <td></td>		_			ndivided	1		
ConfigurationLT07RUpstream Signal000Minor StreetNorthboundSouthboundMovement7891011LTRLTRVolume (veh/h) </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Upstream Signal 0 0 0 Minor Street Northbound Southbound Movement 7 8 9 10 11 12 Volume (veh/h) L T R L T R 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 0 Percent Grade (%) 0 0 2 2 0 8 8 9 10 11 100 0.59 Percent Grade (%) 0			1	0	0	1	-	
Minor Street Northbound Southbound Movement 7 8 9 10 11 12 L T R L T R L T R Volume (veh/h) Image: Constraint of the stress of t		LT					TR	
$\begin{array}{ c c c c c c c } \hline Movement & 7 & 8 & 9 & 10 & 11 & 12 \\ \hline L & T & R & L & T & R \\ \hline Volume (veh/h) & & & & & & & & \\ \hline Peak-Hour Factor, PHF & 0.60 & 1.00 & 0.40 & 0.71 & 1.00 & 0.59 \\ \hline Hourly Flow Rate, HFR & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline Hourly Flow Rate, HFR & 0 & 0 & 2 & 2 & 0 & 8 \\ \hline Percent Heavy Vehicles & 2 & 0 & 2 & 2 & 0 & 8 \\ \hline Percent Grade (\%) & & 0 & & & & & & \\ \hline Percent Grade (\%) & & 0 & & & & & & & \\ \hline Percent Grade (\%) & & 0 & & & & & & & & \\ \hline Percent Grade (\%) & & 0 & & & & & & & & & \\ \hline Percent Grade (\%) & & 0 & & & & & & & & & \\ \hline Percent Grade (\%) & & 0 & & & & & & & & & \\ \hline Percent Grade (\%) & & 0 & & & & & & & & & \\ \hline Storage & & 0 & 0 & 0 & & & & & & & & \\ \hline Storage & & 0 & & 0 & & & & & & & & & \\ \hline Storage & & 0 & 0 & 0 & & & & & & & & & \\ \hline Configuration & & & & & & & & & & & & & & \\ \hline Delay, Queue Length, and Level of Service & & & & & & & & & \\ \hline Approach & Eastbound & Westbound & Northbound & Southbound & \\ \hline Movement & 1 & 4 & 7 & 8 & 9 & 10 & 11 & \\ \hline Lane Configuration & LT & & & & & & & & & \\ \hline Movement & 1 & 4 & 7 & 8 & 9 & 10 & 11 & \\ \hline Lane Configuration & LT & & & & & & & & & & \\ \hline (v(eh/h) & 109 & & & & & & & & & & & & \\ \hline C (m) (veh/h) & 1453 & & & & & & & & & & & & & & \\ \hline M/c & 0.08 & & & & & & & & & & & & & & & & \\ \hline Control Delay (s/veh) & 7.7 & & & & & & & & & & & & & & & \\ \hline Control Delay (s/veh) & 7.7 & & & & & & & & & & & & & & & & \\ \hline Control Delay (s/veh) & 7.7 & & & & & & & & & & & & & & & & \\ \hline \end{array}$	· · ·							
L T R L T R Volume (veh/h) 0 0.60 1.00 0.40 0.71 1.00 0.59 Hourly Flow Rate, HFR (veh/h) 0			Northbound					
Volume (veh/h) Image: stress of the stress of	Movement	7			10			
Peak-Hour Factor, PHF 0.60 1.00 0.40 0.71 1.00 0.59 Hourly Flow Rate, HFR (veh/h) 0		L	Т	R	L	Т	R	
Hourly Flow Rate, HFR (veh/h)000000Percent Heavy Vehicles202208Percent Grade (%)00008Percent Grade (%)00000Flared ApproachNVNVStorage00000RT Channelized00000Lanes000000ConfigurationVVVVDelay, Queue Length, and Level of ServiceVSouthboundSouthboundMovement147891011Lane ConfigurationLTV10V10VV (veh/h)109VVVVV $V(c$ 0.08VVVVV $SySW$ queue length0.24VVVVLOSAVVVVV								
(veh/h) 0 0 0 0 0 0 0 0 0 0 0 0 0 0 8 8 9 0 8 9 0 8 9 0 8 9 10 11 1		0.60	1.00	0.40	0.71	1.00	0.59	
Percent Grade (%) 0 0 Flared Approach N N N Storage 0 0 0 0 RT Channelized 0 0 0 0 0 Lanes 0 0 0 0 0 0 0 Configuration 0	(veh/ĥ)			-			-	
N N N Storage 0 </td <td></td> <td>2</td> <td>0</td> <td>2</td> <td>2</td> <td></td> <td>8</td>		2	0	2	2		8	
Storage 0 </td <td>Percent Grade (%)</td> <td></td> <td>0</td> <td></td> <td></td> <td>0</td> <td></td>	Percent Grade (%)		0			0		
RT Channelized 0	Flared Approach		N			N		
Lanes0000000ConfigurationImage: style	Storage		0			0		
ConfigurationImage: configurationImage: configurationImage: configurationDelay, Queue Length, and Level of ServiceApproachEastboundWestboundNorthboundSouthboundMovement147891011Lane ConfigurationLTImage: configurationLTImage: configurationImage: con	RT Channelized			0			0	
Delay, Queue Length, and Level of ServiceApproachEastboundWestboundNorthboundSouthboundMovement147891011Lane ConfigurationLT </td <td>Lanes</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>	Lanes	0	0	0	0	0	0	
Delay, Queue Length, and Level of ServiceApproachEastboundWestboundNorthboundSouthboundMovement147891011Lane ConfigurationLT </td <td>Configuration</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Configuration							
Approach Eastbound Westbound Northbound Southbound Movement 1 4 7 8 9 10 11 Lane Configuration LT		nd Level of Se	ervice				-	
Movement 1 4 7 8 9 10 11 Lane Configuration LT				Nor	thbound	South	bound	
Lane Configuration LT Image: Configuration LT Image: Configuration LT Image: Configuration LT Image: Configuration Image:				i			n -	
v (veh/h) 109 Image: Constraint of the state of the				·	- v			
C (m) (veh/h) 1453 Image: Constraint of the state of			<u>├</u>			+ +		
//c 0.08 <th<< td=""><td></td><td></td><td>╂────╂</td><td></td><td></td><td>+ $+$</td><td> </td></th<<>			╂────╂			+ $+$	 	
0.24 0.24 <th< td=""><td></td><td></td><td>┥───┤</td><td></td><td></td><td>┥──┤─</td><td></td></th<>			┥───┤			┥──┤─		
Control Delay (s/veh) 7.7 Image: Control Delay (s/veh) 7.7 _OS A Image: Control Delay (s/veh) <			┞─────┝			┥──┤─		
LOS A	· · · · · · · · · · · · · · · · · · ·							
	Control Delay (s/veh)	7.7						
Approach Delay (s/veh)	LOS	A						
	Approach Delay (s/veh)							
Approach LOS			t					

HCS+TM Version 5.6

Generated: 12/29/2016 11:24 AM

		WO-WAY STOP (MARY					
General Informatior	1		Site In	nformati	ion					
Analyst	Shilpa l	Mallem	Intersection			N Little Creek at SR 1 SB				
Agency/Co.		International					Ramp			
Date Performed	12/27/2		Jurisdio			City of Dover, DE				
Analysis Time Period	Propos Peak	ed - 50% Build - AM	Analysis Year			2016	2016			
Project Description Ga		affic Study								
East/West Street: N Littl			North/S	outh Stre	et: SR1 S	B Off-Ramp				
ntersection Orientation:	East-West		Study P	Period (hrs	s): 0.25					
Vehicle Volumes an	d Adjustm	ents								
Major Street		Eastbound				Westbou	nd			
Movement	1	2	3		4	5		6		
	L	Т	R		L	Т		R		
Volume (veh/h)		167				76				
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78		0.68		
Hourly Flow Rate, HFR (veh/h)	0	185	0		0	97		0		
Percent Heavy Vehicles	2				2					
Vedian Type		I		Undivide	ed					
RT Channelized			0					0		
_anes	0	1	0		0	1		0		
Configuration		T	<u> </u>		<u> </u>	T		<u> </u>		
Jpstream Signal		0				0				
Vinor Street	1	Northbound				Southbou	I			
Movement	7	8	9		10			12		
viovement		<u>в</u> Т	R		L	Т		R		
(aluma (uab/b)	L		К			- ·		206		
Volume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40		66 0.71	1.00		206 0.59		
Hourly Flow Rate, HFR	0.80	0	0.40		92	0				
Percent Heavy Vehicles	2	0	2		2	0		3		
Percent Grade (%)	2		2		2	0		3		
()		0				-	1			
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 S	Service								
Approach	Eastbound	Westbound	N	lorthboun	Id	S	outhbound			
Movement	1	4	7	8	9	10	11	12		
_ane Configuration					1		LR			
/ (veh/h)		+ +			1	1	441	1		
C (m) (veh/h)		+ +					891			
		+						<u> </u>		
//c		+					0.49	<u> </u>		
95% queue length					<u> </u>		2.80	<u> </u>		
Control Delay (s/veh)							12.9			
LOS							В			
Approach Delay (s/veh)							12.9			
Approach LOS		+ <u></u> +				1	В			
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	TW	O-WAY STOP C	ONTROL	. SUMMAR	Y				
General Information	1		Site Info	ormation					
Analyst	Shilpa Ma	allem	1			White Oak at Carriage Oak			
Agency/Co.		nternational	Intersecti			White Oak at Garrison Oak			
Date Performed	12/27/201		Jurisdictio			City of Dover, DE			
Analysis Time Period	Proposed Peak	l - 50% Build - PM	Analysis Year 2016						
Project Description Ga	rrison Oak Traf	fic Study							
East/West Street: White		•	North/Sou	th Street: Ga	arrison Oak Driv	e			
Intersection Orientation:	East-West		Study Per	iod (hrs): 0.2	25				
Vehicle Volumes an	d Adiustme	nts							
Major Street		Eastbound			Westbo	und			
Movement	1	2	3	4	5		6		
	L	Т	R	L	T		R		
Volume (veh/h)	20	66			63		4		
Peak-Hour Factor, PHF	0.69	0.42	0.78	0.60	0.79	i	1.00		
Hourly Flow Rate, HFR	28		0	0	79		4		
(veh/ĥ)	28	157	0	0	79		4		
Percent Heavy Vehicles	10			2					
Median Type			U	Individed					
RT Channelized			0				0		
Lanes	0	1	0	0	1		0		
Configuration	LT						TR		
Jpstream Signal		0			0				
Minor Street		Northbound			Southbo	und			
Vovement	7	8	9	10	<u>.</u>	11			
	i i	Т	R		т		12 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	0	0	0	21	0		64		
(veh/ĥ)	-		-						
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	Nor	thbound		Southbound	ł		
Novement	1	4	7	ī	9 10	11	12		
Lane Configuration	LT		·			LR	+		
		┨────┤─		 					
v (veh/h)	28	├ ─── ├		 	 	85			
C (m) (veh/h)	1465					888	 		
//c	0.02					0.10			
95% queue length	0.06					0.32			
Control Delay (s/veh)	7.5			1	i	9.5			
LOS	A	<u> </u>				A	1		
Approach Delay (s/veh)						9.5	1		
Approach LOS						A			

