JOHN COLLINS
ENGINEERS, P.C. TRAFFIC • TRANSPORTATION ENGINEERS
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TRAFFIC IMPACT STUDY

****

YESHIVA HOUSING

(KIRYAS RADIN HOUSING)

TOWN OF RAMAPO, NEW YORK

PROJECT 730

JULY 24, 2003

TABLE OF CONTENTS

A. INTRODUCTION

This study has been prepared to evaluate the potential traffic impacts associated with the proposed Yeshiva Housing (herein referred to as the Kiryas Radin Housing) on the surrounding roadway network. The following sections provide a description of the proposed Project and the tasks undertaken in completing our evaluation.

B. PROJECT DESCRIPTION AND LOCATION (Figure No. 1)

The site which is located on the south side of Grandview Avenue is currently used as a Yeshiva for advanced rabbinical study (Jewish religious school for continuing education after marriage) and includes a study hall, synagogue and 12 homes. Access to the site is currently provided via Kiryas Radin Drive. The site location is shown on Figure No. 1. The Project which is analyzed herein, calls for a new updated Yeshiva building and a total of 60 homes (an increase of 48 homes).

For the purpose of analysis, a Design Year of 2008 has been utilized in completing the traffic analysis.

C. Year 2003 EXISTING TRAFFIC VOLUMES (Figures No. 2 and 3)

In order to identify current traffic conditions in the vicinity of the site, turning movement traffic counts (including school bus and pedestrian activity) were conducted by representatives of John Collins Engineers, P.C. on Wednesday, May 28 and Thursday, May 29, 2003. This count data was utilized to determine the Weekday Peak AM Hour (8:00 AM to 9:00 AM) and Weekday Peak PM Hour (3:15 PM to 4:15 PM) at the following intersections:

- NYS Route 306 and Grandview Avenue
- Grandview Avenue and Baldwin Court
- Grandview Avenue and Kiryas Radin Drive
- Grandview Avenue and Colton Merrill School
- Grandview Avenue and Union Road/New Hempstead Road

The resulting Year 2003 Existing Traffic Volumes are shown on Figures No. 2 and 3 for each of the peak hours, respectively.

D. YEAR 2008 NO-BUILD TRAFFIC VOLUMES (Figures No. 4 and 5)

In order to account for normal background growth in the area, the Year 2003 Existing Traffic Volumes were increased by a growth factor of 2% per year to a 2008 Design Year for a total background growth of 10%. In addition, traffic associated with other specific developments in the area was included. These developments included the Darchei Noam School (New Hempstead), the Yeshiva Zichron Yakov (New Hempstead), The Views at Pomona (Ramapo) and the proposed

expansion to the Rockland Jewish Community Center (Ramapo). The inclusion of these other developments together with the 2% per year growth factor provides a conservative evaluation of future conditions.

The resulting Year 2008 No-Build Traffic Volumes are shown on Figures No. 4 and 5 for each of the peak hours, respectively.

E. SITE GENERATED TRAFFIC VOLUMES (Figures No. 6 and 7)

As indicated previously, the site is currently used as a Yeshiva and has 12 existing homes and as part of the site renovation, there will be a increase of some 48 homes. In order to estimate the amount of traffic to be generated by the additional 48 homes during each of the peak hours, the trip generation rates observed at the existing site were utilized.

As shown on the Figures No. 2 and 3, the existing site which currently has 12 homes has a total generation of 11 vehicles (5 entering vehicles and 6 exiting vehicles) during the Weekday Peak AM Hour and a total generation of 10 vehicles (5 entering vehicles and 5 exiting vehicles) during the Weekday Peak PM Hour. Based on this, the generation for the additional 48 homes would be an additional 44 vehicles (20 entering vehicles and 24 exiting vehicles) during the Weekday Peak AM Hour and an additional 40 vehicles (20 entering vehicles and 20 exiting vehicles) during the Weekday Peak PM Hour.

The site generated traffic volumes were assigned to the roadway network based on the distribution patterns observed at the existing site driveway as well as the existing traffic patterns at the adjacent intersections. The resulting site generated traffic volumes are shown on Figures No. 6 and 7 for each of the peak hours, respectively.

F. YEAR 2008 BUILD TRAFFIC VOLUMES (Figures No. 8 and 9)

The site generated traffic volumes were then added to the Year 2008 No-Build Traffic Volumes to obtain the Year 2008 Build Traffic Volumes. The resulting Year 2008 Build Traffic Volumes are shown on Figures No. 8 and 9 for each of the peak hours, respectively.

G. DESCRIPTION OF ANALYSIS

In order to determine existing and future traffic operating conditions at the study area locations, capacity analysis were performed based on the 2000 Highway Capacity Manual. The following is a description of the analysis method utilized in this report.

- Signalized Intersection Capacity Analysis

  The capacity analysis for the signalized intersection was performed in accordance with the procedures described in the 2000 Highway Capacity Manual published by the Transportation Research Board. The terminology used in identifying traffic flow conditions is Levels of Service. A Level of Service "A"

represents the best condition and a Level of Service "F" represents the worst condition. A Level of Service "C" is generally used as a design standard while a Level of Service "D" is acceptable during peak periods. A Level of Service "E" represents an operation near capacity. In order to identify an intersection's Level of Service the average amount of vehicle delay is computed for each approach to the intersection as well as for the overall intersection.

- Unsignalized Intersection Capacity Analysis

The unsignalized intersection capacity analysis method utilized in this report was also performed in accordance with the procedures described in the 2000 Highway Capacity Manual. The procedure is based on total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. The average total delay for any particular critical movement is a function of the service rate or capacity of the approach and the degree of saturation. In order to identify the Level of Service, the average amount of vehicle delay is computed for each critical movement to the intersection as well as for the overall intersection.

Additional information concerning signalized and unsignalized Levels of Service can be found in Appendix "D" of this report.

H. TRAFFIC IMPACT ANALYSIS (Table No. 1)

In order to evaluate current and future traffic operating conditions, capacity analyses (with school bus traffic included) were conducted at each of the study area intersections utilizing the procedures described above. Summarized below is a brief description of the existing geometrics, traffic control and a summary of the existing and future Levels of Service.

Table No. 1 also summarizes the results of the capacity analysis (Levels of Service and delays) for the Year 2003 Existing, Year 2008 No-Build and the Year 2008 Build Traffic Volumes. Copies of the capacity analysis are contained in Appendix "C" of this study.

1. NYS Route 306 and Grandview Avenue

Grandview Avenue intersects NYS Route 306 to form a full movement, signalized intersection. The NYS Route 306 northbound and southbound approaches consists of a separate left turn lane and a shared through/right turn lane. The Grandview Avenue eastbound and westbound approaches consist of one lane for left, through and right turn movements.

Capacity analysis conducted utilizing the Year 2003 Existing Traffic Volumes indicates that the intersection is currently operating at an overall Level of Service "C" during each of the peak hours.

Capacity analysis conducted utilizing the Year 2008 No-Build and Year 2008 Build Traffic Volumes indicates that the intersection will continue to operate at an overall Level of Service "C" during each of the peak hours.

2. Grandview Avenue and Baldwin Court

Baldwin Court intersects Grandview Avenue at an unsignalized, "T" type intersection. All approaches to the intersection consist of one lane in each direction.

Capacity analysis conducted utilizing the Year 2003 Existing Traffic Volumes indicates that all movements to the intersection are currently operating at a Level of Service "B" or better during each of the peak hours.

Capacity analysis conducted utilizing the Year 2008 No-Build and Year 2008 Build Traffic Volumes indicates that all movements to the intersection will continue to operate at a Level of Service "B" or better during each of the peak hours.

3. Grandview Avenue and Kiryas Radin Drive

Kiryas Radin Drive (site access) intersects Grandview Avenue at an unsignalized, "T" type intersection. All approaches to the intersection consist of one lane in each direction.

Capacity analysis conducted utilizing the Year 2003 Existing Traffic Volumes indicates that all movements to the intersection are currently operating at a Level of Service "B" or better during each of the peak hours.

Capacity analysis conducted utilizing the Year 2008 No-Build and Year 2008 Build Traffic Volumes indicates that all movements to the intersection will continue to operate at a Level of Service "B" or better during each of the peak hours.

4. Grandview Avenue and Colton Merrill School

The Colton Merrill School access intersects Grandview Avenue at an unsignalized, "T" type intersection. All approaches to the intersection consist of one lane in each direction.

Capacity analysis conducted utilizing the Year 2003 Existing Traffic Volumes (with school bus traffic included) indicates that all movements to the intersection are currently operating at a Level of Service "C" or better during each of the peak hours.

Capacity analysis conducted utilizing the Year 2008 No-Build and Year 2008 Build Traffic Volumes indicates that all movements to the intersection will continue to operate at a Level of Service "C" or better during each of the peak hours.

5. Grandview Avenue and Union Road/New Hempstead Road

Grandview Avenue intersects Union Road/New Hempstead Road at an unsignalized, "T" type intersection. All approaches to the intersection consist of one lane in each direction.

Capacity analysis conducted utilizing the Year 2003 Existing Traffic Volumes indicates that traffic existing Grandview Avenue (minor approach) is currently operating at a Level of Service "F" during the Weekday Peak AM Hour and is currently operating at a Level of Service "C" during the Weekday Peak PM Hour.

Capacity analysis conducted utilizing the Year 2008 No-Build Traffic Volumes indicates that the Grandview Avenue approach will continue to operate at a Level of Service "F" and will operate at a Level "E" during the Weekday Peak PM Hour.

Capacity analysis conducted utilizing the Year 2008 Build Traffic Volumes indicates that the Grandview Avenue approach will continue to operate at a Level of Service "F" and will continue to operate at a Level "E" during the Weekday Peak PM Hour.

It should be noted that the additional traffic added to this intersection as a result of the additional 48 homes would be some 16 vehicle during the Weekday Peak AM Hour and some 16 vehicles during the Weekday Peak PM Hour which would equate to an increase in traffic of less than 1.5% which would be less than the normal background traffic growth used (2% per year) in projecting the existing traffic volumes to future conditions.

I. SUMMARY AND CONCLUSION

As summarized in this Report, even with the conservative evaluation of future traffic conditions, the proposed Kiryas Radin Housing will not result in a significant negative impact on the area roadways in the vicinity of the site.

