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**MEMORANDUM**

**Date:** July 7, 2020  
**To:** Brian Hansen  
**From:** Bryan T. Nemeth, P.E., PTOE  
Kelsey E. Retherford, P.E.  
**Subject:** Special Traffic and Parking Study Addendum: Success Academy  
City of Bloomington  
Project No.: T44.119241

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

Date: 7/7/2020

An addendum to the traffic study and amendment finalized in 2018 is being completed to analyze the proposed expansion of the elementary school, Success Academy, at 8201 Park Avenue South in Bloomington, MN. The school is currently approved for up to 130 students. The previous study analyzed an increase in 70 students from the baseline of 60 students. This addendum will analyze peak hour and daily trip generation, trip distribution, and any mitigation measures for the proposed additional 50 students or an additional 120 students above a baseline of 60 students. The additional 50 students will follow a hybrid learning plan in which students have traditional (in person) school Monday – Thursday and online virtual classes on Fridays.

**Existing Trip Generation**

The previous study used the ITE Trip Generation Manual (8<sup>th</sup> Edition) and traffic data collected in April 2018 to determine the existing trips generated from 8201 Park Avenue South. This analysis was updated with this addendum using the 10<sup>th</sup> Edition instead of the 8<sup>th</sup> Edition of the ITE Trip Generation Manual. 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.

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

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

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Traffic due to the homes in the area was determined using the ITE Trip Generation Manual (10<sup>th</sup> Edition) “Single Family Home” (ITE Code: 210) information. The ITE Trip Generation Manual (10<sup>th</sup> 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 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. Updating from the 8<sup>th</sup> Edition to the 10<sup>th</sup> Edition slightly increased the calculated rate of trips per student as the trips per household is slightly lower with the newer edition.

**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 baseline 60 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**

Time of Day	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	42	60	42 trips/60 students = 0.70
Daily	Midnight-Midnight	286	286	572	60	572 trips/60 students = 9.52

\*These are the peak hours for school traffic.

From the number of trips entering and exiting, as generated by 8201 Park Avenue South with the baseline of 60 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.

### **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 generated by the campus 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.

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The calculated rate from **Table 1** was compared to the rates found in the ITE Trip Generation Manual (10<sup>th</sup> Edition) for a “Elementary School”, “Middle School/Junior High School”, “Private School (K-12)” and for a “Charter Elementary School”. The “Private School (K-8)” was not used as only one school was studied making the sample size is too small to make assumptions for other schools. The comparison of the ITE rates and calculated rates for 8201 Park Ave South are is shown in **Table 2**.

**Table 2. Total Trips Generated Per Student**

Peak Hour	Average Rate of Trips per Student				
	Calculated for 8201 Park Avenue South	Elementary School	Private School (K-12)*	Middle/Junior High School	Charter Elementary School*
AM	0.52	0.65	0.81	0.7	1.14
Afternoon	0.81	0.34	0.58	0.35	0.69
PM	0.70	0.17	0.17	0.17	0.14
Daily	2.48**	1.89	2.48	2.13	1.85

\*Rates based on very few studies.

\*\*Rate based on Private School (K-12) ITE rate

**Table 2** shows that the calculated rate of peak hour trips per student for Success Academy was found to be lower than all other schools in the AM peak hour. The afternoon and PM peak hours were found to be higher for 8201 Park Avenue South than the other schools 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 for Success Academy was taken to be the ITE rate for a Private School (K-12) as this is a conservative rate and is the school type that most closely matches Success Academy.

The proposed increase in enrollment of 120 students (increased from baseline of 60 students) was analyzed. **Table 3** shows the additional trips from existing anticipated with the increase in enrollment. The calculated rates were used for the peak hours as that 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 120 Students	
	Entering	Exiting
AM	43	20
Afternoon	46	51
PM	36	48
Daily	149	149

The ITE Trip Generation Manual indicates that the total number of daily trips with 180 students would be 447. The increase in daily trips from 60 to 180 students would be 298. 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 447 trips, matching the ITE Trip Rate.

