

INTRODUCTION

Prepare a Traffic Impact Study for a proposed private Aveccina Academy School. The project site is bounded north by Yonkers Avenue, to the west by Walnut Street, to the south by Garfield Street and to the east by residential homes. The School is to be located in an existing unoccupied building. This building was used in the past for a public school. The study was requested by the City Planning Board to address existing and proposed traffic impacts and to identify any mitigative measures that would minimize traffic flow congestion through the adjacent street.

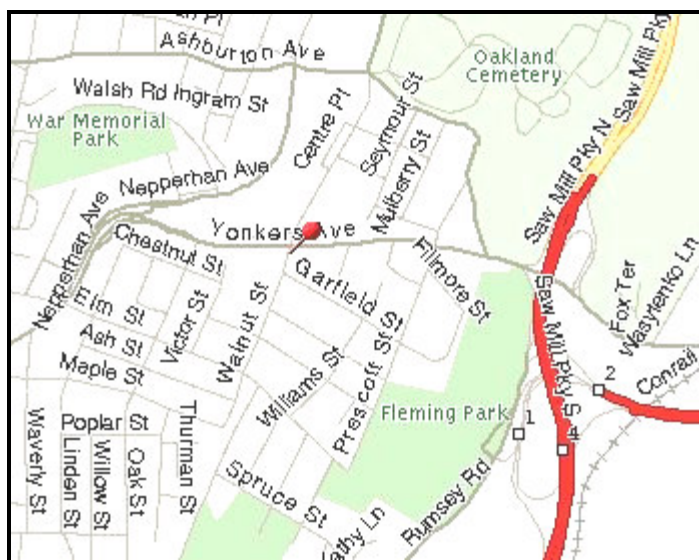
EXISTING CONDITIONS

The School is to be located on the north-east quadrant at the intersection of Walnut and Garfield Street. The building is being retrofitted to accommodate for the new school. East of the site, the surrounding lots are residential.

The primary roadway access to the School will be provided by Yonkers Avenue, Walnut Street, Garfield Street and Prescott Street.

PROPOSED DEVELOPMENT

The proposed Private School is scheduled to accommodate approximately 300 Students and 20 Employees. The school hours are from 8:30 AM until 3:30 PM. The lot has an existing single access driveway located on the proximity with Walnut Street on Garfield Street. The School has no access to Yonkers Avenue or Walnut Street.



The proposed School facility is code number 521 in the Institute of Transportation

engineers (ITE) Trip Generation Manual, 6th edition. The School will have approximately 300 students and 20 Employees.

Based on the ITE Trip Generation Manual, the estimated Weekday A.M. Peak Hour and the P.M. Peak Hour of the Generator based on 300 students are as follows:

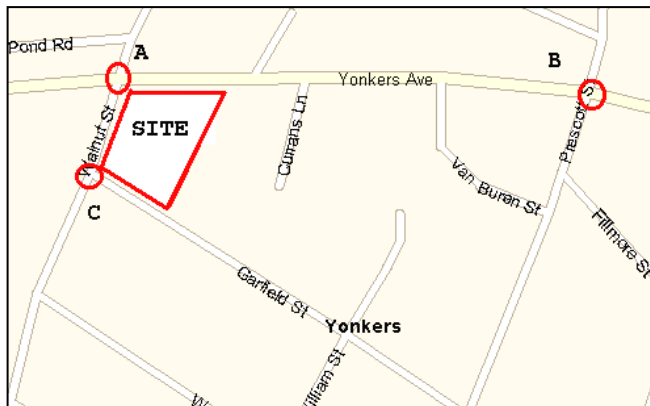
WEEKDAY AM ROADWAY PEAK HOUR			PM PEAK HOUR OF GENERATOR		
IN	OUT	TOTAL	IN	OUT	TOTAL
165	111	276	87	105	192

SCOPE OF TRAFFIC IMPACT REPORT

In order to analyze the traffic impact of the School on the surrounding roadway system, the following procedure was employed:

1. Collect existing roadway and traffic volume information. (Fig. #1)
2. Analyze existing traffic conditions.
3. Estimate arrival/departure distribution and generated site traffic. (Fig. #2 and 3)
4. Combine 2003 existing traffic volumes with the additional traffic generated by the proposed School. (Fig. #4)
5. Recommendations, if necessary, to improve or maintain traffic flow operations.

