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Centennial Village PUD
Southeast & Northeast Quadrant of the Calumet Avenue & 45th Avenue Intersection
Munster, Indiana

Traffic Impact Study
September 6, 2024

Prepared for:
Centennial Village
630 Killarney Drive
Dyer, IN 46311

Prepared by:

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Preparer Qualifications

"I certify that this TRAFFIC IMPACT STUDY has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering."

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DVG Team, Inc.

September 6, 2024

1. Introduction and Summary

The purpose of this study is to assist the developers of the Centennial Village PUD (Planned Unit Development) and Town of Munster staff to evaluate the impacts of future traffic generated by the continuing build out of the PUD. The Centennial Village PUD is generally the area bounded by Calumet Avenue to the west, the CN Railroad to the North, what this report will refer to as S Centennial Drive to the south, and Clayhole Lake to the east.

See Exhibit 1 – Vicinity Map

The PUD is split by Centennial Drive creating a looped roadway **(See Exhibit 1)**, as well as 45th Avenue which was improved in 2021 as part of a major railroad grade separation project which has significantly improved traffic flow in the area. To the knowledge of the report preparer, there have been no significant traffic analyses performed on the surrounding roadway network pertaining to the construction of the PUD.

Surrounding Roadway Network

Calumet Avenue is a north-south arterial roadway with two through lanes in each direction. Its posted speed limit is 35 MPH. At the intersection with 45th Street, there are dual-left turn lanes and a southbound right turn lane. This intersection has an existing traffic signal.

45th Street is a east-west major collector roadway with two through lanes in each direction. Its posted speed limit is 45 MPH west of Calumet Avenue and 35 MPH east of Calumet Avenue. 45th Street runs beneath the CN railroad approximately 1,300 feet east of Calumet Avenue. At the intersection with Calumet Avenue, there are exclusive left turn lanes in each direction. Right turns are shared with the outside through lanes. At the intersection with N Centennial Drive, exclusive left and right turn lanes have been constructed.

Village Drive is a local street with a boulevard appearance, one lane in each direction, a center median, and parallel parking on both sides of the roadway in some sections. It intersects Calumet Avenue 450 feet south of 45th Street. At this location Calumet Avenue is separated by a raised concrete median causing Village Drive to function as a right-in, right-out driveway. Village drive has a speed limit of 25 MPH.

Centennial Drive is a local street with a boulevard appearance, one lane in each direction, a center median, and parallel parking on both sides of the roadway in some sections. It creates a loop within the PUD. It intersects 45th Avenue 500 feet east of Calumet Avenue and intersects Calumet Avenue 850 feet south of 45th Street. Various turn lanes are in place along Centennial Drive to allow access into individual areas of the PUD. Two roundabouts/traffic circles are constructed along Centennial Drive. The southern roundabout serves to provide access to the playground and bandshell area of Centennial Park. The intersection with 45th Avenue is unsignalized and unfinished, with no defined

turn lanes approaching 45th Avenue. The intersection with Calumet Avenue is signalized, with single exclusive left turn, thru, and right turn lanes. The intersection of S Centennial Drive is existing and not modeled as a course of this study, but traffic on S Centennial Drive was observed to inform the findings of this study. Centennial Drive has a speed limit of 25 MPH.

The vertical profiles of all roadways described here are generally flat, with the exception of 45th Avenue as it passes beneath the CN railroad.

2. Proposed Development

The Centennial Village PUD encompasses most of the old Munster Steel property. Construction began in 2016 with its first hotel development coming online in late 2017. The purpose of the PUD is to provide the Town and its residents with "a sustainable, mixed use, Walkable Lifestyle Community adjacent to the key regional thoroughfares of Calumet Avenue and 45th Street". The PUD design standards and development plan have changed slightly as developments have been infilled, but it generally consists of 15 structures of varying sizes and uses, with accompanying parking and pedestrian areas.

See Exhibit 2 – Vicinity Map

For the purposes of this study, Buildings B through G **(See Exhibit 2)** can be considered complete and operational, and do not need to be calculated for future traffic generation. Uses and traffic generation for the unfinished buildings will be discussed later in this report.

3. Area Conditions

The western boundary to the PUD is commercial/office. The northern boundary is residential but buffered by the CN Railroad ROW and old 45th Avenue ROW. The eastern boundary is undeveloped/lake, and the southern boundary is recreational.

24-hour Turning Movement Data was collected at the intersections of Calumet Avenue and 45th Avenue, as well as 45th Avenue and N Centennial Drive. 24-hour roadway volume counts were collected at Village Drive east of Calumet Avenue and S Centennial Drive between the southern roundabout and the entrance to Springhill Suites.

Non-Site 24-Hour Traffic Counts (May 2024)	
Calumet Avenue	*Through*
Total Traffic	33,100
Northbound	17,000
Southbound	16,100

North of 45th Avenue

Non-Site 24-Hour Traffic Counts (May 2024)	
Calumet Avenue	*Through*
Total Traffic	37,630
Northbound	18,870
Southbound	18,760

South of 45th Avenue

Non-Site 24-Hour Traffic Counts (May 2024)	
45th Avenue	*Through*
Total Traffic	20,750
Eastbound	11,800
Westbound	8,950

East of Calumet Avenue

Non-Site 24-Hour Traffic Counts (May 2024)	
45th Avenue	*Through*
Total Traffic	25,650
Eastbound	14,650
Westbound	11,000

West of Calumet Avenue

The INDOT Traffic Count Database System (TCDS) contains state-wide traffic data collection. Its last recording of Calumet Avenue observed 31,300 vehicles in 2018. Its last recording of 45th Avenue observed 18,150 vehicles east of Southwood Drive and 17,450 vehicles west of Calumet Avenue in 2018. It is fair to assume that the improvements to the Calumet Avenue and 45th Avenue intersection have increased the amount of motorists utilizing 45th Avenue for entry into Indiana from Illinois beyond natural population growth over the past 6 years.

See Exhibit 3 – Traffic Volume Exhibit

See Exhibit 4 – Existing AM & PM Peak Hour Volumes, Calumet Avenue & 45th Avenue

See Exhibit 5 – Existing AM & PM Peak Hour Volumes, 45th Avenue & N Centennial Drive

The intersections in their existing conditions with existing traffic are first analyzed. Existing lane configurations, storage lengths, and Peak Hour Factors were utilized. The traffic signal at Calumet Avenue & 45th Avenue was found to operate under standard phasing and a cycle length of 110 seconds. Both the phasing and cycle length were kept constant for this analysis.

Existing Level of Service (LOS) Summary Table

Intersection Name	*Existing Peak Hour LOS (Exhibit #)*	
	AM	*PM*
Calumet Ave at 45th Ave	D *(6A)*	E *(6B)*
45th Ave at N Centennial Dr (unsignalized)	B *(7A)*	E *(7B)*

Given the nearly full build out of the Town of Munster and few other known major developments, no initial adjustments were made to the existing conditions. For comparison with findings further in this report, the Calumet Avenue at 45th Avenue intersection operates at an average 62.6 seconds of control delay during its existing PM Peak Hour.

4. Projected Traffic

To assess the potential traffic impact due to the proposed development on the traffic flow of the surrounding streets and intersections, the future travel demand of the site and other future possible development was simulated. In the case of this development, likely tenants/uses are known to the Developer and outlined within the PUD documents to guide traffic projections.

The Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition was utilized as the source of estimated trips for the remaining land within the PUD. As mentioned previously, certain buildings within the PUD are complete and operational and are ignored for the purpose of traffic projections.

See Exhibit 8 – ITE Land Uses

The following tables outline the traffic generation by land use by building. The building letter designators can be followed by returned to **Exhibit 2**.

Building M – Quality Restaurant (4,240 GFA)
Land Use 931 Quality Restaurant
Average Vehicle Trip Ends vs. per 1,000 SF GFA

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	2	1	1
PM Peak Hour	Adjacent Street	33	22	11
AM Peak Hour	Generator	19	15	4
PM Peak Hour	Generator	35	21	14

Building I – General Office Building (>5,000 SF) (7,250 GFA)
Land Use 710 General Office Building
Average Vehicle Trip Ends vs. per 1,000 SF GFA

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	8	7	1
PM Peak Hour	Adjacent Street	8	1	7
AM Peak Hour	Generator	11	10	1
PM Peak Hour	Generator	10	2	8

Building N – Retail / Big Box (34,000 GFA)
Land Use 820 Shopping Center
Average Vehicle Trip Ends vs. per 1,000 SF GFA

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	32	20	12
PM Peak Hour	Adjacent Street	130	62	68
AM Peak Hour	Generator	N/A	N/A	N/A
PM Peak Hour	Generator	N/A	N/A	N/A

Building L – Small Office Building (5,000 GFA)
Land Use 712 Small Office Building
Average Vehicle Trip Ends vs. per 1,000 SF GFA

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	10	8	2
PM Peak Hour	Adjacent Street	12	4	8
AM Peak Hour	Generator	16	10	6
PM Peak Hour	Generator	19	9	10

Buildings H, J, and K Residential COMBINED
Land Use 220 Multifamily Housing
Average Vehicle Trip Ends vs. Dwelling Units

108 Dwelling Units		*Forecasted Trip Ends*		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	60	17	43
PM Peak Hour	Adjacent Street	72	42	30
AM Peak Hour	Generator	50	12	38
PM Peak Hour	Generator	60	38	22

Buildings H, J, and K Commercial/Retail 1st Floor COMBINED
Land Use 820 Shopping Center
Average Vehicle Trip Ends vs. per 1,000 SF GFA

61,041 SF (Total of 3 Buildings)		*Forecasted Trip Ends*		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	57	35	22
PM Peak Hour	Adjacent Street	233	112	121
AM Peak Hour	Generator	N/A	N/A	N/A
PM Peak Hour	Generator	N/A	N/A	N/A

Building D Hotel/Conference (144 Rooms)
Land Use 310 Hotel
Average Vehicle Trip Ends vs. Rooms

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	68	40	28
PM Peak Hour	Adjacent Street	86	44	42
AM Peak Hour	Generator	N/A	N/A	N/A
PM Peak Hour	Generator	N/A	N/A	N/A

Building A Grocery Store (70,000 SF GFA)
Land Use 850 Supermarket
Average Vehicle Trip Ends vs. per 1,000 SF GFA

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	267	160	107
PM Peak Hour	Adjacent Street	647	330	317
AM Peak Hour	Generator	467	243	224
PM Peak Hour	Generator	532	277	255

Building A Potential Bank Outlot w/Drive In (2,400 SF GFA)
Land Use 912 Drive-In Bank
Average Vehicle Trip Ends vs. per 1,000 SF GFA

		Forecasted Trip Ends		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	24	14	10
PM Peak Hour	Adjacent Street	51	26	25
AM Peak Hour	Generator	37	20	17
PM Peak Hour	Generator	50	25	25

Traffic volumes vary considerably between Adjacent Street Peak Hour and Generator Peak Hour. The Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition displays varying rates depending on uses, as certain land uses experience their peak generation rates at different times from the adjacent roadway peak. As this traffic study is most interested in determining the impacts to the adjacent roadway and access points to it, a sound assumption is to utilize the adjacent street generation rates.

Additionally, this assumption is sound because of the multi-use nature of the development and the likelihood that individual building peaks will not coincide with other building peaks.

The highlighted volumes represent the traffic in and out of the development utilized for the study.

*Total Centennial Village**		*Forecasted Total Trip Ends*		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	227	123	104
PM Peak Hour	Adjacent Street	562	283	279

*Excluding Building A Trips

Total Building A		*Forecasted Total Trip Ends*		
		Two Way	*IN*	*OUT*
AM Peak Hour	Adjacent Street	291	174	117
PM Peak Hour	Adjacent Street	698	355	343

Building A trips should be separated given the different access points available to Building A motorists

5. Analysis Methodology & Traffic Assignments

After trips are determined in the trip generation process described previously (Section 4), trip distribution was performed. Trip distribution is the process of determining the general direction that the site generated traffic is expected to travel to and from the development utilizing existing traffic patterns as a guide. Traffic assignment is the process of assigning traffic turning movements to the access points of the development and to the surrounding roadways/intersections.

The addition volume counts at Village Drive and "S" Centennial Drive shown in **Exhibit 3** inform the trip distribution process.

N Centennial Drive	IN	48%
N Centennial Drive	OUT	49%
Village Drive	IN	19%
Village Drive	OUT	17%
S Centennial Drive	IN	33%
S Centennial Drive	OUT	34%

As the data collected showed consistency between entrances and exits at each node, we can consolidate consistent assignments:

- N Centennial Drive – 48%
- Village Drive – 19%
- S Centennial Drive – 33%

Given the remaining buildings will span into areas both north and south of Village Drive but south of 45th Avenue, these assignment ratios are sound.

Building A motorists will utilize a newly constructed north leg at the intersection of 45th Avenue and N Centennial Drive, and a newly constructed driveway onto Calumet Avenue north of 45th Avenue. This driveway will function as a right-in, right-out driveway due to the presence of a raised concrete median on Calumet Avenue, similar to the south leg of the intersection mentioned previously in this study.

Building A area trips were distributed as follows:

- N Centennial Drive & 45th Avenue, new north leg – 70%
- New Calumet Avenue Driveway – 30%

During the traffic assignment process, trip reduced volumes are applied, if applicable. Pass-by trips, which are intermediate stops between an origin and a primary destination are also considered at this point in a study. Given this a multi-destination development, this should be considered. Given the complexity of the development, the number of access points, and the subjective nature of a multi-destination development, this study does not apply any pass-by trip reductions but omits adding the trips generated by the development to the greater roadway network. That is to say that the trips generated are only added to the turning movements into and out of the access points. To account for this omission, the baseline existing traffic shown in **Exhibit 3** was increased 5% throughout the network before adding development trips. This is a sound compromise given the Town of Munster is nearly 100% built out.

6. Level of Service Analysis

The Level of Service (LOS) is the classification of the quality of traffic flow at a given location. A breakdown of the various LOS conditions is given below:

LOS ‘A’ indicates free flow conditions

LOS ‘B’ indicates stable flow conditions

LOS ‘C’ indicates slight interruptions in flow

LOS ‘D’ indicates moderate interruptions in flow

LOS ‘E’ indicates unstable flow approaching capacity

LOS ‘F’ indicates a forced flow condition

Traffic engineering standards indicate a LOS of ‘D’ or better is acceptable. On some occasions, a LOS ‘E’ is considered acceptable. LOS ‘E’ becomes acceptable in high-volume suburban intersections where level of service improvements can only be achieved by major intersection improvements involving additional lanes and absorbing additional right of way.

The peak hours are defined as the heaviest traffic periods of the day. Traffic engineering standards dictate that the heaviest traffic periods of an average weekday shall be studied and the needs resulting from those analyses shall be considered sufficient for the rest of the time periods not analyzed.

The level of service was computed utilizing the recommended methodology of the Highway Capacity Manual (Sixth Edition, TRB 2016). Using the Synchro software, version 11, by Trafficware, the peak hour turn movement volumes for the full build condition were analyzed to determine their level of service at the following intersections:

- Calumet Avenue at 45th Avenue
  - No improvements considered. This intersection is modeled to observe changes.
- N Centennial Drive at 45th Avenue
  - Modeled as a signalized intersection utilizing already-constructed turn lanes

N Centennial Drive at 45th Avenue was modeled with the same cycle length as the Calumet intersection, which will be discussed later in this study.

The levels of service were then considered by approach and then by turn movement for each of the appropriate intersection movements to determine all traffic impacts.

7. Findings & Comments

The AM peak hour was found to be 10:30 – 11:30 AM. The PM peak hour was found to be 4:45 – 5:45 PM. This later AM peak hour is measurably greater than the normal AM commuting hours. Traffic is generally consistent from the AM peak hour as it rises slightly approaching the PM Peak hour.

See Exhibit 9 – AM Peak Hour Network Design Hourly Volumes, Full Build

See Exhibit 10 – PM Peak Hour Network Design Hourly Volumes, Full Build

Given that the AM Peak Hour is less defined than most signalized intersections and that the PM Peak Hour is demonstrably the more sever peak hour, the following results and discussion focus on the PM Peak Hour. The results of the level of service analysis and the exhibits containing the related details are tabulated below:

Proposed Level of Service (LOS) Summary Table – Full Build

Intersection Name	*Proposed PM Peak Hour (Exhibit #)*	
	LOS	*Average Control Delay*
Calumet Ave at 45th Ave (45th Avenue at N Centennial Drive Signalized)	E *(11)*	70.6 sec *(11)*
Calumet Ave at 45th Ave (45th Avenue at N Centennial Drive Roundabout – Calumet Avenue Optimized)	E *(12)*	73.7 sec *(12)*
Calumet Ave at 45th Ave (45th Avenue at N Centennial Drive Roundabout – Westbound Left Turn Optimized)	E *(13)*	79.2 sec *(13)*

Intersection Name	*Proposed PM Peak Hour (Exhibit #)*	
	LOS	*Average Control Delay*
45th Avenue at N Centennial Drive Signalized	C *(14)*	31.9 sec *(14)*
45th Avenue at N Centennial Drive Roundabout	C *(15)*	16.6 sec *(15)*

Desire for a roundabout at the intersection of N Centennial Drive and 45th Avenue has been discussed by the Town and Developer prior to the commission of this study. The information displayed is meant to inform the Town and Developer of the considerations which should be made while evaluating this option. The intersection of N Centennial Drive is located 510 feet east of Calumet Avenue. Section 46-1.06 of the Indiana Design Manual (IDM) states that "To operate efficiently, signalized intersections should be at least 1,300 feet apart". While commercial areas often have tighter signalized intersection spacing than 1,300 feet, extra care should be taken in the design of these intersections. As we know that 45th Avenue and N Centennial Drive will require additional intersection control measures than are in place today to continue operating with some efficiency, the same care should be taken in evaluating the potential for a roundabout.

Existing Conditions – PM Peak Hour

Referencing **Exhibit 6**, the 45th Avenue & Calumet Avenue intersection operates at a poor level of service presently. 50th Percentile Queues are contained within the available storage lanes. 95th Percentile Queues exceed storage distance for the westbound left turn movement. Queues frequently block entry into left turn lanes for eastbound and southbound traffic. The eastbound through movement volume exceeds the available capacity. All northbound movements and the westbound left turn movements operate at 90% or more of their capacity.

Dual Signalization

Referencing **Exhibit 11**, signalization of the N Centennial Drive intersection along with the traffic growth described earlier in this study demonstrates heightened levels of the scenario described in the existing condition. The eastbound through movement's volume is 12% greater than its available capacity. All northbound movements and the westbound left turn movement operate at 100% of their capacity. Precise calculation of expected queue lengths under this condition is not possible. Visual simulations of intersection performance confirm that queue spillover will consistently occur for the westbound left turn lane at Calumet Avenue back to the N Centennial Drive intersection, precluding some westbound traffic from proceeding through the N Centennial Drive intersection. Queue lengths for eastbound traffic will be excessive during the peak hour. Under extreme conditions, northbound Calumet Avenue traffic may back up to the intersection with Superior Avenue and prevent consistent travel through that intersection during that movement's green phase. This scenario assumes the three intersection traffic signals (N

Centennial/45th, Calumet/45th, and Calumet/Superior) are interconnected and coordinated for maximum efficiency.

N Centennial Drive Roundabout Conversion

Referencing **Exhibit 12**, consideration was given to the installation of a roundabout at the intersection of 45th Avenue and N Centennial Drive. Given that the need to coordinate with another 45th Avenue traffic signal is removed in this condition, certain movement's demand/capacity ratios are reduced, but generally all still function at or over their capacity similar to the condition described earlier. The westbound left turn movement at Calumet Avenue and 45th Avenue is of particular concern under this condition. The available storage of 285 feet is less than the 95th Percentile queue for this movement. This opens the potential for queued traffic to back up into the roundabout under extreme conditions. The overall level of service for Calumet Avenue & 45th Avenue is slightly less than a dual traffic signal, but otherwise similar. This scenario assumes that the traffic signal at Calumet Avenue & 45th Avenue is optimized to reduce overall delay.

N Centennial Drive Roundabout Conversion, Timing Adjustments

Referencing **Exhibit 13**, consideration was given to finding a scenario which could alleviate the concerns of queued traffic backing up into a roundabout at N Centennial Drive & 45th Avenue. The Calumet Avenue & 45th Avenue intersection is not maintained by INDOT, and the Town of Munster has control over the timing of this traffic signal.

By modifying the splits for the westbound left turn movement, timing can be adjusted such that the 95th Percentile queue reduces to approximately 215 feet. At this distance, the concerns raised under the first scenario would be eliminated. However, giving this deference to a minor movement will decrease the overall efficiency of the area's roadway network and cause northbound traffic to queue back through Superior Drive on a more consistent basis. Queueing for the eastbound through movement will increase substantially.

Exhibit 14 and **Exhibit 15** are included to show levels of service for N Centennial Drive & 45th Avenue under a signalized and roundabout condition. Both conditions operate adequately considering the primary focus of this study should be the affect these improvements and expansions have on the major roadway, Calumet Avenue.

8. Conclusion

As clearly shown in this report (Exhibit 6), the intersection of Calumet Avenue and 45th Avenue operates at or over capacity at present. The additional traffic demand will further stress the network. When intersections operate beyond their capacity, modern modeling methods are unable to precisely determine the values needed to concretely evaluate the pros and cons of either intersection improvement type. It is this study's intent to inform both the Town and Developer of the different effects each intersection type will have on the roadway network in this section of the Town.

Exhibit 1

Vicinity Map


Centennial Village
PUD Limits
Calumet
Ave
45th Ave
45th Ave
N Centennial Dr
Village Dr
"S" Centennial Dr
Hyatt Place Munster
Vision Boutique | Eye Doctor | Optometrist
Marathon Gas Station
Franciscan Physician Network Munster
Speedway
White Castle
Valvoline Instant Oil Ch
Franciscan Health Munster
Rosebud Steakhouse Centennial Village
El Salto Mexican
Springhill Suites Chicago Southeast/Munster, IN
Centennial Park Playground
Centennial Park Amphitheater
Layous Medical Group
Franciscan Physician Network Family ...

Exhibit 2

PUD Layout


BLDG A
70,000 SF
CALUMET AVENUE
45TH STREET
PEDESTRIAN BRIDGE
BLDG L
BLDG M
6,950 SF
BLDG B
13,833 SF
BLDG F
5,400 SF
BLDG I
22,188 SF
BLDG C
6,600 SF
BLDG G
77,920 SF
BLDG J
71,040 SF
BLDG O
98,480
BLDG H
74,000 SF
BLDG K
71,040 SF
BLDG D
9,400 SF
BLDG E
57,540 SF
BLDG N
30,000 SF

Exhibit 3

Traffic Volume Data

1544 45th St - TMC Calumet Avenue & 45th Avenue

Thu May 30, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses)
All Movements
ID: 1190987, Location: 41.539648, -87.509076

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg	Calumet Ave					45th St					Calumet Ave					45th St					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
2024-05-30 12:00AM	7	22	4	0	**33**	3	5	3	0	**11**	3	19	9	0	**31**	3	12	8	0	**23**	**98**
12:15AM	4	10	0	0	**14**	5	6	1	0	**12**	1	18	2	0	**21**	2	2	7	0	**11**	**58**
12:30AM	4	11	4	0	**19**	2	1	2	0	**5**	2	8	2	0	**12**	3	3	4	0	**10**	**46**
12:45AM	0	14	0	0	**14**	0	4	2	0	**6**	1	11	4	0	**16**	1	3	5	0	**9**	**45**
Hourly Total	15	57	8	0	**80**	10	16	8	0	**34**	7	56	17	0	**80**	9	20	24	0	**53**	**247**
1:00AM	0	9	1	0	**10**	0	2	3	0	**5**	3	8	1	0	**12**	4	5	1	1	**11**	**38**
1:15AM	3	7	0	0	**10**	2	1	1	0	**4**	0	8	5	2	**15**	0	5	1	0	**6**	**35**
1:30AM	5	14	2	0	**21**	1	1	3	0	**5**	1	11	0	0	**12**	2	4	6	0	**12**	**50**
1:45AM	1	5	0	0	**6**	2	0	0	0	**2**	0	12	0	0	**12**	2	3	3	0	**8**	**28**
Hourly Total	9	35	3	0	**47**	5	4	7	0	**16**	4	39	6	2	**51**	8	17	11	1	**37**	**151**
2:00AM	1	8	3	0	**12**	0	2	1	0	**3**	0	7	1	0	**8**	1	3	5	0	**9**	**32**
2:15AM	2	9	1	0	**12**	2	0	1	0	**3**	3	6	1	0	**10**	2	2	2	0	**6**	**31**
2:30AM	2	10	1	0	**13**	4	3	0	0	**7**	2	7	0	0	**9**	0	6	6	0	**12**	**41**
2:45AM	2	8	0	0	**10**	1	0	1	0	**2**	0	10	5	1	**16**	1	2	1	0	**4**	**32**
Hourly Total	7	35	5	0	**47**	7	5	3	0	**15**	5	30	7	1	**43**	4	13	14	0	**31**	**136**
3:00AM	4	13	0	0	**17**	2	3	1	0	**6**	0	10	1	0	**11**	2	1	5	1	**9**	**43**
3:15AM	0	6	0	0	**6**	0	3	1	0	**4**	1	8	0	0	**9**	2	2	9	0	**13**	**32**
3:30AM	3	14	0	0	**17**	4	4	1	0	**9**	2	14	3	0	**19**	2	2	4	1	**9**	**54**
3:45AM	8	9	0	0	**17**	5	6	1	0	**12**	3	21	1	0	**25**	2	1	7	0	**10**	**64**
Hourly Total	15	42	0	0	**57**	11	16	4	0	**31**	6	53	5	0	**64**	8	6	25	2	**41**	**193**
4:00AM	12	4	2	0	**18**	2	8	3	0	**13**	1	31	3	0	**35**	5	4	2	0	**11**	**77**
4:15AM	21	16	0	0	**37**	7	9	7	0	**23**	3	30	8	0	**41**	2	2	7	0	**11**	**112**
4:30AM	7	30	0	0	**37**	3	8	6	0	**17**	1	34	5	1	**41**	3	1	8	0	**12**	**107**
4:45AM	8	41	2	0	**51**	13	11	13	0	**37**	2	66	9	0	**77**	11	6	11	0	**28**	**193**
Hourly Total	48	91	4	0	**143**	25	36	29	0	**90**	7	161	25	1	**194**	21	13	28	0	**62**	**489**
5:00AM	9	29	2	0	**40**	11	11	8	0	**30**	3	80	14	0	**97**	6	8	10	0	**24**	**191**
5:15AM	13	46	2	0	**61**	17	17	9	0	**43**	3	81	14	0	**98**	10	5	10	0	**25**	**227**
5:30AM	10	51	7	0	**68**	15	22	12	0	**49**	4	116	15	0	**135**	15	15	16	1	**47**	**299**
5:45AM	36	49	10	0	**95**	14	32	19	1	**66**	9	113	28	0	**150**	23	21	16	0	**60**	**371**
Hourly Total	68	175	21	0	**264**	57	82	48	1	**188**	19	390	71	0	**480**	54	49	52	1	**156**	**1088**
6:00AM	18	90	10	0	**118**	25	26	16	0	**67**	13	136	32	0	**181**	27	14	24	0	**65**	**431**
6:15AM	27	92	5	0	**124**	23	48	27	0	**98**	11	162	37	0	**210**	13	22	21	0	**56**	**488**
6:30AM	30	128	18	0	**176**	23	49	25	0	**97**	13	180	37	0	**230**	45	32	42	0	**119**	**622**
6:45AM	45	125	13	0	**183**	30	58	32	0	**120**	23	187	59	0	**269**	34	32	29	0	**95**	**667**
Hourly Total	120	435	46	0	**601**	101	181	100	0	**382**	60	665	165	0	**890**	119	100	116	0	**335**	**2208**
7:00AM	38	137	18	0	**193**	25	49	37	0	**111**	22	163	53	0	**238**	30	27	23	0	**80**	**622**
7:15AM	36	137	12	0	**185**	20	76	36	0	**132**	15	221	46	0	**282**	57	43	27	0	**127**	**726**
7:30AM	54	159	21	0	**234**	28	64	54	0	**146**	25	185	71	1	**282**	60	49	36	1	**146**	**808**
7:45AM	41	177	24	0	**242**	38	84	59	0	**181**	32	186	84	0	**302**	60	80	34	0	**174**	**899**
Hourly Total	169	610	75	0	**854**	111	273	186	0	**570**	94	755	254	1	**1104**	207	199	120	1	**527**	**3055**
8:00AM	44	152	25	0	**221**	25	57	50	0	**132**	39	180	62	0	**281**	25	24	34	0	**83**	**717**
8:15AM	38	147	39	0	**224**	36	69	53	0	**158**	43	182	43	0	**268**	66	75	49	0	**190**	**840**
8:30AM	35	166	21	0	**222**	32	52	50	0	**134**	45	164	42	0	**251**	67	52	40	0	**159**	**766**
8:45AM	30	173	38	0	**241**	25	76	52	0	**153**	38	189	50	0	**277**	62	71	41	0	**174**	**845**
Hourly Total	147	638	123	0	**908**	118	254	205	0	**577**	165	715	197	0	**1077**	220	222	164	0	**606**	**3168**
9:00AM	31	156	39	0	**226**	29	65	44	0	**138**	30	135	47	0	**212**	48	85	43	0	**176**	**752**
9:15AM	32	163	35	0	**230**	25	57	47	0	**129**	42	193	55	1	**291**	81	80	47	1	**209**	**859**
9:30AM	27	169	45	0	**241**	19	43	42	1	**105**	38	154	64	0	**256**	66	81	41	1	**189**	**791**
9:45AM	31	161	35	0	**227**	24	33	53	0	**110**	45	168	68	0	**281**	76	85	37	0	**198**	**816**
Hourly Total	121	649	154	0	**924**	97	198	186	1	**482**	155	650	234	1	**1040**	271	331	168	2	**772**	**3218**
10:00AM	27	166	39	2	**234**	25	47	40	0	**112**	25	165	43	0	**233**	88	77	55	0	**220**	**799**
10:15AM	37	184	35	0	**256**	31	47	43	0	**121**	31	166	63	0	**260**	75	92	67	0	**234**	**871**
10:30AM	20	185	37	0	**242**	33	56	43	0	**132**	57	182	63	0	**302**	87	87	51	0	**225**	**901**

