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TRAFFIC ENGINEERING
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SIGNAL SYSTEMS/DESIGN

FINAL

MEMORANDUM

To: Lynsey Kawski – DeKalb-Sycamore Area Transportation Study (DSATS)
DSATS Technical and Policy Committee
DSATS Staff

From: Tim Sjogren, P.E., PTOE – Metro Transportation Group
Sara Disney – Metro Transportation Group

Date: May 23, 2007

RE: 2007 ADT/ADTT count program results

Metro Transportation Group, Inc., (Metro) was retained by DSATS to perform traffic counts at 32 locations in the DeKalb/Sycamore area. Average daily traffic (ADT) and average daily truck traffic (ADTT) data was collected and compared with similar data gathered in the summers of 2005 and 2006. This year's program also included the collection and compilation of peak hour turning movement counts at a variety of intersections within the DSATS study area. The purpose of these counts has been to establish baseline traffic data for use in future planning efforts and to help build a database that can be used to identify growth trends and changing traffic patterns. The count methodology, data collection results, and summary analysis are presented following.

METHODOLOGY

Per the request of DSATS staff, count data was collected at the 32 locations shown on Figure 1 (attached). Counts were conducted by the use of automatic count machines (tubes) and Hi-Star inroad magnetic recorders that have the capability not only to quantify the number of vehicles moving along a certain roadway, but also to perform vehicle classification. This classification provides the ability to differentiate between vehicle types such as private automobiles, school buses, and multi-axle tractor-trailers. Data was collected over 72+ hours (3 days) at each location during the month of April, and the results averaged to offset the impact of daily traffic variations. In places where physical factors (construction activity, vandalism, equipment malfunction) or excessive daily fluctuations were experienced, adjustments were made to the



data to prevent disproportionate skewing of the 3-day average. In some locations, these factors were so significant that the count data was verified by an additional 72 hours of data collection. ADT and ADTT counts were conducted at the following locations:

- Intersections (counts on all quadrants):
 - Illinois Route 23 @ Plank/Peace Road
 - Illinois Route 23 @ Illinois Route 38
 - Illinois Route 23 @ Gurler Road
 - Illinois Route 38 @ Peace Road
 - Peace Road @ Fairview Drive
 - Somonauk Road @ Bethany Road

- Roadway segments
 - Illinois Route 64 west of Motel Road
 - Illinois Route 64 east of Airport Road
 - Illinois Route 23 north of Barber Greene Road
 - Barber Greene Road west of Peace Road
 - Illinois Route 38 west of Somonauk Road
 - Illinois Route 38 west of 1st Street
 - 1st Street north of Illinois Route 38
 - 1st Street south of Fairview Drive

Through the use of Hi-Star inroad recorders, peak hour turning movement data was also collected. A recorder was placed within each lane, allowing for individual (left, through, right) turning movements to be identified and tabulated. Peak hour turning movement count data was collected at the following locations:

- Illinois Route 23 @ Plank/Peace Road
- Illinois Route 38 @ Peace Road
- Peace Road @ Fairview Drive

Turning movements data at these intersections was supplemented with count information from previous data collection (performed by Christopher B. Burke Engineering, Ltd., and provided to DSATS in late 2006/early 2007). Data from each source was compiled and is presented in *Figure 2* through *Figure 5* (attached).



COUNT RESULTS

Attached to this report are two tables that display the results of the spring 2007 ADT/ADTT counts. 2005 and 2006 summer data are also displayed for comparison, and the relative increases or decreases for both ADT and ADTT are presented for the 2005-2007 and 2006-2007 periods. Heavy vehicle percentage (trucks as a percentage of total vehicles) is also shown for each study year.

ANALYSIS

The data collection results suggest a number of varied conclusions. Most obviously, it may be hard to draw direct conclusions between the summer 2005/2006 and that gathered in spring 2007 because of the differences in the data collection period. With Northern Illinois University and other area schools in session, the traffic volumes gathered in 2007 should presumably be higher than they would if gathered during the summer months when the student population is significantly lower. The data gathered in 2007 is likely more representative of "typical" roadway conditions as it reflects the impact of the student activity that is experienced during eight to nine months of the year. As such, it is not recommended that the 2005 and 2006 data be used in conjunction with that most recently gathered for anything more than casual observation and review. Whatever conclusions can be drawn from the variations in total and truck traffic over the past three years should be very broad in nature and should not be used for trend line analysis or future projections. That said, the data comparisons shown previously can be examined from a more general perspective, and with a proper understanding of the data's limitations, may provide some points of interest that can be more closely examined during future studies.