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## **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 81<sup>st</sup> St so 30% of the new trips were assumed to also travel to 8201 Park Avenue South via E 81<sup>st</sup> St. Estimated turning movement counts for the proposed increase in enrollment is shown in **Figure A1** of the **Appendix**. **Figure A2** in the **Appendix** show the existing and future typical weekday (Tuesday through Thursday) average daily traffic volumes with the additional students. **Figure A3** in the **Appendix** shows the existing and future average Friday traffic volumes. **Figure A3** was not updated from the previous study as the proposed 50 additional students will not attend in person class on Fridays therefore the volumes would not change. Traffic volumes shown in **Figures A2** and **A3** 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 120 Students)	865	180

\*Rounded to the nearest five

## **City Code Analysis**

The Bloomington City Code 21.302.06(b)(7)(A) states that “The establishment of a new institutional use or the expansion of an existing institutional use that creates traffic levels above the following thresholds as documented by a traffic study prepared by a qualified, independent traffic engineering professional under the supervision of the city is prohibited unless the City Council finds that the negative impacts, reasonably attributable to the proposed institutional use, on surrounding residential uses can be sufficiently mitigated to levels consistent with residential livability and pedestrian and motorist safety:

- (i) Adds 300 or more trips per day to a local residential street at least once per week on a regular basis;
- (ii) Adds 100 or more new trips per day on a local residential street, such that the total trips on that local residential street add up to a total of over 1,000 trips per day at least once per week on a regular basis; or
- (iii) The proposed use or expansion is expected to produce 100 or more trips per hour on a local residential street during the peak hour of trip generation for the proposed site, at least once per week on a regular basis.”

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These thresholds are analyzed below.

*Threshold i:*

**Table 5** shows the increase in trips per day is 298 with an increase in students of 120 from the 60 student baseline. Since 298 trips is less than 300, the proposed number of students does not exceed this threshold. With just one more additional student the increase in trips per day would be over 300.

**Table 5. City Code 21.302.06(b)(7)(A)(i) Threshold**

Increase in Number of Students	Rate Per Student	Trips Generated Per Day
120 (180 Total)	2.48*	298