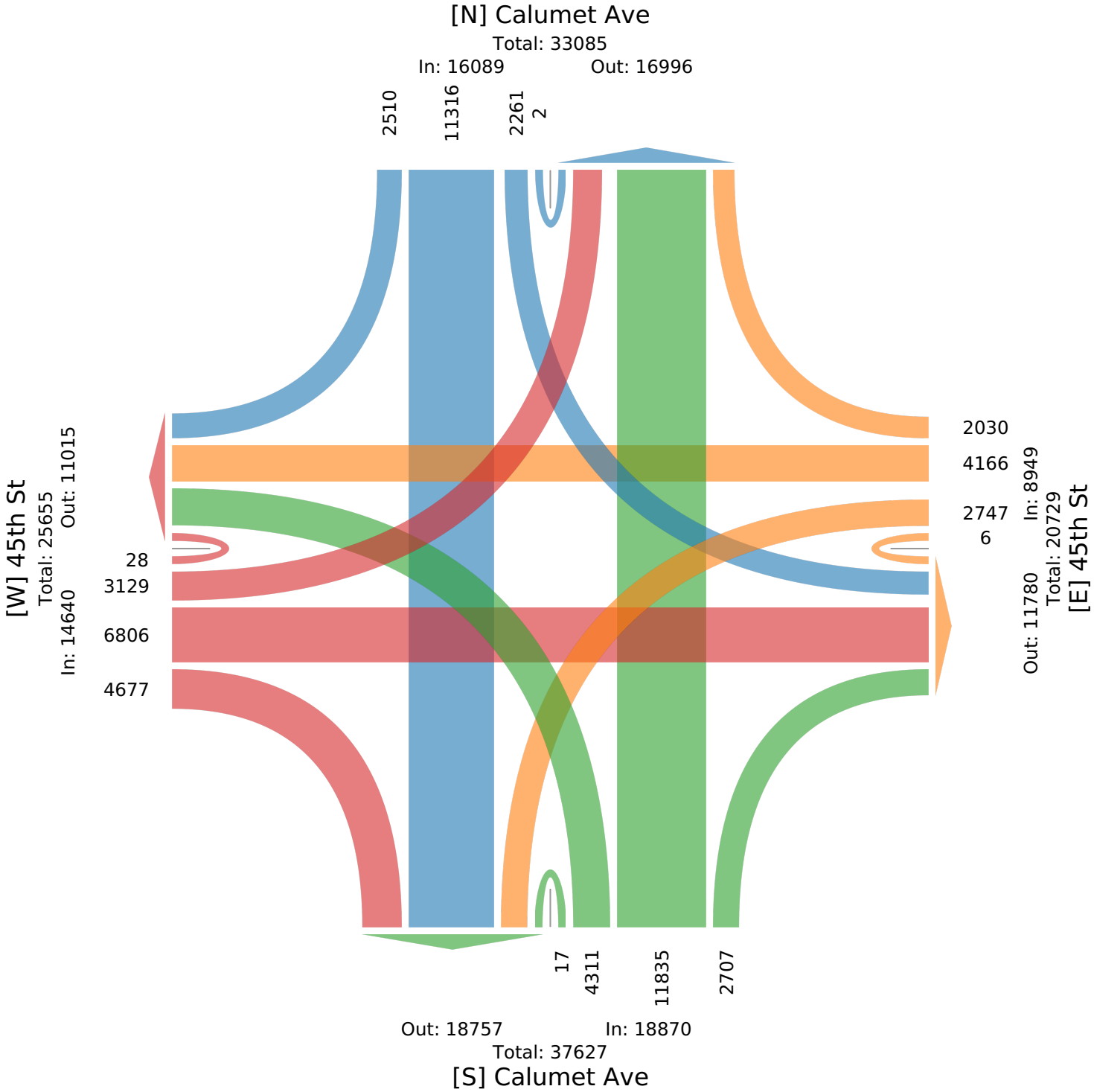
Leg	Calumet Ave					45th St					Calumet Ave					45th St					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	R	T	L	U	App	Int
10:45AM	38	143	27	0	**208**	35	49	53	0	**137**	41	213	64	0	**318**	76	92	58	1	**227**	**890**
Hourly Total	122	678	138	2	**940**	124	199	179	0	**502**	154	726	233	0	**1113**	326	348	231	1	**906**	**3461**
11:00AM	41	151	21	0	**213**	26	52	51	0	**129**	53	166	57	0	**276**	75	105	38	0	**218**	**836**
11:15AM	35	169	56	0	**260**	36	39	46	1	**122**	61	145	77	0	**283**	94	86	65	0	**245**	**910**
11:30AM	37	176	51	0	**264**	29	59	41	0	**129**	46	151	66	0	**263**	66	106	56	0	**228**	**884**
11:45AM	47	173	31	0	**251**	35	53	51	0	**139**	43	190	78	0	**311**	82	108	60	0	**250**	**951**
Hourly Total	160	669	159	0	**988**	126	203	189	1	**519**	203	652	278	0	**1133**	317	405	219	0	**941**	**3581**
12:00PM	43	164	38	0	**245**	50	65	47	0	**162**	45	184	88	0	**317**	106	127	60	0	**293**	**1017**
12:15PM	47	208	54	0	**309**	37	36	33	0	**106**	56	190	76	0	**322**	82	131	43	1	**257**	**994**
12:30PM	45	182	56	0	**283**	50	56	36	0	**142**	53	200	76	1	**330**	97	148	45	0	**290**	**1045**
12:45PM	37	185	40	0	**262**	36	52	58	0	**146**	33	187	68	0	**288**	97	119	76	0	**292**	**988**
Hourly Total	172	739	188	0	**1099**	173	209	174	0	**556**	187	761	308	1	**1257**	382	525	224	1	**1132**	**4044**
1:00PM	34	194	35	0	**263**	36	64	42	0	**142**	44	195	69	0	**308**	102	136	78	0	**316**	**1029**
1:15PM	45	172	33	0	**250**	30	70	49	0	**149**	50	183	86	3	**322**	78	160	68	0	**306**	**1027**
1:30PM	26	200	56	0	**282**	36	58	46	0	**140**	41	201	75	2	**319**	92	130	69	0	**291**	**1032**
1:45PM	38	198	49	0	**285**	28	66	53	0	**147**	42	247	68	0	**357**	50	91	53	0	**194**	**983**
Hourly Total	143	764	173	0	**1080**	130	258	190	0	**578**	177	826	298	5	**1306**	322	517	268	0	**1107**	**4071**
2:00PM	36	178	28	0	**242**	37	75	48	0	**160**	51	184	76	0	**311**	69	110	62	0	**241**	**954**
2:15PM	25	123	26	0	**174**	24	73	53	2	**152**	47	101	62	0	**210**	105	140	43	0	**288**	**824**
2:30PM	44	172	35	0	**251**	46	80	49	0	**175**	40	152	82	0	**274**	93	128	55	0	**276**	**976**
2:45PM	44	247	42	0	**333**	25	80	54	0	**159**	50	188	81	0	**319**	105	123	39	1	**268**	**1079**
Hourly Total	149	720	131	0	**1000**	132	308	204	2	**646**	188	625	301	0	**1114**	372	501	199	1	**1073**	**3833**
3:00PM	39	231	37	0	**307**	32	76	37	0	**145**	55	198	82	0	**335**	89	142	49	0	**280**	**1067**
3:15PM	37	220	41	0	**298**	23	70	45	0	**138**	63	189	58	0	**310**	109	165	50	1	**325**	**1071**
3:30PM	34	201	41	0	**276**	31	76	52	0	**159**	57	185	79	0	**321**	91	155	56	1	**303**	**1059**
3:45PM	41	237	36	0	**314**	29	83	49	0	**161**	60	202	66	1	**329**	115	179	44	0	**338**	**1142**
Hourly Total	151	889	155	0	**1195**	115	305	183	0	**603**	235	774	285	1	**1295**	404	641	199	2	**1246**	**4339**
4:00PM	45	251	52	0	**348**	28	74	50	0	**152**	75	181	82	0	**338**	103	176	62	0	**341**	**1179**
4:15PM	26	196	43	0	**265**	31	75	53	0	**159**	44	211	73	0	**328**	80	156	48	0	**284**	**1036**
4:30PM	27	183	40	0	**250**	26	78	52	0	**156**	76	207	64	0	**347**	81	177	48	0	**306**	**1059**
4:45PM	38	176	19	0	**233**	46	82	58	0	**186**	63	217	74	0	**354**	91	170	49	1	**311**	**1084**
Hourly Total	136	806	154	0	**1096**	131	309	213	0	**653**	258	816	293	0	**1367**	355	679	207	1	**1242**	**4358**
5:00PM	31	236	57	0	**324**	29	91	51	0	**171**	51	201	63	0	**315**	91	168	66	0	**325**	**1135**
5:15PM	35	259	52	0	**346**	38	87	57	0	**182**	63	248	77	0	**388**	76	134	33	0	**243**	**1159**
5:30PM	39	199	50	0	**288**	34	92	51	0	**177**	40	204	89	0	**333**	71	180	47	0	**298**	**1096**
5:45PM	44	204	43	0	**291**	33	65	44	0	**142**	49	168	64	0	**281**	113	161	67	0	**341**	**1055**
Hourly Total	149	898	202	0	**1249**	134	335	203	0	**672**	203	821	293	0	**1317**	351	643	213	0	**1207**	**4445**
6:00PM	52	175	41	0	**268**	45	65	38	0	**148**	65	187	64	0	**316**	81	138	59	0	**278**	**1010**
6:15PM	32	170	40	0	**242**	39	43	46	0	**128**	39	193	76	1	**309**	85	159	77	0	**321**	**1000**
6:30PM	38	170	31	0	**239**	24	88	32	0	**144**	31	211	63	0	**305**	73	141	51	0	**265**	**953**
6:45PM	34	149	33	0	**216**	27	39	30	0	**96**	41	122	80	0	**243**	83	131	42	1	**257**	**812**
Hourly Total	156	664	145	0	**965**	135	235	146	0	**516**	176	713	283	1	**1173**	322	569	229	1	**1121**	**3775**
7:00PM	26	163	36	0	**225**	22	55	28	0	**105**	50	153	45	0	**248**	63	112	40	0	**215**	**793**
7:15PM	29	125	27	0	**181**	19	64	23	0	**106**	35	138	53	0	**226**	62	101	36	0	**199**	**712**
7:30PM	31	132	31	0	**194**	26	44	18	1	**89**	35	149	47	0	**231**	55	86	37	0	**178**	**692**
7:45PM	36	113	26	0	**175**	23	53	23	0	**99**	40	116	71	0	**227**	60	95	31	1	**187**	**688**
Hourly Total	122	533	120	0	**775**	90	216	92	1	**399**	160	556	216	0	**932**	240	394	144	1	**779**	**2885**
8:00PM	33	98	21	0	**152**	12	44	28	0	**84**	43	120	51	0	**214**	44	100	26	2	**172**	**622**
8:15PM	30	112	26	0	**168**	22	42	22	0	**86**	25	123	52	0	**200**	49	98	38	0	**185**	**639**
8:30PM	38	136	36	0	**210**	25	42	16	0	**83**	25	103	37	0	**165**	41	88	27	1	**157**	**615**
8:45PM	45	112	26	0	**183**	26	52	14	0	**92**	11	97	56	0	**164**	42	63	30	0	**135**	**574**
Hourly Total	146	458	109	0	**713**	85	180	80	0	**345**	104	443	196	0	**743**	176	349	121	3	**649**	**2450**
9:00PM	18	102	27	0	**147**	14	59	19	0	**92**	23	70	51	0	**144**	24	45	23	1	**93**	**476**
9:15PM	28	111	28	0	**167**	13	48	15	0	**76**	22	70	34	0	**126**	37	40	20	1	**98**	**467**
9:30PM	26	92	26	0	**144**	13	25	19	0	**57**	20	62	37	0	**119**	21	32	10	0	**63**	**383**
9:45PM	17	69	11	0	**97**	10	33	7	0	**50**	8	72	45	0	**125**	17	17	6	2	**42**	**314**
Hourly Total	89	374	92	0	**555**	50	165	60	0	**275**	73	274	167	0	**514**	99	134	59	4	**296**	**1640**
10:00PM	20	54	10	0	**84**	8	27	14	0	**49**	13	80	44	0	**137**	20	25	14	0	**59**	**329**
10:15PM	8	47	10	0	**65**	8	38	11	0	**57**	14	71	36	0	**121**	23	22	16	1	**62**	**305**
10:30PM	12	48	7	0	**67**	7	33	5	0	**45**	9	64	31	1	**105**	10	11	11	3	**35**	**252**

Leg	Calumet Ave					45th St					Calumet Ave					45th St					
Direction	Southbound					Westbound					Northbound					Eastbound					
Time	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	R	T	L	U	**App**	**Int**
10:45PM	14	50	6	0	**70**	20	18	10	0	**48**	7	27	19	0	**53**	11	16	14	0	**41**	**212**
Hourly Total	54	199	33	0	**286**	43	116	40	0	**199**	43	242	130	1	**416**	64	74	55	4	**197**	**1098**
11:00PM	13	48	5	0	**66**	9	18	5	0	**32**	5	33	14	1	**53**	11	13	8	1	**33**	**184**
11:15PM	11	46	5	0	**62**	3	19	6	0	**28**	7	21	19	1	**48**	7	18	16	0	**41**	**179**
11:30PM	13	37	7	0	**57**	7	17	4	0	**28**	7	20	9	0	**36**	3	16	8	1	**28**	**149**
11:45PM	5	27	6	0	**38**	1	9	3	0	**13**	5	18	7	0	**30**	5	10	7	0	**22**	**103**
Hourly Total	42	158	23	0	**223**	20	63	18	0	**101**	24	92	49	2	**167**	26	57	39	2	**124**	**615**
Total	2510	11316	2261	2	**16089**	2030	4166	2747	6	**8949**	2707	11835	4311	17	**18870**	4677	6806	3129	28	**14640**	**58548**
% Approach	15.6%	70.3%	14.1%	0%	**-**	22.7%	46.6%	30.7%	0.1%	**-**	14.3%	62.7%	22.8%	0.1%	**-**	31.9%	46.5%	21.4%	0.2%	**-**	-
% Total	4.3%	19.3%	3.9%	0%	**27.5%**	3.5%	7.1%	4.7%	0%	**15.3%**	4.6%	20.2%	7.4%	0%	**32.2%**	8.0%	11.6%	5.3%	0%	**25.0%**	-
Motorcycles	4	14	2	0	**20**	5	10	4	0	**19**	3	11	7	0	**21**	5	16	6	0	**27**	87
% Motorcycles	0.2%	0.1%	0.1%	0%	**0.1%**	0.2%	0.2%	0.1%	0%	**0.2%**	0.1%	0.1%	0.2%	0%	**0.1%**	0.1%	0.2%	0.2%	0%	**0.2%**	0.1%
Lights	2363	10881	2205	2	**15451**	1989	4069	2693	6	**8757**	2629	11387	4147	17	**18180**	4487	6610	2920	28	**14045**	56433
% Lights	94.1%	96.2%	97.5%	100%	**96.0%**	98.0%	97.7%	98.0%	100%	**97.9%**	97.1%	96.2%	96.2%	100%	**96.3%**	95.9%	97.1%	93.3%	100%	**95.9%**	96.4%
Single-Unit Trucks	63	185	34	0	**282**	24	75	37	0	**136**	61	191	93	0	**345**	108	128	78	0	**314**	1077
% Single-Unit Trucks	2.5%	1.6%	1.5%	0%	**1.8%**	1.2%	1.8%	1.3%	0%	**1.5%**	2.3%	1.6%	2.2%	0%	**1.8%**	2.3%	1.9%	2.5%	0%	**2.1%**	1.8%
Articulated Trucks	79	231	17	0	**327**	10	10	11	0	**31**	11	231	64	0	**306**	77	49	123	0	**249**	913
% Articulated Trucks	3.1%	2.0%	0.8%	0%	**2.0%**	0.5%	0.2%	0.4%	0%	**0.3%**	0.4%	2.0%	1.5%	0%	**1.6%**	1.6%	0.7%	3.9%	0%	**1.7%**	1.6%
Buses	1	5	3	0	**9**	2	2	2	0	**6**	3	15	0	0	**18**	0	3	2	0	**5**	38
% Buses	0%	0%	0.1%	0%	**0.1%**	0.1%	0%	0.1%	0%	**0.1%**	0.1%	0.1%	0%	0%	**0.1%**	0%	0%	0.1%	0%	**0%**	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

1544 45th St - TMC
Thu May 30, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses)
All Movements
ID: 1190987, Location: 41.539648, -87.509076

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



9600 N Centennial Dr - TMC 45th Avenue & N Centennial Drive
Thu May 30, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses)
All Movements
ID: 1190988, Location: 41.539679, -87.50715

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg / Direction	45th Ave Westbound				Centennial Dr Northbound				45th Ave Eastbound				
Time	T	L	U	App	R	L	U	App	R	T	U	App	Int
2024-05-30 12:00AM	12	0	0	**12**	1	0	0	**1**	0	17	0	**17**	**30**
12:15AM	12	1	0	**13**	0	0	0	**0**	0	4	0	**4**	**17**
12:30AM	5	0	0	**5**	0	0	0	**0**	0	9	0	**9**	**14**
12:45AM	7	0	0	**7**	0	0	0	**0**	0	3	0	**3**	**10**
Hourly Total	36	1	0	**37**	1	0	0	**1**	0	33	0	**33**	**71**
1:00AM	4	0	0	**4**	0	0	0	**0**	0	10	0	**10**	**14**
1:15AM	4	0	0	**4**	1	0	0	**1**	1	3	0	**4**	**9**
1:30AM	5	0	0	**5**	1	0	0	**1**	0	10	0	**10**	**16**
1:45AM	2	0	0	**2**	0	0	0	**0**	0	3	0	**3**	**5**
Hourly Total	15	0	0	**15**	2	0	0	**2**	1	26	0	**27**	**44**
2:00AM	3	0	0	**3**	0	0	0	**0**	0	6	0	**6**	**9**
2:15AM	3	0	0	**3**	0	0	0	**0**	0	6	0	**6**	**9**
2:30AM	7	0	0	**7**	1	0	0	**1**	0	10	0	**10**	**18**
2:45AM	2	0	0	**2**	0	0	0	**0**	0	2	0	**2**	**4**
Hourly Total	15	0	0	**15**	1	0	0	**1**	0	24	0	**24**	**40**
3:00AM	7	0	0	**7**	0	0	0	**0**	0	1	0	**1**	**8**
3:15AM	4	0	0	**4**	0	0	0	**0**	0	3	0	**3**	**7**
3:30AM	9	0	0	**9**	0	0	0	**0**	0	4	0	**4**	**13**
3:45AM	12	1	0	**13**	0	1	0	**1**	0	4	0	**4**	**18**
Hourly Total	32	1	0	**33**	0	1	0	**1**	0	12	0	**12**	**46**
4:00AM	9	0	0	**9**	0	1	0	**1**	0	6	0	**6**	**16**
4:15AM	18	0	0	**18**	0	0	0	**0**	0	6	0	**6**	**24**
4:30AM	15	0	0	**15**	0	0	0	**0**	0	2	0	**2**	**17**
4:45AM	33	0	0	**33**	0	0	0	**0**	2	8	0	**10**	**43**
Hourly Total	75	0	0	**75**	0	1	0	**1**	2	22	0	**24**	**100**
5:00AM	28	0	0	**28**	0	2	0	**2**	0	13	0	**13**	**43**
5:15AM	44	0	0	**44**	0	0	0	**0**	0	9	0	**9**	**53**
5:30AM	44	0	0	**44**	0	2	0	**2**	3	23	0	**26**	**72**
5:45AM	65	1	0	**66**	0	0	0	**0**	4	38	0	**42**	**108**
Hourly Total	181	1	0	**182**	0	4	0	**4**	7	83	0	**90**	**276**
6:00AM	64	1	0	**65**	1	3	0	**4**	0	37	0	**37**	**106**
6:15AM	98	2	0	**100**	2	2	0	**4**	0	35	0	**35**	**139**
6:30AM	103	3	0	**106**	1	2	0	**3**	0	50	0	**50**	**159**
6:45AM	119	3	0	**122**	4	4	0	**8**	1	69	0	**70**	**200**
Hourly Total	384	9	0	**393**	8	11	0	**19**	1	191	0	**192**	**604**
7:00AM	106	5	0	**111**	16	2	0	**18**	0	68	0	**68**	**197**
7:15AM	132	5	0	**137**	3	2	0	**5**	2	62	0	**64**	**206**
7:30AM	155	7	1	**163**	4	1	0	**5**	0	96	0	**96**	**264**
7:45AM	178	4	1	**183**	4	4	0	**8**	1	123	0	**124**	**315**
Hourly Total	571	21	2	**594**	27	9	0	**36**	3	349	0	**352**	**982**
8:00AM	145	9	0	**154**	5	1	0	**6**	0	102	0	**102**	**262**
8:15AM	151	9	0	**160**	2	2	0	**4**	1	155	0	**156**	**320**
8:30AM	139	5	0	**144**	3	2	0	**5**	0	127	0	**127**	**276**
8:45AM	148	12	0	**160**	7	2	0	**9**	0	166	0	**166**	**335**
Hourly Total	583	35	0	**618**	17	7	0	**24**	1	550	0	**551**	**1193**
9:00AM	132	2	0	**134**	7	3	0	**10**	4	153	0	**157**	**301**
9:15AM	127	5	0	**132**	4	4	0	**8**	4	150	0	**154**	**294**
9:30AM	100	4	0	**104**	7	2	0	**9**	4	157	0	**161**	**274**
9:45AM	110	2	0	**112**	7	1	0	**8**	3	159	0	**162**	**282**
Hourly Total	469	13	0	**482**	25	10	0	**35**	15	619	0	**634**	**1151**
10:00AM	113	10	0	**123**	7	1	0	**8**	2	131	1	**134**	**265**
10:15AM	111	9	0	**120**	8	4	0	**12**	5	163	0	**168**	**300**
10:30AM	132	4	0	**136**	10	2	0	**12**	2	176	0	**178**	**326**