Generally speaking, traffic volumes throughout the study area show an increase from previous count periods. While several legs (including Illinois Route 23 south of Illinois Route 38) show a reduction in total traffic, most of the intersections and roadway segments show an increase in overall volumes. The increases are generally less than ten percent (10%) and could presumably be due to the presence of student traffic during this year's count period. While difficult to truly quantify, the impact of the student population may in fact be masking a continuation of an overall reduction in traffic that was observed during the previous count period. It may be desirable to "spot check" several of the count locations during the summer months to help



quantify the relative impact of student traffic and to determine if the previously observed pattern is still present.

Several segments showed larger than typical changes including:

- **IL 23/Gurler Road:** Truck traffic on the State route increased by more than 20% over 2006, reflecting greater utilization of this route by heavy vehicles. Given the opening of the Target distribution center last summer/fall, this increase is not unexpected. Truck traffic on the west leg of Gurler Road was up significantly as well, perhaps due to connections to Annie Glidden and the I-88 Tollway provided west of IL 23.
- **IL 23/IL 38:** The intersection as a whole saw a modest increase in total traffic, most likely attributable to student activity. However, the increase was not uniformly distributed as Lincoln Highway generally saw a significant increase in traffic and Fourth Street saw a large decrease, particularly south of IL 38. This dynamic is the opposite of what was observed in 2006 when Lincoln Highway traffic declined and Fourth Street increased. Preliminary discussions with staff did not uncover any reasonable explanation for the changes or the pattern reversal.
- **IL 23 north of Plank Road:** Like most intersections within the study area, the intersection of IL 23/Plank Road saw an overall increase in traffic volumes. However, truck traffic more than doubled on the north leg of the intersection while total traffic increased over 20 percent. As the other intersection legs saw a decrease in truck traffic, this data was initially assumed to be the result of an equipment error. However, the data was verified by a second series of counts and found to be valid.
- **IL 23 north of Barber Greene:** Overall traffic patterns were down (somewhat surprising given student activity), and truck traffic on this segment was significantly less than each of the previous years. Preliminary thinking is that this may be due to the recently completed expansion of Peace Road, providing a more efficient and direct north/south route through the study area. As the intersection of Peace Road/Sycamore Road was not included in this year's count program, it is somewhat difficult to validate this assumption.

Truck traffic is slightly up (less than one percent) within the study area as a whole when compared with 2006 data. This reverses a pattern observed in 2006 where truck traffic was down nearly 15 percent from the previous year. While there is little correlation between truck traffic and student activity (as opposed to total traffic), the increase is less than expected given



the time of year and the recent opening of the Target distribution center within Park 88. Assuming these two factors had an impact on truck activity at least equal to the 0.9 percent increase observed, overall truck activity is likely steady or slightly down from 2006 observations.

CONCLUSIONS

While Metro has a very high confidence level in the quality of the data provided, few meaningful conclusions can or should be drawn from the 2007 volume data and comparisons to that collected in 2006 and 2005. The differences in the time of year (spring vs. summer) and the resultant impact of the student population on traffic volumes likely account for a significant amount of any traffic growth observed within the study area. While seven new locations were added to the 2007 count program, twelve were removed, leaving 30% of 2005/2006 data unanalyzed. As the program continues (presumably adopting a spring schedule), it will become easier to identify patterns and draw reliable conclusions.

In closing, Metro offers the following recommendations to continue to build a reliable inventory of historical traffic conditions. First, it is recommended that spot checks at several key locations be performed in the summer of 2007. These locations should correspond with counts taken in the spring and should be located far enough away from planned construction activities to provide reliable traffic patterns. The benefit of performing this analysis is to gather some level of empirical data related to the impact of students and school activities on the transportation network. It would also be interesting to discover if the downward trend observed last summer continues to take place or if student activity only accounts for a portion of the increases in vehicular and truck traffic observed in 2007. Second, it is recommended that the 2008 budget (if feasible) make provisions for the collection of data at all the count locations (44) included in the program. While an "every other year" program may provide sufficient data over the long run, the establishment of meaningful baseline data would be greatly enhanced if the program were performed in its entirety for the first several years. Third, it is recommended that the peak hour turning movement program be updated as often as deemed feasible and the results be included and analyzed as part of the yearly program. While subject to more daily fluctuation than ADT/ADTT data, this peak hour data often provides valuable insight into locations where changes in the daily traffic do not fit a logical pattern.

