

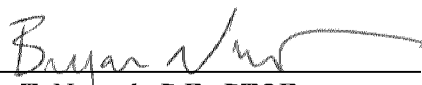


Real People. Real Solutions.

12224 Nicollet Avenue
Burnsville, MN 55337-1649Ph: [952] 890-0509
Fax: [952] 890-8065
Bolton-Menk.com**AMENDMENT 1**

Date: August 17, 2018
To: Amy Marohn, P.E.
From: Bryan T. Nemeth, P.E., PTOE
 Kelsey E. Retherford, E.I.T.
Subject: Special Traffic and Parking Study: Success Academy – Amendment 1
 City of Bloomington
 Project No.: T44.115570

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: 
 Bryan T. Nemeth, P.E., PTOE
 License No. 43354

Date: 8/17/18

An amendment to the traffic study is being completed to analyze the proposed expansion of the elementary school, Success Academy, at 8201 Park Avenue South in Bloomington, MN. This amendment will cover peak hour and daily trip generation, trip distribution and any mitigation measures for the proposed 70 additional students above a baseline of 60 students.

Existing Trip Generation

The Trip Generation Manual (8th Edition) and traffic data collected were used to determine the existing trips generated from 8201 Park Avenue South. The existing traffic entering and exiting 8201 Park Avenue South was calculated from the turning movement counts and tube counts in the surrounding area to determine how many vehicles overall enter the area and how many exit the area daily and during the weekday AM, afternoon and PM peak hours. The traffic assumed to be generated from the houses surrounding 8201 Park Avenue South were subtracted from the total overall entering and exiting volumes in order to determine how many trips are currently generated by 8201 Park Avenue South. The equations below summarize how the existing trips generated from 8201 Park Avenue South were determined.

$$\text{Entering}_{\text{SITE}} = \text{Entering}_{\text{TOTAL}} - \text{Entering}_{\text{HOMES}}$$

$$\text{Exiting}_{\text{SITE}} = \text{Exiting}_{\text{TOTAL}} - \text{Exiting}_{\text{HOMES}}$$

Traffic due to the homes in the area was determined using the Trip Generation Manual (8th Edition) “Single Family Home” (ITE Code: 210) information. The Trip Generation Manual (8th Edition) gives a rate for the daily trips and the AM and PM peak hours depending on the number of homes. A rate for the

Name: Success Academy Special Traffic and Parking Study – Amendment 1

Date: August 17, 2018

Page: 2

afternoon peak hour was calculated by comparing the afternoon peak hour counts to the AM and PM counts to ensure that the afternoon peak hour was increased proportionally to reflect existing traffic patterns.

Table 1 shows the traffic that is entering and exiting 8201 Park Avenue South during the daily and peak hours on a typical weekday with the current 84 enrolled students. The AM peak hour represents the school start time and the afternoon peak hour represents the school dismissal time. The PM peak hour represents other activities that occur at the school which may be related to the number of students and not only the other activities that take place at the site. The daily is assumed to represent school, school related, community center, religious, and other activities that all take place at the site.

Table 1. Existing Trips Determined to be Generated by 8201 Park Ave S

Peak Hour	Time	Entering Trips	Exiting Trips	Total Trips	Number of Students	Calculated Rate of Trips Per Student
AM	7:00 AM - 8:00 AM	21	10	31	60	31 trips/60 students = 0.52
Afternoon	2:45 PM - 3:45 PM	23	25	48	60	48 trips/60 students = 0.80
PM	4:30 PM - 5:30 PM	18	24	41	60	41 trips/60 students = 0.69
Daily	Midnight-Midnight	283	283	566	60	566 trips/60 students = 9.43

Build Trip Generation

Since the daily trips for the property includes trips not directly associated to the school and its enrollment, the ITE Trip Generation Manual rate was used to determine the daily number of trips directly attributed to the school and its enrollment. The daily trips are then distributed throughout the day with inherent peaks at the AM peak hour (school start/community traffic peak), afternoon peak hour (school dismissal), and the PM peak hour (community traffic peak) as consistent with the ITE Trip Generation Manual. While related to the daily trips, the peak hour trips for this study are based off of the actual number of trips coming to and from the property and are only used for the traffic analysis. The actual distribution of “school” trips throughout the day will vary from school to school, but this provides a consistent traffic analysis method to determine operational impacts. This may over-estimate the PM trips, but will not change the daily trips since the daily trips are based off of the ITE rate. The number of trips during the peak hours only affects the operations analysis.

