Traffic Impact Study Report

XEBEC Tucker Station

Louisville, Jefferson Co., KY

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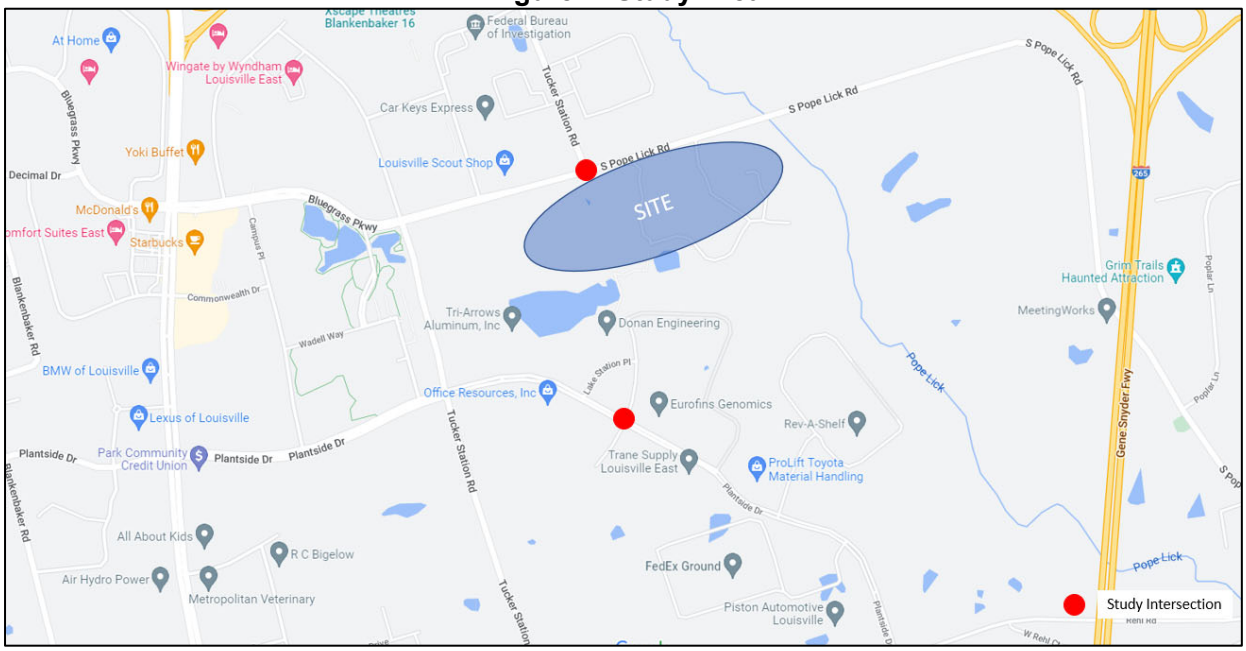
INTRODUCTION

The purpose of this document is to summarize the scope and terms for a Traffic Impact Study of a proposed industrial development in Jefferson County, KY. The development is to be located on the south side of S. Pope Lick Road and Tucker Station Road and is to consist of 5 warehousing buildings totaling 1,010,800 s.f of gross floor area. Five access points along Tucker Station Road and S. Pope Lick Road is proposed with a connection to the south to Plantside Drive via Schutte Station Place. This study will evaluate the proposed access points, as well as the intersections listed below. **Figure 1** shows the proposed site and study intersections. **Appendix A** contains a site plan of the proposed development.

- Schutte Station at Plantside Drive
- Tucker Station at S. Pope Lick Road

The scope of this study is based on a review of existing travel patterns in the area and discussions with Louisville Metro Planning and Design Services.

Figure 1: Study Area



EXISTING CONDITIONS

S. Pope Lick Road is a two-lane roadway with a posted speed of 35 mph. The intersections of S. Pope Lick Road at Tucker Station Road is a T' intersection with all-way stop control. No Auxiliary turn lanes are present at the intersection.

AM and PM turning movement counts were collected on Thursday May 19, 2022 between 7-9 a.m. and 4-6 p.m. at the study intersections. Full turn movement count data is provided in **Appendix B**. AM and PM peak hour traffic volumes are summarized in **Figures 2 and 3.**

Figure 2: AM Peak Hour Turning Movement Counts

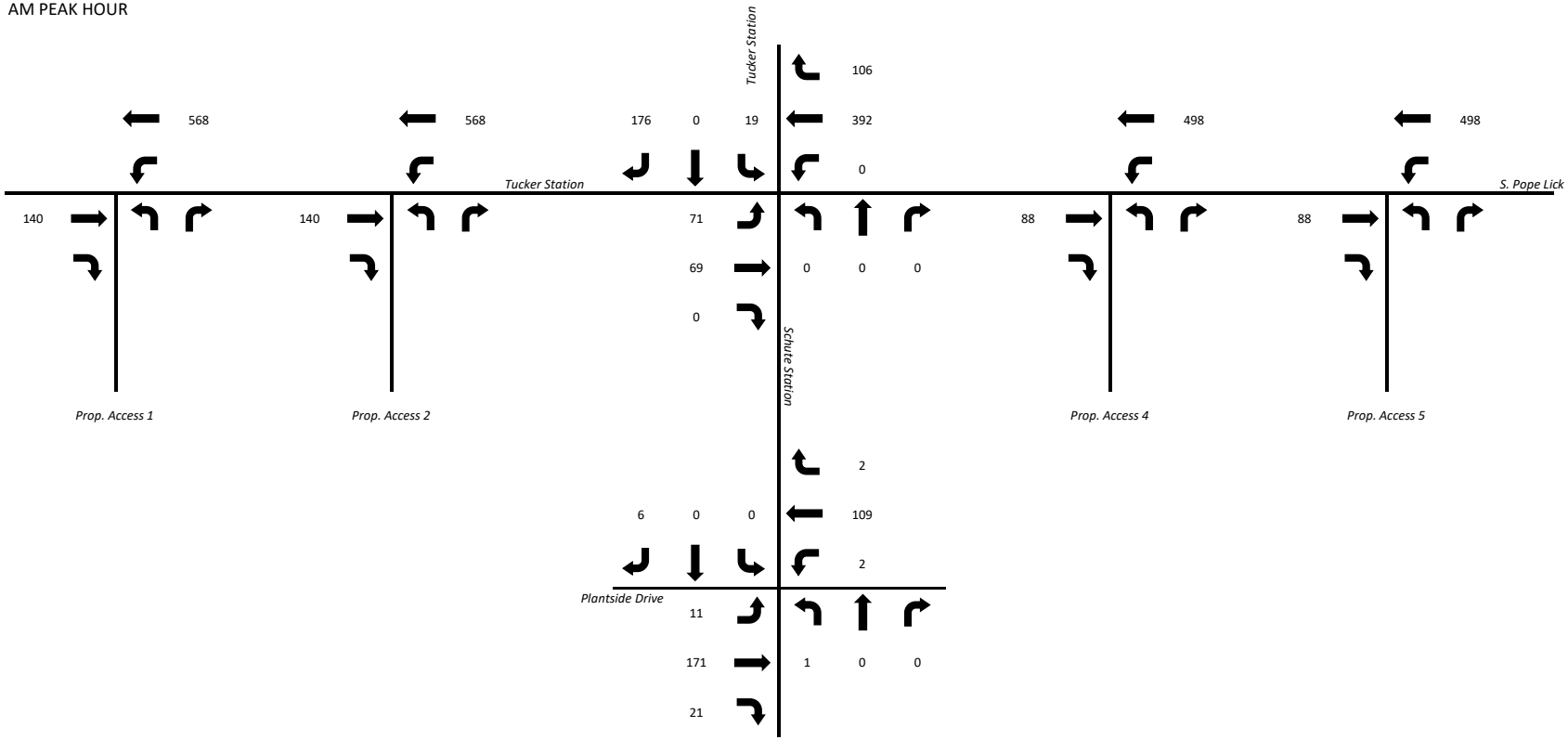
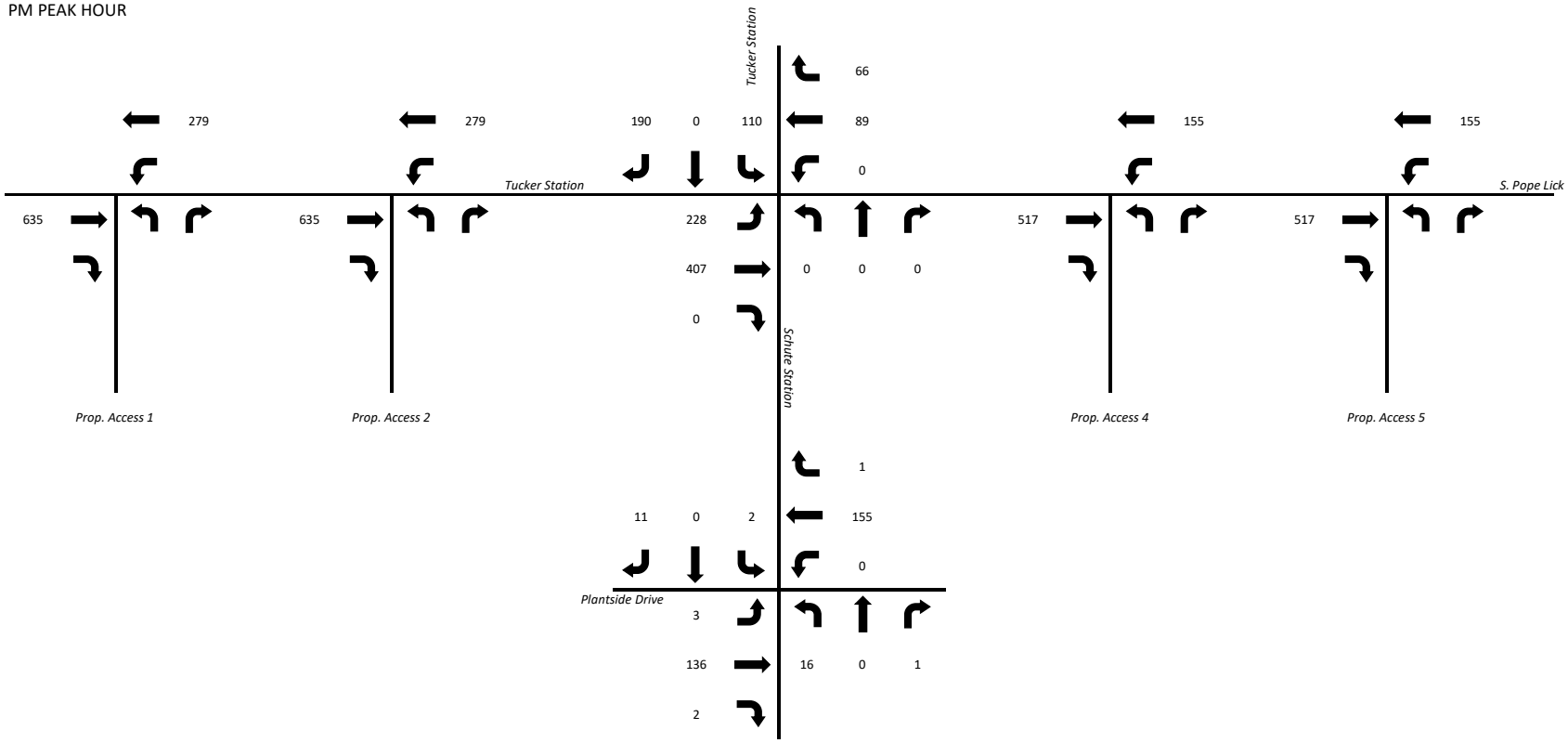


Figure 3: PM Peak Hour Turning Movement Counts



TRAFFIC FORECASTING

Historic traffic counts were not available for S. Pope Lick Road or Tucker Station Road; however, counts were available for Bluegrass Parkway at station 056L91, which is immediately west of the study area. Based on this data, historic traffic patterns indicate a growth rate of 0.43 percent per year. An average growth rate of 0.5% was used for projecting traffic volumes to the year of opening, 2023 and the design year of 2033. **Appendix D** contains the historic traffic data and output from the KYTC Traffic forecasting spreadsheet. AM and PM peak hour volumes for 2023 No Build and 2033 No Build traffic volumes are summarized in **Figures 4, 5, 6 and 7**.

TRIP GENERATION

Trip Generation was conducted in accordance with the ITE Trip Generation Web Based App, 11th edition. Trip Generation utilized **ITE Land Use Code 130 Industrial Park**. This land use provides a higher trip generation than strictly warehousing or distribution land uses in the event some manufacturing or other industrial use was housed in the development. Based on this land use and the 1M s.f. gross floor area, the development is expected to generate 414 and 405 trips per hour during the AM and PM peak hours of the development. **Table 1** summarizes the trip generation for each proposed tract and **Appendix C** contains output from the ITE Trip Generation Manual.

Table 1: Trip Generation

Land Use	ITE Code	Ind. Var.	Units	AM Peak			Saturday		
				Total	Entering	Exiting	Total	Entering	Exiting
Total				**414**	**359**	**55**	**405**	**85**	**320**
Tract 1	130	196.5	units	81	70	11	79	17	62
Tract 2	130	210	units	86	75	11	84	18	66
Tract 3	130	146.9	units	60	52	8	59	12	47
Tract 4	130	146.9	units	60	52	8	59	12	47
Tract 5	130	310.5	units	127	110	17	124	26	98

TRIP DISTRIBUTION METHODOLOGY

Generated trips were distributed onto the roadway network based on recorded travel patterns on Commerce Parkway and the proposed configuration of the development roadway layout. Total roadway volumes at the approaches to the study area were determined and trips distributed consistently with these total volumes. **Figure 8** shows the area wide trip distributions. The final entering and exiting trip distribution is shown in **Figures 9 and 10**. **Figures 11, 12, 13 and 14** show the final build traffic volumes for AM and PM peak hour turning movement for 2023 and 2033.