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		O-WAY STOP O								
General Information			Site In	nformati	on					
Analyst	Shilpa Ma	allem		ation		White Oak at Acorn / and				
Agency/Co.	T.Y. Lin II	nternational	Intersection Jurisdiction			White Oak at Acorn Lane City of Dover, DE				
Date Performed	12/27/201	16	Analysis Year			2016	iver, DE			
Analysis Time Period	Proposed Peak	- 50% Build - PM				2010				
Project Description Gar	rison Oak Traf	fic Study								
East/West Street: White	Oak Road		North/South Street: Acorn Lane							
Intersection Orientation:	East-West		Study P	Period (hrs): 0.25					
Vehicle Volumes and	d Adjustme	nts								
Major Street		Eastbound				Westbou	nd			
Movement	1	2	3		4	5	ľ	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	0	73	70		28	139		0		
(veh/h)	-							-		
Percent Heavy Vehicles	0				2					
Median Type				Undivide	d					
RT Channelized			0				0			
Lanes	0	1	0 0		1		0			
Configuration			TR		LT					
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)	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	1		0					0		
Lanes	0	0	0		0	0		0		
Configuration	1	LR								
Delay, Queue Length, an	d Level of Se	rvice				ł				
Approach	Eastbound	Westbound	Ν	lorthbound	b	S	outhbour	nd		
Movement	1	4	7	8	9	10	11	12		
Lane Configuration		LT		LR		1				
v (veh/h)		28		121						
C (m) (veh/h)		1440		722				-		
. , . ,										
		0.02		0.17						
95% queue length		0.06		0.60						
Control Delay (s/veh)		7.5		11.0			<u> </u>			
LOS		Α		В						
Approach Delay (s/veh)				11.0				- 8		
Approach LOS				В						

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	TW	O-WAY STOP O	ONTRO	OL SUMI	MARY					
General Informatior	า		Site Ir	nformatio	on					
Analyst	Shilpa Ma	allem		ation		N Little Creek at Acorn Lane				
Agency/Co.		nternational	Interse			City of Dover, DE				
Date Performed	12/27/201	16	Jurisdi				over, DE	er, DE		
Analysis Time Period	Proposed Peak	I - 50% Build - PM		is Year		2016	2016			
Project Description Ga	arrison Oak Traf	fic Study								
East/West Street: N Litt		•	North/S	outh Stree	t: Acorn	Lane				
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)	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	d	•				
RT Channelized			0					0		
Lanes	0	1	0		0	1		0		
Configuration	LT		-		-		7			
Upstream Signal		0				0				
Minor Street					Southbou	Ind				
Movement	7	Northbound 8	9		10	11		12		
	L	Т	R		10	T T				
Volume (veh/h)					34			R 22		
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00		2.2).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		<u> </u>		
Flared Approach		N I				N				
Storage		0				0				
RT Channelized	_	0	0					0		
	0	0			0	0		0		
Lanes	0	0	0		0			0		
Configuration		<u> </u>				LR				
Delay, Queue Length, a				1						
Approach Movement	Eastbound 1	Westbound 4	7	Northbound 8	9	10	outhbound 11	12		
Lane Configuration	LT		'	0			LR	- 12		
		<u> </u>				+				
v (veh/h)	67	<u>├</u>				+	75			
C (m) (veh/h)	1317	ļ					427	<u> </u>		
v/c	0.05						0.18			
95% queue length	0.16						0.63			
Control Delay (s/veh)	7.9						15.2			
LOS	A					1	С	İ		
Approach Delay (s/veh)					<u>.</u>		15.2	8		
Approach LOS						1	C			
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	IVV	O-WAY STOP C						
General Information	1		Site Info	rmation				
Analyst	Shilpa Ma	allem	Intersectio		N Little Creek at SR 1 NB			
Agency/Co.	T.Y. Lin I	nternational			Ramp			
Date Performed	12/27/20 ⁻		Jurisdictio		City of Dover	; DE		
Analysis Time Period	Proposec Peak	l - 50% Build - PM	Analysis Y	′ear	2016	2016		
Project Description Ga	rrison Oak Traf	fic Study						
East/West Street: N Littl			North/Sout	th Street: SR1 I	VB On-Ramp			
Intersection Orientation:	East-West		Study Peri	od (hrs): 0.25				
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound			Westbound			
Movement	1	2	3	4	5	6		
	L	Т	R	L	Т	R		
Volume (veh/h)	187	133			124	71		
Peak-Hour Factor, PHF	0.62	0.77	0.78	0.60	0.79	0.75		
Hourly Flow Rate, HFR	301	172	0	0	156	94		
(veh/h)								
Percent Heavy Vehicles	2			2				
Median Type				ndivided				
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		
	L	Т	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 (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			-			1 <u> </u>		
Delay, Queue Length, a	nd Level of Se	rvice				1		
Approach	Eastbound	Westbound	Nor	thbound	Sout	hbound		
Movement	1	4	7	8 9	10	11 12		
		4	1	0 9	10			
Lane Configuration	LT				+			
v (veh/h)	301							
C (m) (veh/h)	1316							
v/c	0.23							
95% queue length	0.88							
Control Delay (s/veh)	8.5							
LOS	A					i		
Approach Delay (s/veh)			I		- <u> </u>	I		
					+			
Approach LOS								

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		O-WAY STOP O							
General Information	า		Site In	formatio	on				
Analyst	Shilpa Ma	allem	Intersection			N Little Creek at SR 1 SB			
Agency/Co.	T.Y. Lin I	nternational				Ramp			
Date Performed	12/27/201		Jurisdic			City of Dover, DE			
Analysis Time Period	Proposed Peak	I - 50% Build - PM	Analysis	s Year		2016			
Project Description Ga		fic Study							
East/West Street: N Litt			North/Sc	outh Stree	t: SR1 S	B Off-Ramp			
ntersection Orientation:	East-West			eriod (hrs)					
Vehicle Volumes ar	nd Adiustme	nts							
Major Street		Eastbound				Westbou	nd		
Movement	1	2	3		4	5		6	
	L		R		L	T T		R	
/olume (veh/h)		297				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		A	1		0	
-	0	1	0		0	1		0	
_anes	0	7 T	0		0	T		0	
Configuration Jpstream Signal	_	0				0			
		-							
Minor Street	7	Northbound			40	Southbou	na	40	
Novement	7	8	9		10	11		12	
	L	Т	R		L	Т		R	
/olume (veh/h)	0.00	1.00	0.40		31	1.00		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			
-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		1					
Approach	Eastbound	Westbound	N	orthbound	1	s	outhbound		
Novement	1	4	7	8	9	10	11	. 12	
ane Configuration			·		Ť		LR	<u> ''</u>	
(veh/h)		<u>├</u>					215	1	
C (m) (veh/h)		<u> </u>					784		
//c		<u>├</u>					0.27		
		<u> </u>							
95% queue length		├					1.12	 	
Control Delay (s/veh)							11.3	<u> </u>	
OS							В		
Approach Delay (s/veh)							11.3		

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	тw	O-WAY STOP C	ONTRO		IARY					
General Informatior	1		Site In	formatio	on					
Analyst	Shilpa Ma	llem								
Agency/Co.		ternational	Intersec			White Oak at Garrison Oak				
Date Performed	12/27/201		Jurisdict			City of Dover, DE				
Analysis Time Period		- 75% Build - AM	Analysis Year 2016							
Project Description Ga	rrison Oak Trafi	fic Study								
East/West Street: Whote	e Oak Road		North/Sc	outh Stree	t: Garriso	on Oak Drive)			
Intersection 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	Т	R		L	Т		R		
Volume (veh/h)	108	33				70		12		
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00		
Hourly Flow Rate, HFR	156	78	0		0	88		12		
(veh/h)					-					
Percent Heavy Vehicles	10				2					
Median Type			Undivided			1				
RT Channelized			0					0		
Lanes	0	1	0		0	1		0		
Configuration	LT						TF			
Upstream Signal		0				0				
Minor Street		Northbound				Southbound				
Movement	7	8	9		10	11		12		
	L	Т	R		L	Т		R		
Volume (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		
Lanes	0	0	0		0	0		0		
Configuration						LR				
Delay, Queue Length, a	nd Level of Se	rvice				•				
Approach	Eastbound	Westbound	N	orthbound		S	outhbound			
Movement	1	4	7	8	9	10	11	12		
Lane Configuration	LT	-	·	-			LR	<u> </u>		
v (veh/h)	156					+	29			
· · · ·						+	-			
C (m) (veh/h)	1444						825			
v/c	0.11						0.04			
95% queue length	0.36						0.11	<u> </u>		
Control Delay (s/veh)	7.8						9.5			
LOS	A						Α			
Approach Delay (s/veh)							9.5			
Approach LOS							A			
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	TW	O-WAY STOP O	ONTRO		MARY			
General Information	1		Site Ir	nformati	on			
Analyst	Shilpa Ma	allem	Interse	otion		White Oa	k at Acar	nlana
Agency/Co.	T.Y. Lin li	nternational	Jurisdi			City of Do		Lane
Date Performed	12/27/201	16		is Year		2016	Nei, DL	
Analysis Time Period	Proposed Peak	l - 75% Build - AM		15 1 641		2010		
Project Description Ga		fic Study						
East/West Street: White			North/S	South Stree	et: Acorn	Lane		
Intersection Orientation:	East-West		Study F	Period (hrs): 0.25			
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)		117	25		15	77		
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			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
Vinor Street		Northbound				Southbou	ind	
Vovement	7	8	9		10	11		12
	L	T	R		L	Т		R
Volume (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				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0	<u> </u>	0
Configuration		LR	<u> </u>		~	<u> </u>		~
Delay, Queue Length, a	nd Level of So						I	
Approach	Eastbound	Westbound	N	Vorthbound	4		outhbour	nd
Movement	1	4	7	8	9	10	11	12
ane Configuration	1	LT	'	LR	3			12
/ (veh/h)		24		85	 			
C (m) (veh/h)		1386		733	 			
//c		0.02		0.12				
95% queue length		0.05		0.39				
Control Delay (s/veh)		7.6		10.6				
LOS		А		В				
Approach Delay (s/veh)				10.6		1	8	
Approach LOS				B				
				U				

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	TW	O-WAY STOP C	ONTRO	OL SUMI	MARY			
General Informatior	1		Site Ir	formatio	on			
Analyst	Shilpa Ma	llem		. P				
Agency/Co.		ternational	Interse				reek at Acc	orn Lane
Date Performed	12/27/201		Jurisdi			City of Do	over, DE	
Analysis Time Period	Proposed Peak	- 75% Build - AM	Analys	is rear		2016		
Project Description Ga	rrison Oak Traff	ic Study						
East/West Street: N Littl	le Creek		North/S	outh Stree	et: Acorn	Lane		
Intersection Orientation:	East-West		Study F	Period (hrs)): 0.25			
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)	24	134				308		23
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82	(0.68
Hourly Flow Rate, HFR (veh/h)	30	167	0		0	375		33
Percent Heavy Vehicles	2				2			
Median Type				Undivided	d			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration	LT							TR
Upstream Signal		0				0		
Minor Street		Northbound				Southbou	Ind	
Movement	7	8	9		10	11		12
	L	T	R		10	Т		R
Volume (veh/h)		· · · · · · · · · · · · · · · · · · ·			33	· · · ·		46
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00		.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		N N				N		
Storage		0				0		
RT Channelized			0			Ť		0
Lanes	0	0	0		0	0		0
Configuration	0	·	0		0			0
Delay, Queue Length, a	nd Loval of Sou							
Approach	Eastbound	Westbound	N	Northbound	4		outhbound	
Movement		4	7	8	9	10	11	12
	LT	4	1	0	9		LR	12
Lane Configuration								
v (veh/h)	30						103	
C (m) (veh/h)	1151				L	4	531	
v/c	0.03						0.19	
95% queue length	0.08						0.71	
Control Delay (s/veh)	8.2						13.4	
LOS	A				1	1	В	
Approach Delay (s/veh)					1	1	13.4	<u>I</u>
Approach LOS						-	 	
						1	D	

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	TW	O-WAY STOP C	ONTRO	L SUMMARY		
General Information			Site Inf	ormation		
Analyst	Shilpa Ma	allem			N Little Cree	k at SR 1 NB
Agency/Co.		nternational	Intersect	ion	Ramp	
Date Performed	12/27/20 ⁻	16	Jurisdicti	on	City of Dove	r, DE
Analysis Time Period	Proposed Peak	l - 75% Build - AM	Analysis	Year	2016	
Project Description Ga	rrison Oak Trat	fic Study				
East/West Street: N Littl		•	North/So	uth Street: SR1	NB On-Ramp	
Intersection Orientation:	East-West		Study Pe	riod (hrs): 0.25		
Vehicle Volumes an	d Adiustme	nts				
Major Street	_	Eastbound			Westbound	
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	68	166			76	27
Peak-Hour Factor, PHF	0.62	0.77	0.78	0.60	0.79	0.75
Hourly Flow Rate, HFR	109	215	0	0	96	36
(veh/h)		215	0		90	30
Percent Heavy Vehicles	2			2		
Median Type			l	Jndivided		
RT Channelized			0			0
Lanes	0	1	0	0	1	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
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		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			•	n
Approach	Eastbound	Westbound	No	orthbound	Sou	thbound
Movement	1	4	7	8 9	10	11 12
Lane Configuration	LT		<u> </u>	<u> </u>		
		├				
/ (veh/h)	109	<u> </u>				
C (m) (veh/h)	1453					
//c	0.08					
95% queue length	0.24					
Control Delay (s/veh)	7.7					
LOS	A					
Approach Delay (s/veh)			I			I
Approach LOS						
Approach LOS				TM V · FO	Conoratadi	

