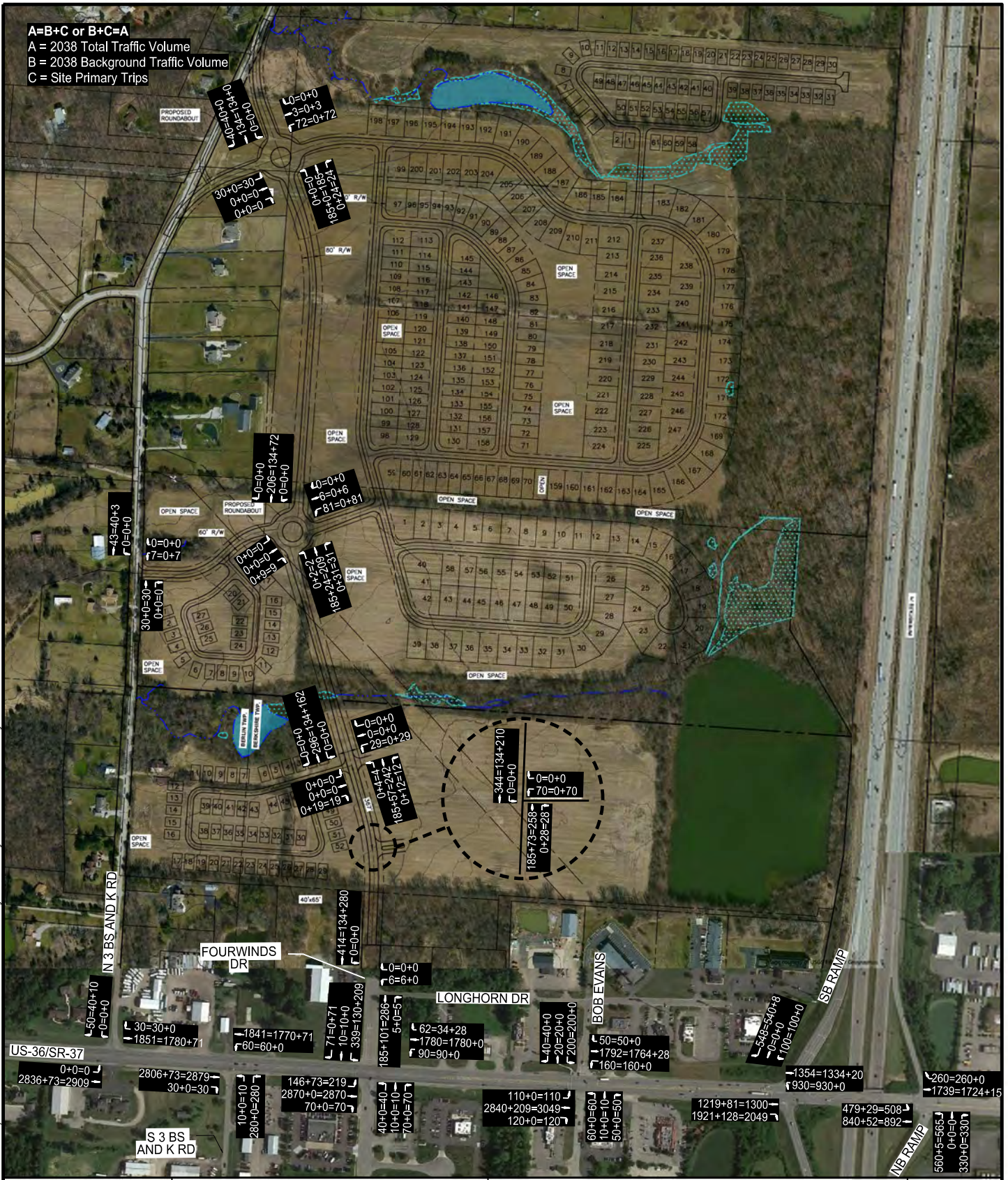


A=B+C or B+C=A
 A = 2038 Total Traffic Volume
 B = 2038 Background Traffic Volume
 C = Site Primary Trips



FILE NAME: X:\Active 50 Projects\OH Office Projects\CIMINEL - 16129 Fourwinds Drive\Drawings\Created\Figure 5 - 2038 AM FullBuild.dwg



SCALE: N.T.S.



Small Firm Client Experience, Big Firm Capabilities
 941 Chatham Lane, Suite 319
 Columbus, Ohio, 43221 / (614) 459-7930



PROJECT NO.	CIMINEL - 16129
PROJECT:	BROOKDOC INVESTMENTS FOURWINDS DR @ US-36/SR-37
TITLE:	2038 FULL BUILD TRAFFIC VOLUMES AM PEAK

FIGURE	5
D.B.	SA
C.B.	DRC
REV.	

A=B+C or B+C=A
 A = 2038 Total Traffic Volume
 B = 2038 Background Traffic Volume
 C = Site Primary Trips



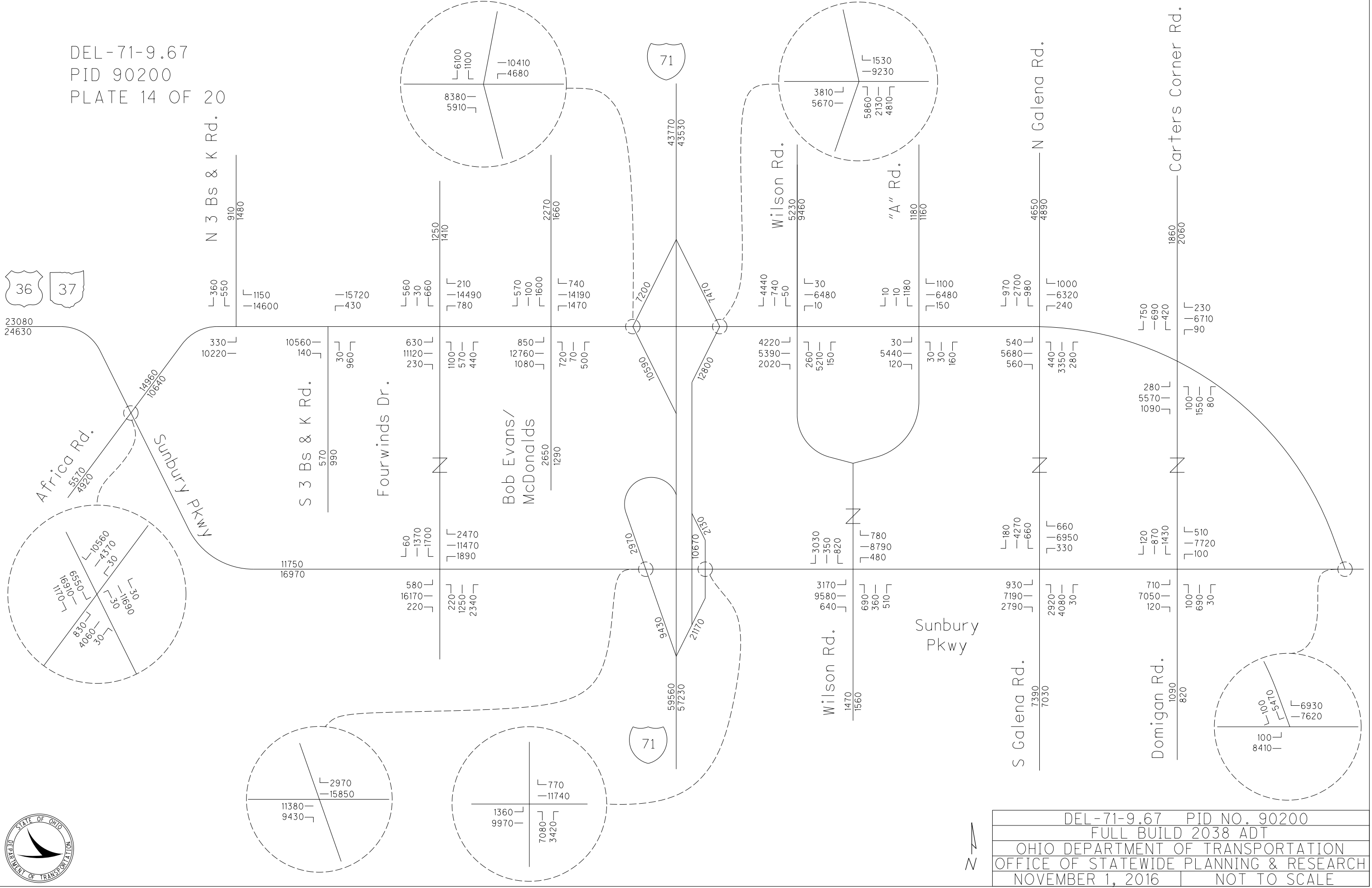
FILE NAME: X:\Active ISD Projects\OH Office Projects\CIMINEL - 16129 Fourwinds Drive\Drawings\Created\Figure 6 - 2038 PM Full Build.dwg

 SCALE: N.T.S.	 Trans ASSOCIATES Small Firm Client Experience, Big Firm Capabilities 941 Chatham Lane, Suite 319 Columbus, Ohio, 43221 / (614) 459-7930	PROJECT NO. CIMINEL - 16129	FIGURE 6 D.B. SA C.B. DRC REV.
		PROJECT: BROOKDOC INVESTMENTS FOURWINDS DR @ US-36/SR-37	
		TITLE: 2038 FULL BUILD TRAFFIC VOLUMES PM PEAK	

