



May 19, 2016

Planning Board Township of Greenwich Municipal Building 420 Washington Street Gibbstown, NJ 08027

Re: Traffic Evaluation

DRP Gibbstown Logistics Center – Phase 1 Warehouse Building 1 Township of Greenwich Gloucester County, New Jersey Langan Project No. 130088802

Dear Board Members:

Langan Engineering & Environmental Services has prepared this traffic evaluation for the DRP Gibbstown Logistics Center – Phase 1 warehouse proposed along the north side of A Line Road. Specifically, this traffic evaluation reviews the traffic-related aspects of the proposed warehouse building including the following items:

- Site trip generation,
- Traffic operations, and
- Access, circulation and parking.

Based on this traffic evaluation, we have concluded the proposed warehouse building will not create any significant impacts on the surrounding road network. Moreover, the proposed site design is in accordance with current standards and will provide adequate access, circulation and parking.

The following sections describe this traffic evaluation.

DEVELOPMENT PROPOSAL

The site is situated on the north side of A Line Road to the west of Repauno Avenue. The site is designated as part of Block 8, Lot 4 and is undeveloped. The applicant proposes to subdivide the site into three lots: 4.05, 4.06 and 4.09. Lot 4.05 will contain Warehouse Building 1, which is proposed to provide 207,396 SF of building area and be served by 200 car parking spaces and 31 trailer parking spaces. Access to Warehouse Building 1 will be provided by two full-access driveways along A Line Road. Lot 4.06 is contemplated to be developed for a warehouse building that will provide approximately 93,800 SF of building area with primary access to Repauno Avenue. The applicant is not seeking site plan approval for proposed Lot 4.06 at this time. Lot 4.09 will encompass A Line Road.



Repauno Avenue Description

Repauno Avenue is a local road with a general north-south orientation and that provides one lane of travel in each direction. Near the site, the speed limit is assumed to be 25mph and parking is permitted on one side of the road. Land use along this road is predominantly residential.

Langan evaluated traffic operations at the following Repauno Avenue intersections:

- Repauno Avenue and Route 44, and
- Repauno Avenue and Democrat Road.

Existing Traffic Volumes

Langan arranged manual turning movement counts for the study intersections. Specifically, the traffic counts were conducted on Tuesday, October 27, 2015 from 7:00 AM to 9:00 AM and from 2:00 PM to 6:00 PM. The manual turning movement counts indicate distinct peak hours where traffic volumes were the highest during each count period. The morning peak hour occurred from 7:00 AM to 8:00 AM and the evening peak hour occurred from 4:30 PM to 5:30 PM.

Attached are the manual turning movement count sheets along with a traffic volume worksheet that shows the existing peak hour traffic volumes.

TRIP GENERATION AND DISTRIBUTION

Langan used trip generation data contained in <u>Trip Generation</u>, 9th edition, published by the Institute of Transportation Engineers (ITE) to estimate the site trips that will be generated by the proposed warehouse building. For purposes of this evaluation and to be conservative, we estimated trip generation for Warehouse Building 1 (204,120 SF of building area) and the contemplated future warehouse building (94,500 SF of building area) on proposed Lot 4.06.

Table 1 shows the estimated trip generation for the critical weekday morning and evening peak hours. We used ITE warehousing trip rates to estimate trip generation and have assumed that 20% of peak hour trip generation will be trucks.



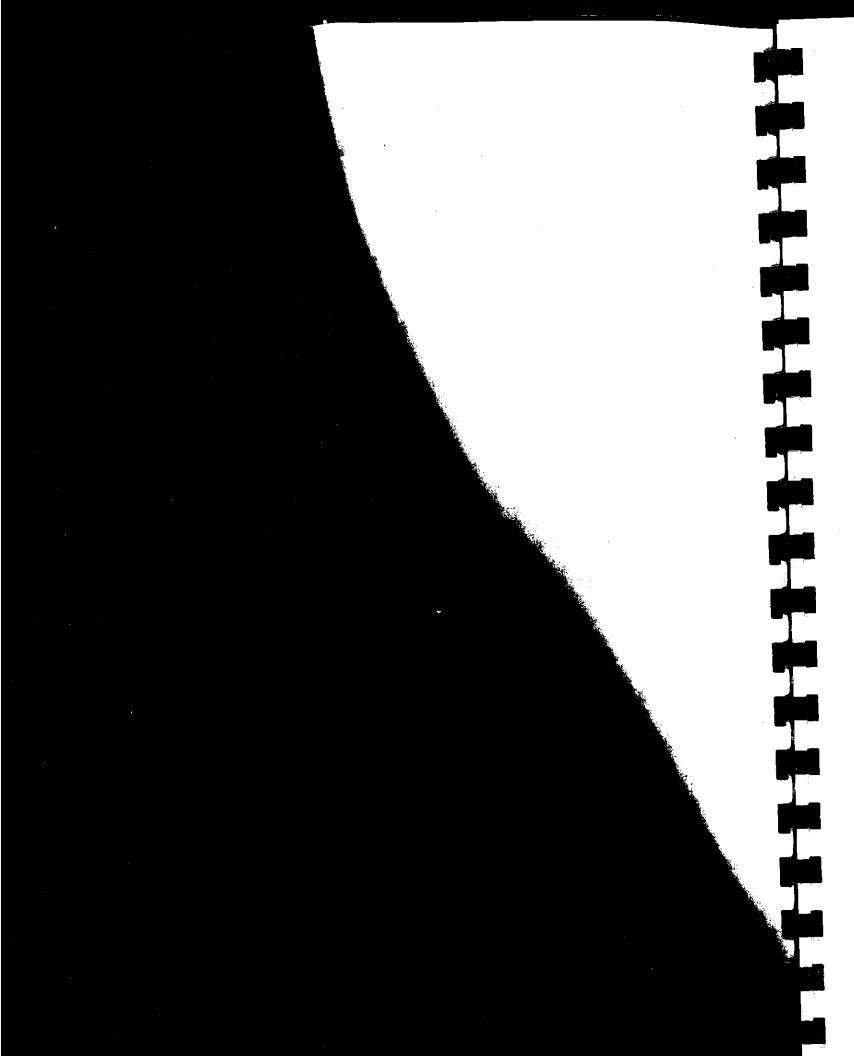


Table 1 - Trip Generation Estimates

		house Build 207,396 SF		Ware	house Build 93,800 SF	ling 2
Time Period	Car	Truck	Total	Car	Truck	Total
	Trips	Trips	Trips	Trips	Trips	Trips
Weekday Morning Peak Hour Enter <u>Exit</u> Total	78 <u>21</u> 99	20 <u>5</u> 25	98 <u>26</u> 124	50 <u>13</u> 63	13 <u>4</u> 17	63 <u>17</u> 90
Weekday Evening Peak Hour Enter Exit Total	19	5	24	12	3	15
	<u>57</u>	<u>14</u>	71	<u>34</u>	<u>9</u>	<u>43</u>
	76	19	95	46	12	58