Figure 4: AM Peak 2023 No Build Traffic Volumes

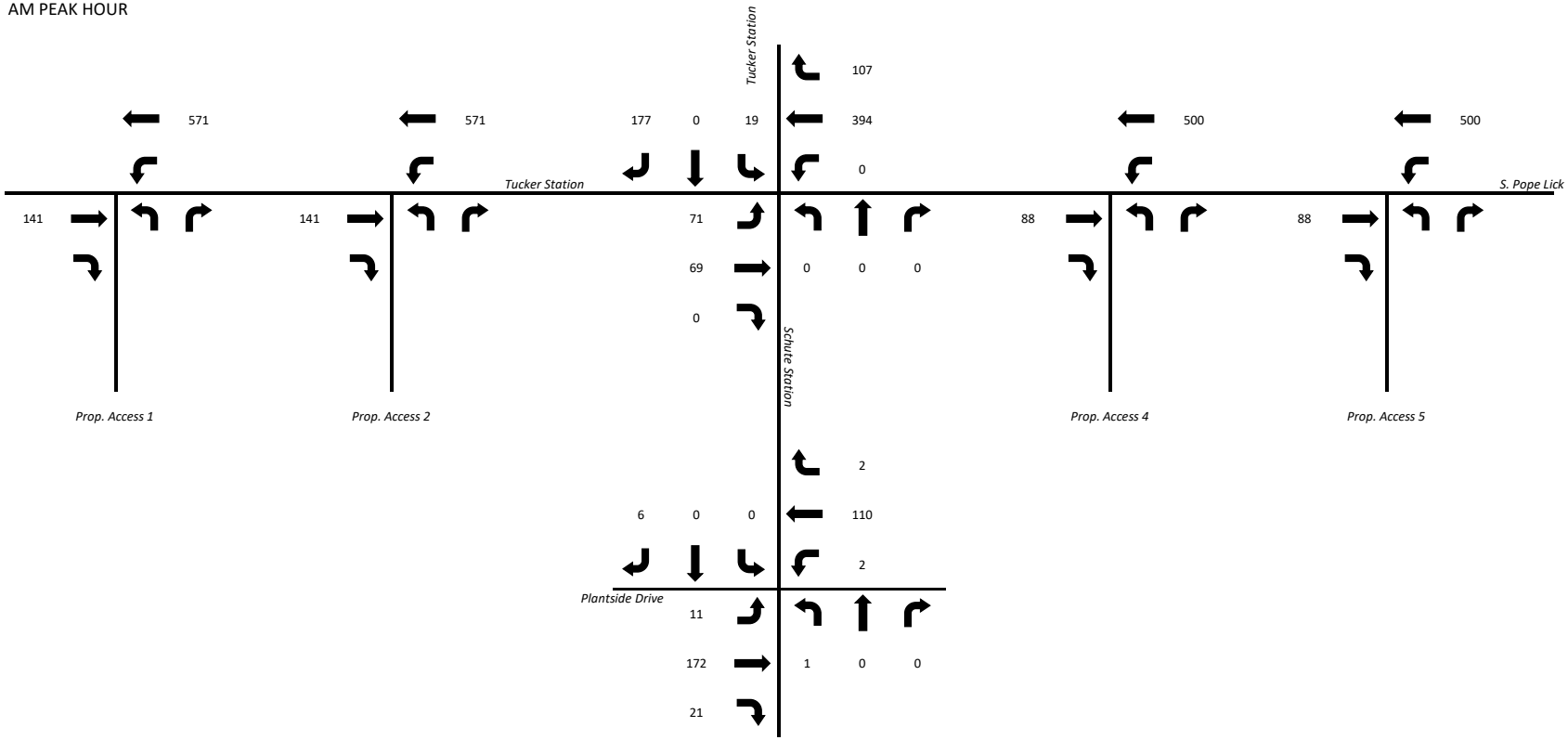


Figure 5: PM Peak 2023 No Build Traffic Volumes

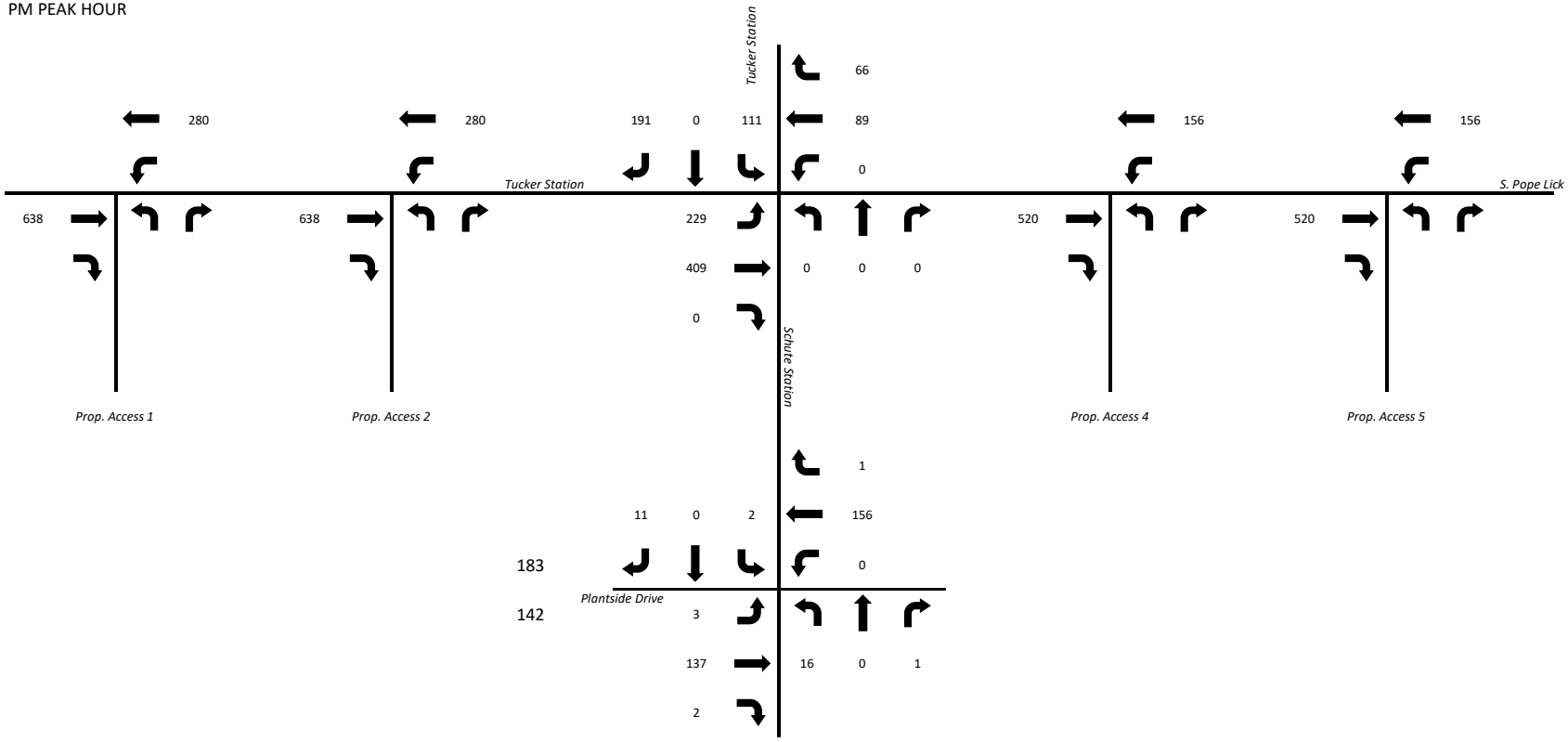


Figure 6: AM Peak 2033 No Build Traffic Volumes

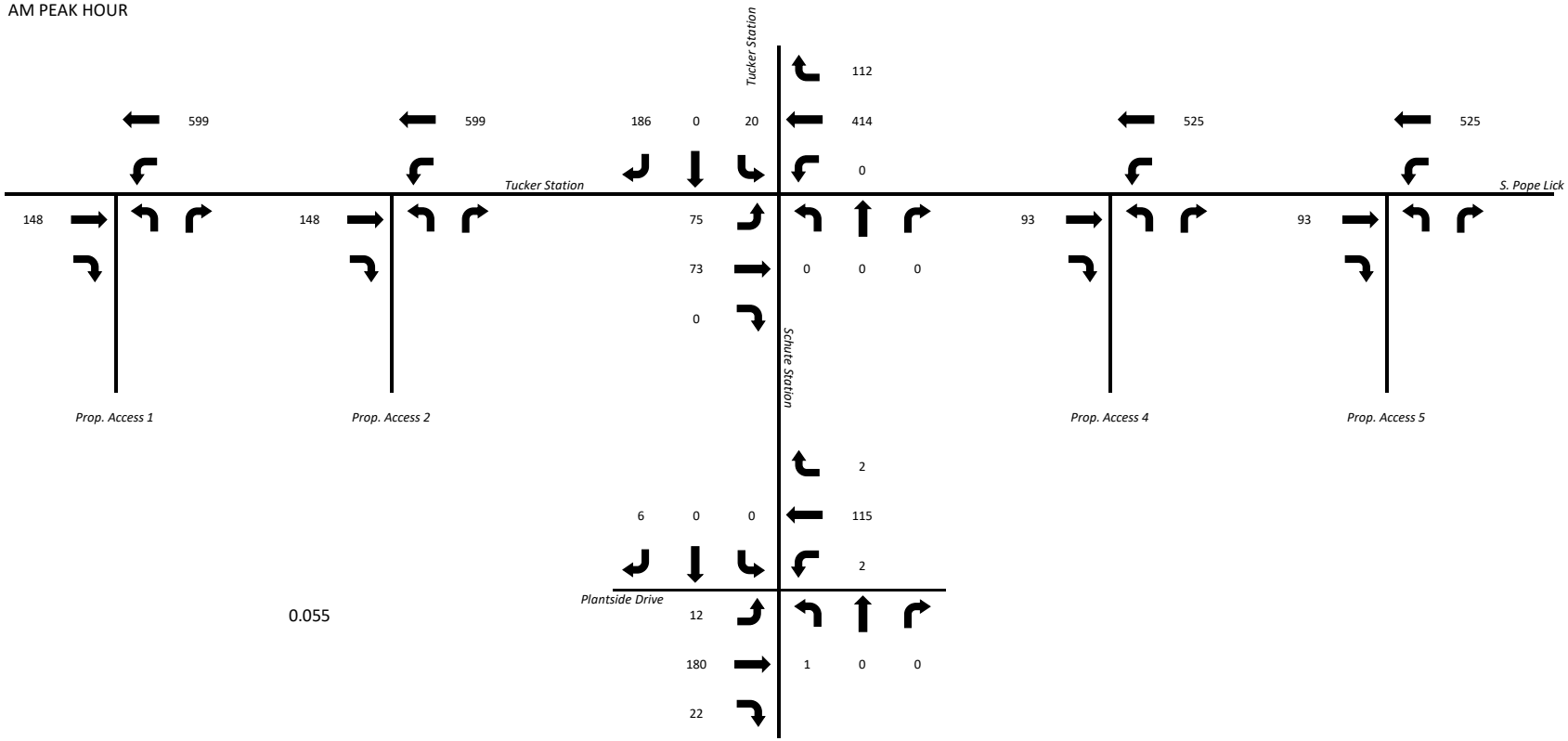


Figure 7: PM Peak 2033 No Build Traffic Volumes

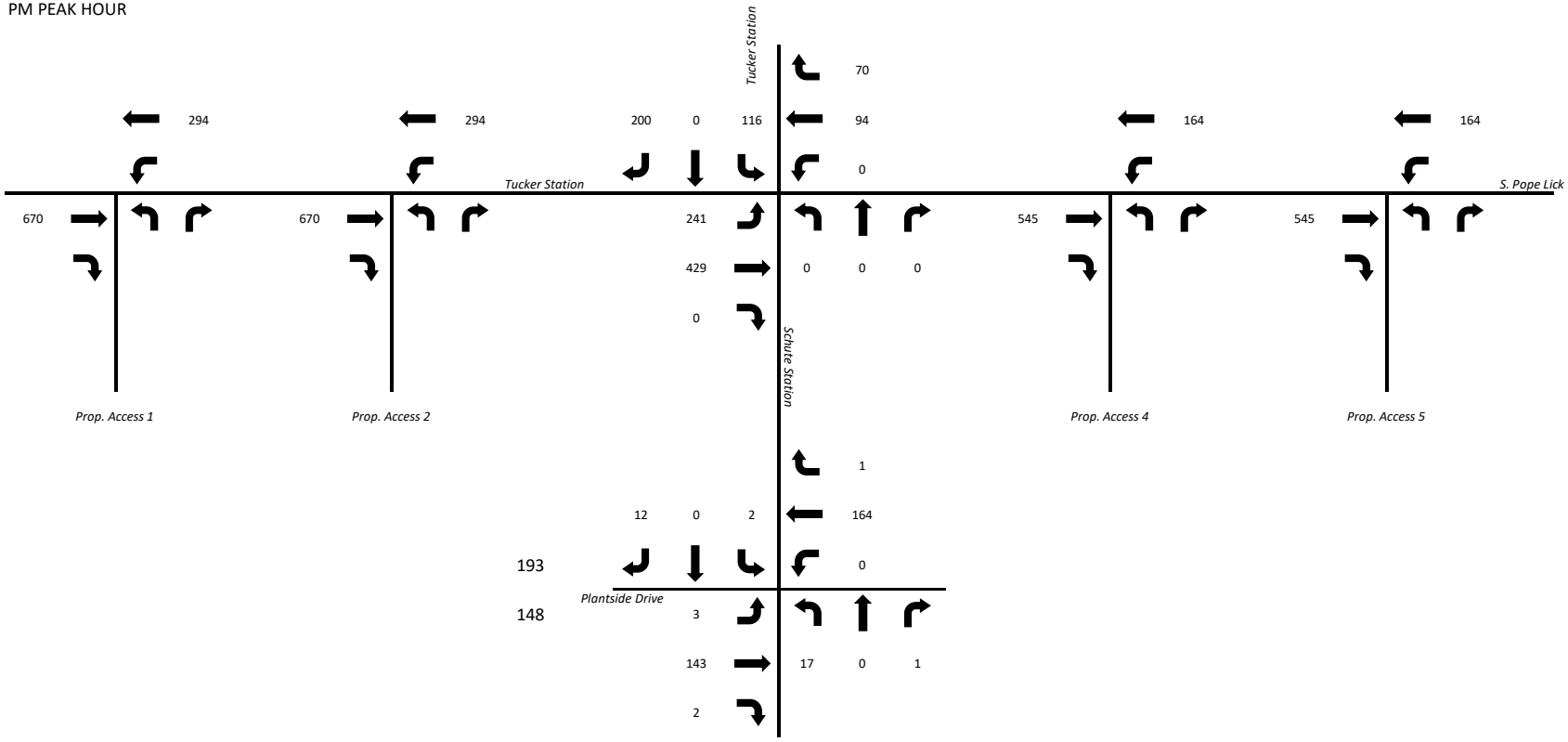


Figure 8: Area-wide Origin-Destination Trip Distribution

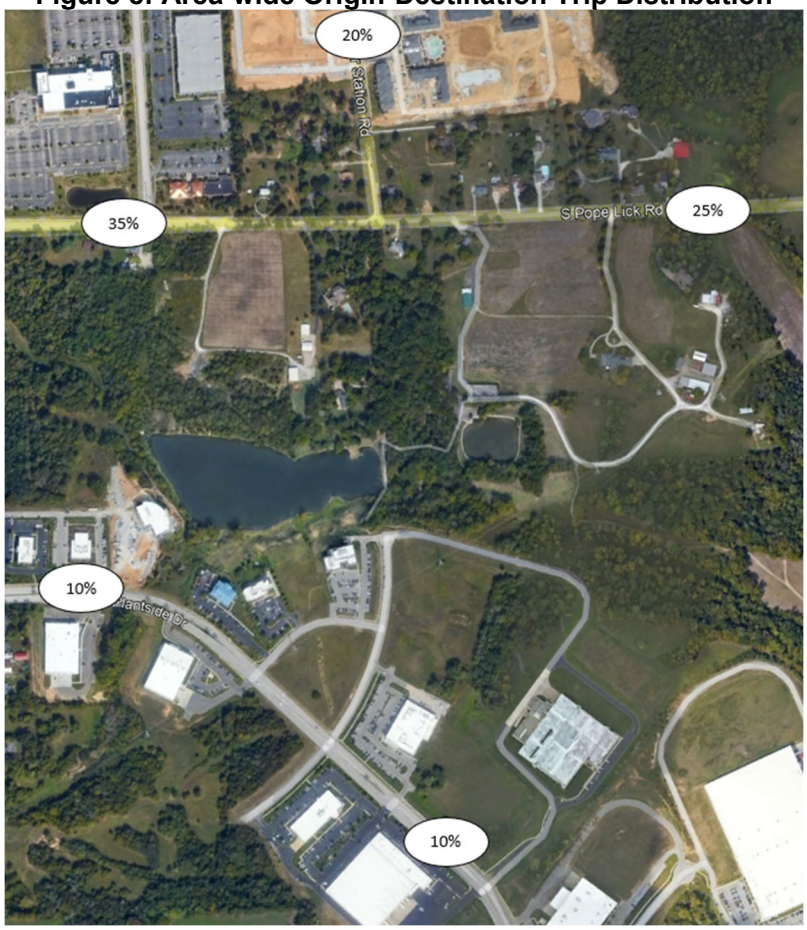


Figure 9: Entering Trip Distribution

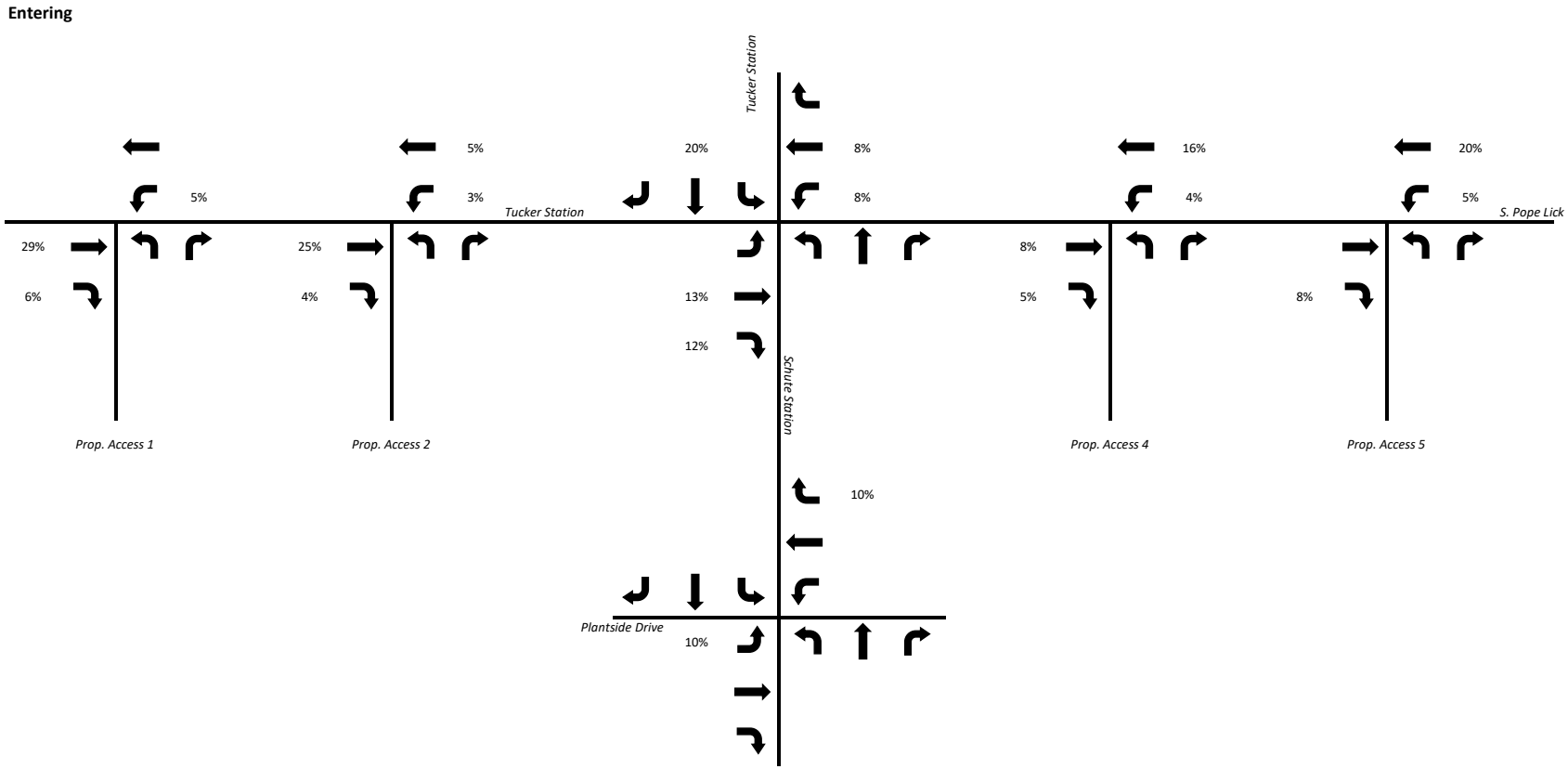


Figure 10: Exiting Trip Distribution

Exiting

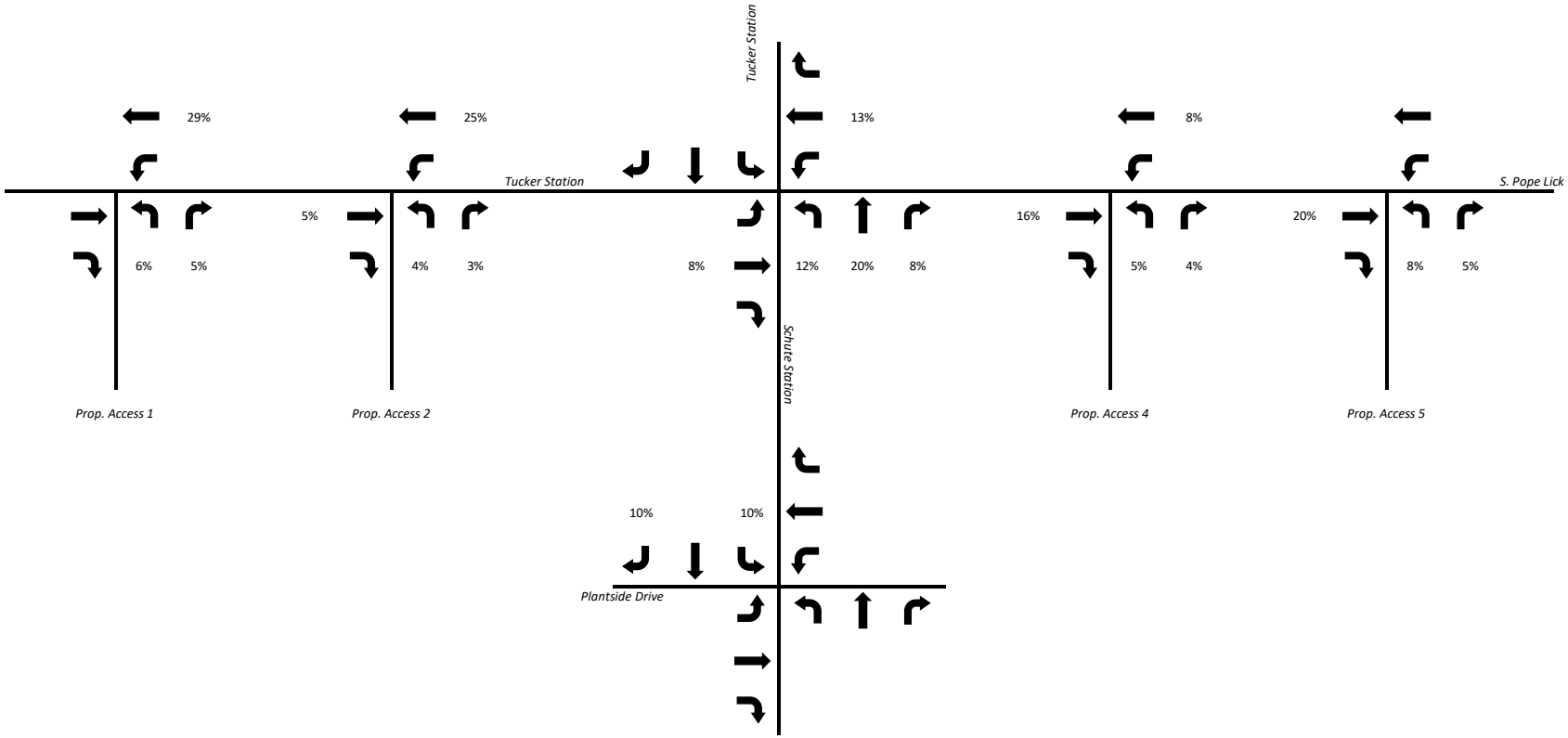


Figure 11: AM Peak Hour 2023 Build

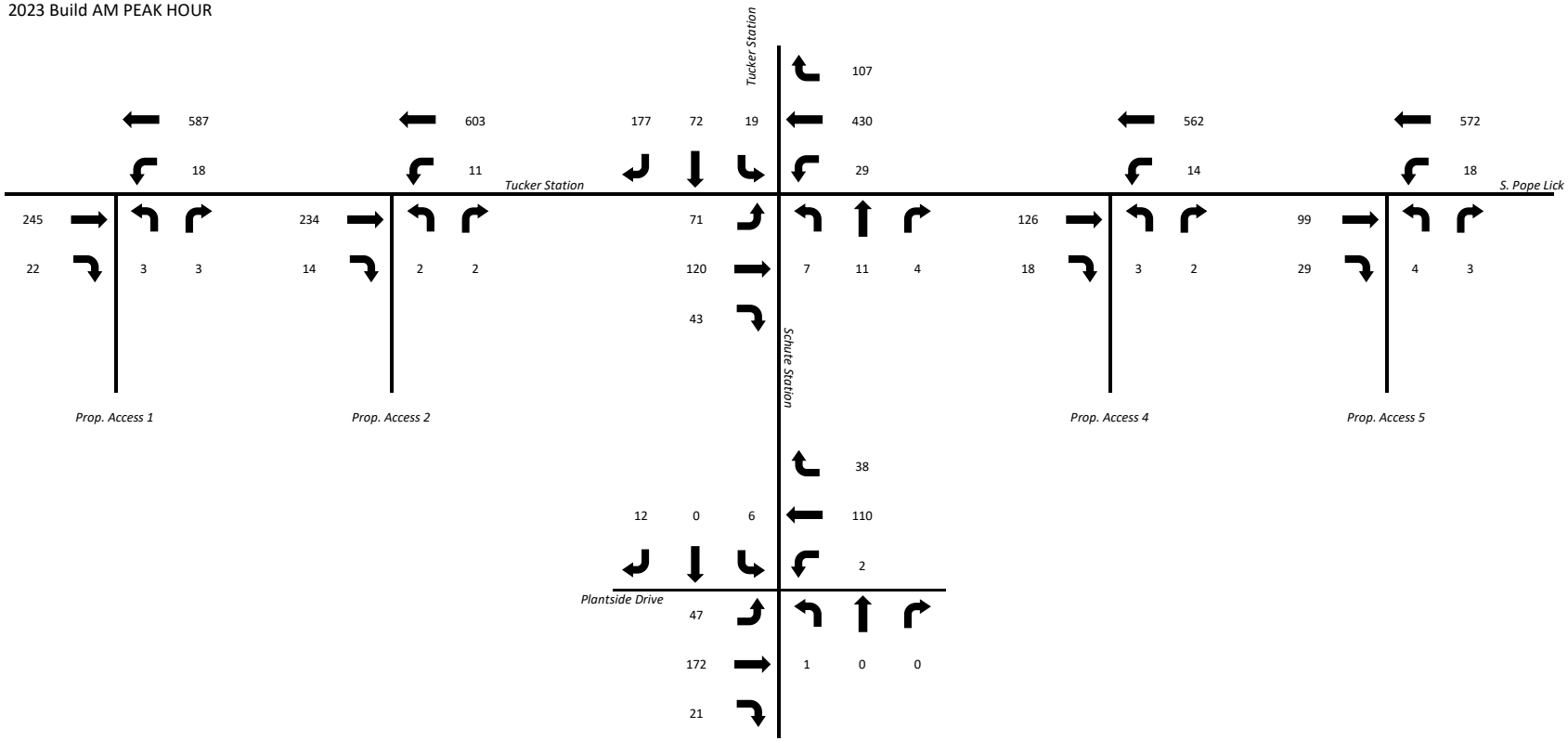


Figure 12: PM Peak Hour 2023 Build

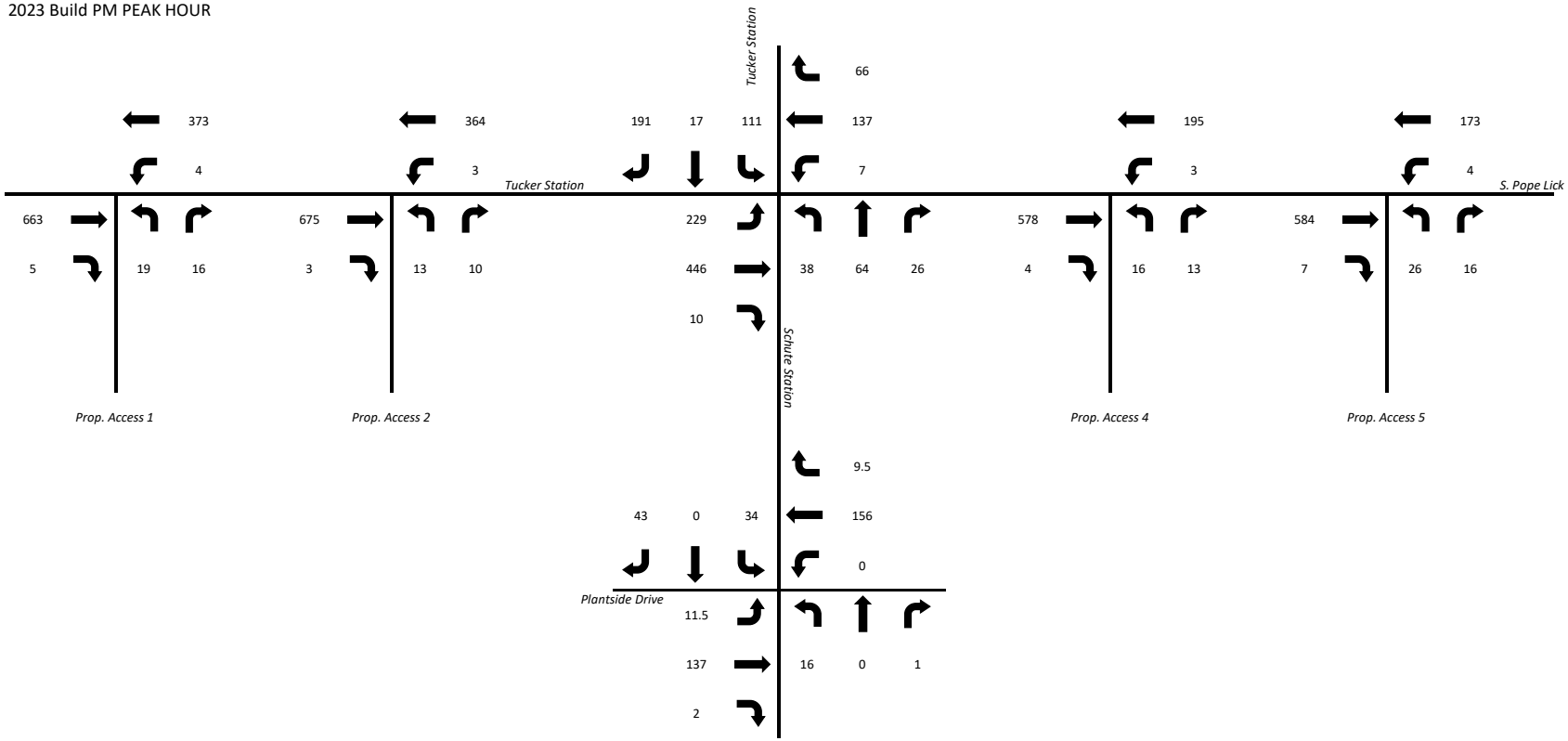


Figure 13: AM Peak Hour 2033 Build

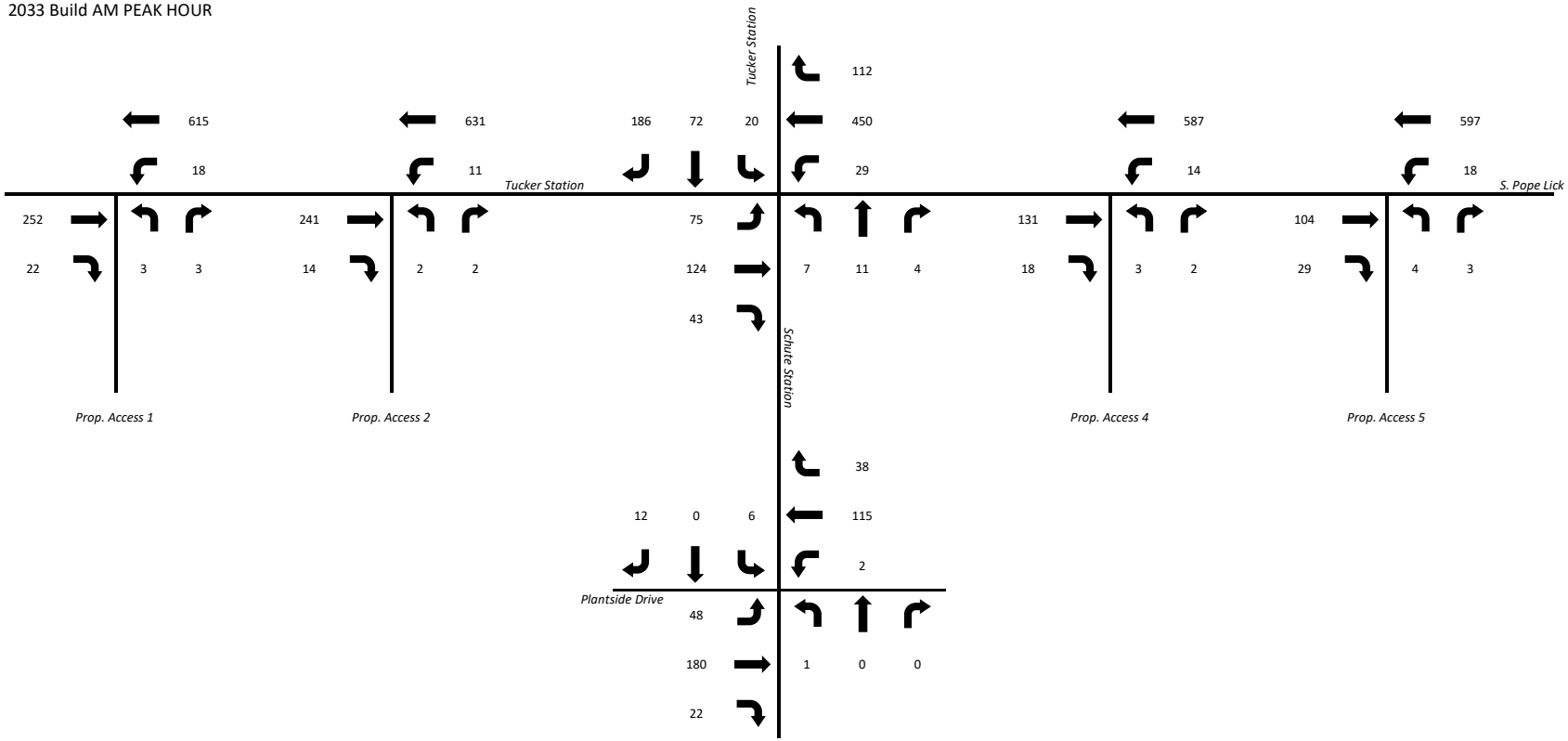
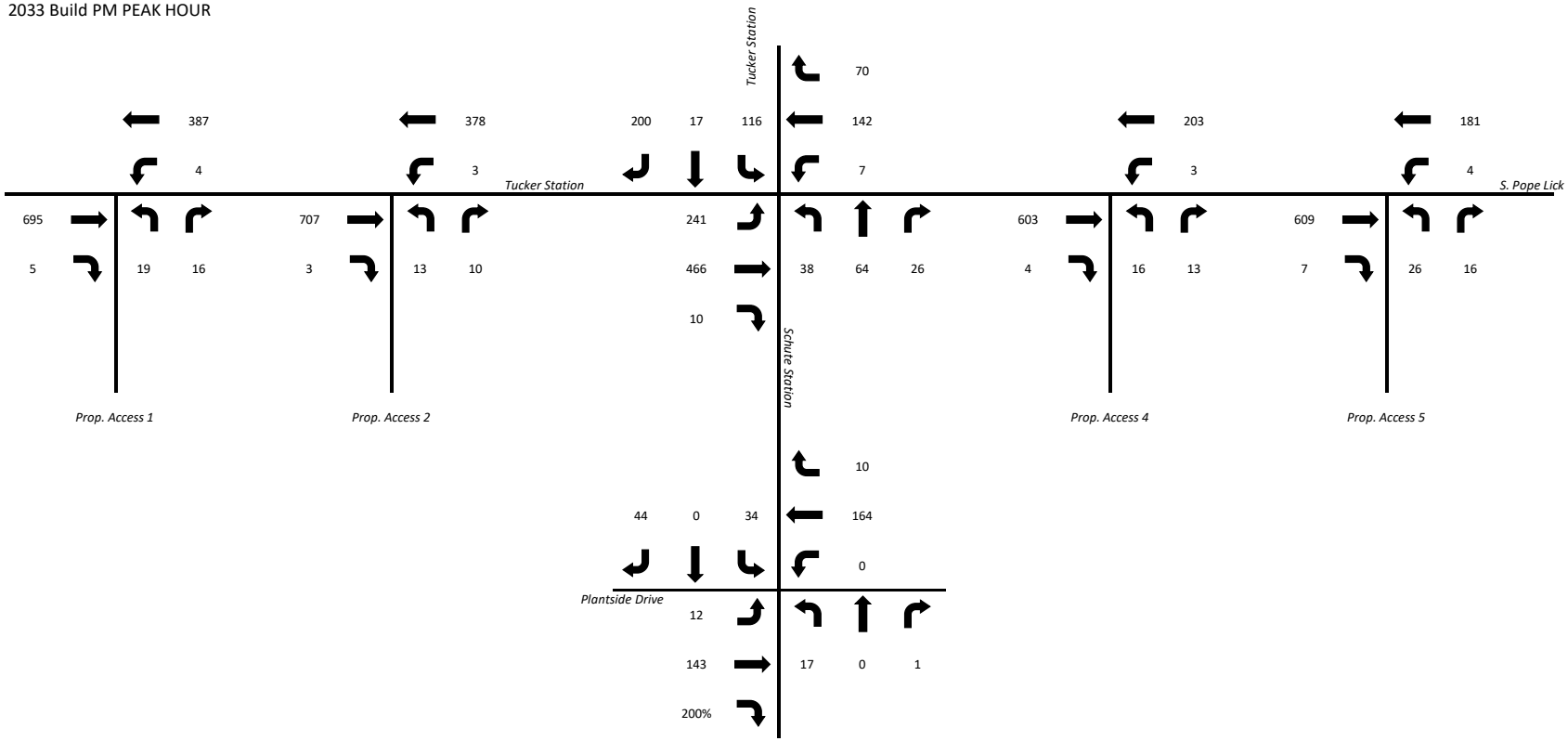


Figure 14: PM Peak Hour 2033 Build



CAPACITY ANALYSIS

Capacity analysis for the no build and build scenarios was completed for the study intersections during the AM and PM peak hours using HCM methodologies as applied Synchro Capacity Software version 10. **Table 2** summarizes the LOS, and delay for the No Build and Build scenarios. Full capacity analysis output is provided in **Appendix E**.

As can be seen from the capacity analysis, all access points and the intersection of Schute Station Road and PLantside Drive are shown to operate at acceptable levels of service during all scenarios evaluated. Eastbound Tucker Station Road at S. Pope Lick Road is anticipated to operate at or near capacity under the 2023 demand, as well as all no build and build scenario during the PM peak period. The additional traffic through the intersection will push this intersection over capacity, with the eastbound approach operating at LOS F under the Build Condition. Providing dedicated left turn lanes for all approaches at this intersection, improves the LOS to 'D' with minimal delay of 24.6 seconds during the 2033 Build scenario. The eastbound approach is shown to operate at LOS E with 38.6 seconds of delay which is improved over the no build PM peak period.

TURN LANE WARRANT ANALYSIS

Auxiliary turn lane warrant analysis was conducted for all proposed access points in accordance with KYTC Auxiliary Turn Lane policy, as applied by the Warrant Calcs Interactive excel spreadsheet provided on the KYTC Division of Design website. Based on this analysis, neither a left nor right turn lane is warranted at any access point, during the 2033 AM and PM peak periods. Output from the warrant analysis is provided in **Appendix F**.

RECOMMENDATIONS

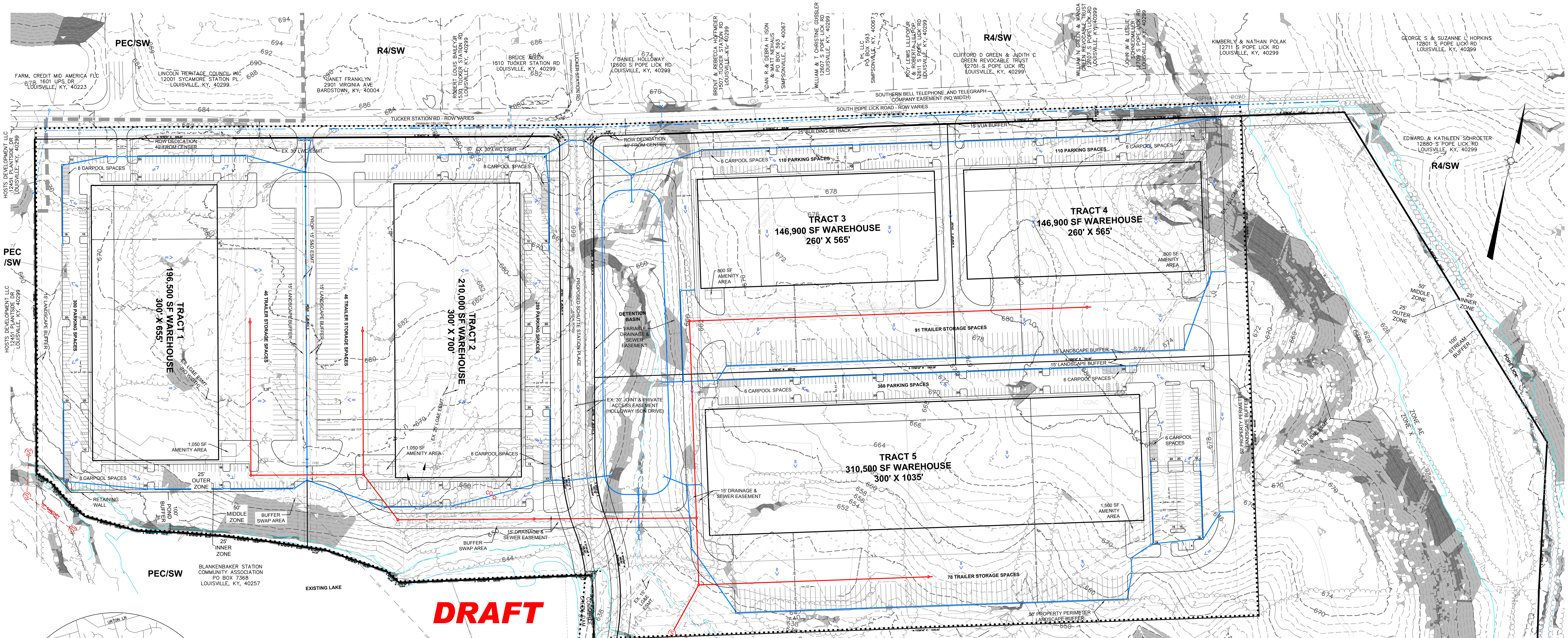
Dedicated left-turn lanes are recommended to improve operations at the intersection of Tucker Station Road and S. Pope Lick Road.

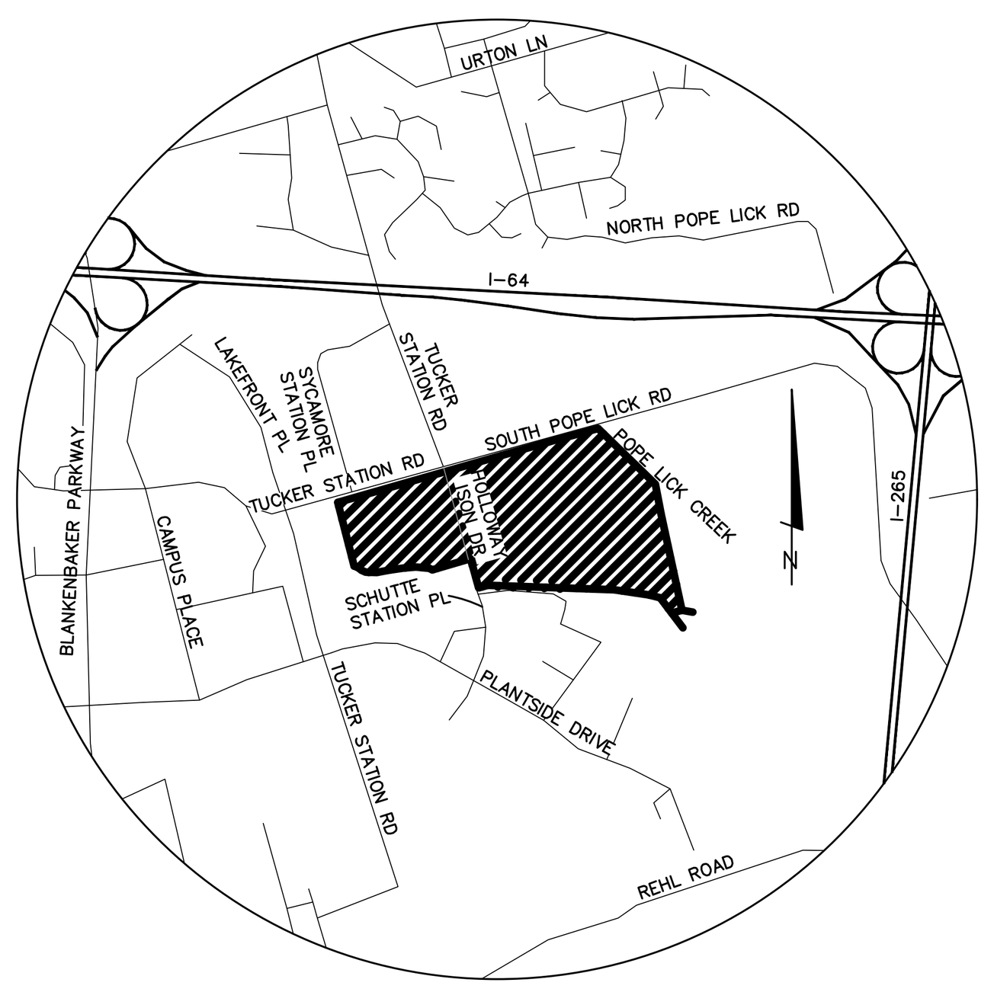
Table 2: Capacity Analysis Summary

AM PEAK HOUR		2023 No Build		2023 Build		2033 No Build		2033 Build	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
S. Pope Lick Road at Tucker Station Road	**Intersection**	**B**	**14.5**	**D**	**25.9**	**C**	**16.0**	**D**	**31.9**
	eastbound (Tucker Station)	A	9.8	B	12.9	B	10.1	B	13.6
	westbound (S. Pope Lick)	C	17.4	E	37.4	C	19.8	E	48.0
	northbound (Shute Station)	A	0.0	B	10.4	A	0.0	B	10.6
	southbound (Tuckjer Station)	B	10.2	B	14.2	B	10.6	C	15.1
Schute Station at Plantside Drive	**Intersection**	-	-	-	-	-	-	-	-
	eastbound LT (Plantside)	A	7.5	A	7.6	A	7.5	A	7.7
	westbound LT (Plantside)	A	7.7	A	7.7	A	7.7	A	7.6
	northbound	B	10.8	B	11.9	B	10.9	B	11.7
	southbound	A	8.7	A	9.7	A	8.7	A	9.8
S. Pope Lick Rd at Access Point 1	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.4	-	-	A	0.4
	northbound (Access 1)	-	-	B	13.9	-	-	B	14.3
S. Pope Lick Rd at Access Point 2	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.3	-	-	A	0.3
	northbound (Access 1)	-	-	B	13.6	-	-	B	14.0
S. Pope Lick Rd at Access Point 4	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.3	-	-	A	0.3
	northbound (Access 1)	-	-	B	12.7	-	-	B	13.0
S. Pope Lick Rd at Access Point 5	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.4	-	-	A	0.4
	northbound (Access 1)	-	-	B	12.6	-	-	B	12.8

PM PEAK HOUR		2023 No Build		2023 Build		2033 No Build		2033 Build	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
S. Pope Lick Road at Tucker Station Road	**Intersection**	**E**	**44.0**	**F**	**91.3**	**F**	**55.6**	**F**	**109.8**
	eastbound (Tucker Station)	F	65.6	F	162.7	F	85.1	F	196.8
	westbound (S. Pope Lick)	B	10.8	B	14.6	B	11.0	C	15.1