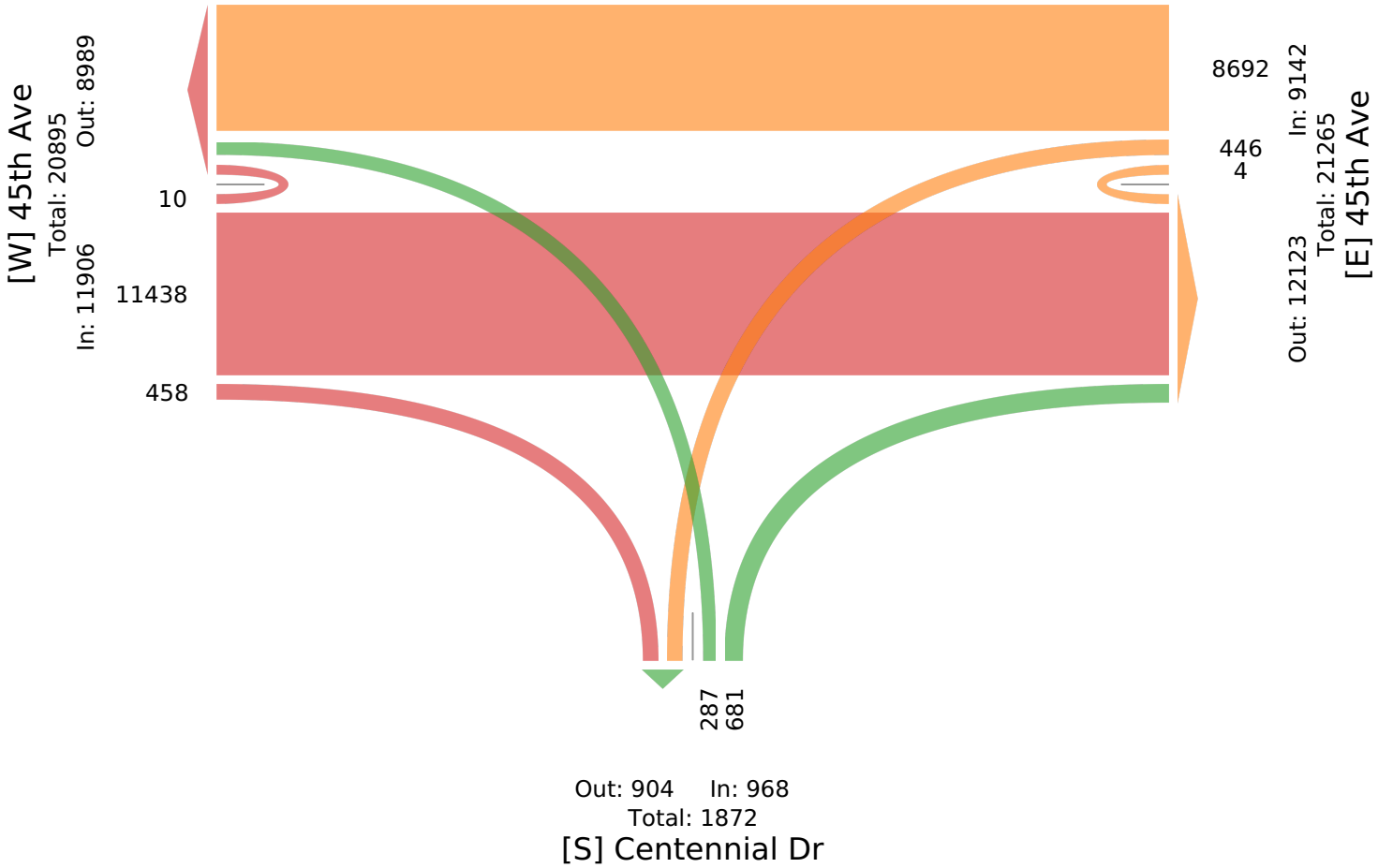
Leg	45th Ave				Centennial Dr				45th Ave				
Direction	Westbound				Northbound				Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
10:45AM	138	7	0	**145**	4	3	0	**7**	5	149	0	**154**	**306**
Hourly Total	494	30	0	**524**	29	10	0	**39**	14	619	1	**634**	**1197**
11:00AM	128	6	0	**134**	11	1	0	**12**	9	171	1	**181**	**327**
11:15AM	124	6	0	**130**	10	1	0	**11**	12	196	0	**208**	**349**
11:30AM	128	8	0	**136**	11	2	0	**13**	10	184	0	**194**	**343**
11:45AM	133	6	0	**139**	13	4	0	**17**	5	187	0	**192**	**348**
Hourly Total	513	26	0	**539**	45	8	0	**53**	36	738	1	**775**	**1367**
12:00PM	163	11	0	**174**	18	5	0	**23**	14	206	0	**220**	**417**
12:15PM	103	8	0	**111**	11	7	0	**18**	8	231	1	**240**	**369**
12:30PM	142	8	0	**150**	12	10	0	**22**	16	244	0	**260**	**432**
12:45PM	134	6	0	**140**	9	5	0	**14**	13	178	0	**191**	**345**
Hourly Total	542	33	0	**575**	50	27	0	**77**	51	859	1	**911**	**1563**
1:00PM	131	8	0	**139**	7	8	0	**15**	9	202	0	**211**	**365**
1:15PM	147	9	0	**156**	8	2	0	**10**	7	249	0	**256**	**422**
1:30PM	138	5	0	**143**	12	3	0	**15**	17	210	0	**227**	**385**
1:45PM	154	7	0	**161**	14	4	0	**18**	3	186	0	**189**	**368**
Hourly Total	570	29	0	**599**	41	17	0	**58**	36	847	0	**883**	**1540**
2:00PM	139	9	0	**148**	17	3	0	**20**	5	186	1	**192**	**360**
2:15PM	140	13	1	**154**	19	7	0	**26**	5	206	0	**211**	**391**
2:30PM	174	11	0	**185**	29	5	0	**34**	8	205	2	**215**	**434**
2:45PM	155	7	0	**162**	12	7	0	**19**	11	208	0	**219**	**400**
Hourly Total	608	40	1	**649**	77	22	0	**99**	29	805	3	**837**	**1585**
3:00PM	144	7	0	**151**	12	3	0	**15**	6	235	0	**241**	**407**
3:15PM	140	8	0	**148**	10	4	0	**14**	12	259	0	**271**	**433**
3:30PM	150	9	0	**159**	19	5	0	**24**	3	252	0	**255**	**438**
3:45PM	145	11	0	**156**	18	3	0	**21**	10	261	0	**271**	**448**
Hourly Total	579	35	0	**614**	59	15	0	**74**	31	1007	0	**1038**	**1726**
4:00PM	159	17	0	**176**	19	5	0	**24**	13	297	1	**311**	**511**
4:15PM	147	19	0	**166**	10	3	0	**13**	10	234	1	**245**	**424**
4:30PM	163	11	0	**174**	16	3	0	**19**	11	286	0	**297**	**490**
4:45PM	167	7	0	**174**	31	4	0	**35**	5	253	0	**258**	**467**
Hourly Total	636	54	0	**690**	76	15	0	**91**	39	1070	2	**1111**	**1892**
5:00PM	171	11	0	**182**	14	7	0	**21**	15	263	1	**279**	**482**
5:15PM	174	14	0	**188**	17	1	0	**18**	12	242	0	**254**	**460**
5:30PM	178	13	0	**191**	15	4	0	**19**	15	262	0	**277**	**487**
5:45PM	138	8	1	**147**	8	1	0	**9**	5	242	0	**247**	**403**
Hourly Total	661	46	1	**708**	54	13	0	**67**	47	1009	1	**1057**	**1832**
6:00PM	147	8	0	**155**	10	7	0	**17**	12	236	0	**248**	**420**
6:15PM	123	9	0	**132**	8	4	0	**12**	11	226	0	**237**	**381**
6:30PM	133	8	0	**141**	15	7	0	**22**	12	193	0	**205**	**368**
6:45PM	92	5	0	**97**	11	2	0	**13**	9	206	0	**215**	**325**
Hourly Total	495	30	0	**525**	44	20	0	**64**	44	861	0	**905**	**1494**
7:00PM	101	1	0	**102**	7	8	0	**15**	3	183	0	**186**	**303**
7:15PM	108	4	0	**112**	6	7	0	**13**	5	157	0	**162**	**287**
7:30PM	84	1	0	**85**	12	7	0	**19**	9	148	0	**157**	**261**
7:45PM	93	3	0	**96**	10	4	0	**14**	9	162	0	**171**	**281**
Hourly Total	386	9	0	**395**	35	26	0	**61**	26	650	0	**676**	**1132**
8:00PM	82	2	0	**84**	6	3	0	**9**	12	153	0	**165**	**258**
8:15PM	82	5	0	**87**	5	5	0	**10**	9	145	0	**154**	**251**
8:30PM	78	3	0	**81**	11	3	0	**14**	12	143	0	**155**	**250**
8:45PM	88	8	0	**96**	5	4	0	**9**	14	86	0	**100**	**205**
Hourly Total	330	18	0	**348**	27	15	0	**42**	47	527	0	**574**	**964**
9:00PM	77	1	0	**78**	9	12	0	**21**	7	89	0	**96**	**195**
9:15PM	71	5	0	**76**	5	2	0	**7**	8	84	0	**92**	**175**
9:30PM	57	2	0	**59**	4	2	0	**6**	1	78	0	**79**	**144**
9:45PM	48	2	0	**50**	9	5	0	**14**	1	41	0	**42**	**106**
Hourly Total	253	10	0	**263**	27	21	0	**48**	17	292	0	**309**	**620**
10:00PM	46	1	0	**47**	7	3	0	**10**	2	46	0	**48**	**105**
10:15PM	51	0	0	**51**	5	6	0	**11**	2	44	0	**46**	**108**
10:30PM	41	1	0	**42**	0	5	0	**5**	2	25	0	**27**	**74**

Leg Direction	45th Ave Westbound				Centennial Dr Northbound				45th Ave Eastbound				
Time	T	L	U	**App**	R	L	U	**App**	R	T	U	**App**	**Int**
10:45PM	45	0	0	**45**	7	4	0	**11**	0	28	0	**28**	**84**
Hourly Total	183	2	0	**185**	19	18	0	**37**	6	143	0	**149**	**371**
11:00PM	22	1	0	**23**	6	8	0	**14**	1	20	1	**22**	**59**
11:15PM	22	0	0	**22**	7	6	0	**13**	2	30	0	**32**	**67**
11:30PM	24	1	0	**25**	3	3	0	**6**	2	30	0	**32**	**63**
11:45PM	13	1	0	**14**	1	0	0	**1**	0	22	0	**22**	**37**
Hourly Total	81	3	0	**84**	17	17	0	**34**	5	102	1	**108**	**226**
Total	8692	446	4	**9142**	681	287	0	**968**	458	11438	10	**11906**	**22016**
% Approach	95.1%	4.9%	0%	**-**	70.4%	29.6%	0%	**-**	3.8%	96.1%	0.1%	**-**	-
% Total	39.5%	2.0%	0%	**41.5%**	3.1%	1.3%	0%	**4.4%**	2.1%	52.0%	0%	**54.1%**	-
Motorcycles	20	3	0	**23**	1	1	0	**2**	1	31	0	**32**	57
% Motorcycles	0.2%	0.7%	0%	**0.3%**	0.1%	0.3%	0%	**0.2%**	0.2%	0.3%	0%	**0.3%**	0.3%
Lights	8503	438	4	**8945**	673	279	0	**952**	447	11123	10	**11580**	21477
% Lights	97.8%	98.2%	100%	**97.8%**	98.8%	97.2%	0%	**98.3%**	97.6%	97.2%	100%	**97.3%**	97.6%
Single-Unit Trucks	137	4	0	**141**	6	7	0	**13**	7	203	0	**210**	364
% Single-Unit Trucks	1.6%	0.9%	0%	**1.5%**	0.9%	2.4%	0%	**1.3%**	1.5%	1.8%	0%	**1.8%**	1.7%
Articulated Trucks	25	1	0	**26**	1	0	0	**1**	2	71	0	**73**	100
% Articulated Trucks	0.3%	0.2%	0%	**0.3%**	0.1%	0%	0%	**0.1%**	0.4%	0.6%	0%	**0.6%**	0.5%
Buses	7	0	0	**7**	0	0	0	**0**	1	10	0	**11**	18
% Buses	0.1%	0%	0%	**0.1%**	0%	0%	0%	**0%**	0.2%	0.1%	0%	**0.1%**	0.1%

*L: Left, R: Right, T: Thru, U: U-Turn

9600 N Centennial Dr - TMC
Thu May 30, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Motorcycles, Lights, Single-Unit Trucks, Articulated Trucks, Buses)
All Movements
ID: 1190988, Location: 41.539679, -87.50715

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



3 - Village Dr btw Calumet Ave & Drwy - 2-la... - ATR

Thu May 30, 2024
Village Drive east of Calumet Avenue
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 1192704, Location: 41.538481, -87.508668

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	East Westbound		West Eastbound		
Time	T	**App**	T	**App**	**Int**
2024-05-30 12:00AM	2	**2**	1	**1**	**3**
12:15AM	0	**0**	0	**0**	**0**
12:30AM	0	**0**	0	**0**	**0**
12:45AM	0	**0**	0	**0**	**0**
Hourly Total	2	**2**	1	**1**	**3**
1:00AM	0	**0**	0	**0**	**0**
1:15AM	1	**1**	0	**0**	**1**
1:30AM	0	**0**	0	**0**	**0**
1:45AM	0	**0**	0	**0**	**0**
Hourly Total	1	**1**	0	**0**	**1**
2:00AM	0	**0**	0	**0**	**0**
2:15AM	0	**0**	0	**0**	**0**
2:30AM	0	**0**	0	**0**	**0**
2:45AM	0	**0**	0	**0**	**0**
Hourly Total	0	**0**	0	**0**	**0**
3:00AM	0	**0**	0	**0**	**0**
3:15AM	0	**0**	0	**0**	**0**
3:30AM	0	**0**	0	**0**	**0**
3:45AM	0	**0**	0	**0**	**0**
Hourly Total	0	**0**	0	**0**	**0**
4:00AM	0	**0**	1	**1**	**1**
4:15AM	1	**1**	0	**0**	**1**
4:30AM	0	**0**	0	**0**	**0**
4:45AM	1	**1**	0	**0**	**1**
Hourly Total	2	**2**	1	**1**	**3**
5:00AM	0	**0**	0	**0**	**0**
5:15AM	0	**0**	0	**0**	**0**
5:30AM	1	**1**	0	**0**	**1**
5:45AM	0	**0**	1	**1**	**1**
Hourly Total	1	**1**	1	**1**	**2**
6:00AM	2	**2**	0	**0**	**2**
6:15AM	1	**1**	1	**1**	**2**
6:30AM	0	**0**	3	**3**	**3**
6:45AM	2	**2**	2	**2**	**4**
Hourly Total	5	**5**	6	**6**	**11**
7:00AM	1	**1**	5	**5**	**6**
7:15AM	5	**5**	2	**2**	**7**
7:30AM	3	**3**	2	**2**	**5**
7:45AM	2	**2**	3	**3**	**5**
Hourly Total	11	**11**	12	**12**	**23**
8:00AM	4	**4**	4	**4**	**8**
8:15AM	6	**6**	5	**5**	**11**
8:30AM	3	**3**	2	**2**	**5**
8:45AM	4	**4**	9	**9**	**13**
Hourly Total	17	**17**	20	**20**	**37**
9:00AM	3	**3**	2	**2**	**5**
9:15AM	7	**7**	5	**5**	**12**
9:30AM	6	**6**	7	**7**	**13**
9:45AM	3	**3**	4	**4**	**7**
Hourly Total	19	**19**	18	**18**	**37**
10:00AM	6	**6**	3	**3**	**9**
10:15AM	3	**3**	1	**1**	**4**
10:30AM	11	**11**	9	**9**	**20**
10:45AM	1	**1**	3	**3**	**4**

Leg Direction	East Westbound		West Eastbound		
Time	T	**App**	T	**App**	**Int**
Hourly Total	21	**21**	16	**16**	**37**
11:00AM	9	**9**	9	**9**	**18**
11:15AM	6	**6**	5	**5**	**11**
11:30AM	11	**11**	6	**6**	**17**
11:45AM	4	**4**	6	**6**	**10**
Hourly Total	30	**30**	26	**26**	**56**
12:00PM	8	**8**	10	**10**	**18**
12:15PM	3	**3**	9	**9**	**12**
12:30PM	6	**6**	8	**8**	**14**
12:45PM	7	**7**	6	**6**	**13**
Hourly Total	24	**24**	33	**33**	**57**
1:00PM	14	**14**	10	**10**	**24**
1:15PM	10	**10**	6	**6**	**16**
1:30PM	6	**6**	2	**2**	**8**
1:45PM	10	**10**	6	**6**	**16**
Hourly Total	40	**40**	24	**24**	**64**
2:00PM	8	**8**	2	**2**	**10**
2:15PM	3	**3**	9	**9**	**12**
2:30PM	7	**7**	8	**8**	**15**
2:45PM	4	**4**	4	**4**	**8**
Hourly Total	22	**22**	23	**23**	**45**
3:00PM	6	**6**	4	**4**	**10**
3:15PM	6	**6**	4	**4**	**10**
3:30PM	2	**2**	10	**10**	**12**
3:45PM	3	**3**	11	**11**	**14**
Hourly Total	17	**17**	29	**29**	**46**
4:00PM	5	**5**	14	**14**	**19**
4:15PM	0	**0**	8	**8**	**8**
4:30PM	6	**6**	8	**8**	**14**
4:45PM	5	**5**	7	**7**	**12**
Hourly Total	16	**16**	37	**37**	**53**
5:00PM	4	**4**	9	**9**	**13**
5:15PM	4	**4**	5	**5**	**9**
5:30PM	5	**5**	8	**8**	**13**
5:45PM	5	**5**	1	**1**	**6**
Hourly Total	18	**18**	23	**23**	**41**
6:00PM	4	**4**	4	**4**	**8**
6:15PM	4	**4**	9	**9**	**13**
6:30PM	3	**3**	7	**7**	**10**
6:45PM	5	**5**	6	**6**	**11**
Hourly Total	16	**16**	26	**26**	**42**
7:00PM	6	**6**	3	**3**	**9**
7:15PM	8	**8**	1	**1**	**9**
7:30PM	7	**7**	2	**2**	**9**
7:45PM	18	**18**	8	**8**	**26**
Hourly Total	39	**39**	14	**14**	**53**
8:00PM	4	**4**	5	**5**	**9**
8:15PM	9	**9**	2	**2**	**11**
8:30PM	10	**10**	2	**2**	**12**
8:45PM	17	**17**	1	**1**	**18**
Hourly Total	40	**40**	10	**10**	**50**
9:00PM	3	**3**	3	**3**	**6**
9:15PM	13	**13**	0	**0**	**13**
9:30PM	10	**10**	2	**2**	**12**
9:45PM	10	**10**	3	**3**	**13**
Hourly Total	36	**36**	8	**8**	**44**
10:00PM	14	**14**	0	**0**	**14**
10:15PM	13	**13**	0	**0**	**13**
10:30PM	6	**6**	0	**0**	**6**
10:45PM	2	**2**	0	**0**	**2**

Leg Direction	East Westbound		West Eastbound		
Time	T	**App**	T	**App**	**Int**
Hourly Total	35	**35**	0	**0**	**35**
11:00PM	3	**3**	0	**0**	**3**
11:15PM	2	**2**	0	**0**	**2**
11:30PM	1	**1**	0	**0**	**1**
11:45PM	1	**1**	0	**0**	**1**
Hourly Total	7	**7**	0	**0**	**7**
Total	419	**419**	328	**328**	**747**
% Approach	100%	**-**	100%	**-**	-
% Total	56.1%	**56.1%**	43.9%	**43.9%**	-
Lights	407	**407**	322	**322**	729
% Lights	97.1%	**97.1%**	98.2%	**98.2%**	97.6%
Articulated Trucks	2	**2**	0	**0**	2
% Articulated Trucks	0.5%	**0.5%**	0%	**0%**	0.3%
Buses and Single-Unit Trucks	10	**10**	6	**6**	16
% Buses and Single-Unit Trucks	2.4%	**2.4%**	1.8%	**1.8%**	2.1%

*T: Thru

3 - Village Dr btw Calumet Ave & Drwy - 2-la... - ATR

Thu May 30, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 1192704, Location: 41.538481, -87.508668

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

4 - Centennial Dr btw Centennial Dr & Spring... - ATR

Thu May 30, 2024 S Centennial Drive north of Roundabout
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 1192705, Location: 41.537591, -87.507249

GEWALT HAMILTON ASSOCIATES, INC.
Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	North Southbound		South Northbound		
Time	T	**App**	T	**App**	**Int**
2024-05-30 12:00AM	3	**3**	0	**0**	**3**
12:15AM	1	**1**	0	**0**	**1**
12:30AM	0	**0**	0	**0**	**0**
12:45AM	0	**0**	1	**1**	**1**
Hourly Total	4	**4**	1	**1**	**5**
1:00AM	0	**0**	0	**0**	**0**
1:15AM	1	**1**	1	**1**	**2**
1:30AM	0	**0**	2	**2**	**2**
1:45AM	0	**0**	0	**0**	**0**
Hourly Total	1	**1**	3	**3**	**4**
2:00AM	0	**0**	0	**0**	**0**
2:15AM	0	**0**	0	**0**	**0**
2:30AM	0	**0**	1	**1**	**1**
2:45AM	0	**0**	0	**0**	**0**
Hourly Total	0	**0**	1	**1**	**1**
3:00AM	0	**0**	0	**0**	**0**
3:15AM	0	**0**	0	**0**	**0**
3:30AM	0	**0**	0	**0**	**0**
3:45AM	0	**0**	0	**0**	**0**
Hourly Total	0	**0**	0	**0**	**0**
4:00AM	0	**0**	0	**0**	**0**
4:15AM	0	**0**	0	**0**	**0**
4:30AM	2	**2**	0	**0**	**2**
4:45AM	1	**1**	1	**1**	**2**
Hourly Total	3	**3**	1	**1**	**4**
5:00AM	0	**0**	0	**0**	**0**
5:15AM	0	**0**	1	**1**	**1**
5:30AM	0	**0**	1	**1**	**1**
5:45AM	2	**2**	0	**0**	**2**
Hourly Total	2	**2**	2	**2**	**4**
6:00AM	2	**2**	1	**1**	**3**
6:15AM	0	**0**	0	**0**	**0**
6:30AM	5	**5**	5	**5**	**10**
6:45AM	3	**3**	2	**2**	**5**
Hourly Total	10	**10**	8	**8**	**18**
7:00AM	6	**6**	12	**12**	**18**
7:15AM	7	**7**	8	**8**	**15**
7:30AM	6	**6**	9	**9**	**15**
7:45AM	8	**8**	6	**6**	**14**
Hourly Total	27	**27**	35	**35**	**62**
8:00AM	7	**7**	4	**4**	**11**
8:15AM	14	**14**	9	**9**	**23**
8:30AM	6	**6**	5	**5**	**11**
8:45AM	8	**8**	12	**12**	**20**
Hourly Total	35	**35**	30	**30**	**65**
9:00AM	11	**11**	3	**3**	**14**
9:15AM	9	**9**	6	**6**	**15**
9:30AM	6	**6**	5	**5**	**11**
9:45AM	4	**4**	6	**6**	**10**
Hourly Total	30	**30**	20	**20**	**50**
10:00AM	6	**6**	6	**6**	**12**
10:15AM	5	**5**	10	**10**	**15**
10:30AM	1	**1**	8	**8**	**9**
10:45AM	9	**9**	8	**8**	**17**

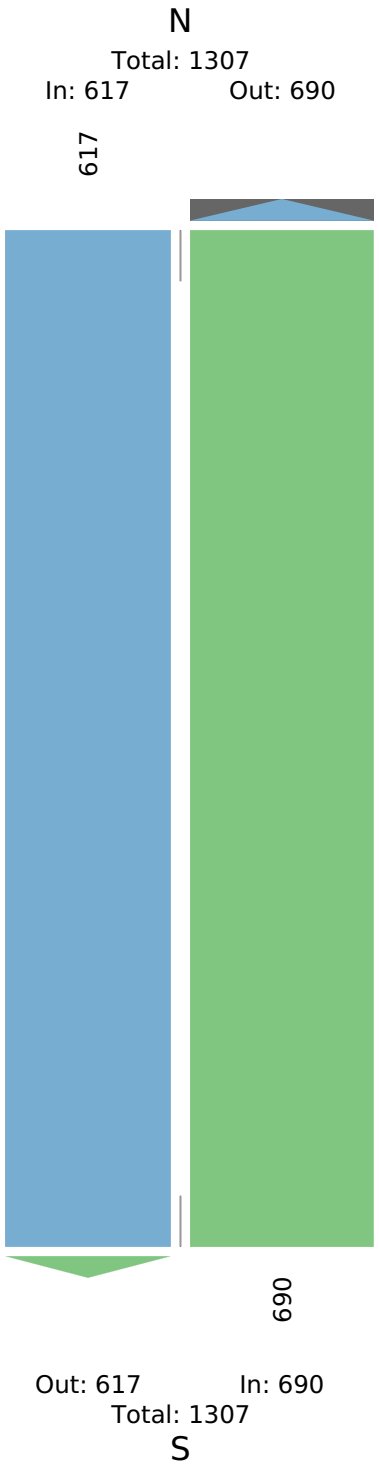
Leg Direction	North Southbound		South Northbound		
Time	T	**App**	T	**App**	**Int**
Hourly Total	21	**21**	32	**32**	**53**
11:00AM	7	**7**	11	**11**	**18**
11:15AM	12	**12**	13	**13**	**25**
11:30AM	13	**13**	11	**11**	**24**
11:45AM	11	**11**	14	**14**	**25**
Hourly Total	43	**43**	49	**49**	**92**
12:00PM	16	**16**	17	**17**	**33**
12:15PM	9	**9**	14	**14**	**23**
12:30PM	9	**9**	11	**11**	**20**
12:45PM	16	**16**	11	**11**	**27**
Hourly Total	50	**50**	53	**53**	**103**
1:00PM	17	**17**	13	**13**	**30**
1:15PM	12	**12**	11	**11**	**23**
1:30PM	7	**7**	8	**8**	**15**
1:45PM	10	**10**	9	**9**	**19**
Hourly Total	46	**46**	41	**41**	**87**
2:00PM	12	**12**	7	**7**	**19**
2:15PM	9	**9**	13	**13**	**22**
2:30PM	7	**7**	27	**27**	**34**
2:45PM	13	**13**	5	**5**	**18**
Hourly Total	41	**41**	52	**52**	**93**
3:00PM	7	**7**	15	**15**	**22**
3:15PM	17	**17**	7	**7**	**24**
3:30PM	19	**19**	15	**15**	**34**
3:45PM	13	**13**	12	**12**	**25**
Hourly Total	56	**56**	49	**49**	**105**
4:00PM	21	**21**	9	**9**	**30**
4:15PM	17	**17**	10	**10**	**27**
4:30PM	10	**10**	13	**13**	**23**
4:45PM	17	**17**	20	**20**	**37**
Hourly Total	65	**65**	52	**52**	**117**
5:00PM	13	**13**	11	**11**	**24**
5:15PM	11	**11**	16	**16**	**27**
5:30PM	12	**12**	15	**15**	**27**
5:45PM	6	**6**	10	**10**	**16**
Hourly Total	42	**42**	52	**52**	**94**
6:00PM	11	**11**	3	**3**	**14**
6:15PM	8	**8**	16	**16**	**24**
6:30PM	8	**8**	17	**17**	**25**
6:45PM	7	**7**	19	**19**	**26**
Hourly Total	34	**34**	55	**55**	**89**
7:00PM	5	**5**	18	**18**	**23**
7:15PM	6	**6**	14	**14**	**20**
7:30PM	7	**7**	20	**20**	**27**
7:45PM	5	**5**	14	**14**	**19**
Hourly Total	23	**23**	66	**66**	**89**
8:00PM	7	**7**	6	**6**	**13**
8:15PM	6	**6**	9	**9**	**15**
8:30PM	9	**9**	12	**12**	**21**
8:45PM	8	**8**	14	**14**	**22**
Hourly Total	30	**30**	41	**41**	**71**
9:00PM	9	**9**	9	**9**	**18**
9:15PM	6	**6**	8	**8**	**14**
9:30PM	4	**4**	4	**4**	**8**
9:45PM	8	**8**	10	**10**	**18**
Hourly Total	27	**27**	31	**31**	**58**
10:00PM	12	**12**	4	**4**	**16**
10:15PM	5	**5**	3	**3**	**8**
10:30PM	2	**2**	0	**0**	**2**
10:45PM	2	**2**	4	**4**	**6**

Leg Direction	North Southbound		South Northbound		
Time	T	**App**	T	**App**	**Int**
Hourly Total	21	**21**	11	**11**	**32**
11:00PM	0	**0**	1	**1**	**1**
11:15PM	4	**4**	1	**1**	**5**
11:30PM	1	**1**	2	**2**	**3**
11:45PM	1	**1**	1	**1**	**2**
Hourly Total	6	**6**	5	**5**	**11**
Total	617	**617**	690	**690**	**1307**
% Approach	100%	**-**	100%	**-**	-
% Total	47.2%	**47.2%**	52.8%	**52.8%**	-
Lights	606	**606**	677	**677**	1283
% Lights	98.2%	**98.2%**	98.1%	**98.1%**	98.2%
Articulated Trucks	2	**2**	1	**1**	3
% Articulated Trucks	0.3%	**0.3%**	0.1%	**0.1%**	0.2%
Buses and Single-Unit Trucks	9	**9**	12	**12**	21
% Buses and Single-Unit Trucks	1.5%	**1.5%**	1.7%	**1.7%**	1.6%

*T: Thru

4 - Centennial Dr btw Centennial Dr & Spring... - ATR
Thu May 30, 2024
Full Length (12 AM-12 AM (+1))
All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks)
All Channels
ID: 1192705, Location: 41.537591, -87.507249