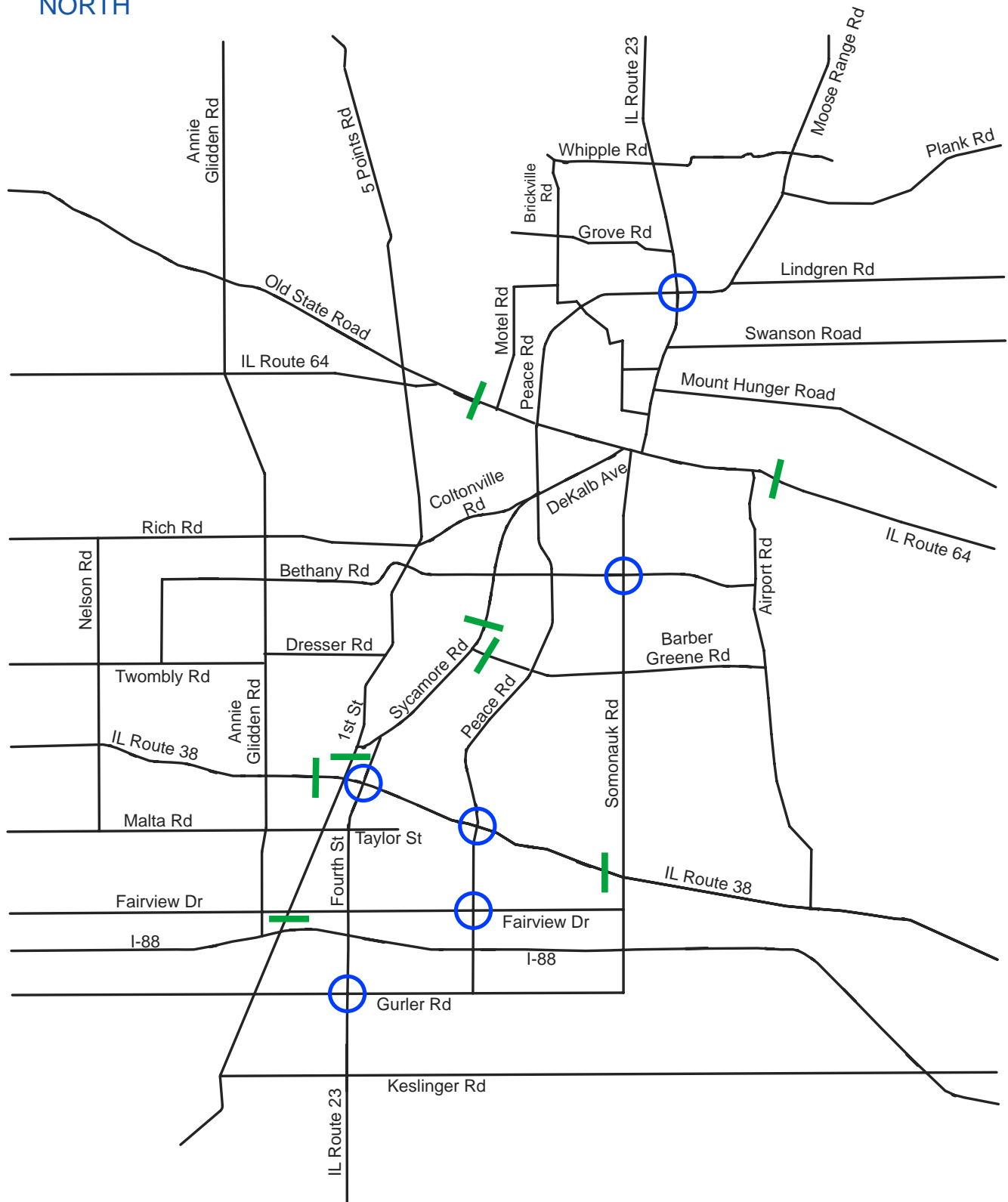
Please feel free to contact this office with any questions or comments regarding the data, analysis, or conclusions contained within this memorandum.

