

Traffic and Transportation Consulting

Kevin P. McDonough (1953-1994) John H. Rea, P.E. Jay S. Troutman, Jr., P.E. Scott T. Kennel

March 19, 2020

Howell Township Zoning Board of Adjustment 4567 Route 9 North P.O. Box 580 Howell, NJ 08730

Re:

366 Ramtown-Greenville Road

Lot 29 in Block 3

Howell Township, Monmouth County

MRA File No. 19-203

Dear Board Members:

McDonough & Rea Associates (MRA) has been asked to provide the Zoning Board of Adjustment with a *Traffic Impact Analysis* for plans to construct a 37,530 SF office/warehouse building on the noted property. The property currently contains a 17,845 SF 1-story masonry building which will be modified to have both warehouse and office uses. The site is currently served by an existing 18 foot wide driveway which will be abandoned. A new 30 foot wide driveway will be constructed along the eastern boundary of the property in order to more safely and effectively serve vehicles entering and exiting the site. The site will be served by 41 employee/visitor parking spaces and 5 loading docks between the 2 buildings.

SCOPE OF STUDY

In order to prepare a thorough *Traffic Impact Analysis* for the proposed warehouse project, MRA conducted the following tasks:

- 1. Made field visits to the site to establish existing roadway and traffic conditions in the area.
- 2. Placed an Automatic Traffic Recorder (ATR) across Ramtown-Greenville Road in order to inventory existing peak hour traffic volumes passing the site frontage.
- 3. Conducted manual turning movement traffic counts along Ramtown-Greenville Road at Arnold Boulevard.

Please reply to:

1431 Lakewood Road, Suite C, Manasquan, NJ 08736 • (732) 528-7076 • Fax (732) 528-6673
 □ 105 Elm Street, Lower Level, Westfield, NJ 07090 • (908) 789-7180 • Fax (908) 789-7181



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Howell Township Zoning Bd. of Adj.

-2-

March 19, 2020

- 4. Prepared estimates of traffic to be generated by the warehouse and office space based upon Institute of Transportation Engineers (ITE) data.
- 5. Projected traffic volumes to a design year of 2022, including background traffic growth along Ramtown-Greenville Road.
- 6. Conducted a level of service capacity analysis for the proposed site driveway to Ramtown-Greenville Road.

The following report sets forth the database accumulated and the conclusions reached with respect to 366 Ramtown-Greenville Road.

EXISTING CONDITIONS

The subject property contains approximately 10 acres and is located on the north side of Ramtown-Greenville Road just north of the bridge over Muddy Ford Brook, as seen on *Figure 1*, a *Site Location Map*, in the *Appendix*. It is currently served by an 18 foot wide driveway to an existing 1-sotry masonry building. Ramtown-Greenville Road is a 2-lane collector roadway in the vicinity of the site with a posted speed limit of 40 MPH. Land use along Ramtown-Greenville Road consists of residential subdivisions and vacant wooded properties. North of the subject property, Ramtown-Greenville Road provides access to the *Howell Township Middle School South* and *Ramtown* and *Greenville Elementary Schools*.

EXISTING TRAFFIC VOLUMES

An ATR was placed across Ramtown-Greenville Road in the vicinity of the noted property and recorded traffic volumes from October 26, 2019-November 2, 2019. Over 150 hours of continuous traffic volume data was collected. Peak hours along Ramtown-Greenville Road typically occur in the morning between 7:00 AM-8:00 AM and in the afternoon between 2:00 PM-3:00 PM. In addition, manual turning movement traffic counts were conducted in November 2019 at the Arnold Boulevard/Ramtown-Greenville Road intersection. The afternoon peak hour coincides with dismissal times at the middle school and elementary schools in the area. *Figure 2* in the *Appendix* illustrates existing peak hour traffic flow passing the site frontage.



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-3-

March 19, 2020

TRIP GENERATION/DISTRIBUTION

Estimates of traffic to be generated by the total office and warehouse space in both buildings were made after consulting the 10^{th} Edition of the ITE Trip Generation Manual. The following Table illustrates the anticipated peak hour traffic generation from both the office space and warehouse space.