DEL-71-9.67
 PID 90200
 PLATE 14 OF 20

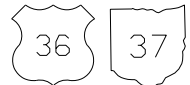


23080
24630

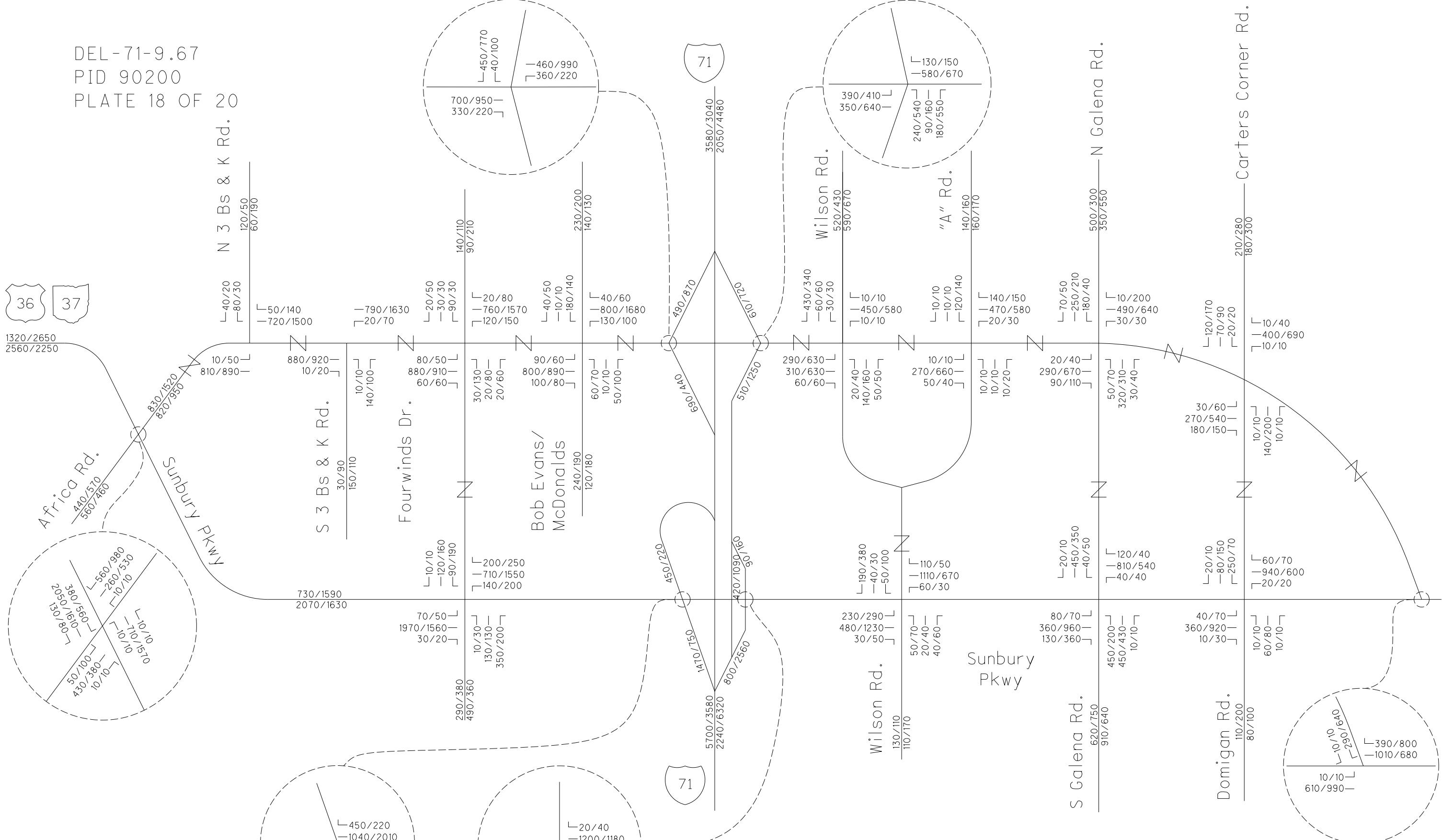
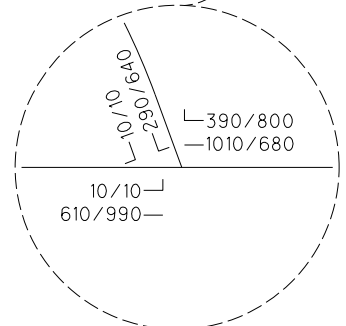
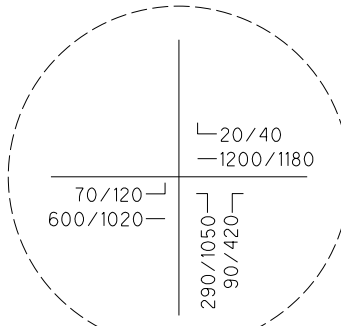
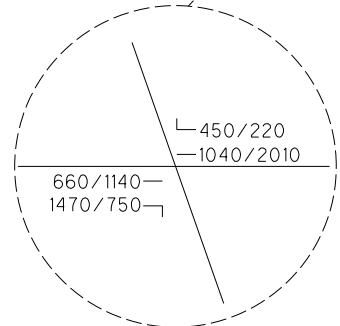
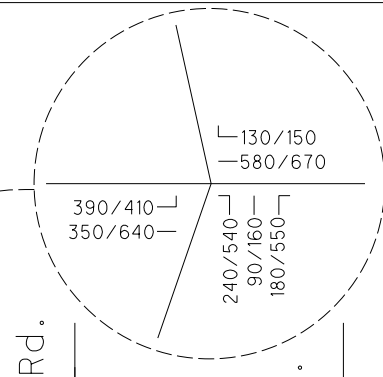
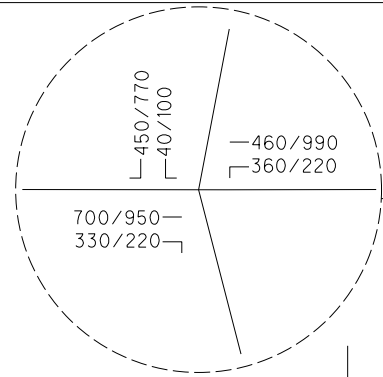
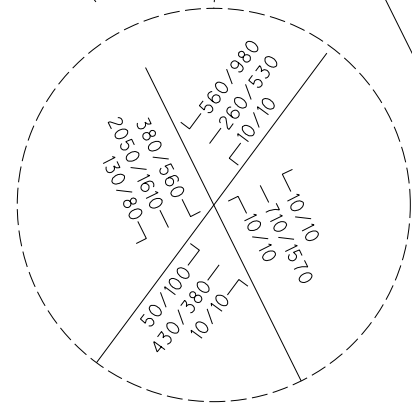


DEL-71-9.67 PID NO. 90200	
FULL BUILD 2038 ADT	
OHIO DEPARTMENT OF TRANSPORTATION	
OFFICE OF STATEWIDE PLANNING & RESEARCH	
NOVEMBER 1, 2016	NOT TO SCALE

DEL-71-9.67
 PID 90200
 PLATE 18 OF 20

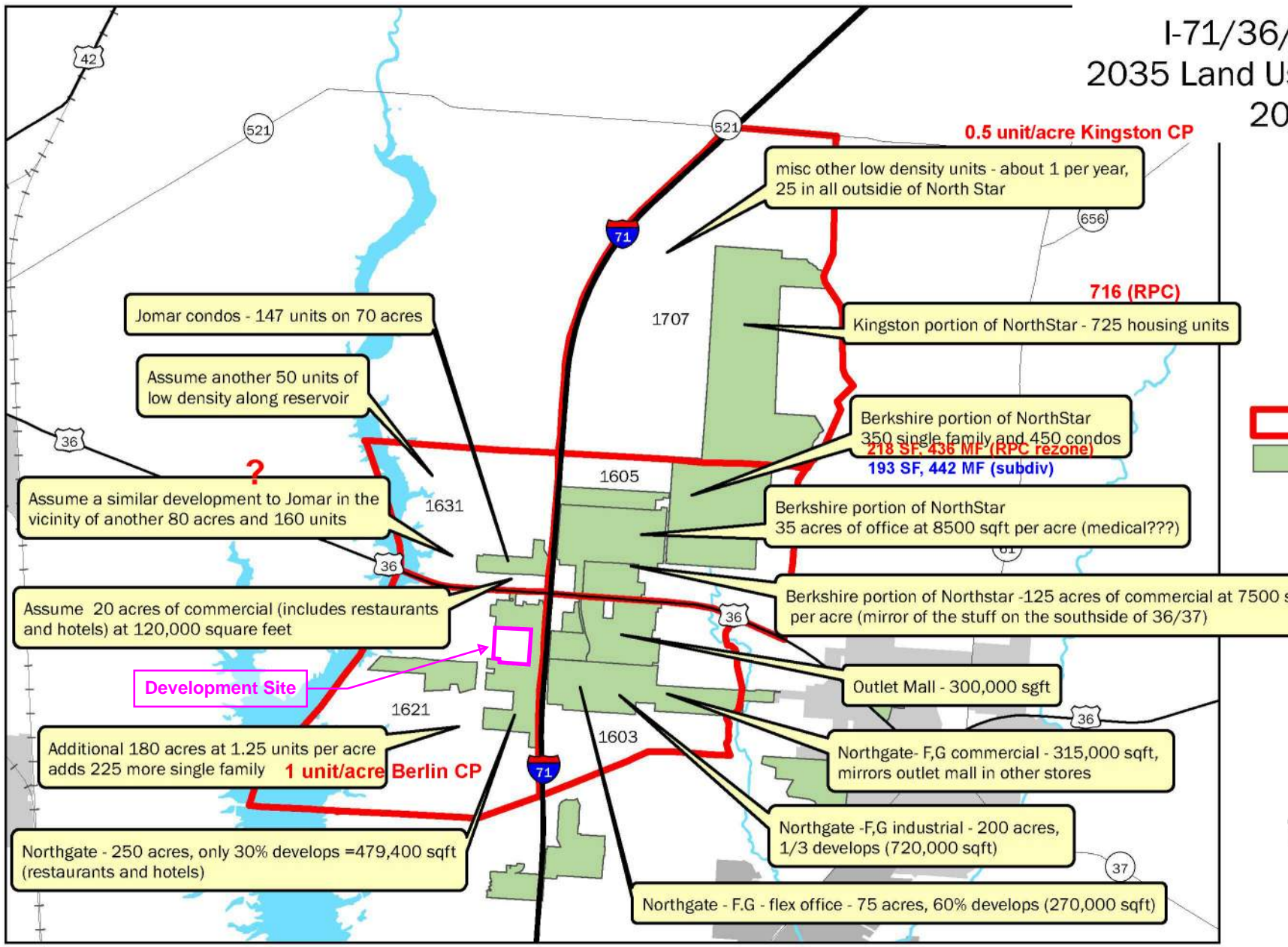


1320/2650
 2560/2250



DEL-71-9.67 PID NO. 90200
 FULL BUILD 2038 AM PEAK/PM PEAK
 OHIO DEPARTMENT OF TRANSPORTATION
 OFFICE OF STATEWIDE PLANNING & RESEARCH
 NOVEMBER 1, 2016 NOT TO SCALE

I-71/36/37
2035 Land Use
201



Dave Meyer

From: Rebekah.Anderson@dot.ohio.gov
Sent: Tuesday, November 24, 2020 4:59 PM
To: Dave Meyer
Cc: Andrew.Hurst@dot.ohio.gov; Dirk.Gross@dot.ohio.gov; Love, Michael; 'Zhuojun Jiang'; Scott.Phinney@dot.ohio.gov
Subject: RE: DEL-71-9.67 - TAZ volumes
Attachments: 36_37b_DCRPCcomments.pdf

[EXTERNAL]

Dave:

If all you're looking for is land use, attached and below are what was proposed at that time. Let me know if that is what you're looking for or if you need something else next week.

1707 - NE of interchange											
Kingston portion of NorthStar - 716 housing units											
misc other low density units - about 1 per year, 25 in all outside of North Star (.5 units per acre)											
1605 NE of interchange											
Berkshire portion of NorthStar - 193 single family and 442 condos											
Berkshire portion of NorthStar - 35 acres of office at 8500 sqft per acre (medical???)											
Berkshire portion of Northstar - 125 acres of commercial at 7500 square feet per acre (mirror of the stuff on the south											
1603 SE of Interchange.											
Northgate- F,G commercial - 75 acres, mirrors outlet mall in other stores											
Northgate -F,G industrial - 200 acres, 1/3 develops											
Northgate - F.G - flex office - 75 acres, 60% develops											
1621 - southwest of interchange											
Northgate - 250 acres, 95% into restaurants and hotels, only 30% develops =479,400 square feet; balance of 15 acres i:											
Additional 180 acres at 1.0 units per acre adds 180 more single family											
1631- northwest quadrant											
Jomar condos - 147 units on 70 acres											
Assume a similar development in the vicinity of another 80 acres and 160 units											
Assume another 50 units of low density along reservoir											
Assume 20 acres of commercial (includes restaurants and hotels) at 120,000 square feet											
Traffic Analysis Zone	Population			Households			Office FA			R	
	2015	Increase	2035	2015	Increase	2035	2015	Increase	2035	2015	It
1707	356	1,945	2,301	129	741	870	0	0	0	1,600	
1605	185	1,591	1,776	70	635	705	7,200	178,500	185,700	32,400	
1603	239	1,367	1,606	83	500	583	2,100	162,000	164,100	36,400	
1621	725	534	1,260	232	180	412	11,400	0	11,400	94,800	
1631	182	906	1,088	66	384	450	5,100	0	5,100	74,000	
Total	1,687	6,343	8,030	580	2,440	3,020	25,800	340,500	366,300	239,200	1,

Rebekah Straub Anderson, P.E.

Transportation Engineer

ODOT Office of Statewide Planning and Research

1980 W. Broad Street #3280, Columbus, Ohio 43223

C: 614.551.8419

W: 614.752.5735 (but I'm not currently there)