From the number of trips entering and exiting, as generated by 8201 Park Avenue South with 84 students, the average rate of trips per student was calculated so that the increase in trips during the peak hours could be determined based on the increase in the number of students at Success Academy. This calculation is shown in **Table 1** with the calculated rate found by taking the existing total trips number of trips calculated to be generated by 8201 Park Avenue South and dividing it by the current number of students enrolled. This calculated rate was compared to the rates found in the Trip Generation Manual (8th Edition) for a “Public School (Elementary School)” and a “Private School (K-8)” and for a “Charter Elementary School” from the Trip Generation Manual (10th Edition). This comparison is shown in **Table**

Name: Success Academy Special Traffic and Parking Study – Amendment 1

Date: August 17, 2018

Page: 3

2. **Table 2** also includes the school daily trip rate used for the study (note that this is lower than the daily trip rate calculated for the site as determined in **Table 1**).

Table 2. Total Trips Generated Per Student

Peak Hour	Average Rate of Trips per Student			
	Calculated for 8201 Park Avenue South	Public School (Elementary School)	Private School (K-8)*	Charter Elementary School*
AM	0.52	0.45	0.9	1.11
Afternoon	0.8	0.28	0.6	0.69
PM	0.69	0.15	0.17	0.14
Daily	2.48**	1.29	2.48	1.85

*Rates based on very few studies.

**Rate based on Private School (K-8) ITE rate

Table 2 shows that the calculated rate of peak hour trips per student for Success Academy was found to be between that of a public school and a private school in the AM peak hour. The afternoon and PM peak hours were found to be higher for 8201 Park Avenue South than a public school, private school, and charter elementary school which may be due to the other uses in the building during non-school hours and at the end of the school day. The daily rate matches the ITE rate as discussed previously. The proposed increase in enrollment analyzed was 70 students (increased from baseline of 60 students).

Table 3 shows the increase in trips from existing anticipated with the increase in enrollment. The calculated rate shown in **Table 3** was used to correlate the increase in trips with the increase in students at Success Academy. The peak hour rates were used as it is what was observed at 8201 Park Avenue South and was therefore assumed to be the most accurate for this particular property and the school.

Table 3. Additional Trips with Increase in Enrollment

Peak Hour	Increase in 70 Students	
	Entering	Exiting
AM	25	12
Afternoon	27	29
PM	21	28
Daily	87	87

The ITE Trip Generation Manual indicates that the total number of daily trips with 130 students would be 322. The increase in daily trips from 60 to 130 students would be 174. Due to the other uses that this school has in comparison to a traditional public school, the daily trips into and out of the area are higher, but it would be anticipated that the daily number of trips from just the school would be approximately 322 trips, matching the ITE Trip Rate.

Name: Success Academy Special Traffic and Parking Study – Amendment 1

Date: August 17, 2018

Page: 4

Build Trip Distribution

The current distribution of traffic at the intersections in the area were used to determine where the added trips would enter and exit 8201 Park Avenue South. It was assumed that existing traffic would not change and the added trips would follow current traffic patterns. For example: 30% of the traffic entering the area was found to travel along E 81st St so 30% of the new trips were assumed to also travel to 8201 Park Avenue South via E 81st St. Estimated turning movement counts for the proposed increase in enrollment is shown in **Figure 1** of the **Appendix**. **Figure 2** in the **Appendix** show the existing and future typical weekday (Tuesday through Thursday) average daily traffic volumes and **Figure 3** in the **Appendix** shows the existing and future average Friday traffic volumes. Traffic volumes shown in **Figures 2** and **3** are lower than traffic volume data collected by the City in the summer and fall of 2017. This could be due to the seasonal variation in counts. **Table 4** shows the total daily trips generated by the site in the existing year and the anticipated trips in the future years with the increase in enrollment.

Table 4. Trip Generation Total for Overall Site

Scenario	Total Daily Trips from Site*	Number of Students Enrolled
Existing (Baseline 60 Students)	565	60
Proposed (Increase of 70 Students)	740	130

*Rounded to the nearest five

Additionally, graphics are included in the **Appendix** which summarize the trips generated by day, total trips on Park Avenue south of E 82nd Street with an increase in 70 students, and trips generated during the peak hour which pertain to City Code 21.302.06(b)(7)(A)(i), (ii) and (iii), respectively.

Conclusions and Recommendations

All of the mitigations and recommendations previously developed in the *Success Academy – Special Traffic and Parking Study Memorandum, July 11, 2018, Updated July 17, 2018* are still recommended with the newly proposed increase in students. Decreasing the number of proposed students would not eliminate any of the recommendations as all proposed recommendations are based on existing needs and the potential for increased need based on any additional trips.