\*Based on Private School ITE Rate

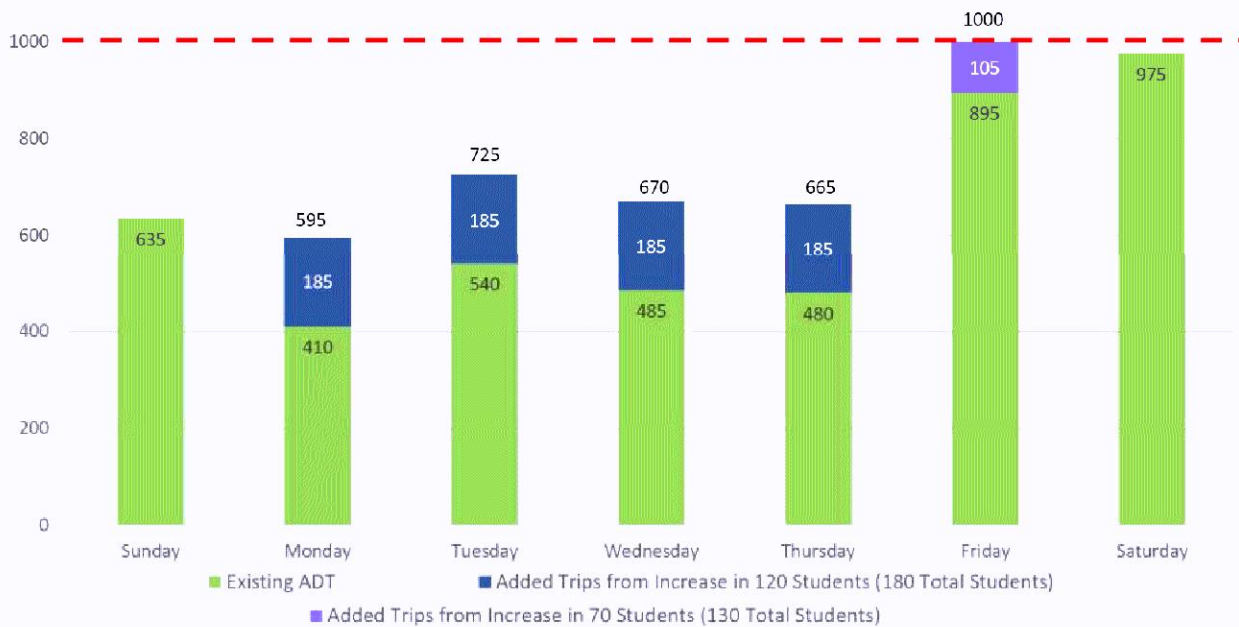
*Threshold ii:*

Based on the build trip distribution shown in **Figure A2** in the **Appendix** 185 trips per day (Monday-Thursday) will be added to Park Avenue south of E 82<sup>nd</sup> St. **Figure 1** shows how the roadway volume remains under 1,000 vehicles with this increase in trips Monday through Thursday when the new 50 students (120 addition from 60 student baseline) would be at Success Academy. Therefore, the proposed number of students does not exceed this threshold. Additionally **Figure 1** shows how there will be no changes from the previously approved 70 additional students (from the 60 student baseline) on Fridays.

**Figure 1. City Code 21.302.06(b)(7)(A)(ii) Threshold**

**Total Trips on Park Avenue South of E 82<sup>nd</sup> Street with an Increase in 120 Students (M-Th)**

1200



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*Threshold iii:*

**Table 6** shows the peak hour increase in trips is 96 with an increase in students of 120 from the 60 student baseline. Five more additional students could be added before the number of trips is greater than 100, triggering threshold iii criteria. The number of students currently proposed does not exceed this threshold.

**Table 6. City Code 21.302.06(b)(7)(A)(iii) Threshold**

Increase in Number of Students	Rate Per Student	Trips Generated During Peak Hour
120 (180 Total)	0.8*	96

\*Based on Calculated Rate

### **Mitigation Review**

The previous study recommended several mitigation measures based on the existing needs and the potential increased need with additional trips. Several of the recommendations were required by the City Council as outlined in the decision notice for the 2018 Condition Use Permit application. The property and surrounding area were evaluated to ensure the required mitigation measures were complete.

All mitigation measures as required by the City Council have been addressed. These included:

- Add signage and striping to make the eastern parking lot drive aisle one way (northbound)
- Extend sidewalk within parking lot along the southern driveway
- Improve pedestrian safety at the 82<sup>nd</sup> St and Park Ave
  - Curb bump outs were originally planned at this location, however, during design issues with drainage were realized so an alternative improvement was constructed. This alternative improvement consists of a pedestrian refuge along Park Ave in addition to signing and striping the crossing which addresses the safety concerns.
- Construct new access to Success Academy off 83<sup>rd</sup> St
- Financially contribute to the construction of the new driveway access to Smith Park off Park Ave
- Add “Enter Only” signage to the south driveway of 8201 Park Avenue South.
- Add “Exit Only” signage to the north driveway of 8201 Park Avenue South.
  - “Do Not Enter” signage was also added to enforce this access as an exit only
- Proof of Parking has been established as required by City Council.
  - Add the 49 parking spaces as shown in the proof of parking agreement to accommodate the maximum number of vehicles recorded to park on the street.
    - There are 267 spaces currently available at 8201 Park Ave South. City code requires 207 spaces. Therefore, the property meets the required amount of parking. City Council required the proof of parking be maintained and approved by the Planning Manager. The additional parking is recommended if there is a demand for additional parking, but not required as the site currently has more parking available than City code requires.