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



INDOT TCDS Counts - Last Update 2018

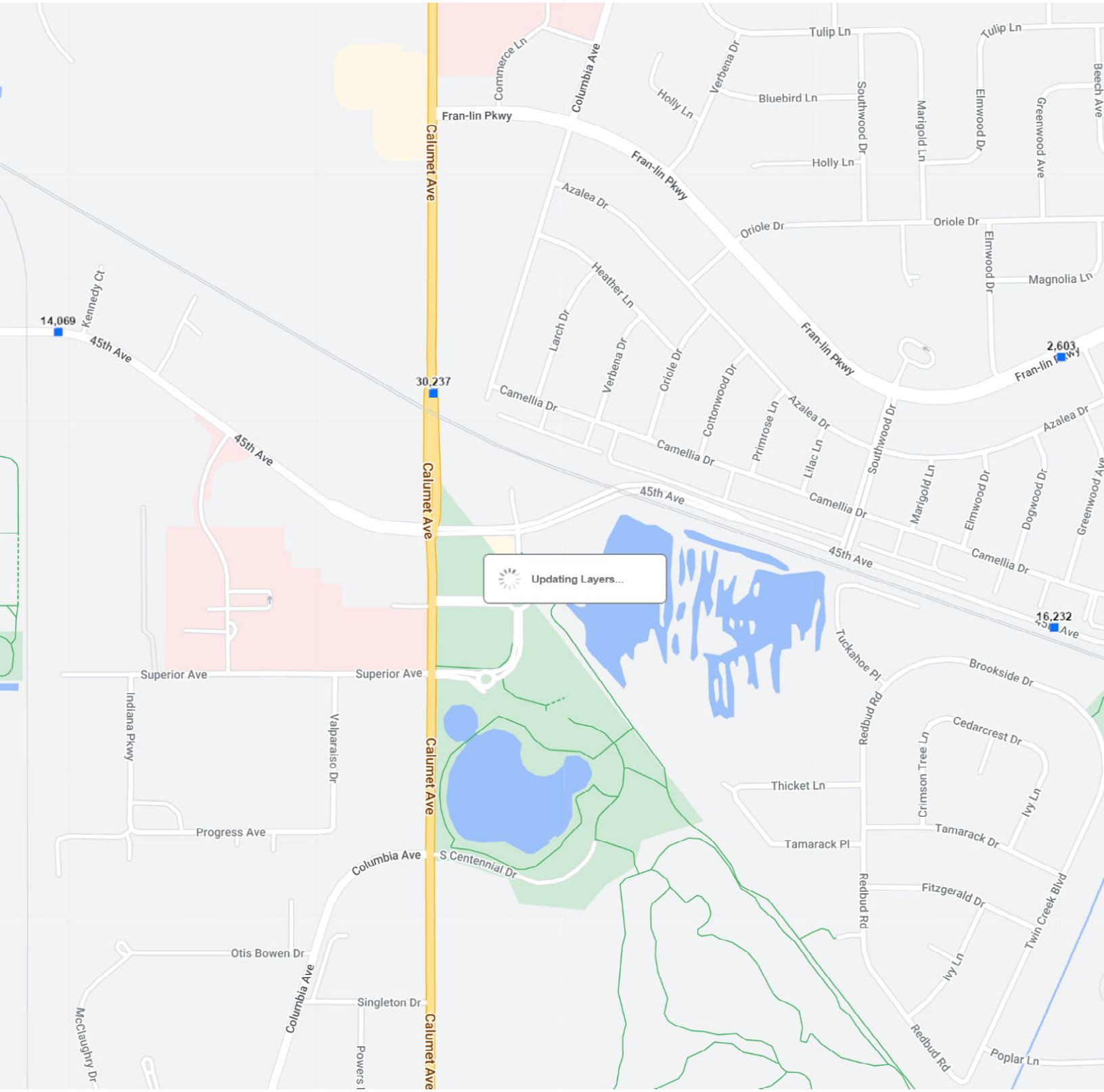
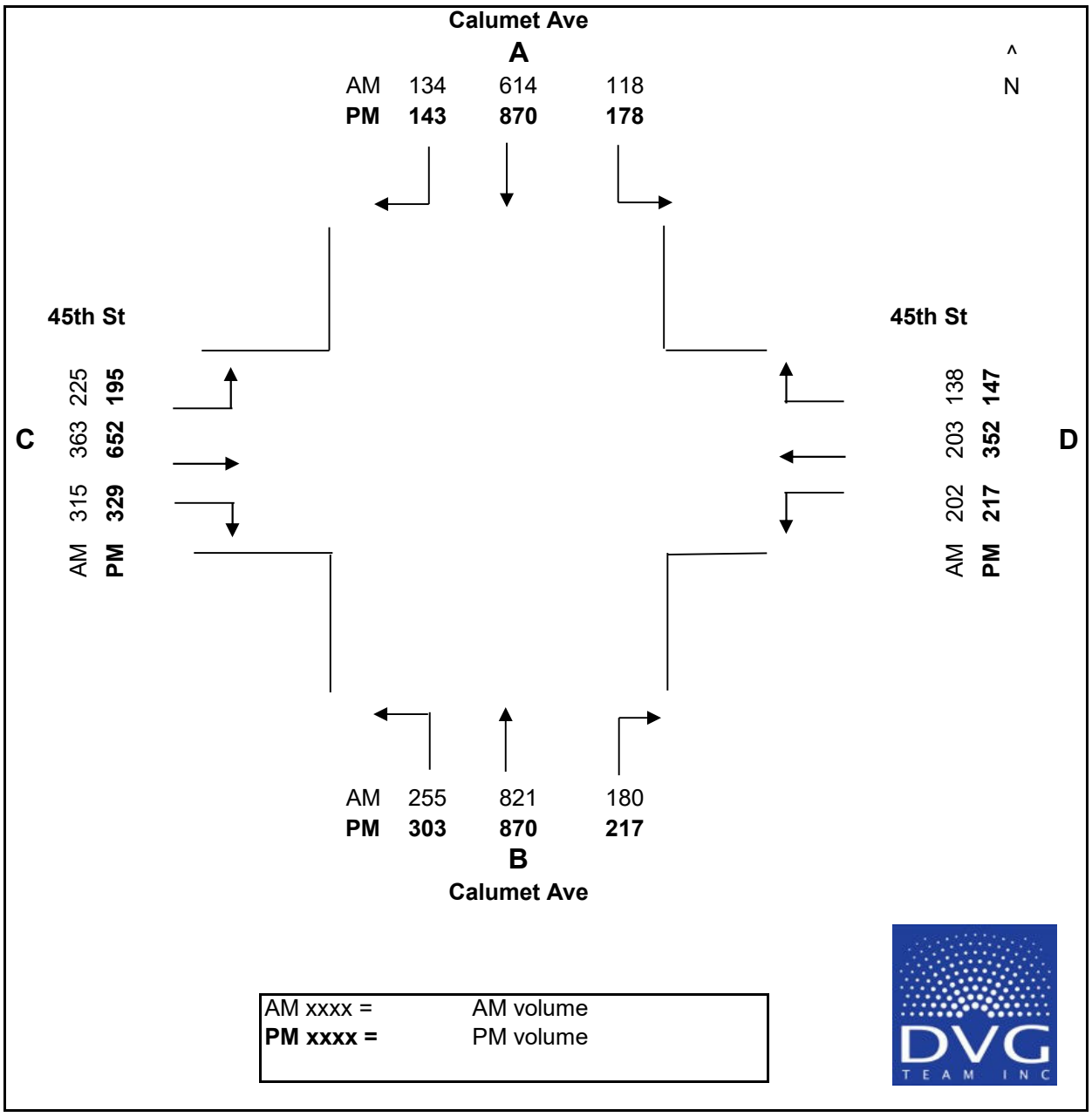


Exhibit 4

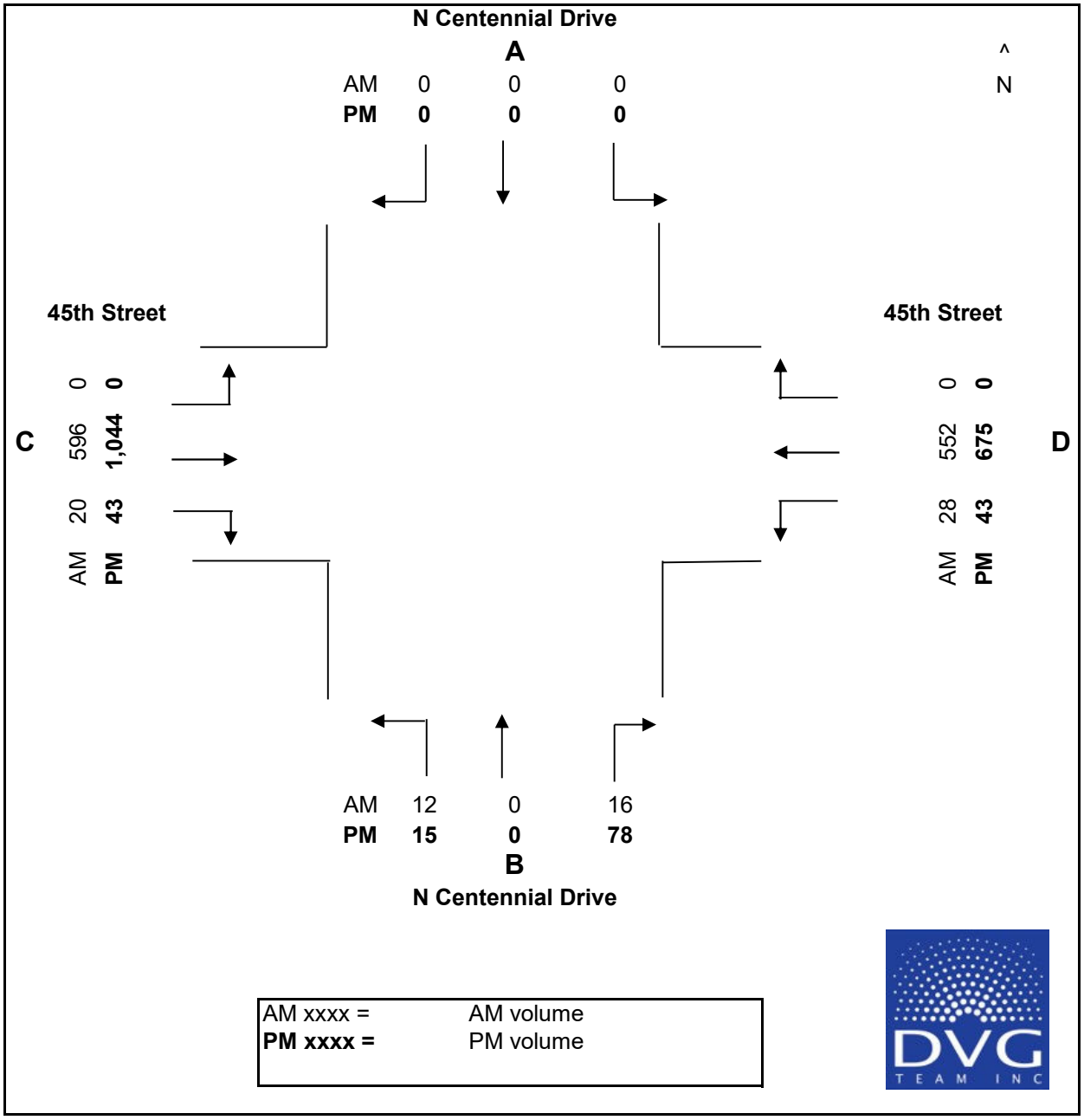
AM & PM Existing Peak Hour Volumes, Calumet Avenue & 45th Avenue



DHV
PRESENT
(2024)

Exhibit 5

AM & PM Existing Peak Hour Volumes, 45th Avenue & N Centennial Drive



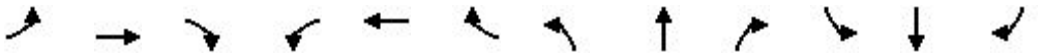
DHV
PRESENT
(2024)

Exhibit 6A

AM LOS – Existing Conditions – Calumet Avenue & 45th Avenue

HCM 6th Signalized Intersection Summary
1: 45th & Calumet

06/26/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	225	363	315	202	203	138	255	821	180	118	614	134
Future Volume (veh/h)	225	363	315	202	203	138	255	821	180	118	614	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	232	367	346	213	223	139	255	855	228	148	740	152
Peak Hour Factor	0.97	0.99	0.91	0.95	0.91	0.99	1.00	0.96	0.79	0.80	0.83	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	396	353	268	457	274	323	1227	327	207	1453	648
Arrive On Green	0.12	0.22	0.22	0.11	0.21	0.21	0.09	0.44	0.44	0.06	0.41	0.41
Sat Flow, veh/h	1781	1777	1585	1781	2138	1279	3456	2775	739	3456	3554	1585
Grp Volume(v), veh/h	232	367	346	213	184	178	255	547	536	148	740	152
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1640	1728	1777	1737	1728	1777	1585
Q Serve(g_s), s	11.0	22.3	23.9	10.1	10.0	10.5	7.9	27.3	27.3	4.6	17.1	6.9
Cycle Q Clear(g_c), s	11.0	22.3	23.9	10.1	10.0	10.5	7.9	27.3	27.3	4.6	17.1	6.9
Prop In Lane	1.00		1.00	1.00		0.78	1.00		0.43	1.00		1.00
Lane Grp Cap(c), veh/h	400	396	353	268	380	351	323	786	768	207	1453	648
V/C Ratio(X)	0.58	0.93	0.98	0.79	0.48	0.51	0.79	0.70	0.70	0.71	0.51	0.23
Avail Cap(c_a), veh/h	469	396	353	321	380	351	443	786	768	236	1453	648
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.7	41.9	42.5	31.0	37.9	38.1	48.8	24.7	24.7	50.8	24.3	21.3
Incr Delay (d2), s/veh	1.3	27.8	42.4	11.0	1.0	1.2	6.6	5.1	5.2	8.5	1.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	12.7	13.4	5.1	4.4	4.3	3.7	12.3	12.1	2.2	7.3	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.0	69.7	84.9	41.9	38.9	39.3	55.4	29.8	29.9	59.3	25.6	22.1
LnGrp LOS	C	E	F	D	D	D	E	C	C	E	C	C
Approach Vol, veh/h		945			575			1338			1040	
Approach Delay, s/veh		65.5			40.2			34.7			29.9	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	53.2	16.8	29.0	14.8	49.5	17.7	28.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	44.5	15.5	24.5	14.1	37.9	17.5	22.5
Max Q Clear Time (g_c+I1), s	6.6	29.3	12.1	25.9	9.9	19.1	13.0	12.5
Green Ext Time (p_c), s	0.0	6.5	0.2	0.0	0.3	5.5	0.3	1.5

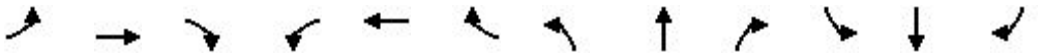
Intersection Summary	
HCM 6th Ctrl Delay	41.7
HCM 6th LOS	D

Exhibit 6B

PM LOS & Queue Report – Existing Conditions – Calumet Avenue & 45th Avenue

HCM 6th Signalized Intersection Summary
1: 45th & Calumet

06/26/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	652	329	217	352	147	303	870	217	178	870	143
Future Volume (veh/h)	195	652	329	217	352	147	303	870	217	178	870	143
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	264	716	366	231	367	184	356	989	252	228	1036	155
Peak Hour Factor	0.74	0.91	0.90	0.94	0.96	0.80	0.85	0.88	0.86	0.78	0.84	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	672	343	245	627	309	393	1026	260	258	1160	517
Arrive On Green	0.12	0.30	0.30	0.10	0.27	0.27	0.11	0.37	0.37	0.07	0.33	0.33
Sat Flow, veh/h	1781	2276	1162	1781	2305	1137	3456	2806	713	3456	3554	1585
Grp Volume(v), veh/h	264	559	523	231	282	269	356	625	616	228	1036	155
Grp Sat Flow(s),veh/h/ln	1781	1777	1661	1781	1777	1666	1728	1777	1742	1728	1777	1585
Q Serve(g_s), s	11.5	32.5	32.5	10.3	15.1	15.5	11.2	37.9	38.2	7.2	30.5	8.0
Cycle Q Clear(g_c), s	11.5	32.5	32.5	10.3	15.1	15.5	11.2	37.9	38.2	7.2	30.5	8.0
Prop In Lane	1.00		0.70	1.00		0.68	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	400	525	491	245	483	453	393	649	637	258	1160	517
V/C Ratio(X)	0.66	1.06	1.07	0.94	0.58	0.59	0.91	0.96	0.97	0.89	0.89	0.30
Avail Cap(c_a), veh/h	429	525	491	245	483	453	393	649	637	258	1160	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	38.8	38.8	28.9	34.6	34.8	48.2	34.2	34.3	50.4	35.2	27.7
Incr Delay (d2), s/veh	3.4	57.5	59.3	41.7	1.8	2.1	24.1	27.2	28.5	28.5	10.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	22.1	20.9	7.1	6.6	6.4	6.1	20.6	20.5	4.1	14.5	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	96.3	98.1	70.7	36.4	36.9	72.3	61.4	62.8	78.9	45.9	29.1
LnGrp LOS	C	F	F	E	D	D	E	E	E	E	D	C
Approach Vol, veh/h		1346			782			1597			1419	
Approach Delay, s/veh		83.7			46.7			64.4			49.3	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	44.7	15.6	37.0	17.0	40.4	18.2	34.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.2	40.2	11.1	32.5	12.5	35.9	15.5	28.1
Max Q Clear Time (g_c+I1), s	9.2	40.2	12.3	34.5	13.2	32.5	13.5	17.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	2.2	0.2	2.4

Intersection Summary	
HCM 6th Ctrl Delay	62.6
HCM 6th LOS	E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	264	1082	231	551	356	1241	228	1036	155
v/c Ratio	0.73	1.05	0.94	0.60	0.90	0.99	0.88	0.92	0.25
Control Delay	32.2	73.4	70.4	31.1	71.3	55.5	78.4	46.7	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.2	73.4	70.4	31.1	71.3	55.5	78.4	46.7	5.3
Queue Length 50th (ft)	110	~373	98	139	117	400	75	332	0
Queue Length 95th (ft)	135	#505	#248	196	#181	#536	#112	#384	44
Internal Link Dist (ft)		527		437		357		570	
Turn Bay Length (ft)	255		290		435		245		250
Base Capacity (vph)	375	1035	245	916	394	1251	260	1128	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	1.05	0.94	0.60	0.90	0.99	0.88	0.92	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Exhibit 7A

AM LOS – Existing Conditions – 45th Avenue & N Centennial Drive

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	596	20	28	552	12	16
Future Vol, veh/h	596	20	28	552	12	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	155	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	596	20	28	552	12	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	616	0	928	298
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	960	-	267	698
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	960	-	259	698
Mov Cap-2 Maneuver	-	-	-	-	259	-
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	679	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	14.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	404	-	-	960	-
HCM Lane V/C Ratio	0.069	-	-	0.029	-
HCM Control Delay (s)	14.6	-	-	8.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Exhibit 7B

PM LOS – Existing Conditions – 45th Avenue & N Centennial Drive

Intersection	
Int Delay, s/veh	3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1044	43	43	675	15	78
Future Vol, veh/h	1044	43	43	675	15	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	155	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	72	77	97	54	63
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1147	60	56	696	28	124

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1207	0	1607	574
Stage 1	-	-	-	-	1147	-
Stage 2	-	-	-	-	460	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	574	-	96	462
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	602	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	574	-	87	462
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	265	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	37.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	-	-	574	-
HCM Lane V/C Ratio	0.588	-	-	0.097	-
HCM Control Delay (s)	37.1	-	-	11.9	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	3.4	-	-	0.3	-

Exhibit 8

ITE Land Uses

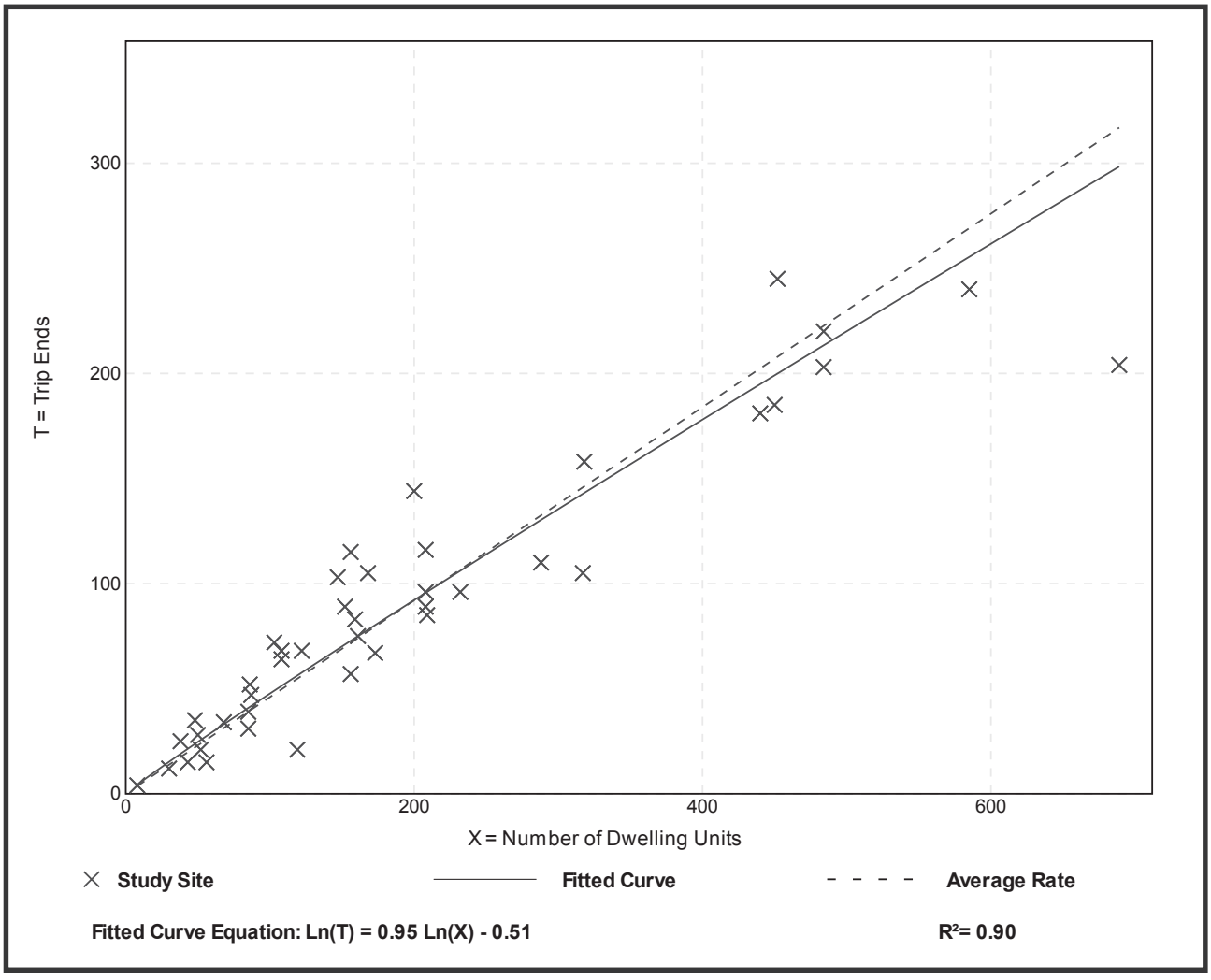
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 42
Avg. Num. of Dwelling Units: 199
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



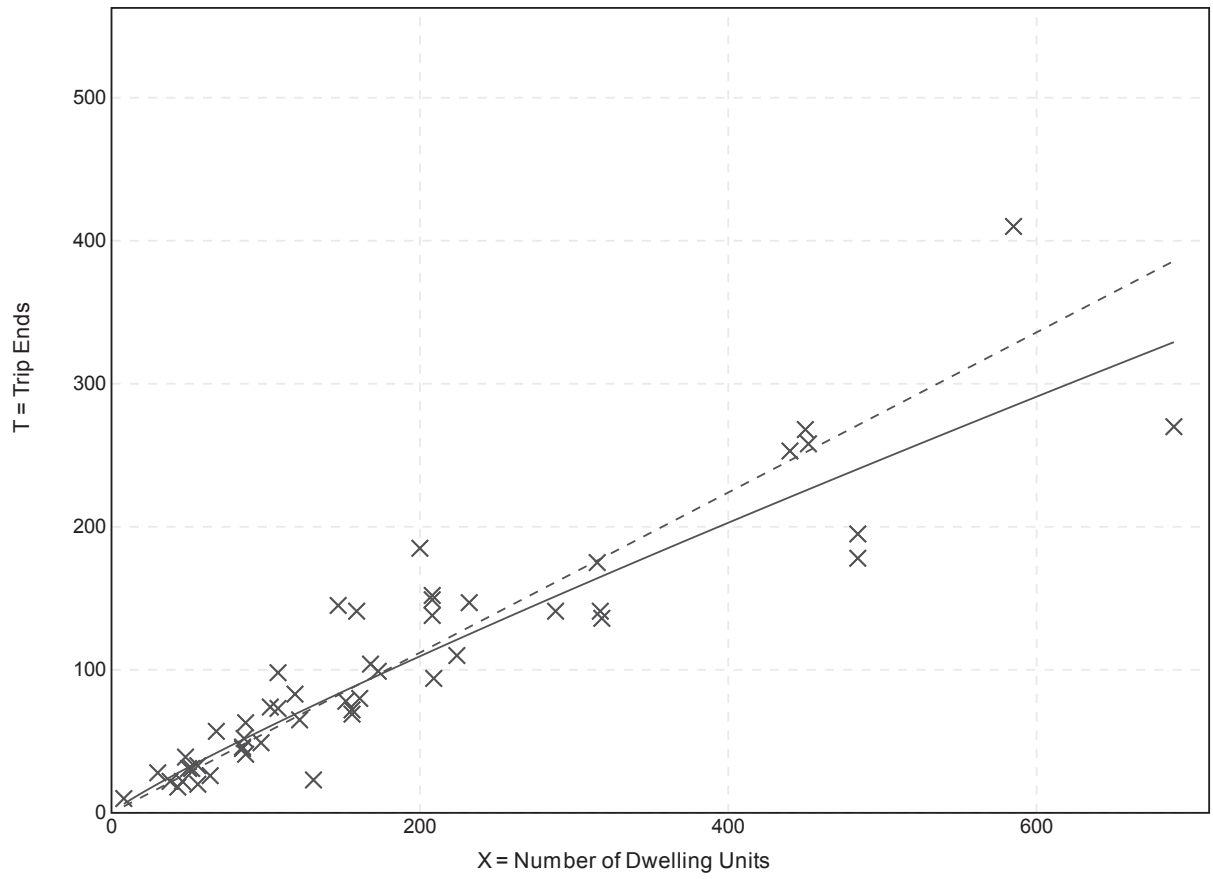
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	50
Avg. Num. of Dwelling Units:	187
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



Multifamily Housing (Low-Rise)
(220)