Based on the analysis contained in this Report, similar Levels of Service and delays will be experienced under the Year 2008 Projected and Year 2008 Future Conditions.

Respectfully submitted,
JOHN COLLINS ENGINEERS, P.C.

John T. Collins, Ph.D., P.E.

Ronald P. Rieman, Project Engineer

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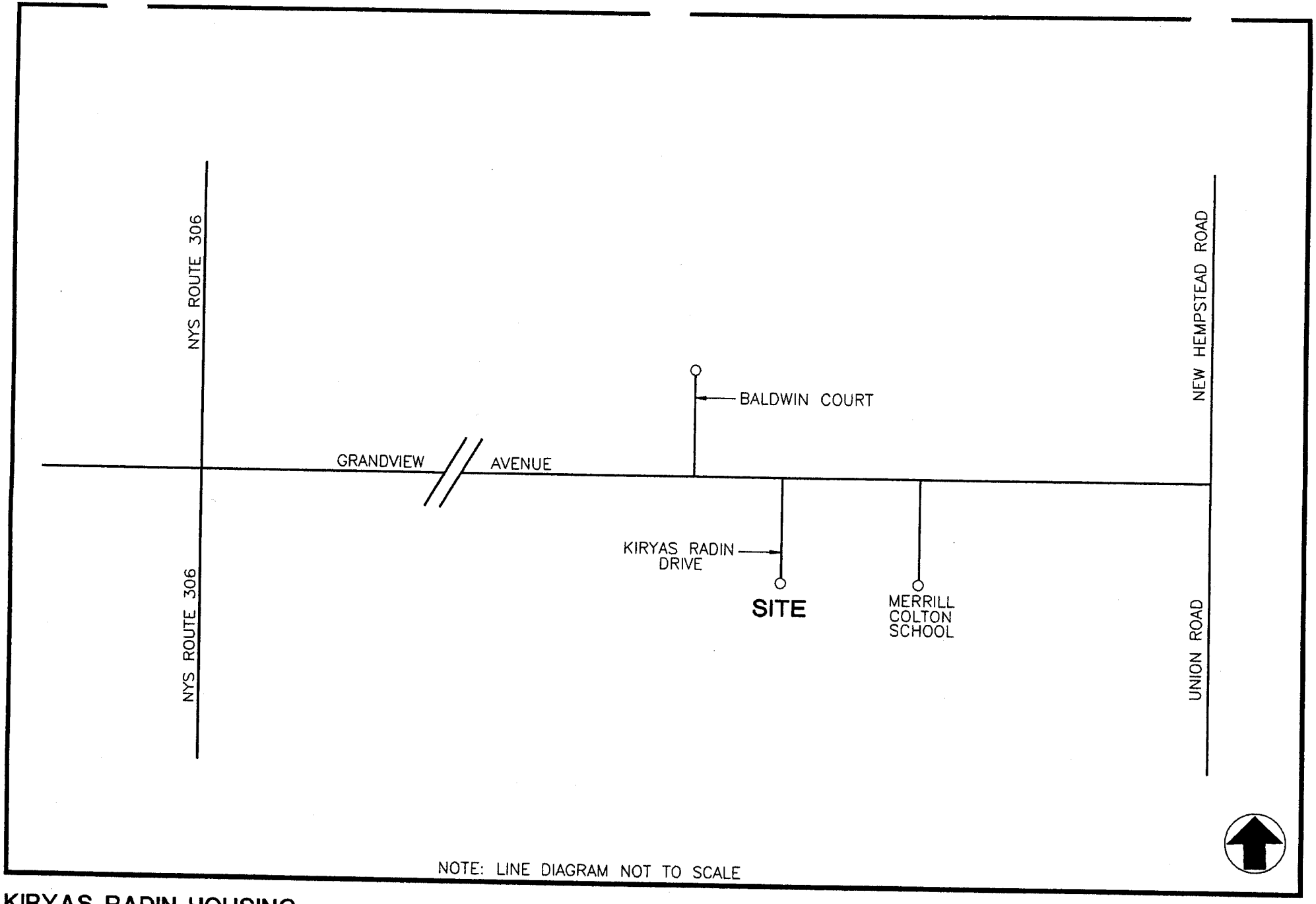
APPENDIX "A"

FIGURES



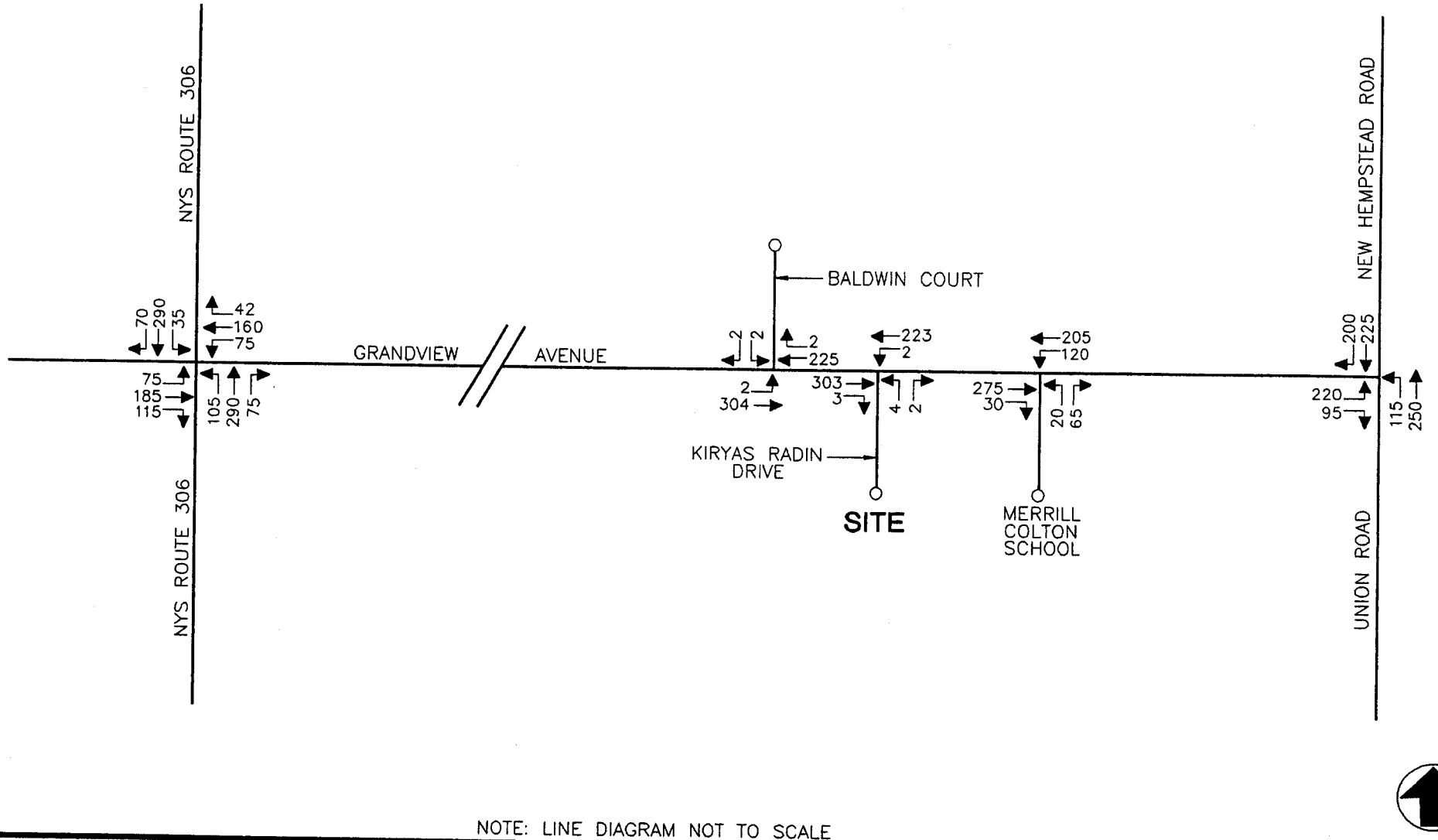
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

SITE LOCATION

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 DATE: JULY, 2003 FIG. NO.1



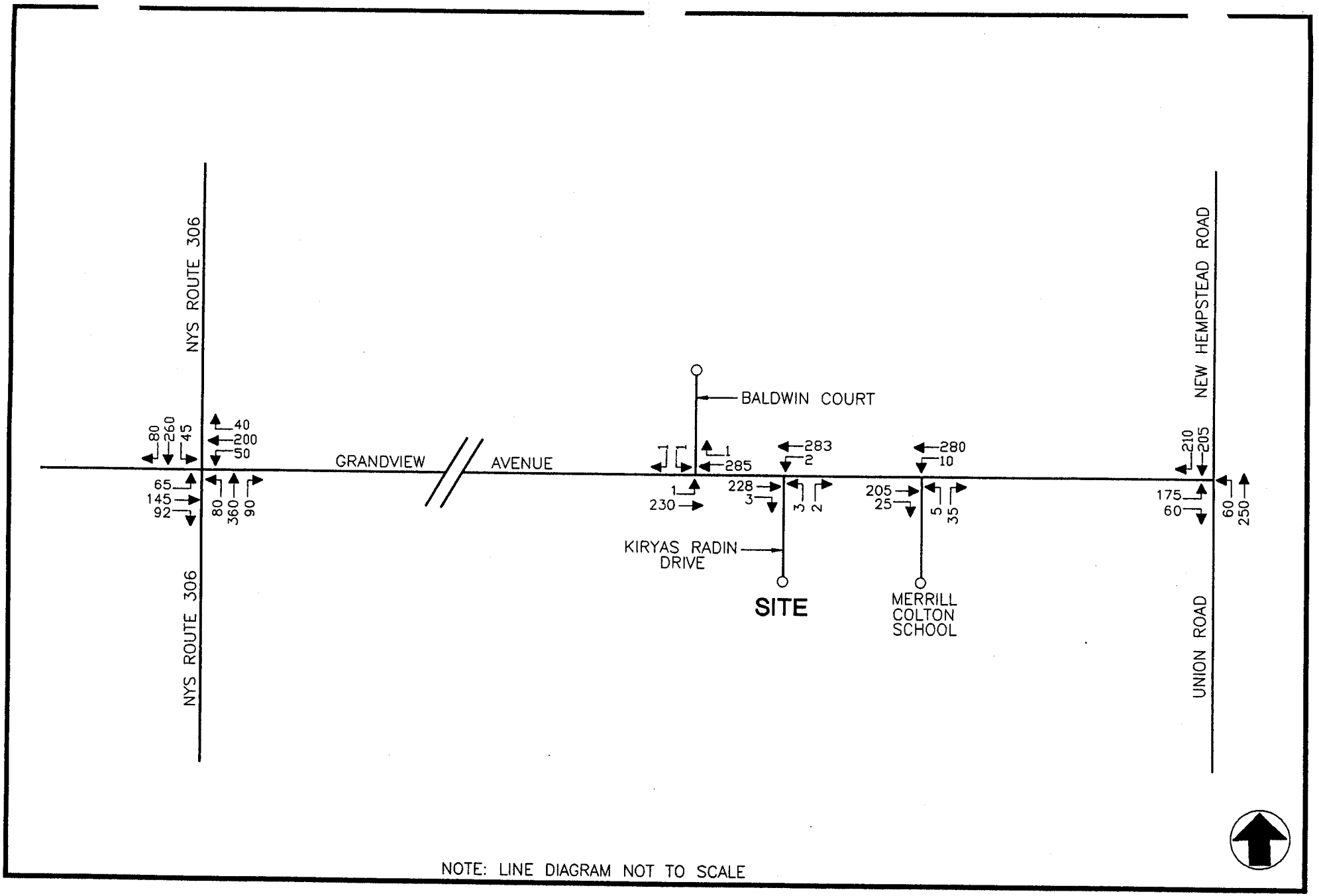
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