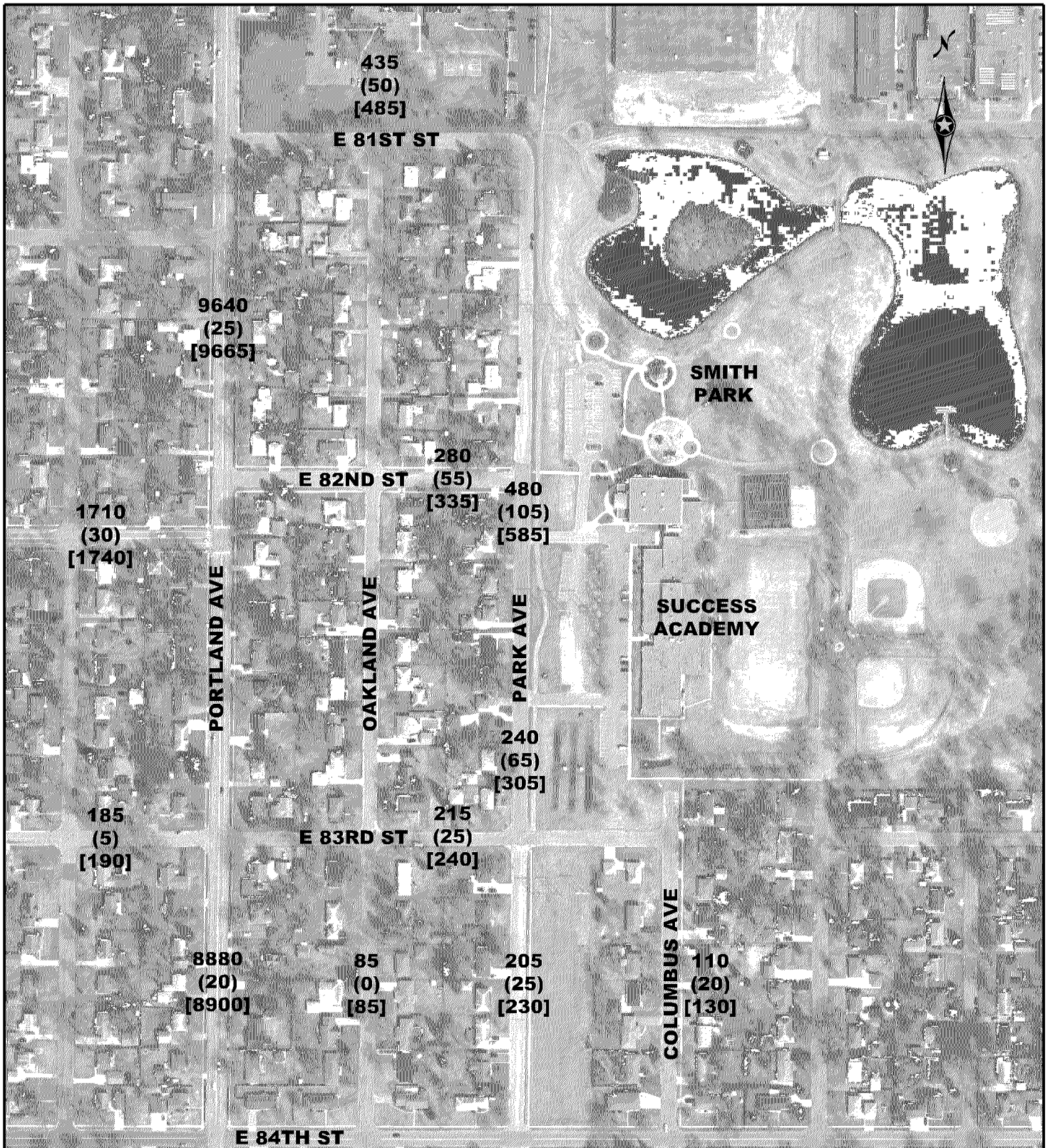
Appendix

H:\BLOM\T44115570\CAD\MS\Figures\Success Academy\Figure 2. Weekday Traffic Volumes.dgn

5:06:12 PM

8/15/2018

kelseyre



LEGEND

XXX EXISTING WEEKDAY ADT (AVERAGE DAILY TRAFFIC)