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	TWO	-WAY STOP C	ONTRO		IARY				
General Information			Site Inf	ormatio	on				
Analyst	Shilpa Mall	em	1			N Little C	reek at SR	1 SB	
Agency/Co.	T.Y. Lin Int		Intersect	ion		Ramp			
Date Performed	12/27/2016		Jurisdicti	on		City of Do	over, DE		
Analysis Time Period	Proposed - Peak	75% Build - AM	Analysis	Year		2016			
Project Description Gari	rison Oak Traffic	c Study							
East/West Street: N Little			North/So	uth Stree	t: SR1 S	B Off-Ramp			
ntersection Orientation:	East-West		Study Pe	riod (hrs)	: 0.25	•			
Vehicle Volumes and	d ∆diustmen	ts							
Major Street		Eastbound				Westbou	nd		
Movement	1	2	3		4	5		6	
	L	<u>–</u> Т	R		L	T T		R	
Volume (veh/h)		168				76			
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78	(0.68	
Hourly Flow Rate, HFR	0	186	0		0	97		0	
(veh/ĥ)	0	186	0		0	97		0	
Percent Heavy Vehicles	2				2				
Vedian Type			R	aised cur	b				
RT Channelized			0					0	
anes	0	1	0		0	1		0	
Configuration		Т				Т			
Jpstream Signal		0				0			
Minor Street		Northbound				Southbou	und		
Movement	7	8	9		10	11		12	
Movement	Ļ	T	R		 L	Т		R	
Volume (veh/h)	-	-			66			207	
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.71	1.00		2.59 2.59	
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 I				N			
Storage		0				0			
		0						0	
RT Channelized			0					0	
Lanes	0	0	0		0	0		0	
Configuration						LR			
Delay, Queue Length, an	ir -					-			
Approach	Eastbound	Westbound	No	orthbound		S	outhbound		
Movement	1	4	7	8	9	10	11	12	
Lane Configuration							LR		
v (veh/h)		1					442		
C (m) (veh/h)							896		
v/c							0.49		
95% queue length							2.78	 	
Control Delay (s/veh)							12.9		
LOS							В		
Approach Delay (s/veh)							12.9		
Approach LOS							В		
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	1 4 4	O-WAY STOP C						
General Information			Site Inf	ormation				
Analyst	Shilpa Ma	allem				Is at Carrie	an Oak	
Agency/Co.		nternational	Intersect		City of Do	k at Garris	on Oak	
Date Performed	12/27/20	16			2016	over, DE		
Analysis Time Period	Proposed Peak	1 - 75% Build - PM	Analysis	rear	2016			
Project Description Ga	rrison Oak Trai	ffic Study						
East/West Street: White	Oak Road		North/Sou	uth Street: Garrise	on Oak Drive	;		
ntersection Orientation:	East-West		Study Pe	riod (hrs): 0.25				
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound			Westbou	nd		
Movement	1	2	3	4	5		6	
	L	Т	R	L	Т		R	
Volume (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	10			 Individed				
RT Channelized			0				0	
	0	1	0	0	1		0	
Lanes Configuration	LT	/	0	0			TR	
Jpstream Signal	LI	0			0		IR	
· •	<u> </u>				÷			
Minor Street	7	Northbound		10	Southbou		40	
Novement	7	8 T	9	10	<u>11</u> Т		12	
	L		R	L	I		R	
Volume (veh/h)	0.00	1.00	0.40	30	1.00		82	
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	30	0		89	
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	ervice		•		n .		
Approach	Eastbound	Westbound	No	rthbound	S	outhbound		
Vovement	1	4	7	8 9	10	11	12	
Lane Configuration	LT	<u>†</u> − †	·			LR		
/ (veh/h)	39	<u>├</u>			1	119		
	1462	┼───┼				874		
C (m) (veh/h)		<u>├</u>						
//c	0.03	├ ─── │				0.14	<u> </u>	
95% queue length	0.08					0.47		
Control Delay (s/veh)	7.5					9.8		
· · · · · · · · · · · · · · · · · · ·	-					Λ	1	
OS	A					A		
LOS Approach Delay (s/veh)	<u> </u>				_	9.8	I	

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	1 VV	O-WAY STOP C	ONTRO	JL SUN	IMARY				
General Information			Site Ir	nformat	ion				
Analyst	Shilpa Ma	allem	Interse	otion		W/bita Oa	k at A aar	n Lono	
Agency/Co.		nternational	Jurisdie			White Oa City of Do		II LAIIE	
Date Performed	12/27/201	6	Analysi			2016	iver, DE		
Analysis Time Period	Proposed Peak	- 75% Build - PM				2010			
Project Description Gar		fic Study							
East/West Street: White	Oak Road		North/South Street: Acorn Lane						
Intersection Orientation:	East-West		Study Period (hrs): 0.25						
Vehicle Volumes and	d Adjustme	nts							
Major Street		Eastbound				Westbou	nd		
Movement	1	2	3		4	5		6	
	L	Т	R		L	Т		R	
Volume (veh/h)		79	55		21	116		1.00	
Peak-Hour Factor, PHF	1.00	1.00	0.78		0.60	0.69	0.69		
Hourly Flow Rate, HFR (veh/h)	0	79	70		34	168		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				Southbou	Ind		
Movement	7	8	9		10	11		12	
	L	Т	R		L	Т		R	
/olume (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		1 1	0					0	
Lanes	0	0	0		0	0		0	
Configuration	Ť	LR	Ŭ		-	Ť		-	
Delay, Queue Length, ar	d Level of Se					1	1		
Approach	Eastbound	Westbound	N	lorthbour	nd		outhbour	nd	
Vovement	1	4	7	8	9	10	11	12	
_ane Configuration	•	LT		LR	Ť				
		34		123					
/ (veh/h)								_	
C (m) (veh/h)		1432		685					
//c		0.02		0.18				_	
95% queue length		0.07		0.65					
Control Delay (s/veh)		7.6		11.4					
LOS		Α		В					
Approach Delay (s/veh)			I	11.4	•		-		
Approach LOS				В		1			

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	тwo	D-WAY STOP C	ONTRO	DL SUMN	IARY				
General Informatior	า		Site In	formatio	on				
Analyst	Shilpa Mal	llem		4'					
Agency/Co.		ternational	- Intersec				reek at Acc	orn Lane	
Date Performed	12/27/201		Jurisdic			City of Do	over, DE		
Analysis Time Period	Proposed Peak	- 75% Build - PM	Analysis	s year		2016			
Project Description Ga	nrrison Oak Traffi	ic Study							
East/West Street: N Littl	le Creek		North/So	outh Stree	t: Acorn	Lane			
Intersection Orientation:	East-West		Study P	eriod (hrs)	: 0.25				
Vehicle Volumes an	nd Adjustmer	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		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				Undivided	1	_			
RT Channelized			0					0	
Lanes	0	1	0		0	1		0	
Configuration	LT							TR	
Upstream Signal		0				0	0		
Minor Street		Northbound				Southbou	ind		
Movement	7	8	9		10	11		12	
	L	T	R		L	Т		R	
Volume (veh/h)		· · ·			37	· ·		23	
Peak-Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00		2.85	
Hourly Flow Rate, HFR (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				N			
Storage	_	0				0			
RT Channelized			0			Ť		0	
Lanes	0	0	0		0	0		0	
Configuration			0		0			0	
Delay, Queue Length, a						LIN			
	i i	Westbound	N	orthbound	1		outhbound		
Approach Movement	Eastbound		i i		-	-		ñ	
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LT					<u> </u>	LR		
v (veh/h)	68						82	<u> </u>	
C (m) (veh/h)	1317						424		
v/c	0.05						0.19		
95% queue length	0.16						0.71		
Control Delay (s/veh)	7.9					1	15.5	i	
LOS	A						C		
Approach Delay (s/veh)							15.5		
• • • •							C		
Approach LOS							د د		

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		O-WAY STOP C				
General Information	1		Site Inf	ormation		
Analyst	Shilpa Ma	llem	Intersect	ion	N Little Cr	eek at SR 1 NB
Agency/Co.		nternational	Intersect	ion	Ramp	
Date Performed	12/27/201	6	Jurisdicti	on	City of Do	ver, DE
Analysis Time Period		- 75% Build - PM	Analysis	Year	2016	
-	Peak	Se Otrete				
Project Description Ga East/West Street: N Littl		ic Study	North/So	uth Streats SI	R1 NB On-Ramp	
Intersection Orientation:			_	riod (hrs): 0.2		
		. 4 .	Sludy Fe	110u (1115). 0.2		
Vehicle Volumes an	a Adjustme					
Major Street		Eastbound		<u> </u>	Westbour	
Movement	1	2	3	4	5	6
	L	Т	R	L	Т	R
Volume (veh/h)	188	134	0.70		124	71
Peak-Hour Factor, PHF	0.62	0.77	0.78	0.60	0.79	0.75
Hourly Flow Rate, HFR (veh/h)	303	174	0	0	156	94
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			Southbour	nd
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	1.00	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		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	So	outhbound
Movement	1	4	7	8	9 10	11 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					
LOS	A					
Approach Delay (s/veh)						
Approach LOS						

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		VO-WAY STOP								
General Information	n		Site Ir	nform	atio	on				
Analyst	Shilpa M		Interse	ction				reek at SR	1 SB	
Agency/Co.		International					Ramp			
Date Performed	12/27/20		Jurisdi				City of Do	ver, DE		
Analysis Time Period	Propose Peak	d - 75% Build - PM	Analys	is real	r		2016			
· · ·	arrison Oak Tra	affic Study					•			
East/West Street: N Litt						:: SR1 SB	Off-Ramp			
Intersection Orientation:	East-West		Study F	Period ((hrs):	0.25				
Vehicle Volumes ar	nd Adjustme	ents								
Major Street		Eastbound					Westbou	nd		
Movement	1	2	3			4	5		6	
	L	Т	R			L	Т		R	
Volume (veh/h)		299					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				Undiv	/ided			ł		
RT Channelized			0						0	
Lanes	0	1	0			0	1		0	
Configuration		Т					Т			
Upstream Signal		0					0	0		
Minor Street		Northbound					Southbou	nd		
Movement	7	8	9			10	11		12	
	L	Т	R			L	Т		R	
Volume (veh/h)						31			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				, v		0	
Lanes	0	0	0			0	0		0	
Configuration	0		0			0	LR		0	
Delay, Queue Length, a		onvico								
Approach	Eastbound	Westbound	N	Northbo	hund			outhbound	1	
Movement		4	7	8		9	10	11	12	
Lane Configuration	I		'			3	10	LR	12	
v (veh/h)		+						215		
		+ +								
C (m) (veh/h)		+						783	ļ	
v/c		+						0.27		
95% queue length		\downarrow						1.12		
Control Delay (s/veh)								11.3		
LOS								В		
Approach Delay (s/veh)								11.3		
Approach LOS								В		