	northbound (Shute Station)	A	0.0	B	13.3	A	0.0	B	13.5
	southbound (Tuckjer Station)	C	15.3	C	20.0	C	16.0	C	21.4
Schute Station at Plantside Drive	**Intersection**	-	-	-	-	-	-	-	-
	eastbound LT (Plantside)	A	7.6	A	7.6	A	7.6	A	7.6
	westbound LT (Plantside)	A	0.0	A	0.0	A	0.0	A	0.0
	northbound	B	10.4	B	11.2	B	10.5	B	11.3
	southbound	A	9.0	B	10.1	A	9.1	B	10.2
S. Pope Lick Rd at Access Point 1	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.1	-	-	A	0.1
	northbound (Access 1)	-	-	C	19.7	-	-	C	20.8
S. Pope Lick Rd at Access Point 2	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.1	-	-	A	0.1
	northbound (Access 1)	-	-	C	19.1	-	-	C	20.1
S. Pope Lick Rd at Access Point 4	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.2	-	-	A	0.2
	northbound (Access 1)	-	-	C	15.2	-	-	C	15.7
S. Pope Lick Rd at Access Point 5	**Intersection**	-	-	-	-	-	-	-	-
	westbound (left turn)	-	-	A	0.2	-	-	A	0.2
	northbound (Access 1)	-	-	C	15.8	-	-	C	16.4

APPENDIX A: DEVELOPMENT PLAN





LOCATION MAP

NOT TO SCALE

LOT REQUIREMENTS

	STANDARD EZ-1
MIN. LOT AREA	NONE
MIN. LOT WIDTH	NONE
FRONT YARD	25'
STREET SIDE YARD	25'
REAR YARD	NONE
BUILDING HEIGHT	50'+
MAX. FAR	1.0

LEGEND

- PROP. STORM SEWER
- EX. SANITARY SEWER
- PROP. SANITARY SEWER
- EX. PROPERTY LINE TO BE REMOVED
- EX. GAS LINE
- EX. OVERHEAD UTILITY LINE
- EX. UTILITY POLE
- EX. WATER LINE
- EX. MAJOR CONTOUR
- EX. MINOR CONTOUR
- EX. ZONING BOUNDARY
- PROP. FLOW ARROW
- LIMITS OF DISTURBANCE
- 20–30% SLOPES
- 30%+ SLOPES

SITE DATA

EXISTING ZONING:	R4
PROPOSED ZONING DISTRICT:	PEC
EXISTING FORM DISTRICT:	SUBURBAN WORKPLACE
EXISTING USE:	UNDEVELOPED/SINGLE FAMILY
PROPOSED USE:	INDUSTRIAL/WAREHOUSE
BUILDING HEIGHT:	45'
GROSS SITE AREA (EXCLUDING RESIDUAL TRACT):	74.29 ACS
AREA IN ROW:	3.45 ACS
NET AREA:	70.84 ACS

	TRACT 1	TRACT 2	TRACT 3	TRACT 4	TRACT 5
SITE AREA (SF):	596,253 SF	635,493 SF	489,146 SF	400,886 SF	963,986 SF
BUILDING (SF):	196,500 SF	210,000 SF	146,900 SF	146,900 SF	310,500 SF
FAR:	0.33	0.33	0.30	0.37	0.32

PARKING CALCULATIONS

MIN PARKING REQUIRED: 1 PARKING SPACE/10,000 SF OF BUILDING
MAX PARKING ALLOWED: 1 PARKING SPACE/500 SF OF BUILDING

	MIN. REQUIRED	MAX. ALLOWED	PARKING PROVIDED
TRACT 1:	20 SPACES	393 SPACES	300 SPACES
TRACT 2:	21 SPACES	420 SPACES	289 SPACES
TRACT 3:	15 SPACES	294 SPACES	110 SPACES
TRACT 4:	15 SPACES	294 SPACES	110 SPACES
TRACT 5:	31 SPACES	621 SPACES	360 SPACES
TOTAL:	102 SPACES	2,022 SPACES	1,169 SPACES

(INCLUDING 32 H.C. PARKING SPACES.)

BICYCLE PARKING

MIN BICYCLE PARKING REQUIRED 3 SPACES OR 10% OF REQUIRED PARKING

	REQUIRED	PROVIDED
TRACT 1:	3 SPACES	4 SPACES
TRACT 2:	3 SPACES	4 SPACES
TRACT 3:	3 SPACES	4 SPACES
TRACT 4:	3 SPACES	4 SPACES
TRACT 5:	3 SPACES	4 SPACES

TREE CANOPY CALCULATIONS

	EXISTING CANOPY	PRESERVED CANOPY	TOTAL LOT AREA	TREE CANOPY REQUIRED (25%*)
TRACT 1:	190,489 SF (32%)	0 SF	596,253 SF	149,063 SF
TRACT 2:	162,988 SF (26%)	0 SF	635,493 SF	158,873 SF
TRACT 3:	82,642 SF (17%)	0 SF	489,146 SF	122,287 SF
TRACT 4:	90,957 SF (23%)	0 SF	400,886 SF	100,222 SF
TRACT 5:	232,745 SF (24%)	0 SF	963,986 SF	240,997 SF
TOTAL:	759,821 SF (25%)	0 SF	3,085,746 SF	771,442 SF

* ASSUMING 5% REDUCTION FOR GREEN TECHNOLOGY.

AMENITY AREA

	OFFICE AREA	10% AMENITY REQUIRED	AMENITY PROVIDED
TRACT 1:	9,825 SF	983 SF	1,050 SF
TRACT 2:	10,500 SF	1,050 SF	1,050 SF
TRACT 3:	7,345 SF	735 SF	800 SF
TRACT 4:	7,345 SF	735 SF	800 SF
TRACT 5:	15,525 SF	1,553 SF	1,560 SF

(AMOUNT OF OFFICE SPACE IS AN ESTIMATE. AMENITY AREA SIZES WILL BE ADJUSTED ACCORDINGLY WHEN ARCHITECTURAL PLANS ARE COMPLETE.)

ILA CALCULATIONS

	VUA AREA	7.5% ILA REQUIRED	ILA PROVIDED
TRACT 1:	221,308 SF	16,598 SF	32,831 SF
TRACT 2:	242,820 SF	18,212 SF	60,973 SF
TRACT 3:	250,835 SF	18,813 SF	59,333 SF
TRACT 4:	354,527 SF	26,590 SF	38,101 SF
TRACT 5:	0 SF	0 SF	0 SF

IMPERVIOUS AREA CALCULATIONS

SITE AREA:	4,746,660 SF (108.97 ACS)
EXISTING IMPERVIOUS AREA:	253,544 SF (5.82 ACS)
PROPOSED IMPERVIOUS AREA:	2,066,789 SF (47.45 ACS)
DIFFERENCE:	+1,813,245 SF (41.63 ACS)

GENERAL NOTES

1.) THE DEVELOPMENT LIES IN THE ANCHORAGE/MIDDLETOWN & JEFFERSONTOWN FIRE DISTRICTS.

2.) SIDEWALKS AND ROADWAY PAVEMENT WIDTHS WILL BE PROVIDED AS REQUIRED IN CHAPTER 6 OF THE LAND DEVELOPMENT CODE.

3.) COMPATIBLE UTILITY LINES (ELECTRIC, PHONE, CABLE) SHALL BE PLACED IN A COMMON TRENCH UNLESS OTHERWISE REQUIRED BY APPROPRIATE AGENCIES.

4.) ALL DIMENSIONS SHOWN IN PAVED AREAS ARE FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT UNLESS SHOWN OTHERWISE.

5.) ALL PARKING AREAS, INCLUDING ISLANDS SHALL BE OUTLINED WITH MIN. 6" HT. & W. CONCRETE CURB UNLESS NOTED OTHERWISE.