DSATS Count Data Comparison - Intersections



Roadway Segment	05 ADT	05 ADTT	05 HV%	06 ADT	06 ADTT	06 HV%	07 ADT	07 ADTT	07 HV%	ADT 06-07	ADT 05-07	ADTT 06-07	ADTT 05-07
IL 23 N Gurler Road	5,450	870	16%	5,015	650	13%	5,530	835	15%	9%	1%	22%	-4%
IL 23 S Gurler Road	6,160	1,110	18%	5,605	685	12%	5,870	895	15%	5%	-5%	23%	-24%
Gurler Road E IL 23	1,750	175	10%	1,840	175	10%	1,890	165	9%	3%	7%	-6%	-6%
Gurler Road W IL 23	1,225	145	12%	1,275	100	8%	1,555	200	13%	18%	21%	50%	28%
<i>Intersection</i>	<i>7,293</i>	<i>1,150</i>	<i>16%</i>	<i>6,868</i>	<i>805</i>	<i>12%</i>	<i>7,423</i>	<i>1,048</i>	<i>14%</i>	<i>7%</i>	<i>2%</i>	<i>23%</i>	<i>-10%</i>
Peace N Sycamore	14,440	1,445	10%	15,795	1,250	8%							
Peace S Sycamore	9,660	1,255	13%	11,625	1,165	10%							
Sycamore E Peace (2)	17,895	2,145	12%	19,615	1,495	8%							
Sycamore W Peace	23,140	1,545	7%	23,820	1,395	6%							
<i>Intersection</i>	<i>32,568</i>	<i>3,195</i>	<i>10%</i>	<i>35,428</i>	<i>2,653</i>	<i>7%</i>							
Somonauk N Bethany							6,590	540	8%				
Somonauk S Bethany							5,040	375	7%				
Bethany E Somonauk							2,295	205	9%				
Bethany W Somonauk							4,655	195	4%				
<i>Intersection</i>							<i>9,290</i>	<i>658</i>	<i>7%</i>				
Glidden N Fairview	9,245	460	5%	7,525	500	7%							
Glidden S Fairview	7,960	635	8%	6,525	535	8%							
Fairview E Glidden	4,775	620	13%	4,755	575	12%							
Fairview W Glidden	955	105	11%	1,045	95	9%							
<i>Intersection</i>	<i>11,468</i>	<i>910</i>	<i>8%</i>	<i>9,925</i>	<i>853</i>	<i>9%</i>							
IL 23 N IL 38	7,155	570	8%	7,560	435	6%	7,270	485	7%	-4%	2%	10%	-18%
IL 23 S IL 38	8,290	680	8%	8,525	610	7%	7,035	455	6%	-21%	-18%	-34%	-49%
IL 38 E IL 23	9,980	900	9%	8,500	710	8%	10,005	800	8%	15%	0%	11%	-13%
IL 38 W IL 23	9,275	335	4%	8,255	735	9%	10,395	995	10%	21%	11%	26%	66%
<i>Intersection</i>	<i>17,350</i>	<i>1,243</i>	<i>7%</i>	<i>16,420</i>	<i>1,245</i>	<i>8%</i>	<i>17,353</i>	<i>1,368</i>	<i>8%</i>	<i>5%</i>	<i>0%</i>	<i>9%</i>	<i>9%</i>
Peace N IL 38	16,765	2,345	14%	18,145	1,675	9%	18,445	1,600	9%	2%	9%	-5%	-47%
Peace S IL 38	11,545	2,845	25%	12,095	1,355	11%	12,635	1,180	9%	4%	9%	-15%	-141%
IL 38 E Peace	11,145	1,335	12%	11,950	1,180	10%	12,540	1,105	9%	5%	11%	-7%	-21%
IL 38 W Peace	12,755	1,660	13%	12,680	1,125	9%	13,865	1,040	8%	9%	8%	-8%	-60%
<i>Intersection</i>	<i>26,105</i>	<i>4,093</i>	<i>16%</i>	<i>27,435</i>	<i>2,668</i>	<i>10%</i>	<i>28,743</i>	<i>2,463</i>	<i>9%</i>	<i>5%</i>	<i>9%</i>	<i>-8%</i>	<i>-66%</i>
IL 23 N Plank	8,885	1,245	14%	9,575	1,750	18%	12,045	3,865	32%	21%	26%	55%	68%
IL 23 S Plank	8,700	1,220	14%	8,900	1,150	13%	8,330	655	8%	-7%	-4%	-76%	-86%
Plank E IL 23	8,480	1,020	12%	8,925	670	8%	9,795	465	5%	9%	13%	-44%	-119%
Plank W IL 23	10,565	635	6%	11,025	860	8%	11,865	565	5%	7%	11%	-52%	-12%
<i>Intersection</i>	<i>18,315</i>	<i>2,060</i>	<i>11%</i>	<i>19,213</i>	<i>2,215</i>	<i>12%</i>	<i>21,018</i>	<i>2,775</i>	<i>13%</i>	<i>9%</i>	<i>13%</i>	<i>20%</i>	<i>26%</i>
Peace N Fairview	12,055	1,810	15%	11,680	1,355	12%	12,490	1,310	10%	6%	3%	-3%	-38%
Peace S Fairview	11,775	1,415	12%	11,785	1,330	11%	12,930	1,535	12%	9%	9%	13%	8%
Fairview E Peace	1,620	80	5%	1,640	85	5%	1,590	55	3%	-3%	-2%	-55%	-45%
Fairview W Peace	6,225	1,620	26%	5,585	960	17%	5,375	810	15%	-4%	-16%	-19%	-100%
<i>Intersection</i>	<i>15,838</i>	<i>2,463</i>	<i>16%</i>	<i>15,345</i>	<i>1,865</i>	<i>12%</i>	<i>16,193</i>	<i>1,855</i>	<i>11%</i>	<i>5%</i>	<i>2%</i>	<i>-1%</i>	<i>-33%</i>