TABLE I TRIP GENERATION

		<u>AM F</u>	<u>PSH</u>		PM P	<u>SH</u>
<u>Use</u>	<u>In</u>	<u>Out</u>	TOTAL	<u>IN</u>	OUT	TOTAL
Warehouse Space-45,975 SF	24	7	31	9	25	34
Office Space-9,400 SF	_9	<u>2</u>	<u>11</u>	_3	_8	<u>11</u>
Total	33	9	42	12	33	45

With respect to the anticipated distribution of site generated traffic, it is anticipated that approximately 60 percent of site generated trips will be oriented to and from the north along Ramtown-Greenville Road, towards Newtons Corner Road and an eventual connection with I-195, north of the property.

Figure 3 in the Appendix illustrates peak hour site generated traffic flow.

It should be noted that in order to prepare a worst case analysis, MRA utilized the *Peak Hour of Generator* traffic generation numbers from the ITE *Trip Generation Manual* and analyzed the highest peak hour of traffic flow passing the site frontage in the morning (7:00 AM-8:00 AM) and afternoon (2:00 PM-3:00 PM).

ANALYSIS OF FUTURE TRAFFIC

A design year of 2022 was selected for analysis. The New Jersey Department of Transportation's (NJDOT) *Background Traffic Growth Rate* data for the area was consulted with a finding that background traffic growth along collector roads such as Ramtown-Greenville Road, is anticipated to grow at 2.5 percent per year. MRA conservatively increased existing traffic volumes by 10 percent in order to project traffic volumes to the 2022 design year. Design year 2022 traffic volumes are shown on *Figure 4* in the *Appendix*. Site generated and distributed traffic was surcharge onto *no-build* volumes and are shown on *Figure 5* in the *Appendix* entitled, *Design Year 2022 Build Traffic Volumes*.



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-4-

March 19, 2020

Traffic engineers calculate levels of service of unsignalized intersections which relate to the quality of traffic flow. Level of service is a measure of average control delay. Average control delay is the time lost due to deceleration and the amount of time from when a vehicle is stopped for a traffic control device (or at the end of the queue) to when the vehicle departs the intersection. Delay is a relative quantity of driver discomfort, frustration, fuel consumption, and loss in travel time.

Levels of service range from "A" to "F" with "A" being the highest or best attainable level of service. Level of service "E" with average control delays of not more than 50 seconds per vehicle at an unsignalized intersection indicates near to or at capacity conditions and is generally considered the limit of acceptable level of service and delay.

Full definitions of levels of service for unsignalized intersections and level of service summaries are included in the *Appendix*. The intersections studied by this report were analyzed according to the procedures set forth in the *Highway Capacity Manual 2010*, using the *Highway Capacity Software (HCS7 version 7.5)*.

Findings were that exiting movements from the site driveway to Ramtown-Greenville Road will operate at level of service "B" during both the AM and PM peak street hours. Left turn movements into the site driveway will operate at level of service "A" during both time frames. Therefore, this intersection will operate well within accepted traffic engineering parameters.

CONCLUSIONS

It is concluded based on the analysis set forth in this report, that plans to construct 37,530 SF of office/warehouse building on the noted property, in addition to the 17,845 SF building that exists on the site, can be approved and operate compatibly with future traffic flows in the area. The site driveway to Ramtown-Greenville Road will operate at an excellent level of service for both the morning and afternoon peak hour.



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-5-

March 19, 2020

A representative from MRA will be in attendance at an upcoming Howell Township Zoning Board of Adjustment meeting to provide expert testimony and to answer any questions board members, board experts or the public may have.