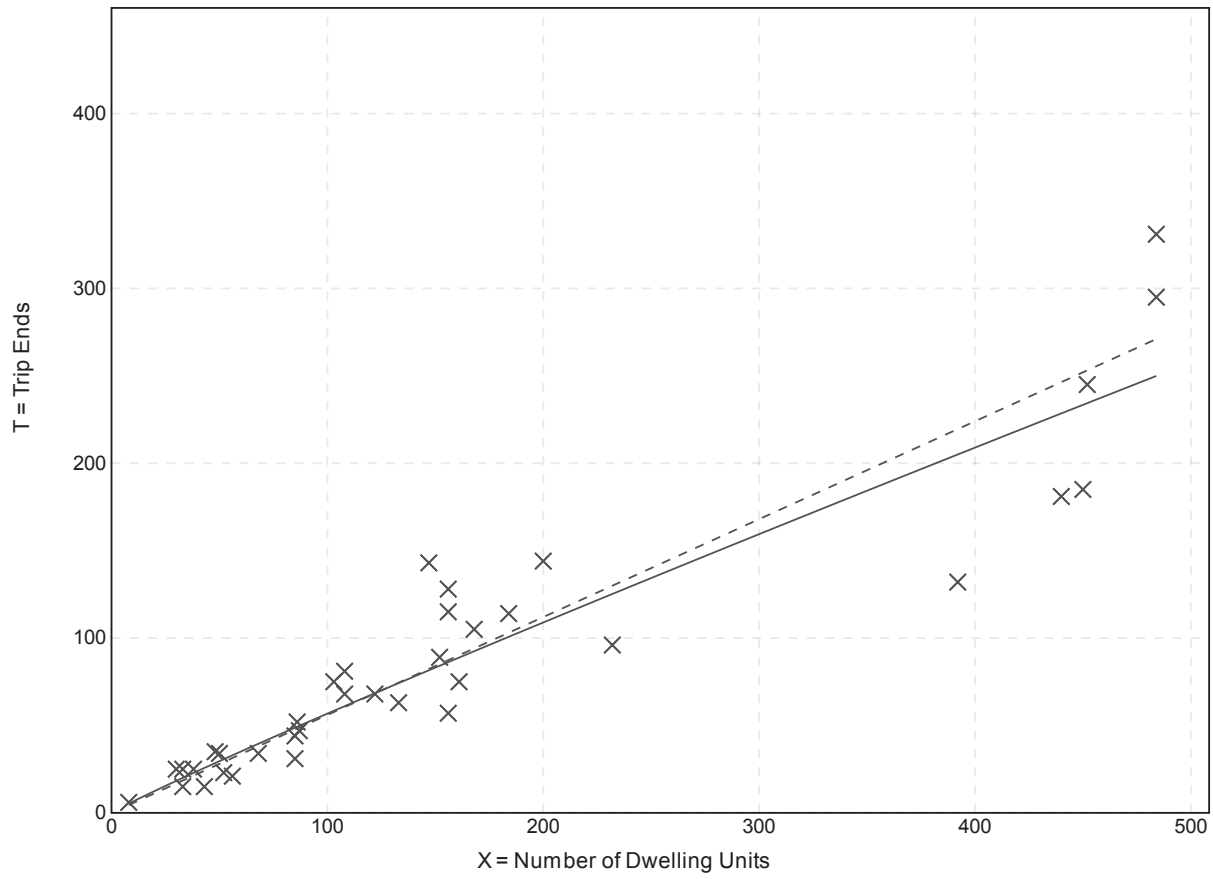
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 36
Avg. Num. of Dwelling Units: 161
Directional Distribution: 28% entering, 72% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.34 - 0.97	0.15

Data Plot and Equation



Multifamily Housing (Low-Rise)
(220)

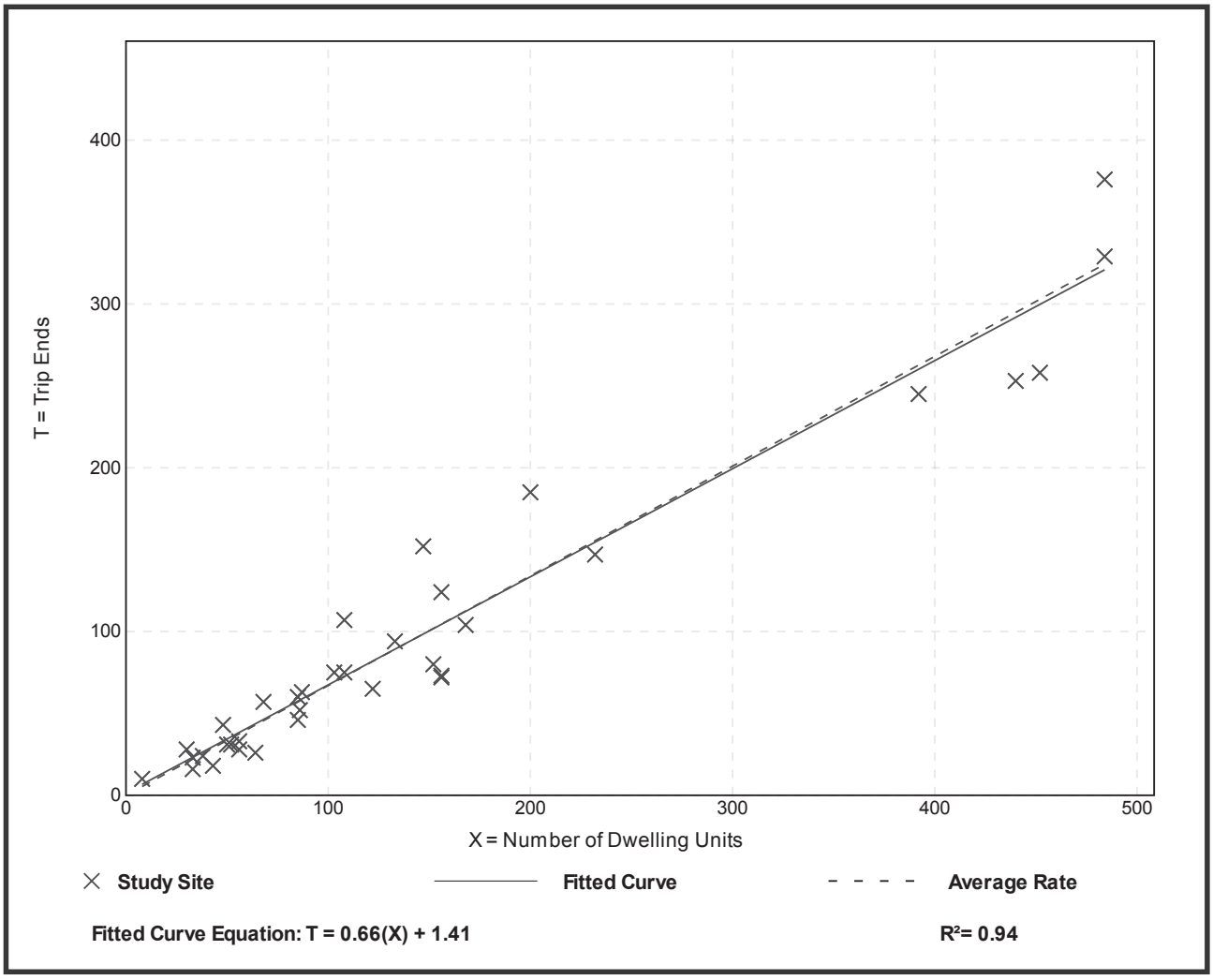
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 35
Avg. Num. of Dwelling Units: 146
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.67	0.41 - 1.25	0.14

Data Plot and Equation



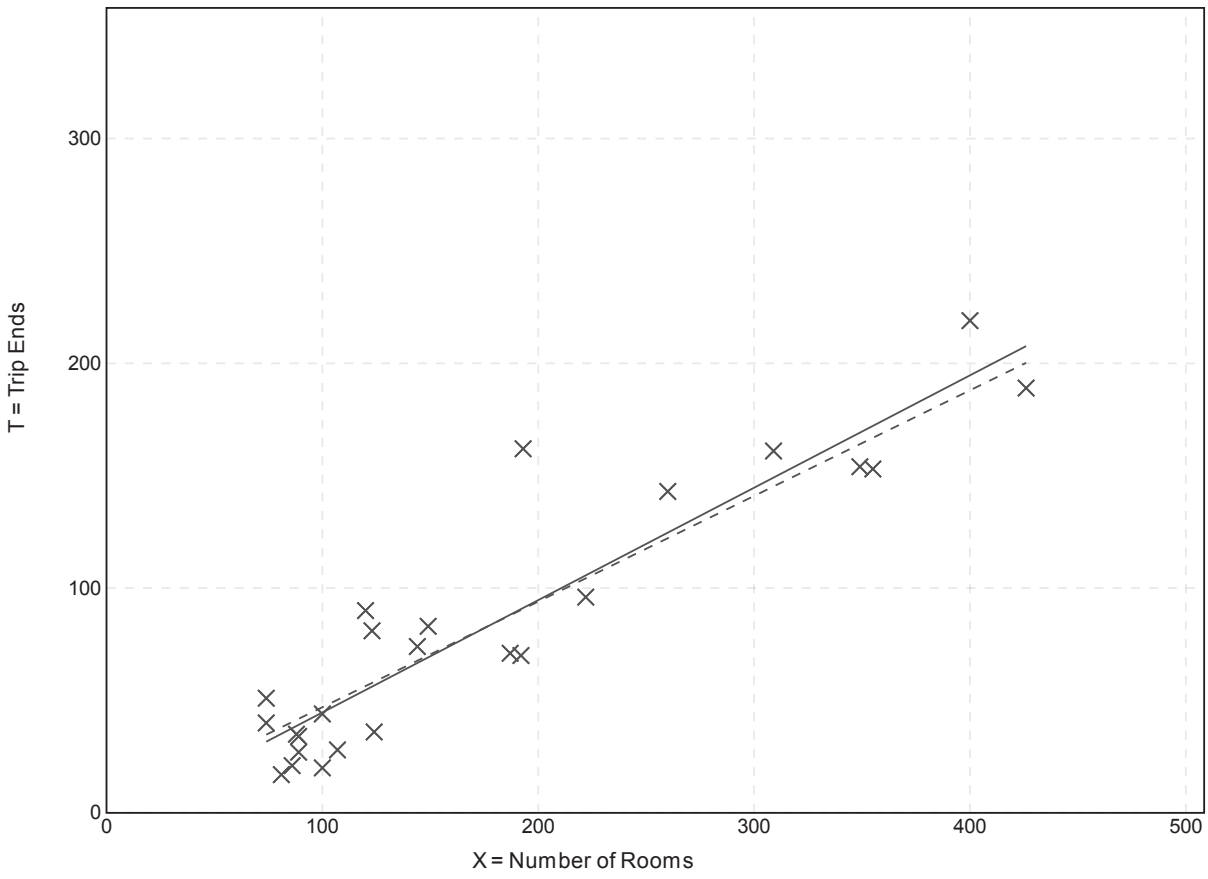
Hotel
(310)

Vehicle Trip Ends vs:	**Rooms**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	25
Avg. Num. of Rooms:	178
Directional Distribution:	59% entering, 41% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
0.47	0.20 - 0.84	0.14

Data Plot and Equation



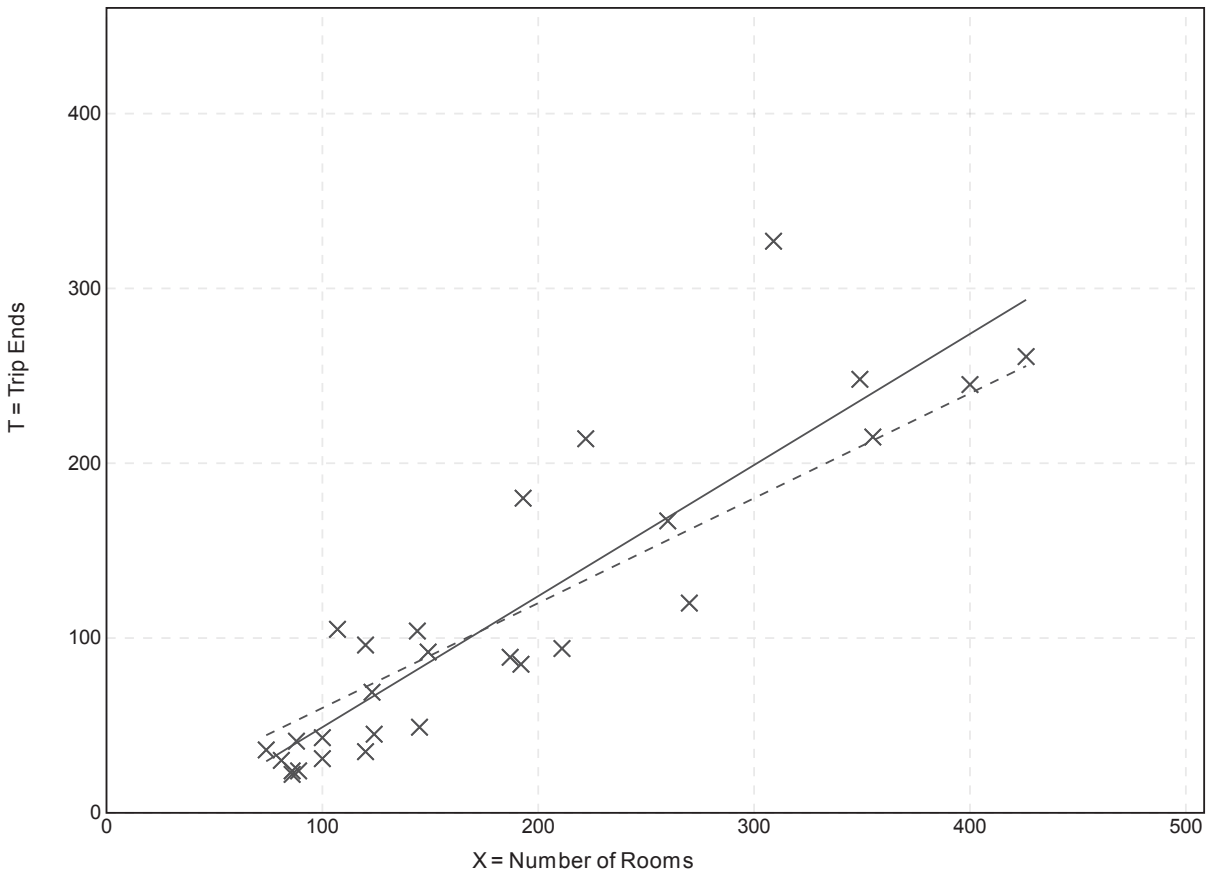
Hotel
(310)

Vehicle Trip Ends vs:	**Rooms**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	28
Avg. Num. of Rooms:	183
Directional Distribution:	51% entering, 49% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
0.60	0.26 - 1.06	0.22

Data Plot and Equation



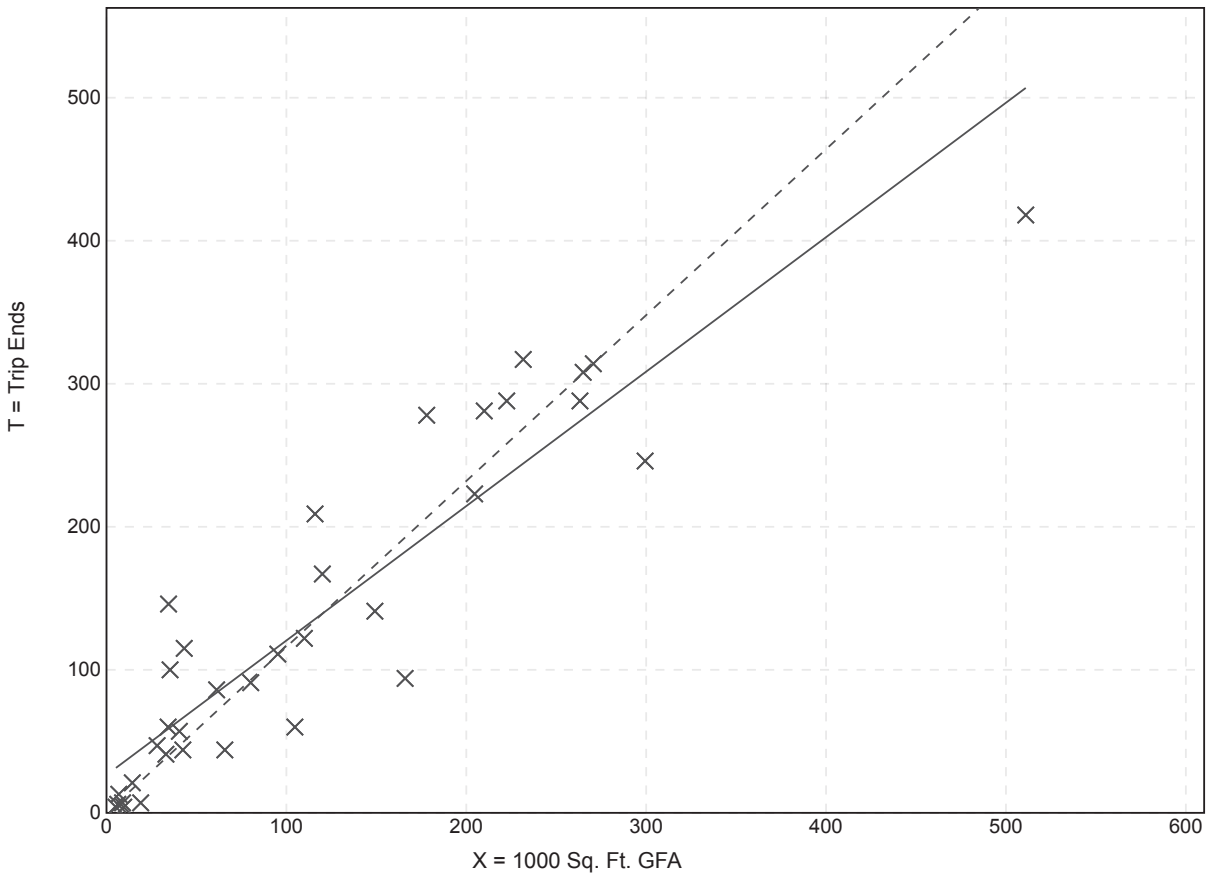
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 35
1000 Sq. Ft. GFA: 117
Directional Distribution: 86% entering, 14% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.16	0.37 - 4.23	0.47

Data Plot and Equation



Fitted Curve Equation: T = 0.94(X) + 26.49

R^2= 0.85

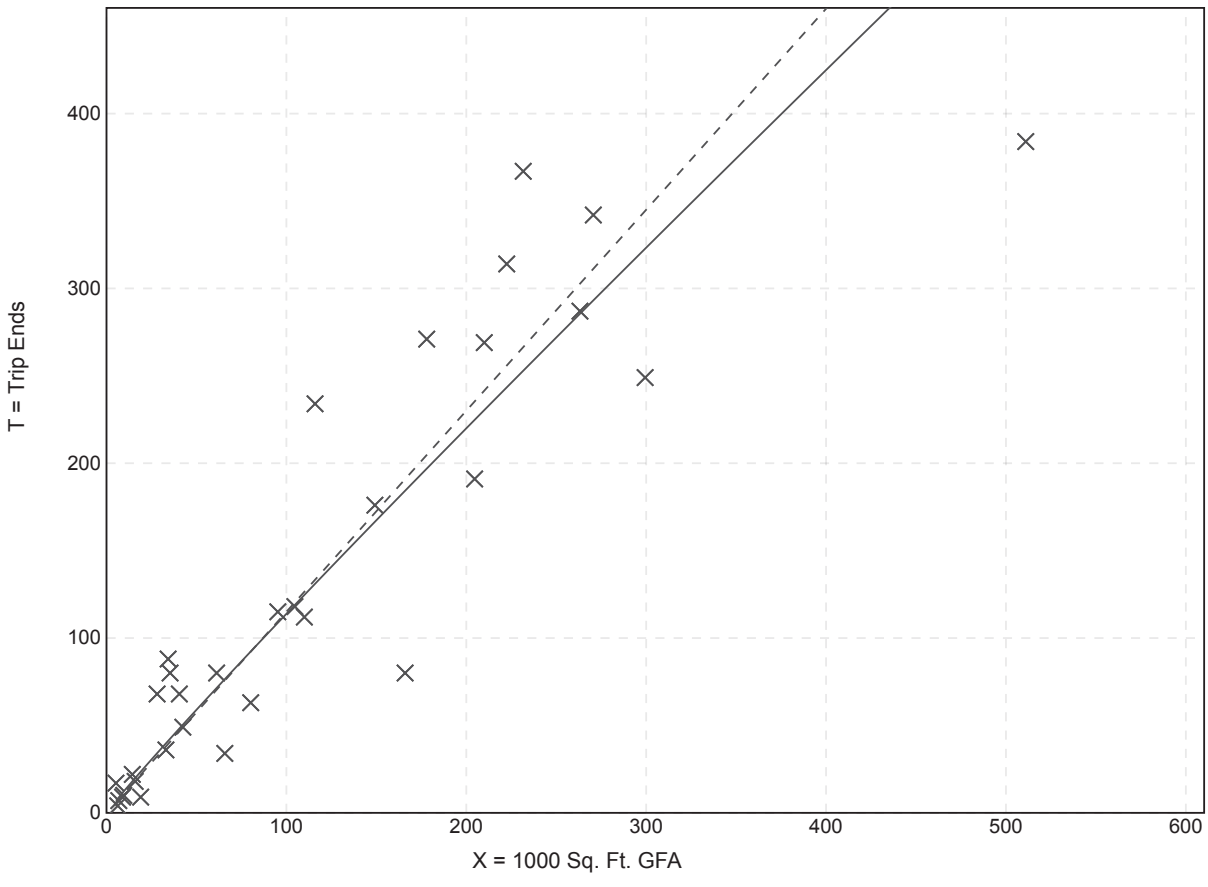
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 32
1000 Sq. Ft. GFA: 114
Directional Distribution: 16% entering, 84% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.15	0.47 - 3.23	0.42

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.95 Ln(X) + 0.36

R^2= 0.88

General Office Building
(710)

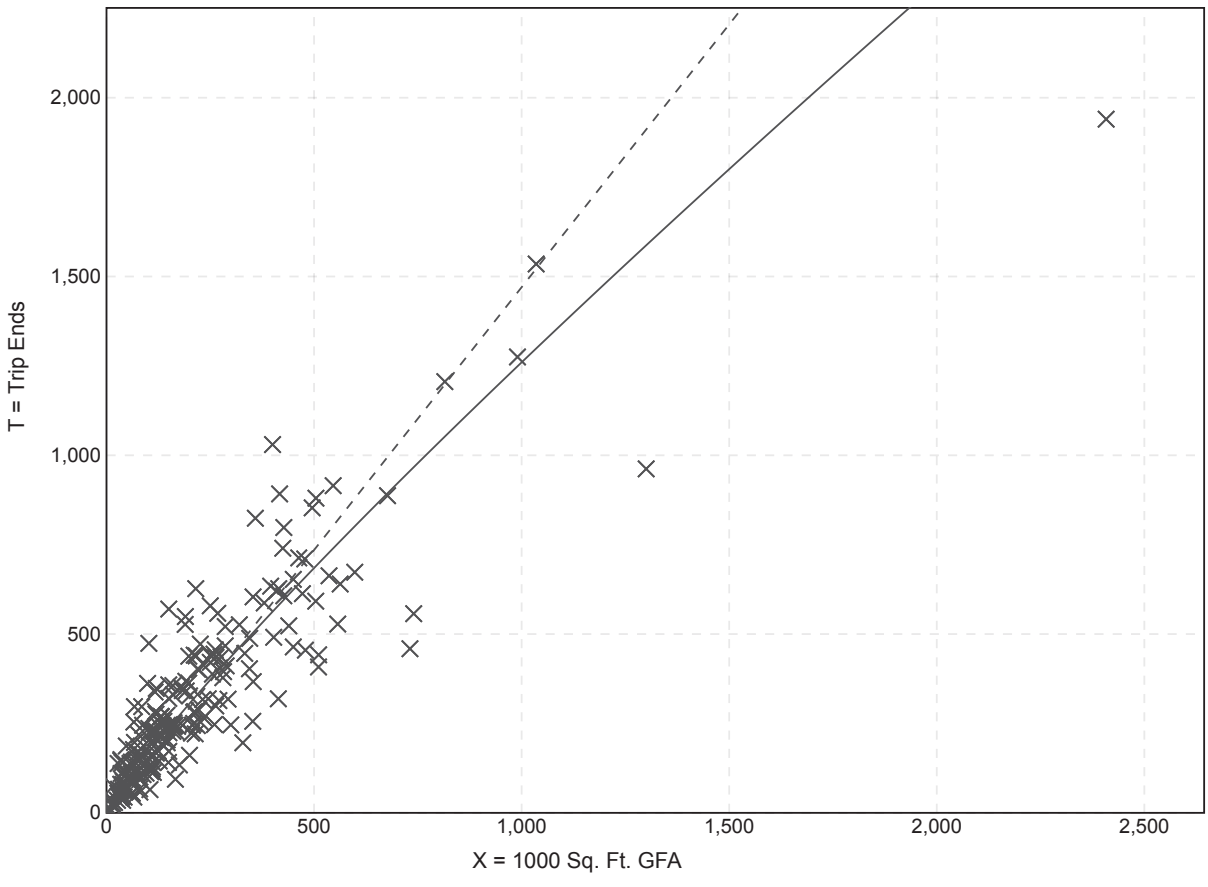
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 228
1000 Sq. Ft. GFA: 209
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.47	0.57 - 4.93	0.60

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.88 Ln(X) + 1.06

R^2= 0.84

General Office Building
(710)

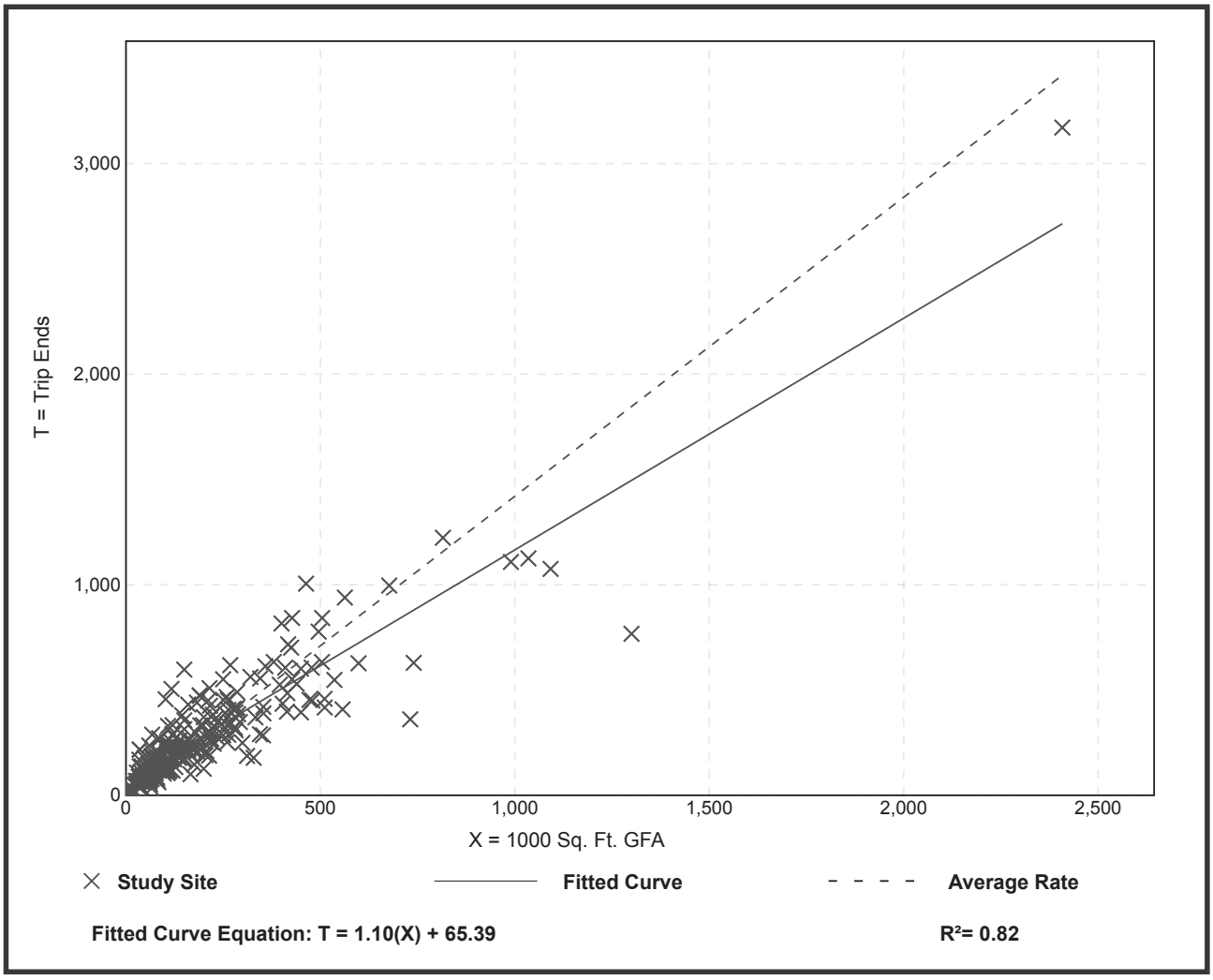
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 243
1000 Sq. Ft. GFA: 205
Directional Distribution: 18% entering, 82% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.42	0.49 - 6.20	0.61