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	1 VV	O-WAY STOP C	UNIKC					
General Informatior	1		Site In	formatio	on			
Analyst	Shilpa Ma	allem	Interes	otion			k at Carria	on Ook
Agency/Co.		nternational	Intersec				k at Garriso	on Oak
Date Performed	12/27/201	16	Jurisdic			City of Do 2016	over, DE	
Analysis Time Period	Proposed Peak	-100% Build - AM	Analysi	srear		2016		
Project Description Ga	rrison Oak Traf	fic Study						
East/West Street: Whote		•	North/S	outh Stree	t: Garriso	on Oak Drive)	
Intersection Orientation:	East-West		Study P	eriod (hrs)): 0.25			
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)	137	33				70		15
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		1.00
Hourly Flow Rate, HFR	198	78	0		0	00		15
(veh/ĥ)		/0	0		-	88		15
Percent Heavy Vehicles	10				2			
Median Type				Undivided	1	-		
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT							TR
Jpstream Signal		0				0		
Vinor Street		Northbound				Southbou	Ind	
Vovement	7	8	9		10	11		12
	Ĺ	T	R			T		R
/olume (veh/h)		· · ·			6	· ·		29
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		2.92).92
Hourly Flow Rate, HFR	0	0	0		6	0		31
Percent Heavy Vehicles	2	0	2		2	0		0
Percent Grade (%)		0				0		-
Flared Approach		N N				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration	0		0		0			0
Delay, Queue Length, a		rvice Westbound	N	la utla la cura a				
Approach	Eastbound		ir -	lorthbound	r	_	outhbound	n-
Vovement	1	4	7	8	9	10	11	12
_ane Configuration	LT	┝────┤					LR	
/ (veh/h)	198						37	<u> </u>
C (m) (veh/h)	1440						796	
//c	0.14						0.05	
95% queue length	0.48						0.15	
Control Delay (s/veh)	7.9	<u>├</u>					9.7	
LOS		├				+		
	A						A	
Approach Delay (s/veh)							9.7	
Approach LOS							Α	

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	TW	O-WAY STOP C	ONTRO		MARY			
General Informatior	1		Site Ir	nformati	on			
Analyst	Shilpa Ma	allem	Interse	ation		White Oa	k at Acar	a / ana
Agency/Co.	T.Y. Lin I	nternational	Jurisdie			City of Do		Lane
Date Performed	12/27/20 ⁻	16	Analysi			2016	Nei, DL	
Analysis Time Period	Proposec Peak	1 -100% Build - AM				2010		
Project Description Ga		ffic Study						
East/West Street: White	Oak Road				et: Acorn	Lane		
ntersection Orientation:	East-West		Study F	Period (hrs): 0.25			
Vehicle Volumes an	d Adjustme	nts						
Major Street	-	Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)		143	25		16	82		
Peak-Hour Factor, PHF	1.00	0.75	0.78		0.60	0.69		1.00
Hourly Flow Rate, HFR (veh/h)	0	190	32		26	118		0
Percent Heavy Vehicles	0				2			
Median Type				Undivide	d			
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration			TR		LT			
Upstream Signal		0				0		
Vinor Street		Northbound				Southbou	ind ind	
Vovement	7	8	9		10	11		12
	L	T	R		L	Т		R
Volume (veh/h)	29		18					
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		1.00
Hourly Flow Rate, HFR (veh/h)	48	0	44		0	0		0
Percent Heavy Vehicles	2	0	2		0	0		0
Percent Grade (%)		0			-	0		-
Flared Approach		N I				N		
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR	U		0			0
Delay, Queue Length, a	nd Lovel of Se							
Approach	Eastbound	Westbound	N	Jorthbound	4		outhboun	d
Novement		4	7	8	9	10	11	12
	I	LT	1		9	10		
_ane Configuration				LR				
/ (veh/h)		26		92				_
C (m) (veh/h)		1347		702				
//c		0.02		0.13				
95% queue length		0.06		0.45				
Control Delay (s/veh)		7.7		10.9				
LOS		A		В				
Approach Delay (s/veh)				10.9	1		1	
Approach LOS		 		B				
				ם				

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	TW	O-WAY STOP C	ONTRO		IARY			
General Information	I		Site Inf	ormatio	on			
Analyst	Shilpa Ma	allem	Intersect	ion		NI Little C	reek at Acc	rn I ana
Agency/Co.	T.Y. Lin Ir	nternational	Jurisdicti			City of Do		III Lane
Date Performed	12/27/201		Analysis			2016		
Analysis Time Period	Proposed Peak	-100% Build - AM		Teal		2070		
Project Description Ga	rrison Oak Trafi	fic Study						
East/West Street: N Littl	le Creek		North/So	uth Stree	t: Acorn	Lane		
ntersection Orientation:	East-West		Study Pe	riod (hrs)	: 0.25			
/ehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound				Westbou	nd	
Novement	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			
/ledian Type			l	Undivided	1	•		
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT							TR
Jpstream Signal		0				0	0	
/ /inor Street		Northbound				Southbou	Ind	
/lovement	7	8	9		10	11		12
	L	T	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
lourly 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				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	Nc	orthbound		s	outhbound	
Novement	1	4	7	8	9	10	11	12
ane Configuration	LT		<u> </u>	0	3	10	LR	
								<u> </u>
v (veh/h)	32						104	
C (m) (veh/h)	1149						528	
/c	0.03						0.20	
95% queue length	0.09						0.73	
Control Delay (s/veh)	8.2						13.5	
.OS	A						В	1
Approach Delay (s/veh)			I				13.5	8
Approach LOS							B	
•••								16 12:44

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	тw	O-WAY STOP C	ONTROL	_ SUMMARY		
General Information			Site Inf	ormation		
Analyst	Shilpa Ma	allem			N Little Creek	at SR 1 NB
Agency/Co.		nternational	Intersect	on	Ramp	
Date Performed	12/27/20 ⁻		Jurisdicti	on	City of Dover	, DE
Analysis Time Period	Proposec Peak	l -100% Build - AM	Analysis	Year	2016	
Project Description Ga	rrison Oak Traf	ffic Study	-1			
East/West Street: N Littl			North/Sou	uth Street: SR1	NB On-Ramp	
ntersection Orientation:	East-West		Study Per	riod (hrs): 0.25	•	
Vehicle Volumes an	d ∆diustme	nts		, ,		
Major Street		Eastbound			Westbound	
Movement	1	2	3	4	5	6
	Ĺ		R		T	R
Volume (veh/h)	68	166			76	27
Peak-Hour Factor, PHF	0.62	0.77	0.78	0.60	0.79	0.75
Hourly Flow Rate, HFR						
(veh/ĥ)	109	215	0	0	96	36
Percent Heavy Vehicles	2			2		
Median Type			L	Individed		
RT Channelized			0			0
Lanes	0	1	0	0	1	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
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		N			N	
Storage	1	0			0	
RT Channelized	1		0			0
Lanes	0	0	0	0	0	0
Configuration			-			1
Delay, Queue Length, a	nd Level of Se	rvice			I	1
Approach	Eastbound	Westbound	No	rthbound	Sout	nbound
Vovement	1	4	7	8 9	10	11 12
			· ·	5 9		11 12
Lane Configuration	LT	<u>├</u> ───┤				
/ (veh/h)	109	┨────┤				
C (m) (veh/h)	1453					
//c	0.08					
95% queue length	0.24					
Control Delay (s/veh)	7.7					
LOS	А					
Approach Delay (s/veh)			I		<u>_</u>	I
Approach LOS						
	rida, All Bighta Boa	I		TM v · co	Conorotodi	

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		D-WAY STOP C						
General Information	1		Site In	format	ion			
Analyst	Shilpa Ma		Intersed	rtion			reek at SR	1 SB
Agency/Co.		ternational				Ramp		
Date Performed	12/27/201		Jurisdic			City of Do	over, DE	
Analysis Time Period	Proposed Peak	-100% Build - AM	Analysi	s Year		2016		
Project Description Ga	rrison Oak Traffi	ic Study	-1					
East/West Street: N Littl			North/So	outh Stre	et: SR1 S	B Off-Ramp		
ntersection Orientation:	East-West		Study P	eriod (hrs	s): 0.25			
Vehicle Volumes an	d Adiustmer	nts						
Major Street	1	Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	T	R		L	Т		R
Volume (veh/h)		168				76		
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78		0.68
Hourly Flow Rate, HFR (veh/h)	0	186	0		0	97		0
Percent Heavy Vehicles	2				2			
Vedian Type			I	Raised cu	ırb			
RT Channelized			0	1			1	0
Lanes	0	1	0		0	1		0
Configuration		T	-		-	T		-
Upstream Signal		0				0		
Minor Street		Northbound				Southbound		
Movement	7	8	9		10	11		12
	L	T	R		L	Т		R
Volume (veh/h)					66			208
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		92	0		352
Percent Heavy Vehicles	2	0	2		2	0		3
Percent Grade (%)		0				0		-
Flared Approach		N				N	1	
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		II.			II	
Approach	Eastbound	Westbound	N	lorthboun	d	S	outhbound	
Movement	1	4	7	8	9	10	11	12
_ane Configuration		· · · · · · · · · · · · · · · · · · ·	-	-			LR	
/ (veh/h)					1		444	
C (m) (veh/h)					1		896	1
//c					+	+	0.50	
95% queue length							2.81	<u> </u>
Control Delay (s/veh)							12.9	<u> </u>
LOS							В	
Approach Delay (s/veh)							12.9	
Approach LOS						В		

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	1 44	O-WAY STOP C	UNIKUL				
General Information			Site Info	ormation			
Analyst	Shilpa Ma	allem] Intersecti	- in		Is at Carrie	
Agency/Co.		nternational	Intersecti			<u>k at Garris</u>	on Oak
Date Performed	12/27/201	16			City of Do 2016	over, DE	
Analysis Time Period	Proposed Peak	l -100% Build - PM	Analysis	rear	2016		
Project Description Gai	rrison Oak Traf	fic Study					
East/West Street: White	Oak Road		North/Sou	ith Street: Garri	son Oak Drive	9	
Intersection Orientation:	East-West		Study Per	iod (hrs): 0.25			
Vehicle Volumes an	d Adjustme	nts					
Major Street		Eastbound			Westbou	nd	
Movement	1	2	3	4	5	Î	6
	L	Т	R	L	Т		R
Volume (veh/h)	34	66			63		7
Peak-Hour Factor, PHF	0.69	0.42	0.78	0.60	0.79		1.00
Hourly Flow Rate, HFR (veh/h)	49	157	0	0	79		7
Percent Heavy Vehicles	10			2			
Median Type		•	U	Individed	•		
RT Channelized			0				0
Lanes	0	1	0	0	1		0
Configuration	LT		-				TR
Jpstream Signal		0			0		
Minor Street		Northbound			Southbou	Ind	
Movement	7	8	9	10	<u>.</u>	i	
	,	Т	R	L	т		12 R
Volume (veh/h)		· · ·		38	· ·		106
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	38	0		115
Percent Heavy Vehicles	2	0	2	2	0		10
Percent Grade (%)		0	-		0		10
Flared Approach		N I			N N		
Storage	-	0			0		
0				_			0
RT Channelized		+	0		<u> </u>		0
Lanes	0	0	0	0	0		0
Configuration					LR		
Delay, Queue Length, ar		i i					
Approach	Eastbound	Westbound	II.	rthbound		outhbound	1
Movement	1	4	7	8 9	10	11	12
Lane Configuration	LT					LR	
v (veh/h)	49					153	
C (m) (veh/h)	1461					850	
//c	0.03					0.18	1
95% queue length	0.10					0.65	
v	7.5	├					
Control Delay (s/veh)		├ ───┤				10.2	
LOS	А	├ ───┤				В	
Approach Delay (s/veh)						10.2	
Approach LOS						В	

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	1 VV	O-WAY STOP O						
General Information			Site In	formati	on			
Analyst	Shilpa Ma	allem	Interse	otion		White Oa	k of Acor	
Agency/Co.	T.Y. Lin II	nternational	Jurisdic			City of Do		n Lane
Date Performed	12/27/201		Analysi			2016	iver, DE	
Analysis Time Period	Proposed Peak	I -100% Build - PM				2010		
Project Description Ga	rrison Oak Traf	fic Study						
East/West Street: White	Oak Road		North/S	outh Stree	et: Acorn	Lane		
ntersection Orientation:	East-West		Study P	Period (hrs): 0.25			
Vehicle Volumes an	d Adjustme	nts						
Major Street		Eastbound				Westbou	nd	
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				Undivide	d			
RT Channelized			0					0
_anes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
Minor Street		Northbound				Southbou	ind .	
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	ľ	
Storage		0				0		
RT Channelized			0					0
Lanes	0	0	0		0	0		0
Configuration		LR	0		v			0
Delay, Queue Length, a	nd Lavel of So			I				
Approach	Eastbound	Westbound	N	Jorthbound	4		outhboun	d
Movement	Easibound 1	4	7	onnoannoi 8	9	10	ouinboun 11	12
	I	LT	1		9	10		
_ane Configuration				LR				
/ (veh/h)		39		126				
C (m) (veh/h)		1425		652	 			
//c		0.03		0.19				
95% queue length		0.08		0.71				
Control Delay (s/veh)		7.6		11.8				
LOS		A		В	1			
Approach Delay (s/veh)				11.8	1			I
						1		