YEAR 2003 EXISTING TRAFFIC VOLUMES
WEEKDAY PEAK AM HOUR

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 DATE: JULY, 2003 FIG. NO. 2



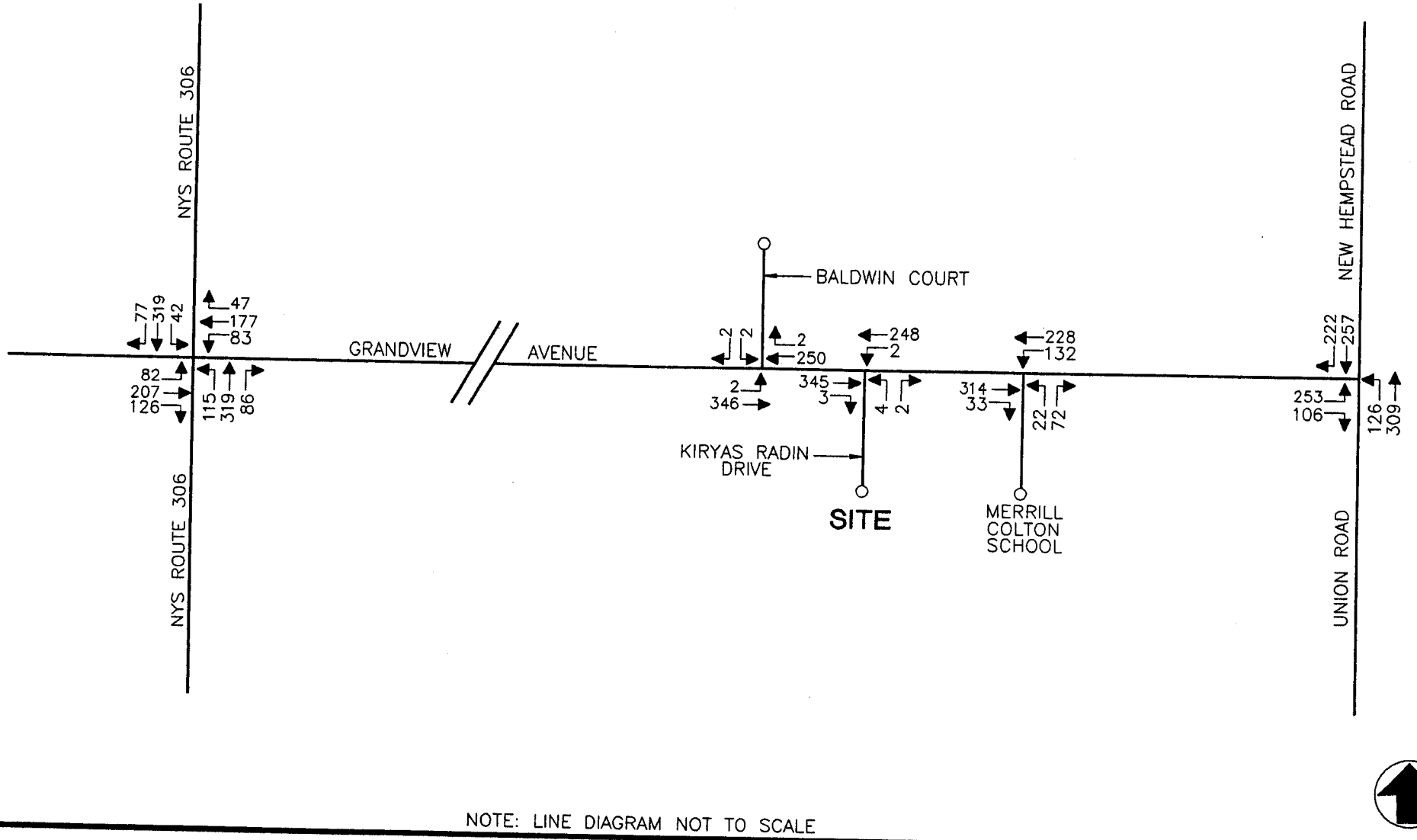
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

YEAR 2003 EXISTING TRAFFIC VOLUMES
WEEKDAY PEAK PM HOUR

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 **DATE: JULY, 2003** **FIG. NO. 3**



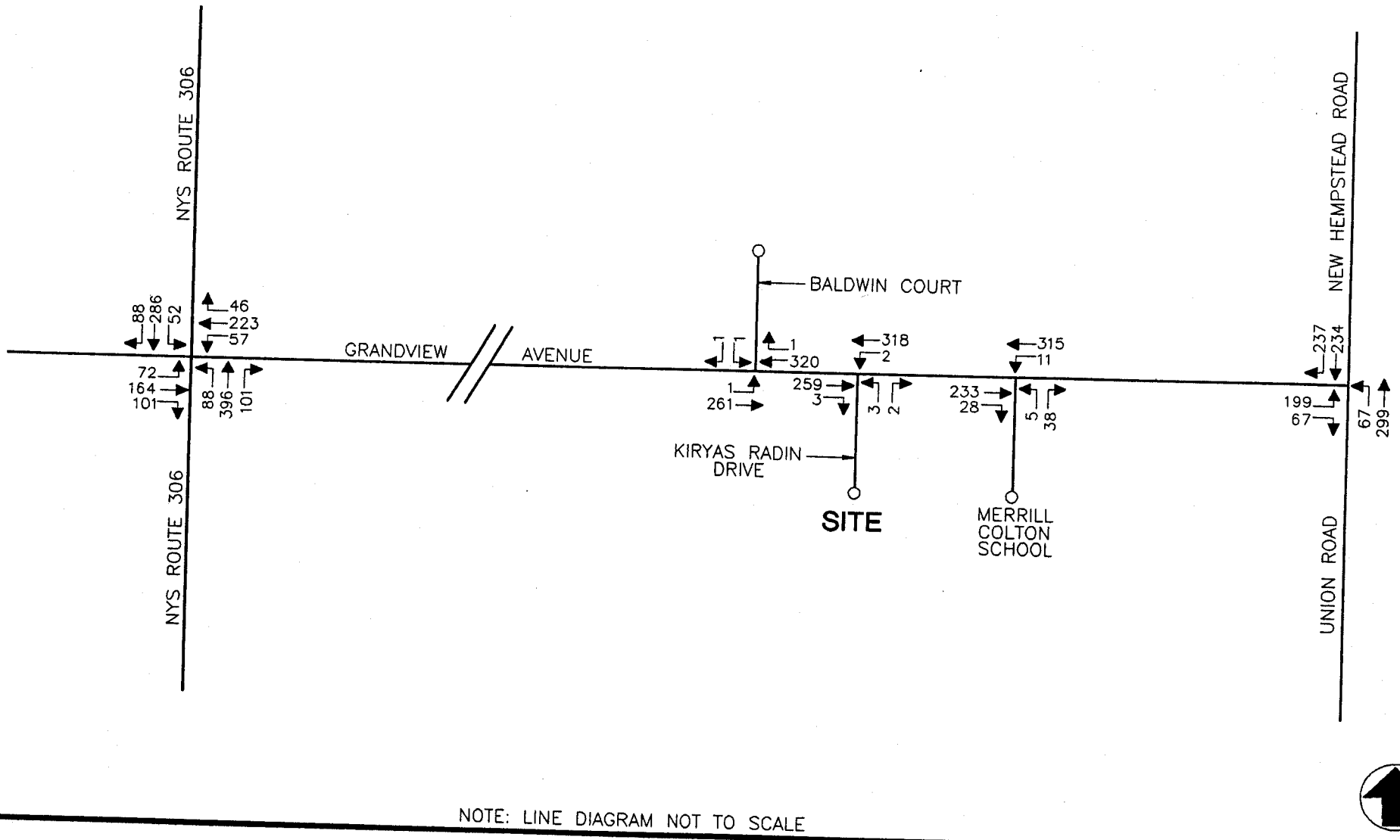
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

YEAR 2008 NO-BUILD TRAFFIC VOLUMES
WEEKDAY PEAK AM HOUR

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 DATE: JULY, 2003 FIG. NO. 4