EXISTING TRAFFIC VOLUMES



Manual traffic counts were conducted for some 27 individual movements at Yonkers Avenue, Walnut and Prescott Street by representatives of HAKS on March 12, during the AM roadway peak hour (7:00-8:30 AM), and PM peak hour of the generator (3:00-4:30 PM).

A summary of the movements are identified in Appendix A. (Existing Traffic Counts)

Traffic counts were recorded in 15 minutes intervals, with the four highest consecutive 15 minutes interval periods establishing the peak hours. The existing peak hour traffic volumes are shown on Figure #1.

DISTRIBUTION AND ASSIGNMENT OF SITE TRAFFIC

The arrival/departure distribution were estimated on the basis of population centers, and analysis of the existing traffic flow and patterns on the roadways within the area of the site. The Private School typically has service students that travel long distances to get to the School.

70 percent of the site generated traffic is estimated to be oriented to and from the north, east and west of the site, and 30% is estimated to be oriented to from the south. The anticipated distribution on the surrounding roadways are shown on Figure #2.

COMBINED TRAFFIC VOLUMES

The site generated traffic on each roadway segment was added to the existing 2003 external highway traffic, resulting in the 2003 combined traffic volumes shown on figure #4.

Description of Analyses

Capacity Analyses

A. Signalized Intersection Analysis

Detailed capacity analyses were conducted at the two (2) signalized intersections in the study area. The intersection analyses were performed using the analytical procedures described in the 2000 Highway Capacity Manual (HCM), Special Report 209, published by Transportation Research Board, Washington, D.C.

The capacity of a signalized intersection is evaluated in terms of volume/capacity (V/C) ratio and the level of service (LOS) is evaluated on the basis of average stopped delay per vehicle (in seconds per vehicle). A LOS "D" is considered the minimum acceptable level of operation while LOS "E" is a measure of theoretical capacity. At LOS "F", the facility operates over capacity and is susceptible to long traffic delays and break downs in traffic flow. The LOS criteria for signalized intersections, as defined in the 2000 HCM, are as follows:

LOS Stopped Delay per vehicle (Sec)

	A	≤ 10.0
B		10.1 to 20.0
C		20.1 to 35.0
D		35.1 to 55.0
E		55.1 to 80.0
F		> 80.0

The two(2) signalized intersections were analyzed for daily peak operating conditions using Version 4.1c of the Highway Capacity Software (HCS) software. Traffic volumes, signal timing, intersection geometry (lane utilization, parking regulations, etc.), parking maneuver data, and bus stop activity data were collected in the field during the critical peak hours and were used in the analysis. The results of the signalized intersection analysis for the 2003 existing traffic volumes and the 2003 combined traffic volumes or proposed are as follows:

2003 Existing Conditions (No Build)

- Yonkers Avenue and Walnut Street –Walnut Street northbound approach is operating at LOS “D” in the AM Peak Hour. The remaining approaches are operating at LOS “C” or better during the AM Peak Hour and PM Peak Hour of the Generator. The overall intersection is operating at LOS “C” during both Peak Hours.

	AM Peak			PM Peak		
	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)
Walnut Street						
NB LT + TH + RT	D	0.68	35.8	C	0.58	32.7
SB LT + TH + RT	C	0.35	27.0	C	0.55	30.6
Yonkers Avenue						
EB LT	B	0.16	15.8	C	0.40	28.3
EB TH + RT	C	0.89	25.8	B	0.73	18.9
WB LT	C	0.13	20.3	B	0.14	15.5
WB TH + RT	B	0.73	18.7	C	0.85	23.3
Overall Intersection	C		23.9	C		23.0

- Yonkers Avenue and Prescott Street – Prescott Street northbound approach is operating at LOS “E” in the AM Peak Hour, and LOS “D” during the PM Peak Hour of the Generator. The remaining approaches are operating at LOS “C” or better during the AM Peak Hour and PM Peak Hour of the Generator. The overall intersection is operating at LOS “C” during the both Peak Hours.

	AM Peak			PM Peak		
	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)
Prescott Street NB LT + TH + RT	E	0.86	56.7	D	0.61	38.5
Yonkers Avenue EB LT	B	0.40	14.8	C	0.54	21.7
EB TH + RT	C	0.94	31.4	B	0.68	17.5
WB LT	B	0.02	10.7	A	0.02	6.3
WB TH + RT	C	0.82	21.5	C	0.88	24.7
Overall Intersection	C		28.8	C		22.6

2003 Proposed Conditions (Build)

- Yonkers Avenue and Walnut Street – Walnut Street northbound approach will operate at LOS “D” in the AM Peak Hour and PM Peak Hour of the Generator. The remaining approaches are operating at LOS “C” or better during the AM Peak Hour and PM Peak Hour of the Generator. The overall intersection is operating at LOS “C” during both Peak Hours.