Data Plot and Equation



Fitted Curve Equation: T = 1.10(X) + 65.39

R^2= 0.82

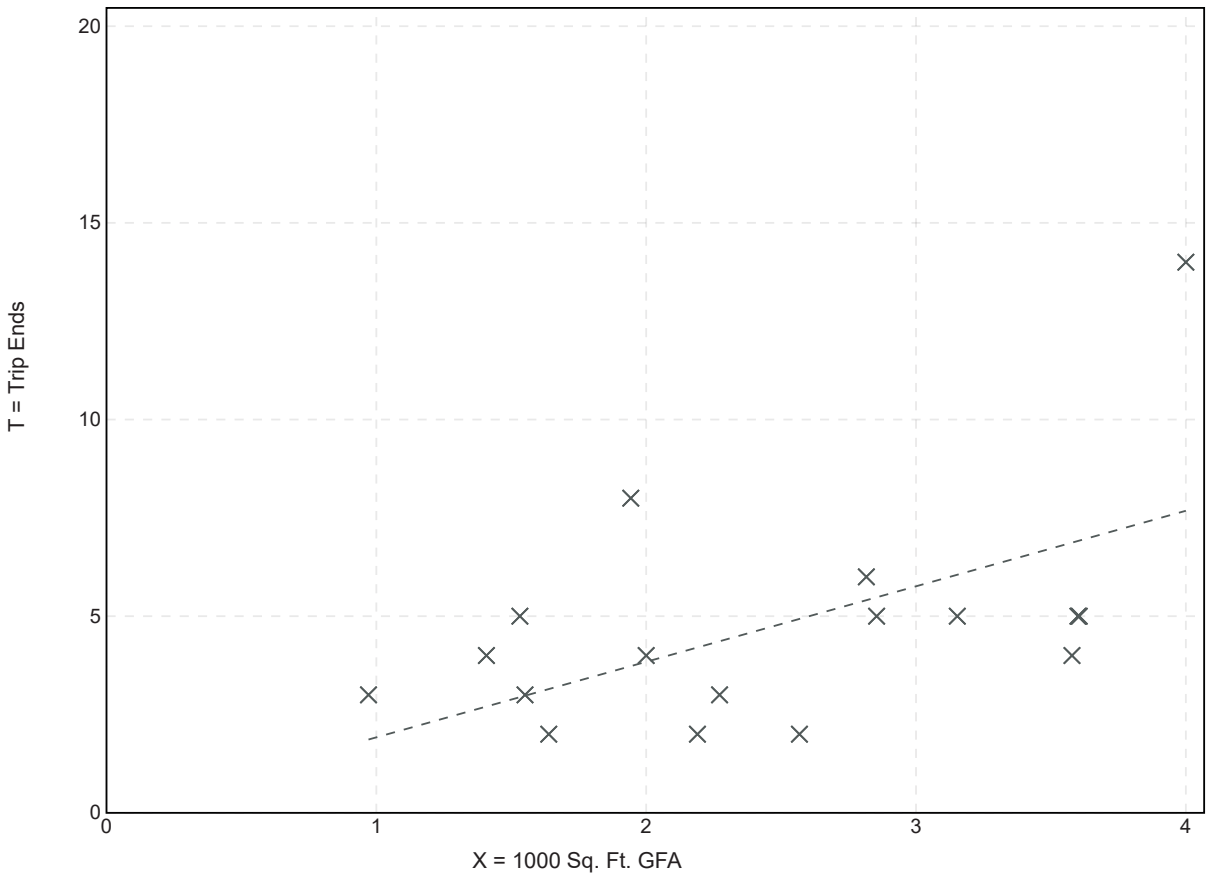
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 17
1000 Sq. Ft. GFA: 2
Directional Distribution: 83% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.92	0.78 - 4.12	0.97

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

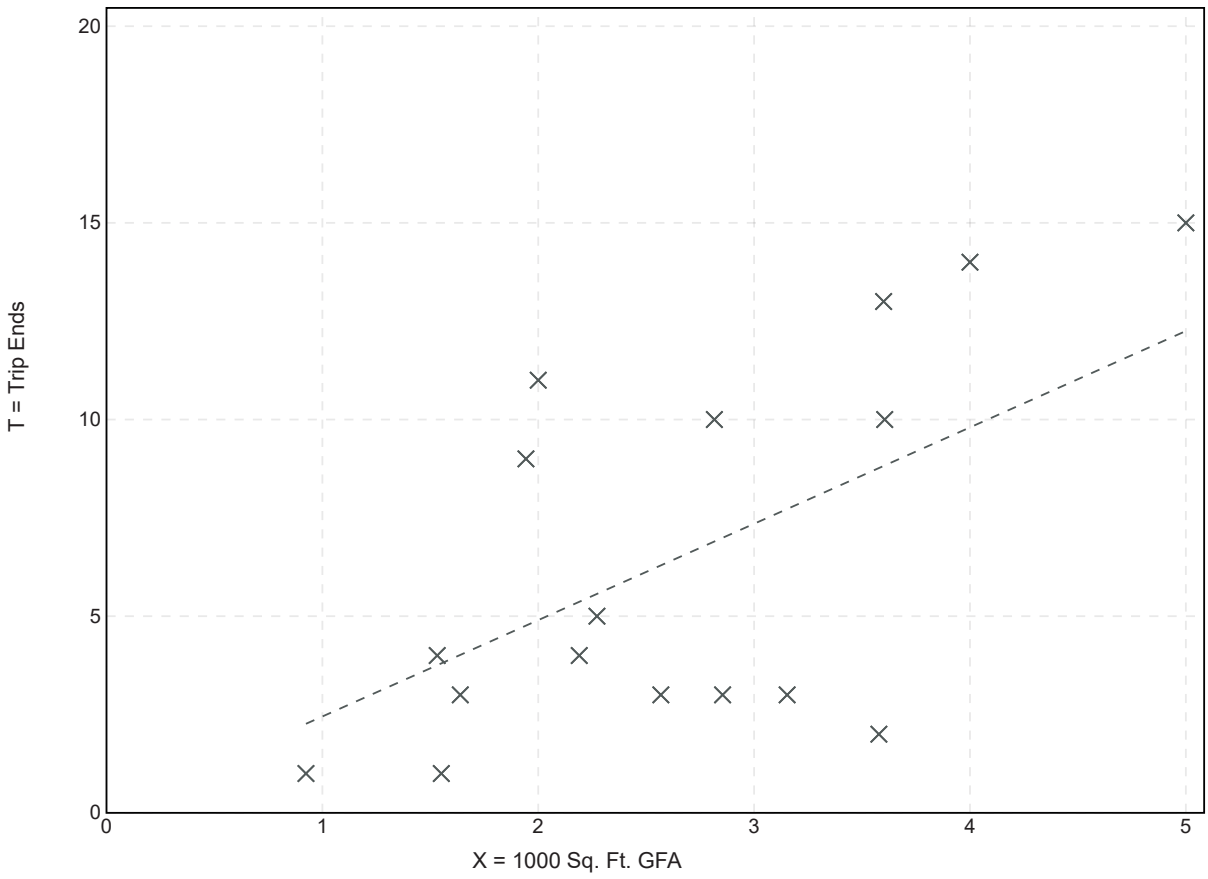
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 17
1000 Sq. Ft. GFA: 3
Directional Distribution: 32% entering, 68% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.45	0.56 - 5.50	1.38

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Small Office Building
(712)

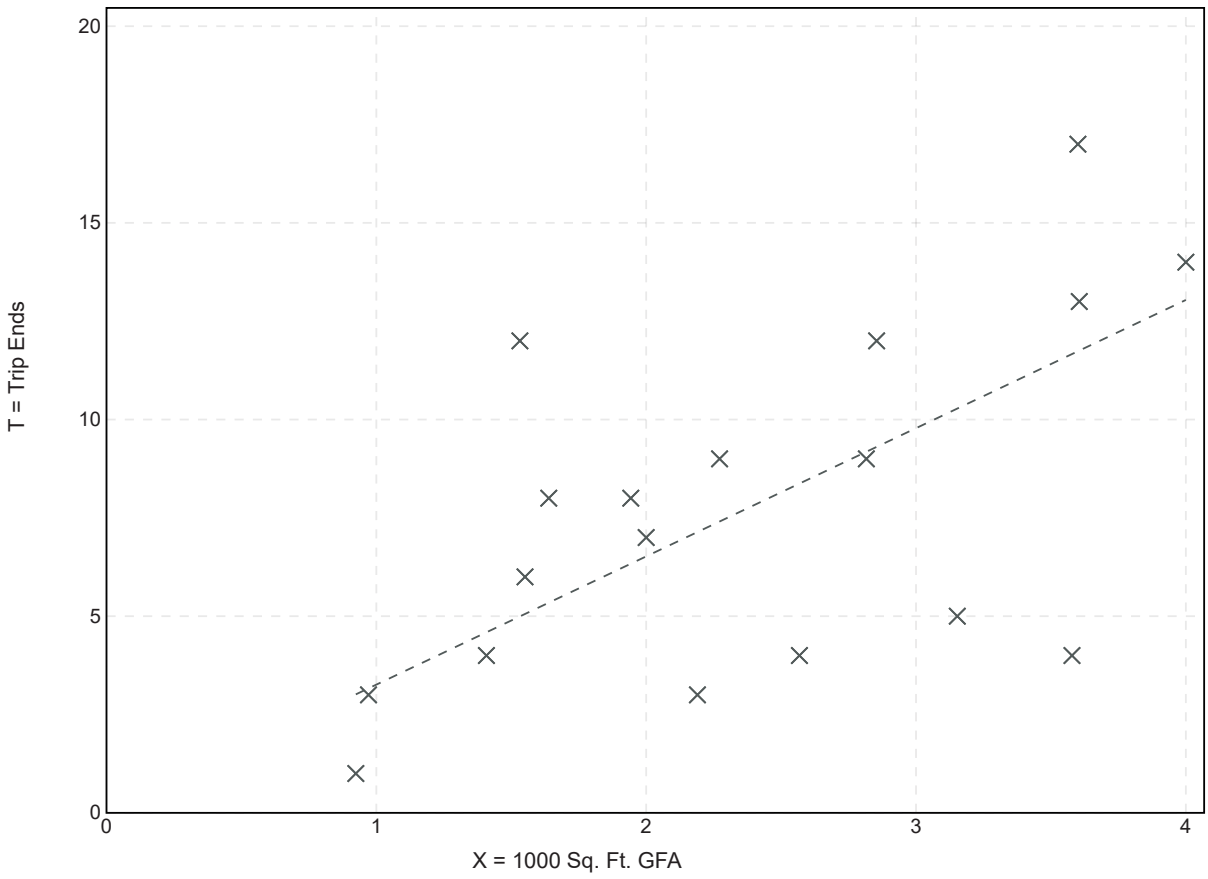
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 18
1000 Sq. Ft. GFA: 2
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.26	1.08 - 7.83	1.54

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Small Office Building
(712)

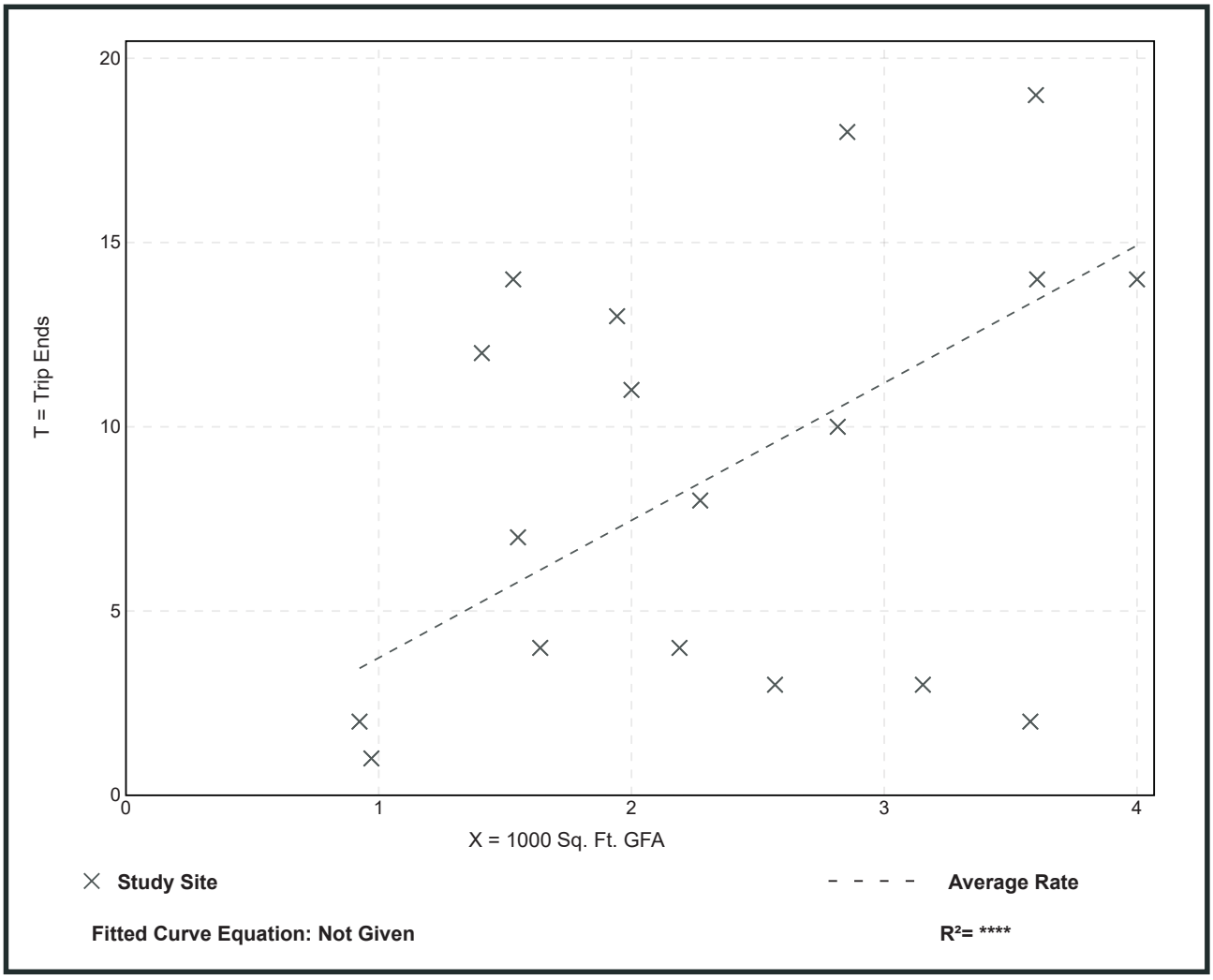
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 18
1000 Sq. Ft. GFA: 2
Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.73	0.56 - 9.14	2.37

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

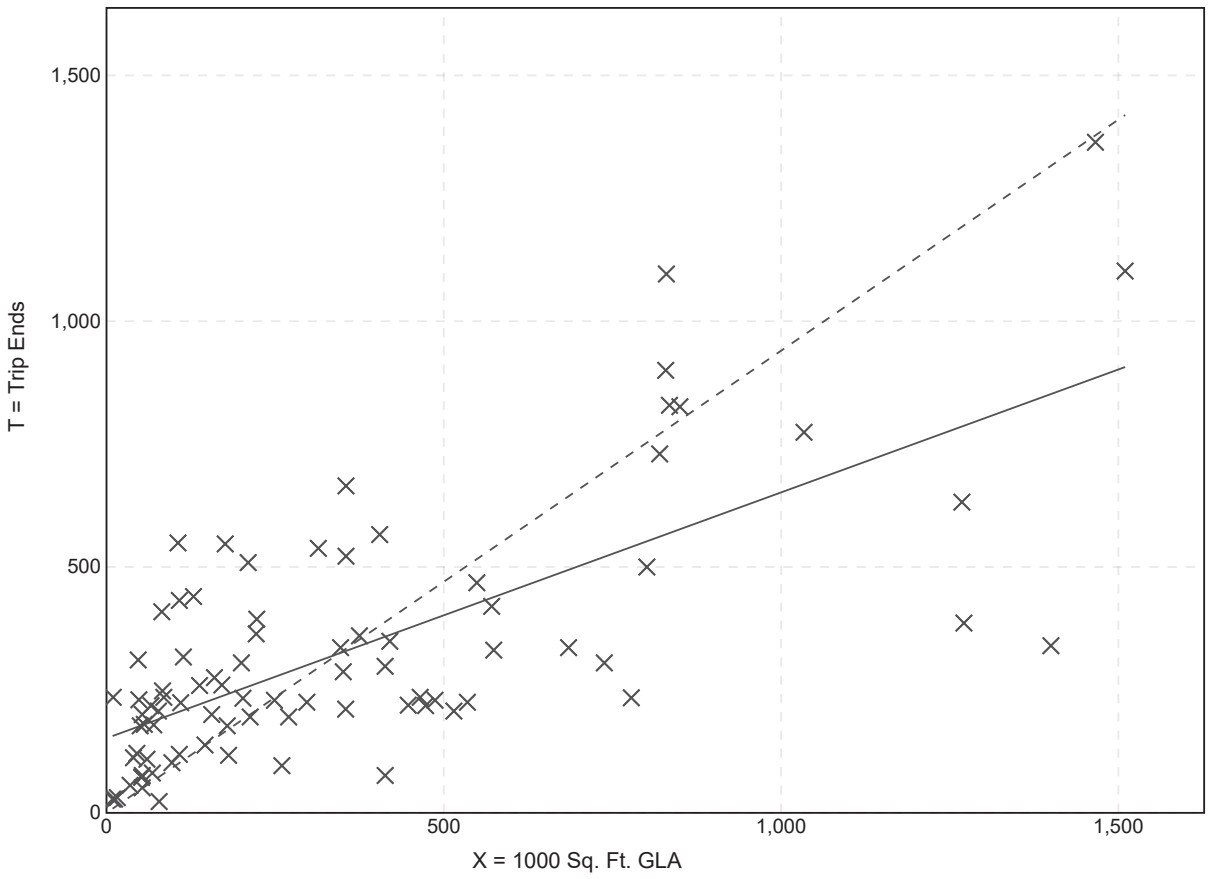
Shopping Center
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 84
1000 Sq. Ft. GLA: 351
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.94	0.18 - 23.74	0.87

Data Plot and Equation



Fitted Curve Equation: T = 0.50(X) + 151.78

R^2= 0.50

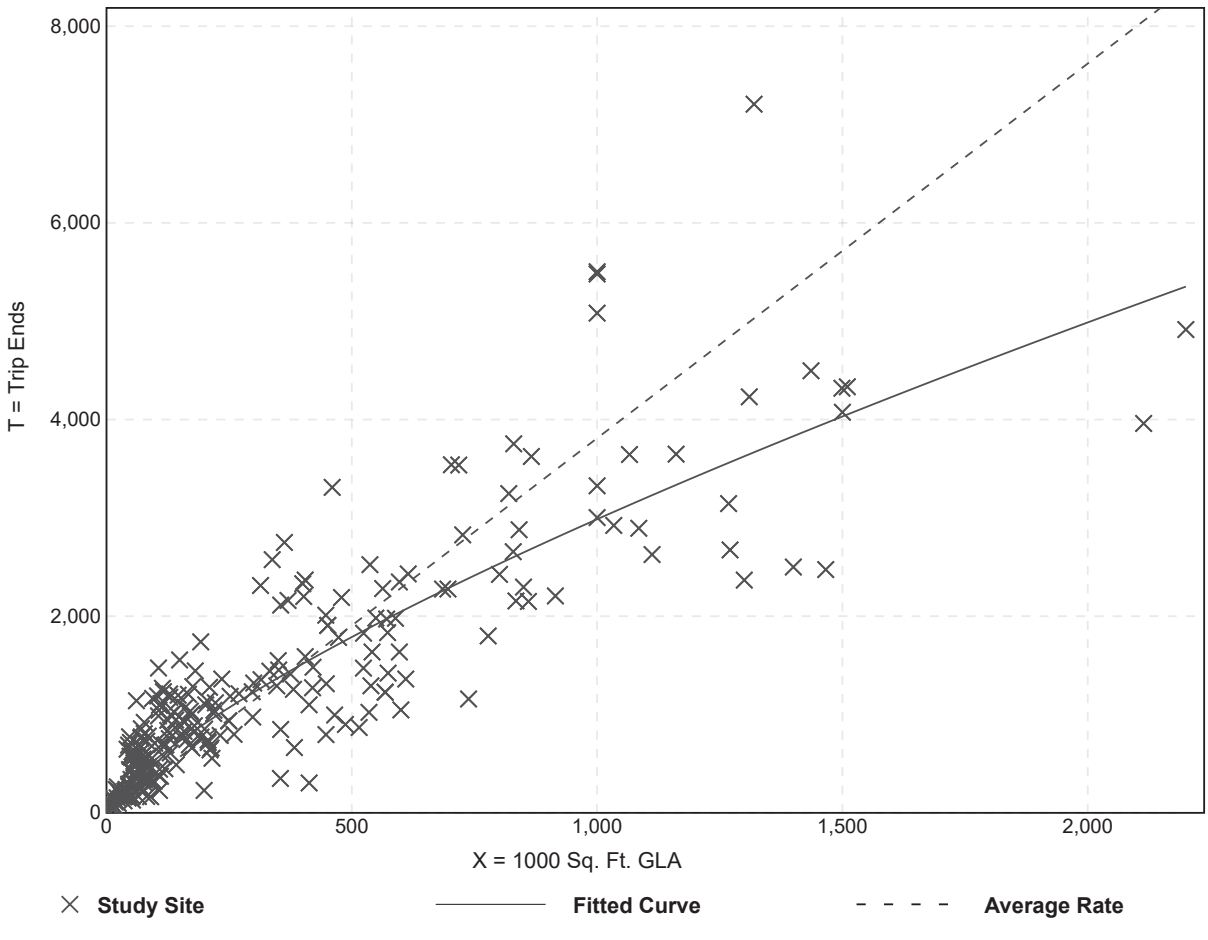
Shopping Center
(820)

Vehicle Trip Ends vs: **1000 Sq. Ft. GLA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 261
1000 Sq. Ft. GLA: 327
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.81	0.74 - 18.69	2.04

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.74 Ln(X) + 2.89

R^2= 0.82

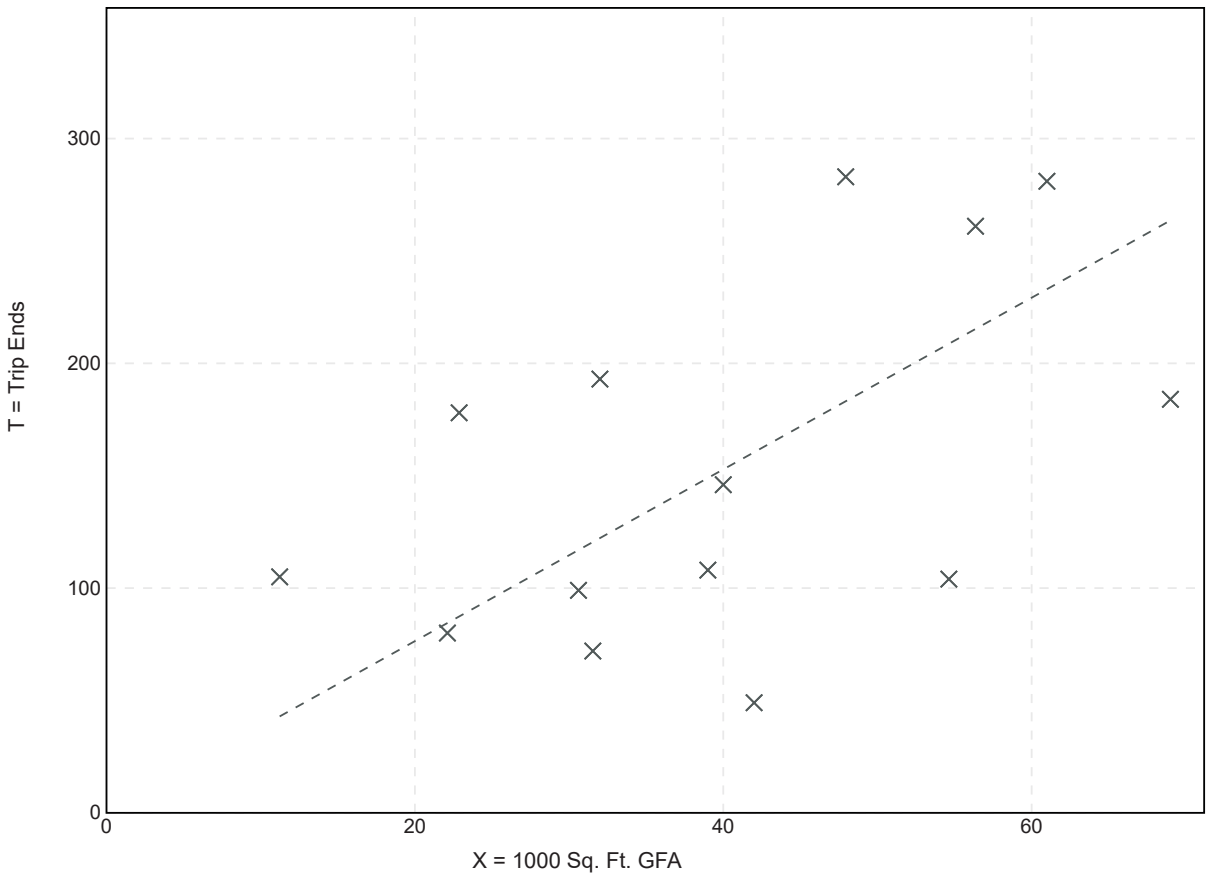
Supermarket
(850)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 7 and 9 a.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	14
1000 Sq. Ft. GFA:	40
Directional Distribution:	60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.82	1.17 - 9.35	1.89