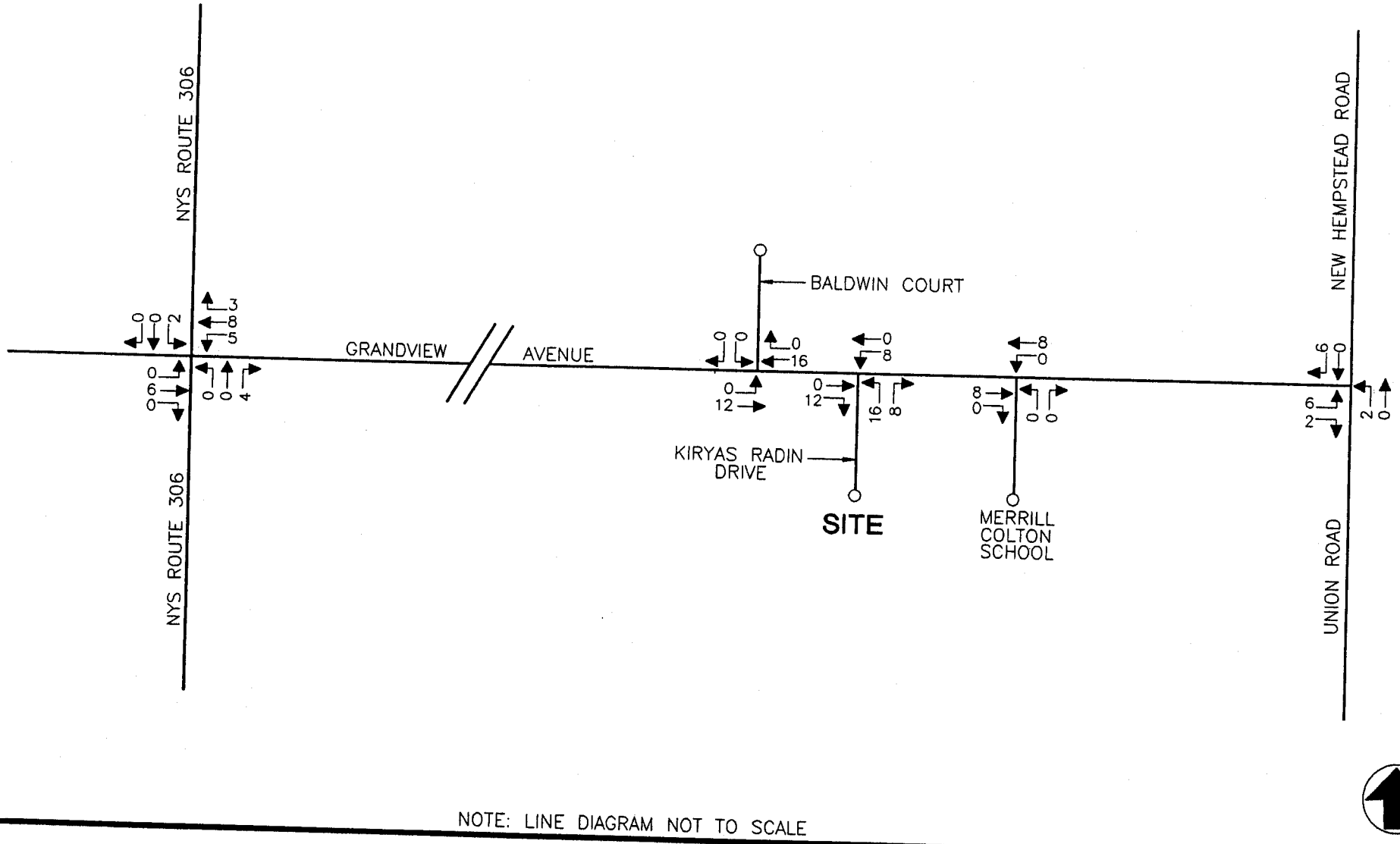
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

YEAR 2008 NO-BUILD TRAFFIC VOLUMES
WEEKDAY PEAK PM HOUR

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 **DATE: JULY, 2003** **FIG. NO. 5**



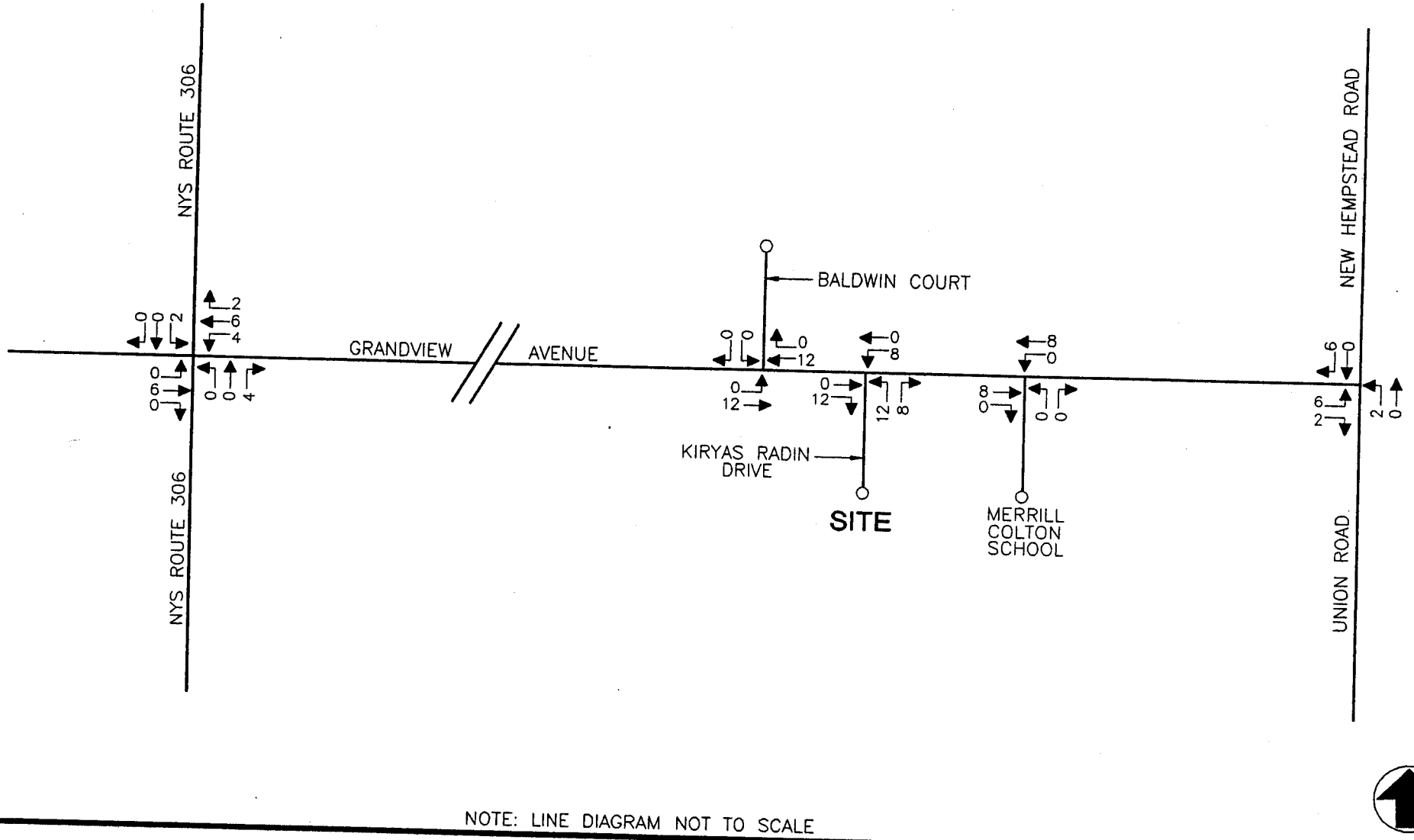
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

SITE GENERATED TRAFFIC VOLUMES
WEEKDAY PEAK AM HOUR

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 DATE: JULY, 2003 FIG. NO. 6



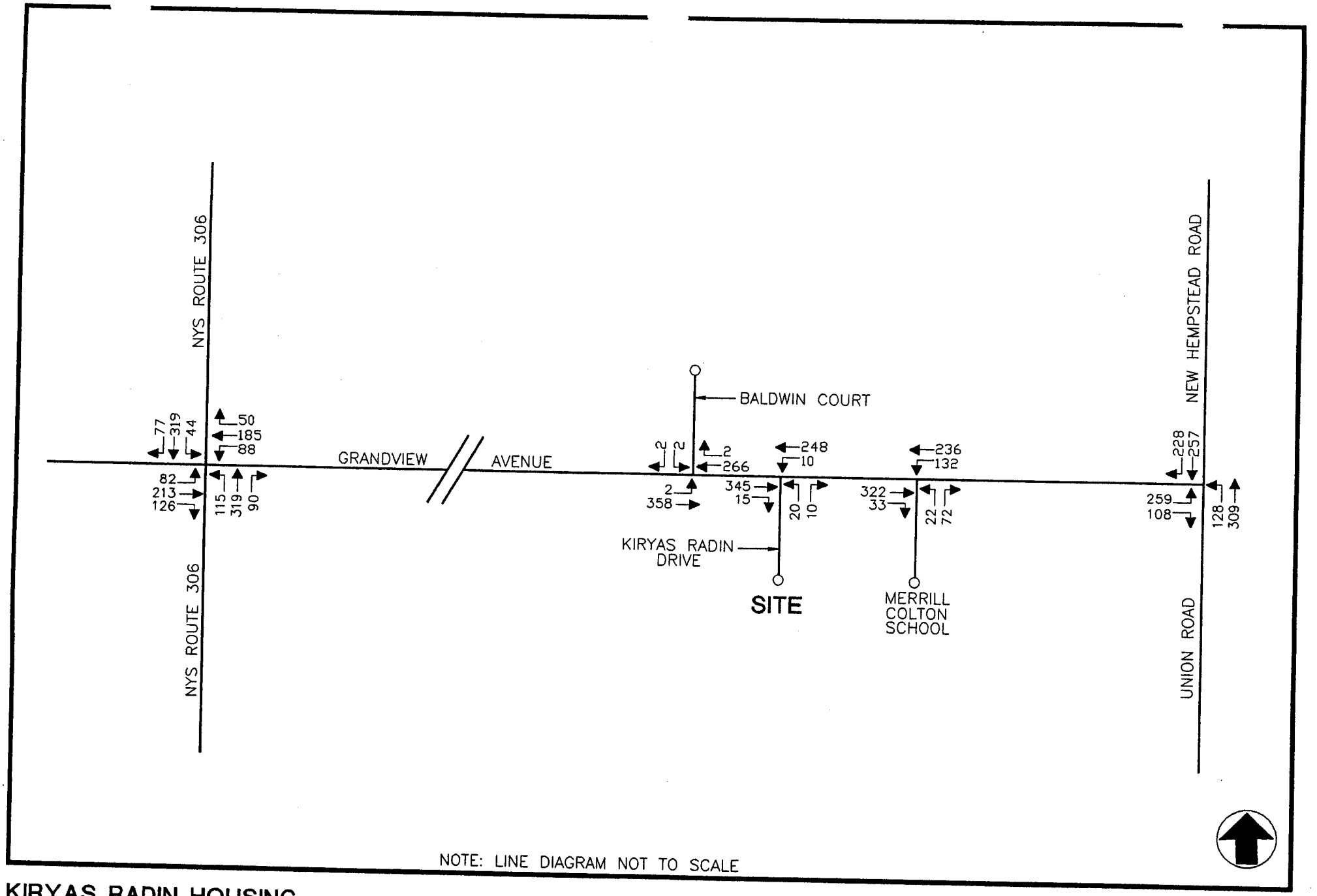
NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