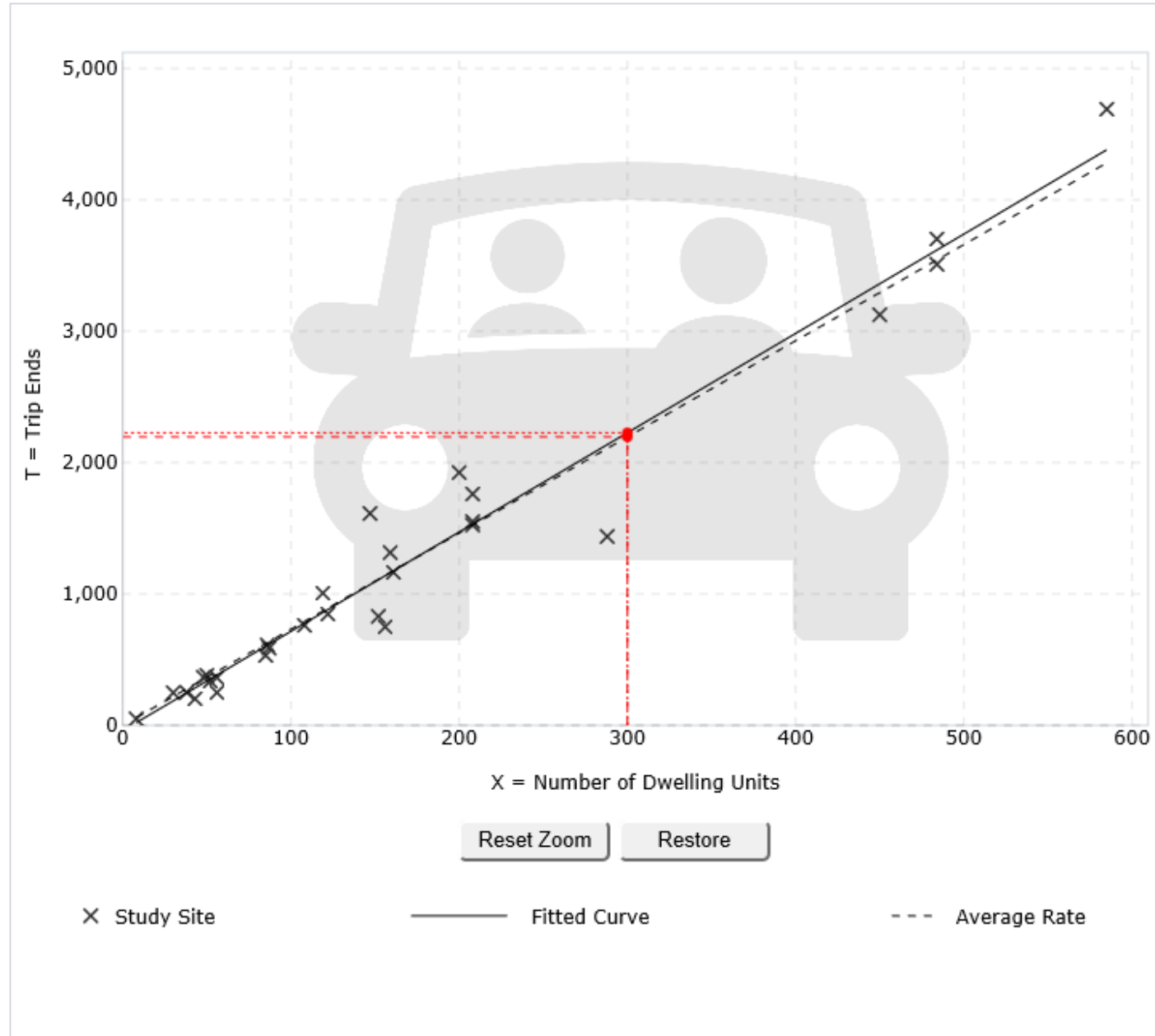
rebekah.anderson@dot.ohio.gov

transportation.ohio.gov



Data Plot and Equation

MFR - 300 units Total Daily



DATA STATISTICS

Land Use:

Multifamily Housing (Low-Rise) (220) [Click for more details](#)

Independent Variable:

Dwelling Units

Time Period:

Weekday

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

29

Avg. Num. of Dwelling Units:

168

Average Rate:

7.32

Range of Rates:

4.45 - 10.97

Standard Deviation:

1.31

Fitted Curve Equation:

$T = 7.56(X) - 40.86$

R²:

0.96

Directional Distribution:

50% entering, 50% exiting

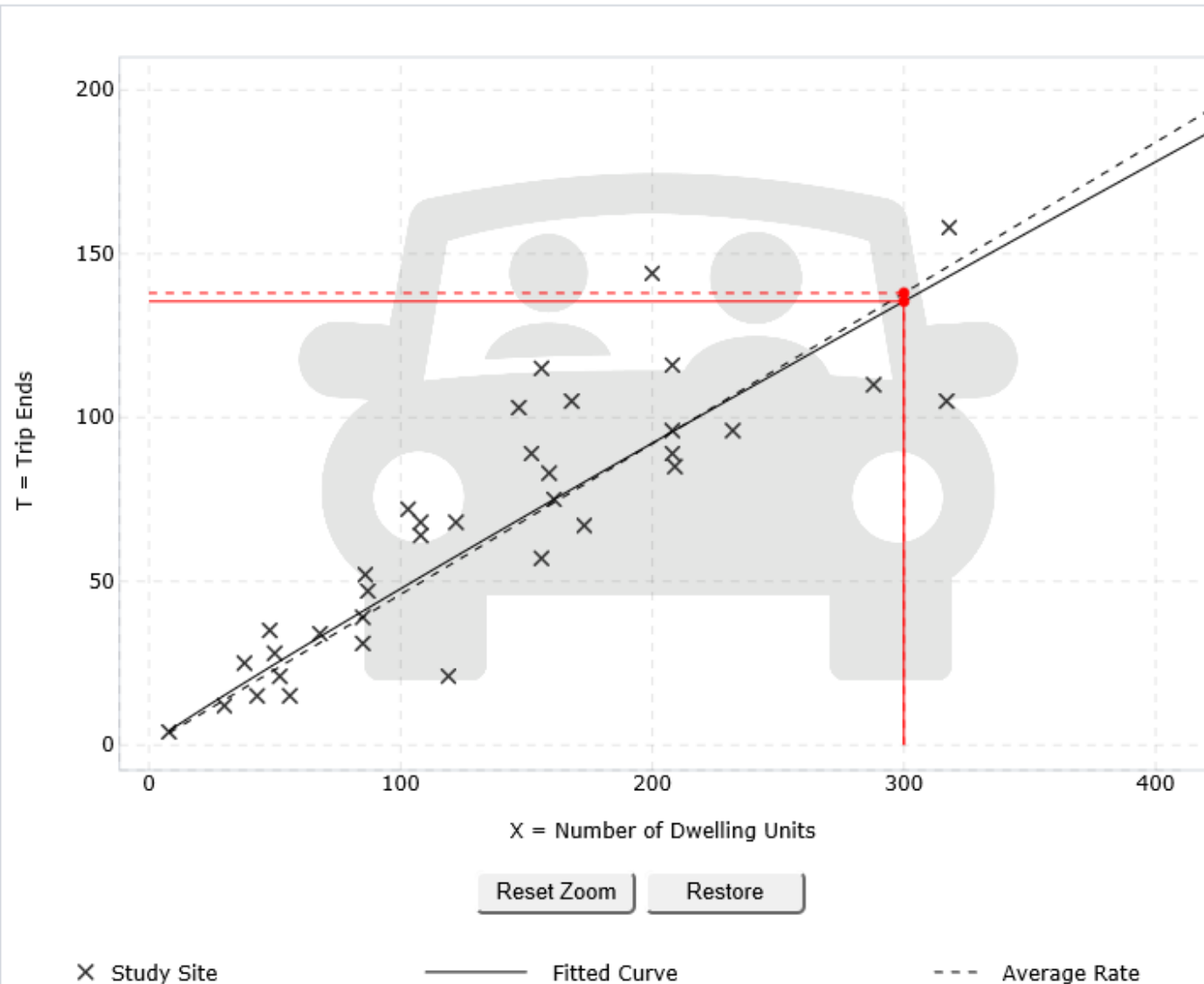
Calculated Trip Ends:

Average Rate: 2196 (Total), 1098 (Entry), 1098 (Exit)

Fitted Curve: 2227 (Total), 1113 (Entry), 1114 (Exit)

Data Plot and Equation

MFR - 300 units AM Peak



DATA STATISTICS

Land Use:

Multifamily Housing (Low-Rise) (220) [Click for more details](#)

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:

42

Avg. Num. of Dwelling Units:

199

Average Rate:

0.46

Range of Rates:

0.18 - 0.74

Standard Deviation:

0.12

Fitted Curve Equation:

$\ln(T) = 0.95 \ln(X) - 0.51$

R²:

0.90

Directional Distribution:

23% entering, 77% exiting

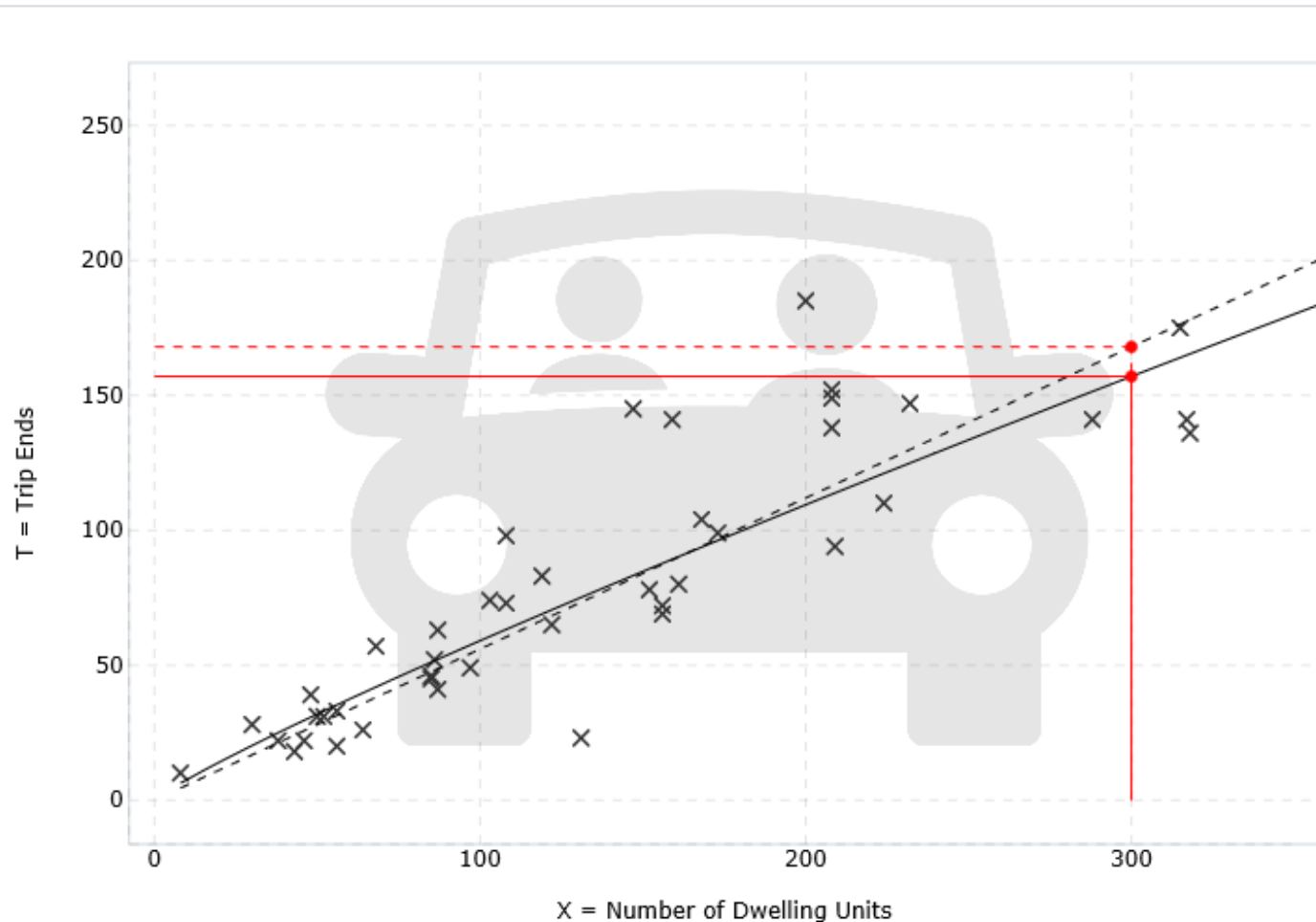
Calculated Trip Ends:

Average Rate: 138 (Total), 32 (Entry), 106 (Exit)

Fitted Curve: 135 (Total), 31 (Entry), 104 (Exit)

Data Plot and Equation

MFR - 300 units PM Peak



Reset Zoom

Restore

x Study Site

— Fitted Curve

- - - Average Rate

DATA STATISTICS

Land Use:

Multifamily Housing (Low-Rise) (220) [Click for more details](#)

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:

50

Avg. Num. of Dwelling Units:

187

Average Rate:

0.56

Range of Rates:

0.18 - 1.25

Standard Deviation:

0.16

Fitted Curve Equation:

$\ln(T) = 0.89 \ln(X) - 0.02$

R²:

0.86

Directional Distribution:

63% entering, 37% exiting

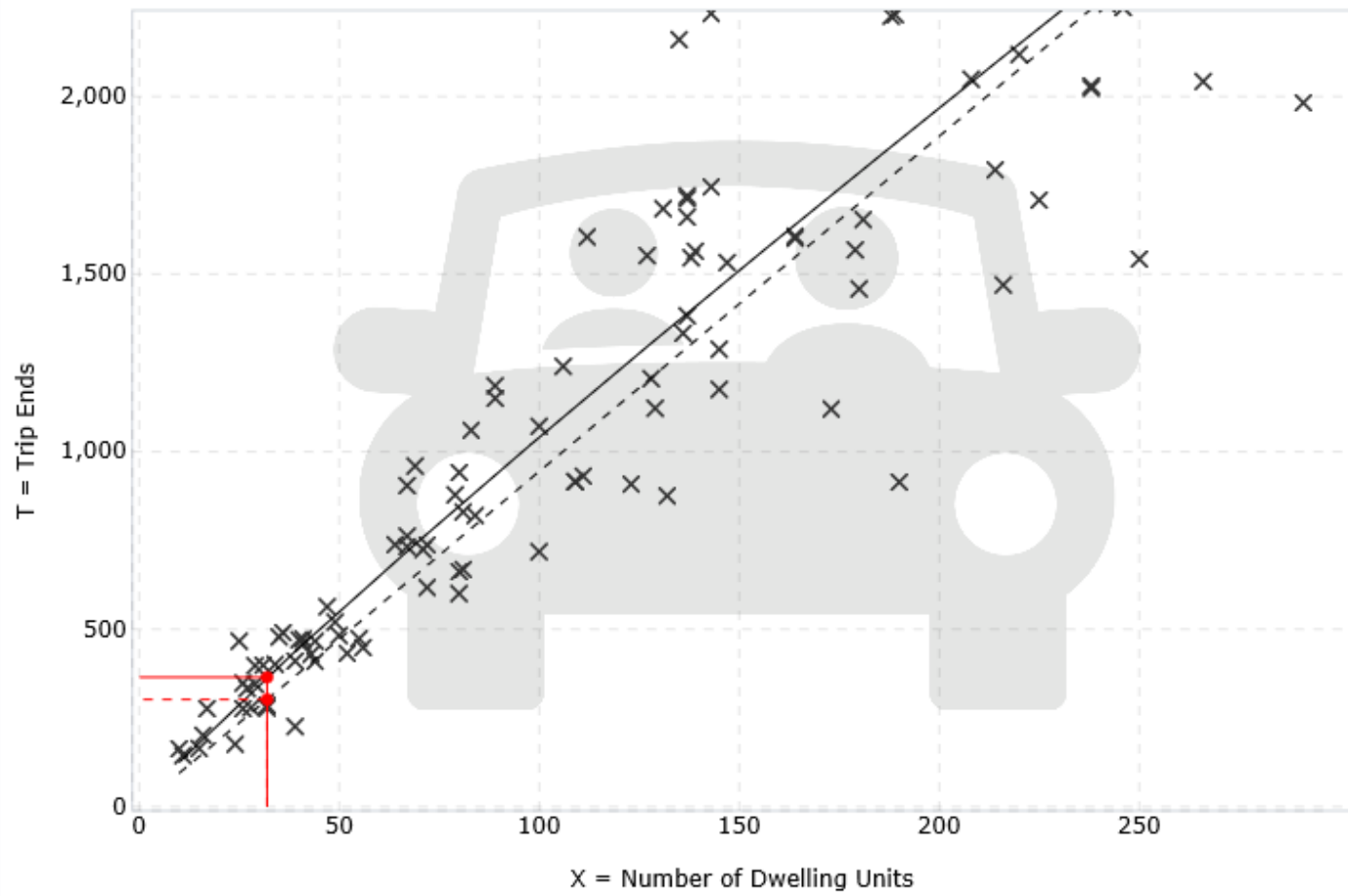
Calculated Trip Ends:

Average Rate: 168 (Total), 106 (Entry), 62 (Exit)

Fitted Curve: 157 (Total), 99 (Entry), 58 (Exit)

Data Plot and Equation

SFR - 32 units Total Daily



× Study Site — Fitted Curve - - - Average Rate

DATA STATISTICS

Land Use:
Single-Family Detached Housing (210) [Click for more details](#)

Independent Variable:
Dwelling Units

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
159

Avg. Num. of Dwelling Units:
264

Average Rate:
9.44

Range of Rates:
4.81 - 19.39

Standard Deviation:
2.10

Fitted Curve Equation:
 $\ln(T) = 0.92 \ln(X) + 2.71$

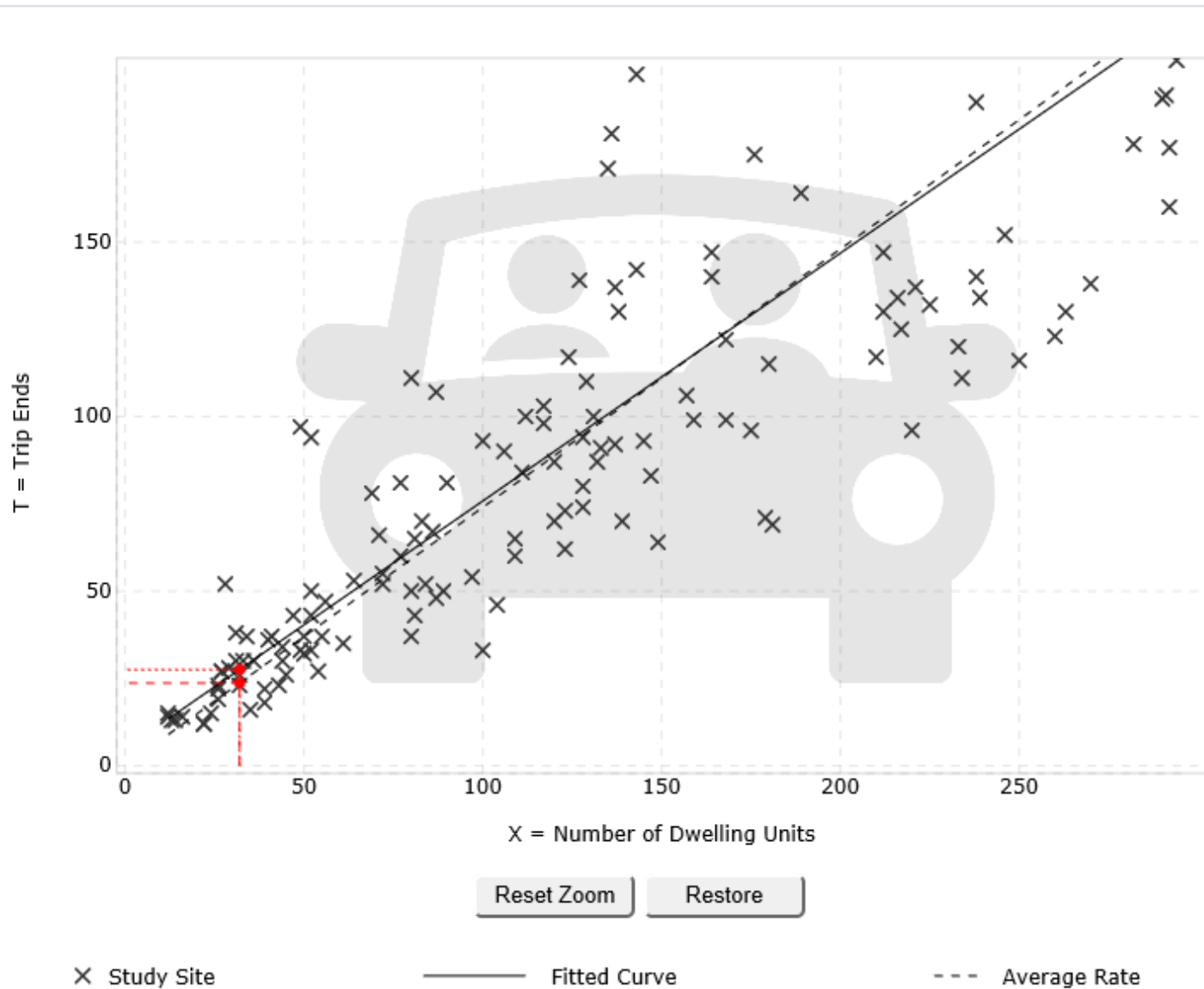
R²:
0.95

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 302 (Total), 151 (Entry), 151 (Exit)
Fitted Curve: 364 (Total), 182 (Entry), 182 (Exit)

Data Plot and Equation

SFR - 32 units AM Peak



DATA STATISTICS

Land Use:

Single-Family Detached Housing (210) [Click for more details](#)

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:

173

Avg. Num. of Dwelling Units:

219

Average Rate:

0.74

Range of Rates:

0.33 - 2.27

Standard Deviation:

0.27

Fitted Curve Equation:

$T = 0.71(X) + 4.80$

R²:

0.89

Directional Distribution:

25% entering, 75% exiting

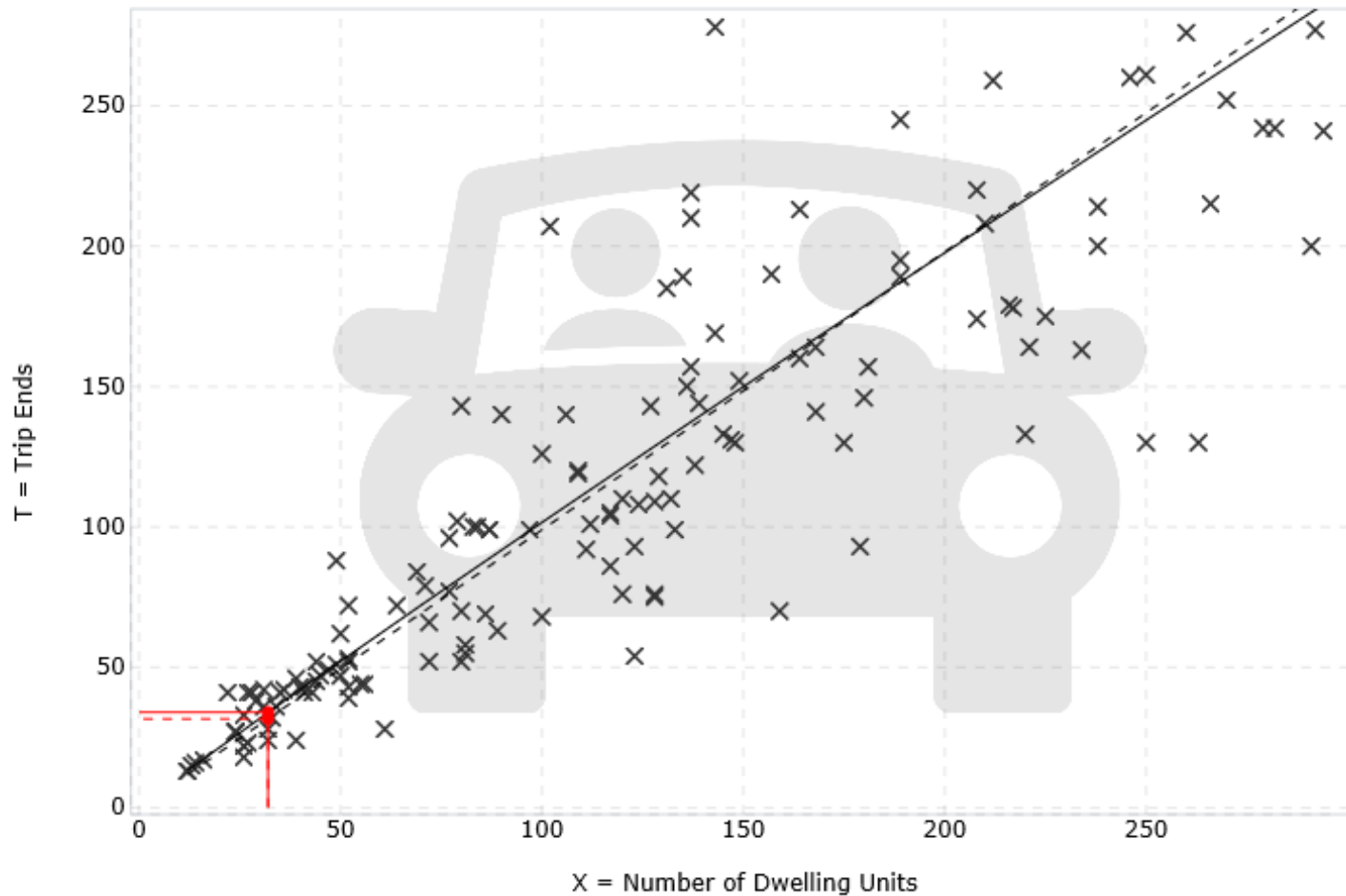
Calculated Trip Ends:

Average Rate: 24 (Total), 6 (Entry), 18 (Exit)

Fitted Curve: 28 (Total), 7 (Entry), 21 (Exit)

Data Plot and Equation

SFR - 32 units PM Peak



Reset Zoom

Restore

X Study Site

— Fitted Curve

- - - Average Rate

DATA STATISTICS

Land Use:

Single-Family Detached Housing (210) [Click for more details](#)

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:

190

Avg. Num. of Dwelling Units:

242

Average Rate:

0.99

Range of Rates:

0.44 - 2.98

Standard Deviation:

0.31

Fitted Curve Equation:

$\ln(T) = 0.96 \ln(X) + 0.20$

R²:

0.92

Directional Distribution:

63% entering, 37% exiting

Calculated Trip Ends:

Average Rate: 32 (Total), 20 (Entry), 12 (Exit)

Fitted Curve: 34 (Total), 21 (Entry), 13 (Exit)