6.) ALL HANDICAP SITE FEATURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH ACCEPTABLE "A.D.A." REQUIREMENTS FOR HANDICAP ACCESSIBILITY.

7.) ALL SIGNS SHALL BE IN ACCORDANCE WITH CHAPTER 8 OF THE LDC.

8.) CONSTRUCTION PLANS, BOND & PERMIT ARE REQUIRED BY METRO PUBLIC WORKS PRIOR TO CONSTRUCTION APPROVAL.

9.) MITIGATION MEASURES FOR DUST CONTROL SHALL BE IN PLACE DURING CONSTRUCTION TO PREVENT FUGITIVE PARTICULATE EMISSIONS FROM REACHING EXISTING ROADS AND NEIGHBORING PROPERTIES.

10.) ALL SERVICE STRUCTURES SHALL BE SCREENED IN ACCORDANCE WITH CHAPTER 10 OF THE LAND DEVELOPMENT CODE. SERVICE STRUCTURES INCLUDE BUT ARE NOT LIMITED TO: PROPANE TANKS, DUMPSTERS, HVAC UNITS, ELECTRIC TRANSFORMERS AND TELECOM BOXES.

11.) DUMPSTERS WILL BE LOCATED INSIDE THE BUILDING.

12.) BIKE PARKING WILL BE LOCATED INSIDE THE BUILDING OR ON BIKE RACKS AS SHOWN. FINAL DECISIONS WILL BE MADE ONCE TENANTS ARE KNOWN.

13.) STREET TREES WILL BE PROVIDED ON ALL PUBLIC RIGHTS-OF-WAY PER LDC CHAPTER 10 REQUIREMENTS.

14.) ALL EXISTING DRIVES AND STRUCTURES TO BE REMOVED.

15.) LOADING DOCKS ON TRACTS 1 & 2 WILL BE SCREENED FROM THE ROW WITH VEGETATION. LOADING DOCKS ON TRACTS 3-5 WILL BE SCREENED FROM THE ROW BY THE PROPOSED BUILDING.

MSD NOTES

1.) SANITARY SEWER SERVICE PROVIDED BY LATERAL EXTENSION, SUBJECT TO FEES AND ANY APPLICABLE CHARGES.

2.) ONSITE DETENTION WILL BE PROVIDED. POSTDEVELOPED PEAK FLOWS WILL BE LIMITED TO PREDEVELOPED PEAK FLOWS FOR THE 2, 10, 25, AND 100-YEAR STORMS OR TO THE CAPACITY OF THE DOWNSTREAM SYSTEM, WHICHEVER IS MORE RESTRICTIVE.

3.) EROSION & SILT CONTROL: A SOIL AND SEDIMENTATION CONTROL PLAN SHALL BE DEVELOPED AND IMPLEMENTED IN ACCORDANCE WITH MSD AND THE USDA NATURAL RESOURCES CONSERVATION SERVICE RECOMMENDATIONS. DOCUMENTATION OF MSD'S APPROVAL OF THE PLAN SHALL BE SUBMITTED TO THE PLANNING COMMISSION PRIOR TO GRADING AND CONSTRUCTION ACTIVITIES.

4.) THE FINAL DESIGN OF THIS PROJECT MUST MEET ALL MS4 WATER QUALITY REGULATIONS ESTABLISHED BY MSD. SITE LAYOUT MAY CHANGE AT THE DESIGN PHASE DUE TO PROPER SIZING OF GREEN BMPS.

5.) THIS PROPERTY IS LOCATED IN A 100 YEAR FLOOD HAZARD AREA. (FEMA MAP 21111C0049F & 21111C0065F, DECEMBER 5, 2006)

6.) CONSTRUCTION PLANS AND DOCUMENTS SHALL COMPLY WITH LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT'S DESIGN MANUAL AND STANDARD SPECIFICATIONS AND OTHER LOCAL, STATE AND FEDERAL ORDINANCES.

7.) MSD DRAINAGE BOND REQUIRED PRIOR TO CONSTRUCTION PLAN APPROVAL.

8.) IF SITE HAS THRU DRAINAGE, AN EASEMENT PLAT WILL BE REQUIRED PRIOR TO MSD GRANTING CONSTRUCTION PLAN APPROVAL.

9.) KDOW AND USACE APPROVAL REQUIRED PRIOR TO MSD CONSTRUCTION PAN APPROVAL.

EPSC NOTES

THE APPROVED EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) PLAN SHALL BE IMPLEMENTED PRIOR TO ANY LAND-DISTURBING ACTIVITY ON THE CONSTRUCTION SITE. ANY MODIFICATIONS TO THE APPROVED EPSC PLAN MUST BE REVIEWED AND APPROVED BY M.S.D.'S PRIVATE DEVELOPMENT REVIEW OFFICE. EPSC BMPs SHALL BE INSTALLED PER THE PLAN AND M.S.D. STANDARDS.

DETENTION BASINS, IF APPLICABLE, SHALL BE CONSTRUCTED FIRST AND SHALL PERFORM AS SEDIMENT BASINS DURING CONSTRUCTION UNTIL THE CONTRIBUTING DRAINAGE AREAS ARE SEEDED AND STABILIZED.

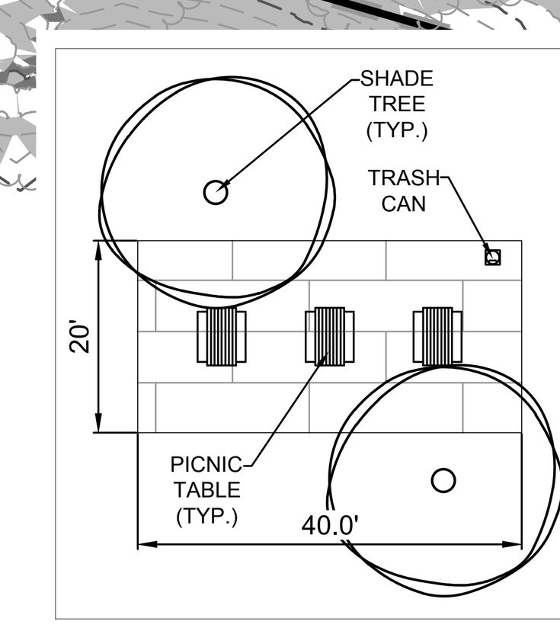
ACTIONS MUST BE TAKEN TO MINIMIZE THE TRACKING OF MUD AND SOIL FROM CONSTRUCTION AREAS ONTO PUBLIC ROADWAYS. SOILS TRACKED ONTO THE ROADWAY SHALL BE REMOVED DAILY.

SOIL STOCKPILES SHALL BE LOCATED AWAY FROM STREAMS, PONDS, SWALES, AND CATCH BASINS. STOCKPILES SHALL BE SEEDED, MULCHED, AND ADEQUATELY CONTAINED THROUGH THE USE OF SILT FENCING.

ALL STREAM CROSSINGS MUST UTILIZE LOW-WATER CROSSING STRUCTURES PER M.S.D. STANDARD DRAWING ER-02.

WHERE CONSTRUCTION OR LAND DISTURBANCE ACTIVITY WILL OR HAS TEMPORARILY CEASED ON ANY PORTION OF A SITE, TEMPORARY SITE STABILIZATION MEASURES SHALL BE REQUIRED AS SOON AS PRACTICABLE, BUT NOT LATER THAN 14 CALENDAR DAYS AFTER THE ACTIVITY HAS CEASED.

SEDIMENT-LADEN GROUNDWATER ENCOUNTERED DURING TRENCHING, BORING, OR OTHER EXCAVATION ACTIVITIES SHALL BE PUMPED TO A SEDIMENT TRAPPING DEVICE PRIOR TO BEING DISCHARGED INTO A STREAM, POND, SWALE, OR CATCH BASIN.



AMENITY AREA DETAIL

SCALE: 1" =20'

EPSC CONCEPT PLAN

- INSTALL SILT FENCE AND TEMPORARY CONSTRUCTION ENTRANCE.
- EXISTING TEMPORARY SEDIMENT BASIN SHALL BE CHECKED & MAINTAINED THROUGHOUT PROJECT.
- BEGIN SITEWORK GRADING AND STORM SEWER CONSTRUCTION.
- INSTALL INLET PROTECTION.
- REMOVE TEMPORARY SEDIMENT BASIN & STABILIZE SITE.
- REMOVE SILT FENCE AND INLET PROTECTION ONCE VEGETATION IS ESTABLISHED.

UTILITY NOTES

1) ALL UTILITIES ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR OR SUBCONTRACTOR SHALL NOTIFY THE UTILITY PROTECTION CENTER "B.U.D." (TOLL FREE PHONE NO. 1-800-382-5544) 48 HOURS IN ADVANCE OF ANY CONSTRUCTION ON THIS PROJECT. THIS NUMBER WAS ESTABLISHED TO PROVIDE ACCURATE LOCATIONS OF EXISTING BELOW GROUND UTILITIES (i.e. CABLES, ELECTRIC WIRES, GAS AND WATER LINES). THE CONTRACTOR SHALL BE RESPONSIBLE FOR BECOMING FAMILIAR WITH ALL UTILITY REQUIREMENTS SET FORTH ON THE PLANS AND IN THE TECHNICAL SPECIFICATIONS AND SPECIAL PROVISIONS.

2) THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXACT LOCATION, NATURE, AND STATUS OF ALL EXISTING UTILITIES WITHIN THE CONSTRUCTION AREA WHETHER SHOWN ON THE PLANS OR NOT, AND SHALL EXTEND, ADJUST OR RECONSTRUCT TO THE SIZE AND LOCATION AS SHOWN ON THE ARCHITECTS PLANS.

OWNERS

MARK & SANDRA HOLLOWAY
1531 TUCKER STATION ROAD
LOUISVILLE, KY 40299
D.B. 5509, PG. 679 & D.B. 8624, PG. 599

LRH, FAMILY LLC
12600 & 12800 S POPE LICK RD
JEFFERSONTOWN, KY, 40299
NO DEED LISTED
D.B. 12251, PG. 215L; D.B. 8380, PG. 453 & D.B. 11646, PG. 629

LOIS R HOLLOWAY REVOCABLE TRUST
12800 S POPE LICK RD
LOUISVILLE, KY, 40299
D.B. 12259, PG. 129

WILLIAM GARY HOLLOWAY
PO BOX 43338
LOUISVILLE, KY, 40253
D.B. 9840, PG. 297; D.B. 8933, PG. 84 & D.B. 6390, PG. 985

BRIAN & ANNETTE WHITCOMB
1711 TUCKER STATION RD
LOUISVILLE, KY, 40299
D.B. 6947, PG. 245

HHOP PARTNERS, LLC
12451 PLANTSIDE DR
LOUISVILLE, KY, 40299
D.B. 11888, PG. 937 & D.B. 11888, PG. 932

GRAPHIC SCALE 0 25 50 100 200

CASE # 22-ZONEPA-0026
WM # 6924/22 1039

SABAK, WILSON & LINGO, INC
ENGINEERS, LANDSCAPE ARCHITECTS & PLANNERS
THE HENRY CLAY 608 S. THIRD STREET, LOUISVILLE, KENTUCKY 40202 (502) 584 - 6271

NO.	REVISION	DATE
1	NEIGHBORHOOD MEETING #2	06/30/22

SHEET TITLE: DETAILED DEVELOPMENT & MAJOR PRELIMINARY SUBDIVISION PLAN

PROJECT TITLE: XEBEC TUCKER STATION
1525, 1531, 1601, 1701, 1705, & 1711 TUCKER STATION ROAD; 12600, 12604, 12800, 12850, & 1704 S. POPE LICK ROAD; & HOLLOWAY ISON DRIVE
LOUISVILLE, KY 40299
TAX BLOCK 3672, LOTS 1, 3, & 7; TAX BLOCK 39, LOTS 205, 262, 410, 438, & 471; TAX BLOCK 40, LOTS 306, 363, 364, & 365

DEVELOPER: XEBEC PURSUITS, LLC
2100 ROSS AVENUE, SUITE 895, DALLAS, TX 75201

JOB NO.	3294
SCALE:	1"=100'
DATE:	06/03/2022
DRAWING NO:	DDP

SHEET 1 OF 1

K:\JOBS\3294\Planning\DDP\3294-DDP, 30X42, Kelli Jones, 6/30/2022

APPENDIX B: TRAFFIC DATA

Cummins Consulting Services, LLC
swcummins@ccsdata.com 859-361-2589
"2022 ... Data Collection simplified"

Partly Sunny
Schools in Session

File Name : Plantside_Drive_at_Schutte_Station_Place_05-19-2022
Site Code : Site 2 - Thursday
Start Date : 5/19/2022
Page No : 1

Groups Printed- Cars - Buses - Trucks

	Schutte Station Place From North					Plantside Drive From East					Schutte Station Place From South					Plantside Drive From West					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
07:00 AM	0	0	1	0	1	0	23	0	0	23	0	0	0	0	0	5	29	0	0	34	58
07:15 AM	0	0	0	0	0	1	14	0	0	15	1	0	0	0	1	3	28	7	0	38	54
07:30 AM	0	0	4	0	4	0	25	0	0	25	0	0	0	0	0	3	44	4	0	51	80
07:45 AM	0	0	1	0	1	1	27	0	0	28	0	0	0	0	0	0	43	6	0	49	78
Total	0	0	6	0	6	2	89	0	0	91	1	0	0	0	1	11	144	17	0	172	270
08:00 AM	0	0	1	0	1	1	25	2	0	28	0	0	0	0	0	5	38	9	0	52	81
08:15 AM	0	0	0	0	0	0	32	0	0	32	1	0	0	0	1	3	46	2	0	51	84
08:30 AM	0	0	1	0	1	0	17	0	0	17	0	0	0	0	0	1	43	0	0	44	62
08:45 AM	0	0	0	0	0	0	29	1	0	30	0	0	0	0	0	3	37	1	0	41	71
Total	0	0	2	0	2	1	103	3	0	107	1	0	0	0	1	12	164	12	0	188	298
04:00 PM	0	0	0	0	0	0	45	1	0	46	4	0	1	0	5	0	35	1	0	36	87
04:15 PM	2	0	3	0	5	0	35	0	0	35	1	0	0	0	1	1	42	0	0	43	84
04:30 PM	0	0	3	0	3	0	46	0	0	46	5	0	0	0	5	2	31	1	0	34	88
04:45 PM	0	0	5	0	5	0	29	0	0	29	6	0	0	0	6	0	28	0	0	28	68
Total	2	0	11	0	13	0	155	1	0	156	16	0	1	0	17	3	136	2	0	141	327
05:00 PM	0	0	1	0	1	0	53	0	0	53	1	0	1	0	2	0	31	0	0	31	87
05:15 PM	0	0	1	0	1	0	21	0	0	21	1	0	0	0	1	1	39	0	0	40	63
05:30 PM	0	0	3	0	3	0	39	0	0	39	3	0	0	0	3	0	50	0	0	50	95
05:45 PM	0	0	3	0	3	0	30	0	0	30	1	0	0	0	1	1	45	0	0	46	80
Total	0	0	8	0	8	0	143	0	0	143	6	0	1	0	7	2	165	0	0	167	325
Grand Total	2	0	27	0	29	3	490	4	0	497	24	0	2	0	26	28	609	31	0	668	1220
Apprch %	6.9	0	93.1	0		0.6	98.6	0.8	0		92.3	0	7.7	0		4.2	91.2	4.6	0		
Total %	0.2	0	2.2	0	2.4	0.2	40.2	0.3	0	40.7	2	0	0.2	0	2.1	2.3	49.9	2.5	0	54.8	
Cars	2	0	22	0	24	3	426	2	0	431	22	0	2	0	24	22	491	30	0	543	1022
% Cars	100	0	81.5	0	82.8	100	86.9	50	0	86.7	91.7	0	100	0	92.3	78.6	80.6	96.8	0	81.3	83.8
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Buses	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0.2	0	0	0.1	0.2
Trucks	0	0	5	0	5	0	63	2	0	65	2	0	0	0	2	6	117	1	0	124	196
% Trucks	0	0	18.5	0	17.2	0	12.9	50	0	13.1	8.3	0	0	0	7.7	21.4	19.2	3.2	0	18.6	16.1

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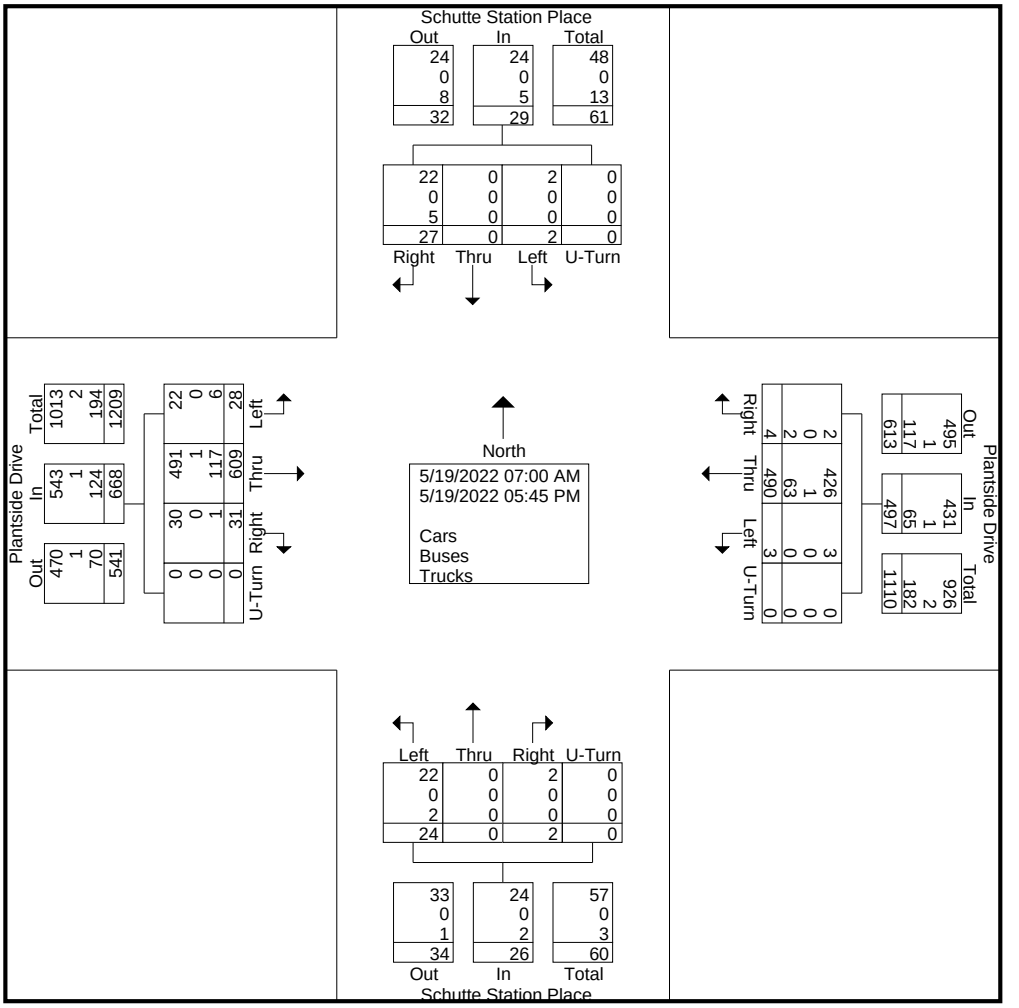
"2022 ... Data Collection simplified"

File Name : Plantside_Drive_at_Schutte_Station_Place_05-19-2022
Site Code : Site 2 - Thursday
Start Date : 5/19/2022
Page No : 2



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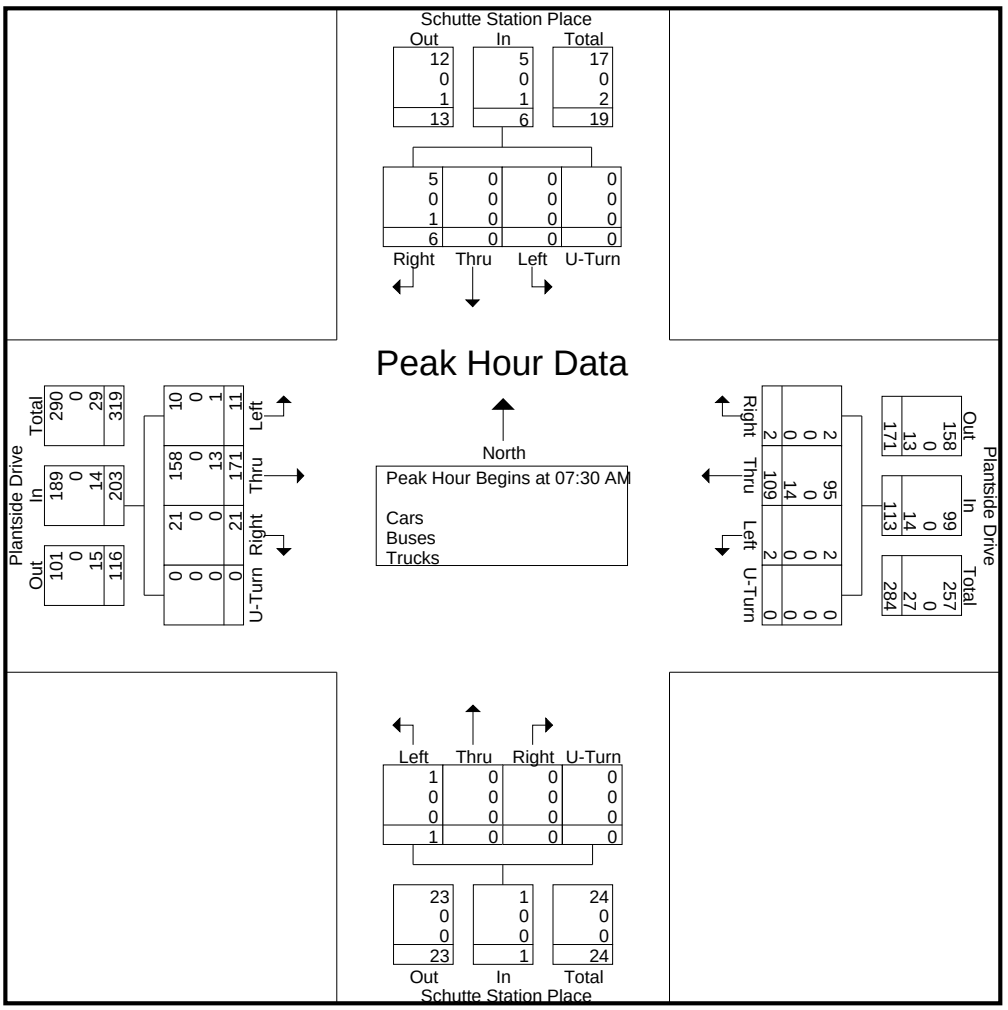
"2022 ... Data Collection simplified"

File Name : Plantside_Drive_at_Schutte_Station_Place_05-19-2022
Site Code : Site 2 - Thursday
Start Date : 5/19/2022
Page No : 3

	Schutte Station Place From North					Plantside Drive From East					Schutte Station Place From South					Plantside Drive From West					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	**4**	0	**4**	0	25	0	0	25	0	0	0	0	0	3	44	4	0	51	80
07:45 AM	0	0	1	0	1	**1**	27	0	0	28	0	0	0	0	0	0	43	6	0	49	78
08:00 AM	0	0	1	0	1	1	25	**2**	0	28	0	0	0	0	0	**5**	38	**9**	0	**52**	81
08:15 AM	0	0	0	0	0	0	**32**	0	0	**32**	**1**	0	0	0	**1**	3	**46**	2	0	51	**84**
Total Volume	0	0	6	0	6	2	109	2	0	113	1	0	0	0	1	11	171	21	0	203	323
% App. Total	0	0	100	0		1.8	96.5	1.8	0		100	0	0	0		5.4	84.2	10.3	0		
PHF	.000	.000	.375	.000	.375	.500	.852	.250	.000	.883	.250	.000	.000	.000	.250	.550	.929	.583	.000	.976	.961
Cars	0	0	5	0	5	2	95	2	0	99	1	0	0	0	1	10	158	21	0	189	294
% Cars	0	0	83.3	0	83.3	100	87.2	100	0	87.6	100	0	0	0	100	90.9	92.4	100	0	93.1	91.0
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	1	0	1	0	14	0	0	14	0	0	0	0	0	1	13	0	0	14	29
% Trucks	0	0	16.7	0	16.7	0	12.8	0	0	12.4	0	0	0	0	0	9.1	7.6	0	0	6.9	9.0