We based the distribution and assignment of the car trips on the existing peak hour travel patterns identified from the traffic counts. For the distribution and assignment of the truck trips, we identified the following two routes as the most viable for trucks to travel between the site and Route 295:

- Inbound Trucks Tomlin Road to Route 44 to Repaumo Avenue, and
- Outbound Trucks Repauno Avenue to Democrat Road.

Trip distribution and site generated trips worksheets are attached.

FUTURE TRAFFIC VOLUMES

We anticipate the proposed warehouse building will be completed by the end of 2017. Therefore, to derive the future 2017 No-Build traffic volumes, we increased the Existing traffic volumes by an annual 1.00% growth rate to account for background traffic growth. That background traffic growth rate is published by the New Jersey Department of Transportation for Gloucester County. We then added the site generated trips to the 2017 No-Build traffic volumes to develop the 2017 Build traffic volumes.

The traffic volume worksheets are attached.

OPERATIONAL ANALYSIS

We conducted a Level of Service (LOS) analysis using the <u>Highway Capacity Software</u>, which is based on methodologies contained in the <u>HCM 2010 Highway Capacity Manual</u> published by the Transportation Research Board. LOS is the term used to denote the operating condition of a road segment or intersection under prevailing conditions and reflects several factors such as number of travel lanes, traffic volume, speed, and motorist delay. LOS designations range from



A to F, with LOS A representing the best operating conditions and LOS F representing poor operating conditions.

LOS designations are reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection. For unsignalized intersections, the analysis considers the operation of all movements that conflict with other movements, such as main-line left turns and traffic exiting a side street.

The HCM defines LOS for signalized intersections as follows:

<u>LOS</u>	Delay Range (sec/veh)
А	<10 sec
В	≥10 and ≤20 sec
C	≥20 and ≤35 sec
D	≥35 and ≤55 sec
Е	≥55 and ≤80 sec
F	>80 sec

The HCM defines LOS for unsignalized intersections as follows:

<u>LOS</u>	Delay Range (sec/veh)
Α	<10 sec
В	≥10 and ≤15 sec
С	≥15 and ≤25 sec
D	≥25 and ≤35 sec
E	≥35 and ≤50 sec
F	>50 sec

Level of Service Analysis

We conducted a Level of Service analysis of the study intersections. Tables 2 and 3 summarize the Levels of Service for the weekday morning and evening peak hours respectively. As can be seen, there will be no changes to LOS at the study intersections.



Table 2 - Intersection Level of Service Analysis Summary
Weekday Morning Peak Hour

	2017 No-Build Conditio	n 2017 Build Condition
Location		LOS*
Repauno Avenue	/Route 44	
Eastbound	. A	Α
Westbound .	A	A
Northbound	В	В
Southbound	В	В
Repauno Avenue	/Democrat Road	
Eastbound	Α	Α
Southbound	A	Α

Based on HCS Software

Table 3 - Intersection Level of Service Analysis Summary Weekday Evening Peak Hour

	2017 No-Build Condition LOS*	2017 Build Condition
Location		LOO
Repauno Avenue/	Houte 44	
Eastbound	Α	Α
Westbound	А	Α
Northbound	В	. В
Southbound	В	. В
Repauno Avenue/	Democrat Road	
Eastbound	. A	Α
Southbound	A	A

Based on HCS Software

Based on the Level of Service analysis, the proposed warehouse will not have a significant impact along the adjacent roads and any changes to area traffic operations will be minor.

SITE PLAN REVIEW

We have reviewed the site plan for the proposed warehouse building. In particular, we focused on access, circulation and parking supply, which the following items address:

- The site plan shows access to the proposed warehouse building will be provided by two
 full-access driveways along A Line Road. We expect those driveways to function
 efficiently and facilitate turning into and out of the proposed warehouse building site.
- The proposed passenger car parking provides 9 feet wide and 18 feet deep perpendicular parking spaces served by two-way aisles with a minimum width of 24 feet. The proposed trailer parking provides 12 feet wide and 55 feet deep parking spaces served by a two-way aisle with effectively a minimum width of 50 feet. These parking space dimensions are consistent with current parking design standards.



^{*} Level of Service

^{*} Level of Service

- The majority of the proposed passenger car parking has been isolated from the truck court and will allow pedestrians to access building entrances without having to walk across truck circulation aisles.
- The proposed trailer parking has been arranged in a uniform pattern opposite a portion of the loading docks, which will provide efficient circulation.
- We anticipate the proposed parking supply will adequately accommodate the parking demands of the proposed warehouse building. A total of 200 parking spaces will serve the proposed warehouse building. Based on the 85th percentile of the ITE warehouse parking demand data, the proposed warehouse building will have a parking demand of approximately 165 vehicles.

Based on our review, we believe convenient access, efficient circulation and adequate parking will be provided for the site.

CONCLUSION

The proposed warehouse building will have a minimal traffic impact on the surrounding road network. We expect area traffic operations to remain largely unchanged with the proposed warehouse building in place. Moreover, the site design will provide adequate access, circulation and parking.

Should you have any questions or comments concerning this traffic evaluation, please do not hesitate to contact our office.

Very truly yours,

Langan Engineering and Environmental Services, Inc.