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	TW	O-WAY STOP C	CONTRO		MARY			
eral Information			Site In	formatio	on			
yst	Shilpa Ma	allem	Intersed	ation		N Little C	reek at Acc	rn Lane
ncy/Co.		nternational	Jurisdic			City of Do		
Performed	12/27/201		Analysi			2016		
ysis Time Period	Proposed Peak	-100% Build - PM		5 100		2010		
ct Description Garr		fic Study						
West Street: N Little	Creek		North/So	outh Stree	t: Acorn	Lane		
section Orientation:	East-West		Study P	eriod (hrs)	: 0.25			
icle Volumes and	l Adjustme	nts						
r Street		Eastbound				Westbou	nd	
ement	1	2	3		4	5		6
	L	Т	R		L	Т		R
ne (veh/h)	54	334				171		28
-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82		0.68
ly Flow Rate, HFR h)	68	417	0		0	208		41
ent Heavy Vehicles	2				2			
an Type	2			Undivided				
hannelized	1		0		4			0
S	0	1	0		0	1		0
guration	LT	/	0		0	· · ·		TR
ream Signal	L1	0				0		
ean Signal								
	7	Northbound	9		10	Southbound 11		12
ement		8 T	 R		10			R
	L		ĸ		L 39			25
ne (veh/h) -Hour Factor, PHF	0.60	1.00	0.40		0.67	1.00		<u>∠5</u> 0.85
ly Flow Rate, HFR	0.60	1.00	0.40					
h)	0	0	0		58	0		29
ent Heavy Vehicles	2	0	2		2	0		3
ent Grade (%)		0				0		
d Approach		N				N		
orage		0				0		
hannelized			0					0
S	0	0	0		0	0		0
guration						LR		
y, Queue Length, and	d Level of Se	rvice				•	l	
	Eastbound	Westbound	N	lorthbound		s	outhbound	
ement	1	4	7	8	9	10	11	12
Configuration	LT		·	<u> </u>	Ť		LR	<u>'</u>
h/h)	68					+	87	
,	1317					+	426	
) (veh/h)								
	0.05						0.20	
					L			
rol Delay (s/veh)	7.9						15.6	
	Α						С	
oach Delay (s/veh)							15.6	
							С	
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	1 **	O-WAY STOP C	ONTROL				
General Information			Site Info	ormation			
Analyst	Shilpa Ma	allem			N Little Creek	at SR 1 NB	
Agency/Co.		nternational	Intersecti	on	Ramp		
Date Performed	12/27/201		Jurisdictio	on	City of Dover,	DE	
Analysis Time Period	Proposeo Peak	l -100% Build - PM	Analysis	Year	2016		
Project Description Gar	rison Oak Traf	fic Studv	-1				
East/West Street: N Little			North/Sou	th Street: SR1 N	IB On-Ramp		
ntersection Orientation:	East-West			iod (hrs): 0.25	1		
Vehicle Volumes an	d ∆diustme	nts					
Major Street		Eastbound			Westbound		
Movement	1	2	3	4	5	6	
			R	L .	T	R	
Volume (veh/h)	189	135		- <u> </u>	124	71	
Peak-Hour Factor, PHF	0.62	0.77	0.78	0.60	0.79	0.75	
Hourly Flow Rate, HFR							
(veh/ĥ)	304	175	0	0	156	94	
Percent Heavy Vehicles	2			2			
Median Type			U	Individed			
RT Channelized			0			0	
anes	0	1	0	0	1	0	
Configuration	LT					TR	
Upstream Signal		0			0		
Minor Street		Northbound			Southbound		
Movement	7	8	9	10	11	12	
	Ĺ	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 (veh/h)	0	0	0	0	0	0	
Percent Heavy Vehicles	2	0	2	2	0	8	
Percent Grade (%)	_	0			0	-	
Flared Approach		N I		_	N N	1	
Storage		0			0		
			0				
RT Channelized			0			0	
Lanes	0	0	0	0	0	0	
Configuration	<u> </u>						
Delay, Queue Length, ar		r			1		
Approach	Eastbound	Westbound	1	rthbound		nbound	
Movement	1	4	7	8 9	10	11 12	
Lane Configuration	LT						
/ (veh/h)	304						
C (m) (veh/h)	1316						
//c	0.23						
95% queue length	0.20	<u>├</u>			+		
		<u>}</u>			+ +		
Control Delay (s/veh)	8.6	├ ─── ├			+		
LOS	A						
Approach Delay (s/veh)							
Approach LOS							

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		VO-WAY STOP C	0					
General Information	า		Site Info	ormatio	n			
Analyst	Shilpa M		Intersecti	on			reek at SR	1 SB
Agency/Co.		International				Ramp		
Date Performed	12/27/20		Jurisdictio			City of Do	over, DE	
Analysis Time Period	Propose Peak	d -100% Build - PM	Analysis `	Year		2016		
Project Description Ga		ffic Study	11					
East/West Street: N Litt						B Off-Ramp		
ntersection Orientation:	East-West		Study Per	riod (hrs):	0.25			
Vehicle Volumes ar	nd Adjustme	ents						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	Т	R		L	Т		R
Volume (veh/h)		301				124		
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			U	Individed				
RT Channelized			0					0
Lanes	0	1	0		0	1		0
Configuration		Т				Т		
Jpstream Signal		0				0		
Minor Street		Northbound				Southbound		
Vovement	7	8	9		10	11		12
	L	Т	R		L	Т		R
Volume (veh/h)					31			102
Peak-Hour Factor, PHF	0.60	1.00	0.40).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	0		0	_	0			0
						LN		
Delay, Queue Length, a			N.					1
Approach	Eastbound	Westbound		rthbound		_	outhbound	<u>n</u>
Movement	1	4	7	8	9	10	11	12
Lane Configuration		↓					LR	
/ (veh/h)							215	<u> </u>
C (m) (veh/h)							783	
//c							0.27	
95% queue length							1.12	
Control Delay (s/veh)							11.3	
LOS		1 1					B	
_00 Approach Delay (s/veh)						+	11.3	
Approach LOS		+				+	 	
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	-	WO-WAY STOP						
General Information			Site Inf	ormation	า			
Analyst	Shilpa Ma		Intersec	tion		White Oa	k at Garriso	on Oak
Agency/Co.		nternational	Jurisdict			City of Do		
Date Performed	<u>12/27/201</u>		Analysis	s Year		2016	·	
Analysis Time Period	Prop_100 Peak	% Build_LDS_AM						
	rrison Oak Traff	ic Study						
East/West Street: Whote						n Oak Drive		
ntersection Orientation:			Study Pe	eriod (hrs)	: 0.25			
/ehicle Volumes and	Adjustments							
Aajor Street		Eastbound				Westbou	nd	
Novement	1	2	3		4	5		6
(aluma (uah/h)	L 148	T	R		L	T 220		R
/olume (veh/h) Peak-Hour Factor, PHF	148 0.69	33 0.42	0.78		0.60	229 0.79		<u>18</u> 1.00
lourly Flow Rate, HFR	214	78	0.78		0.00	289		<u>1.00</u> 18
veh/ĥ)	10				2			
Percent Heavy Vehicles	10			1 1	_			
Nedian Type				Undivided	1	1		
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT						TR	
Jpstream Signal		0				0		
/linor Street		Northbound	1			Southbou	ind	
lovement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)		(00			7	1 1 0 0		30 0.92
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00	.00 0.	
lourly Flow Rate, HFR veh/h)	0	0	0		7	0		32
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 Ser	vice						
Approach	Eastbound	Westbound	N	orthbound		S	outhbound	
/lovement	1	4	7	8	9	10	11	12
ane Configuration	LT						LR	
r (veh/h)	214						39	1
(m) (veh/h)	1210						582	<u> </u>
/c	0.18	├				+	0.07	
		┝────┼						
5% queue length	0.64	┝────┼					0.21	
Control Delay (s/veh)	8.6						11.6	
.OS	А						В	
pproach Delay (s/veh)							11.6	
			В					

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				f				
General Information	<u>lo: "</u>			formatio	on			
Analyst	Shilpa Ma	allem nternational	Interse	ction		White Oa	k at Acorn	Lane
Agency/Co. Date Performed	1.Y. Lin II 12/27/201		Jurisdi	ction		City of Do	ver, DE	
		% Build_LDS_ AM	- Analys	is Year		2016		
Analysis Time Period	Peak							
	rrison Oak Traff	ïc Study						
East/West Street: White					et: Acorn	Lane		
ntersection Orientation:	East-West		Study F	Period (hr	s): 0.25			
/ehicle Volumes and	Adjustments							
Major Street		Eastbound				Westbound		
Novement	1	2	3		4	5 T		6
/- l	L	T	R		L			R
/olume (veh/h) Peak-Hour Factor, PHF	1.00	161 0.75	25 0.78		<u>41</u> 0.60	218 0.69		1.00
Hourly Flow Rate, HFR								
veh/h)	0	214	32		68	315		0
Percent Heavy Vehicles	0				2			
/ledian Type		·		Undivid	ed			
RT Channelized	_		0					0
anes	0	1	0		0	1		0
Configuration			TR		LT			
Jpstream Signal		0				0		
Minor Street		Northbound				Southbou	Ind	
Novement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)	29		20				0 1.0	
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00	.00 1	
Hourly Flow Rate, HFR veh/h)	48	0	49		0	0		0
Percent Heavy Vehicles	2	0	2		0	0		0
Percent Grade (%)		0				0		
-Iared 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 Ser	vice					•	
Approach	Eastbound	Westbound		Northbou	nd	S	outhbound	d
Novement	1	4	7	8	9	10	11	12
_ane Configuration		LT		LR	1			
/ (veh/h)		68		97	1			
C (m) (veh/h)		1320		533				
//c		0.05		0.18	+			
95% queue length		0.16		0.66	+			
Control Delay (s/veh)		7.9		13.3				
		7.9 A		13.3 B				
Approach Delay (s/veh)				13.3				
Approach LOS			В		1			

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	Т							
General Information			Site In	formatio	on			
Analyst	Shilpa Ma		Interse	ction		N Little C	reek at Aco	rn Lane
Agency/Co.		nternational	Jurisdi			City of Do		
Date Performed	12/27/201		- Analys	is Year		2016		
Analysis Time Period	Peak	% Build_LDS_AM						
	rrison Oak Traff	ic Study	-					
East/West Street: N Littl					et: Acorn L	ane		
ntersection Orientation:			Study I	Period (hr	s): 0.25			
/ehicle Volumes and	Adjustments							
Major Street		Eastbound				Westbou	nd	
Novement	1	2	3		4	5		6
/olume (veh/h)	L 26	Т 134	R		L	Т 308		R 26
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82		20 0.68
lourly Flow Rate, HFR veh/h)	32	167	0.70		0.00	375	`	38
Percent Heavy Vehicles	2				2			
Aedian Type				Undivid				
RT Channelized			~		eu			0
-			0					0
anes	0	1	0		0	1		0
Configuration	LT					-		TR
Jpstream Signal		0				0		
Minor Street		Northbound			10	Southbou	ind	10
Novement	7	8	9		10	11		12
	L	Т	R		L 45	Т		R 60
/olume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40		<u>45</u> 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		
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 Ser	vice						
Approach	Eastbound	Westbound		Northbou	nd	S	outhbound	
Novement	1	4	7	8	9	10	11	12
ane Configuration	LT				1		LR	
/ (veh/h)	32						137	
C (m) (veh/h)	1146						525	
//c	0.03	├─── ┼			+		0.26	
95% queue length	0.09	├ ──── ├			+		1.04	
Control Delay (s/veh)	8.2						14.3	
		┝────┼					B	
OS	A	 -						
Approach Delay (s/veh)							14.3	
Approach LOS							В	