Very truly yours,

hn H. Rea, PE

#rincipal

Scott T. Kennel Sr. Associate

cc:

Ken Pape, Esq. Nechama Morgan Chaim Dubin





TRAFFIC AND TRANSPORTATION CONSULTING

FIGURE

JOB NO. 19-203

DATE: NOV 2019

SUBJECT:

366 RAMTOWN - GREENVILLE ROAD: HOWELL SITE LOCATION MAP

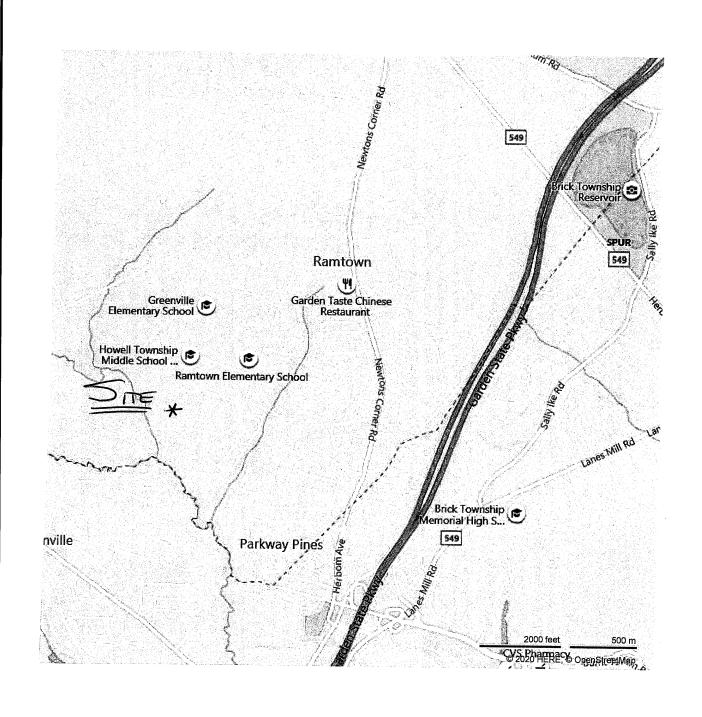




FIGURE 2

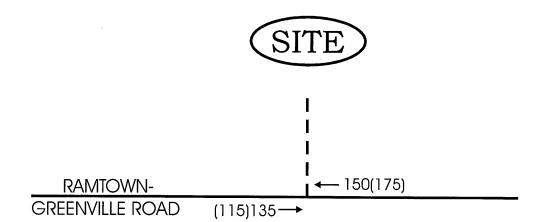
TRAFFIC AND TRANSPORTATION CONSULTING

JOB NO. 19-203

DATE: NOV 2019

SUBJECT:

366 RAMTOWN - GREENVILLE ROAD: HOWELL EXISTING AM PSH (PM PSH) TRAFFIC VOLUMES





FIGURE

3

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JOB NO. 19-203

DATE: MAR 2020

SUBJECT:

366 RAMTOWN - GREENVILLE ROAD: HOWELL SITE GENERATED TRAFFIC VOLUMES



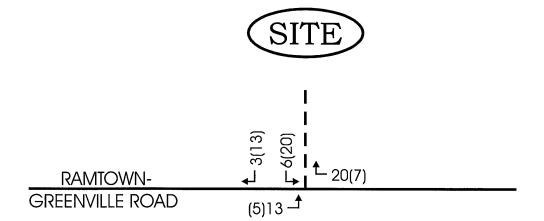




FIGURE 4

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JOB NO. 19-203

DATE: NOV 2019

SUBJECT:

366 RAMTOWN - GREENVILLE ROAD: HOWELL 2022 NO - BUILD TRAFFIC VOLUMES

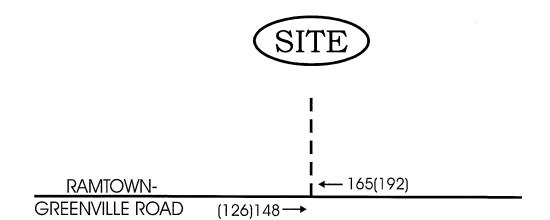


FIGURE 5

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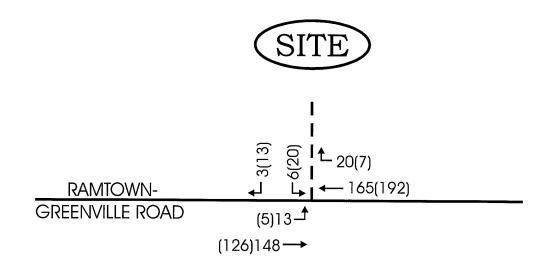
JOB NO.