	AM Peak			PM Peak		
	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)
Walnut Street NB LT + TH + RT	D	0.78	41.7	D	0.67	36.4
SB LT + TH + RT	C	0.37	27.5	C	0.56	30.8
Yonkers Avenue EB LT	B	0.17	16.5	C	0.40	28.6
EB TH + RT	C	0.91	27.7	B	0.75	19.3
WB LT	C	0.20	22.8	B	0.18	16.8
WB TH + RT	B	0.75	19.2	C	0.87	24.4
Overall Intersection	C		25.9	C		24.0

- Yonkers Avenue and Prescott Street – Prescott Street northbound approach will operate at LOS “E” in the AM Peak Hour, and LOS “D” during the PM Peak Hour of the Generator. Yonkers Avenue eastbound thru-right approach is operating at LOS “E” during the AM Peak Hour. The remaining approaches are operating at LOS “C” or better during the AM Peak Hour and PM Peak Hour of the Generator. The overall intersection is operating at LOS “C” during the both Peak Hours.

	AM Peak			PM Peak		
	LOS	V/C Ratio	Delay (sec)	LOS	V/C Ratio	Delay (sec)
Prescott Street NB LT + TH + RT	E	0.98	78.9	D	0.72	44.4
Yonkers Avenue EB LT	B	0.40	15.0	C	0.54	21.8
EB TH + RT	D	0.97	35.5	B	0.71	18.1
WB LT	B	0.25	14.7	A	0.13	0.13
WB TH + RT	C	0.83	22.0	C	0.88	25.2
Overall Intersection	C		33.0	C		23.5

B. Unsignalized Intersection Analysis

A detailed capacity analysis for the one (1) unsignalized intersection was performed. The capacity of an unsignalized intersection is evaluated in terms of critical gap size and the LOS evaluated on the basis of control delay per vehicle (in seconds per vehicle). Control delay includes initial acceleration delay, queue move-up time, stopped delay, and final acceleration typically for a 15-minute analysis period. The LOS criteria for unsignalized intersections are defined in the 2000 HCM as follows:

<u>LOS</u>	<u>Stopped Delay per vehicle (Sec)</u>
A	≤ 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
	F > 50.0

The results of the 2003 Existing Condition (No-Build) and 2003 Proposed Condition (Build) unsignalized intersection analysis are as follow:

2003 Existing Conditions (No Build)

- Garfield/Walnut Street – All approaches are operating at LOS “B” or better during the AM and PM Peak Hour of the Generator.

	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Garfield Street WB LT + RT	A	7.2	A	7.2
Walnut Street NB TH + RT	B	11.0	B	10.4
SB LT	B	10.3	B	11.0

2003 Proposed Conditions (Build)

- Garfield/Walnut Street – All approaches will operate at LOS “B” or better during the AM and PM Peak Hour of the Generator.

	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Garfield Street WB LT + RT	A	7.2	A	7.2
Walnut Street NB TH + RT	B	11.8	B	11.0
SB LT	B	12.4	B	12.4

PARKING

A total of 33 Parking spaces will be provided for the School Staff and visitors. These parking spaces will be located on School premises (14 spaces), Elm Street (15 spaces) and Garfield Street (4 spaces).

RECOMMENDATIONS AND CONCLUSIONS

The traffic generated by the proposed School can be accommodated on the surrounding roadway system. The anticipated traffic increase on the local roads by the School is very small.



The following recommendations are presented to provide for safety and mobility of vehicles and students:

- 1) That the DROP-OFF location for the students should be as far as possible from the intersection of Walnut and Garfield Street. A preferable location would be at entrance to the auditorium. The students would be guided on a single line to the main entrance of the school. This recommendation would help with overall operation of the intersection of Garfield and Walnut Street since no vehicle would be blocking traffic or creating an unsafe condition for student drop-off in the vicinity of this intersection.
- 2) Adjust the signal timing at Yonkers Avenue and Walnut Street in order to provide additional green time at Walnut Street north and southbound approaches. All the movements at Yonkers Avenue are operating at LOS "C" or better during the AM and PM Peak Hours.