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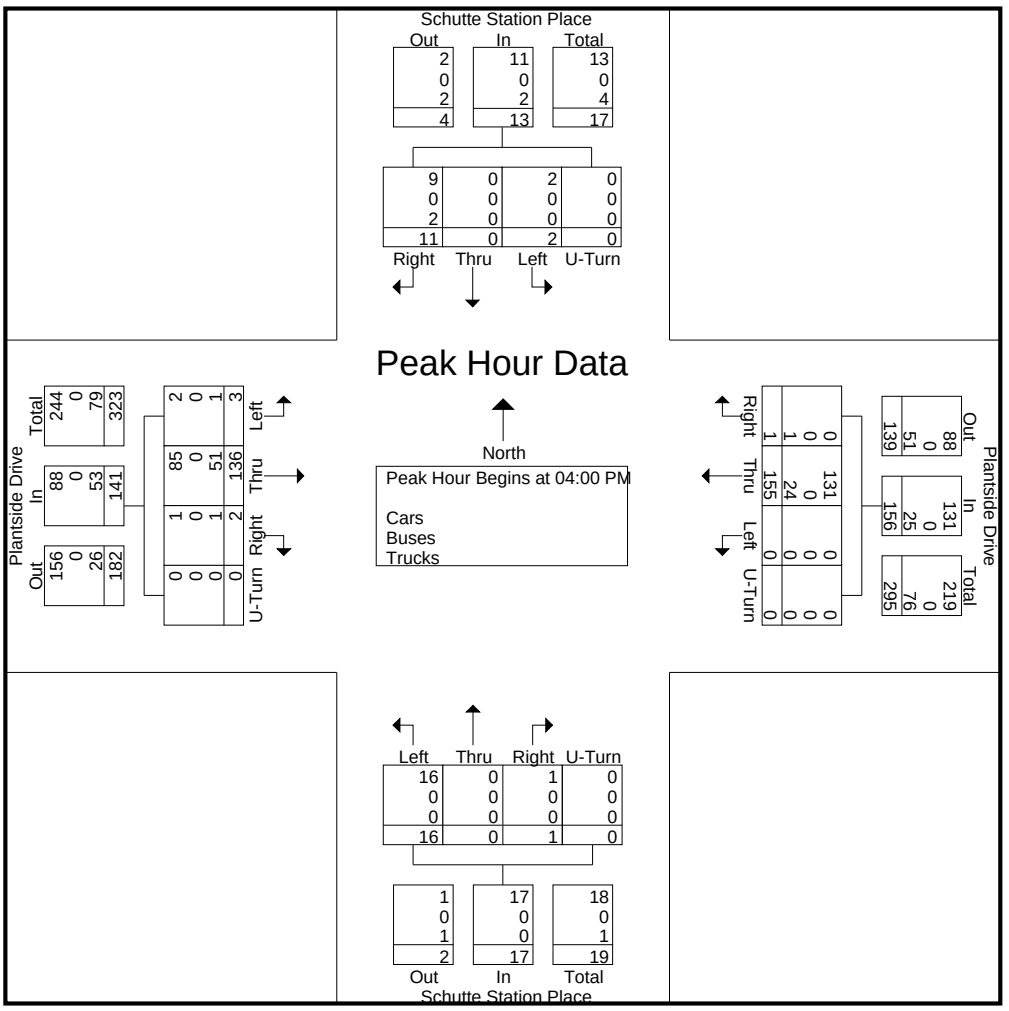
File Name : Plantside_Drive_at_Schutte_Station_Place_05-19-2022
Site Code : Site 2 - Thursday
Start Date : 5/19/2022
Page No : 4

	Schutte Station Place From North					Plantside Drive From East					Schutte Station Place From South					Plantside Drive From West					
Start Time	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Left	Thru	Right	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	45	**1**	0	**46**	4	0	**1**	0	5	0	35	**1**	0	36	87
04:15 PM	**2**	0	3	0	**5**	0	35	0	0	35	1	0	0	0	1	1	**42**	0	0	**43**	84
04:30 PM	0	0	3	0	3	0	**46**	0	0	46	5	0	0	0	5	**2**	31	1	0	34	**88**
04:45 PM	0	0	**5**	0	5	0	29	0	0	29	**6**	0	0	0	**6**	0	28	0	0	28	68
Total Volume	2	0	11	0	13	0	155	1	0	156	16	0	1	0	17	3	136	2	0	141	327
% App. Total	15.4	0	84.6	0		0	99.4	0.6	0		94.1	0	5.9	0		2.1	96.5	1.4	0		
PHF	.250	.000	.550	.000	.650	.000	.842	.250	.000	.848	.667	.000	.250	.000	.708	.375	.810	.500	.000	.820	.929
Cars	2	0	9	0	11	0	131	0	0	131	16	0	1	0	17	2	85	1	0	88	247
% Cars	100	0	81.8	0	84.6	0	84.5	0	0	84.0	100	0	100	0	100	66.7	62.5	50.0	0	62.4	75.5
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks	0	0	2	0	2	0	24	1	0	25	0	0	0	0	0	1	51	1	0	53	80
% Trucks	0	0	18.2	0	15.4	0	15.5	100	0	16.0	0	0	0	0	0	33.3	37.5	50.0	0	37.6	24.5



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Partly Sunny
Schools in Session

File Name : Tucker_Station_Road_at_Pope_Lick_Road_05-19-2022
Site Code : Site 3 - Thursday
Start Date : 5/19/2022
Page No : 1

Groups Printed- Cars - Buses - Trucks

	Tucker Station Road From North				Pope Lick Road From East				Pope Lick Road From West				
Start Time	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Left	Thru	U-Turn	App. Total	Int. Total
07:00 AM	6	17	0	23	38	20	0	58	15	8	0	23	104
07:15 AM	6	40	0	46	86	19	0	105	13	13	0	26	177
07:30 AM	7	38	0	45	84	24	0	108	22	17	0	39	192
07:45 AM	3	53	0	56	122	31	0	153	20	21	0	41	250
Total	22	148	0	170	330	94	0	424	70	59	0	129	723
08:00 AM	3	45	0	48	100	32	0	132	16	18	0	34	214
08:15 AM	3	38	0	41	68	18	0	86	15	16	0	31	158
08:30 AM	7	31	0	38	48	18	0	66	23	15	0	38	142
08:45 AM	6	20	0	26	46	11	0	57	14	5	0	19	102
Total	19	134	0	153	262	79	0	341	68	54	0	122	616
04:00 PM	22	42	0	64	20	14	0	34	45	86	0	131	229
04:15 PM	30	36	0	66	16	12	0	28	42	67	0	109	203
04:30 PM	22	36	0	58	17	9	0	26	37	111	1	149	233
04:45 PM	30	47	0	77	14	19	0	33	54	104	0	158	268
Total	104	161	0	265	67	54	0	121	178	368	1	547	933
05:00 PM	31	47	0	78	20	16	0	36	64	121	0	185	299
05:15 PM	20	45	0	65	21	21	0	42	62	93	0	155	262
05:30 PM	29	51	0	80	34	10	0	44	48	89	1	138	262
05:45 PM	21	42	0	63	18	11	0	29	38	65	0	103	195
Total	101	185	0	286	93	58	0	151	212	368	1	581	1018
Grand Total	246	628	0	874	752	285	0	1037	528	849	2	1379	3290
Apprch %	28.1	71.9	0		72.5	27.5	0		38.3	61.6	0.1		
Total %	7.5	19.1	0	26.6	22.9	8.7	0	31.5	16	25.8	0.1	41.9	
Cars	243	618	0	861	738	279	0	1017	518	839	2	1359	3237
% Cars	98.8	98.4	0	98.5	98.1	97.9	0	98.1	98.1	98.8	100	98.5	98.4
Buses	2	1	0	3	0	3	0	3	2	2	0	4	10
% Buses	0.8	0.2	0	0.3	0	1.1	0	0.3	0.4	0.2	0	0.3	0.3
Trucks	1	9	0	10	14	3	0	17	8	8	0	16	43
% Trucks	0.4	1.4	0	1.1	1.9	1.1	0	1.6	1.5	0.9	0	1.2	1.3

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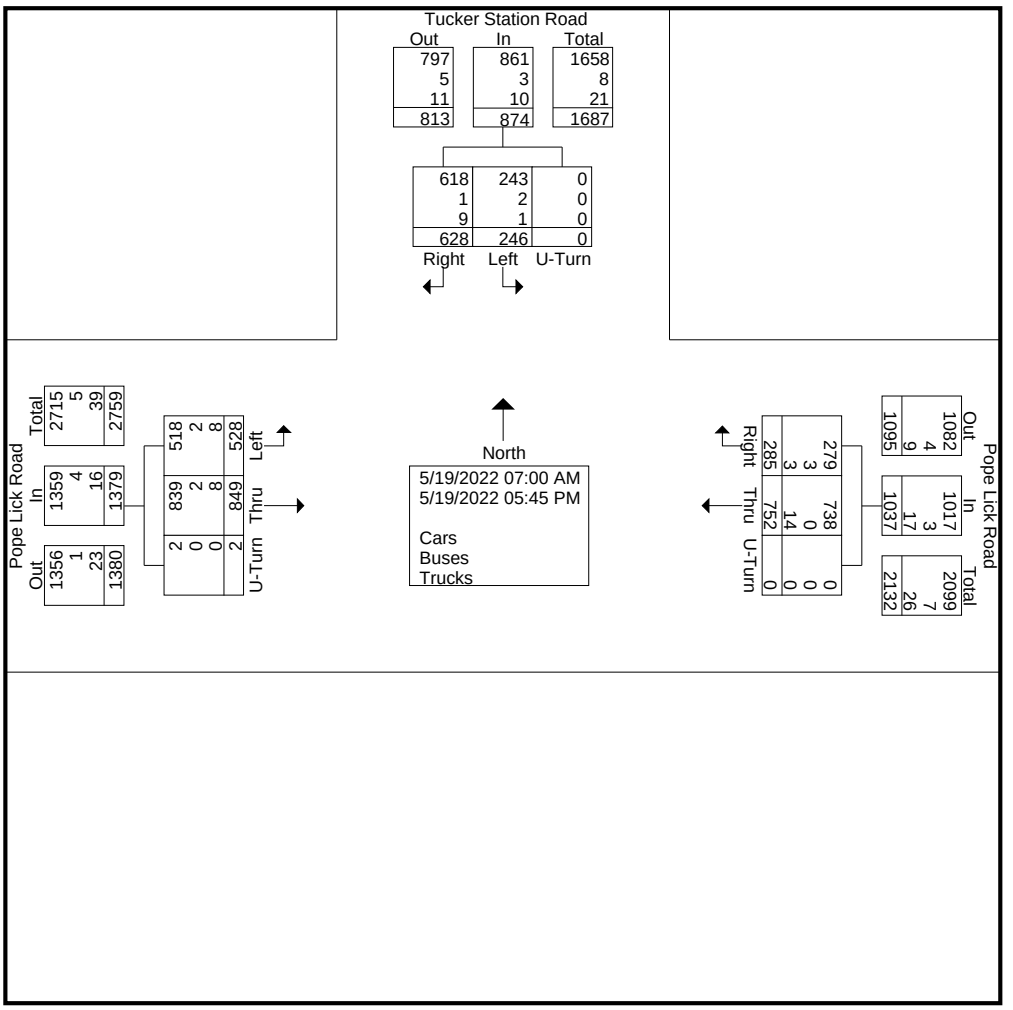
File Name : Tucker_Station_Road_at_Pope_Lick_Road_05-19-2022
Site Code : Site 3 - Thursday
Start Date : 5/19/2022
Page No : 2



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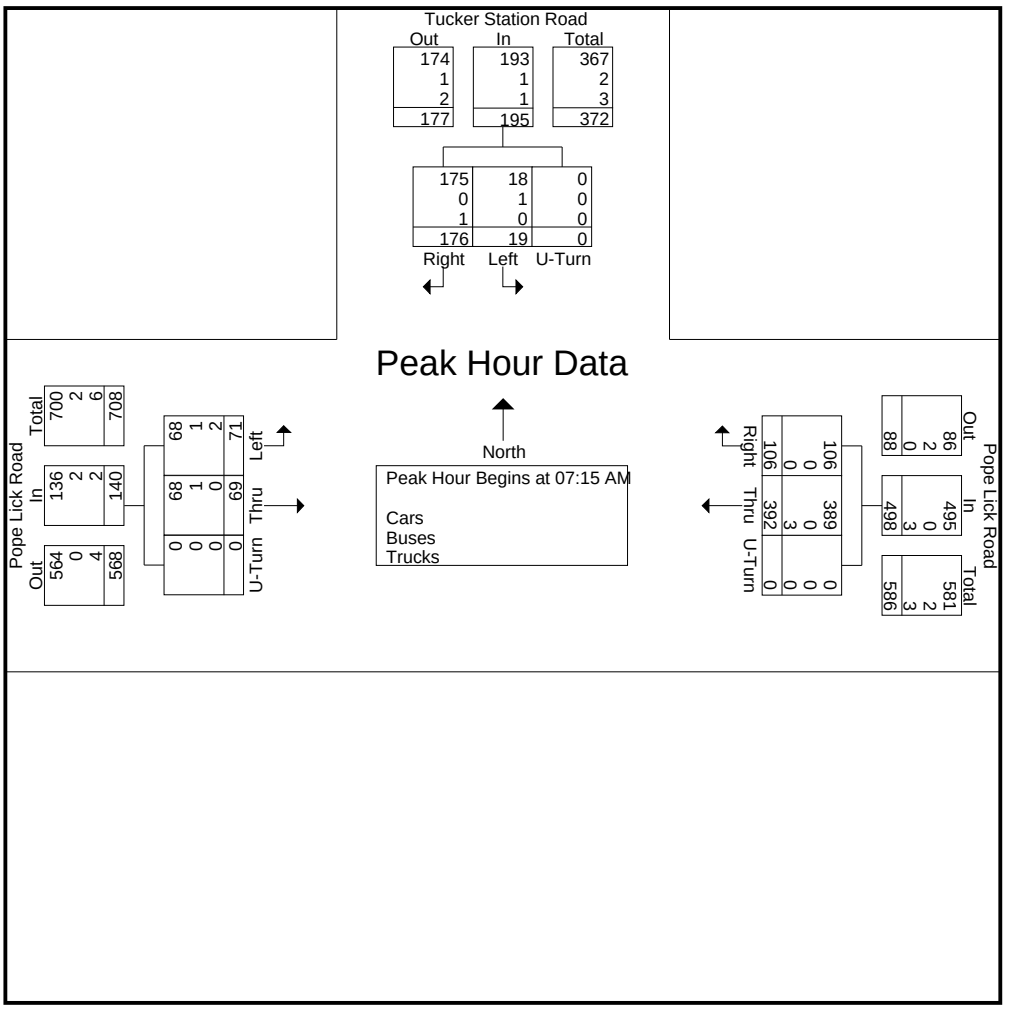
File Name : Tucker_Station_Road_at_Pope_Lick_Road_05-19-2022
Site Code : Site 3 - Thursday
Start Date : 5/19/2022
Page No : 3

	Tucker Station Road From North				Pope Lick Road From East				Pope Lick Road From West				
Start Time	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Left	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	6	40	0	46	86	19	0	105	13	13	0	26	177
07:30 AM	**7**	38	0	45	84	24	0	108	**22**	17	0	39	192
07:45 AM	3	**53**	0	**56**	**122**	31	0	**153**	20	**21**	0	**41**	**250**
08:00 AM	3	45	0	48	100	**32**	0	132	16	18	0	34	214
Total Volume	19	176	0	195	392	106	0	498	71	69	0	140	833
% App. Total	9.7	90.3	0		78.7	21.3	0		50.7	49.3	0		
PHF	.679	.830	.000	.871	.803	.828	.000	.814	.807	.821	.000	.854	.833
Cars	18	175	0	193	389	106	0	495	68	68	0	136	824
% Cars	94.7	99.4	0	99.0	99.2	100	0	99.4	95.8	98.6	0	97.1	98.9
Buses	1	0	0	1	0	0	0	0	1	1	0	2	3
% Buses	5.3	0	0	0.5	0	0	0	0	1.4	1.4	0	1.4	0.4
Trucks	0	1	0	1	3	0	0	3	2	0	0	2	6
% Trucks	0	0.6	0	0.5	0.8	0	0	0.6	2.8	0	0	1.4	0.7



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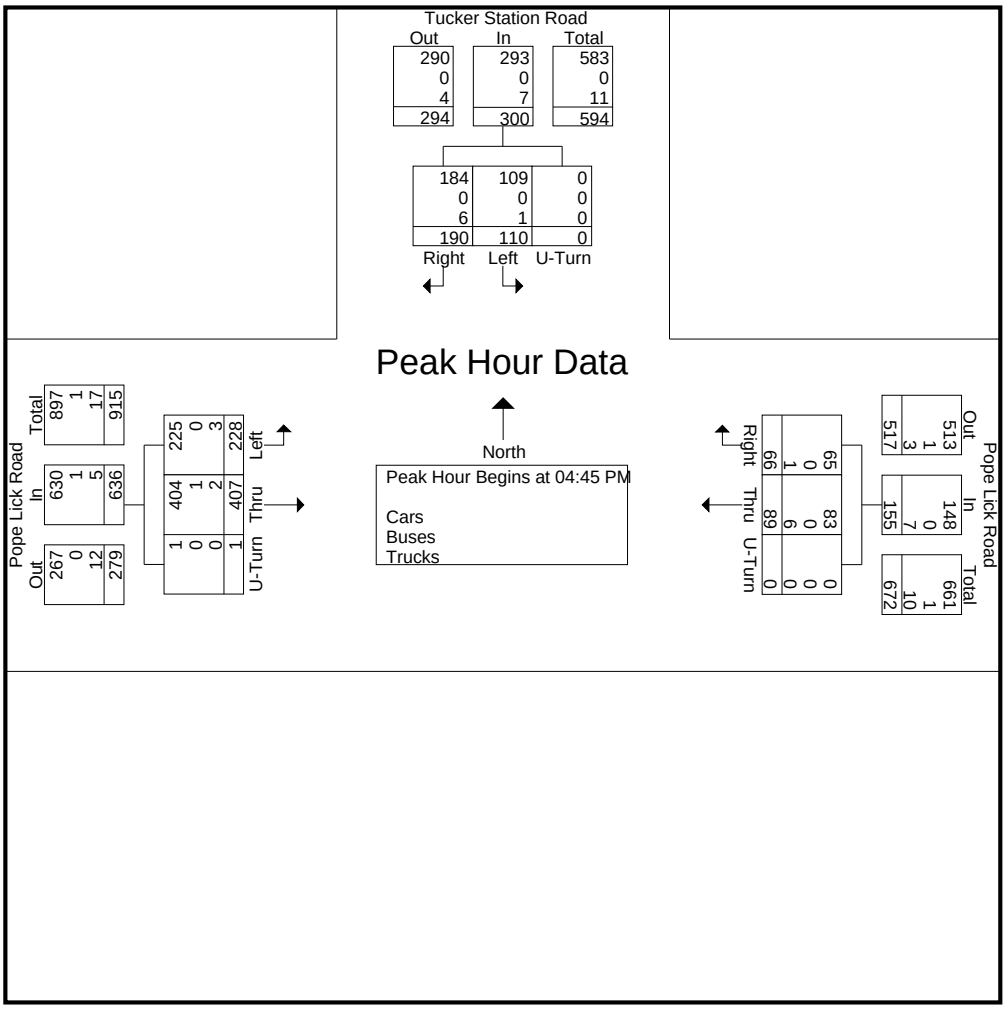
File Name : Tucker_Station_Road_at_Pope_Lick_Road_05-19-2022
Site Code : Site 3 - Thursday
Start Date : 5/19/2022
Page No : 4

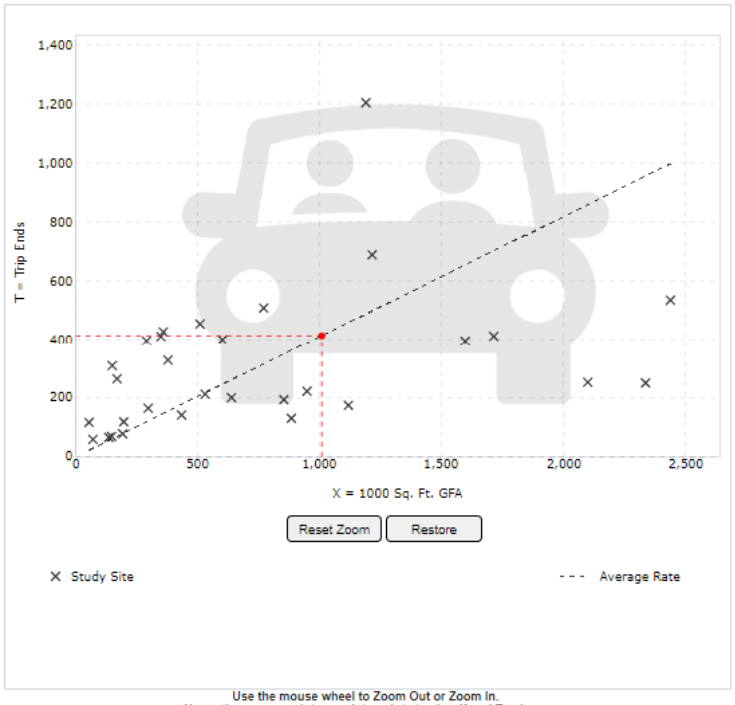
	Tucker Station Road From North				Pope Lick Road From East				Pope Lick Road From West				
Start Time	Left	Right	U-Turn	App. Total	Thru	Right	U-Turn	App. Total	Left	Thru	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	30	47	0	77	14	19	0	33	54	104	0	158	268
05:00 PM	**31**	47	0	78	20	16	0	36	**64**	**121**	0	**185**	**299**
05:15 PM	20	45	0	65	21	**21**	0	42	62	93	0	155	262
05:30 PM	29	**51**	0	**80**	**34**	10	0	**44**	48	89	**1**	138	262
Total Volume	110	190	0	300	89	66	0	155	228	407	1	636	1091
% App. Total	36.7	63.3	0		57.4	42.6	0		35.8	64	0.2		
PHF	.887	.931	.000	.938	.654	.786	.000	.881	.891	.841	.250	.859	.912
Cars	109	184	0	293	83	65	0	148	225	404	1	630	1071
% Cars	99.1	96.8	0	97.7	93.3	98.5	0	95.5	98.7	99.3	100	99.1	98.2
Buses	0	0	0	0	0	0	0	0	0	1	0	1	1
% Buses	0	0	0	0	0	0	0	0	0	0.2	0	0.2	0.1
Trucks	1	6	0	7	6	1	0	7	3	2	0	5	19
% Trucks	0.9	3.2	0	2.3	6.7	1.5	0	4.5	1.3	0.5	0	0.8	1.7



APPENDIX C: TRIP GENERATION DATA

ITE Land Use Code 210 Single Family Residential (AM Peak)

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Industrial Park (130) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
AM Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
30