Daniel D. Disario, P.E., PTOE

Principal

NJ Certificate of Authorization No: 24GA27996400 \\langan.com\data\LAVV\data8\130088802\Office Data\Reports\Traffic\TIS - 11-3-15.doc



TRAFFIC COUNTS

NJ Route 44 & Repauno Avenue Manual Turning Movement Count Weekday AM and PM Peak Hours Tuesday, 27 October 2015

File Name:NJ Route 44 and Repauno Ave AMPM Site Code:000000000 Start Date:10/27/2015 Page No :1

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NJ Route 44 & Repauno Avenue Manual Turning Movement Count Weekday AM and PM Peak Hours Tuesday, 27 October 2015

File Name: NJ Route 44 and Repauno Ave AMPM Site Code: 00000000 Start Date: 10/27/2015

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	표		.880	.583	.818	417	.750	583	.825	.688	.833	.417	889	.714	.594	625	006	.887

Repauno Avenue & Democrat Road (C.R. 673) Manual Turning Movement Count Weekday AM and PM Peak Hours Tuesday, 27 October 2015

File Name: Repauno Ave and Democrat Rd (C.R. 673) AMPM Site Code : 00000000 Start Date : 10/27/2015 Page No : 1

						Grou	Groups Printed- Class	Class 1							
		REPAUNO AVENUE Southbound	AVENUE		DEMO	CRAT ROAD (MOCRAT ROAD (C.R. 673) Westbound		DEMO	DEMOCRAT ROAD (C.R. 673) Eastbound	ND (C.R. 6) und	ଚ			
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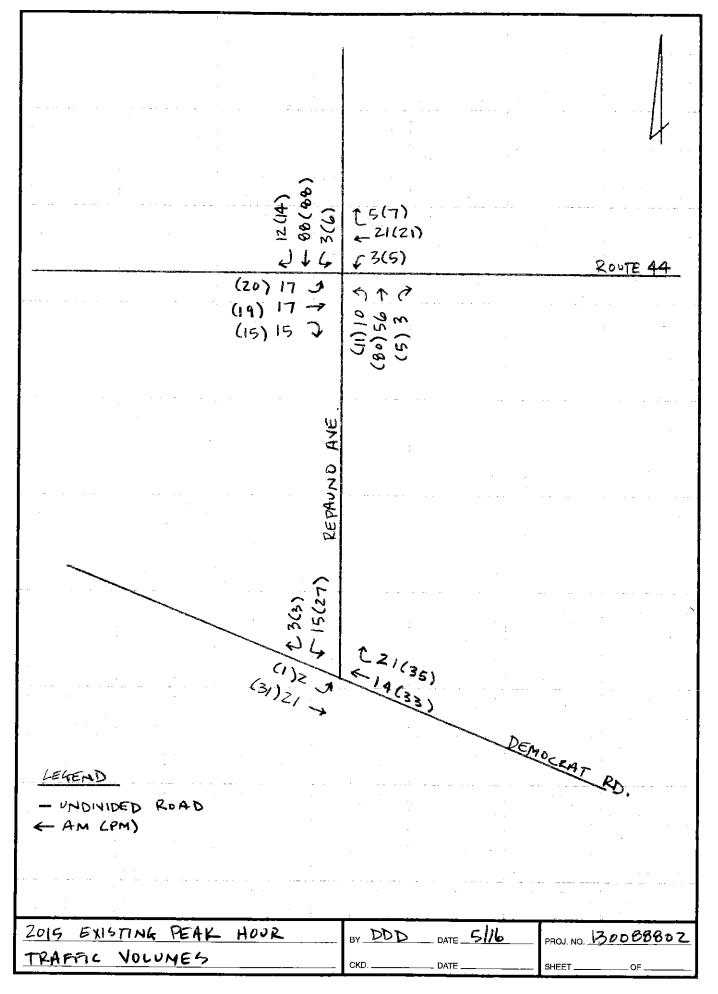
Repauno Avenue & Democrat Road (C.R. 673)

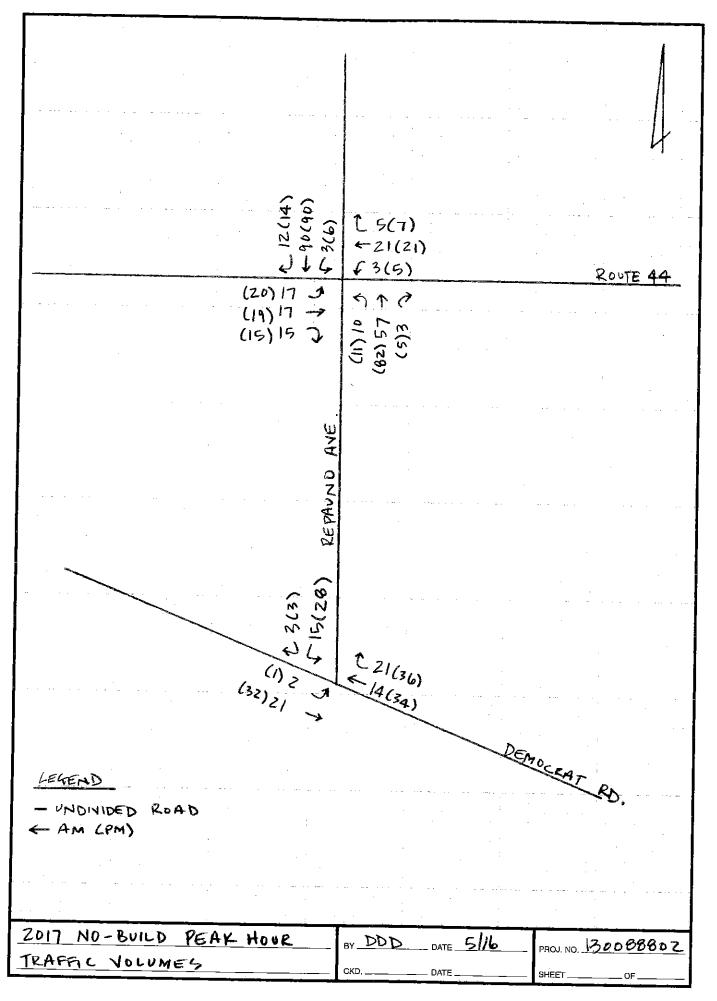
Manual Turning Movement Count Weekday AM and PM Peak Hours Tuesday, 27 October 2015

File Name: Repauno Ave and Democrat Rd (C.R. 673) AMPM Site Code: 000000000 Start Date: 10/27/2015 Page No: 2

	뀖	REPAUNO AVENUE		DEMOCR	DEMOCRAT ROAD (C.R. 673)	. 673)	DEMOCR	DEMOCRAT ROAD (C.R. 673)	673)	
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TRAFFIC VOLUME WORKSHEETS