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Traffic control signs and striping requirements were completed as adjusted and required by the City Engineer.

The following items were recommended in the previous study but were not required by City Council. These items were reanalyzed to determine if they are still recommended.

- Install stop signs at the new Smith Park driveway and new Success Academy driveway off 83<sup>rd</sup> St
  - Stop signs were recommended at these locations, however, volumes at these accesses are low and the intersection environment makes it clear to drivers that traffic along 83<sup>rd</sup> St and Park Ave have priority at these intersections. Stop signs are not required and only recommended if a crash issue arises. Traffic control signs and striping requirements were completed as adjusted and required by the City Engineer.
- Install signage to enforce parking restrictions
  - This was recommended to increase the safety and efficiency of the school drop off and pick up. Since school is not currently in session, the current procedures during school drop off and pick up times could not be observed. Traffic control signs and striping requirements were completed as adjusted and required by the City Engineer.
- Add directional arrows throughout parking lot to enforce one way restrictions
  - This recommendation was partially met as the City Council required signing and striping to make the eastern parking lot one way. Additional arrows were recommended throughout the parking lot to show where traffic is one-way verses two way. With the “Do Not Enter” signage within the parking lot in addition to the “Begin One Way” signage and pavement marking it clear to drivers which portion of the lot is restricted to one way traffic so this is no longer recommended. Traffic control signs and striping requirements were completed as adjusted and required by the City Engineer.
- Add striping along the southern driveway to allow for two lanes of traffic entering the site
  - This was recommended to address potential traffic backups and separate traffic specifically during peak school hours when there is traffic queued waiting to drop off or pick up students in addition to traffic parking in the lot. Again, since school is not currently in session, traffic could not be observed to determine if there is an issue. If traffic queues onto Park Ave the striping is recommended to mitigate the issue. Traffic control signs and striping requirements were completed as adjusted and required by the City Engineer.

No additional mitigation measures are recommended.

## **Conclusion**

This addendum memorandum to the traffic study and amendment finalized in 2018 analyzed the proposed expansion of the elementary school, Success Academy, at 8201 Park Avenue South in Bloomington, MN. The school is currently approved for up to 130 student and is proposing to add 50 students. The additional 50 students will follow a hybrid learning plan in which students have traditional (in person) school Monday – Thursday and online virtual classes on Fridays. The analysis indicated that adding 50 students would not create traffic levels above the thresholds outlined in City Code 21.302.06(b)(7)(A). Additionally, the mitigation measures recommended from the previous study were reanalyzed. A review of the site indicated that all of the required measures were completed. There were also mitigation measures recommended in the previous study that were not required by City Council. These measures

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have not been implemented and were reanalyzed to determine if they are still recommended. This analysis is summarized below:

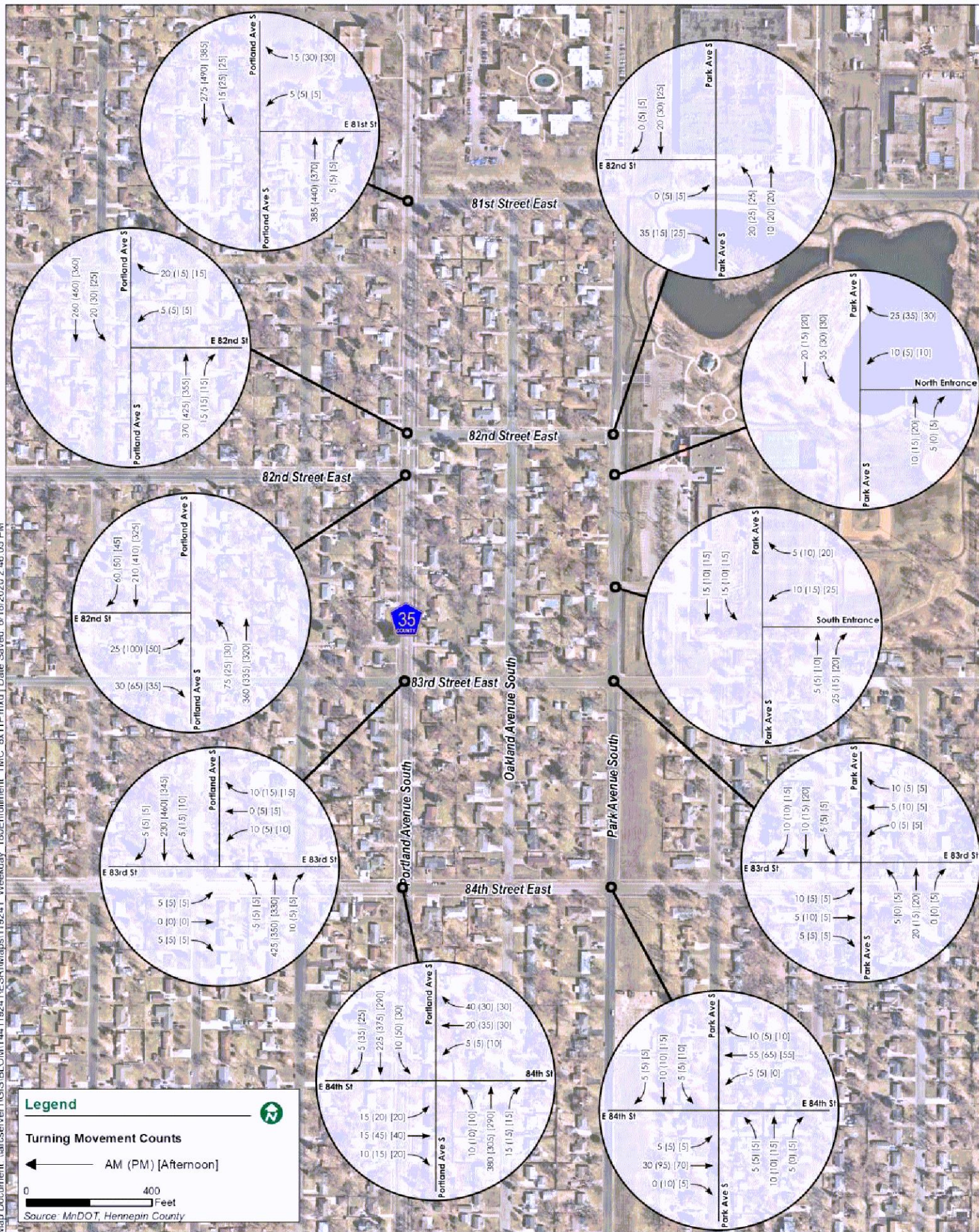
Measures still recommended if traffic demand shows a need for improvement:

- Additional parking
- Striping of the southern driveway
- Install signage to enforce parking restrictions (pending other measures in place to create a safe and efficient student drop off/pick up

Measures no longer recommended:

- Stops signs at the Smith Park driveway and off 83<sup>rd</sup> St
- Directional arrows throughout parking lot