Avg. 1000 Sq. Ft. GFA:
757

Average Rate:
0.41

Range of Rates:
0.11 - 2.13

Standard Deviation:
0.37

Fitted Curve Equation:
Not Given

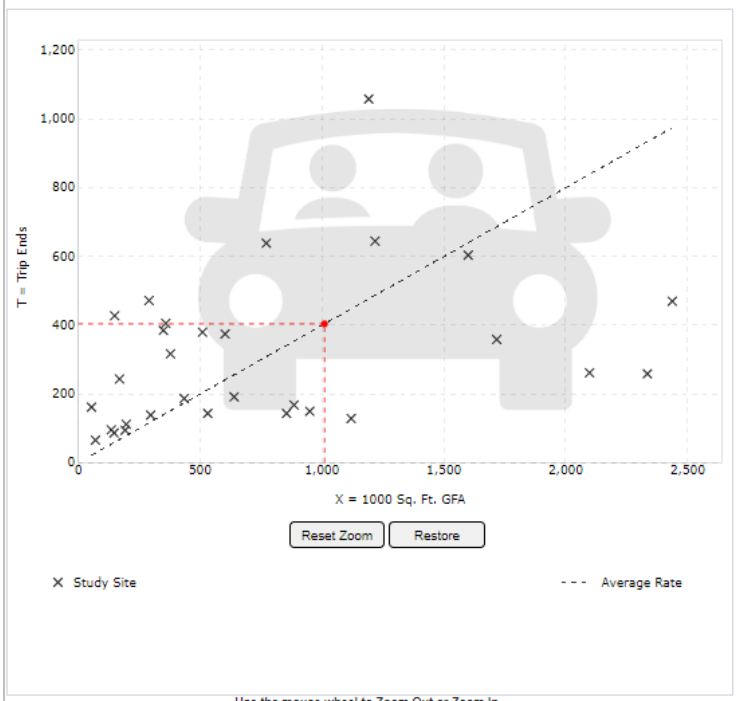
R^2:
****

Directional Distribution:
87% entering, 13% exiting

Calculated Trip Ends:
Average Rate: 414 (Total), 360 (Entry), 54 (Exit)

ITE Land Use Code 210 Single Family Residential (PM Peak)

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Industrial Park (130) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday
PM Peak Hour of Generator

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
30

Avg. 1000 Sq. Ft. GFA:
757

Average Rate:
0.40

Range of Rates:
0.11 - 2.95

Standard Deviation:
0.41

Fitted Curve Equation:
Not Given

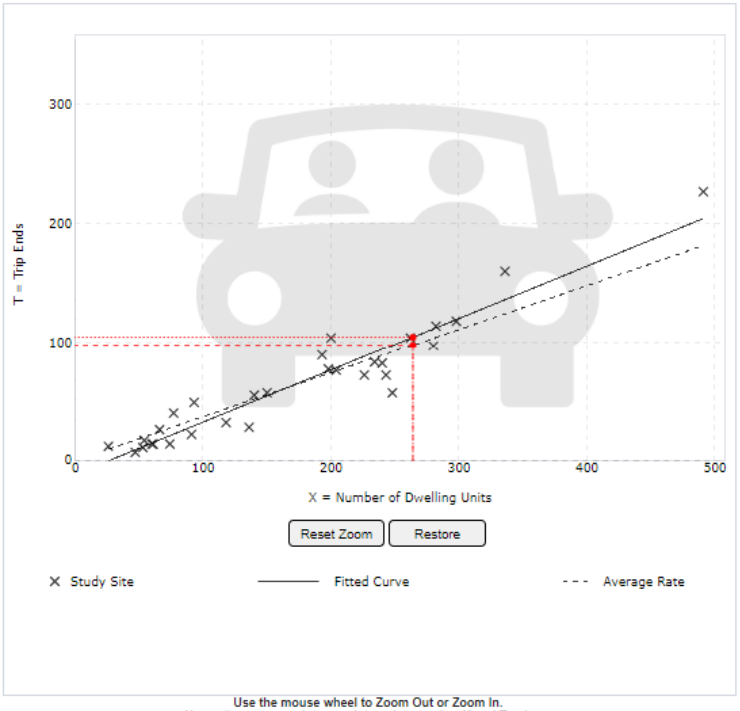
R^2:
****

Directional Distribution:
21% entering, 79% exiting

Calculated Trip Ends:
Average Rate: 404 (Total), 85 (Entry), 319 (Exit)

ITE Land Use Code 221 Multi Family Housing (AM Peak)

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
30

Avg. Num. of Dwelling Units:
173

Average Rate:
0.37

Range of Rates:
0.15 - 0.53

Standard Deviation:
0.09

Fitted Curve Equation:
T = 0.44(X) - 11.61

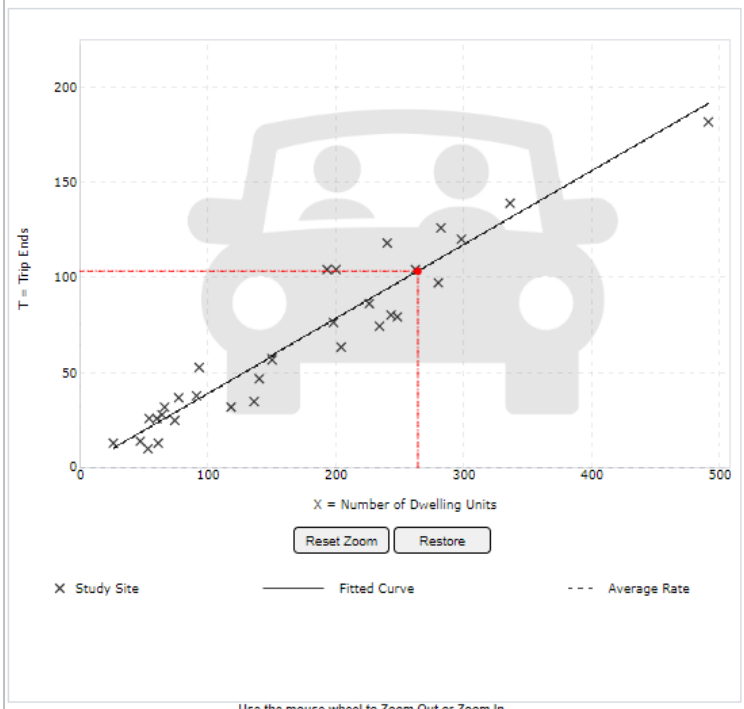
R^2:
0.91

Directional Distribution:
23% entering, 77% exiting

Calculated Trip Ends:
Average Rate: 98 (Total), 22 (Entry), 76 (Exit)
Fitted Curve: 105 (Total), 24 (Entry), 81 (Exit)

ITE Land Use Code 221 Multi Family Housing (PM Peak)

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Multifamily Housing (Mid-Rise) - Not Close to Rail Transit (221) Click for Description and Data Plots

Independent Variable:
Dwelling Units

Time Period:
Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
31

Avg. Num. of Dwelling Units:
169

Average Rate:
0.39

Range of Rates:
0.19 - 0.57

Standard Deviation:
0.08

Fitted Curve Equation:
T = 0.39(X) + 0.34

R^2:
0.91

Directional Distribution:
61% entering, 39% exiting

Calculated Trip Ends:
Average Rate: 103 (Total), 63 (Entry), 40 (Exit)
Fitted Curve: 103 (Total), 63 (Entry), 40 (Exit)

APPENDIX D: TRAFFIC FORECASTING REPORT (EXCERPT)

Count Year	2022	Number of Counts	4
Opening Year	2023		
Design Year	2043	Growth Rate	0.43%
Years Back	15		

KYTC Traffic Count Station #1	
STA ID	056L91
Year	AADT
2022	
2021	
2020	
2019	
2018	7155
2017	
2016	
2015	6939
2014	7634
2013	6701

KYTC Traffic Count Station #2	
STA ID	XXXXXX
Paste Count Data Here	

KYTC Traffic Count Station #3	
STA ID	XXXXXX
Paste Count Data Here	

Historical Traffic Volume Summary
Station Details:

Sta ID:	056L91
Sta Type:	Full Coverage
Map:	MapIt
District:	5
County:	Jefferson
Route:	056-CS-1002H -000
Route Desc:	BLUEGRASS PKWY

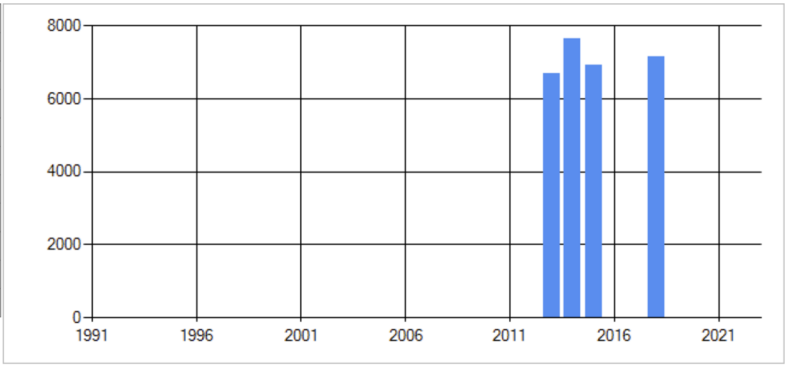
Begin MP:	2.4740
Begin Desc:	KY 913 (BLANKENBAKER PKWY)
End Mp:	2.9270
End Desc:	TUCKER STATION ROAD
Impact Year:	
Year Added:	2012

Newest Count:

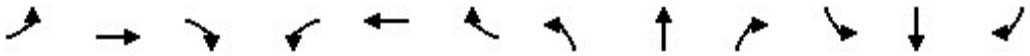
AADT:	7155
Year:	2018
% Single:	
% Combo:	
K Factor:	13
D Factor:	66

Definitions:
Sta. ID - Three digit county number + station number
MP - milepoint
Impact Year – year of significant change to traffic pattern within station segment
AADT – Annual Average Daily Traffic – the annualized average 24-hour volume of vehicles on a segment of roadway
% Single – single unit truck volume as a percentage of the AADT
% Combo – combination truck volume as a percentage of the AADT
K Factor – peak hour volume as a percentage of the AADT
D Factor – percentage of peak hour volume flowing in the peak direction

Year	AADT	Year	AADT	Year	AADT
2022		2012		2002	
2021		2011		2001	
2020		2010		2000	
2019		2009		1999	
2018	7155	2008		1998	
2017		2007		1997	
2016		2006		1996	
2015	6939	2005		1995	
2014	7634	2004		1994	
2013	6701	2003		1993	



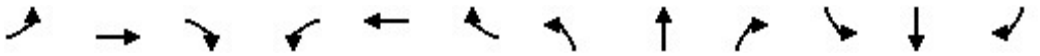
APPENDIX E: CAPACITY ANALYSIS OUTPUT



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	71	69	0	0	394	107	0	0	0	19	0	177
Future Volume (vph)	71	69	0	0	394	107	0	0	0	19	0	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	75	0	0	428	116	0	0	0	21	0	192

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	152	544	0	213
Volume Left (vph)	77	0	0	21
Volume Right (vph)	0	116	0	192
Hadj (s)	0.14	-0.09	0.00	-0.49
Departure Headway (s)	5.3	4.6	6.0	5.1
Degree Utilization, x	0.22	0.70	0.00	0.30
Capacity (veh/h)	634	762	526	641
Control Delay (s)	9.8	17.4	9.0	10.2
Approach Delay (s)	9.8	17.4	0.0	10.2
Approach LOS	A	C	A	B

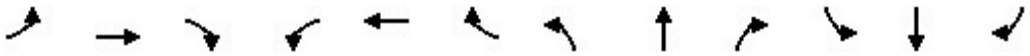
Intersection Summary				
Delay	14.5			
Level of Service	B			
Intersection Capacity Utilization	56.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	172	21	2	110	2	1	0	0	0	0	6
Future Volume (Veh/h)	11	172	21	2	110	2	1	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	187	23	2	120	2	1	0	0	0	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	122			210			294	348	105	242	359	61
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			210			294	348	105	242	359	61
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	100	100	99
cM capacity (veh/h)	1463			1358			627	568	929	686	561	991

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	12	125	85	2	80	42	1	7
Volume Left	12	0	0	2	0	0	1	0
Volume Right	0	0	23	0	0	2	0	7
cSH	1463	1700	1700	1358	1700	1700	627	991
Volume to Capacity	0.01	0.07	0.05	0.00	0.05	0.02	0.00	0.01
Queue Length 95th (ft)	1	0	0	0	0	0	0	1
Control Delay (s)	7.5	0.0	0.0	7.7	0.0	0.0	10.8	8.7
Lane LOS	A			A			B	A
Approach Delay (s)	0.4			0.1			10.8	8.7
Approach LOS							B	A

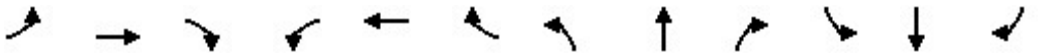
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	17.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	229	409	0	0	89	66	0	0	0	111	0	191
Future Volume (vph)	229	409	0	0	89	66	0	0	0	111	0	191
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	249	445	0	0	97	72	0	0	0	121	0	208

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	694	169	0	329
Volume Left (vph)	249	0	0	121
Volume Right (vph)	0	72	0	208
Hadj (s)	0.11	-0.22	0.00	-0.27
Departure Headway (s)	5.3	5.7	6.9	5.8
Degree Utilization, x	1.03	0.27	0.00	0.53
Capacity (veh/h)	670	607	486	601
Control Delay (s)	65.6	10.8	9.9	15.3
Approach Delay (s)	65.6	10.8	0.0	15.3
Approach LOS	F	B	A	C

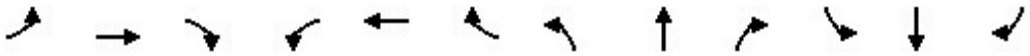
Intersection Summary				
Delay	44.0			
Level of Service	E			
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	137	2	0	156	1	16	0	1	2	0	11
Future Volume (Veh/h)	3	137	2	0	156	1	16	0	1	2	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	149	2	0	170	1	17	0	1	2	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	171			151			253	327	76	252	328	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171			151			253	327	76	252	328	86
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	99
cM capacity (veh/h)	1404			1428			670	589	970	679	589	956

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	3	99	52	0	113	58	18	14
Volume Left	3	0	0	0	0	0	17	2
Volume Right	0	0	2	0	0	1	1	12
cSH	1404	1700	1700	1700	1700	1700	682	904
Volume to Capacity	0.00	0.06	0.03	0.00	0.07	0.03	0.03	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	2	1
Control Delay (s)	7.6	0.0	0.0	0.0	0.0	0.0	10.4	9.0
Lane LOS	A						B	A
Approach Delay (s)	0.1			0.0			10.4	9.0
Approach LOS							B	A

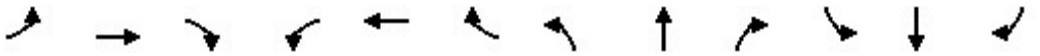
Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	15.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	75	73	0	0	414	112	0	0	0	20	0	186
Future Volume (vph)	75	73	0	0	414	112	0	0	0	20	0	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	79	0	0	450	122	0	0	0	22	0	202

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	161	572	0	224
Volume Left (vph)	82	0	0	22
Volume Right (vph)	0	122	0	202
Hadj (s)	0.14	-0.09	0.00	-0.49
Departure Headway (s)	5.4	4.7	6.1	5.2
Degree Utilization, x	0.24	0.74	0.00	0.32
Capacity (veh/h)	623	754	519	628
Control Delay (s)	10.1	19.8	9.1	10.6
Approach Delay (s)	10.1	19.8	0.0	10.6
Approach LOS	B	C	A	B

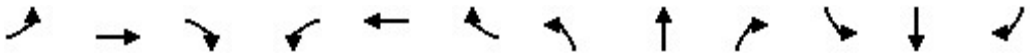
Intersection Summary				
Delay	16.0			
Level of Service	C			
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	180	22	2	115	2	1	0	0	0	0	6
Future Volume (Veh/h)	12	180	22	2	115	2	1	0	0	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	196	24	2	125	2	1	0	0	0	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	127			220			308	365	110	254	376	64
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	127			220			308	365	110	254	376	64
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	100	100	99
cM capacity (veh/h)	1457			1346			613	556	922	673	548	988

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	131	89	2	83	44	1	7
Volume Left	13	0	0	2	0	0	1	0
Volume Right	0	0	24	0	0	2	0	7
cSH	1457	1700	1700	1346	1700	1700	613	988
Volume to Capacity	0.01	0.08	0.05	0.00	0.05	0.03	0.00	0.01
Queue Length 95th (ft)	1	0	0	0	0	0	0	1
Control Delay (s)	7.5	0.0	0.0	7.7	0.0	0.0	10.9	8.7
Lane LOS	A			A			B	A
Approach Delay (s)	0.4			0.1			10.9	8.7
Approach LOS							B	A

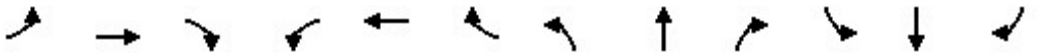
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	17.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	241	429	0	0	94	70	0	0	0	116	0	200
Future Volume (vph)	241	429	0	0	94	70	0	0	0	116	0	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	262	466	0	0	102	76	0	0	0	126	0	217

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	728	178	0	343
Volume Left (vph)	262	0	0	126
Volume Right (vph)	0	76	0	217
Hadj (s)	0.11	-0.22	0.00	-0.27
Departure Headway (s)	5.4	5.8	7.0	5.8
Degree Utilization, x	1.09	0.28	0.00	0.56
Capacity (veh/h)	655	600	479	600
Control Delay (s)	85.1	11.0	10.0	16.0
Approach Delay (s)	85.1	11.0	0.0	16.0
Approach LOS	F	B	A	C

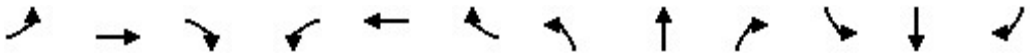
Intersection Summary			
Delay	55.6		
Level of Service	F		
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	142	2	0	164	1	17	0	1	2	0	12
Future Volume (Veh/h)	3	142	2	0	164	1	17	0	1	2	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	154	2	0	178	1	18	0	1	2	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	179			156			263	340	78	262	340	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	179			156			263	340	78	262	340	90
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	99
cM capacity (veh/h)	1394			1422			658	579	967	667	579	951

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	3	103	53	0	119	60	19	15
Volume Left	3	0	0	0	0	0	18	2
Volume Right	0	0	2	0	0	1	1	13
cSH	1394	1700	1700	1700	1700	1700	670	900
Volume to Capacity	0.00	0.06	0.03	0.00	0.07	0.04	0.03	0.02
Queue Length 95th (ft)	0	0	0	0	0	0	2	1
Control Delay (s)	7.6	0.0	0.0	0.0	0.0	0.0	10.5	9.1
Lane LOS	A						B	A
Approach Delay (s)	0.1			0.0			10.5	9.1
Approach LOS							B	A

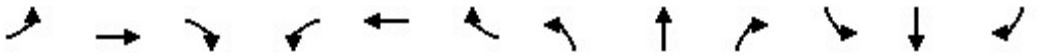
Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	15.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	71	120	43	29	430	107	7	11	4	19	72	177
Future Volume (vph)	71	120	43	29	430	107	7	11	4	19	72	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	130	47	32	467	116	8	12	4	21	78	192

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	254	615	24	291
Volume Left (vph)	77	32	8	21
Volume Right (vph)	47	116	4	192
Hadj (s)	-0.02	-0.07	0.00	-0.35
Departure Headway (s)	5.9	5.3	7.0	5.9
Degree Utilization, x	0.41	0.90	0.05	0.48
Capacity (veh/h)	585	674	446	577
Control Delay (s)	12.9	37.4	10.4	14.2
Approach Delay (s)	12.9	37.4	10.4	14.2
Approach LOS	B	E	B	B

Intersection Summary				
Delay	25.9			
Level of Service	D			
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	172	21	2	110	28	1	0	0	6	0	12
Future Volume (Veh/h)	47	172	21	2	110	28	1	0	0	6	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	187	23	2	120	30	1	0	0	7	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	150			210			378	454	105	334	451	75
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150			210			378	454	105	334	451	75
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	99	100	99
cM capacity (veh/h)	1429			1358			532	482	929	578	484	971

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	51	125	85	2	80	70	1	20
Volume Left	51	0	0	2	0	0	1	7
Volume Right	0	0	23	0	0	30	0	13
cSH	1429	1700	1700	1358	1700	1700	532	785
Volume to Capacity	0.04	0.07	0.05	0.00	0.05	0.04	0.00	0.03
Queue Length 95th (ft)	3	0	0	0	0	0	0	2
Control Delay (s)	7.6	0.0	0.0	7.7	0.0	0.0	11.8	9.7
Lane LOS	A			A			B	A
Approach Delay (s)	1.5			0.1			11.8	9.7
Approach LOS							B	A

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	22.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	245	22	18	587	3	3
Future Volume (Veh/h)	245	22	18	587	3	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	266	24	20	638	3	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				500		
pX, platoon unblocked						
vC, conflicting volume			290		956	278
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			290		956	278
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	100
cM capacity (veh/h)			1272		282	761

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	290	658	6
Volume Left	0	20	3
Volume Right	24	0	3
cSH	1700	1272	411
Volume to Capacity	0.17	0.02	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.4	13.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	13.9
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	234	14	11	603	2	2
Future Volume (Veh/h)	234	14	11	603	2	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	254	15	12	655	2	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				721		
pX, platoon unblocked						
vC, conflicting volume			269		940	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			269		940	262
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1295		290	777

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	269	667	4
Volume Left	0	12	2
Volume Right	15	0	2
cSH	1700	1295	422
Volume to Capacity	0.16	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.3	13.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	13.6
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		50.5%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	126	18	14	562	3	2
Future Volume (Veh/h)	126	18	14	562	3	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	20	15	611	3	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				570		
pX, platoon unblocked						
vC, conflicting volume			157		788	147
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			157		788	147
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1423		356	900

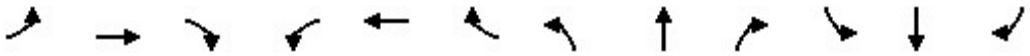
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	157	626	5
Volume Left	0	15	3
Volume Right	20	0	2
cSH	1700	1423	470
Volume to Capacity	0.09	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.3	12.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	12.7
Approach LOS			B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	99	29	18	572	4	3
Future Volume (Veh/h)	99	29	18	572	4	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	32	20	622	4	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			140		786	124
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			140		786	124
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1443		356	927

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	140	642	7
Volume Left	0	20	4
Volume Right	32	0	3
cSH	1700	1443	484
Volume to Capacity	0.08	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.4	12.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	12.6
Approach LOS			B

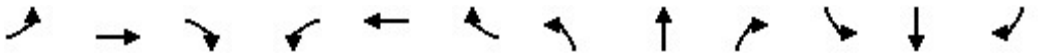
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	229	446	10	7	137	66	38	64	26	111	17	191
Future Volume (vph)	229	446	10	7	137	66	38	64	26	111	17	191
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	249	485	11	8	149	72	41	70	28	121	18	208

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	745	229	139	347
Volume Left (vph)	249	8	41	121
Volume Right (vph)	11	72	28	208
Hadj (s)	0.09	-0.15	-0.03	-0.26
Departure Headway (s)	6.2	6.7	7.4	6.5
Degree Utilization, x	1.29	0.43	0.28	0.63
Capacity (veh/h)	564	499	443	533
Control Delay (s)	162.7	14.6	13.3	20.0
Approach Delay (s)	162.7	14.6	13.3	20.0
Approach LOS	F	B	B	C