SITE GENERATED TRAFFIC VOLUMES
WEEKDAY PEAK PM HOUR

PROJECT NO. 730 DATE: JULY, 2003 FIG. NO. 7

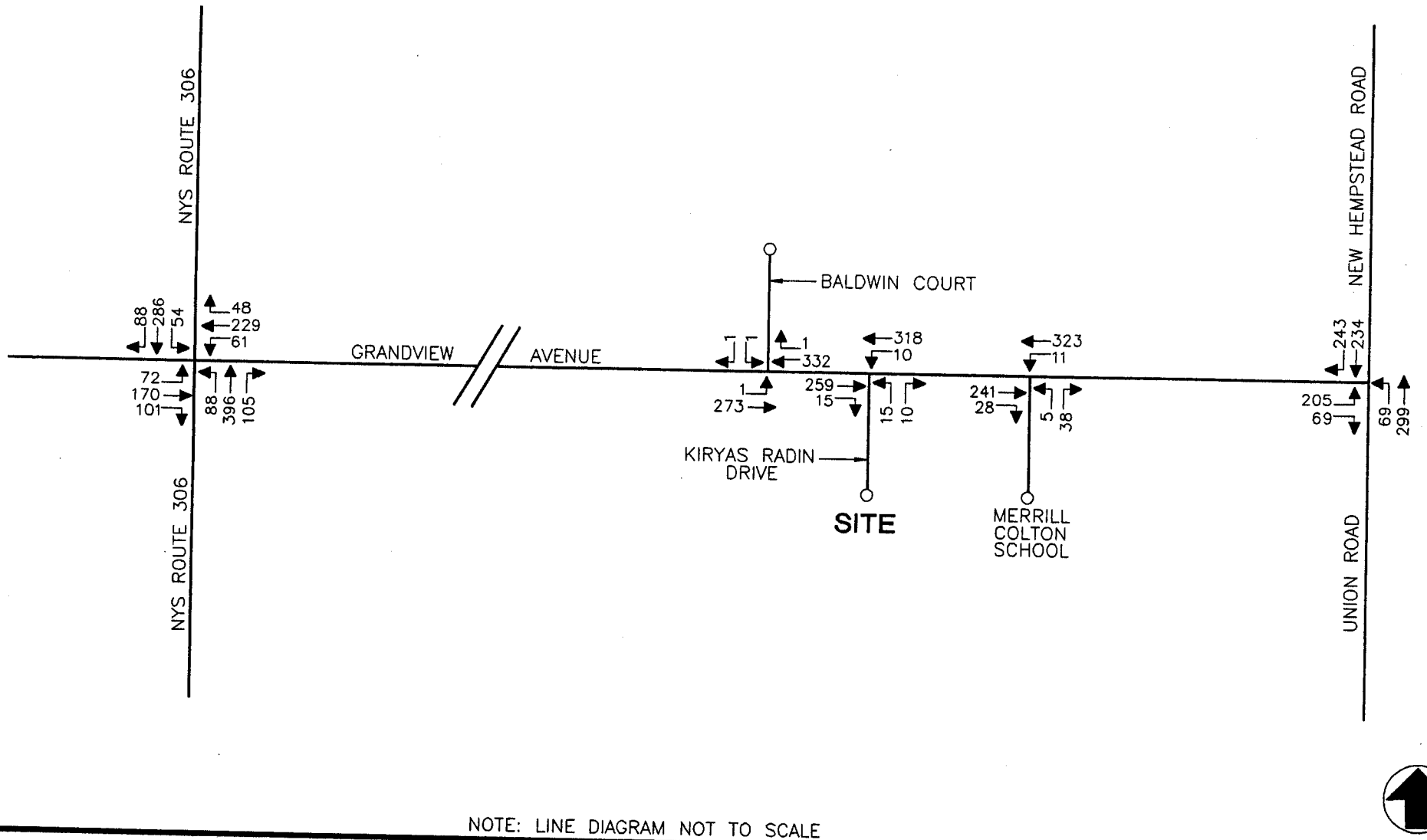


KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

YEAR 2008 BUILD TRAFFIC VOLUMES
WEEKDAY PEAK AM HOUR

PROJECT NO. 730 DATE: JULY, 2003 FIG. NO. 8



NOTE: LINE DIAGRAM NOT TO SCALE

KIRYAS RADIN HOUSING
TOWN OF RAMAPO, NEW YORK

YEAR 2008 BUILD TRAFFIC VOLUMES
WEEKDAY PEAK PM HOUR

JOHN COLLINS ENGINEERS, P.C.
HAWTHORNE , NEW YORK

PROJECT NO. 730 **DATE: JULY, 2003** **FIG. NO. 9**

APPENDIX "B"

TABLES

TABLE NO. 1

LEVEL OF SERVICE SUMMARY TABLE

	LOCATION	YEAR 2003 EXISTING CONDITIONS		YEAR 2008 NO-BUILD CONDITIONS		YEAR 2008 BUILD CONDITIONS	
		WEEKDAY AM	WEEKDAY PM	WEEKDAY AM	WEEKDAY PM	WEEKDAY AM	WEEKDAY PM
1.	NYS ROUTE 306 & GRANDVIEW AVENUE						
	(SIGNALIZED)						
	EASTBOUND LEFT / THROUGH / RIGHT	C [24.6]	C [24.3]	C [27.5]	C [26.5]	C [28.2]	C [26.9]
	EASTBOUND APPROACH	**C [24.6]**	**C [24.3]**	**C [27.5]**	**C [26.5]**	**C [28.2]**	**C [26.9]**
	WESTBOUND LEFT / THROUGH / RIGHT	C [21.8]	C [23.3]	C [23.7]	C [24.7]	C [25.1]	C [25.4]
	WESTBOUND APPROACH	**C [21.8]**	**C [23.3]**	**C [23.7]**	**C [24.7]**	**C [25.1]**	**C [25.4]**
	NORTHBOUND LEFT	B [14.2]	B [11.7]	B [15.0]	B [12.2]	B [15.0]	B [12.2]
	NORTHBOUND THROUGH / RIGHT	C [26.7]	C [26.1]	C [29.3]	C [29.1]	C [29.6]	C [29.7]
	NORTHBOUND APPROACH	**C [23.9]**	**C [23.9]**	**C [26.1]**	**C [26.6]**	**C [26.4]**	**C [27.1]**
	SOUTHBOUND LEFT	B [13.1]	B [12.6]	B [13.7]	B [13.5]	B [13.8]	B [13.6]
	SOUTHBOUND THROUGH / RIGHT	C [26.4]	C [21.9]	C [28.5]	C [23.0]	C [28.5]	C [23.0]
	SOUTHBOUND APPROACH	**C [25.2]**	**C [20.8]**	**C [27.1]**	**C [21.8]**	**C [27.1]**	**C [21.8]**
	OVERALL INTERSECTION	**C [24.0]**	**C [23.1]**	**C [26.3]**	**C [25.0]**	**C [26.8]**	**C [25.4]**
2.	GRANDVIEW AVENUE & BALDWIN COURT						
	(UNSIGNALIZED)						
	EASTBOUND LEFT	A (7.9)	A (8.0)	A (7.9)	A (8.1)	A (8.0)	A (8.1)
	SOUTHBOUND LEFT / RIGHT	B (11.4)	B (11.4)	B (11.9)	B (12.0)	B (12.2)	B (12.2)
3.	GRANDVIEW AVENUE & KIRYAS RADIN DRIVE (SITE ACCESS)						
	(UNSIGNALIZED)						
	WESTBOUND LEFT	A (8.1)	A (7.8)	A (8.2)	A (7.9)	A (8.3)	A (7.9)
	NORTHBOUND LEFT / RIGHT	B (12.2)	B (11.7)	B (13.0)	B (12.3)	B (13.8)	B (12.8)
4.	GRANDVIEW AVENUE & MERRILL COLTON SCHOOL						
	(UNSIGNALIZED)						
	WESTBOUND LEFT	A (8.7)	A (7.9)	A (9.0)	A (8.0)	A (9.0)	A (8.0)
	NORTHBOUND LEFT / RIGHT	B (15.0)	B (10.4)	C (17.0)	B (10.7)	C (17.4)	B (10.8)
5.	GRANDVIEW AVENUE & UNION ROAD / NEW HEMPSTEAD ROAD						
	(UNSIGNALIZED)						
	NORTHBOUND LEFT	A (8.6)	A (8.4)	A (8.8)	A (8.7)	A (8.9)	A (8.7)
	EASTBOUND LEFT / RIGHT	F (71.8)	C (24.9)	F (191.7)	E (40.9)	F (210.5)	E (44.7)

NOTE:

THE ABOVE SUMMARIZES THE LEVELS OF SERVICE AND VEHICLE DELAY, IN SECONDS, B [12.0], FOR EACH APPROACH AS WELL AS FOR THE OVERALL INTERSECTION FOR THE SIGNALIZED INTERSECTION AND THE LEVELS OF SERVICE AND VEHICLE DELAY, IN SECONDS, B (12.0) FOR THE CRITICAL MOVEMENTS FOR THE UNSIGNALIZED INTERSECTIONS.