DSATS Count Data Comparison - Roadway Segments

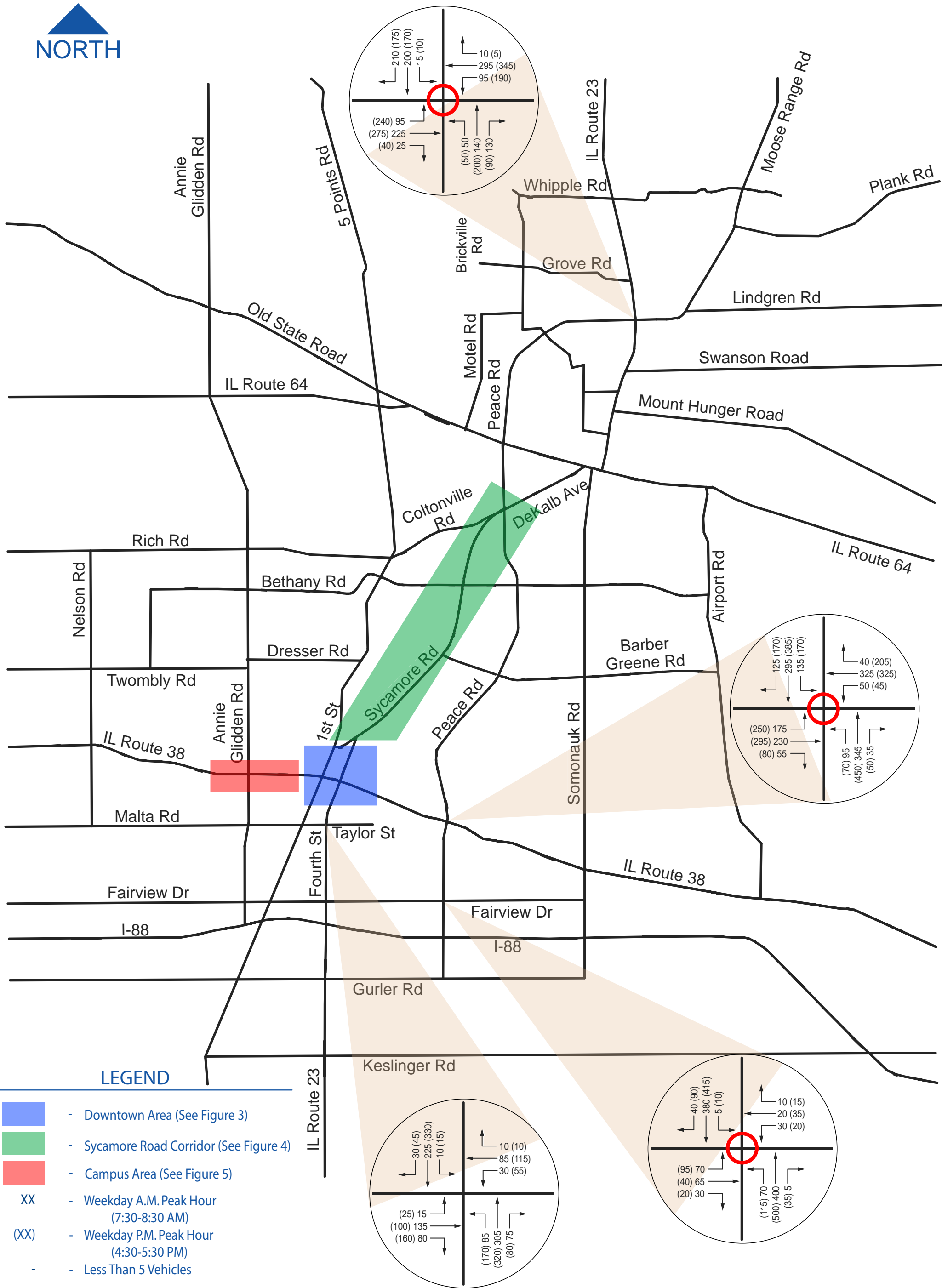
Roadway Segment	05 ADT	05 ADTT	05 HV%	06 ADT	06 ADTT	06 HV%	07 ADT	07 ADTT	07 HV%	ADT 06-07	ADT 05-07	ADTT 06-07	ADTT 05-07
Glidden S IL 64	4,950	345	7%	5,070	310	6%							
IL 64 W Somonauk	9,070	1,000	11%	9,945	960	10%							
IL 64 E Airport	7,385	740	10%	7,830	825	11%	7,640	630	8%	-2%	3%	-31%	-17%
IL 64 W Motel							10,450	980	9%				
IL 38 W Somonauk	10,980	990	9%	10,370	970	9%	11,510	930	8%	10%	5%	-4%	-6%
IL 38 W 1st							21,755	1,845	8%				
IL 23 N Barber Green	28,220	1,975	7%	24,785	1,555	6%	24,390	930	4%	-2%	-16%	-67%	-112%
IL 23 S Barber Green	21,975	1,320	6%	22,515	1,285	6%							
Barber Green E IL 23	7,465	375	5%	6,550	675	10%	8,765	485	6%	25%	15%	-39%	23%
1st N IL 38							17,915	860	5%				
1st S Fairview	3,355	535	16%	3,480	610	18%	3,441	553	16%	-1%	2%	-10%	3%
IL 38 W Glidden	9,405	1,225	13%	8,115	1,090	13%							