(XX) ADDED DAILY TRIPS FROM INCREASE IN STUDENTS

[XXX] FUTURE WEEKDAY ADT



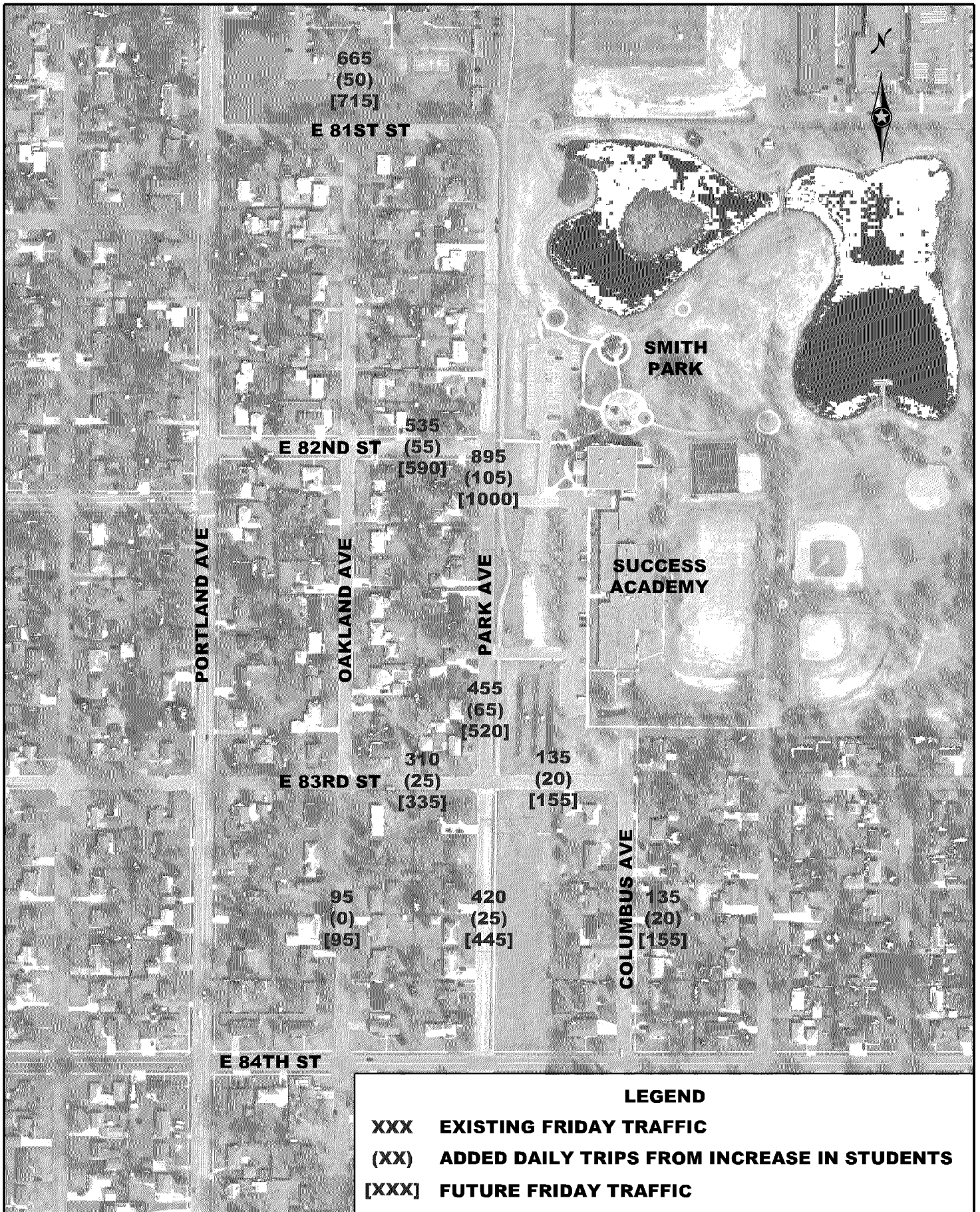
FIGURE 2. WEEKDAY TRAFFIC VOLUMES
SUCCESS ACADEMY - SPECIAL TRAFFIC AND PARKING STUDY

H:\BLOM\T44115570\CAD\MS\Figures\Success Academy\Figures 3. Average Friday Traffic Volumes.dgn

5:07:35 PM

8/15/2018

kelseyre



LEGEND

XXX EXISTING FRIDAY TRAFFIC

(XX) ADDED DAILY TRIPS FROM INCREASE IN STUDENTS

[XXX] FUTURE FRIDAY TRAFFIC



FIGURE 3. FRIDAY TRAFFIC VOLUMES
SUCCESS ACADEMY - SPECIAL TRAFFIC AND PARKING STUDY

21.302.06(b)(7)(A)(i)