APPENDIX "C"

CAPACITY ANALYSIS

Analyst: JCE
Agency: JOHN COLLINS ENGINEERS, P.C.
Date: 7/22/2003
Period: WEEKDAY PEAK AM HOUR
Project ID: 730
E/W St: GRANDVIEW AVENUE

Inter.: AM1EX
Area Type: All other areas
Jurisd:
Year : 2003 EXISTING TRAFFIC VOLUMES

N/S St: NYS ROUTE 306

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	75	185	115	75	160	42	105	290	75	35	290	70
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	A							
	Thru	A							
	Right	A							
	Peds								
WB	Left	A							
	Thru	A							
	Right	A							
	Peds								
NB	Right								
	Right								
NB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
SB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
EB	Right								
WB	Right								
Green		35.0				8.0	32.0		
Yellow		3.0				3.0	3.0		
All Red		2.0				2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	619	1591	0.64	0.39	24.6	C	24.6	C
Westbound								
LTR	565	1453	0.52	0.39	21.8	C	21.8	C
Northbound								
L	343	1532	0.32	0.50	14.2	B		
TR	595	1674	0.65	0.36	26.7	C	23.9	C
Southbound								
L	340	1532	0.11	0.50	13.1	B		
TR	596	1677	0.64	0.36	26.4	C	25.2	C

Intersection Delay = 24.0 (sec/veh) Intersection LOS = C

one:
E-Mail:

Fax:

OPERATIONAL ANALYSIS

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK AM HOUR
Intersection:	AM1EX
Area Type:	All other areas
Jurisdiction:	
Analysis Year:	2003 EXISTING TRAFFIC VOLUMES
Project ID: 730	

East/West Street: GRANDVIEW AVENUE
North/South Street: NYS ROUTE 306

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	75	185	115	75	160	42	105	290	75	35	290	70
% Heavy Veh	10	10	10	10	10	10	10	10	10	10	10	10
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PK 15 Vol	20	49	30	20	42	11	28	76	20	9	76	18
Ln Vol												
Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0
Adj Flow		395			291		111	384		37	379	
%InSharedLn												
Prop LTs		0.200			0.271		1.000	0.000		1.000	0.000	
Prop RTs		0.306			0.151			0.206			0.195	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase								0.0			0.0	
Duration	0.25			Area Type: All other areas								

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	
Ped Min g		3.2			3.2			3.2			3.2	

Analyst: JCE
Agency: JOHN COLLINS ENGINEERS, P.C.
Date: 7/22/2003
Period: WEEKDAY PEAK PM HOUR
Project ID: 730
E/W St: GRANDVIEW AVENUE

Inter.: PM1EX
Area Type: All other areas
Jurisd:
Year : 2003 EXISTING TRAFFIC VOLUMES

N/S St: NYS ROUTE 306

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	65	145	92	50	200	40	80	360	90	45	260	80
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	A							
	Thru	A							
	Right	A							
	Peds								
WB	Left	A							
	Thru	A							
	Right	A							
	Peds								
NB	Right								
	Right								
NB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
SB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
EB	Right								
WB	Right								
Green		32.0				8.0	35.0		
Yellow		3.0				3.0	3.0		
All Red		2.0				2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	581	1635	0.55	0.36	24.3	C	24.3	C
Westbound								
LTR	622	1748	0.49	0.36	23.3	C	23.3	C
Northbound								
L	414	1604	0.20	0.53	11.7	B		
TR	683	1755	0.69	0.39	26.1	C	23.9	C
Southbound								
L	331	1604	0.14	0.53	12.6	B		
TR	679	1746	0.53	0.39	21.9	C	20.8	C

Intersection Delay = 23.1 (sec/veh) Intersection LOS = C

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E-Mail: Fax:

OPERATIONAL ANALYSIS

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK PM HOUR
Intersection:	PM1EX
Area Type:	All other areas
Jurisdiction:	
Analysis Year:	2003 EXISTING TRAFFIC VOLUMES
Project ID: 730	

East/West Street: GRANDVIEW AVENUE
North/South Street: NYS ROUTE 306

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	65	145	92	50	200	40	80	360	90	45	260	80
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PK 15 Vol	17	38	24	13	53	11	21	95	24	12	68	21
Ln Vol												
Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0		1	1	0	1	1
LGConfig		LTR			LTR		L		TR	L		TR
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0
Adj Flow		318			306		84	474		47	358	
InSharedLn												
Prop LTs		0.214			0.173		1.000	0.000		1.000	0.000	
Prop RTs	0.305			0.137				0.200			0.235	
Peds Bikes	0			0				0			0	
Buses		0			0		0	0		0	0	
InProtPhase												
Duration	0.25						0.0			0.0		

Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Unit Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	
Med Min g		3.2			3.2			3.2			3.2	

Analyst: JCE
Agency: JOHN COLLINS ENGINEERS, P.C.
Date: 7/22/2003
Period: WEEKDAY PEAK AM HOUR
Project ID: 730
E/W St: GRANDVIEW AVENUE

Inter.: AM1NB
Area Type: All other areas
Jurisd:
Year : 2008 NO-BUILD TRAFFIC VOLUMES

N/S St: NYS ROUTE 306

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	82	207	126	83	177	47	115	319	86	42	319	77
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	A							
	Thru	A							
	Right	A							
	Peds								
WB	Left	A							
	Thru	A							
	Right	A							
	Peds								
NB	Right								
	Right								
Green		35.0				8.0	32.0		
Yellow		3.0				3.0	3.0		
All Red		2.0				2.0	2.0		

NB	Left	A	A					
	Thru		A					
	Right		A					
	Peds							
SB	Left	A	A					
	Thru		A					
	Right		A					
	Peds							
EB	Right							
WB	Right							

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	607	1561	0.72	0.39	27.5	C	27.5	C
Westbound								
LTR	541	1390	0.60	0.39	23.7	C	23.7	C
Northbound								
L	317	1532	0.38	0.50	15.0	B		
TR	594	1672	0.72	0.36	29.3	C	26.1	C
Southbound								
L	310	1532	0.14	0.50	13.7	B		
TR	596	1677	0.70	0.36	28.5	C	27.1	C

Intersection Delay = 26.3 (sec/veh) Intersection LOS = C

Phone:
E-Mail: Fax:

OPERATIONAL ANALYSIS

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM1NB
Area Type: All other areas
Jurisdiction:
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730

East/West Street: GRANDVIEW AVENUE
North/South Street: NYS ROUTE 306

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	82	207	126	83	177	47	115	319	86	42	319	77
% Heavy Veh	10	10	10	10	10	10	10	10	10	10	10	10
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PK 15 Vol	22	54	33	22	47	12	30	84	23	11	84	20
Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0		1	1	0	1	1	0
LGConfig		LTR			LTR		L		TR	L		TR
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0
Adj Flow		437			322		121	427		44	417	
%InSharedLn												
Prop LTs		0.197			0.270		1.000	0.000		1.000	0.000	
Prop RTs		0.304			0.152			0.213			0.194	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase								0.0			0.0	
Duration	0.25			Area Type: All other areas								

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
PF Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	
Ped Min g		3.2			3.2			3.2			3.2	

Analyst: JCE
Agency: JOHN COLLINS ENGINEERS, P.C.
Date: 7/22/2003
Period: WEEKDAY PEAK PM HOUR
Project ID: 730
E/W St: GRANDVIEW AVENUE

Inter.: PM1NB
Area Type: All other areas
Jurisd:
Year : 2008 NO-BUILD TRAFFIC VOLUMES

N/S St: NYS ROUTE 306

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	72	164	101	57	223	46	88	396	101	52	286	88
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	A							
	Thru	A							
	Right	A							
	Peds								
WB	Left	A							
	Thru	A							
	Right	A							
	Peds								
NB	Right								
	Right								
NB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
SB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
EB	Right								
WB	Right								
Green		32.0				8.0	35.0		
Yellow		3.0				3.0	3.0		
All Red		2.0				2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	560	1575	0.63	0.36	26.5	C	26.5	C
Westbound								
LTR	604	1699	0.57	0.36	24.7	C	24.7	C
Northbound								
L	387	1604	0.24	0.53	12.2	B		
TR	683	1755	0.77	0.39	29.1	C	26.6	C
Southbound								
L	297	1604	0.19	0.53	13.5	B		
TR	679	1745	0.58	0.39	23.0	C	21.8	C

Intersection Delay = 25.0 (sec/veh) Intersection LOS = C

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OPERATIONAL ANALYSIS

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM1NB
Area Type: All other areas
Jurisdiction:
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730

East/West Street: GRANDVIEW AVENUE
North/South Street: NYS ROUTE 306

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	72	164	101	57	223	46	88	396	101	52	286	88
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PK 15 Vol	19	43	27	15	59	12	23	104	27	14	75	23
Ln Vol												
% Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0
Adj Flow		355			343		93	523		55	394	
%InSharedLn												
Prop LTs		0.214			0.175		1.000	0.000		1.000	0.000	
Prop RTs		0.299			0.140			0.203			0.236	
Peds Bikes		0			0			0			0	
Buses		0			0		0	0		0	0	
%InProtPhase								0.0			0.0	
Duration	0.25			Area Type: All other areas								

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Unit Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	
Med Min g		3.2			3.2			3.2			3.2	

Analyst: JCE
Agency: JOHN COLLINS ENGINEERS, P.C.
Date: 7/22/2003
Period: WEEKDAY PEAK AM HOUR
Project ID: 730
E/W St: GRANDVIEW AVENUE

Inter.: AM1BD
Area Type: All other areas
Jurisd:
Year : 2008 BUILD TRAFFIC VOLUMES

N/S St: NYS ROUTE 306

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	82	213	126	88	185	50	115	319	90	44	319	77
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	A							
	Thru	A							
	Right	A							
	Peds								
WB	Left	A							
	Thru	A							
	Right	A							
	Peds								
NB	Right								
	Right								
NB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
SB	Left					A	A		
	Thru						A		
	Right						A		
	Peds								
EB	Right								
WB	Right								
Green		35.0				8.0	32.0		
Yellow		3.0				3.0	3.0		
All Red		2.0				2.0	2.0		

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	603	1551	0.73	0.39	28.2	C	28.2	C
Westbound								
LTR	530	1364	0.64	0.39	25.1	C	25.1	C
Northbound								
L	317	1532	0.38	0.50	15.0	B		
TR	594	1670	0.73	0.36	29.6	C	26.4	C
Southbound								
L	308	1532	0.15	0.50	13.8	B		
TR	596	1677	0.70	0.36	28.5	C	27.1	C

Intersection Delay = 26.8 (sec/veh) Intersection LOS = C

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E-Mail: Fax:

OPERATIONAL ANALYSIS

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK AM HOUR
Intersection:	AM1BD
Area Type:	All other areas
Jurisdiction:	
Analysis Year:	2008 BUILD TRAFFIC VOLUMES
Project ID: 730	