LEGEND

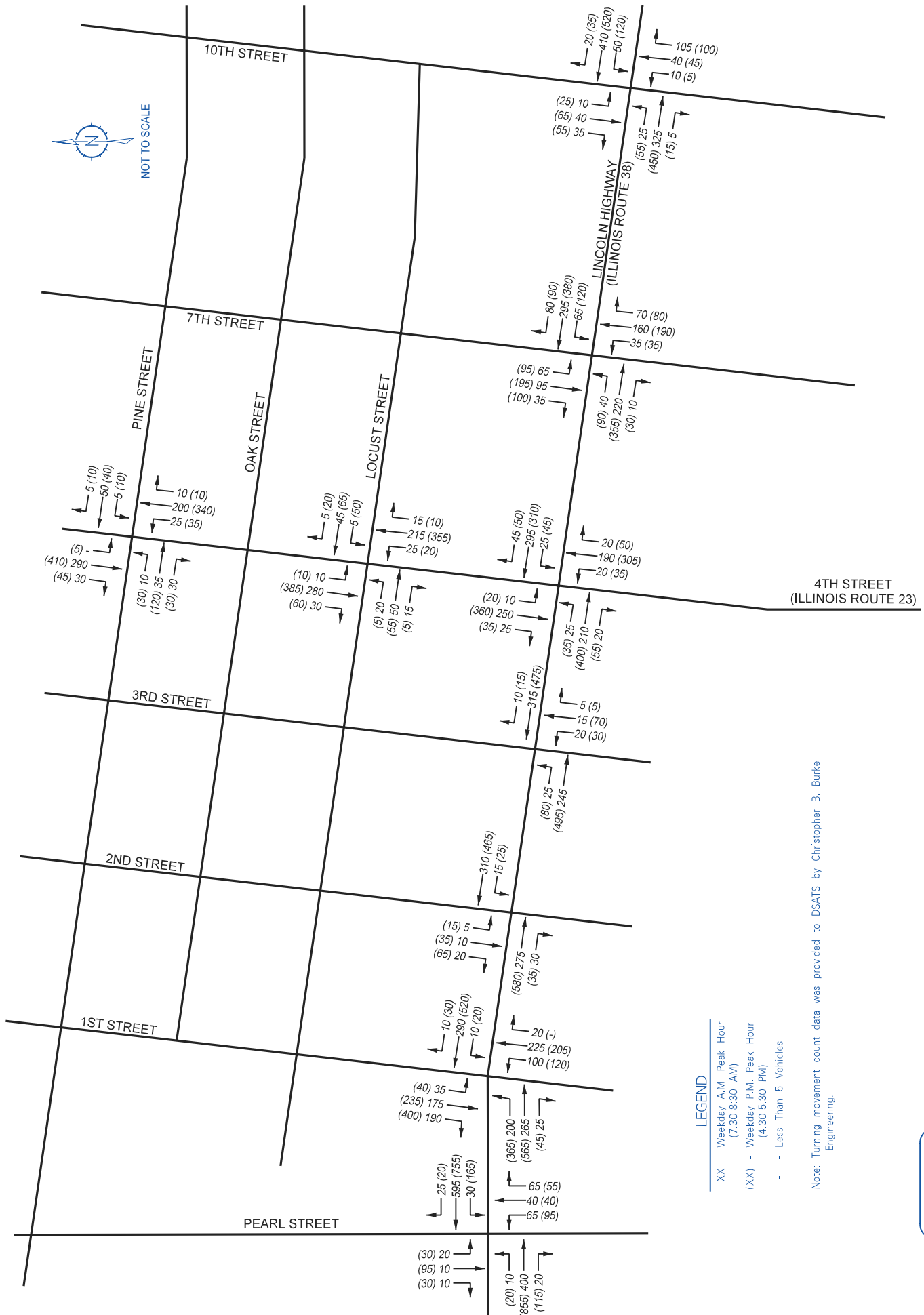
-  - Intersection Count (All Legs)
-  - Roadway Segment