Traffic Volume Projections



Traffic Volume Projections - Opening Year 2022

Background Traffic Growth Rate	2%

Counted Year	2014
Opening Year	2022

AM Peak - 3B's&K Road at Site Connector	(EB)			(WB) Connector Dr			(NB) 3B's&K Road			(SB) 3B's&K Road		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)				0		0		156	0	0	51	
Opening Year Background Volumes (2022)				0		0		181	0	0	59	
50% of Fourwinds Development Traffic				0		0		0	0	0		
Opening Year No-Build Traffic Volumes (2022)				0		0		181	0	0	59	
Phoenix Place Development Site Traffic				5		99		0	1	30	0	
Opening Year Build Traffic Volumes (2022)				5		99		181	1	30	59	

PM Peak - 3B's&K Road at Site Connector	(EB)			(WB) Connector Dr			(NB) 3B's&K Road			(SB) 3B's&K Road		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)				0		0		91	0	0	129	
Opening Year Background Volumes (2022)				0		0		106	0	0	150	
50% of Fourwinds Development Traffic				0		0		0	0	0		
Opening Year No-Build Traffic Volumes (2022)				0		0		106	0	0	150	
Phoenix Place Development Site Traffic				3		55		0	5	94	0	
Opening Year Build Traffic Volumes (2022)				3		55		106	5	94	150	

AM Peak - 3B's&K Road at US 36 / SR 37	(EB) US36/SR37			(WB) US36/SR37			(NB) 3B's&K Road			(SB) Access Drive		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)	2	1421	15	36	753	0	2	0	154	0	0	0
Opening Year Background Volumes (2022)	2	1648	17	42	873	0	2	0	179	0	0	0
50% of Fourwinds Development Traffic	0	37	0	0	36	0	0	0	0	0	0	0
Opening Year No-Build Traffic Volumes (2022)	2	1685	17	42	909	0	2	0	179	0	0	0
Phoenix Place Development Site Traffic	0	0	8	22	0	0	26	0	73	0	0	0
Opening Year Build Traffic Volumes (2022)	2	1685	25	64	909	0	28	0	252	0	0	0

PM Peak - 3B's&K Road at US 35 / SR 37	(EB) US36/SR37			(WB) US36/SR37			(NB) 3B's&K Road			(SB) Access Drive		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)	5	962	29	100	1424	8	20	1	70	1	1	11
Opening Year Background Volumes (2022)	6	1116	34	116	1652	9	23	1	81	1	1	13
50% of Fourwinds Development Traffic	0	62	0	0	49	0	0	0	0	0	0	0
Opening Year No-Build Traffic Volumes (2022)	6	1178	34	116	1701	9	23	1	81	1	1	13
Phoenix Place Development Site Traffic	0	0	25	69	0	0	14	0	41	0	0	0
Opening Year Build Traffic Volumes (2022)	6	1178	59	185	1701	9	37	1	122	1	1	13



Traffic Volume Projections - Opening Year 2022

Background Traffic Growth Rate	2%

Counted Year	2014
Opening Year	2022

AM Peak - US 36 / SR 37 at Fourwinds Drive	(EB) US36/SR37			(WB) US36/SR37			(NB) Fourwinds Dr			(SB) Fourwinds Dr		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)	7	1537	16	23	757	2	10	0	17	4	0	0
Opening Year Background Volumes (2022)	8	1783	19	27	878	2	12	0	20	5	0	0
50% of Fourwinds Development Traffic	37	0	0	0	0	17	0	0	0	105	0	36
Opening Year No-Build Traffic Volumes (2022)	45	1783	19	27	878	19	12	0	20	110	0	36
Phoenix Place Development Site Traffic	0	73	0	0	22	0	0	0	0	0	0	0
Opening Year Build Traffic Volumes (2022)	45	1856	19	27	900	19	12	0	20	110	0	36

PM Peak - US 36 / SR 37 at Fourwinds Drive	(EB) US36/SR37			(WB) US36/SR37			(NB) Fourwinds Dr			(SB) Fourwinds Dr		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)	3	1002	33	46	1493	0	21	0	27	0	0	0
Opening Year Background Volumes (2022)	3	1162	38	53	1732	0	24	0	31	0	0	0
50% of Fourwinds Development Traffic	62	0	0	0	0	93	0	0	0	37	0	49
Opening Year No-Build Traffic Volumes (2022)	65	1162	38	53	1732	93	24	0	31	37	0	49
Phoenix Place Development Site Traffic	0	41	0	0	69	0	0	0	0	0	0	0
Opening Year Build Traffic Volumes (2022)	65	1203	38	53	1801	93	24	0	31	37	0	49

AM Peak - US 36 / SR 37 at I-71 SB Ramps	(EB) US36/SR37			(WB) US36/SR37			(NB)			(SB) I-71 Ramp		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)		402	1265	666	710					32	0	175
Opening Year Background Volumes (2022)		466	1467	773	824					37	0	203
50% of Fourwinds Development Traffic		41	64	0	10					0	0	4
Opening Year No-Build Traffic Volumes (2022)		507	1531	773	834					37	0	207
Phoenix Place Development Site Traffic		26	47	0	19					0	0	3
Opening Year Build Traffic Volumes (2022)		533	1578	773	853					37	0	210

PM Peak - US 36 / SR 37 at I-71 SB Ramps	(EB) US36/SR37			(WB) US36/SR37			(NB)			(SB) I-71 Ramp		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)		664	611	343	1437					57	0	250
Opening Year Background Volumes (2022)		770	709	398	1667					66	0	290
50% of Fourwinds Development Traffic		25	12	0	70					0	0	24
Opening Year No-Build Traffic Volumes (2022)		795	721	398	1737					66	0	314
Phoenix Place Development Site Traffic		15	26	0	59					0	0	10
Opening Year Build Traffic Volumes (2022)		810	747	398	1796					66	0	324



Traffic Volume Projections - Opening Year 2022

Background Traffic Growth Rate	2%

Counted Year	2014
Opening Year	2022

AM Peak - US 36 / SR 37 at I-71 NB Ramps	(EB) US36/SR37			(WB) US36/SR37			(NB) I-71 Ramp			(SB)		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)	144	291			955	87	424	0	265			
Opening Year Background Volumes (2022)	167	338			1108	101	492	0	307			
50% of Fourwinds Development Traffic	15	26			8	0	3	0	0			
Opening Year No-Build Traffic Volumes (2022)	182	364			1116	101	495	0	307			
Phoenix Place Development Site Traffic	10	16			5	0	14	0	0			
Opening Year Build Traffic Volumes (2022)	192	380			1121	101	509	0	307			
PM Peak - US 36 / SR 37 at I-71 NB Ramps	(EB) US36/SR37			(WB) US36/SR37			(NB) I-71 Ramp			(SB)		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
MORPC Counted Traffic Volumes (2014)	180	474			685	80	1092	0	739			
Opening Year Background Volumes (2022)	209	550			795	93	1267	0	857			
50% of Fourwinds Development Traffic	8	18			33	0	37	0	0			
Opening Year No-Build Traffic Volumes (2022)	217	568			828	93	1304	0	857			
Phoenix Place Development Site Traffic	6	9			15	0	44	0	0			
Opening Year Build Traffic Volumes (2022)	223	577			843	93	1348	0	857			

Turn Lane Warrant Charts

2-Lane Highway Left Turn Lane Warrant (>40MPH)

AM Peak:

Left Turns = 30
% Left Turns = 34%

NOT WARRANTED

PM Peak:

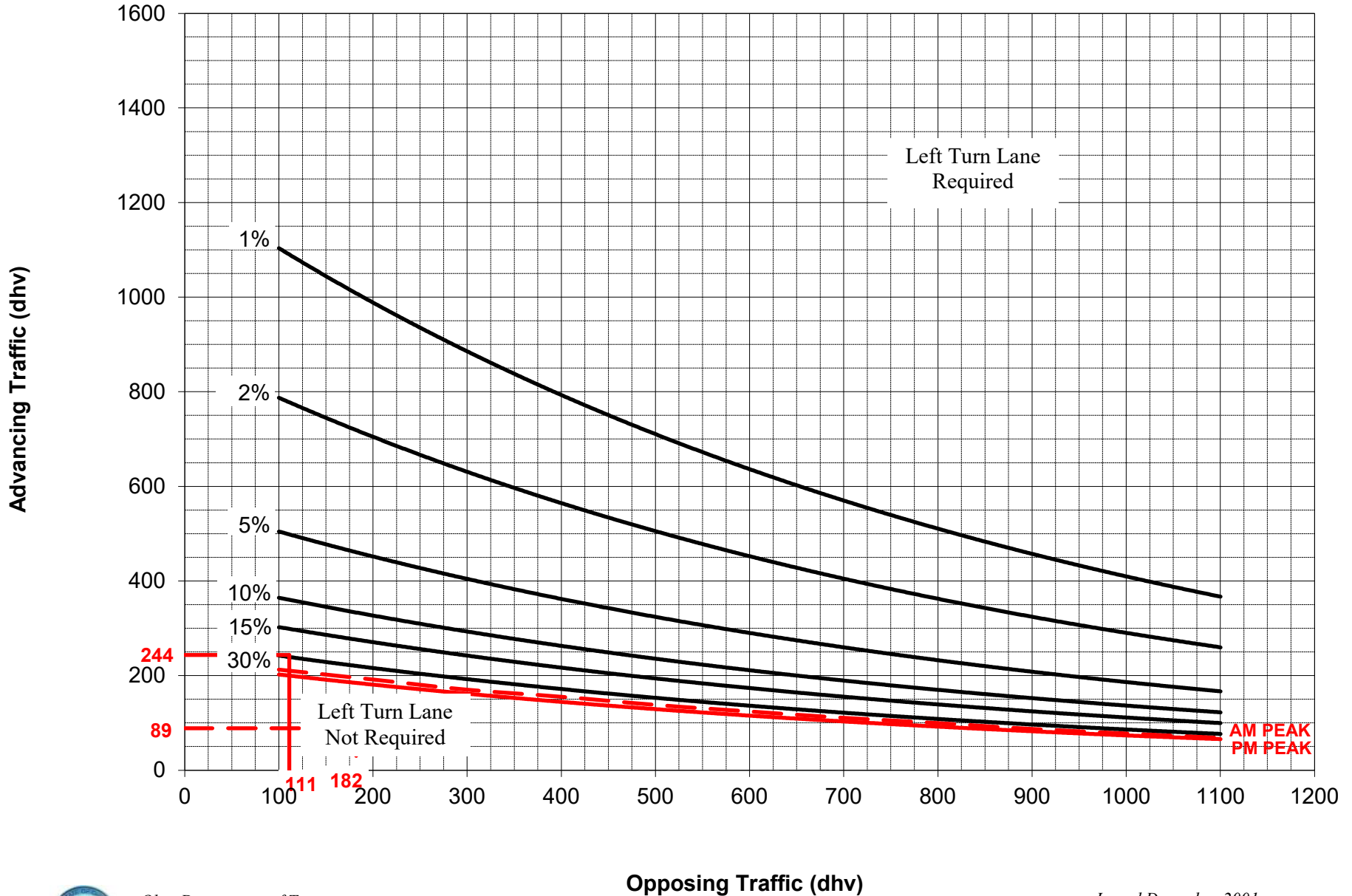
Left Turns = 94
% Left Turns = 39%

WARRANTED

Volumes Analyzed: 2022 Build

Phoenix Place TIS

3B's&K Rd @ Connector Dr

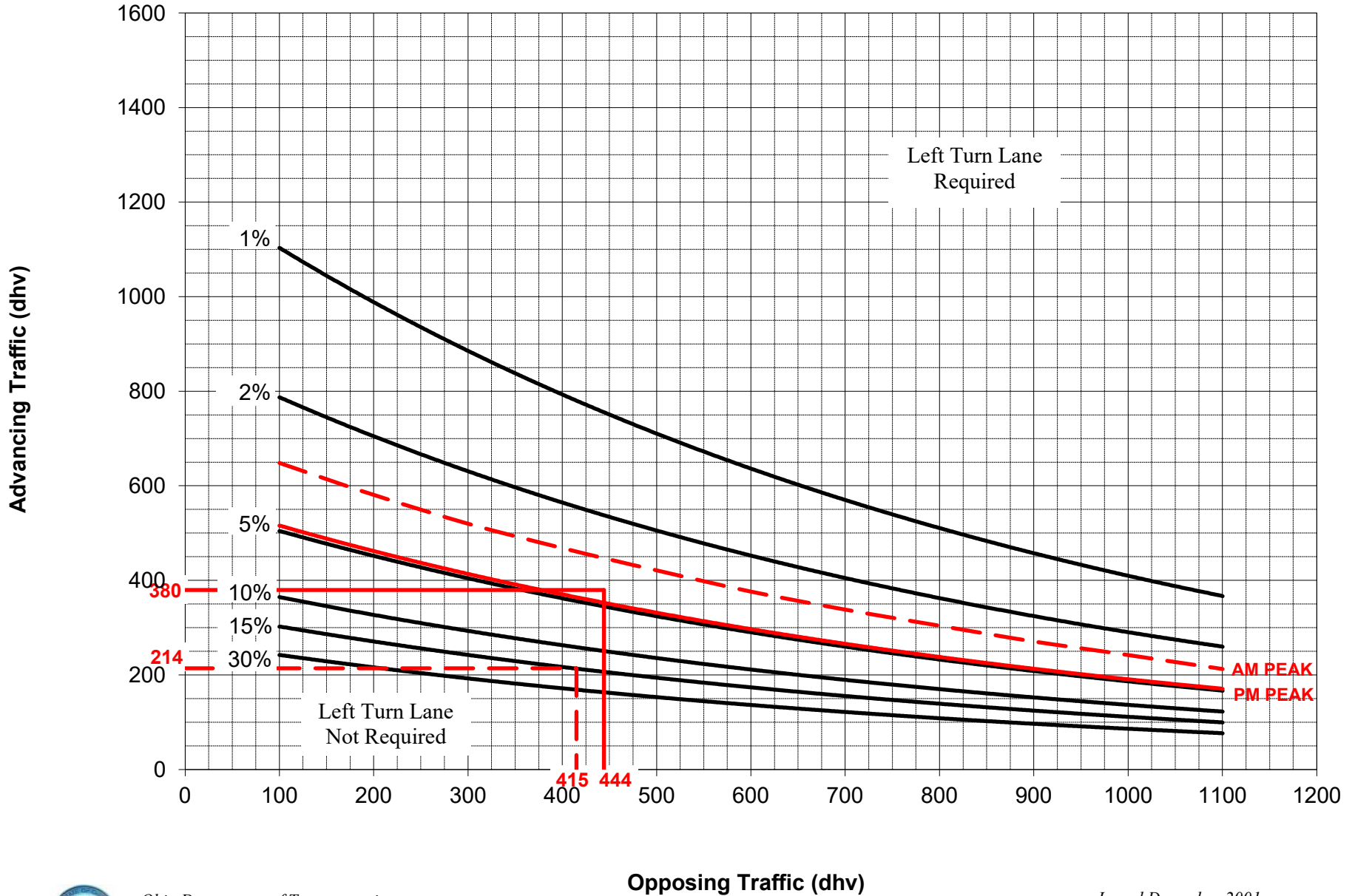


2-Lane Highway Left Turn Lane Warrant (>40MPH)

AM Peak:
 # Left Turns = 6
 % Left Turns = 3%
NOT WARRANTED

PM Peak:
 # Left Turns = 18
 % Left Turns = 5%
WARRANTED

Volumes Analyzed: 2038 Build
Phoenix Place TIS
Fourwinds Dr @ N Access Dr

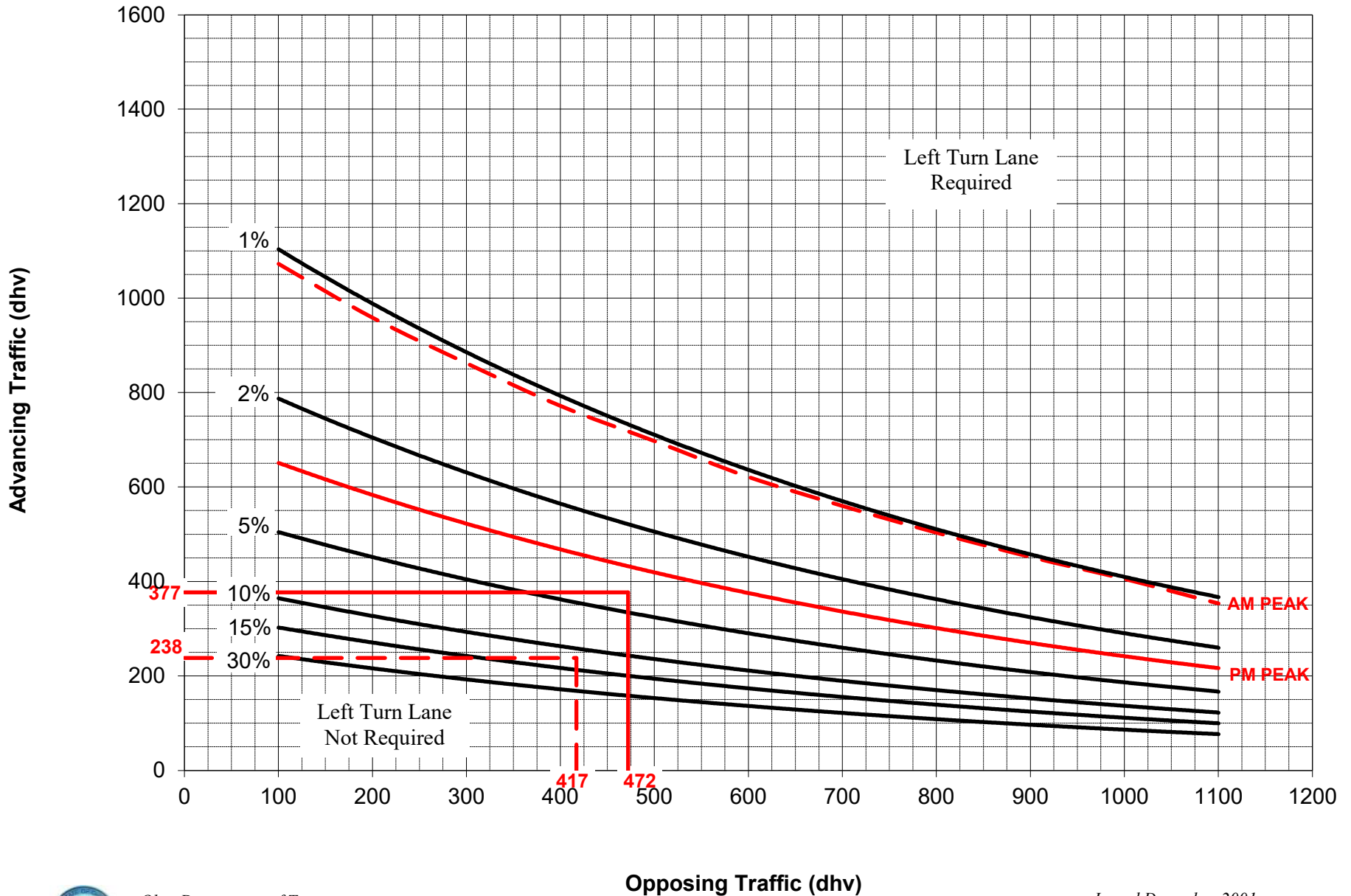


2-Lane Highway Left Turn Lane Warrant (>40MPH)

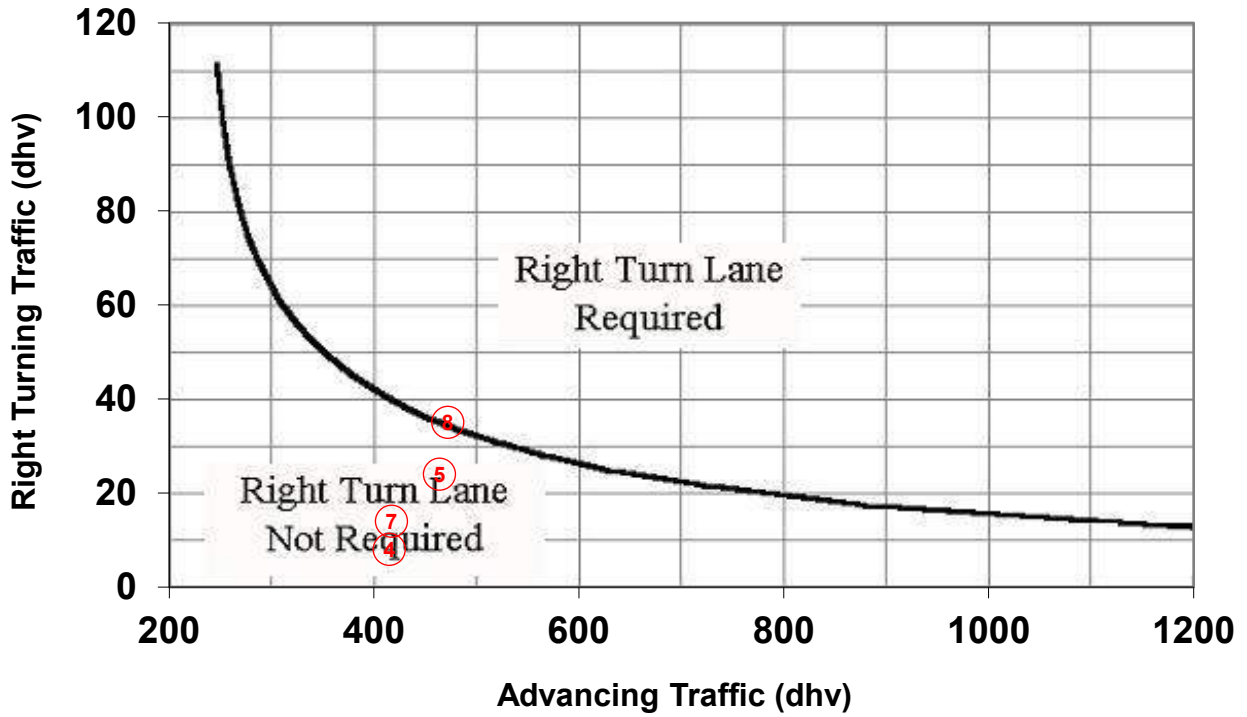
AM Peak:
 # Left Turns = 3
 % Left Turns = 1%
NOT WARRANTED

PM Peak:
 # Left Turns = 12
 % Left Turns = 3%
NOT WARRANTED

Volumes Analyzed: 2038 Build
Phoenix Place TIS
Fourwinds Dr @ S Access Dr



2-Lane Highway Right Turn Lane Warrant
 > 40 mph or 70 kph Posted Speed



REQ	Intersection	Advancing Traffic Volume	Right Turning Traffic	Result
1	3B's & K Rd At Connector Dr - AM	182	1	NO
2	3B's & K Rd At Connector Dr - PM	111	5	NO
3				
4	Fourwinds Drive @ N. Access - AM	415	8	NO
5	Fourwinds Drive @ N. Access - PM	464	24	NO
6				
7	Fourwinds Drive @ S. Access - AM	417	14	NO
8	Fourwinds Drive @ S. Access - PM	472	35	MARGINAL
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

BASIS FOR COMPUTING LENGTH OF TURN LANES	401-9
	REFERENCE SECTIONS 401.6.1, 401.6.3

Type of Traffic Control	Design Speed		
	30-35	40-65	
	Turn Demand Volume		
	All	Low*	High
Signalized	A	** B or C	** B or C
Unsignalized Stopped Crossroad	A	A	A
Unsignalized Through Road	A	B	** B or C

*Low is considered 10% or less of approach traffic volume

**Whichever is greater

CONDITION A	STORAGE ONLY
Length = 50' (diverging taper) + Storage Length (Figure 401-10)	

CONDITION B	HIGH SPEED DECELERATION ONLY
Design Speed	Length (including 50' Diverging Taper)
40	125
45	175
50	225
55	285
60	345
65	405

CONDITION C	MODERATE SPEED DECELERATION AND STORAGE
Design Speed	Length (including 50' Diverging Taper)
40	115 + Storage Length (Figure 401-10)
45	125 "
50	145 "
55	165 "
60	185 "
65	205 "

For explanation, see Turn Lane Design Example

STORAGE LENGTH AT INTERSECTIONS	401-10
	REFERENCE SECTIONS 401.6.1, 401.6.3

* AVERAGE NO. OF VEHICLES/CYCLE	REQUIRED LENGTH (FT.)	* AVERAGE NO. OF VEHICLES/CYCLE	REQUIRED LENGTH (FT.)
1	50	17	600
2	100	18	625
3	150	19	650
4	175	20	675
5	200	21	725
6	250	22	750
7	275	23	775
8	325	24	800
9	350	25	825
10	375	30	975
11	400	35	1125
12	450	40	1250
13	475	45	1400
14	500	50	1550
15	525	55	1700
16	550	60	1850

* AVERAGE VEHICLES PER CYCLE = $\frac{\text{DHV (TURNING LANE)}}{\text{CYCLES/HOUR}}$

IF CYCLES ARE UNKNOWN ASSUME:

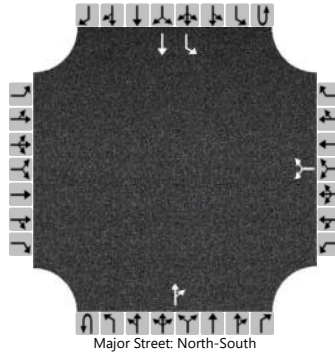
- UNSIGNALIZED OR 2 PHASE = 60 CYCLES/HOUR
- 3 PHASE = 40 CYCLES/HOUR
- 4 PHASE = 30 CYCLES/HOUR