DATE: 19-203 MAR 2020

SUBJECT:

366 RAMTOWN - GREENVILLE ROAD: HOWELL 2022 BUILD TRAFFIC VOLUMES





RAMTOWN - GREENVILLE LLC RAMTOWN - GREENVILLE ROAD HOWELL TOWNSHIP, MONMOUTH COUNTY MRA JOB 19-203 ATR COUNT

McDonough & Rea Associates 1431 Lakewood Road Suite C Manasquan NJ 08736 (732) 528-7076

Site Code: 19203
19203 OCT RAMTOWN GREENVILLE ATR COUNT
Located near #366 RamtownGreenville road
Station ID: 15293

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McDonough & Rea Associates 1431 Lakewood Road Suite C Manasquan NJ 08736 (732) 528-7076 RAMTOWN - GREENVILLE LLC RAMTOWN - GREENVILLE ROAD HOWELL TOWNSHIP, MONMOUTH COUNTY MRA JOB 19-203 ATR COUNT

Site Code: 19203
19203 OCT RAMTOWN GREENVILLE ATR COUNT
Located near #366 RamtownGreenville road
Station ID: 15293

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366 RAMTOWN - GREENVILLE ROAD
ARNOLD BLVD & RAMTOWN - GREENVILLE RD
HOWELL TOWNSHIP, MONMOUTH COUNTY
MRA JOB 19-203 WEDNESDAY AM COUNT

McDonough & Rea Associates 1431 Lakewood Road Suite C Manasquan NJ 08736 (732) 528-7076

File Name: 19203 arnold & ramtown am1 Site Code: 00019203 Start Date: 11/6/2019 Page No: 1

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Ramtown-Greenville Road Southbound	Right			104	65.8	26			37	
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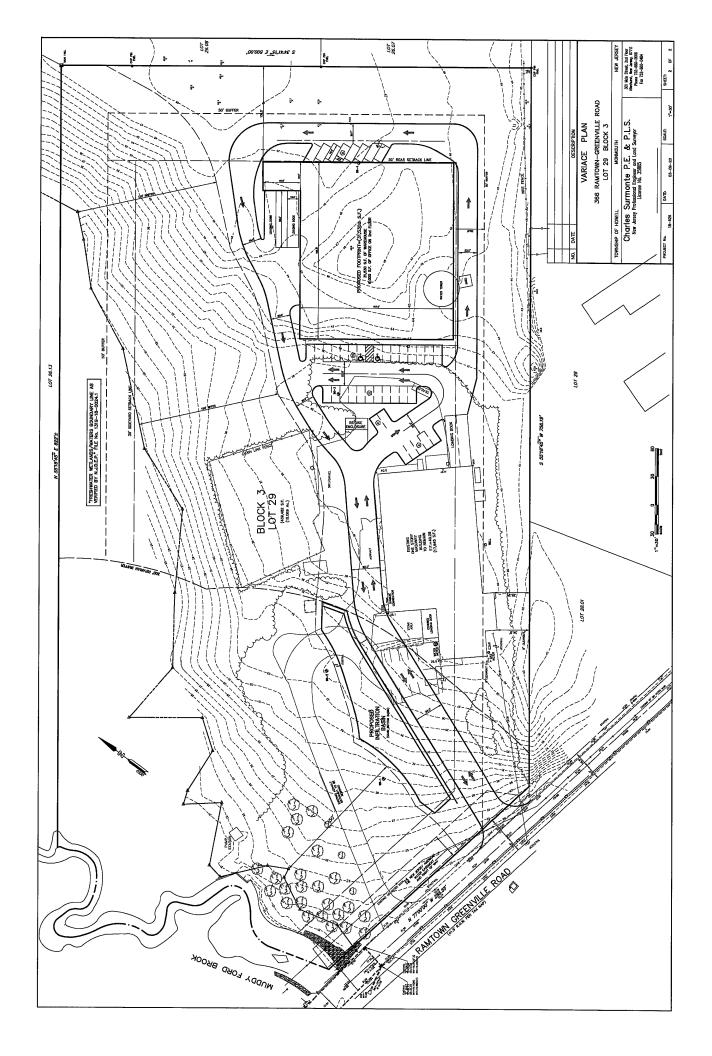
ARNOLD BLVD & RAMTOWN - GREENVILLE RD HOWELL TOWNSHIP, MONMOUTH COUNTY MRA JOB 19-203 WEDNESDAY PM COUNT 366 RAMTOWN - GREENVILLE ROAD