Note: Turning movement count data was provided to DSATS by Christopher B. Burke Engineering. Data for intersections marked with a red circle was collected by Metro Transportation Group to supplement the previous counts.



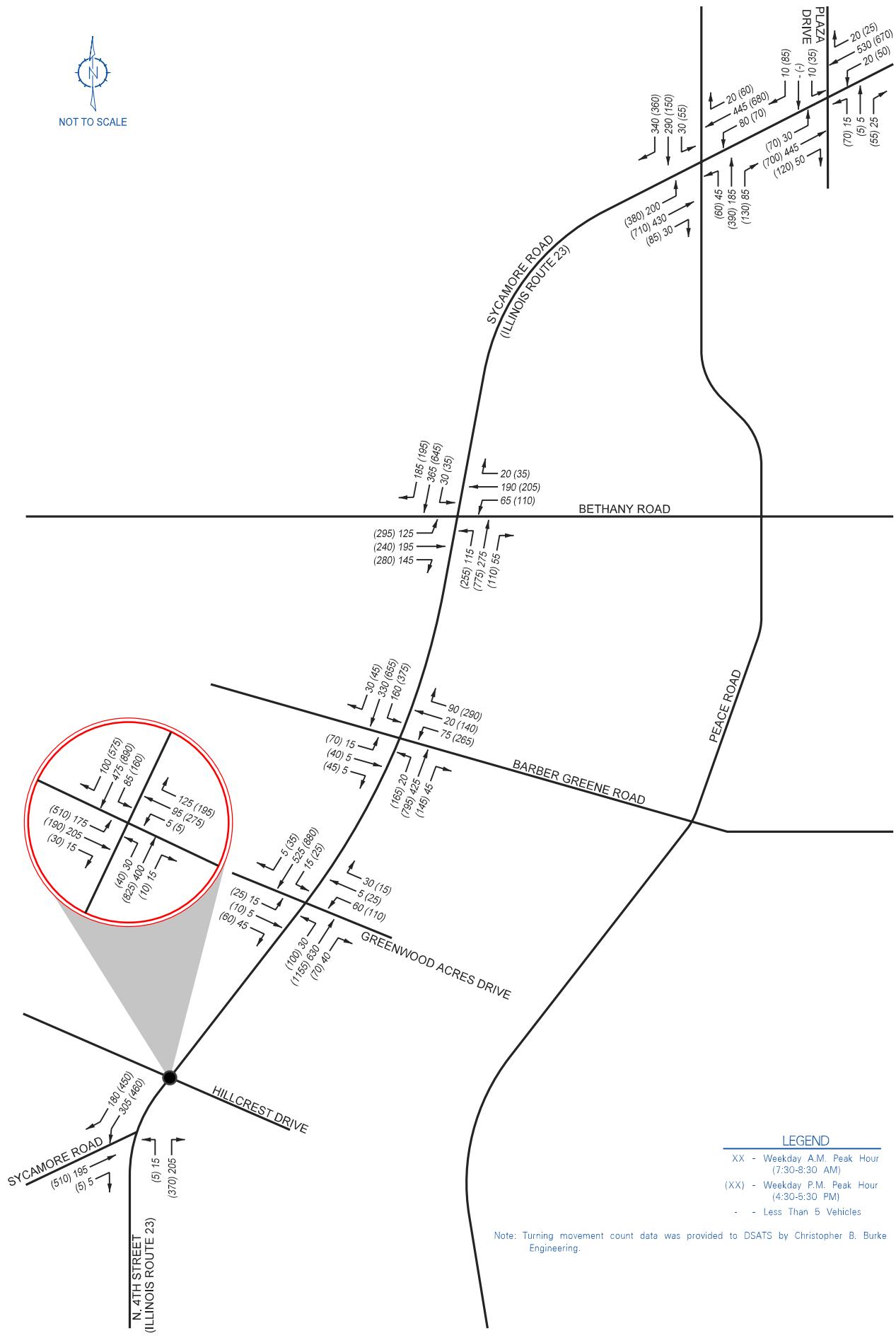


Note: Turning movement count data was provided to DSATS by Christopher B. Burke Engineering.