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

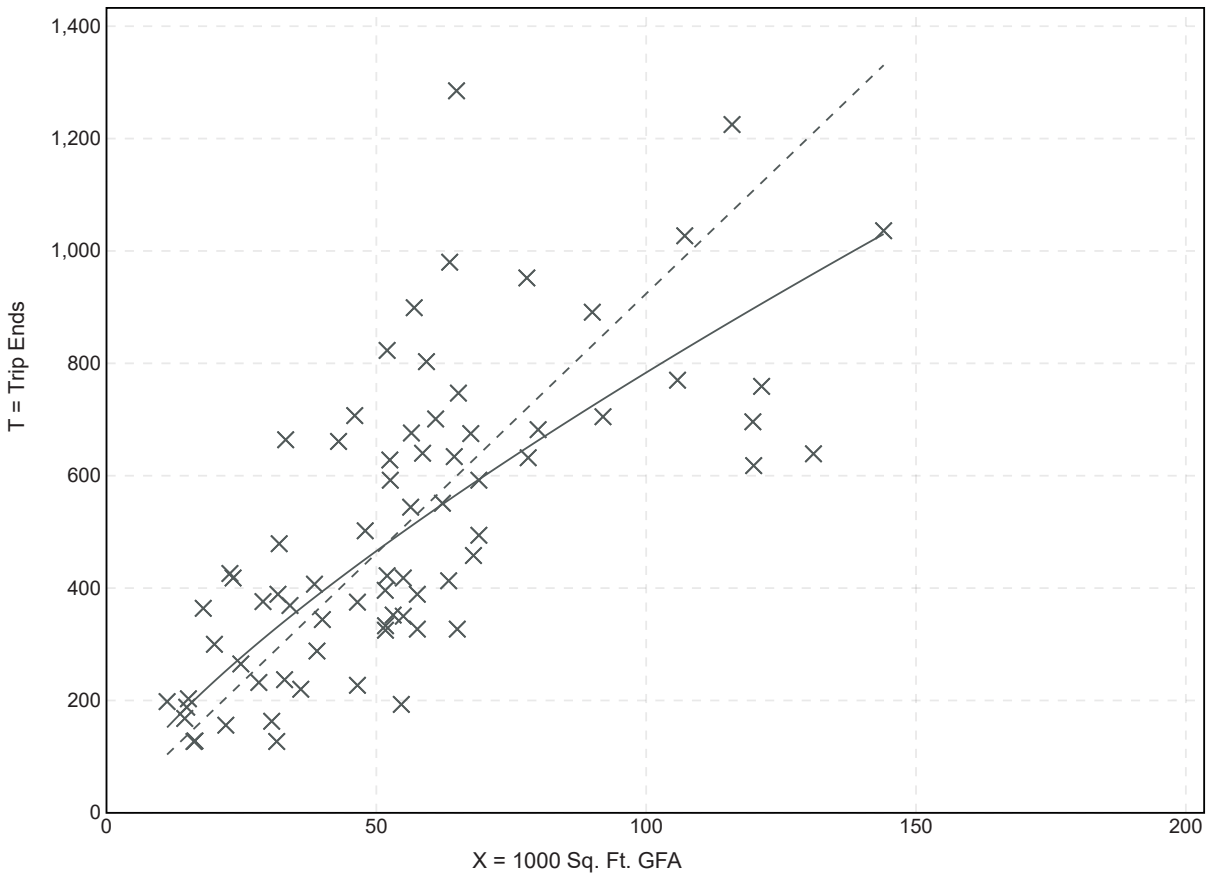
Supermarket
(850)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 73
1000 Sq. Ft. GFA: 55
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.24	3.53 - 20.30	3.69

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.75 Ln(X) + 3.21

R^2= 0.57

Supermarket
(850)

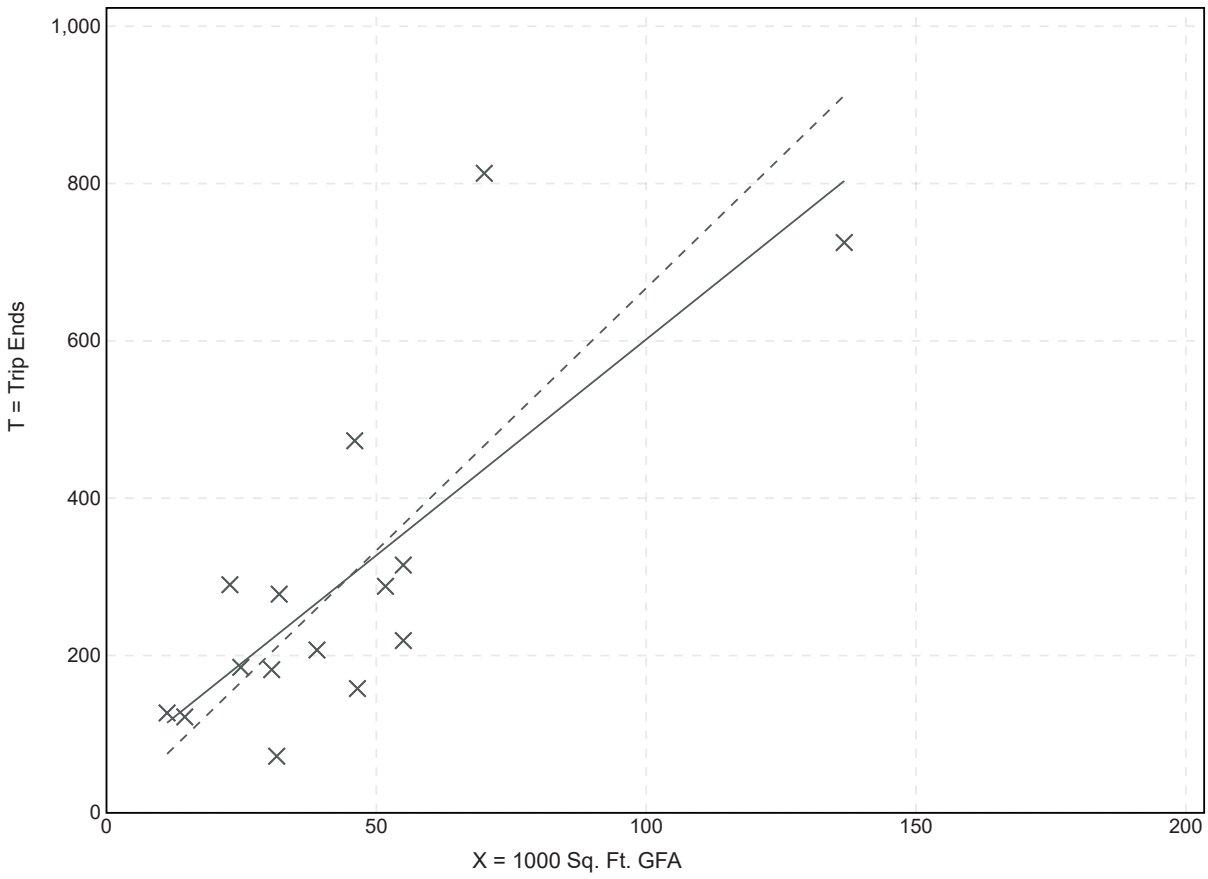
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 15
1000 Sq. Ft. GFA: 45
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
6.67	2.28 - 12.68	2.98

Data Plot and Equation



Fitted Curve Equation: T = 5.49(X) + 52.83

R^2= 0.59

Supermarket
(850)

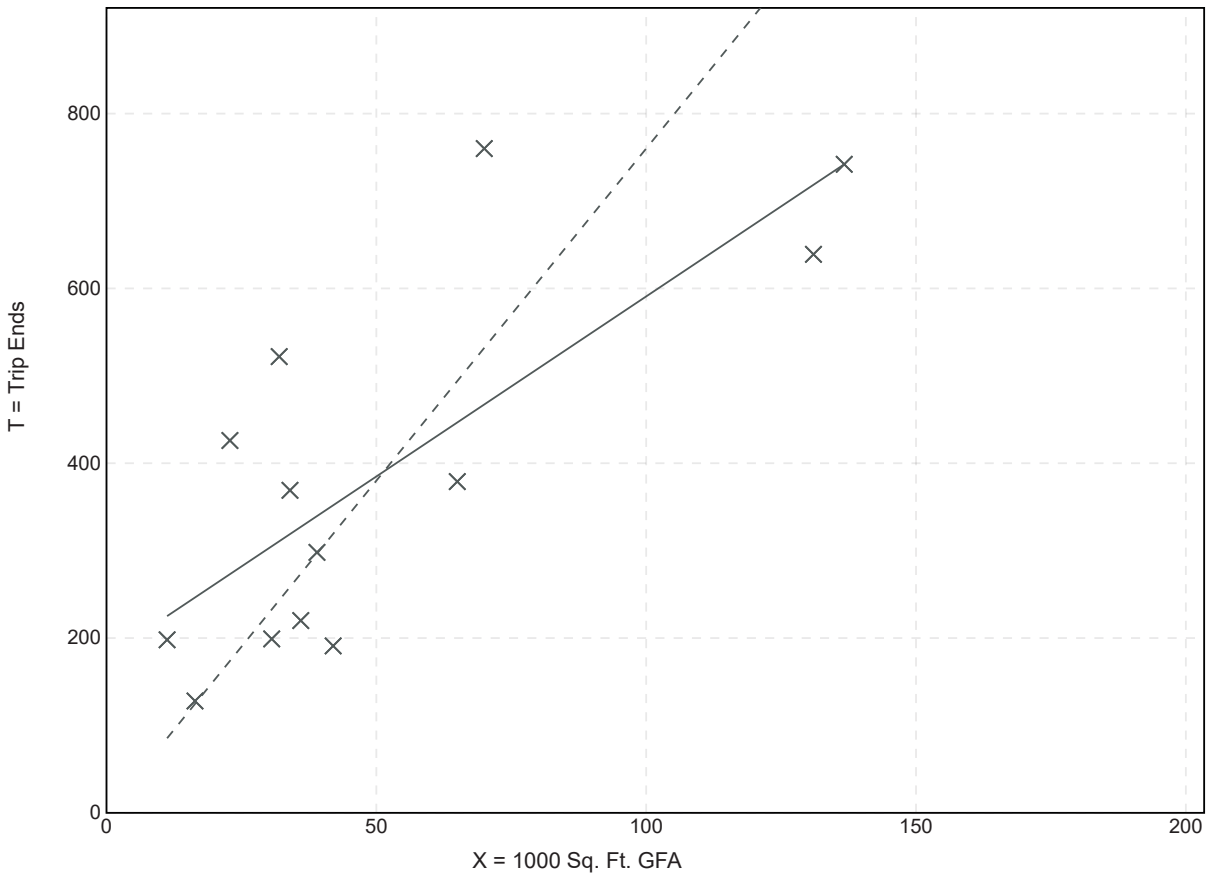
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 13
1000 Sq. Ft. GFA: 51
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
7.60	4.55 - 18.63	3.98

Data Plot and Equation



Fitted Curve Equation: T = 4.12(X) + 178.83

R^2= 0.59

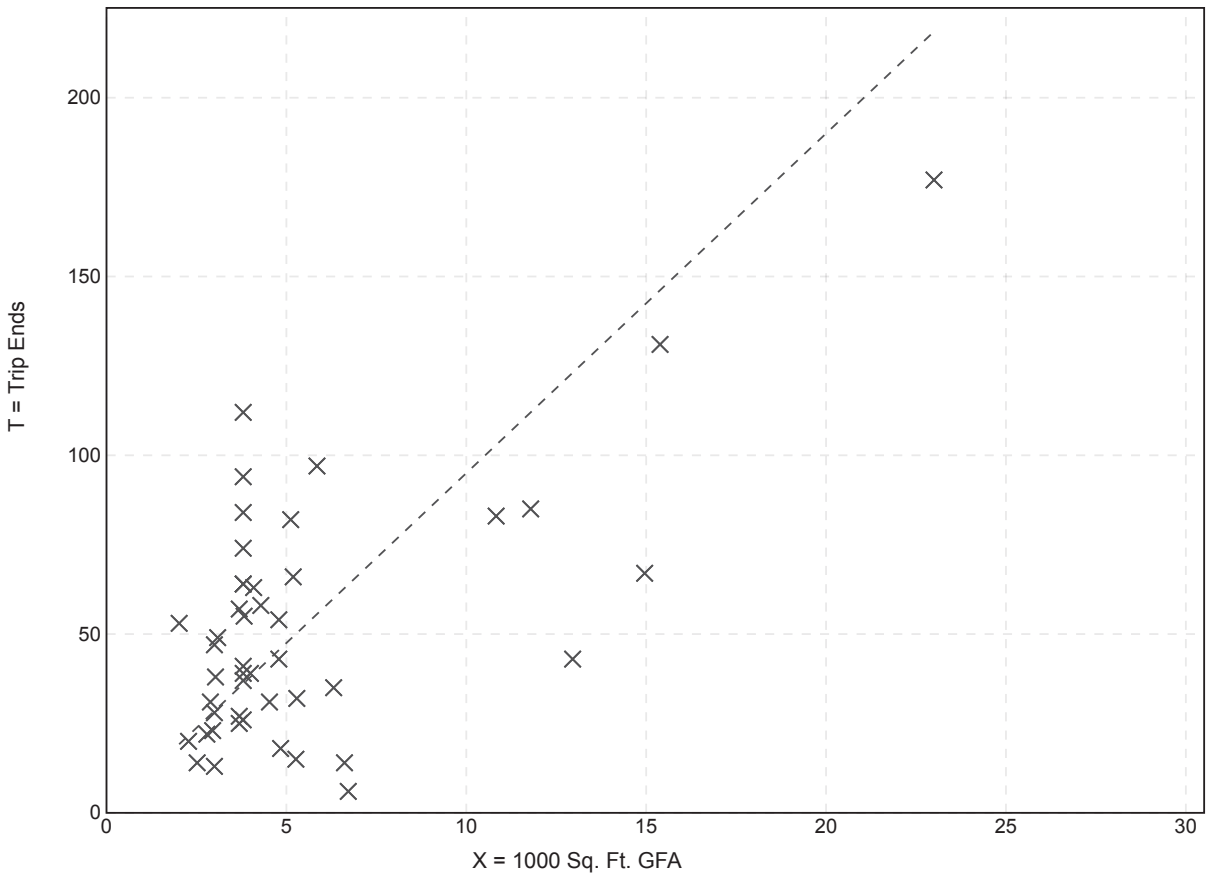
Drive-in Bank
(912)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	46
1000 Sq. Ft. GFA:	5
Directional Distribution:	58% entering, 42% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.50	0.89 - 29.47	5.85

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

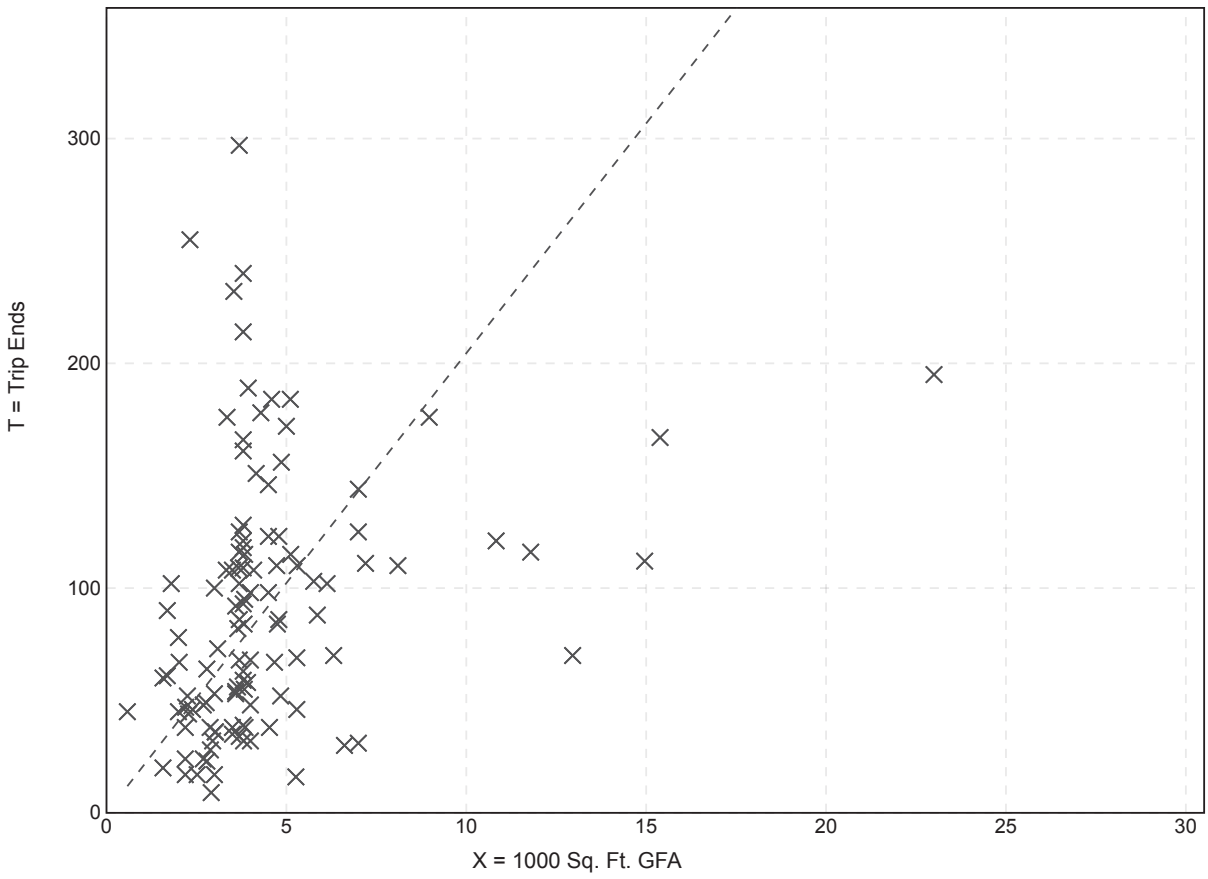
Drive-in Bank
(912)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,** **Peak Hour of Adjacent Street Traffic,** **One Hour Between 4 and 6 p.m.**
Setting/Location:	**General Urban/Suburban**
Number of Studies:	115
1000 Sq. Ft. GFA:	4
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
20.45	3.04 - 109.91	15.01

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Drive-in Bank
(912)

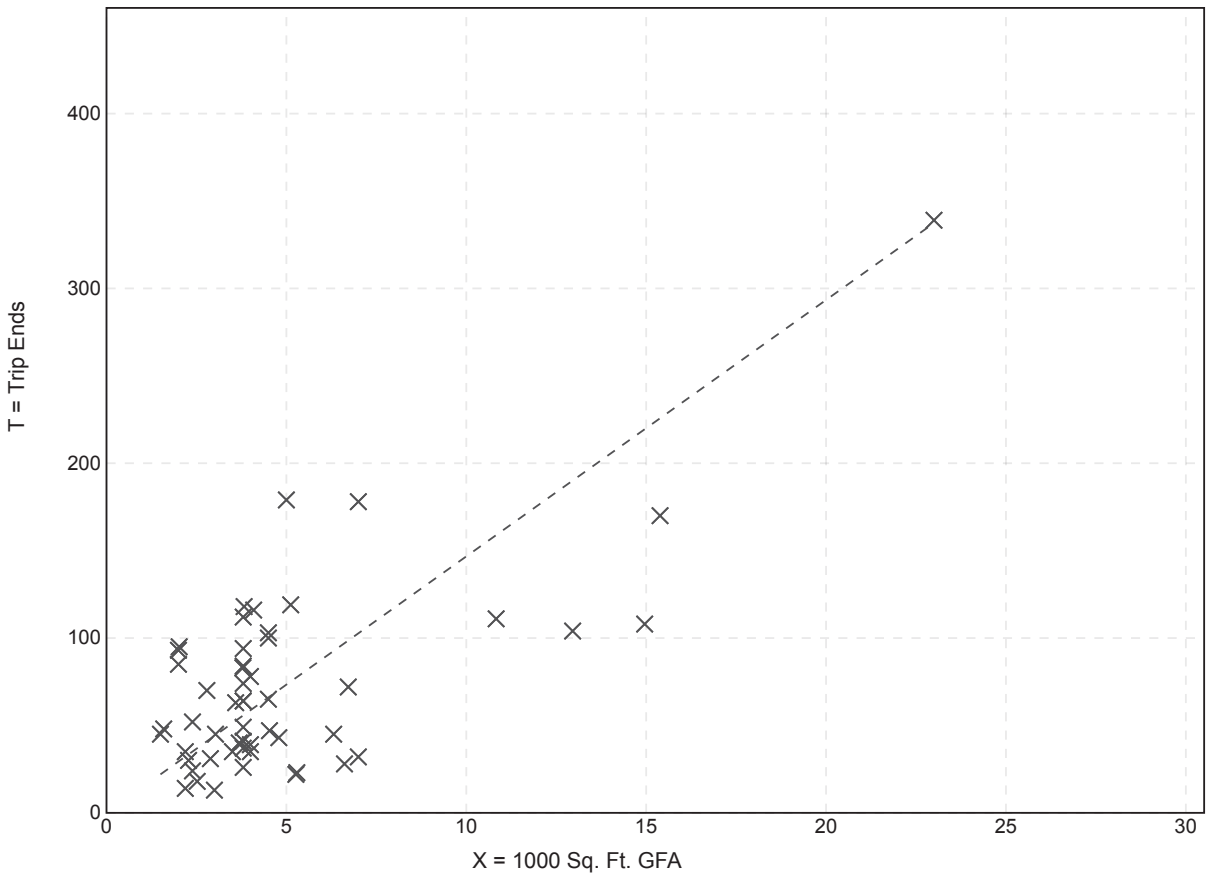
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 53
1000 Sq. Ft. GFA: 5
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.67	4.18 - 47.03	9.06

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Drive-in Bank
(912)

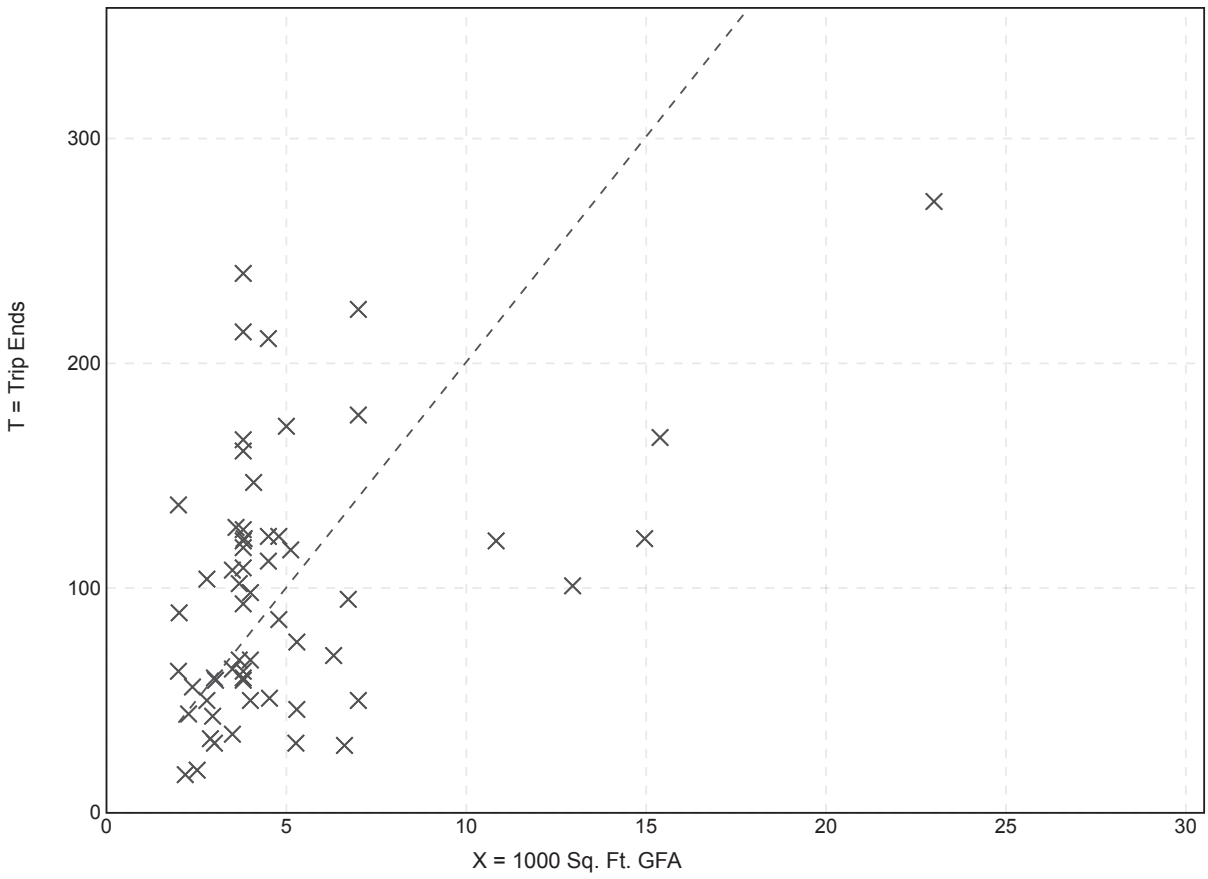
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 59
1000 Sq. Ft. GFA: 5
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
20.06	4.54 - 68.50	13.13

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

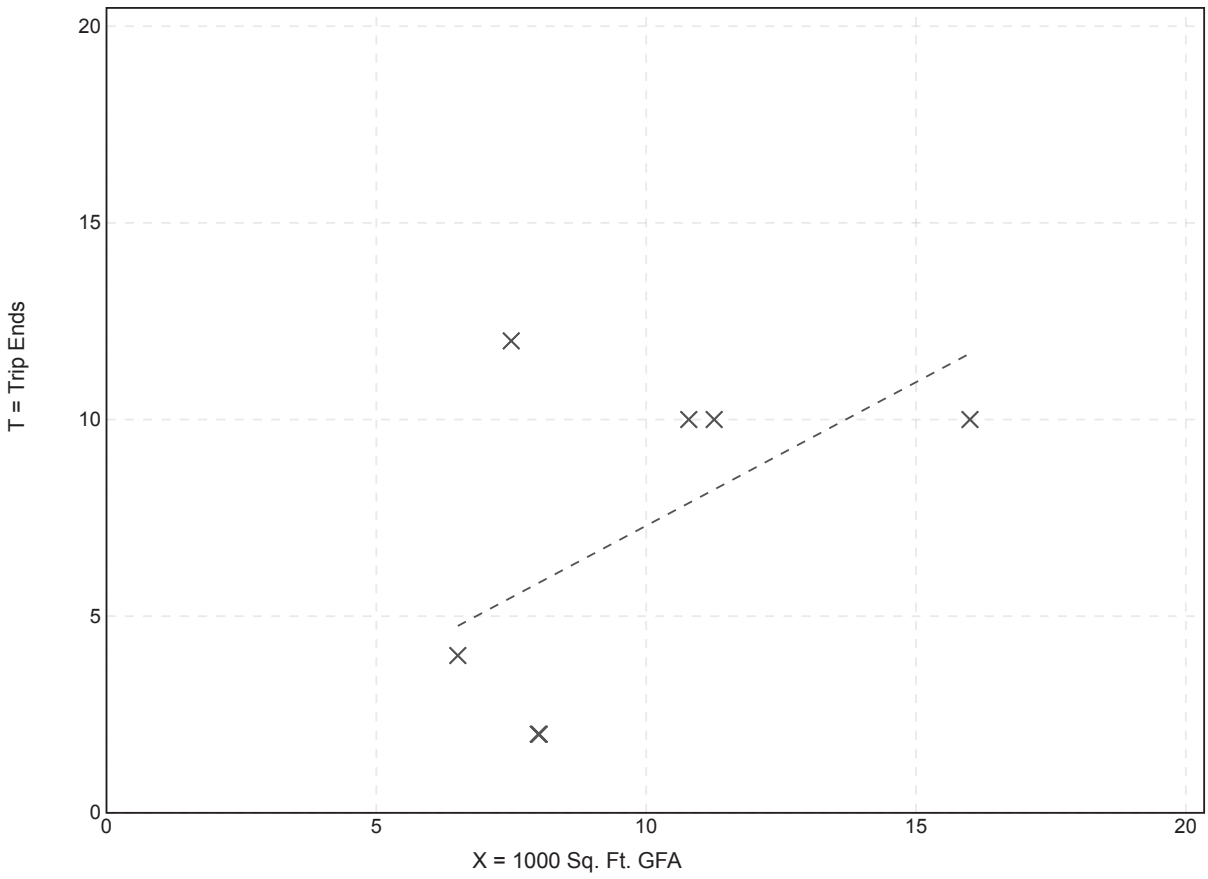
Quality Restaurant
(931)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 7
1000 Sq. Ft. GFA: 10
Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.73	0.25 - 1.60	0.42