Intersection Summary				
Delay	91.3			
Level of Service	F			
Intersection Capacity Utilization	83.8%	ICU Level of Service	E	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	137	2	0	156	10	16	0	1	34	0	43
Future Volume (Veh/h)	12	137	2	0	156	10	16	0	1	34	0	43
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	149	2	0	170	11	17	0	1	37	0	47
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	181			151			308	357	76	277	352	90
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181			151			308	357	76	277	352	90
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	94	100	95
cM capacity (veh/h)	1392			1428			586	562	970	648	566	949

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	99	52	0	113	68	18	84
Volume Left	13	0	0	0	0	0	17	37
Volume Right	0	0	2	0	0	11	1	47
cSH	1392	1700	1700	1700	1700	1700	600	788
Volume to Capacity	0.01	0.06	0.03	0.00	0.07	0.04	0.03	0.11
Queue Length 95th (ft)	1	0	0	0	0	0	2	9
Control Delay (s)	7.6	0.0	0.0	0.0	0.0	0.0	11.2	10.1
Lane LOS	A						B	B
Approach Delay (s)	0.6			0.0			11.2	10.1
Approach LOS							B	B

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	20.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	663	5	4	373	19	16
Future Volume (Veh/h)	663	5	4	373	19	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	721	5	4	405	21	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				500		
pX, platoon unblocked						
vC, conflicting volume			726		1136	724
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			726		1136	724
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	96
cM capacity (veh/h)			877		222	426

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	726	409	38
Volume Left	0	4	21
Volume Right	5	0	17
cSH	1700	877	283
Volume to Capacity	0.43	0.00	0.13
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.0	0.1	19.7
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	19.7
Approach LOS			C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	675	3	3	364	13	10
Future Volume (Veh/h)	675	3	3	364	13	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	734	3	3	396	14	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				721		
pX, platoon unblocked						
vC, conflicting volume			737		1138	736
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			737		1138	736
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	97
cM capacity (veh/h)			869		222	419

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	737	399	25
Volume Left	0	3	14
Volume Right	3	0	11
cSH	1700	869	280
Volume to Capacity	0.43	0.00	0.09
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.1	19.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	19.1
Approach LOS			C

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	578	4	3	195	16	13
Future Volume (Veh/h)	578	4	3	195	16	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	628	4	3	212	17	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				570		
pX, platoon unblocked						
vC, conflicting volume			632		848	630
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			632		848	630
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	97
cM capacity (veh/h)			951		331	482

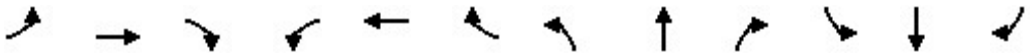
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	632	215	31
Volume Left	0	3	17
Volume Right	4	0	14
cSH	1700	951	385
Volume to Capacity	0.37	0.00	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.2	15.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	15.2
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	584	7	4	173	26	16
Future Volume (Veh/h)	584	7	4	173	26	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	635	8	4	188	28	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			643		835	639
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			643		835	639
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		92	96
cM capacity (veh/h)			942		336	476

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	643	192	45
Volume Left	0	4	28
Volume Right	8	0	17
cSH	1700	942	378
Volume to Capacity	0.38	0.00	0.12
Queue Length 95th (ft)	0	0	10
Control Delay (s)	0.0	0.2	15.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	15.8
Approach LOS			C

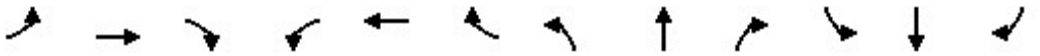
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	41.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	75	124	43	29	450	112	7	11	4	20	72	186
Future Volume (vph)	75	124	43	29	450	112	7	11	4	20	72	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	135	47	32	489	122	8	12	4	22	78	202

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	264	643	24	302
Volume Left (vph)	82	32	8	22
Volume Right (vph)	47	122	4	202
Hadj (s)	-0.01	-0.07	0.00	-0.35
Departure Headway (s)	6.0	5.4	7.3	6.1
Degree Utilization, x	0.44	0.96	0.05	0.51
Capacity (veh/h)	581	656	439	576
Control Delay (s)	13.6	48.0	10.6	15.1
Approach Delay (s)	13.6	48.0	10.6	15.1
Approach LOS	B	E	B	C

Intersection Summary				
Delay	31.9			
Level of Service	D			
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	160	22	2	115	38	1	0	0	6	0	12
Future Volume (Veh/h)	48	160	22	2	115	38	1	0	0	6	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	174	24	2	125	41	1	0	0	7	0	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	166			198			370	460	99	340	452	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166			198			370	460	99	340	452	83
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	99	100	99
cM capacity (veh/h)	1410			1372			538	477	937	572	483	960

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	52	116	82	2	83	83	1	20
Volume Left	52	0	0	2	0	0	1	7
Volume Right	0	0	24	0	0	41	0	13
cSH	1410	1700	1700	1372	1700	1700	538	776
Volume to Capacity	0.04	0.07	0.05	0.00	0.05	0.05	0.00	0.03
Queue Length 95th (ft)	3	0	0	0	0	0	0	2
Control Delay (s)	7.7	0.0	0.0	7.6	0.0	0.0	11.7	9.8
Lane LOS	A			A			B	A
Approach Delay (s)	1.6			0.1			11.7	9.8
Approach LOS							B	A

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	21.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	252	22	18	615	3	3
Future Volume (Veh/h)	252	22	18	615	3	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	274	24	20	668	3	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				500		
pX, platoon unblocked						
vC, conflicting volume			298		994	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			298		994	286
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	100
cM capacity (veh/h)			1263		267	753

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	298	688	6
Volume Left	0	20	3
Volume Right	24	0	3
cSH	1700	1263	395
Volume to Capacity	0.18	0.02	0.02
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.4	14.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	14.3
Approach LOS			B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		56.9%	ICU Level of Service B
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	241	14	11	631	2	2
Future Volume (Veh/h)	241	14	11	631	2	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	262	15	12	686	2	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				721		
pX, platoon unblocked						
vC, conflicting volume			277		980	270
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			277		980	270
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1286		275	769

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	277	698	4
Volume Left	0	12	2
Volume Right	15	0	2
cSH	1700	1286	405
Volume to Capacity	0.16	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.3	14.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	14.0
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	131	18	14	587	3	2
Future Volume (Veh/h)	131	18	14	587	3	2
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	20	15	638	3	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				570		
pX, platoon unblocked						
vC, conflicting volume			162		820	152
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			162		820	152
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1417		341	894

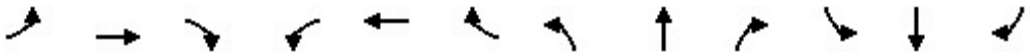
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	162	653	5
Volume Left	0	15	3
Volume Right	20	0	2
cSH	1700	1417	453
Volume to Capacity	0.10	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.3	13.0
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	13.0
Approach LOS			B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	104	29	18	597	4	3
Future Volume (Veh/h)	104	29	18	597	4	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	113	32	20	649	4	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			145		818	129
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			145		818	129
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	100
cM capacity (veh/h)			1437		341	921

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	145	669	7
Volume Left	0	20	4
Volume Right	32	0	3
cSH	1700	1437	467
Volume to Capacity	0.09	0.01	0.01
Queue Length 95th (ft)	0	1	1
Control Delay (s)	0.0	0.4	12.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	12.8
Approach LOS			B

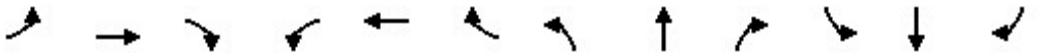
Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	241	466	10	7	142	70	38	64	26	116	17	200
Future Volume (vph)	241	466	10	7	142	70	38	64	26	116	17	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	262	507	11	8	154	76	41	70	28	126	18	217

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	780	238	139	361
Volume Left (vph)	262	8	41	126
Volume Right (vph)	11	76	28	217
Hadj (s)	0.09	-0.15	-0.03	-0.26
Departure Headway (s)	6.3	6.8	7.5	6.6
Degree Utilization, x	1.37	0.45	0.29	0.66
Capacity (veh/h)	571	496	436	530
Control Delay (s)	196.8	15.1	13.5	21.4
Approach Delay (s)	196.8	15.1	13.5	21.4
Approach LOS	F	C	B	C

Intersection Summary				
Delay		109.8		
Level of Service		F		
Intersection Capacity Utilization		86.9%	ICU Level of Service	E
Analysis Period (min)		15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	143	2	0	164	10	17	0	1	34	0	44
Future Volume (Veh/h)	12	143	2	0	164	10	17	0	1	34	0	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	155	2	0	178	11	18	0	1	37	0	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	189			157			319	371	78	288	366	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189			157			319	371	78	288	366	94
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	94	100	95
cM capacity (veh/h)	1382			1420			575	552	966	637	555	944

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	103	54	0	119	70	19	85
Volume Left	13	0	0	0	0	0	18	37
Volume Right	0	0	2	0	0	11	1	48
cSH	1382	1700	1700	1700	1700	1700	588	780
Volume to Capacity	0.01	0.06	0.03	0.00	0.07	0.04	0.03	0.11
Queue Length 95th (ft)	1	0	0	0	0	0	3	9
Control Delay (s)	7.6	0.0	0.0	0.0	0.0	0.0	11.3	10.2
Lane LOS	A						B	B
Approach Delay (s)	0.6			0.0			11.3	10.2
Approach LOS							B	B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	20.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	695	5	4	387	19	16
Future Volume (Veh/h)	695	5	4	387	19	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	755	5	4	421	21	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				500		
pX, platoon unblocked						
vC, conflicting volume			760		1186	758
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			760		1186	758
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	96
cM capacity (veh/h)			852		207	407

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	760	425	38
Volume Left	0	4	21
Volume Right	5	0	17
cSH	1700	852	266
Volume to Capacity	0.45	0.00	0.14
Queue Length 95th (ft)	0	0	12
Control Delay (s)	0.0	0.1	20.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	20.8
Approach LOS			C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	707	3	3	378	13	10
Future Volume (Veh/h)	707	3	3	378	13	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	768	3	3	411	14	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				721		
pX, platoon unblocked						
vC, conflicting volume			771		1186	770
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			771		1186	770
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	97
cM capacity (veh/h)			844		208	401

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	771	414	25
Volume Left	0	3	14
Volume Right	3	0	11
cSH	1700	844	263
Volume to Capacity	0.45	0.00	0.09
Queue Length 95th (ft)	0	0	8
Control Delay (s)	0.0	0.1	20.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	20.1
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	603	4	3	203	16	13
Future Volume (Veh/h)	603	4	3	203	16	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	655	4	3	221	17	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				570		
pX, platoon unblocked						
vC, conflicting volume			659		884	657
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			659		884	657
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	97
cM capacity (veh/h)			929		315	465

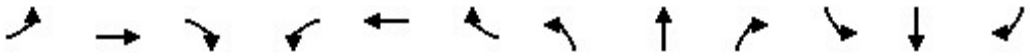
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	659	224	31
Volume Left	0	3	17
Volume Right	4	0	14
cSH	1700	929	369
Volume to Capacity	0.39	0.00	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.2	15.7
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	15.7
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	609	7	4	181	26	16
Future Volume (Veh/h)	609	7	4	181	26	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	662	8	4	197	28	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			670		871	666
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			670		871	666
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	96
cM capacity (veh/h)			920		320	459

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	670	201	45
Volume Left	0	4	28
Volume Right	8	0	17
cSH	1700	920	362
Volume to Capacity	0.39	0.00	0.12
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.0	0.2	16.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	16.4
Approach LOS			C

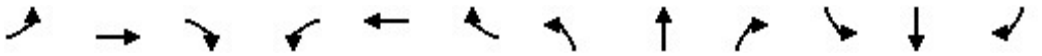
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	241	466	10	7	142	70	38	64	26	116	17	200
Future Volume (vph)	241	466	10	7	142	70	38	64	26	116	17	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	262	507	11	8	154	76	41	70	28	126	18	217

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	262	518	8	230	41	98	126	235
Volume Left (vph)	262	0	8	0	41	0	126	0
Volume Right (vph)	0	11	0	76	0	28	0	217
Hadj (s)	0.53	0.02	0.53	-0.20	0.53	-0.17	0.53	-0.61
Departure Headway (s)	7.1	6.6	7.8	7.1	8.4	7.7	7.9	6.8
Degree Utilization, x	0.51	0.94	0.02	0.45	0.10	0.21	0.28	0.44
Capacity (veh/h)	498	536	439	489	413	450	439	514
Control Delay (s)	16.1	50.0	9.8	14.7	11.1	11.5	12.8	13.9
Approach Delay (s)	38.6		14.5		11.4		13.5	
Approach LOS	E		B		B		B	

Intersection Summary				
Delay	26.4			
Level of Service	D			
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	143	2	0	164	10	17	0	1	34	0	44
Future Volume (Veh/h)	12	143	2	0	164	10	17	0	1	34	0	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	155	2	0	178	11	18	0	1	37	0	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	189			157			319	371	78	288	366	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	189			157			319	371	78	288	366	94
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	100	100	94	100	95
cM capacity (veh/h)	1382			1420			575	552	966	637	555	944

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	13	103	54	0	119	70	19	85
Volume Left	13	0	0	0	0	0	18	37
Volume Right	0	0	2	0	0	11	1	48
cSH	1382	1700	1700	1700	1700	1700	588	780
Volume to Capacity	0.01	0.06	0.03	0.00	0.07	0.04	0.03	0.11
Queue Length 95th (ft)	1	0	0	0	0	0	3	9
Control Delay (s)	7.6	0.0	0.0	0.0	0.0	0.0	11.3	10.2
Lane LOS	A						B	B
Approach Delay (s)	0.6			0.0			11.3	10.2
Approach LOS							B	B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	20.8%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	695	5	4	387	19	16
Future Volume (Veh/h)	695	5	4	387	19	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	755	5	4	421	21	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				500		
pX, platoon unblocked						
vC, conflicting volume			760		1186	758
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			760		1186	758
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		90	96
cM capacity (veh/h)			852		207	407

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	760	425	38
Volume Left	0	4	21
Volume Right	5	0	17
cSH	1700	852	266
Volume to Capacity	0.45	0.00	0.14
Queue Length 95th (ft)	0	0	12
Control Delay (s)	0.0	0.1	20.8
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	20.8
Approach LOS			C

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	707	3	3	378	13	10
Future Volume (Veh/h)	707	3	3	378	13	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	768	3	3	411	14	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				721		
pX, platoon unblocked						
vC, conflicting volume			771		1186	770
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			771		1186	770
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		93	97
cM capacity (veh/h)			844		208	401

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	771	414	25
Volume Left	0	3	14
Volume Right	3	0	11
cSH	1700	844	263
Volume to Capacity	0.45	0.00	0.09
Queue Length 95th (ft)	0	0	8
Control Delay (s)	0.0	0.1	20.1
Lane LOS		A	C
Approach Delay (s)	0.0	0.1	20.1
Approach LOS			C

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	47.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	603	4	3	203	16	13
Future Volume (Veh/h)	603	4	3	203	16	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	655	4	3	221	17	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				570		
pX, platoon unblocked						
vC, conflicting volume			659		884	657
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			659		884	657
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	97
cM capacity (veh/h)			929		315	465

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	659	224	31
Volume Left	0	3	17
Volume Right	4	0	14
cSH	1700	929	369
Volume to Capacity	0.39	0.00	0.08
Queue Length 95th (ft)	0	0	7
Control Delay (s)	0.0	0.2	15.7
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	15.7
Approach LOS			C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	609	7	4	181	26	16
Future Volume (Veh/h)	609	7	4	181	26	16
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	662	8	4	197	28	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			670		871	666
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			670		871	666
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		91	96
cM capacity (veh/h)			920		320	459

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	670	201	45
Volume Left	0	4	28
Volume Right	8	0	17
cSH	1700	920	362
Volume to Capacity	0.39	0.00	0.12
Queue Length 95th (ft)	0	0	11
Control Delay (s)	0.0	0.2	16.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	16.4
Approach LOS			C

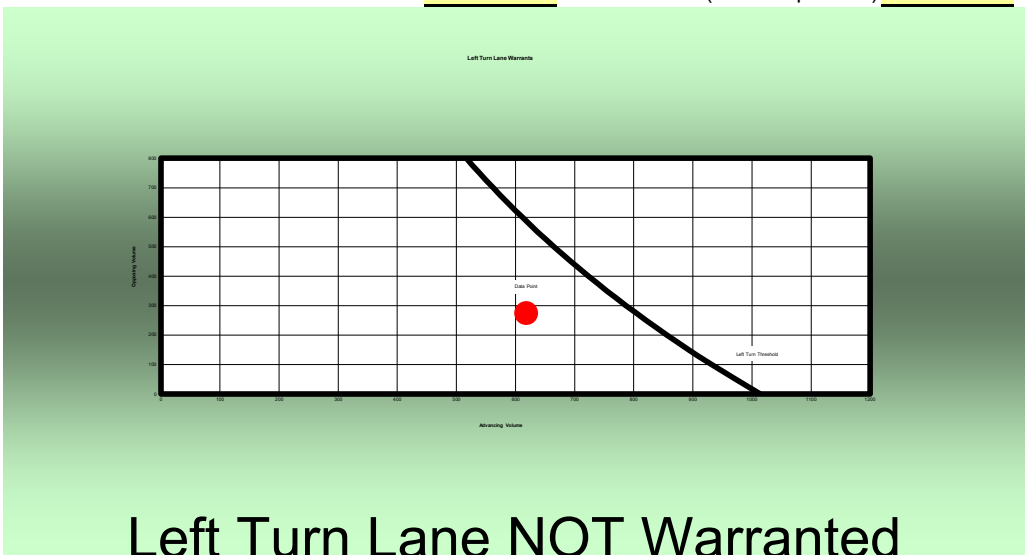
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX F: AUXILLIARY TURN LANE WARRANTS

Access Point 1 (AM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	18	Speed Limit (mph)	35
Advancing Volume (vph)	615	No. of through lanes	2
Opposing Volume (vph)	274	Percent Heavy Vehicles (decimal percent)	0.05



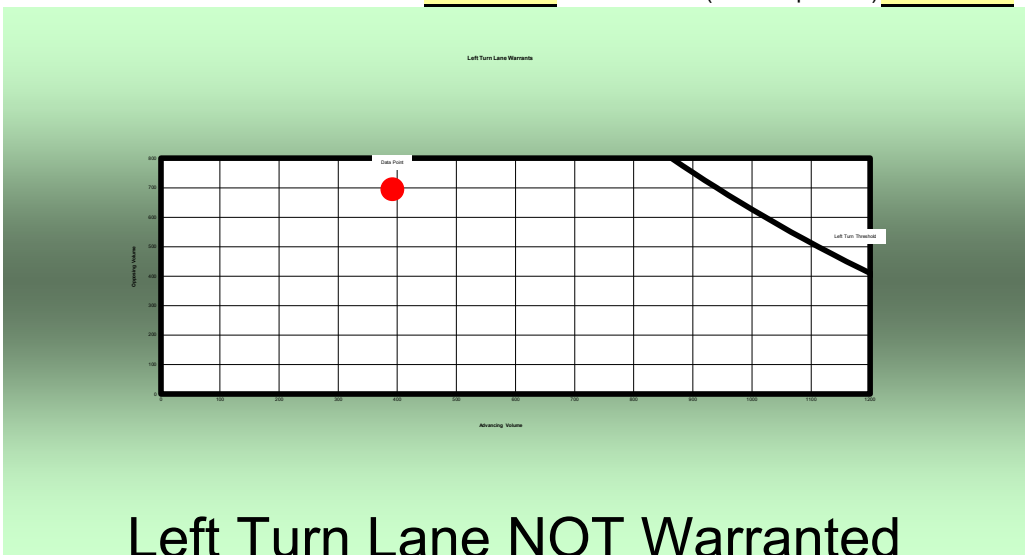
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 1 (PM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	4	Speed Limit (mph)	35
Advancing Volume (vph)	387	No. of through lanes	2
Opposing Volume (vph)	695	Percent Heavy Vehicles (decimal percent)	0.05



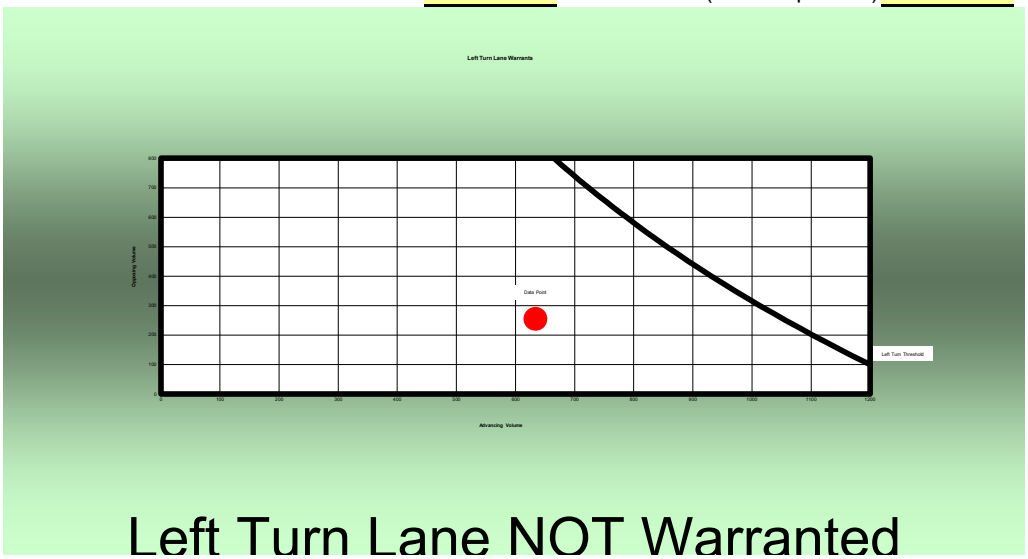
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 2 (AM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	11	Speed Limit (mph)	35
Advancing Volume (vph)	631	No. of through lanes	2
Opposing Volume (vph)	255	Percent Heavy Vehicles (decimal percent)	0.05



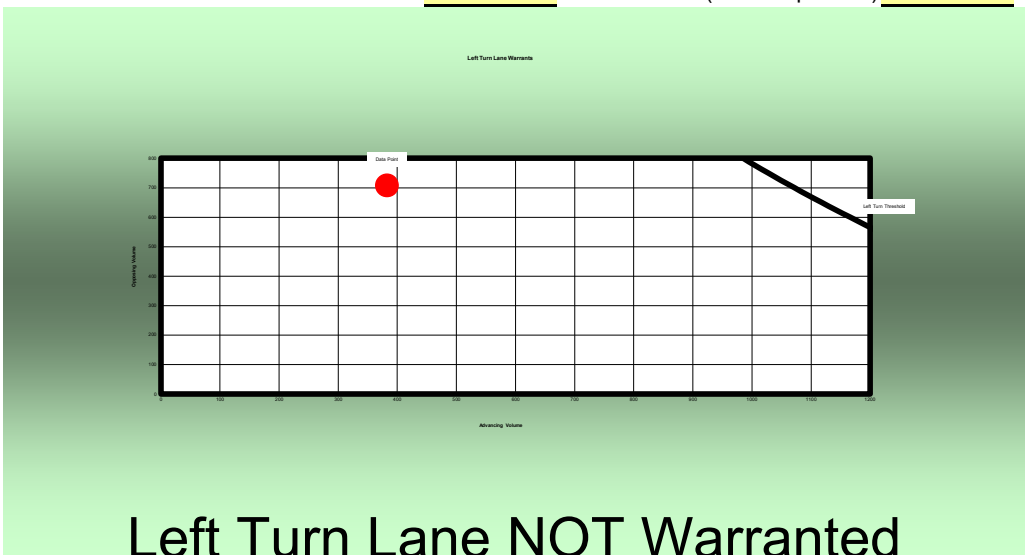
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 2 (PM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	3	Speed Limit (mph)	35
Advancing Volume (vph)	378	No. of through lanes	2
Opposing Volume (vph)	707	Percent Heavy Vehicles (decimal percent)	0.05