McDonough & Rea Associates 1431 Lakewood Road Suite C Manasquan NJ 08736 (732) 528-7076

File Name: 19203 arnold & ramtown pm1 Site Code: 00019203 Start Date: 11/6/2019 Page No: 1

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	Ramtow	S	Thru	16	7	15	16	54	22	14	17	18	71	15	15	18	13	61	186	56.2	16.4	
			Start Time	03:00 PM	03:15 PM	03:30 PM	03:45 PM	Total	04:00 PM	04:15 PM	04:30 PM	04:45 PM	Total	05:00 PM	05:15 PM	05:30 PM	05:45 PM	Total	Grand Total	Apprch %	Total %	

	Ramtow	Ramtown-Greenville Road	DE	Ramtov	Ramtown-Greenville Road	oad		Arnold Blvd		
-		Southbound			Northbound			Eastbound		
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour From 03:00 PM to 05:45 PM - Peak 1 of 1	PM - Peak 1 of 1									
Intersection 04:00 PM	04:00 PM									
Volume	71	42	113	78	22	133	80	98	166	412
Percent	62.8	37.2		58.6	41.4		48.2	51.8		
04:00 Volume	22	15	37	21	10	31	24	27	51	119
Peak Factor										0.866
High Int.	High Int. 04:00 PM			04:30 PM			04:00 PM			
Volume	22	15	37	17	20	37	24	27	51	
Peak Factor			0.764			0.899			0.814	



ITE Land Use: 150, Warehousing
45,975 SF
Average Rate Stu
1.74
0.17
0.19
0.24 25
0.15
0.05
0.06
0.04

ITE Land Use: 710, General Office B	710, General Off	ice Building	מ								
Size of Development:	9,400 SF	SF		10th							
										İ	
Time Period	Average Rate	<u>Studies</u>	Avg. Size	~	Trips		Equ	Equation	Trips	Split	±
Weekday Daily	9.74	99	171	0.83	91.6	Ln(T)=	0.970	Ln(x)+ 2.500	107.1	1	20
AM Peak Street Hour	1.16	35	117	0.85	10.9	Ľ	0.940	-	35.3	\vdash	14
PM Peak Street Hour	1.15	32	114	0.88	10.8	Ln(T)=		Ln(x)+ 0.360	12.0	16	8
AM Peak Hour of Generator	1.47	228	209	0.84	13.8	Ln(T)=	0.880	Ln(x)+ 1.060	20.7	88	12
PM Peak Hour of Generator	1.42	243	205	0.82	13.3	ļi H		(x)+ 65.390	75.7	18	82
Saturday Daily	2.21	5	94	ŊĊ	20.8		Not	Not Given	₹ N	20	20
Saturday Peak Hour of Generator	0.53	က	82	ŊĊ	2.0		Not	Not Given	¥X		46
Sunday Daily	0.70	2	94	ŊĠ	9.9		Not	Not Given	₹ Z	+	20
Sunday Peak Hour of Generator	0.21	3	82	NG	2.0		Not	Not Given	N/A	28	42

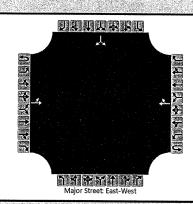
LEVEL OF SERVICE CRITERIA FOR $\label{eq:two-Way} \textbf{STOP-CONTROLLED INTERSECTIONS}^1$

Level of Service	Average Control Delay
A	≤ 10.0 Seconds Per Vehicle
В	> 10.0 and ≤ 15.0 Seconds Per Vehicle
C	$>$ 15.0 and \leq 25.0 Seconds Per Vehicle
D	$>$ 25.0 and \leq 35.0 Seconds Per Vehicle
Е	$>$ 35.0 and \leq 50.0 Seconds Per Vehicle
F	> 50.0 Seconds Per Vehicle

¹ Transportation Research Board, <u>Highway Capacity Manual 2010</u>, National Research Council, Washington, DC, 2010.