Trips Generated Per Day

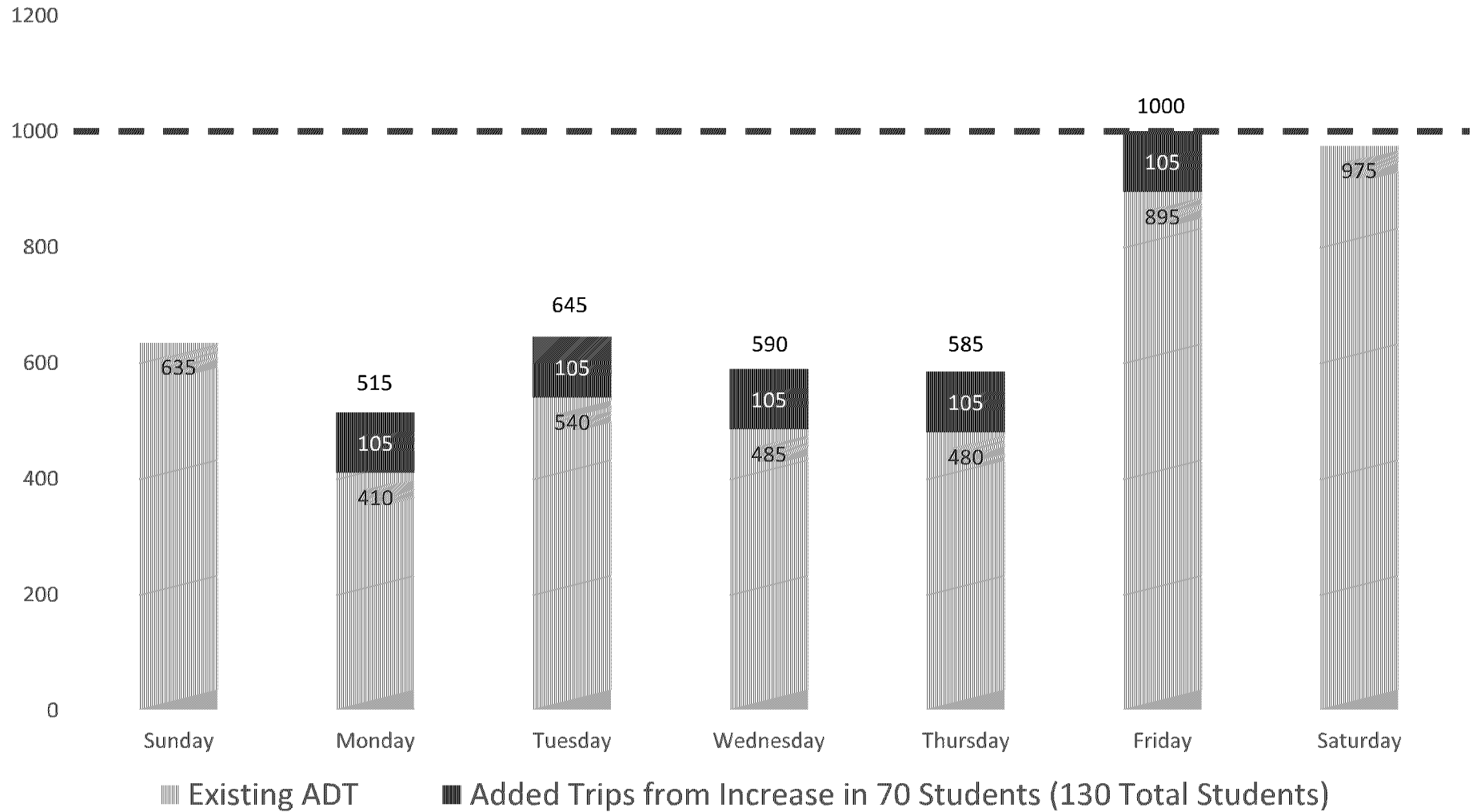
Increase in Number of Students	Rate Per Student	Trips Generated Per Day
70 (130 Total)	2.48*	174

*Based on Private School (K-8) ITE Rate



21.302.06(b)(7)(A)(ii)

Total Trips on Park Avenue South of E 82nd Street with an Increase in 70 Students



21.302.06(b)(7)(A)(iii)

Trips Generated During Peak Hour

Increase in Number of Students	Rate Per Student	Trips Generated During Peak Hour**
70 (130 Total)	0.8*	56

*Based on Calculated Rate

**Peak Hour: 2:45 PM – 3:45 PM