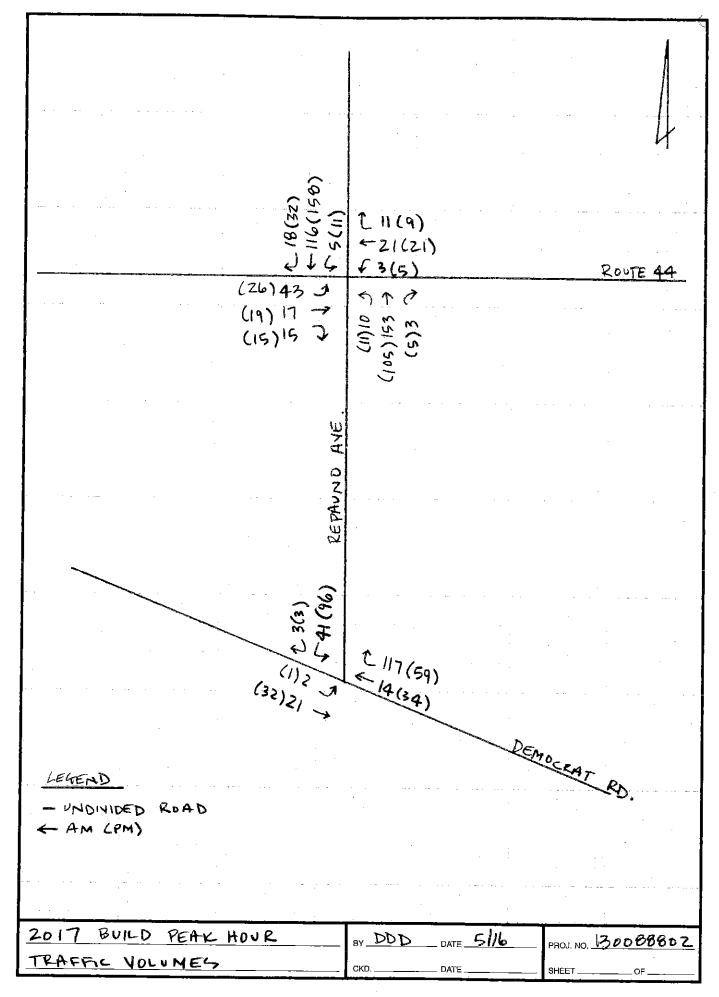


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LEGEND				POCKAT RD.
- UNDIVIDED ROAD - AM CPM) ENTER (EXIT)				
	<u> </u>		_ 1	
TRIP DISTRIBUTIONCARS			DATE 5/16	PROJ. NO. 130088802
		CKD:	DATE	SHEET OF

	i	1
·		
		4
€ 6 (18) ← 26 (68) ← 2 (68)	£6(2)	
644	Ç	ROUTE 44
(6) 26 3	510	
→	96(82)	
	er en la	
AVE		
REPAUND	· · · · · · · · · · · · · · · · · · ·	
(8)		
25	£ 96 (23)	
• • • • • • • • • • • • • • • • • • •	(23)	
	REM	OCEAT RD.
LEGEND		RD.
- UNDIVIDED ROAD - AM CPM)		
SITE GENERATED TRAFFIC	BY DDD DATE 5/16	PROJ. NO. 13008880Z
CARS	CKD DATE	SHEET OF

2 \ 4 100 1/• J	EOUTE 44
3	↑ ↑
REPAUND AVE	
\$ (100 %)	
LEGEND - UNDIVIDED ROAD - AM (PM) ENTER (EXIT)	PEMOCRAT RD.
TRIP DISTRIBUTION TRUCKS	BY DDD DATE 51/6 PROJ. NO. 130088802

C 9 (23)	14	<u>t</u>			Route 44
(8) 33	5 <u>タ</u>	510			
	40 AVE				
	REPAUND				
*	34	Ć ~			<u></u>
LEGEND	**			DEMOCRAT	
- UNDIVIDED ROAD AM CPM)					~ 0,
• • • • • • • • • • • • • • • • • • •					
SITE GENERATED TRAPTIC		BY	DATE 5//6	PROJ. NO	3008880Z