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General Information			Site In	formatio	n	<u>.</u>		
Analyst	Shilpa Ma		Intersed	ction		N Little Cr	eek at SR	1 NB
Agency/Co.		nternational	Jurisdic			Ramp City of Do	VOR DE	
Date Performed	12/27/201 Bron 100	% Build_LDS_AM	Analysi			2016	ver, DE	
Analysis Time Period	Prop_100 Peak	% Build_LDS_AM		3 1 Cal		2070		
Project Description Ga		ic Study						
East/West Street: N Littl						B On-Ramp		
ntersection Orientation:			Study P	eriod (hrs)): 0.25			
/ehicle Volumes and	Adjustments							
Major Street		Eastbound				Westbour	nd	
Novement	1	2	3		4	5		6
/olume (veh/h)	L 71	Т 174	R		L	Т 76		R 27
Peak-Hour Factor, PHF	0.62	0.77	0.78		0.60	0.79		0.75
Hourly Flow Rate, HFR	114	225	0.70		0.00	96		36
veh/ĥ)		-	-		-			
Percent Heavy Vehicles	2				2			
/ledian Type				Undivide	d			
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT					_		TR
Jpstream Signal		0				0		
linor Street		Northbound				Southbou	nd	
Novement	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			0.40			1.00		
veh/h)	0	0	0		0	0		0
Percent Heavy Vehicles	2	0	2		2	0		8
Percent Grade (%)		0				0		
Iared 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 Ser	vice						
Approach	Eastbound	Westbound	N	lorthbound	d	S	outhbound	
<i>l</i> lovement	1	4	7	8	9	10	11	12
ane Configuration	LT				1	1		
v (veh/h)	114				1			1
C (m) (veh/h)	1453	++			1			
//c	0.08	┝────┼				+		
95% queue length	0.26				 			
Control Delay (s/veh)	7.7							
OS	А							
Approach Delay (s/veh)								
Approach LOS								

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		WO-WAY STOP						
General Information			Site In	formati	on			
Analyst	Shilpa M		Interse	ction			reek at SR	1 SB
Agency/Co.		nternational	Jurisdi	ction		Ramp City of Dc	war DE	
Date Performed	12/27/20 Drop 10/			is Year		2016	ivel, DE	
Analysis Time Period	Prop_100 Peak	0% Build _LDS_AM	Analys			2010		
Project Description Ga	rrison Oak Traf	fic Studv						
East/West Street: N Littl			North/S	outh Stre	et: SR1 S	B Off-Ramp		
ntersection Orientation:	East-West		Study F	Period (hr	s): 0.25			
Vehicle Volumes and	Adjustments	5						
Major Street		Eastbound				Westbou	nd	
Movement	1	2	3		4	5		6
	L	T	R		L	T		R
Volume (veh/h)	0.70	179	0.70		0.00	76		
Peak-Hour Factor, PHF Hourly Flow Rate, HFR	0.79	0.90	0.78		0.60	0.78		0.68
veh/h)	0	198	0		0	97		0
Percent Heavy Vehicles	2				2			
Vedian Type	_			Raised c	urb			
RT Channelized			0					0
_anes	0	1	0		0	1		0
Configuration		Т				Т		
Jpstream Signal		0				0		
Minor Street		Northbound				Southbou	Ind	
Movement	7	8	9		10	11		12
	L	Т	R		L	Т		R
Volume (veh/h)	_				66		2	
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		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, a	nd Level of Se	rvice						
Approach	Eastbound	Westbound	1	Northbou	nd	S	outhbound	
Novement	1	4	7	8	9	10	11	12
ane Configuration							LR	
v (veh/h)							447	
C (m) (veh/h)							894	
//c		<u>├</u> ───┤			+		0.50	
		┼───┼			+			
95% queue length		┥───┤					2.85	
Control Delay (s/veh)		├ ──── ├			_		13.0	<u> </u>
LOS							В	
Approach Delay (s/veh)							13.0	
Approach LOS							В	
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	T	WO-WAY STOP	CONTRO						
General Information			Site In	formatio	on				
Analyst		Shilpa Mallem				White Oak at Garrison Oak			
Agency/Co.		nternational	Intersection		City of Dover, DE				
Date Performed	12/27/201		-	Analysis Year		2016			
Analysis Time Period	Prop_100 Peak								
	nrrison Oak Traff	ïc Study							
East/West Street: White			-		et: Garriso	n Oak Drive			
ntersection Orientation:			Study F	Period (hrs	s): 0.25				
Vehicle Volumes and	Adjustments								
Major Street		Eastbound					nd		
Movement	1	2	3		4	5		6	
Volume (veh/h)	L 35	T 227	R		L	Т 63		R 8	
Peak-Hour Factor, PHF	0.69	0.42	0.78		0.60	0.79		0 1.00	
Hourly Flow Rate, HFR veh/h)	50	540	0.70		0	79		8	
Percent Heavy Vehicles	10				2				
Median Type	10			Undivide					
RT Channelized	+		0		50	1		0	
	0	1	-		0	1		0	
anes	-	1	0		0	1		•	
Configuration	LT							TR	
Jpstream Signal		0				0			
Minor Street		Northbound			4.0	Southbound		10	
Novement	7	8	9		10	11		12	
/olume (veh/h)	L	Т	R		L 40	Т		R 116	
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	0		126	
Percent Heavy Vehicles	2	0	2		2	0		10	
Percent Grade (%)		0				0			
-Iared 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	1	Northbour	nd	s	outhbound		
Novement	1	4	7	8	9	10	11	12	
ane Configuration	LT	· · · · · · · · · · · · · · · · · · ·	,	5			LR	- 12	
(veh/h)	50	<u> </u>					166		
, ,		├ ──── │			+	+		<u> </u>	
C (m) (veh/h)	1460	├ ──── ├					700		
//c	0.03	ļļ					0.24		
95% queue length	0.11						0.92		
Control Delay (s/veh)	7.6						11.7		
OS	А						В		
Approach Delay (s/veh)							11.7		
Approach LOS						1	В		
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	•	WO-WAY STOP						
General Information			Site In	formatio	on			
Analyst	Shilpa Mallem		Interse	Intersection		White Oak at Acorn Lane		
Agency/Co.		nternational		Jurisdiction		City of Dover, DE		
Date Performed						2016		
Analysis Time Period Prop_100% Peak		% Build_LDSPM						
	rrison Oak Traff	ic Study						
East/West Street: White				North/South Street: Acorn La				
ntersection Orientation:	East-West		Study F	Period (hrs	s): 0.25			
/ehicle Volumes and	Adjustments							
Aajor Street		Eastbound		Westbound				
Novement	1	2	3		4	5		6
	L	T	R		L	T (50		R
/olume (veh/h) Peak-Hour Factor, PHF	1.00	225	55		27	152		1 00
Hourly Flow Rate, HFR	1.00	1.00	0.78		0.60	0.69		1.00
veh/ĥ)	0	225	70		44	220		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		
/inor Street		Northbound				Southbound		
Novement	7	8	9		10	11		12
	L	Т	R		L	Т		R
/olume (veh/h)	57		34					
Peak-Hour Factor, PHF	0.60	1.00	0.40		1.00	1.00		1.00
lourly 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, a	nd Level of Ser	vice		•				
Approach	Eastbound	Westbound	1	Northboun	ıd	Southbound		d
Novement	1	4	7	8	9	10	11	12
ane Configuration	•	LT		LR				
v (veh/h)		44		178		1		
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				
OS		А		В				
			14.0			8		
Approach Delay (s/veh)				14.0				

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		WO-WAY STOP						
General Information			Site Inf	formatio	า			
Analyst		Shilpa Mallem			N Little Creek at Acorn Lane			
Agency/Co.		nternational	Jurisdiction		City of Dover, DE			
Date Performed	12/27/201			Analysis Year		2016		
Analysis Time Period	Prop_100 Peak	Prop_100% Build_LDS_PM Peak						
Project Description Ga		ic Study						
East/West Street: N Litt					t: Acorn L	.ane		
ntersection Orientation:			Study P	eriod (hrs)	: 0.25			
/ehicle Volumes and	Adjustments							
Major Street		Eastbound		Westbound				
Novement	1	2	3		4	5		6
/olume (veh/h)	68	T 334	R		L	T 171		R 35
Peak-Hour Factor, PHF	0.79	0.80	0.78		0.60	0.82		35 0.68
lourly Flow Rate, HFR veh/h)	86	417	0.78		0.00	208		51
Percent Heavy Vehicles	2	_			2			
	2			Undivide				
Median Type			^	Undivided	J			
RT Channelized			0					0
anes	0	1	0		0	1		0
Configuration	LT							TR
Jpstream Signal		0				0		
Ainor Street		Northbound				Southbound		
Novement	7	8	9		10	11		12
(- l	L	Т	R		L	Т		R
/olume (veh/h) Peak-Hour Factor, PHF	0.60	1.00	0.40		42 0.67	1.00		25 0.85
Hourly Flow Rate, HFR								
veh/ĥ)	0	0	0		62	0		29
Percent Heavy Vehicles	2	0	2		2	0 3		3
Percent Grade (%)		0				0		
Iared 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 Sei	vice						
Approach	Eastbound	Westbound	Ν	lorthbound	1	S	outhbound	
/lovement	1	4	7	8	9	10	11	12
ane Configuration	LT						LR	
/ (veh/h)	86						91	
, ,	1306	├					-	
C (m) (veh/h)					 		396	
ı/c	0.07	ļļ			 		0.23	
95% queue length	0.21						0.88	
Control Delay (s/veh)	8.0						16.8	
OS	А						С	Ĩ
Approach Delay (s/veh)			I				16.8	8
Approach LOS							C	
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General Information			Site Information					
Analyst	Shilpa Mallem		Intersection			N Little Creek at SR 1 N		
Agency/Co.		nternational				Ramp		
Date Performed	12/27/201		Jurisdiction			City of Dover, DE		
Analysis Time Period	Prop_100 Peak	% Build_LDS_PM	Analysis Year		2016	2016		
Project Description Ga	rrison Oak Traff	ic Study			•			
East/West Street: N Littl			North/So	uth Street: S	R1 NB On-Ram	2		
ntersection Orientation:	East-West		Study Pe	riod (hrs): 0.2	25			
/ehicle Volumes and	Adjustments							
Major Street		Eastbound			Westb	ound		
Vovement	1	2	3	4	5		6	
	L	Т	R	L	Т		R	
Volume (veh/h)	192	135			120		71	
Peak-Hour Factor, PHF	0.62	0.77	0.78	0.60	0.7	<u>y</u>	0.75	
lourly Flow Rate, HFR veh/h)	309	175	0	0	159)	94	
Percent Heavy Vehicles	2			2				
Median Type			l	Jndivided				
RT Channelized			0				0	
anes	0	1	0	0	1		0	
Configuration	LT						TR	
Jpstream Signal		0			0			
Vinor Street		Northbound			Southb	Southbound		
Novement	7	8	9	10			12	
	L	Т	R	L	Т		R	
/olume (veh/h)								
Peak-Hour Factor, PHF	0.60	1.00	0.40	0.71	1 1.0)	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		Ν			N			
Storage		0			0			
RT Channelized			0				0	
_anes	0	0	0	0	0		0	
Configuration								
Delay, Queue Length, a	nd Level of Ser	vice						
Approach	Eastbound	Westbound	No	orthbound		Southbound		
Novement	1	4	7	8	9 10	11	12	
ane Configuration	LT			-				
/ (veh/h)	309							
C (m) (veh/h)	1312					+	-	
//c		├				+		
	0.24	└─── ─					_	
95% queue length	0.92							
Control Delay (s/veh)	8.6							
_OS	А							
Approach Delay (s/veh)			_					
Approach LOS								