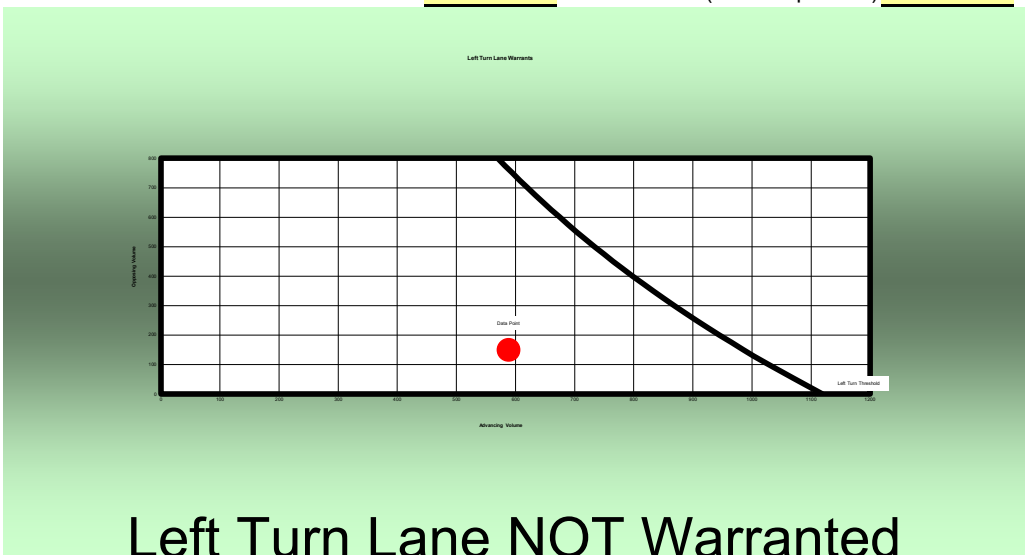
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 4 (AM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	14	Speed Limit (mph)	35
Advancing Volume (vph)	587	No. of through lanes	2
Opposing Volume (vph)	149	Percent Heavy Vehicles (decimal percent)	0.05



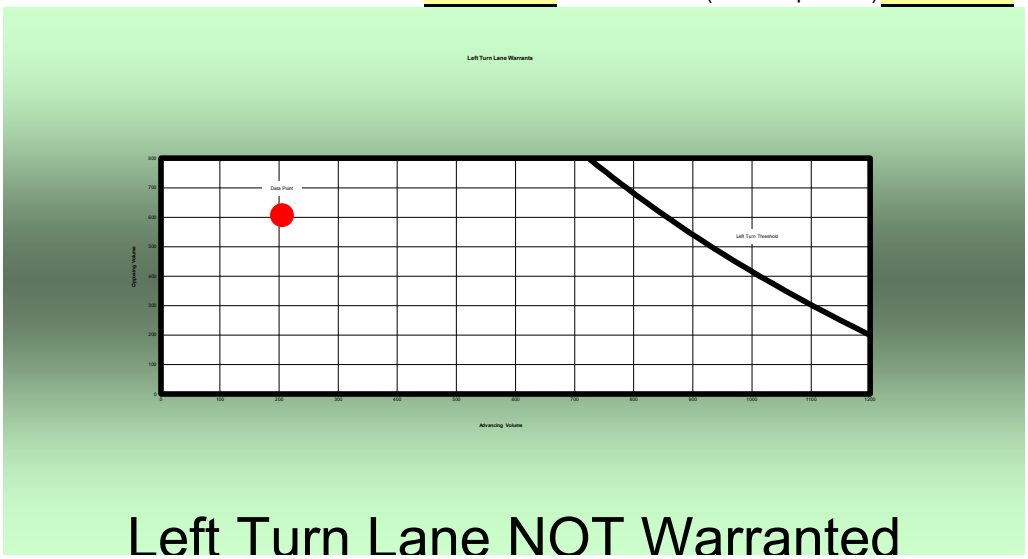
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 4 (PM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	3	Speed Limit (mph)	35
Advancing Volume (vph)	203	No. of through lanes	2
Opposing Volume (vph)	607	Percent Heavy Vehicles (decimal percent)	0.05



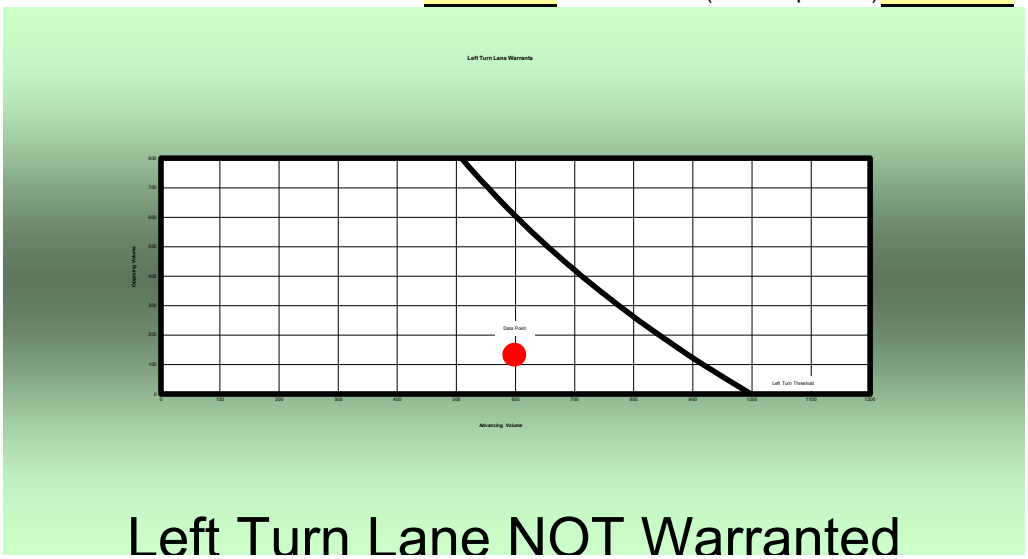
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 5 (AM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	18	Speed Limit (mph)	35
Advancing Volume (vph)	597	No. of through lanes	2
Opposing Volume (vph)	133	Percent Heavy Vehicles (decimal percent)	0.05



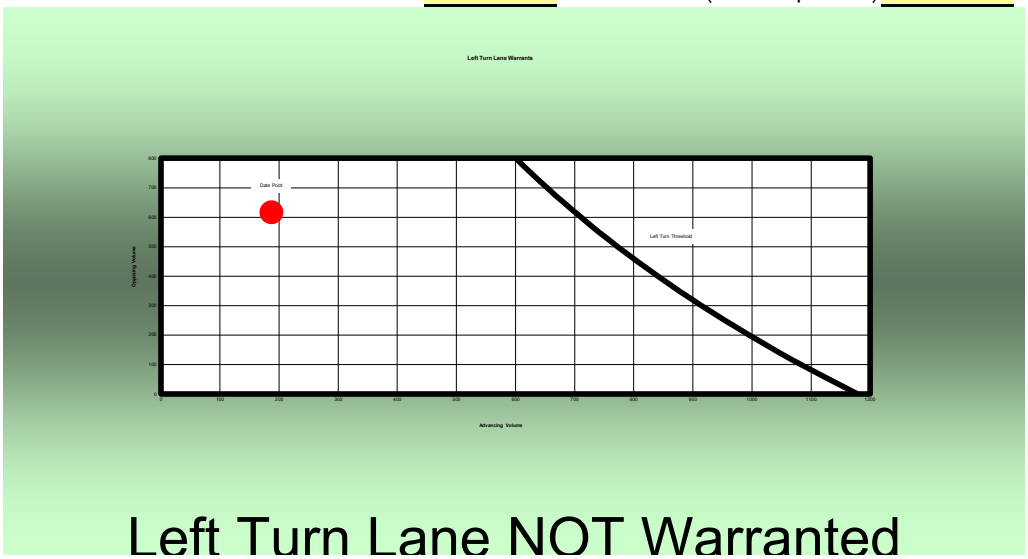
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 5 (PM Peak)
Westbound Left Turn Lane Warrants

Input Fields

Left Turn Volume (vph)	4	Speed Limit (mph)	35
Advancing Volume (vph)	185	No. of through lanes	2
Opposing Volume (vph)	616	Percent Heavy Vehicles (decimal percent)	0.05



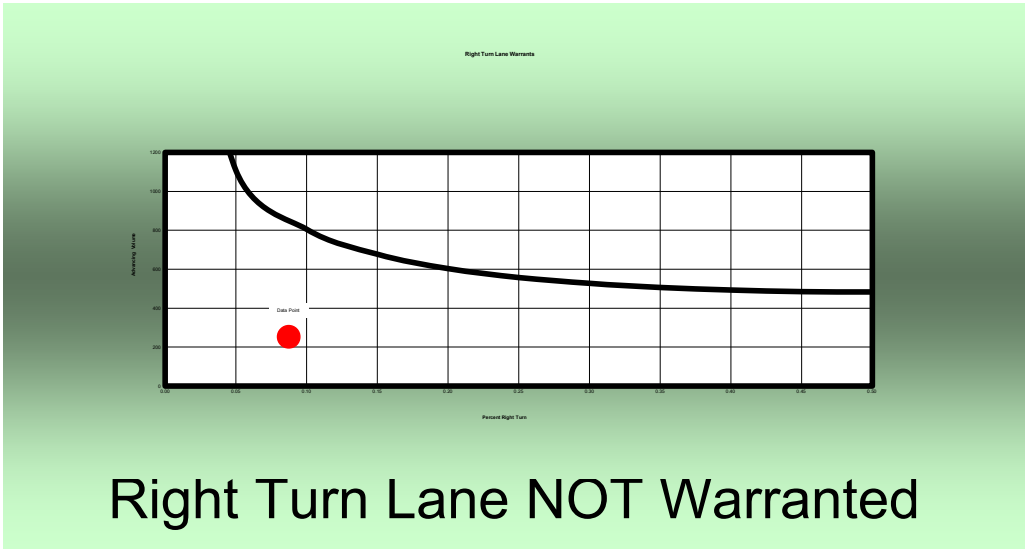
Left Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 1 (AM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	22	Speed Limit (mph)	35
Advancing Volume (vph)	252		



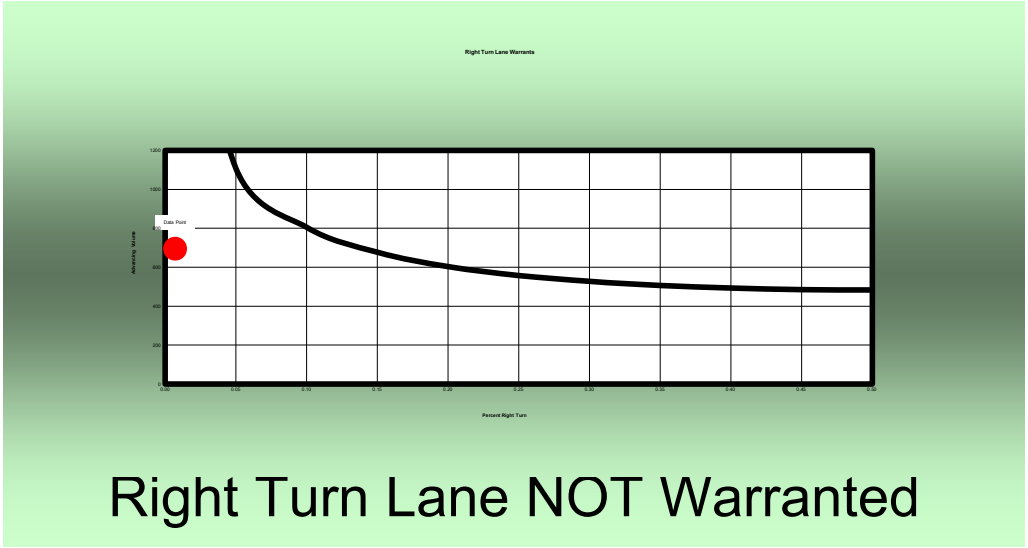
Right Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 1 (PM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	5	Speed Limit (mph)	35
Advancing Volume (vph)	695		



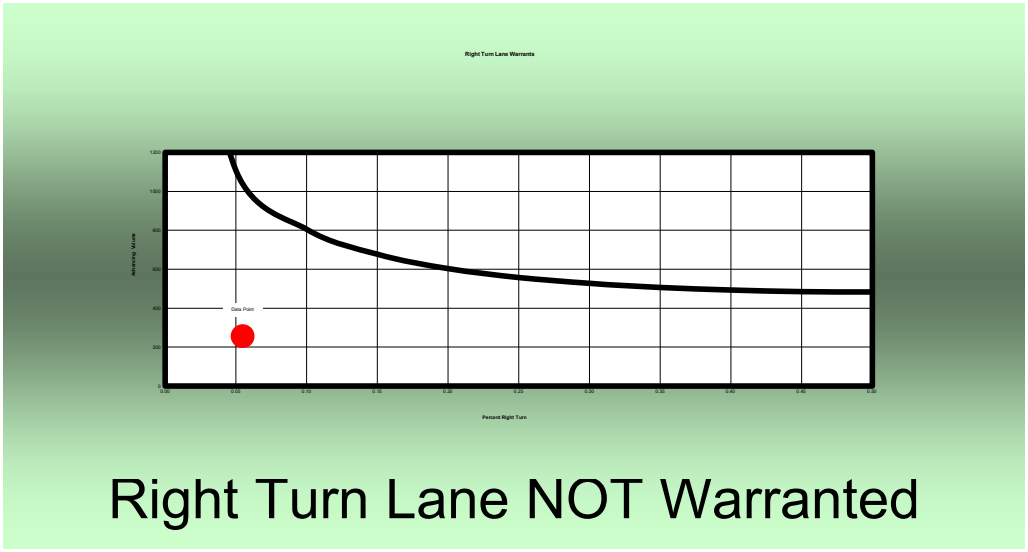
Right Turn Lane NOT Warranted

Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 2 (AM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	14	Speed Limit (mph)	35
Advancing Volume (vph)	255		

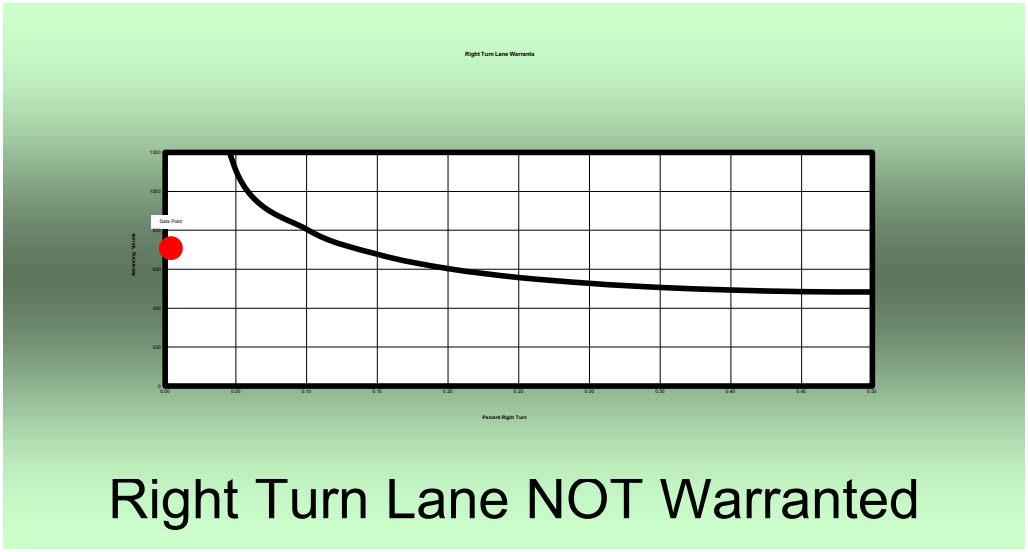


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 2 (PM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	3	Speed Limit (mph)	35
Advancing Volume (vph)	707		

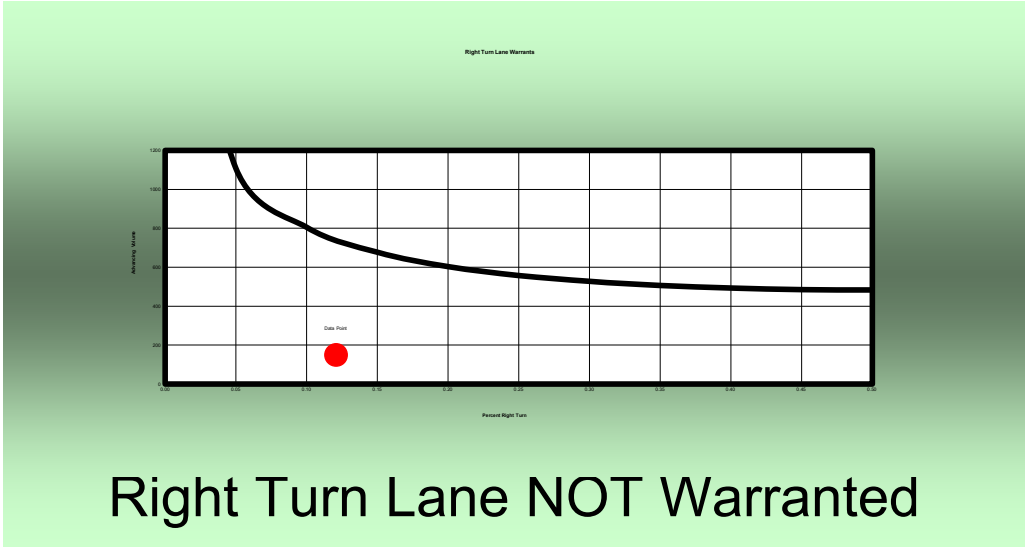


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 4 (AM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	18	Speed Limit (mph)	35
Advancing Volume (vph)	149		

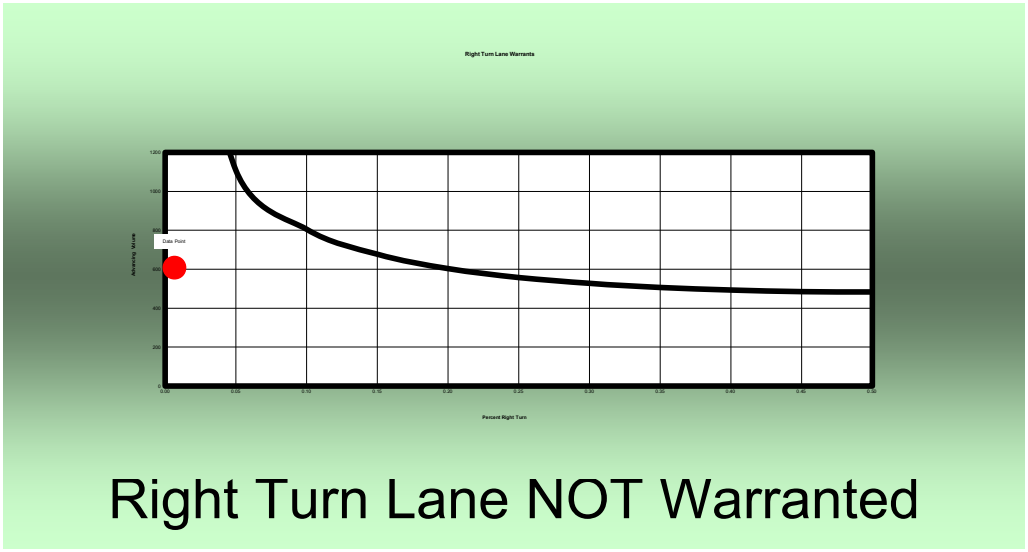


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 4 (PM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	4	Speed Limit (mph)	35
Advancing Volume (vph)	607		

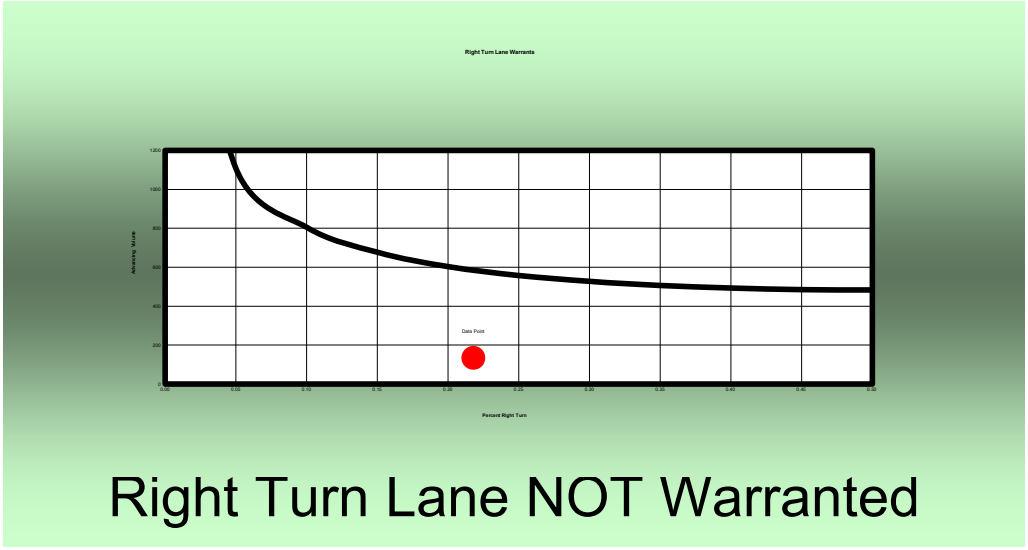


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 5 (AM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	29	Speed Limit (mph)	35
Advancing Volume (vph)	133		

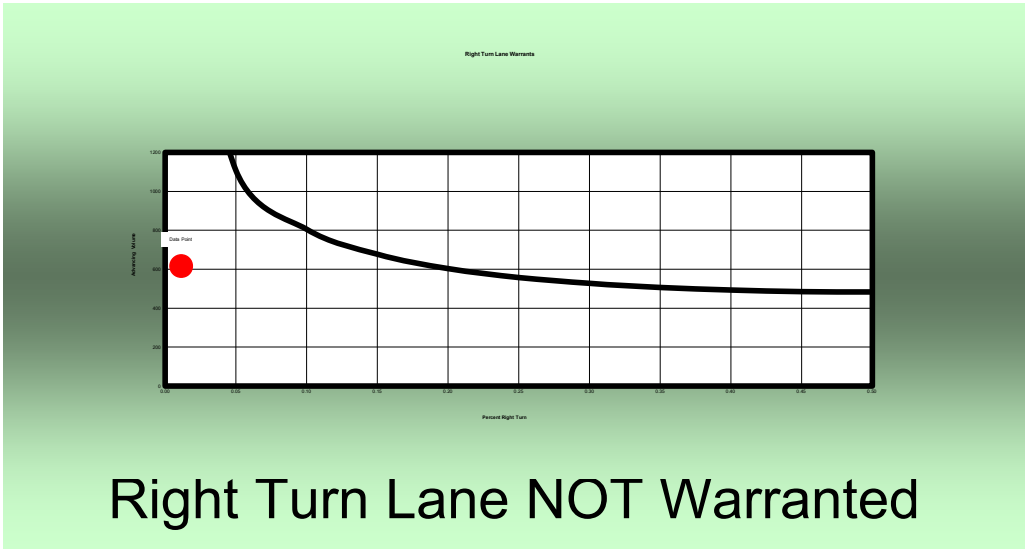


Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.

Access Point 5 (PM Peak)
Eastbound Right Turn Lane Warrants

Input Fields

Right Turn Volume (vph)	7	Speed Limit (mph)	35
Advancing Volume (vph)	616		



Note: This spreadsheet is intended to supplement the guidance provided in the Auxiliary Turn Lane policy outlined in the KYTC Highway Design Manual. This policy should be fully reviewed and understood prior to using this application.