LEVELS OF SERVICE ANALYSIS PRINTOUTS

		HCS 2	010 S	ignali	zed	Inters	sec	ction	Re	sults	s Sı	umma	ary				
General Inform	etion			, <u>.</u>		<u> </u>				1-1		i I-4				11.4	Y LOL
	таноп	I avaan										ion Info	40.212	on	_	, .	
Agency		Langan						· · · · · · · ·		Durat			0.25				<u> </u>
Analyst		KAMP			A	ite 11/2				Area	Туре	2	Othe		<u>^</u> ? 		
Jurisdiction				Time F				Build		PHF			0.98	<u> </u>			
Urban Street	/			Analys	·			 	1			Period	1 > 7:	00	_ ₹		~
Intersection		NJ 44 & Repauno A		File Na	ame	NJ44	18.F	Repaur	ιοΑνε	AM N	10-B	uild.xu	3		_	*	
Project Descrip	tion	130088802 - Green	wich										_			¶a• H (+)	filhir
Demand Inform	nation				E	3			W	В	-		NB			SB	
Approach Move	ement			L	T	R		Ĺ.	1		R	L	T	R	L	T	R
Demand (v), v	eh/h			17	17	7 15		3	2	1	-5	10	57	3	3	90	12
		· · · · · · · · · · · · · · · · · · ·			,			,				_,	(a. 264)			Calles Valoria a s	- 10 M
Signal Informa		In /		1	1.3	뒬세	ă							A 6.50		e de gre	
Cycle, s	46.3	Reference Phase	2	l		E 1	17										
Offset, s	0	Reference Point	End	Green	28.0		U	0.0	0.0) (0.0	0.0					
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow	5.0	3.0	-7,	0.0	0.0		0.0	0.0	***				N. H.
Force Mode	Fixed	Simult, Gap N/S	On	Red	2.0	2.0		0.0	0.0) [0	0.0	0.0	1,72				
Timer Results	•			EBI	T	EBT	Ŧ	WBL		WBT	Г	NBI		NBT	SB	ı T	SBT
Assigned Phase	Э	·			_	2	t		+	6				8	<u> </u>		4
Case Number	·····					8.0	1		十	8.0				8.0			0.8
Phase Duration	, S	 				35.0	T			35.0				11.3			11.3
Change Period,	(Y+R	c), s				7.0	1			7.0				5.0		Ì	5.0
Max Allow Head					$\neg \uparrow$	3.1	1			3.1				3.1	 		3.1
Queue Clearan	 .					2.6	t	· <u></u> ,.	7	2.3				3.6			4.7
Green Extensio						0.1	†			0.1	7		_	0.3			0.3
Phase Call Prot		(3-1)-			一十	1.00	†		十	1.00				0.90			0.90
Max Out Probat					_	0.00	†	····	_	0.00				0.00			0.00
Movement Gro							ŧ		14/5				NC				
Approach Move		suits			EE	l R	╂		WE T				NB T	1 0		SB T	
Assigned Move				5	2	12	╁	1		F		L.		R			R
Adjusted Flow F		() 1 (a b /b		5.	50		╂		6 30	10	0	3	8 71	18	7	4	14
		ow Rate (s), veh/h/l	, n		151	_	╁		175	_			1755	 		107 1716	
Queue Service			11		0.0		╁		0.0	_			0.0		 	0.0	_
Cycle Queue Ci					0.6		╅	┯┪	0.3				1.6	<u> </u>		2.7	
Green Ratio (g.		o			0.60	_	+		0.60	_	_		0.14			0,14	
Capacity (c), v					102		╁		114		┪		328			313	
Volume-to-Capa		etio (X)			0.04		╁		0.02	_	-		0.218			0.34	
Available Capac					147		╁		167				1200	 		1186	
		eh/ln (95 th percenti	le)		0.2		†		0.1	_			1.1	$\vdash -$	 	1.7	
		RQ) (95 th percent			0.00		+		0.00		-		0.00	 	 -	0.00	
Uniform Delay ()		3.7		+		3.7				18.0		—	18.4	
Incremental Del					0.0	- 	+		0.0	+	_		0.1	ļ		0.2	
Initial Queue De					0.0		+		0.0				0.0		 -	0.0	
Control Delay (3.7		†		3.7				18.1		!	18.7	
Level of Service					Α	1	t		A		7		В		1	В	1
Approach Delay				3.7		A	†	3.7	Ť	A	7	18.1		В.	18.		В
Intersection Del							13.	_							В		
Mulkiman	- 11						Ţ										
Multimodal Re Pedestrian LOS					EE	- y-	4	. 0.0	WE		<u> </u>		NB	В	- 0.4	SB T	
Bicycle LOS Sc				2.0		B.	╁	2.0	\dashv	В	{	2.1	_	В • л	2.1 0.7		В
Dickeie ros so	OLA L LC	<i>J</i> 3		0.6		Α		0.5	L	Α		0.6		A	0.7		Α

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		HCS 2	2010 \$	Signa	lized	Inter	sec	tion	Res	ults S	Summ	ary				
Concret Inform																
General Inform	mation	li .		·							tion in	format	ion		الجديدانة ل	1.4.7
Agency		Langan								Duration		0.25			φ.	
Analyst Jurisdiction		DDD	····		/sis Da		/201	5		Area Ty	ре	Othe				
Urban Street			······		Period		Build			PHF		0.98		→		∻ −
Intersection		NJ 44 & Repauno	A	->	/sis Ye						Period	1> 7	:00			
Project Descrip	ofion	130088802 - Green		File N	vame	NJ4	4ℜ	paun	ioAve	AM Buil	d.xus				4-	
Troject Descrip	Juon	130066602 - Gleer	IWICH	_											ካነተ፣ ቀን	P P F
Demand Infor	mation				E	3			WB		- ,	NE		7	0.0	
Approach Move	ement	<u> </u>			7 -				T	R	 	T	T R	╁	SB T =	
Demand (v), v	/eh/h			43	17			3	21	11	10	153		L 5	116	R
											10	10.	3 1 3	3	1110	18
Signal Informa	ation				1_	되세	,]	_				7 4 V 6.5	2 8	ALPRO T		
Cycle, s	47.1	Reference Phase	2		Ħ	1.								4	405 D	
Offset, s	0	Reference Point	End	Greer	_		<u> </u>	0.0	0.0	0.0	0.0	2.55			e e	Property of
Uncoordinated	Yes	Simult. Gap E/W	On	Yellov		3.0		0.0	0.0	0.0	0.0					
Force Mode	Fixed	Simult, Gap N/S	On	Red	2.0	2.0		.0	0.0	0.0	0.0		Visual III	* %	المدود	
Timer Results		<u> </u>	<u> </u>	FD		ED*										
Assigned Phase			·	EB	<u>-</u>	EBT	╃	WBL		WBT	NB	<u> </u>	NBT	SE	31_	SBT
Case Number	<u> </u>	,				2	 			6			8	ļ		4
Phase Duration						8.0	-			8.0			8.0	<u> </u>		8.0
Change Period,		.) e			 -	35.0 7.0	╂			35.0	,		12.1			12.1
Max Allow Head						3.1	╂			7.0			5.0			5.0
Queue Clearan						2.9	╄┈			3.1			3.1			3.1
Green Extensio						0.2	+		_	2.4 0.2			6.7			5.7
Phase Call Prot		(90)10	****			1.00	1-	· 	-	1.00		_	0.5	L		0.5
Max Out Probat						0.00	╂╌			0.00	<u> </u>		0.98			0.98
				-		-			_ '	0.00			0.00	Ĺ		0.00
Movement Gro		ults			EB		\mathbf{L}		WB			NB			SB	
Approach Move		· · · · · · · · · · · · · · · · · · ·		L	T	R			Т	R	L	Ţ	R	L	T	R
Assigned Move				5	2	12			6	16	3	8	18	7	4	14
Adjusted Flow F					77		L		36			169			142	
		w Rate (s), veh/h/li	n		1459)	_		1723			1609			1678	
Queue Service			····		0.0		↓		0.0			1.0			0.0	
Cycle Queue Cl Green Ratio (g/		Time (g_c), s			0.9		<u> </u>		0.4			4.7			3.7	
Capacity (c), ve		- <u></u>			0.59		<u> </u>	_	0.59			0.15			0.15	ļ
Volume-to-Capa		io (X)			988		 	-	1108			323			331	
Available Capac					0.077 1417		┞—		0.032			0.525			0.428	
		h/ln (95 th percentil	٥١		0.3	- -	╀		1613			1095			1139	
		RQ) (95 th percenti			0.00		┢		0.1			2.8			2.3	
Uniform Delay (10)		4.0	 	 		0.00 3.9			0.00			0.00	
Incremental Dela					0.0	 -	├					19.0			18.6	
Initial Queue De					0.0	 -	╂—		0.0			0.5			0.3	
Control Delay (<u> </u>			4.1		 		0.0 3.9		·····	0.0			0.0	
Level of Service		· · · · · · · · · · · · · · · · · · ·			4. t	+	├		3.9 A			19.5 B	 		18.9	
Approach Delay,		LOS		4.1	- î	 	-	3.9		A	<u>J</u> 19.5		L	40.4	J B	<u> </u>
Intersection Dela				r. 1		·	5.2	J. J	<u> </u>		19.5		В	18.9 3	<u>'</u>	В
No. 142																
Multimodal Res		1.00			EB				WB			NB			SB	
Pedestrian LOS				2.0		В		2.0	_	В	2.1		В	2.1		В
Bicycle LOS Sco	re / LOS	3	1	0.6	L_	Α		0.5		Α	0.8		Α	0.7		Α