FIGURE 3

TURNING MOVEMENT COUNTS - DOWNTOWN AREA



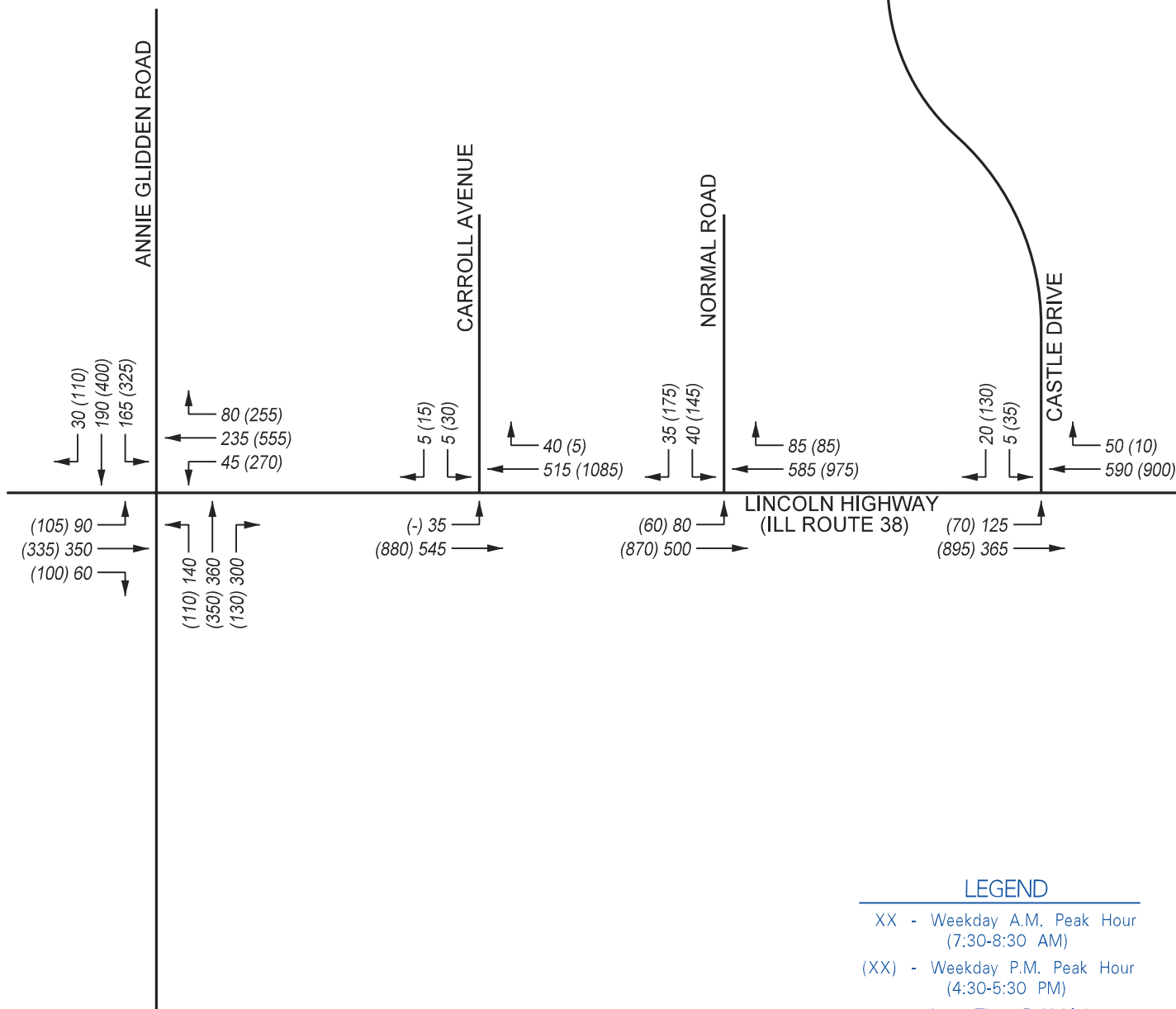


TURNING MOVEMENT COUNTS - SYCAMORE ROAD CORRIDOR

FIGURE: 4



NOT TO SCALE



LEGEND

- XX - Weekday A.M. Peak Hour (7:30-8:30 AM)
- (XX) - Weekday P.M. Peak Hour (4:30-5:30 PM)
- - Less Than 5 Vehicles

Note: Turning movement count data was provided to DSATS by Christopher B. Burke Engineering.