East/West Street: GRANDVIEW AVENUE
North/South Street: NYS ROUTE 306

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	82	213	126	88	185	50	115	319	90	44	319	77
% Heavy Veh	10	10	10	10	10	10	10	10	10	10	10	10
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PK 15 Vol	22	56	33	23	49	13	30	84	24	12	84	20
Ln Vol												
Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0
Adj Flow		443			341		121	431		46	417	
%InSharedLn												
Prop LTs		0.194			0.273		1.000	0.000		1.000	0.000	
Prop RTs	0.300			0.155				0.220			0.194	
Peds Bikes	0			0				0			0	
Buses		0			0		0	0		0	0	
%InProtPhase								0.0			0.0	
Duration	0.25			Area Type: All other areas								

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Init Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Init Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	
Ped Min g		3.2			3.2			3.2			3.2	

Analyst: JCE
Agency: JOHN COLLINS ENGINEERS, P.C.
Date: 7/22/2003
Period: WEEKDAY PEAK PM HOUR
Project ID: 730
E/W St: GRANDVIEW AVENUE

Inter.: PM1BD
Area Type: All other areas
Jurisd:
Year : 2008 BUILD TRAFFIC VOLUMES

N/S St: NYS ROUTE 306

SIGNALIZED INTERSECTION SUMMARY

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Volume	72	170	101	61	229	48	88	396	105	54	286	88
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0

Duration 0.25 Area Type: All other areas

Signal Operations

Phase Combination		1	2	3	4	5	6	7	8
EB	Left	A				NB Left	A	A	
	Thru	A				Thru		A	
	Right	A				Right		A	
	Peds					Peds			
WB	Left	A				SB Left	A	A	
	Thru	A				Thru		A	
	Right	A				Right		A	
	Peds					Peds			
NB	Right					EB Right			
	Right					WB Right			
Green		32.0					8.0	35.0	
Yellow		3.0					3.0	3.0	
All Red		2.0					2.0	2.0	

Cycle Length: 90.0 secs

Intersection Performance Summary

Appr/ Lane Grp	Lane Group Capacity	Adj Sat Flow Rate (s)	Ratios v/c	Ratios g/C	Lane Group Delay	Lane Group LOS	Approach Delay	Approach LOS
Eastbound								
LTR	558	1568	0.65	0.36	26.9	C	26.9	C
Westbound								
LTR	596	1676	0.60	0.36	25.4	C	25.4	C
Northbound								
L	387	1604	0.24	0.53	12.2	B		
TR	681	1752	0.78	0.39	29.7	C	27.1	C
Southbound								
L	294	1604	0.19	0.53	13.6	B		
TR	679	1745	0.58	0.39	23.0	C	21.8	C

Intersection Delay = 25.4 (sec/veh) Intersection LOS = C

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E-Mail:

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OPERATIONAL ANALYSIS

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK PM HOUR
Intersection:	PM1BD
Area Type:	All other areas
Jurisdiction:	
Analysis Year:	2008 BUILD TRAFFIC VOLUMES
Project ID: 730	

East/West Street: GRANDVIEW AVENUE

North/South Street: NYS ROUTE 306

VOLUME DATA

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Volume	72	170	101	61	229	48	88	396	105	54	286	88
% Heavy Veh	5	5	5	5	5	5	5	5	5	5	5	5
PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PK 15 Vol	19	45	27	16	60	13	23	104	28	14	75	23
Ln Vol												
Grade		0			0			0			0	
Ideal Sat		1900			1900		1900	1900		1900	1900	
ParkExist												
NumPark												
No. Lanes	0	1	0	0	1	0	1	1	0	1	1	0
LGConfig		LTR			LTR		L	TR		L	TR	
Lane Width		15.0			15.0		10.0	12.0		10.0	12.0	
RTOR Vol			0			0			0			0
Adj Flow		361			356		93	528		57	394	
InSharedLn												
Prop LTs		0.211			0.180		1.000	0.000		1.000	0.000	
Prop RTs	0.294			0.143				0.210			0.236	
Peds Bikes	0			0				0			0	
Buses		0			0		0	0		0	0	
InProtPhase								0.0			0.0	
Duration	0.25											

Area Type: All other areas

OPERATING PARAMETERS

	Eastbound			Westbound			Northbound			Southbound		
	L	T	R	L	T	R	L	T	R	L	T	R
Unit Unmet		0.0			0.0		0.0	0.0		0.0	0.0	
Arriv. Type		3			3		3	3		3	3	
Unit Ext.		3.0			3.0		3.0	3.0		3.0	3.0	
Factor		1.000			1.000			1.000			1.000	
Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Ext of g		2.0			2.0		2.0	2.0		2.0	2.0	
Ped Min g		3.2			3.2			3.2			3.2	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM3EX
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2003 EXISTING TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: BALDWIN COURT
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	304			225	2
Peak-Hour Factor, PHF	0.50	0.90			0.90	0.50
Hourly Flow Rate, HFR	4	337			250	4
Percent Heavy Vehicles	10	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				2		2
Peak Hour Factor, PHF				0.50		0.50
Hourly Flow Rate, HFR				4		4
Percent Heavy Vehicles				10		10
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	4						8	
C(m) (vph)	1266						569	
v/c	0.00						0.01	
95% queue length	0.01						0.04	
Control Delay	7.9						11.4	
LOS	A						B	
Approach Delay							11.4	
Approach LOS							B	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM3EX
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2003 EXISTING TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: BALDWIN COURT
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	1	230			285	1
Peak-Hour Factor, PHF	0.25	0.90			0.90	0.25
Hourly Flow Rate, HFR	4	255			316	4
Percent Heavy Vehicles	5	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				1		1
Peak Hour Factor, PHF				0.25		0.25
Hourly Flow Rate, HFR				4		4
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	4						8	
C(m) (vph)	1223						567	
v/c	0.00						0.01	
95% queue length	0.01						0.04	
Control Delay	8.0						11.4	
LOS	A						B	
Approach Delay							11.4	
Approach LOS							B	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM3NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: BALDWIN COURT
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	2	346			250	2
Peak-Hour Factor, PHF	0.50	0.90			0.90	0.50
Hourly Flow Rate, HFR	4	384			277	4
Percent Heavy Vehicles	10	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				2		2
Peak Hour Factor, PHF				0.50		0.50
Hourly Flow Rate, HFR				4		4
Percent Heavy Vehicles				10		10
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	4						8	
C(m) (vph)	1237						527	
v/c	0.00						0.02	
95% queue length	0.01						0.05	
Control Delay	7.9						11.9	
LOS	A						B	
Approach Delay							11.9	
Approach LOS							B	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM3NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: BALDWIN COURT
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	1	261			320	1
Peak-Hour Factor, PHF	0.25	0.90			0.90	0.25
Hourly Flow Rate, HFR	4	290			355	4
Percent Heavy Vehicles	5	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				1		1
Peak Hour Factor, PHF				0.25		0.25
Hourly Flow Rate, HFR				4		4
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	4						8	
C(m) (vph)	1183						523	
v/c	0.00						0.02	
95% queue length	0.01						0.05	
Control Delay	8.1						12.0	
LOS	A						B	
Approach Delay							12.0	
Approach LOS							B	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM3BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: BALDWIN COURT
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	2	358			266	2
Peak-Hour Factor, PHF	0.50	0.90			0.90	0.50
Hourly Flow Rate, HFR	4	397			295	4
Percent Heavy Vehicles	10	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				2		2
Peak Hour Factor, PHF				0.50		0.50
Hourly Flow Rate, HFR				4		4
Percent Heavy Vehicles				10		10
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	4						8	
C(m) (vph)	1218						509	
v/c	0.00						0.02	
queue length	0.01						0.05	
Control Delay	8.0						12.2	
LOS	A						B	
Approach Delay							12.2	
Approach LOS							B	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM3BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: BALDWIN COURT
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	1	273			332	1
Peak-Hour Factor, PHF	0.25	0.90			0.90	0.25
Hourly Flow Rate, HFR	4	303			368	4
Percent Heavy Vehicles	5	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				1		1
Peak Hour Factor, PHF				0.25		0.25
Hourly Flow Rate, HFR				4		4
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	4						8	
C(m) (vph)	1170						508	
v/c	0.00						0.02	
95% queue length	0.01						0.05	
Control Delay	8.1						12.2	
LOS	A						B	
Approach Delay							12.2	
Approach LOS							B	