		HCS 2	010 5	Signa	lize	d Ir	iters	ectio	n Re	sul	ts S	umn	ary		,		
General Informati	on .				· .					land.			ź			2434	a son est e
Agency	Langan	the state of the s			• • •					-	ation		format 0.25				
Analyst	KAMP			Analy	vsis F	Date	11/2/2	015					Othe	·			<u> </u>
Jurisdiction		·		Time			PM N			PHI	а Тур	е	0.89		_		- 3-A
Urban Street				Analy			2017	O-Duilo				Period					*
Intersection	NJ 44 & F	Repauno A	∖ve	File N			NJ448	Rena	μης Δν					.00			
Project Description							1.40.7.10	пора	anonv	G I IV	1140-1	Jana-At					· የየነዚበ
Demand Informati	<u> </u>		_	_	į	EΒ		Ţ				Ţ					
Approach Moveme		` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` 		L		T	R	+	_	/B	-	 	. NE			S	
Demand (v), veh/l				20		19	15	5	2	 -	R 7	11	82	R 5	6	91	
Signal Information													02				14
Cycle, s 46		o Dhoon		4	. 3	, 🛬	21/3										4
Offset, s			2	ł	R	i E	747	7		Í				4.5			
Uncoordinated Ye			End	Greer			6.7	0.0	0.0)	0.0	0.0					
Force Mode Fix			On Ол	Yellov Red	v 5.0 2.0		3.0 2.0	0.0	0.0		0.0	0.0	100				
1 IX	ou omiak. G	ap IV/O	Oil	rieu	12.	<u> </u>	2.0	0.0	0.0	<u> </u>	0.0]0.0		<u> </u>	4 260		
Timer Results				EB	IL.	E	ВТ	WE	3L	WE	3T	NB	L	NBT	SE	3L	SBT
Assigned Phase							2			6				8			4
Case Number]	8	3.0			8.0)			8.0			8.0
Phase Duration, s						3:	5.0			35.	0	-		11.7			11.7
Change Period, (Y						. 7	'.O _.			7.0)			5.0			5.0
Max Allow Headway						3	3,1			3.1	1	_		3.1			3.1
Queue Clearance T		<u> </u>				2	.7			2.4	1			4.6			5.0
Green Extension Tir						0	.2			0.2	2			0.4			0.4
Phase Call Probabil	<u> </u>				1	1.	00			1.0	0			0.95			0.95
Max Out Probability						0.	00			0.0	0			0.00			0.00
Movement Group I	Results				E.	В			WB				NB			SB	
Approach Movemen	it			L	T	•	R	L	T		R		T	R		T	R
Assigned Movemen	t			5	2		12	. 1	6		16	3	8	18	7	4	14
Adjusted Flow Rate					61	í		**	37				110	10	 	124	
Adjusted Saturation), veh/h/Ir)		153	39			1719	, T			1779	1		1733	
Queue Service Time					0.0	0			0.0	_			0.0		 	0.0	_
Cycle Queue Cleara	ince Time (\dot{g} $_{c}$), s			0.7	7			0.4	1			2.6	1		3.0	
Green Ratio (g/C)					0.6	0			0.60				0.14			0.14	
Capacity (c), veh/h					102	29			1120)			340			329	_
Volume-to-Capacity		·			0.05	59			0.033	3	\neg		0.324			0.370	
Available Capacity (148	34			1626				1209			1185	
Back of Queue (Q)					0.2	2			0.1				1.7			2.0	
Queue Storage Ratio		percenti	le)		0.0	0			0.00	\perp			0.00			0.00	
Uniform Delay (d 1)					3.9)			3.8				18.2			18.4	
ncremental Delay (0.0	_			0.0				0.2			0.3	
nitial Queue Delay (0.0				0.0				0.0			0.0	
Control Delay (d), s					3.9				3.8	ـــــ			18.4			18.7	
evel of Service (LO Approach Delay, s/ve					<u> </u>				A		_		В			В	
ntersection Delay, s/ve				3.9				3.8		Α	_	18.4		В	18.7	7	В
	VGII / LOS						14,	2						<u> </u>	В		
lultimodal Results					EE	3			WB				NB			SB	
edestrian LOS Scor				2.0		В	}	2.0		В	十	2.1	T	В	2.1		В
Bicycle LOS Score /	LOS			0.6		Α		0.5		A		0.7	\dashv	A	0.7	_	Ā

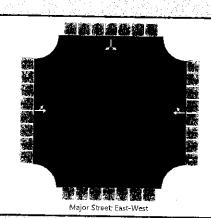
HCS 2010 Signalized Intersection Results Summary