## Appendix

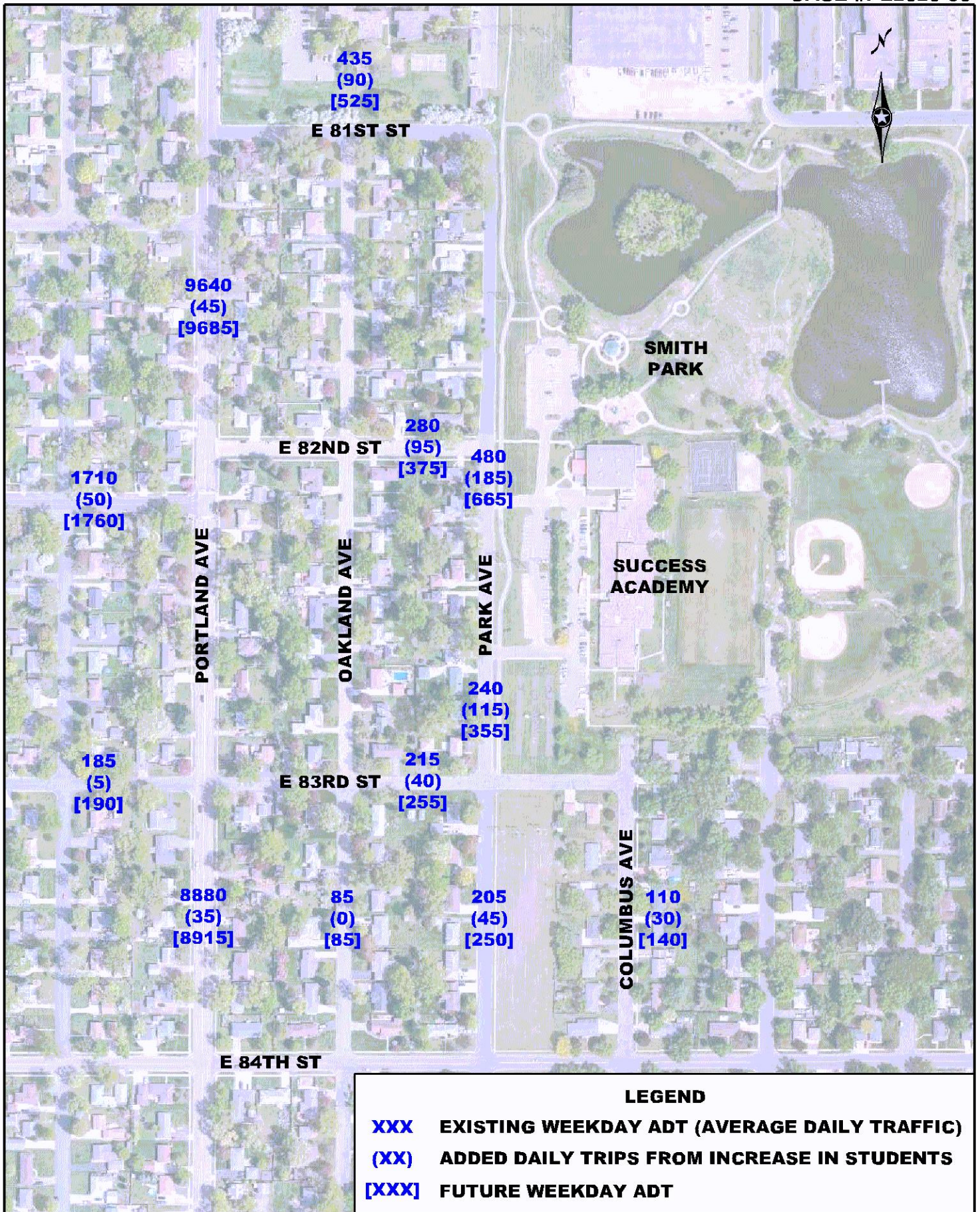


H:\BLOM\T44115570\CAD\MS\Figures\Success Academy\Figure A2.Weekday Traffic Volumes.dgn