TWO-WAY STOP CONTROL SUMMARY

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK AM HOUR
Intersection:	AM5EX
Jurisdiction:	
Units: U. S. Customary	
Analysis Year:	2003 EXISTING TRAFFIC VOLUMES
Project ID: 730	
East/West Street:	GRANDVIEW BOULEVARD
North/South Street:	KIRYAS RADIN DRIVE
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		303	3	2	223	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		336	4	2	247	
Percent Heavy Vehicles		--	--	10	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	4		2			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	5		2			
Percent Heavy Vehicles	10		10			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		7				
C(m) (vph)		1176		505				
v/c		0.00		0.01				
95% queue length		0.01		0.04				
Control Delay		8.1		12.2				
LOS		A		B				
Approach Delay				12.2				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM5EX
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2003 EXISTING TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: KIRYAS RADIN DRIVE
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		228	3	2	283	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		253	4	2	314	
Percent Heavy Vehicles		--	--	5	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3		2			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	4		2			
Percent Heavy Vehicles	5		5			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		6				
C(m) (vph)		1290		546				
v/c		0.00		0.01				
95% queue length		0.00		0.03				
Control Delay		7.8		11.7				
LOS		A		B				
Approach Delay				11.7				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM5NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: KIRYAS RADIN DRIVE
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		345	3	2	248	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		383	4	2	275	
Percent Heavy Vehicles		--	--	10	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	4		2			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	5		2			
Percent Heavy Vehicles	10		10			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		7				
C(m) (vph)		1129		459				
v/c		0.00		0.02				
95% queue length		0.01		0.05				
Control Delay		8.2		13.0				
LOS		A		B				
Approach Delay				13.0				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM5NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: KIRYAS RADIN DRIVE
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		259	3	2	318	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		287	4	2	353	
Percent Heavy Vehicles		--	--	5	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	3		2			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	4		2			
Percent Heavy Vehicles	5		5			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		2		6				
C(m) (vph)		1254		500				
v/c		0.00		0.01				
queue length		0.00		0.04				
Control Delay		7.9		12.3				
LOS		A		B				
Approach Delay				12.3				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM5BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: KIRYAS RADIN DRIVE
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		345	15	10	248	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		383	20	13	275	
Percent Heavy Vehicles		--	--	10	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR		LT	
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	20		10			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	26		13			
Percent Heavy Vehicles	10		10			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		13		39				
C(m) (vph)		1114		450				
v/c		0.01		0.09				
95% queue length		0.04		0.28				
Control Delay		8.3		13.8				
LOS		A		B				
Approach Delay				13.8				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM5BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: KIRYAS RADIN DRIVE
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		259	15	10	318	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		287	20	13	353	
Percent Heavy Vehicles		--	--	5	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration		TR		LT		
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	15		10			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	20		13			
Percent Heavy Vehicles	5		5			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		13		33				
C(m) (vph)		1237		496				
v/c		0.01		0.07				
95% queue length		0.03		0.21				
Control Delay		7.9		12.8				
LOS		A		B				
Approach Delay				12.8				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK AM HOUR
Intersection:	AM4EX
Jurisdiction:	
Units: U. S. Customary	
Analysis Year:	2003 EXISTING TRAFFIC VOLUMES
Project ID: 730	
East/West Street:	GRANDVIEW BOULEVARD
North/South Street:	MERRILL COLTON SCHOOL
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		275	30	120	205	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		305	40	160	227	
Percent Heavy Vehicles		--	--	20	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	20		65			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	26		86			
Percent Heavy Vehicles	30		30			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		160		112				
C(m) (vph)		1120		473				
v/c		0.14		0.24				
95% queue length		0.50		0.91				
Control Delay		8.7		15.0-				
LOS		A		B				
Approach Delay				15.0-				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK PM HOUR
Intersection:	PM4EX
Jurisdiction:	
Units: U. S. Customary	
Analysis Year:	2003 EXISTING TRAFFIC VOLUMES
Project ID: 730	
East/West Street:	GRANDVIEW BOULEVARD
North/South Street:	MERRILL COLTON SCHOOL
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		205	25	10	280	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		227	33	13	311	
Percent Heavy Vehicles		--	--	10	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Major Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	5		35			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	6		46			
Percent Heavy Vehicles	10		10			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		13		52				
C(m) (vph)		1259		718				
v/c		0.01		0.07				
95% queue length		0.03		0.23				
Control Delay		7.9		10.4				
LOS		A		B				
Approach Delay				10.4				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM4NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: MERRILL COLTON SCHOOL
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		314	33	132	228	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		348	44	176	253	
Percent Heavy Vehicles		--	--	20	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	22		72			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	29		96			
Percent Heavy Vehicles	30		30			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		176		125				
C(m) (vph)		1075		423				
v/c		0.16		0.30				
95% queue length		0.58		1.22				
Control Delay		9.0		17.0				
LOS		A		C				
Approach Delay				17.0				
Approach LOS				C				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM4NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: MERRILL COLTON SCHOOL
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		233	28	11	315	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		258	37	14	350	
Percent Heavy Vehicles		--	--	10	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	5		38			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	6		50			
Percent Heavy Vehicles	10		10			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		14		56				
C(m) (vph)		1222		685				
v/c		0.01		0.08				
95% queue length		0.03		0.27				
Control Delay		8.0		10.7				
LOS		A		B				
Approach Delay				10.7				
Approach LOS				B				

HCS2000: Unsignalized Intersections Release 4.1c

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM4BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: MERRILL COLTON SCHOOL
Intersection Orientation: EW Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume		322	33	132	236	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		357	44	176	262	
Percent Heavy Vehicles		--	--	20	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	22		72			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	29		96			
Percent Heavy Vehicles	30		30			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		176		125				
C(m) (vph)		1067		415				
v/c		0.16		0.30				
95% queue length		0.59		1.25				
Control Delay		9.0		17.4				
LOS		A		C				
Approach Delay				17.4				
Approach LOS				C				

TWO-WAY STOP CONTROL SUMMARY

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK PM HOUR
Intersection:	PM4BD
Jurisdiction:	
Units: U. S. Customary	
Analysis Year:	2008 BUILD TRAFFIC VOLUMES
Project ID: 730	
East/West Street:	GRANDVIEW BOULEVARD
North/South Street:	MERRILL COLTON SCHOOL
Intersection Orientation: EW	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Eastbound			Westbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume		241	28	11	323	
Peak-Hour Factor, PHF		0.90	0.75	0.75	0.90	
Hourly Flow Rate, HFR		267	37	14	358	
Percent Heavy Vehicles		--	--	10	--	--
Median Type	Undivided					
RT Channelized?						
Lanes		1	0	0	1	
Configuration			TR	LT		
Upstream Signal?		No			No	

Minor Street: Approach	Northbound			Southbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume	5		38			
Peak Hour Factor, PHF	0.75		0.75			
Hourly Flow Rate, HFR	6		50			
Percent Heavy Vehicles	10		10			
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?		No				
Storage						
RT Channelized?						
Lanes	0		0			
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Config		LT		LR				
v (vph)		14		56				
C(m) (vph)		1213		675				
v/c		0.01		0.08				
95% queue length		0.04		0.27				
Control Delay		8.0		10.8				
LOS		A		B				
Approach Delay				10.8				
Approach LOS				B				

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM2EX
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2003 EXISTING TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: UNION RD / NEW HEMPSTEAD RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	115	250			225	200
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	121	263			236	210
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Major Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				220		95
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				231		100
Percent Heavy Vehicles				10		10
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	121						331	
C(m) (vph)	1125						348	
v/c	0.11						0.95	
95% queue length	0.36						10.13	
Control Delay	8.6						71.8	
LOS	A						F	
Approach Delay							71.8	
Approach LOS							F	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM2EX
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2003 EXISTING TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: UNION RD / NEW HEMPSTEAD RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	60	250			205	210
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	63	263			215	221
Percent Heavy Vehicles	5	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				175		60
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				184		63
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	63						247	
C(m) (vph)	1108						422	
v/c	0.06						0.59	
95% queue length	0.18						3.63	
Control Delay	8.4						24.9	
LOS	A						C	
Approach Delay							24.9	
Approach LOS							C	

TWO-WAY STOP CONTROL SUMMARY

Analyst:	JCE
Agency/Co.:	JOHN COLLINS ENGINEERS, P.C.
Date Performed:	7/22/2003
Analysis Time Period:	WEEKDAY PEAK AM HOUR
Intersection:	AM2NB
Jurisdiction:	
Units: U. S. Customary	
Analysis Year:	2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730	
East/West Street:	GRANDVIEW BOULEVARD
North/South Street:	UNION RD / NEW HEMPSTEAD RD
Intersection Orientation: NS	Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1 L	2 T	3 R	4 L	5 T	6 R
Volume	126	309			257	222
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	132	325			270	233
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7 L	8 T	9 R	10 L	11 T	12 R
Volume				253		106
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				266		111
Percent Heavy Vehicles				10		10
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	132						377	
C(m) (vph)	1072						291	
v/c	0.12						1.30	
95% queue length	0.42						18.42	
Control Delay	8.8						191.7	
LOS	A						F	
Approach Delay							191.7	
Approach LOS							F	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM2NB
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 NO-BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: UNION RD / NEW HEMPSTEAD RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	67	299			234	237
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	70	314			246	249
Percent Heavy Vehicles	5	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				199		67
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				209		70
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	70						279	
C(m) (vph)	1053						364	
v/c	0.07						0.77	
95% queue length	0.21						6.21	
Control Delay	8.7						40.9	
LOS	A						E	
Approach Delay							40.9	
Approach LOS							E	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK AM HOUR
Intersection: AM2BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: UNION RD / NEW HEMPSTEAD RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	128	309			257	228
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	134	325			270	240
Percent Heavy Vehicles	0	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration		LT				TR
Upstream Signal?		No			No	

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				259		108
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				272		113
Percent Heavy Vehicles				10		10
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	134						385	
C(m) (vph)	1065						287	
v/c	0.13						1.34	
95% queue length	0.43						19.61	
Control Delay	8.9						210.5	
LOS	A						F	
Approach Delay							210.5	
Approach LOS							F	

TWO-WAY STOP CONTROL SUMMARY

Analyst: JCE
Agency/Co.: JOHN COLLINS ENGINEERS, P.C.
Date Performed: 7/22/2003
Analysis Time Period: WEEKDAY PEAK PM HOUR
Intersection: PM2BD
Jurisdiction:
Units: U. S. Customary
Analysis Year: 2008 BUILD TRAFFIC VOLUMES
Project ID: 730
East/West Street: GRANDVIEW BOULEVARD
North/South Street: UNION RD / NEW HEMPSTEAD RD
Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	69	299			234	243
Peak-Hour Factor, PHF	0.95	0.95			0.95	0.95
Hourly Flow Rate, HFR	72	314			246	255
Percent Heavy Vehicles	5	--	--		--	--
Median Type	Undivided					
RT Channelized?						
Lanes	0	1			1	0
Configuration	LT					TR
Upstream Signal?		No			No	

Major Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume				205		69
Peak Hour Factor, PHF				0.95		0.95
Hourly Flow Rate, HFR				215		72
Percent Heavy Vehicles				5		5
Percent Grade (%)		0			0	
Median Storage						
Flared Approach: Exists?					No	
Storage						
RT Channelized?						
Lanes				0		0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Config	LT						LR	
v (vph)	72						287	
C(m) (vph)	1048						360	
v/c	0.07						0.80	
95% queue length	0.22						6.77	
Control Delay	8.7						44.7	
LOS	A						E	
Approach Delay							44.7	
Approach LOS							E	

APPENDIX "D"

LEVEL OF SERVICE STANDARDS

LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of control delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, geometrics, traffic, and incidents. Specifically, LOS criteria for traffic signals are stated in terms of the average control delay per vehicle, typically for a 15-minute analysis period. The criteria are given in Exhibit 16-2 from the 2000 Highway Capacity Manual published by the Transportation Research Board.

EXHIBIT 16-2

LEVEL OF SERVICE FOR SIGNALIZED INTERSECTIONS

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (S/VEH)
A	≤10
B	>10-20
C	>20-35
D	>35-55
E	>55-80
F	>80