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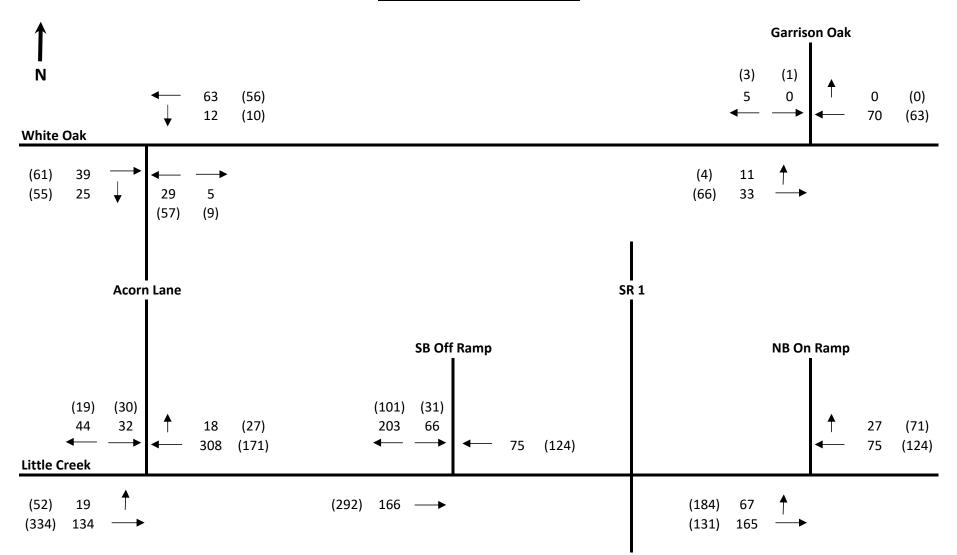
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	I	WO-WAY STOP								
General Information			Site In	format	ion					
Analyst	Shilpa Mallem		Interse	Intersection		N Little Creek at SR 1 SB				
Agency/Co.		T.Y. Lin International				Ramp				
Date Performed	12/27/20		Jurisdi			City of Dover, DE				
Analysis Time Period	Prop_10 Peak	0% Build_LDS_PM	Analysis Year		2010	2016				
Project Description Ga	rrison Oak Traf	fic Study				•				
East/West Street: N Littl			North/South Street: SR1 SB Off-Ramp							
ntersection Orientation:	East-West		Study F	Period (h	rs): 0.25					
Vehicle Volumes and	Adjustments	;								
Major Street		Eastbound		Westbound						
Movement	1	2	3		4	5		6		
	L	Т	R		L	Т		R		
Volume (veh/h)		304				126				
Peak-Hour Factor, PHF	0.79	0.90	0.78		0.60	0.78		0.68		
Hourly Flow Rate, HFR veh/h)	0	337	0		0	161		0		
Percent Heavy Vehicles	2				2					
Median Type				Undivid	ded					
RT Channelized			0					0		
_anes	0	1	0		0	1		0		
Configuration		Т				Т				
Jpstream Signal		0				0				
Minor Street		Northbound				Southbound				
Novement	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		0.59		
Hourly Flow Rate, HFR [veh/h]	0	0	0		43	0		181		
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		Northbou	und	S	Southbound			
Novement	1	4	7	8	9	10	11	12		
_ane Configuration		† †		-			LR			
/ (veh/h)							224	1		
C (m) (veh/h)		+ +					782	+		
//c		├								
							0.29	<u> </u>		
95% queue length		↓					1.18	 		
Control Delay (s/veh)	L						11.4			
LOS							В			
Approach Delay (s/veh)							11.4			
Approach LOS							В			
Copyright © 2010 University of Fl	lorida. All Rights Re	served		HCS+™ V	lersion 5.6	Gene	erated: 1/16/20)17 3.3		

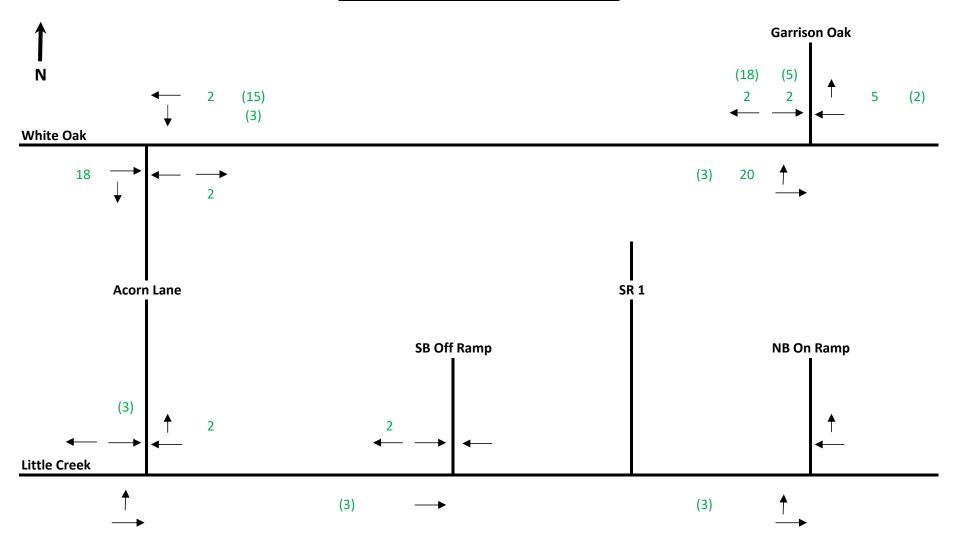
HCS+[™] Version 5.6 Generated: 1/16/2017 3:31 PM

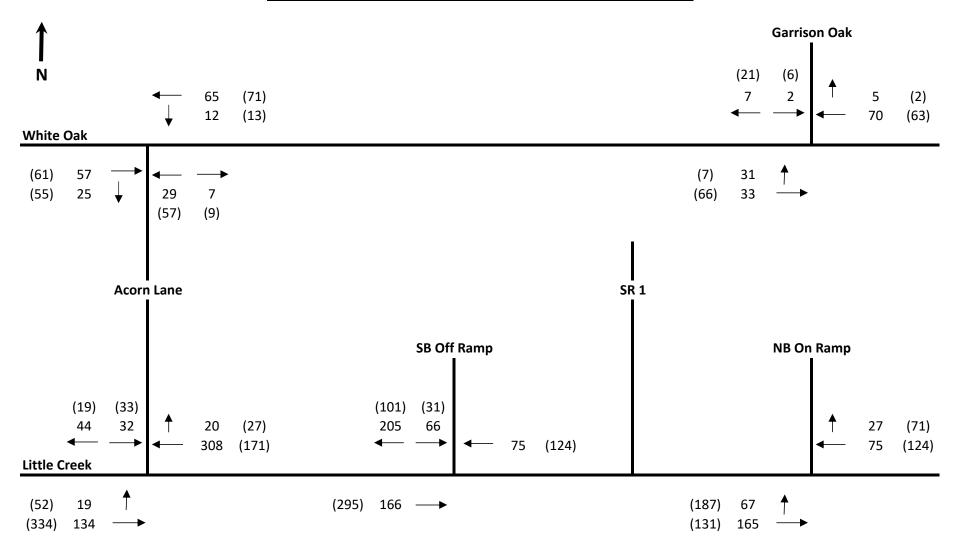
APPENDIX B TRIP DISTRIBUTION

Existing Traffic Conditions

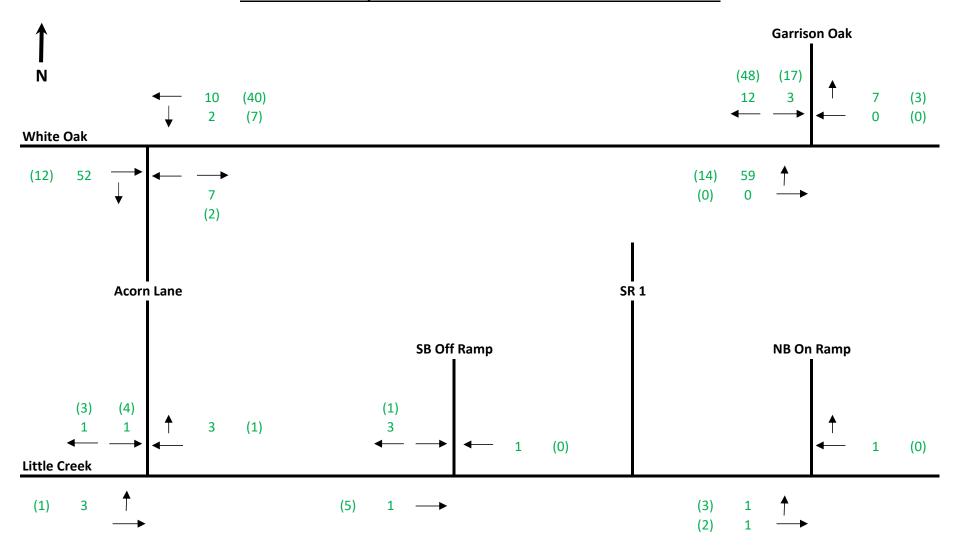


Proposed Development: Advantech

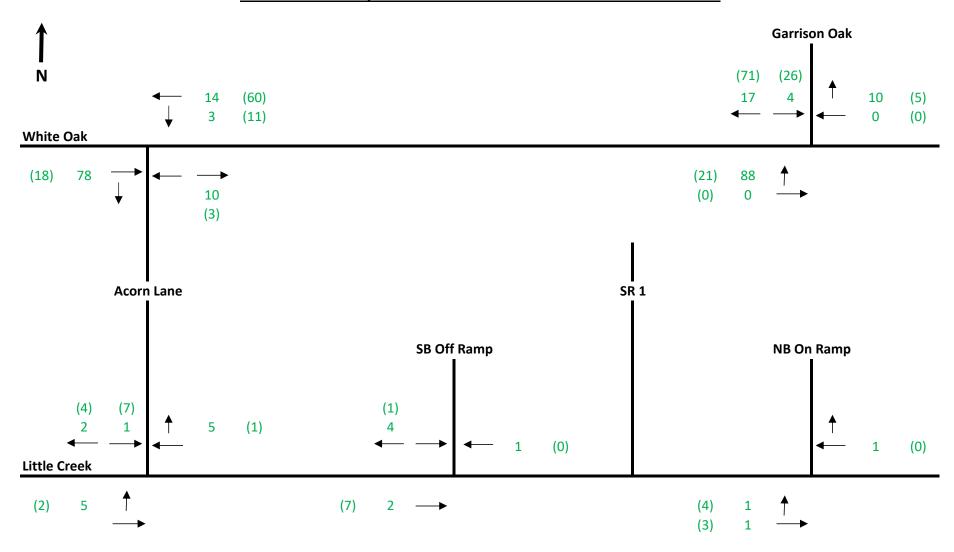




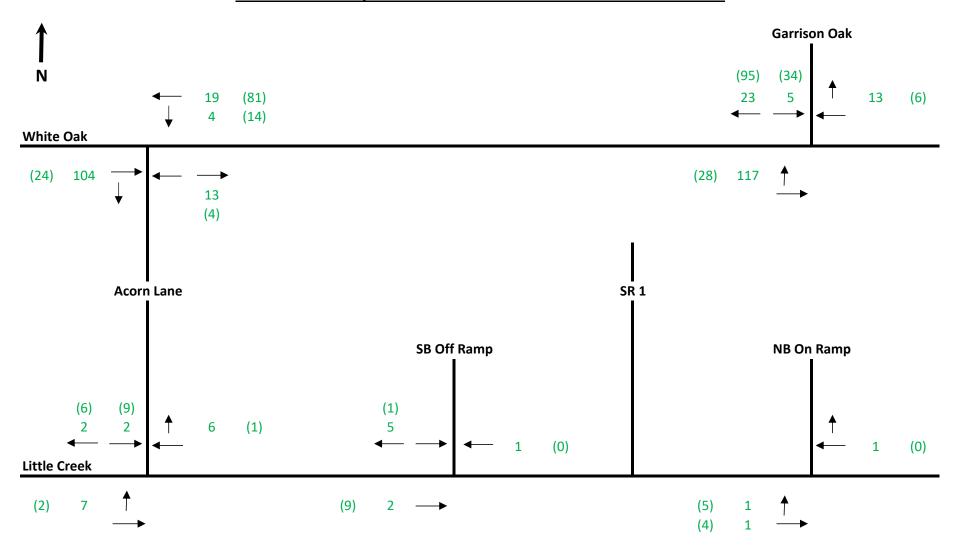
Study Baseline Conditions: Existing Traffic + Advantech