		HCS 2	010 S	ignali	zed l	nters	ection	n Res	ults S	umm	ary				
					, .						. <u>.</u>				
General Inform	nation	1						1	ntersec	tion Inf		OR .		1414	<u> </u>
Agency		Langan	····					[Duration	, h	0.25			*	
Analyst		DDD		Analys	sis Date	e 11/2/2	015	/	4геа Тур	e	Other	'			
Jurisdiction				Time F	Period	PM B	uild	I	PHF		0.89		4-4		+3
Urban Street				Analys	sis Year	r 2017		1	Analysis	Period	1> 7:0	00	*		
Intersection		NJ 44 & Repauno A	√ve	File Na	ame	NJ448	Repau	inoAve	PM Buile	d.xus			,	*	
Project Descrip	otion	130088802 - Greer	wich										7	াৰ' চাৰু প	* ^
Demand Infor	mation		•		EB			WB		Ţ <u>-</u>	NB		1	SB	
Approach Mov	_ ' .		-	L	T	R		TT	R	T i	T	R	i	Ιτ	R
Demand (v), v				26	19	15	5	21	9	11	105	5	11	158	32
									. •				1	100	- 02
Signal Informa	ation				_ 2						W. 3				
Cycle, s	49.0	Reference Phase	2		R	~11°	a					20	4		4
Offset, s	0	Reference Point	End	Green	9	9.0	0.0	0.0	0.0	0.0	10 30 T		34 34 ·		
Uncoordinated	Yes	Simult. Gap E/W	On	Yellow		3.0	0.0	0.0	0.0	0.0			9 -		
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	0.0	0.0	0.0	0.0			e.	,	T
T 5 1														· · · · ·	
Timer Results			· · · · · ·	EBI		EBT	WB	<u>-</u>	WBT	NBI		NBT	SBI		SBT
Assigned Phas	e					2			6			8			4
Case Number	 .			<u> </u>		8.0			8.0	· .		8.0	!		8.0
Phase Duration						35.0			35.0			14.0			14.0
Change Period						7.0			7.0		 -	5.0			5.0
Max Allow Hea						3.1			3.1			3.1	E.		3.1
Queue Clearan		Alban Maria Da Arabata III	• • • • • • • • • • • • • • • • • • • •			2.8			2.5			5.3	<u>,, </u>		8.4
Green Extension		(<i>g</i> e), S				0.2			0.2			0.6			0.6
Phase Call Pro		*				1.00			1.00			0.99			0.99
Max Out Proba	bility					0.00			0.00			0.00			0.00
Movement Gro	oup Res	sults			EB	,,,	_	WB			NB			SB	
Approach Move	ement	, , , , , , , , , , , , , , , , , , , 		L	Т	R	Ĺ	T	R	L	Τ	R	L	Т	R
Assigned Move	ment		·	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow	Rate (v), veh/h	,,		67			39			136			226	+
Adjusted Satura	ation Flo	ow Rate (s), veh/h/l	n		1528			1711	1		1722			1630	
Queue Service					0.0			0.0			0.0			1.6	
Contract of the Contract of th		e Time (<i>g c</i>), s			0.8			0.5	† T		3.3			6.4	
Green Ratio (g					0.57		-	0.57			0.18			0.18	
Capacity (c), v					979			1062	1		395	*****		376	
Volume-to-Cap		itio (X)	·		0.069		,	0.037			0.344			0.601	-
Available Capa	city (c a), veh/h			1410	1		1543	 		1114			1067	
		eh/ln (95 th percenti	le)		0.3			0.2			2.2	, ,		3.9	
		RQ) (95 th percent			0.00			0.00			0.00			0.00	
Uniform Delay	(d 1), si	/veh			4.7			4.6			17.7			18.9	
Incremental De	lay (d 2), s/veh			0.0			0.0	<u> </u>		0.2			0.6	
Initial Queue De					0.0			0.0			0.0			0.0	
Control Delay (4.7		, .	4.6			17.9	· · · · · · · · · · · · · · · · · · ·		19.5	
Level of Service					A			A			В			В	-
Approach Delay		/LOS		4.7	Ť	A	4.6		A	17.9		В	19.5		В
Intersection De						15	<u> </u>				L		B		
Multimodal Re	sults				EB			WB			NΒ			SB	
Pedestrian LOS	Score	/LOS		2.0		В	2.0		В	2.1		В	2.1		В
Bicycle LOS Sc	ore / LC)S		0.6		Α	0.6		Α	0.7	1	Α	0.9		Α
													-		

HCS 2010 Two-Way Stop Control Summary Report

General Information		Signification	
Analyst	KAMP	Intersection	Democrat Rd & Repauno Ave
Agency/Co.	Langan	Jurisdiction	a repairio Ave
Date Performed	11/2/2015	East/West Street	Democrat Road
Analysis Year	2017	North/South Street	Repauno Avenue
Time Analyzed	AM No Build	Peak Hour Factor	0.73
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	130088802 - Greenwich		

Lanes



Vehicle Volumes and Adjustments

Approach		Eastbound				West	bound			North	bound		T T		bound	
Movement	U	L	T	R	U	L	ī	R	U	1. 1	Т	R	-	30011	.bodilid -#	
Priority	10	1	2	3	4U	4	5	6	Ť	7	- ' 8	9	0	10		R
Number of Lanes	0	. 0	1	-	0	0	1	. 0		0	0.	0		10	11	12
Configuration		LT	 				<u> </u>	TR	-	-			-	0	. 0	0
Volume (veh/h)		2	21				14	21				.	 	ļ	LR	
Percent Heavy Vehicles		4					- 1-7	- 21		<u> </u>				15		3
Proportion Time Blocked							-	 		<u> </u>			ļ	6		6
Right Turn Channelized	- 	N	lo			L: N		<u></u>		L.,		<u> </u>	 -	<u> </u>	<u> </u>	
Median Type			· · · ·				-	Undi	No No No Undivided							
Median Storage																

Jelay, Queue Length, and Level of Service

		<u></u>		Error C						grifte (A)	Part de	k. Y. i		
32			T			Γ	<u> </u>			T	T	Γ	75	l —
1544	111	 	 					 	-	 	 	 	 -	
0.02		 -	 				 	<u> </u>					<u> </u>	
0.0			 	├──	 			-	ļ. <u></u>	 -	ļ			
73		<u> </u>	-	-					ļ	 				
			 	 -							<u></u>		8.9	
			 -		<u> </u>	<u> </u>				<u> </u>	<u> </u>		Α	
Ā	Verage	· · · · ·			- .	-							9	
	32 1544 0.02 0.0 7.3 A	32 1544 0.02 0.0 7.3 A 0.7	32 1544 0.02 0.0 7.3	32 1544 0.02 0.0 7.3 A 0.7 A	32 1544 0.02 0.0 7.3 A 0.7	32 1544 0.02 0.0 7.3 A 0.7 A	32 1544 0.02 0.0 7.3 A 0.7	32	32 1544 0.02 0.0 7.3 A 0.7	32	32	32	32	32