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kelseyre



**LEGEND**

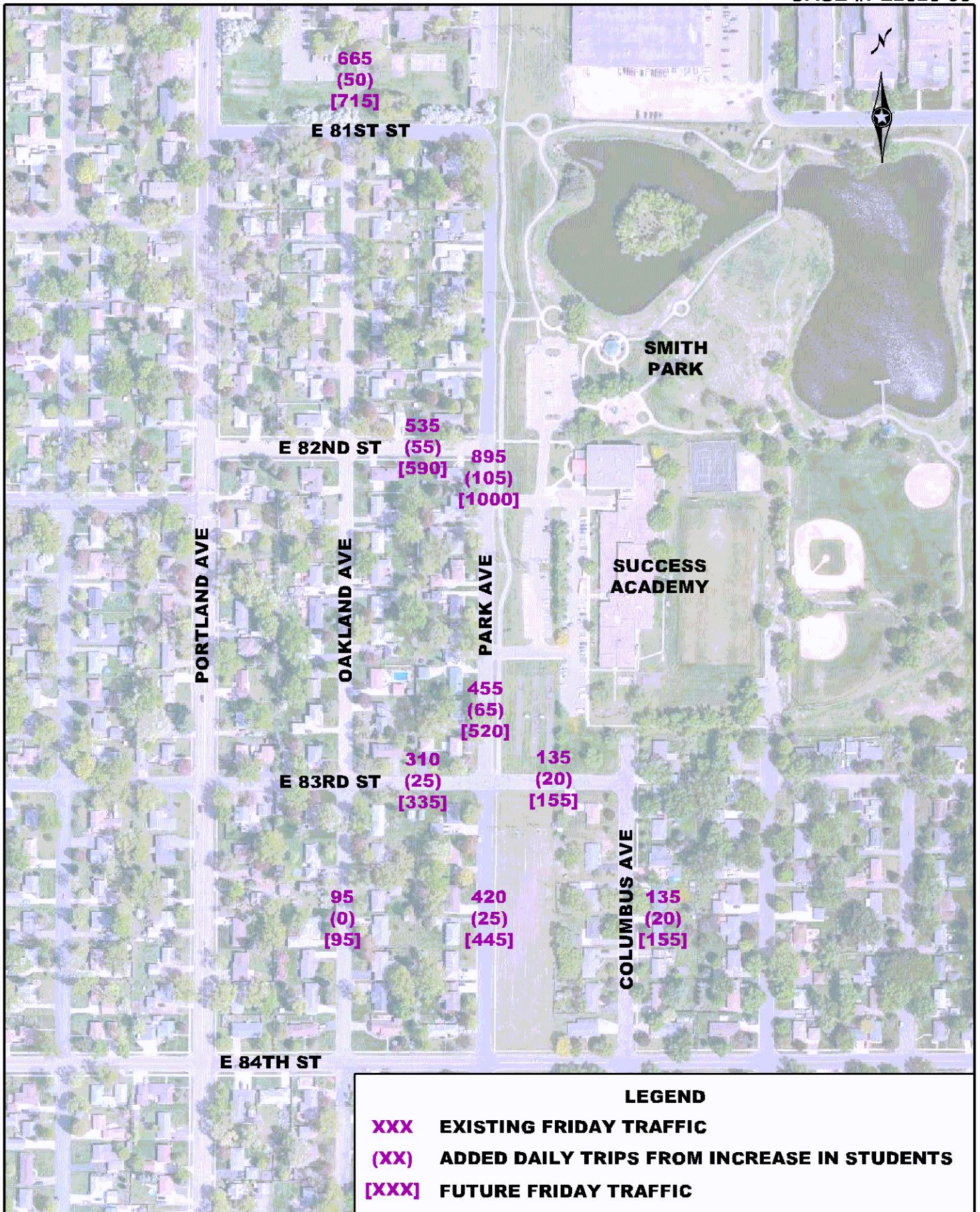
**XXX** EXISTING WEEKDAY ADT (AVERAGE DAILY TRAFFIC)

**(XX)** ADDED DAILY TRIPS FROM INCREASE IN STUDENTS

**[XXX]** FUTURE WEEKDAY ADT



**FIGURE A2. WEEKDAY TRAFFIC VOLUMES**  
**SUCCESS ACADEMY - SPECIAL TRAFFIC AND PARKING STUDY**



**LEGEND**

**XXX** EXISTING FRIDAY TRAFFIC

**(XX)** ADDED DAILY TRIPS FROM INCREASE IN STUDENTS

**[XXX]** FUTURE FRIDAY TRAFFIC



FIGURE A3. FRIDAY TRAFFIC VOLUMES  
 SUCCESS ACADEMY - SPECIAL TRAFFIC AND PARKING STUDY