2022 HCS Capacity Analysis Reports

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Mike Penrod	Intersection	3Bs & K Rd @ Connector Dr
Agency/Co.	The Kleingers Group	Jurisdiction	Delaware County
Date Performed	2/2/2021	East/West Street	Connector Drive
Analysis Year	2022	North/South Street	3B's & K Road
Time Analyzed	Build AM Peak	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Phoenix Place Development		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						5		99			181	1		30	59	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.43		6.23							4.13	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.53		3.33							2.23	

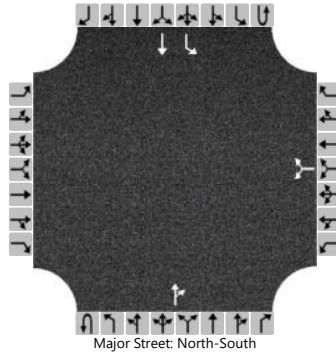
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						113								33		
Capacity, c (veh/h)						830								1369		
v/c Ratio						0.14								0.02		
95% Queue Length, Q ₉₅ (veh)						0.5								0.1		
Control Delay (s/veh)						10.0								7.7		
Level of Service (LOS)						B								A		
Approach Delay (s/veh)						10.0								2.6		
Approach LOS						B										

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Mike Penrod			Intersection	3Bs & K Rd @ Connector Dr		
Agency/Co.	The Kleingers Group			Jurisdiction	Delaware County		
Date Performed	2/2/2021			East/West Street	Connector Drive		
Analysis Year	2022			North/South Street	3B's & K Road		
Time Analyzed	Build PM Peak			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place Development						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						3		55			106	5		94	150	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.43		6.23						4.13		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

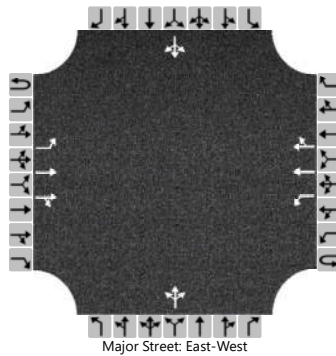
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						63								102		
Capacity, c (veh/h)						892								1461		
v/c Ratio						0.07								0.07		
95% Queue Length, Q ₉₅ (veh)						0.2								0.2		
Control Delay (s/veh)						9.3								7.6		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)					9.3								2.9			
Approach LOS					A											

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	D Meyer			Intersection	US 36 at 3Bs&K Rd		
Agency/Co.	The Kelingers Group			Jurisdiction	Delaware County		
Date Performed	1/3/2021			East/West Street	US 36		
Analysis Year	2038			North/South Street	3bs&K Road		
Time Analyzed	2022 No-Build AM Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place TIS						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	2	1685	17	0	42	909	0		2	0	179		0	0	0
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

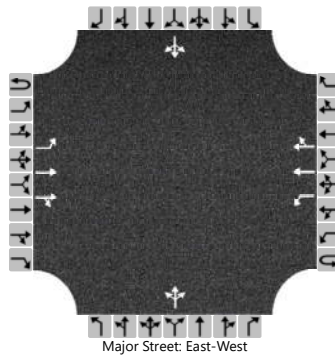
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				46					197				0	
Capacity, c (veh/h)		689				320					225					
v/c Ratio		0.00				0.14					0.87					
95% Queue Length, Q ₉₅ (veh)		0.0				0.5					7.0					
Control Delay (s/veh)		10.2				18.1					76.8					
Level of Service (LOS)		B				C					F					
Approach Delay (s/veh)		0.0				0.8				76.8						
Approach LOS										F						

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	D Meyer			Intersection	US 36 at 3Bs&K Rd		
Agency/Co.	The Kelingers Group			Jurisdiction	Delaware County		
Date Performed	1/3/2021			East/West Street	US 36		
Analysis Year	2022			North/South Street	3bs&K Road		
Time Analyzed	2022 No-Build PM Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place TIS						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	6	1178	34	0	116	1701	9		23	1	81		1	1	13
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

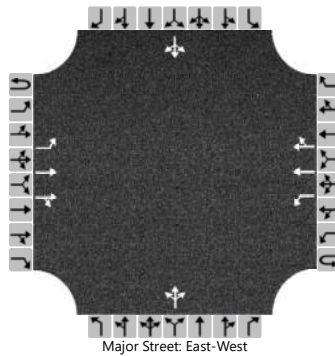
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7				126					114				16	
Capacity, c (veh/h)		317				515					37				32	
v/c Ratio		0.02				0.24					3.12				0.50	
95% Queue Length, Q ₉₅ (veh)		0.1				1.0					13.0				1.7	
Control Delay (s/veh)		16.6				14.2					1187.3				197.7	
Level of Service (LOS)		C				B					F				F	
Approach Delay (s/veh)		0.1			0.9					1187.3			197.7			
Approach LOS										F			F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	D Meyer			Intersection	US 36 at 3Bs&K Rd		
Agency/Co.	The Kelingers Group			Jurisdiction	Delaware County		
Date Performed	1/3/2021			East/West Street	US 36		
Analysis Year	2038			North/South Street	3bs&K Road		
Time Analyzed	2022 Build AM Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place TIS						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	2	1685	20	0	68	909	0		12	0	268		0	0	0
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

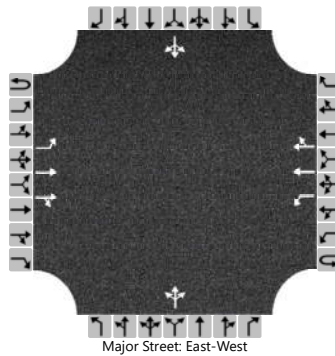
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				74					304					0
Capacity, c (veh/h)		689				319					140					
v/c Ratio		0.00				0.23					2.17					
95% Queue Length, Q ₉₅ (veh)		0.0				0.9					25.1					
Control Delay (s/veh)		10.2				19.7					601.9					
Level of Service (LOS)		B				C					F					
Approach Delay (s/veh)		0.0				1.4				601.9						
Approach LOS										F						

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	D Meyer			Intersection	US 36 at 3Bs&K Rd		
Agency/Co.	The Kelingers Group			Jurisdiction	Delaware County		
Date Performed	1/3/2021			East/West Street	US 36		
Analysis Year	2022			North/South Street	3bs&K Road		
Time Analyzed	2022 Build PM Peak			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place TIS						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	6	1178	44	0	200	1701	9		29	1	130		1	1	13
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

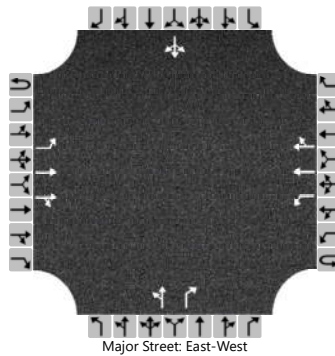
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7				217					174					16	
Capacity, c (veh/h)		317				510					23					17	
v/c Ratio		0.02				0.43					7.49					0.99	
95% Queue Length, Q ₉₅ (veh)		0.1				2.1					21.8					2.5	
Control Delay (s/veh)		16.6				17.2					3250.7					531.8	
Level of Service (LOS)		C				C					F					F	
Approach Delay (s/veh)		0.1				1.8				3250.7				531.8			
Approach LOS										F				F			

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	D Meyer			Intersection	US 36 at 3Bs&K Rd		
Agency/Co.	The Kelingers Group			Jurisdiction	Delaware County		
Date Performed	1/3/2021			East/West Street	US 36		
Analysis Year	2038			North/South Street	3bs&K Road		
Time Analyzed	2022 Build IMPROVED AM			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place TIS						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	1		0	1	0
Configuration		L	T	TR		L	T	TR		LT		R			LTR	
Volume (veh/h)	0	2	1685	20	0	68	909	0		12	0	268		0	0	0
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No							
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

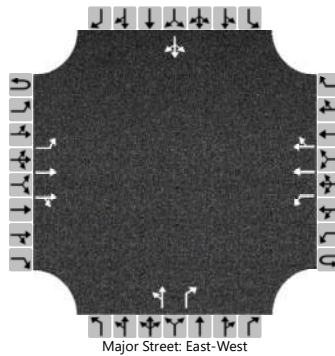
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		2				74				13		291			0	
Capacity, c (veh/h)		689				319				60		268				
v/c Ratio		0.00				0.23				0.22		1.09				
95% Queue Length, Q ₉₅ (veh)		0.0				0.9				0.7		12.0				
Control Delay (s/veh)		10.2				19.7				81.7		120.8				
Level of Service (LOS)		B				C				F		F				
Approach Delay (s/veh)		0.0				1.4				119.2						
Approach LOS										F						

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	D Meyer			Intersection	US 36 at 3Bs&K Rd		
Agency/Co.	The Kelingers Group			Jurisdiction	Delaware County		
Date Performed	1/3/2021			East/West Street	US 36		
Analysis Year	2022			North/South Street	3bs&K Road		
Time Analyzed	2022 Build IMPROVED PM			Peak Hour Factor	0.92		
Intersection Orientation	East-West			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place TIS						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Priority																
Number of Lanes	0	1	2	0	0	1	2	0		0	1	1		0	1	0
Configuration		L	T	TR		L	T	TR		LT		R			LTR	
Volume (veh/h)	0	6	1178	44	0	200	1701	9		29	1	130		1	1	13
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)									0				0			
Right Turn Channelized									No							
Median Type Storage	Left Only								1							

Critical and Follow-up Headways

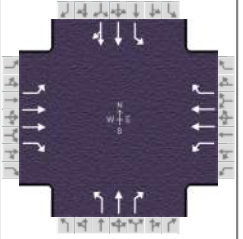
Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7				217				33		141			16		
Capacity, c (veh/h)		317				510				25		401			34		
v/c Ratio		0.02				0.43				1.32		0.35			0.48		
95% Queue Length, Q ₉₅ (veh)		0.1				2.1				4.0		1.6			1.6		
Control Delay (s/veh)		16.6				17.2				526.5		18.8			183.4		
Level of Service (LOS)		C				C				F		C			F		
Approach Delay (s/veh)		0.1				1.8				114.0				183.4			
Approach LOS										F				F			

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Kleingers Group			Duration, h	0.250
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other
Jurisdiction	ODOT	Time Period	No-Build AM	PHF	0.92
Urban Street	US36/SR37	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	Fourwinds Drive	File Name	2022 aNo-Build_US 36 at Fourwinds AM.xus		
Project Description	2022 No-Build AM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	45	1783	19	27	878	19	12	0	20	110	0	36

Signal Information				Signal Phases									
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	4.4	1.3	85.7	10.7	0.0	0.0	0.0	0.0	0.0
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	3.0	1.1	3.0		5.0		6.0
Phase Duration, s	11.6	92.9	10.4	91.7		16.7		16.7
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0		3.1		3.1
Queue Clearance Time (g_s), s	2.9		2.5			6.0		10.4
Green Extension Time (g_e), s	0.1	0.0	0.0	0.0		0.3		0.3
Phase Call Probability	0.80		0.62			1.00		1.00
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	49	1938	21	29	954	21	13	0	22	120	0	39
Adjusted Saturation Flow Rate (s), veh/h/ln	1667	1666	1483	1667	1666	1483	1390	1750	1483	1667	1750	1483
Queue Service Time (g_s), s	0.9	46.0	0.5	0.5	13.8	0.5	1.1	0.0	1.6	8.4	0.0	3.0
Cycle Queue Clearance Time (g_c), s	0.9	46.0	0.5	0.5	13.8	0.5	4.0	0.0	1.6	8.4	0.0	3.0
Green Ratio (g/C)	0.76	0.72	0.72	0.75	0.71	0.71	0.09	0.09	0.09	0.09	0.09	0.09
Capacity (c), veh/h	496	2414	1074	196	2379	1059	150	156	132	209	156	132
Volume-to-Capacity Ratio (X)	0.099	0.803	0.019	0.150	0.401	0.020	0.087	0.000	0.164	0.573	0.000	0.296
Back of Queue (Q), ft/ln (95 th percentile)	11.1	535.7	6.2	15.2	198.6	6.5	16.8	0	27.4	160.2	0	50
Back of Queue (Q), veh/ln (95 th percentile)	0.4	21.4	0.2	0.6	7.9	0.3	0.7	0.0	1.1	6.4	0.0	2.0
Queue Storage Ratio (RQ) (95 th percentile)	0.04	0.00	0.03	0.06	0.00	0.02	0.07	0.00	0.11	0.64	0.00	0.00
Uniform Delay (d_1), s/veh	4.4	10.9	4.6	14.2	6.9	5.0	53.0	0.0	50.5	53.6	0.0	51.1
Incremental Delay (d_2), s/veh	0.0	2.9	0.0	0.1	0.5	0.0	0.1	0.0	0.2	0.9	0.0	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	4.4	13.8	4.7	14.4	7.4	5.0	53.1	0.0	50.7	54.5	0.0	51.6
Level of Service (LOS)	A	B	A	B	A	A	D		D	D		D
Approach Delay, s/veh / LOS	13.5		B	7.5		A	51.6		D	53.8		D
Intersection Delay, s/veh / LOS	14.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.22	B	2.05	B	2.47	B	2.47	B
Bicycle LOS Score / LOS	2.14	B	1.32	A	0.54	A	0.62	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	The Kleingers Group			Duration, h	0.250	
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other	
Jurisdiction	ODOT	Time Period	No-Build PM	PHF	0.92	
Urban Street	US36/SR37	Analysis Year	2022	Analysis Period	1 > 7:00	
Intersection	Fourwinds Drive	File Name	2022 aNo-Build_US 36 at Fourwinds PM.xus			
Project Description	2022 No-Build PM					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	65	1162	38	53	1732	93	24	0	31	37	0	49