HCS7 Two-Way Stop-Control Report General Information Site Information Analyst STK RAMTOWN-GREENVILLE & SITE Intersection Agency/Co. MRA Jurisdiction Date Performed 3/18/2020 East/West Street RAMTOWN-GREENVILLE Analysis Year 2022 North/South Street SITE TRAFFIC Time Analyzed PM Peak Hour Factor 0.90 Intersection Orientation East-West Analysis Time Period (hrs) 0.25 **Project Description** 19-203PFB

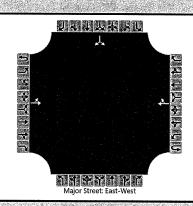
Lanes



Vehicle Volumes and Ad		A Carlotte Company				10.00										7
Approach			ound			West	bound	·		North	bound			South	bound	
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	Т	R
Priority	1U	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		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		5	126				192	7						20		13
Percent Heavy Vehicles (%)		10												10		10
Proportion Time Blocked																
Percent Grade (%)		-													0	
Right Turn Channelized														114.35		
Median Type Storage				Undi	vided											
Critical and Follow-up H	eadwa	ys														
Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.20								J.				6.50		6.30
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.29											, VA	3.59	gg dis	3.39
Delay, Queue Length, an	d Leve	l of Se	ervice												i de la company	
Flow Rate, v (veh/h)		6													37	
Capacity, c (veh/h)		1302							5574					Y 1	676	
v/c Ratio		0.00													0.05	
95% Queue Length, Q ₉₅ (veh)		0.0												Tay A	0.2	
Control Delay (s/veh)		7.8													10.6	
Level of Service (LOS)		Α								in the p					В	
Approach Delay (s/veh)		0.	.3			L		<u> </u>			<u> </u>	13. 14. 2	3/5 -	10	0.6	<u> </u>
Approach LOS										······			ļ	······	R	

	HCS7 Two-Way	y Stop-Control Report	
General Information		Site Information	
Analyst	STK	Intersection	RAMTOWN-GREENVILLE & SITE
Agency/Co.	MRA	Jurisdiction	
Date Performed	3/18/2020	East/West Street	RAMTOWN-GREENVILLE
Analysis Year	2022	North/South Street	SITE TRAFFIC
Time Analyzed	AM	Peak Hour Factor	0.90
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	19-203AFB		

Lanes



Vehicle Volumes and Ad	justine	nts														54.2		
Approach		Eastbound				Westbound				Northbound				Southbound				
Movement	U	L	T	R	U	L	T	R	U	L	Ť	R	U	L	T	R		
Priority	1U	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		0	1	0		
Configuration		LT						TR							LR			
Volume (veh/h)		13	148				165	20			1			6		3		
Percent Heavy Vehicles (%)		10												10		10		
Proportion Time Blocked																		
Percent Grade (%)										-		4			0			
Right Turn Channelized																		
Median Type Storage				Undi	vided													
Critical and Follow-up H	leadwa	ys	u.				A STATE											
Base Critical Headway (sec)		4.1							200,000,000	and the same of th		10.000.000.000.000.000.000.000.000.000.		7.1		6.2		
Critical Headway (sec)		4.20											4.00	6.50		6.30		
Base Follow-Up Headway (sec)		2.2												3.5		3.3		
Follow-Up Headway (sec)		2.29								75.85				3.59		3.39		
Delay, Queue Length, an	d Leve	l of Se	ervice															
Flow Rate, v (veh/h)		14										ST THE STATE OF TH			10	744 37 484.		
Capacity, c (veh/h)		1319													655			
v/c Ratio		0.01													0.02			
95% Queue Length, Q ₉₅ (veh)		0.0													0.0			
Control Delay (s/veh)		7.8													10.6			
Level of Service (LOS)		Α													В			
Approach Delay (s/veh)		0.7								The second of th				10.6				
Approach LOS															В			