Garrison Oak Trip Generation and Distribution: 50% Build Out

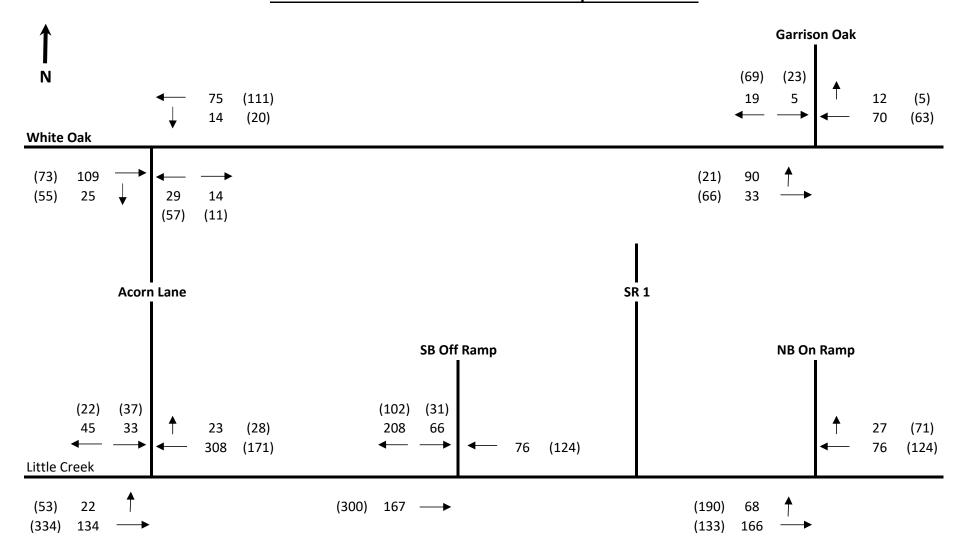


Garrison Oak Trip Generation and Distribution: 75% Build Out



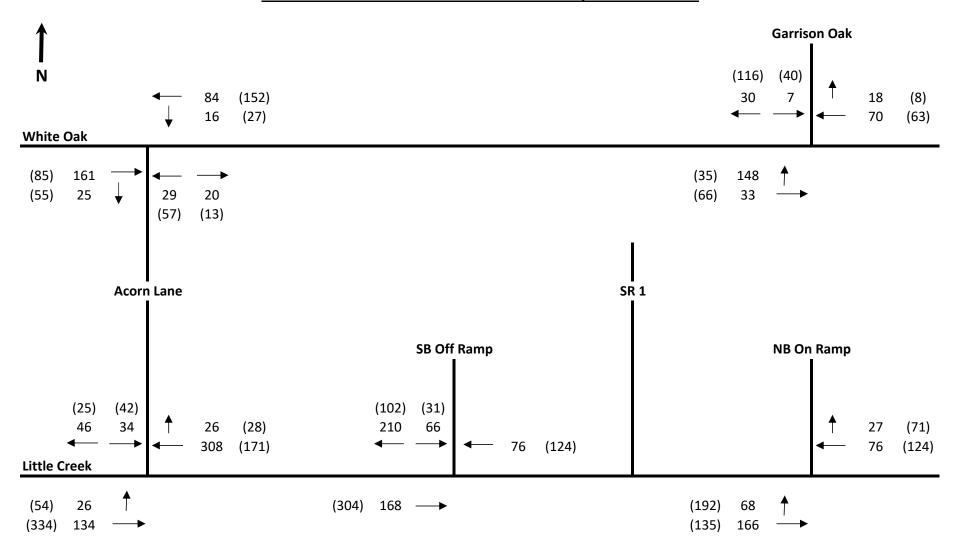
Garrison Oak Trip Generation and Distribution: 100% Build Out

Future Traffic Conditions - with 50% Proposed Buildout

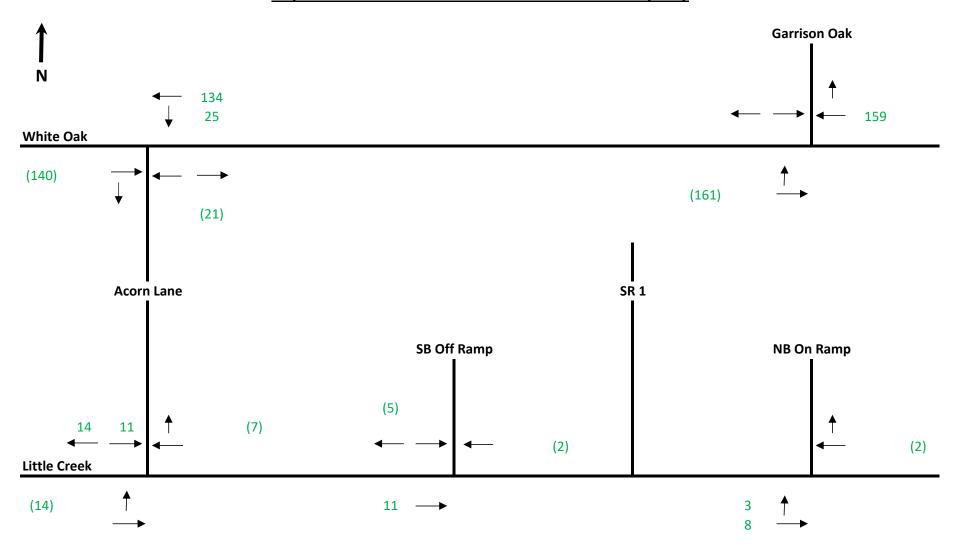


Garrison Oak Ν (92) (32) 24 79 (131) 6 15 (7) 15 (24) 70 (63) -____ ≁ White Oak (79) (28) 135 119 → (55) 25 29 17 (66) 33 * (57) (12) Acorn Lane SR 1 SB Off Ramp NB On Ramp (23) (102) (31) (40) 27 46 33 25 (28) 209 66 (71) <---76 308 (171) -> (124) ┢ ◀ 76 (124) ◄ Little Creek (54) (302) 168 ----> (191) 24 68 (334) 134 (134) 166 -----≁

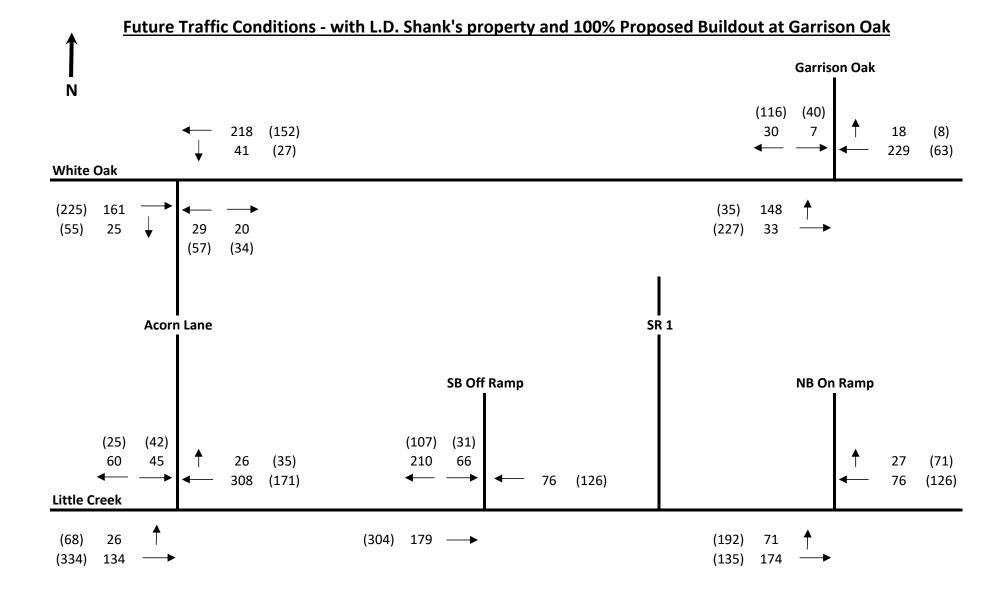
Future Traffic Conditions - with 75% Proposed Buildout



Future Traffic Conditions - with 100% Proposed Buildout



Trip Generation and Distribution: L.D. Shank Property



DEPARTMENT OF POLICE

Chief Marvin C. Mailey Chief of Police





400 South Queen Street Dover, Delaware 19904 302-736-7111 Fax: 302-672-1842

Dover Police Department Internal Affairs Citizen Complaint Statistical Summary

2015-2016-2017

Case Totals

This is a breakdown of the total number of cases received, completed, and sustained in 2015-2017.

Incident Type	Received	Completed	Percent Completed	Sustained	Percent Sustained
Citizen Complaints 2015	14	14	100%	0	0%
Citizen Complaints 2016	5	5	100%	0	0%
Citizen Complaints 2017	19	19	100%	0	0%
Total	38	38	100%	0	0%

(Percentages are rounded to the next higher or lower number as appropriate)



PROCEDURAL NOTICE 46.1B CADET PROGRAM



I. <u>PURPOSE</u>

The purpose of this order is to establish standards for the administration and operation of the Cadet Program, and its interactions with the other units within this department and the citizens of the City of Dover.

II. <u>POLICY</u>

It is the policy of this department to provide cadet services to the citizens of the City of Dover. The Cadet Program will assume high visibility patrol throughout the City of Dover.

III. <u>TRAINING</u>

Prior to any assignments, Cadets will receive instruction and/or training appropriate to the duties anticipated. Other such training is conducted one-on-one with an officer assigned to perform such duties. Cadet training will vary from classroom to on-the-job training.

IV. AUTHORIZED UNIFORM

In order to clearly distinguish Cadets from sworn officers, Cadets are authorized to wear the SPECIAL EVENTS UNIFORM, described in Procedural Notice 22B 1V.4, with the exception that their polo shirts are black and bright blue and black 5.11 rip stop tactical pants.

V. DUTIES AND RESPONSIBILITIES

Cadets are NOT sworn officers and are NOT given the power of authority to make physical arrests. Cadets shall have the authority to enforce City ordinance violations and issue summons for these violations. Cadets shall not intentionally engage in activities that may require the powers given to sworn officers, such as the use of force or powers of arrest. This does not prohibit their ability to come to the aid of a citizen, a fellow cadet, or a sworn officer in need of assistance as would any other citizen or at the direction of a lawful order by a sworn officer. Cadets shall not be assigned to perform law enforcement related tasks which require a law enforcement officer without direct supervision of a sworn member of this agency. Cadets shall not be assigned or authorized to carry any firearms while on duty. Cadets shall be authorized to carry and will be assigned Tasers, after formal training has been conducted by a certified Taser instructor.

- A. Cadets will assist sworn members of this agency in accomplishing work objectives to include:
 - 1. Conducting foot patrol with the City of Dover limits

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- 2. Issuing Dover City Ordinance citations for violations observed for parking and quality of life issues
- 3. Administrative duties
- 4. Assisting with crowd and traffic control at public events (i.e. music events, fireworks displays, parades, and sporting events)
- 5. Assisting with crowd and traffic control at crime scenes, fires, traffic light outages, and other unusual occurrences
- 6. Cadets may also be used as a resource for support services during emergencies and large scale events in accordance with their scope of authority
- 7. Any other related duties authorized by the Special Enforcement Unit Commander or Immediate Supervisor.

VI. OPERTATION OF DEPARTMENTAL VEHICLES

Cadets may operate departmental vehicles ONLY if they are on duty, possess a valid operator's license, and directed to do so by a supervisor. Cadets are only permitted to operate specialty vehicles for which they have received training. Vehicles operated by any Cadet may ONLY be used for:

- A. Transportation to and from maintenance facilities
- B. Administrative purposes
- C. Transportation to and from assignment locations
- D. Special Assignment

VII. <u>SUPERSEDES</u>

This order supersedes all previous procedures, written and otherwise, not in complete conformity herewith.

VIII. EFFECTIVE DATE

This order shall become effective upon execution and issuance. ORDER

EXECUTED and ISSUED this 5^{TH} day of December, 2017.

Man L'M

Marvin Mailey Chief of Police

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