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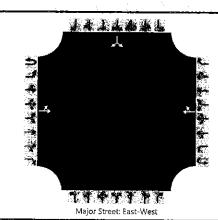
HCS 2010™ TWSC Version 6.70 DemocratRd&RepaunoAve AM No-Build.xtw

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HCS 2010 Two-Way Stop Control Summary Report

	Site Information							
DDD	Intersection	Democrat Rd & Repauno Ave						
Langan	Jurisdiction							
5/19/2016	East/West Street	Democrat Road						
2017	North/South Street	Repauno Avenue						
AM Build	Peak Hour Factor	0.73						
East-West	Analysis Time Period (hrs)	0.25						
130088802 - Greenwich								
	DDD Langan 5/19/2016 2017 AM Build East-West	DDD Intersection Langan Jurisdiction 5/19/2016 East/West Street 2017 North/South Street AM Build Peak Hour Factor East-West Analysis Time Period (hrs)						

Lanes



ehicle Volumes and Adjustments

Approach		Easth	ound			West	bound			North	bound			South	bound	
Movement	U	L	1	R	U	L	Т	,R	υ	L	Т	R	U	L	т	R
Priority	10	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0	ļ	0	0	0
Configuration		ĻŢ						TR				1-		<u> </u>	LR	
Volume (veh/h)		2	21				14	117			1			41		3
Percent Heavy Vehicles		4											 	18	 	6
Proportion Time Blocked															 	
Right Turn Channelized		<u> </u>	lo			No					No					
Median Type				<u></u>		. <u>.</u>		Undi	ndivided							

elay, Queue Length, and Level of Service

Median Storage

32		:									60
1383											829
0.02											0.07
0.0											0.2
7.6											9.7
A											Α
0.7							<u> </u>			9.7	
A			. •		<u> </u>					Α	
	1383 0.02 0.0 7.6 A	1383 0.02 0.0 0.0 7.6 A	32	32	32	32	32	32	32	32	32

HCS 2010 Two-Way Stop Control Summary Report Sile Information KAMP Intersection Democrat Rd & Repauno Ave Langan Jurisdiction 11/2/2015 East/West Street Democrat Road 2017 North/South Street Repauno Avenue

Peak Hour Factor

Analysis Time Period (hrs)

0.25

Lanes

Analyst

Agency/Co.

Date Performed

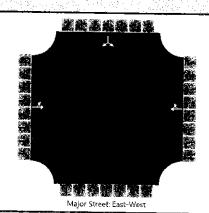
Analysis Year

Time Analyzed

Intersection Orientation

Project Description

General Information



Vehicle Volumes and Adjustments

PM No Build

130088802 - Greenwich

East-West

Approach		East	bound			West	bound			North	ibound			South	bound		
Movement	U	L	Т	R	U	L	Т	R	Ü	L	Ţ	R	U	L	Т.	R	
Priority	1U	1	2	3	4U	4	5	6	<u> </u>	7	8	9	 	10	11	12	
Number of Lanes	0	0	1	0	0	0	1	. 0		0	0	0		0	0	.0	
Configuration		LT						TR	 			 	├	<u> </u>	LR	⊢	
Volume (veh/h)		1	32				34	36				 		28	LIX.	 	
Percent Heavy Vehicles		3							 _					3	-	3	
Proportion Time Blocked		··									<u> </u>		<u> </u>			 -	
Right Turn Channelized		N	lo	L		N	l Io			N	lo.	<u>. </u>	No				
Median Type		· · · · · · · · · · · · · · · · · · ·			<u> </u>					Lvided				110			
Median Storage		······································		<u>- </u>		·	···	5/10/	*1000	·		·····		·			

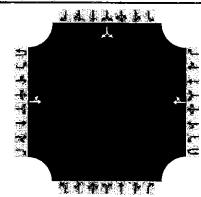
Delay, Queue Length, and Level of Service

						Edgines.	HIME ,	54			yr ei ite		garyan W			
Flow Rate (veh/h)	l	38	ŀ			ľ		1							36	
Capacity		1507						 	<u> </u>				 	-	903	
v/c Ratio		0.03		<u> </u>				 		 	 -		 		0.04	
95% Queue Length		0.0					-	<u> </u>	1						0.04	
Control Delay (s/veh)		7.4			 	<u> </u>			╁╌──	 	-	 	 			
Level of Service (LOS)		Α				 			 - -						9.2	
Approach Delay (s/veh)		0	.2			L	<u> </u>	<u> </u>	 	<u> </u>	L	l		9	A .	<u>. </u>
Approach LOS			Α		-		<u> </u>		-							

HCS 2010 Two-Way Stop Control Summary Report

General Information		Site Information	
Analyst	DDD	Intersection	Democrat Rd & Repauno Ave
Agency/Co.	Langan	Jurisdiction	
Date Performed	5/19/2016	East/West Street	Democrat Road
Analysis Year	2017	North/South Street	Repauno Avenue
Time Analyzed	PM Build	Peak Hour Factor	0.86
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	130088802 - Greenwich		

Lanes



Major Street: East-Wes

Vehicle Volumes and Adjustments

Approach		Eastb	ound	-		West	bound			North	bound			South	bound	
Movement	U	Ĺ	Ţ	R	U	L	Т	R	U	Ĺ	Т	R	Ų	L	Ţ	R
Priority	10	1	2	3	4U	4	5	6		7	8	9	1	10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration		LT						TR							LR	
Volume (veh/h)		1	32				34	59						96		3
Percent Heavy Vehicles		3												19		· 3
Proportion Time Blocked													**			
Right Turn Channelized		No				<u> </u>	10			١	10		No			
Median Type			<u> </u>	, <u>-</u> \ <u>-</u> \				Undi	viđed		· · · · · · · · · · · · · · · · · · ·		, , .			
Median Storage												÷			· -·······	···

Delay, Queue Length, and Level of Service

			100	· **	at the second			4.5	100	 S		
Flow Rate (veh/h)	38										115	
Capacity	1473										846	
v/c Ratio	0.03										0.14	
95% Queue Length	0.0						.,				0.5	
Control Delay (s/veh)	7.4										9.9	
Level of Service (LOS)	А										Α	
Approach Delay (s/veh)	0.2									9.	.9	
Approach LOS		A								/	1	