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

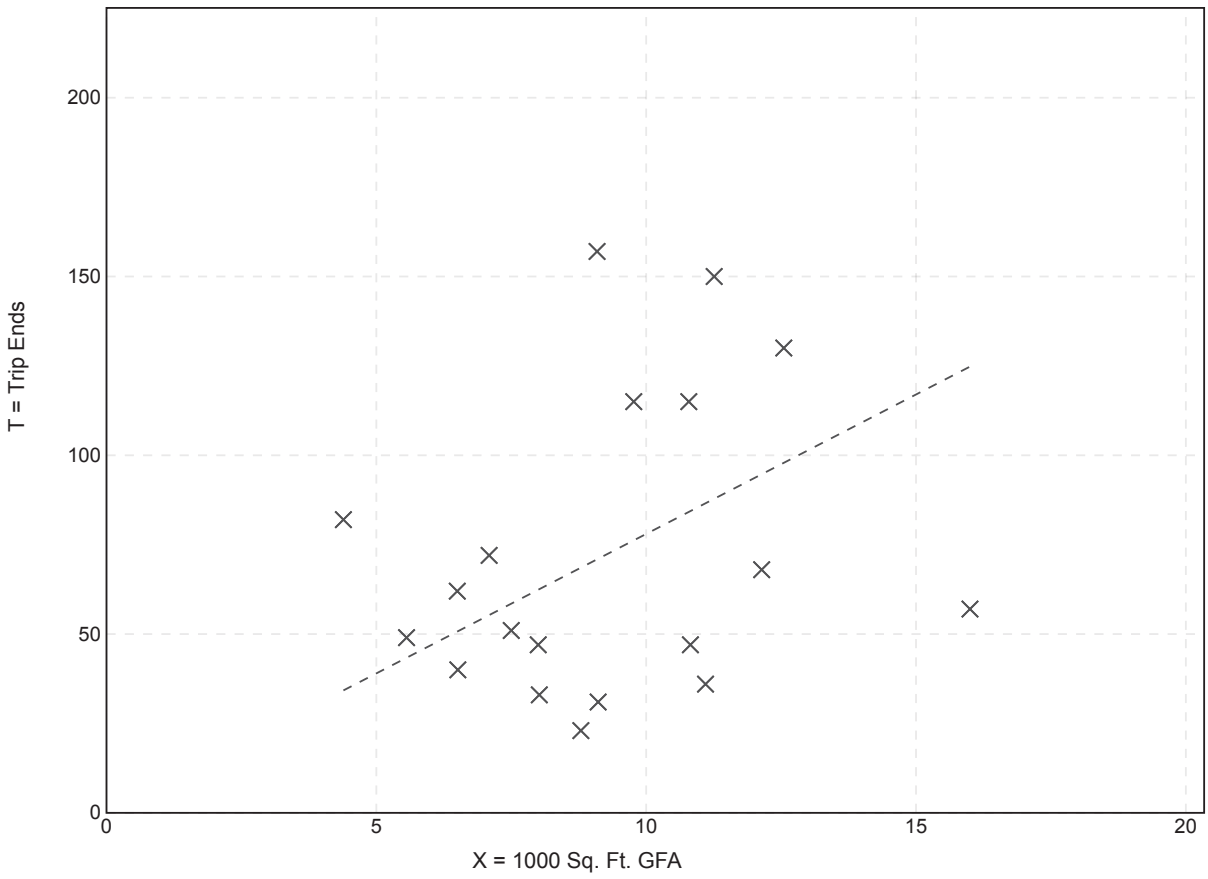
Quality Restaurant
(931)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	19
1000 Sq. Ft. GFA:	9
Directional Distribution:	67% entering, 33% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
7.80	2.62 - 18.68	4.49

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Quality Restaurant
(931)

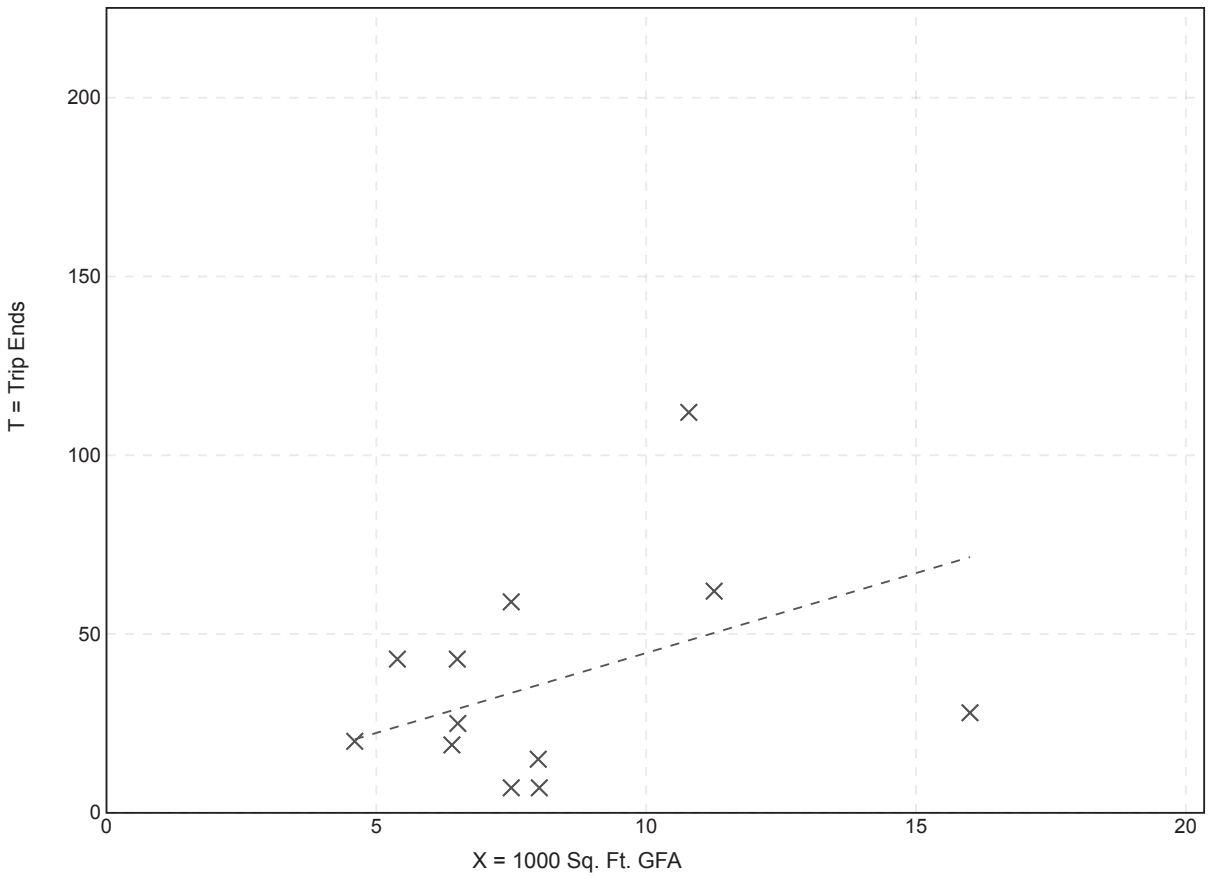
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
AM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 12
1000 Sq. Ft. GFA: 8
Directional Distribution: 80% entering, 20% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.47	0.87 - 10.38	3.26

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Quality Restaurant
(931)

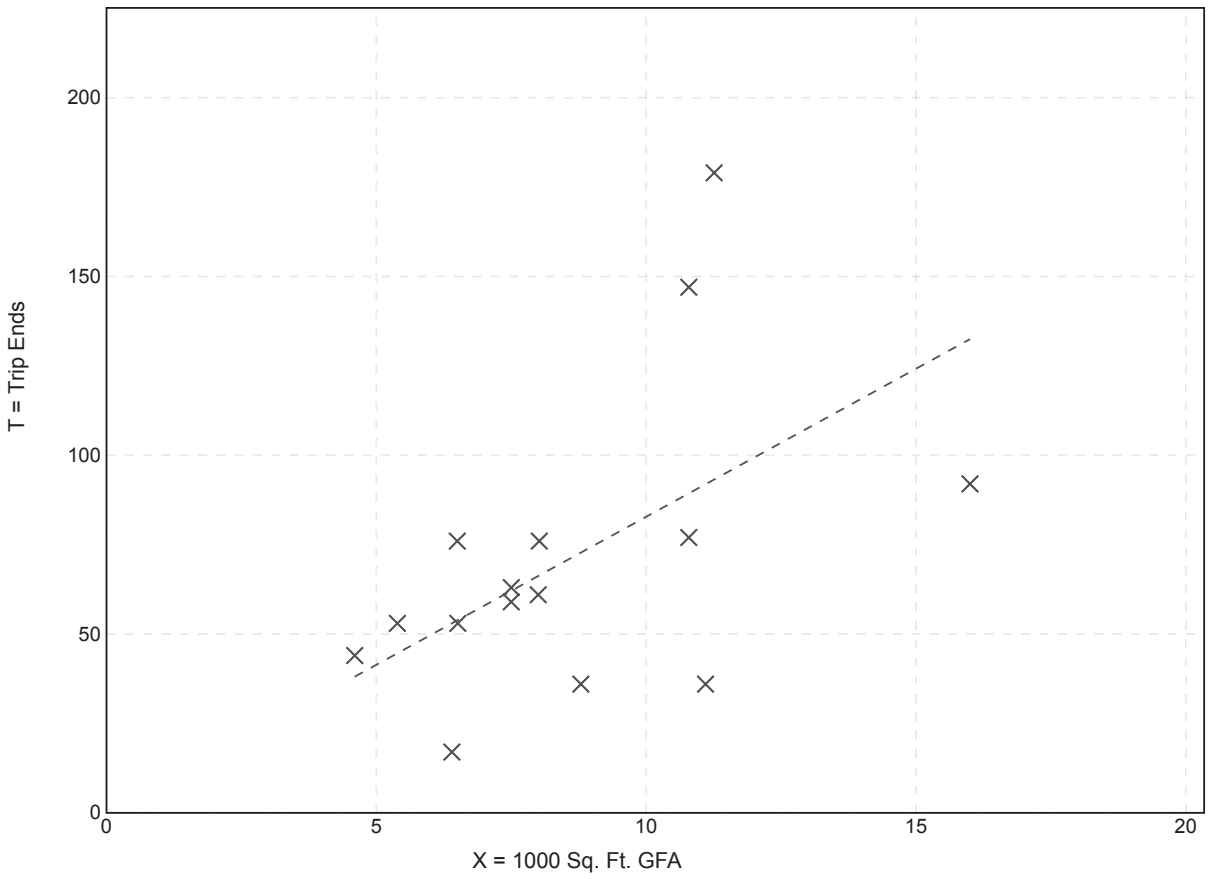
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
PM Peak Hour of Generator

Setting/Location: **General Urban/Suburban**
Number of Studies: 15
1000 Sq. Ft. GFA: 9
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
8.28	2.66 - 15.90	3.89

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ****

Exhibit 9

AM Peak Hour – Network Design Hourly Volumes – Full Build


45th Ave
AM Peak Hour
909
35
Calumet
1191
52
140
645
124
145
213
212
41
4
37
57
580
59
45th
236
381
331
268
862
189
63
626
48
4
36
42
N Centennial
1188
34
Village
1315
41
Greenway

Exhibit 10

PM Peak Hour – Network Design Hourly Volumes – Full Build

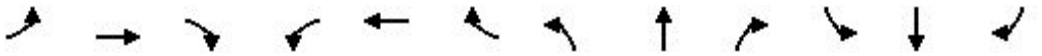

45th Ave
PM Peak Hour
1250
103
Calumet
1166
107
94
709
148
140
10
90
154
370
228
150
913
187
45th
205
685
345
318
914
228
145
1096
129
69
10
161
N Centennial
1487
90
Village
1467
84
Greenway

Exhibit 11

PM LOS & Queue Report – Full Build Conditions – Calumet Avenue & 45th Avenue – Dual Signals

HCM 6th Signalized Intersection Summary
1: 45th & Calumet

09/05/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	685	345	228	370	154	318	914	228	187	913	150
Future Volume (veh/h)	205	685	345	228	370	154	318	914	228	187	913	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	277	753	383	243	385	192	374	1039	265	240	1087	163
Peak Hour Factor	0.74	0.91	0.90	0.94	0.96	0.80	0.85	0.88	0.86	0.78	0.84	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	408	674	342	242	610	300	393	1031	262	258	1166	520
Arrive On Green	0.13	0.30	0.30	0.17	0.44	0.44	0.11	0.37	0.37	0.07	0.33	0.33
Sat Flow, veh/h	1781	2281	1158	1781	2308	1135	3456	2807	712	3456	3554	1585
Grp Volume(v), veh/h	277	586	550	243	295	282	374	656	648	240	1087	163
Grp Sat Flow(s),veh/h/ln	1781	1777	1662	1781	1777	1666	1728	1777	1742	1728	1777	1585
Q Serve(g_s), s	12.1	32.5	32.5	10.9	14.1	14.5	11.8	40.4	40.4	7.6	32.6	8.5
Cycle Q Clear(g_c), s	12.1	32.5	32.5	10.9	14.1	14.5	11.8	40.4	40.4	7.6	32.6	8.5
Prop In Lane	1.00		0.70	1.00		0.68	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	408	525	491	242	469	440	393	653	640	258	1166	520
V/C Ratio(X)	0.68	1.12	1.12	1.00	0.63	0.64	0.95	1.00	1.01	0.93	0.93	0.31
Avail Cap(c_a), veh/h	456	525	491	242	469	440	393	653	640	258	1166	520
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	38.8	38.8	28.3	26.6	26.7	48.5	34.8	34.8	50.6	35.8	27.7
Incr Delay (d2), s/veh	3.5	75.3	77.7	55.4	2.4	2.8	33.2	36.5	38.9	38.0	14.4	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	24.7	23.4	7.9	5.3	5.1	6.8	23.3	23.3	4.6	16.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.3	114.0	116.5	83.7	28.9	29.4	81.7	71.3	73.7	88.6	50.2	29.2
LnGrp LOS	C	F	F	F	C	C	F	F	F	F	D	C
Approach Vol, veh/h		1413			820			1678			1490	
Approach Delay, s/veh		98.2			45.3			74.5			54.1	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	44.9	15.4	37.0	17.0	40.6	18.8	33.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.2	40.4	10.9	32.5	12.5	36.1	17.3	26.1
Max Q Clear Time (g_c+I1), s	9.6	42.4	12.9	34.5	13.8	34.6	14.1	16.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	1.1	0.3	2.4

Intersection Summary	
HCM 6th Ctrl Delay	70.6
HCM 6th LOS	E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	277	1136	243	578	374	1304	240	1087	163
v/c Ratio	0.76	1.08	1.00	0.64	0.96	1.02	0.94	0.94	0.26
Control Delay	35.5	87.6	103.3	25.0	85.5	63.9	94.5	51.4	6.3
Queue Delay	0.0	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.5	95.5	103.3	25.0	85.5	63.9	94.5	51.4	6.3
Queue Length 50th (ft)	128	~451	~152	71	137	~490	88	388	5
Queue Length 95th (ft)	153	#586	#304	131	#210	#618	#131	#442	51
Internal Link Dist (ft)		527		437		357		316	
Turn Bay Length (ft)	255		290		435		245		250
Base Capacity (vph)	386	1050	242	901	390	1281	255	1161	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	118	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.22	1.00	0.64	0.96	1.02	0.94	0.94	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

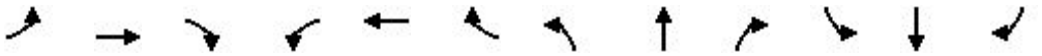
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Exhibit 12

LOS Full Build & Queue Report – Calumet Avenue & 45th Avenue – PM Peak Hour with N Centennial Drive Roundabout – Fully Optimized Signal

HCM 6th Signalized Intersection Summary
1: 45th & Calumet

09/05/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	685	345	228	370	154	318	914	228	187	913	150
Future Volume (veh/h)	205	685	345	228	370	154	318	914	228	187	913	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	277	753	383	243	385	192	374	1039	265	240	1087	163
Peak Hour Factor	0.74	0.91	0.90	0.94	0.96	0.80	0.85	0.88	0.86	0.78	0.84	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	393	674	342	242	610	300	393	1031	262	258	1166	520
Arrive On Green	0.13	0.30	0.30	0.10	0.26	0.26	0.08	0.25	0.25	0.07	0.33	0.33
Sat Flow, veh/h	1781	2281	1158	1781	2308	1135	3456	2807	712	3456	3554	1585
Grp Volume(v), veh/h	277	586	550	243	295	282	374	656	648	240	1087	163
Grp Sat Flow(s),veh/h/ln	1781	1777	1662	1781	1777	1666	1728	1777	1742	1728	1777	1585
Q Serve(g_s), s	12.1	32.5	32.5	10.9	16.1	16.5	11.9	40.4	40.4	7.6	32.6	8.5
Cycle Q Clear(g_c), s	12.1	32.5	32.5	10.9	16.1	16.5	11.9	40.4	40.4	7.6	32.6	8.5
Prop In Lane	1.00		0.70	1.00		0.68	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	393	525	491	242	469	440	393	653	640	258	1166	520
V/C Ratio(X)	0.70	1.12	1.12	1.00	0.63	0.64	0.95	1.00	1.01	0.93	0.93	0.31
Avail Cap(c_a), veh/h	441	525	491	242	469	440	393	653	640	258	1166	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	38.8	38.8	29.8	35.7	35.8	50.5	41.5	41.5	50.6	35.8	27.7
Incr Delay (d2), s/veh	4.4	75.3	77.7	59.0	2.7	3.1	33.2	36.5	38.9	38.0	14.4	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	24.7	23.4	8.5	7.2	7.0	7.1	24.7	24.7	4.6	16.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	114.0	116.5	88.8	38.4	39.0	83.8	77.9	80.3	88.6	50.2	29.2
LnGrp LOS	C	F	F	F	D	D	F	F	F	F	D	C
Approach Vol, veh/h		1413			820			1678			1490	
Approach Delay, s/veh		98.4			53.5			80.2			54.1	
Approach LOS		F			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	44.9	15.4	37.0	17.0	40.6	18.8	33.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.2	40.4	10.9	32.5	12.5	36.1	17.3	26.1
Max Q Clear Time (g_c+I1), s	9.6	42.4	12.9	34.5	13.9	34.6	14.1	18.5
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	1.1	0.3	2.1

Intersection Summary	
HCM 6th Ctrl Delay	73.7
HCM 6th LOS	E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	277	1136	243	578	374	1304	240	1087	163
v/c Ratio	0.76	1.08	1.00	0.64	0.96	1.02	0.94	0.94	0.26
Control Delay	35.5	87.6	89.3	36.0	85.2	60.5	94.5	51.4	6.3
Queue Delay	0.0	0.4	12.8	0.0	0.0	0.0	0.0	2.1	0.0
Total Delay	35.5	88.0	102.1	36.0	85.2	60.5	94.5	53.4	6.3
Queue Length 50th (ft)	128	~451	~128	171	144	~507	88	388	5
Queue Length 95th (ft)	153	#586	#296	233	m#209	m#596	#131	#442	51
Internal Link Dist (ft)		527		437		357		316	
Turn Bay Length (ft)	255		290		435		245		250
Base Capacity (vph)	386	1050	242	901	390	1281	255	1161	622
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	1	10	0	0	0	0	27	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	1.08	1.05	0.64	0.96	1.02	0.94	0.96	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

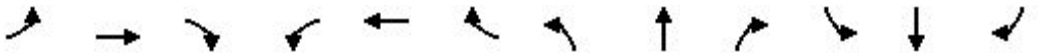
m Volume for 95th percentile queue is metered by upstream signal.

Exhibit 13

LOS Full Build & Queue Report – Calumet Avenue & 45th Avenue – PM Peak Hour with N Centennial Drive Roundabout – Queue Sensitive Timing

HCM 6th Signalized Intersection Summary
1: 45th & Calumet

09/05/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	205	685	345	228	370	154	318	914	228	187	913	150
Future Volume (veh/h)	205	685	345	228	370	154	318	914	228	187	913	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	277	753	383	243	385	192	374	1039	265	240	1087	163
Peak Hour Factor	0.74	0.91	0.90	0.94	0.96	0.80	0.85	0.88	0.86	0.78	0.84	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	381	613	311	274	597	293	357	1108	281	234	1276	569
Arrive On Green	0.13	0.27	0.27	0.12	0.26	0.26	0.10	0.39	0.39	0.07	0.36	0.36
Sat Flow, veh/h	1781	2281	1158	1781	2308	1135	3456	2807	712	3456	3554	1585
Grp Volume(v), veh/h	277	586	550	243	295	282	374	656	648	240	1087	163
Grp Sat Flow(s),veh/h/ln	1781	1777	1662	1781	1777	1666	1728	1777	1742	1728	1777	1585
Q Serve(g_s), s	13.6	32.5	32.5	12.1	17.9	18.3	12.5	42.8	43.4	8.2	34.2	8.9
Cycle Q Clear(g_c), s	13.6	32.5	32.5	12.1	17.9	18.3	12.5	42.8	43.4	8.2	34.2	8.9
Prop In Lane	1.00		0.70	1.00		0.68	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	381	477	446	274	459	431	357	701	688	234	1276	569
V/C Ratio(X)	0.73	1.23	1.23	0.89	0.64	0.65	1.05	0.94	0.94	1.02	0.85	0.29
Avail Cap(c_a), veh/h	404	477	446	379	459	431	357	701	688	234	1276	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.82	0.82	0.82	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	44.2	44.3	32.3	39.9	40.0	54.3	35.1	35.3	56.4	35.8	27.7
Incr Delay (d2), s/veh	6.0	120.0	122.6	17.1	3.0	3.5	56.1	18.6	19.9	65.4	7.3	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	29.9	28.3	6.4	8.1	7.8	8.2	21.5	21.6	5.7	15.7	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.9	164.2	166.8	49.4	42.9	43.6	110.4	53.7	55.2	121.8	43.1	29.0
LnGrp LOS	C	F	F	D	D	D	F	D	E	F	D	C
Approach Vol, veh/h		1413			820			1678			1490	
Approach Delay, s/veh		139.9			45.1			66.9			54.2	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	52.3	19.0	37.0	17.0	48.0	20.3	35.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.2	40.4	21.7	32.5	12.5	36.1	17.3	26.1
Max Q Clear Time (g_c+I1), s	10.2	45.4	14.1	34.5	14.5	36.2	15.6	20.3
Green Ext Time (p_c), s	0.0	0.0	0.4	0.0	0.0	0.0	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	79.2
HCM 6th LOS	E

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	277	1136	243	578	374	1304	240	1087	163
v/c Ratio	0.68	1.04	0.79	0.51	1.05	1.12	1.03	1.03	0.29
Control Delay	28.9	78.1	46.1	31.1	114.3	102.2	121.8	77.0	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	78.1	46.1	31.1	114.3	102.2	121.8	77.0	9.7
Queue Length 50th (ft)	128	~491	132	170	~164	~609	~103	~476	17
Queue Length 95th (ft)	149	#678	215	229	#241	#721	#150	#541	69
Internal Link Dist (ft)		527		437		787		521	
Turn Bay Length (ft)	255		290		435		250		250
Base Capacity (vph)	428	1088	377	1125	355	1166	233	1057	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.04	0.64	0.51	1.05	1.12	1.03	1.03	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Exhibit 14

LOS Full Build – 45th Avenue & N Centennial Drive – Signalized

HCM 6th Signalized Intersection Summary
6: N Centennial

09/05/2024

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	1096	129	148	709	94	69	10	161	140	10	90
Future Volume (veh/h)	145	1096	129	148	709	94	69	10	161	140	10	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	158	1204	179	192	731	102	128	11	256	152	11	98
Peak Hour Factor	0.92	0.91	0.72	0.77	0.97	0.92	0.54	0.92	0.63	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	358	1324	590	236	1368	610	589	15	343	341	14	127
Arrive On Green	0.07	0.37	0.37	0.08	0.38	0.38	0.29	0.22	0.22	0.15	0.09	0.09
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	66	1529	1781	162	1447
Grp Volume(v), veh/h	158	1204	179	192	731	102	128	0	267	152	0	109
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	0	1595	1781	0	1610
Q Serve(g_s), s	5.9	35.4	3.6	7.2	17.5	2.9	1.4	0.0	17.1	4.3	0.0	7.3
Cycle Q Clear(g_c), s	5.9	35.4	3.6	7.2	17.5	2.9	1.4	0.0	17.1	4.3	0.0	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.90
Lane Grp Cap(c), veh/h	358	1324	590	236	1368	610	589	0	358	341	0	141
V/C Ratio(X)	0.44	0.91	0.30	0.81	0.53	0.17	0.22	0.00	0.75	0.45	0.00	0.77
Avail Cap(c_a), veh/h	389	1373	612	281	1444	644	589	0	358	341	0	284
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.1	32.8	4.0	25.5	26.2	8.4	27.7	0.0	39.7	40.2	0.0	49.1
Incr Delay (d2), s/veh	0.1	1.0	0.0	14.2	0.3	0.1	0.2	0.0	13.2	0.9	0.0	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	15.0	3.0	3.9	7.4	1.7	2.5	0.0	8.0	3.7	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.2	33.7	4.0	39.7	26.5	8.6	27.9	0.0	52.9	41.1	0.0	57.8
LnGrp LOS	C	C	A	D	C	A	C	A	D	D	A	E
Approach Vol, veh/h		1541			1025			395			261	
Approach Delay, s/veh		28.9			27.2			44.8			48.1	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.5	29.2	13.8	45.5	36.6	14.1	12.5	46.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.7	24.7	12.1	42.5	18.0	19.4	9.9	44.7
Max Q Clear Time (g_c+I1), s	6.3	19.1	9.2	37.4	3.4	9.3	7.9	19.5
Green Ext Time (p_c), s	0.2	0.8	0.1	3.6	0.3	0.3	0.1	5.8

Intersection Summary	
HCM 6th Ctrl Delay	31.9
HCM 6th LOS	C

Exhibit 14

LOS Full Build – 45th Avenue & N Centennial Drive – Signalized

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	1541	1025	395	261
Demand Flow Rate, veh/h	1572	1046	403	266
Vehicles Circulating, veh/h	362	303	1544	1073
Vehicles Exiting, veh/h	977	1644	390	276
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	19.3	9.3	29.4	10.8
Approach LOS	C	A	D	B

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	LT	TR	L	TR	L	TR
Assumed Moves	LT	TR	LT	TR	L	TR	L	TR
RT Channelized								
Lane Util	0.470	0.530	0.470	0.530	0.325	0.675	0.583	0.417
Follow-Up Headway, s	2.667	2.535	2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.645	4.328	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	739	833	492	554	131	272	155	111
Cap Entry Lane, veh/h	968	1044	1021	1098	326	382	503	570
Entry HV Adj Factor	0.980	0.980	0.980	0.981	0.977	0.981	0.981	0.980
Flow Entry, veh/h	724	817	482	543	128	267	152	109
Cap Entry, veh/h	948	1023	1001	1077	319	375	493	559
V/C Ratio	0.764	0.798	0.482	0.505	0.402	0.712	0.308	0.195
Control Delay, s/veh	18.7	19.7	9.3	9.2	20.7	33.6	12.1	9.0
LOS	C	C	A	A	C	D	B	A
95th %tile Queue, veh	8	9	3	3	2	5	1	1