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On										
Force Mode	Fixed	Simult. Gap N/S	On										
		Green		6.0	0.4	85.7	9.9	0.0	0.0				
		Yellow		4.0	0.0	4.0	4.0	0.0	0.0				
		Red		2.0	0.0	2.0	2.0	0.0	0.0				

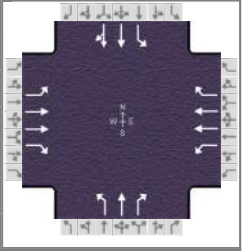
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	3.0	1.1	3.0		5.0		6.0
Phase Duration, s	12.3	92.1	12.0	91.7		15.9		15.9
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0		3.3		3.3
Queue Clearance Time (g_s), s	3.2		3.0			8.3		6.1
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0		0.2		0.2
Phase Call Probability	0.91		0.85			0.99		0.99
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	71	1263	41	58	1883	101	26	0	34	40	0	53
Adjusted Saturation Flow Rate (s), veh/h/ln	1667	1666	1483	1667	1666	1483	1372	1750	1483	1667	1750	1483
Queue Service Time (g_s), s	1.2	20.7	1.0	1.0	44.5	2.5	2.2	0.0	2.6	2.7	0.0	4.1
Cycle Queue Clearance Time (g_c), s	1.2	20.7	1.0	1.0	44.5	2.5	6.3	0.0	2.6	2.7	0.0	4.1
Green Ratio (g/C)	0.77	0.72	0.72	0.76	0.71	0.71	0.08	0.08	0.08	0.08	0.08	0.08
Capacity (c), veh/h	232	2390	1064	378	2380	1059	127	145	123	198	145	123
Volume-to-Capacity Ratio (X)	0.304	0.528	0.039	0.152	0.791	0.095	0.206	0.000	0.274	0.203	0.000	0.434
Back of Queue (Q), ft/ln (95 th percentile)	42.2	274.2	13	13	527.8	33.6	34.7	0	43.2	51.4	0	69.6
Back of Queue (Q), veh/ln (95 th percentile)	1.7	11.0	0.5	0.5	21.1	1.3	1.4	0.0	1.7	2.1	0.0	2.8
Queue Storage Ratio (RQ) (95 th percentile)	0.16	0.00	0.06	0.05	0.00	0.10	0.14	0.00	0.17	0.21	0.00	0.00
Uniform Delay (d_1), s/veh	15.0	7.7	4.9	5.8	11.3	5.3	55.3	0.0	51.6	51.7	0.0	52.4
Incremental Delay (d_2), s/veh	0.3	0.8	0.1	0.1	2.8	0.2	0.3	0.0	0.4	0.2	0.0	0.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	15.3	8.6	5.0	5.9	14.0	5.4	55.6	0.0	52.1	51.9	0.0	53.2
Level of Service (LOS)	B	A	A	A	B	A	E		D	D		D
Approach Delay, s/veh / LOS	8.8		A	13.4		B	53.6		D	52.7		D
Intersection Delay, s/veh / LOS	13.3						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.22	B	2.05	B	2.47	B	2.47	B
Bicycle LOS Score / LOS	1.62	B	2.17	B	0.59	A	0.56	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information			
Agency	The Kleingers Group			Duration, h	0.250		
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other		
Jurisdiction	ODOT	Time Period	Build AM	PHF	0.92		
Urban Street	US36/SR37	Analysis Year	2022	Analysis Period	1 > 7:00		
Intersection	Fourwinds Drive	File Name	2022 Build_US 36 at Fourwinds AM.xus				
Project Description	2022 Build AM						



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	45	1856	19	27	900	19	12	0	20	110	0	36

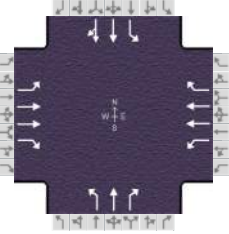
Signal Information				Signal Timing (s)								Signal Phases			
Cycle, s	120.0	Reference Phase	2												
Offset, s	0	Reference Point	End	Green	4.4	1.3	85.7	10.7	0.0	0.0					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0	4.0	4.0	0.0	0.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	0.0	2.0	2.0	0.0	0.0					

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	3.0	1.1	3.0		5.0		6.0
Phase Duration, s	11.6	92.9	10.4	91.7		16.7		16.7
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0		3.1		3.1
Queue Clearance Time (g_s), s	2.9		2.5			6.0		10.4
Green Extension Time (g_e), s	0.1	0.0	0.0	0.0		0.3		0.3
Phase Call Probability	0.80		0.62			1.00		1.00
Max Out Probability	0.00		0.00			0.00		0.00

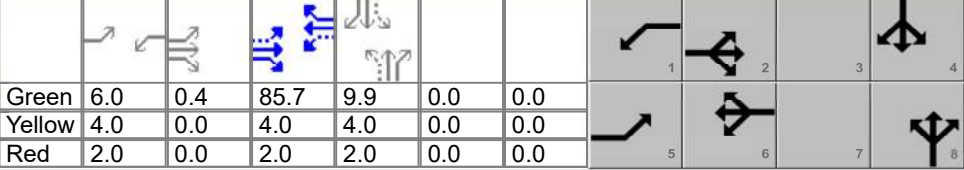
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	49	2017	21	29	978	21	13	0	22	120	0	39
Adjusted Saturation Flow Rate (s), veh/h/ln	1667	1666	1483	1667	1666	1483	1390	1750	1483	1667	1750	1483
Queue Service Time (g_s), s	0.9	50.8	0.5	0.5	14.3	0.5	1.1	0.0	1.6	8.4	0.0	3.0
Cycle Queue Clearance Time (g_c), s	0.9	50.8	0.5	0.5	14.3	0.5	4.0	0.0	1.6	8.4	0.0	3.0
Green Ratio (g/C)	0.76	0.72	0.72	0.75	0.71	0.71	0.09	0.09	0.09	0.09	0.09	0.09
Capacity (c), veh/h	486	2414	1074	182	2379	1059	150	156	132	209	156	132
Volume-to-Capacity Ratio (X)	0.101	0.836	0.019	0.161	0.411	0.020	0.087	0.000	0.164	0.573	0.000	0.296
Back of Queue (Q), ft/ln (95 th percentile)	11.1	587	6.2	17.5	204	6.5	16.8	0	27.4	160.2	0	50
Back of Queue (Q), veh/ln (95 th percentile)	0.4	23.5	0.2	0.7	8.2	0.3	0.7	0.0	1.1	6.4	0.0	2.0
Queue Storage Ratio (RQ) (95 th percentile)	0.04	0.00	0.03	0.07	0.00	0.02	0.07	0.00	0.11	0.64	0.00	0.00
Uniform Delay (d_1), s/veh	4.5	11.6	4.6	16.6	7.0	5.0	53.0	0.0	50.5	53.6	0.0	51.1
Incremental Delay (d_2), s/veh	0.0	3.6	0.0	0.2	0.5	0.0	0.1	0.0	0.2	0.9	0.0	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	4.5	15.2	4.7	16.8	7.5	5.0	53.1	0.0	50.7	54.5	0.0	51.6
Level of Service (LOS)	A	B	A	B	A	A	D		D	D		D
Approach Delay, s/veh / LOS	14.8		B	7.7		A	51.6		D	53.8		D
Intersection Delay, s/veh / LOS	14.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.22	B	2.05	B	2.47	B	2.47	B
Bicycle LOS Score / LOS	2.21	B	1.34	A	0.54	A	0.62	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	The Kleingers Group			Duration, h	0.250	
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other	
Jurisdiction	ODOT	Time Period	Build PM	PHF	0.92	
Urban Street	US36/SR37	Analysis Year	2022	Analysis Period	1 > 7:00	
Intersection	Fourwinds Drive	File Name	2022 Build_US 36 at Fourwinds PM.xus			
Project Description	2022 Build PM					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	65	1203	38	53	1801	93	24	0	31	37	0	49

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End										
Uncoordinated	No	Simult. Gap E/W	On	Green	6.0	0.4	85.7	9.9	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Yellow	4.0	0.0	4.0	4.0	0.0	0.0			
				Red	2.0	0.0	2.0	2.0	0.0	0.0			

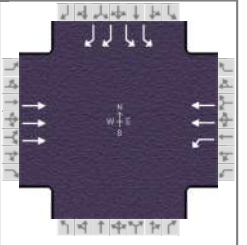
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		8		4
Case Number	1.1	3.0	1.1	3.0		5.0		6.0
Phase Duration, s	12.3	92.1	12.0	91.7		15.9		15.9
Change Period, ($Y+R_c$), s	6.0	6.0	6.0	6.0		6.0		6.0
Max Allow Headway (MAH), s	3.1	0.0	3.1	0.0		3.3		3.3
Queue Clearance Time (g_s), s	3.2		3.0			8.3		6.1
Green Extension Time (g_e), s	0.1	0.0	0.1	0.0		0.2		0.2
Phase Call Probability	0.91		0.85			0.99		0.99
Max Out Probability	0.00		0.00			0.00		0.00

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	71	1308	41	58	1958	101	26	0	34	40	0	53
Adjusted Saturation Flow Rate (s), veh/h/ln	1667	1666	1335	1667	1666	1483	1372	1750	1483	1667	1750	1483
Queue Service Time (g_s), s	1.2	21.9	1.1	1.0	48.8	2.5	2.2	0.0	2.6	2.7	0.0	4.1
Cycle Queue Clearance Time (g_c), s	1.2	21.9	1.1	1.0	48.8	2.5	6.3	0.0	2.6	2.7	0.0	4.1
Green Ratio (g/C)	0.77	0.72	0.72	0.76	0.71	0.71	0.08	0.08	0.08	0.08	0.08	0.08
Capacity (c), veh/h	218	2390	958	364	2380	1059	127	145	123	198	145	123
Volume-to-Capacity Ratio (X)	0.324	0.547	0.043	0.158	0.822	0.095	0.206	0.000	0.274	0.203	0.000	0.434
Back of Queue (Q), ft/ln (95 th percentile)	49.1	287.1	13.1	13	574.1	33.6	34.7	0	43.2	51.4	0	69.6
Back of Queue (Q), veh/ln (95 th percentile)	2.0	11.5	0.5	0.5	23.0	1.3	1.4	0.0	1.7	2.1	0.0	2.8
Queue Storage Ratio (RQ) (95 th percentile)	0.18	0.00	0.07	0.05	0.00	0.10	0.14	0.00	0.17	0.21	0.00	0.00
Uniform Delay (d_1), s/veh	17.8	7.9	4.9	6.1	11.9	5.3	55.3	0.0	51.6	51.7	0.0	52.4
Incremental Delay (d_2), s/veh	0.3	0.9	0.1	0.1	3.4	0.2	0.3	0.0	0.4	0.2	0.0	0.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (d), s/veh	18.1	8.8	5.0	6.2	15.2	5.4	55.6	0.0	52.1	51.9	0.0	53.2
Level of Service (LOS)	B	A	A	A	B	A	E		D	D		D
Approach Delay, s/veh / LOS	9.1		A	14.5		B	53.6		D	52.7		D
Intersection Delay, s/veh / LOS	14.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.22	B	2.05	B	2.47	B	2.47	B
Bicycle LOS Score / LOS	1.66	B	2.23	B	0.59	A	0.56	A

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Kleingers Group			Duration, h	0.250
Analyst	Dave M	Analysis Date	1/4/2021	Area Type	Other
Jurisdiction	ODOT	Time Period	No-Build AM	PHF	0.94
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	I-71 NB Ramps	File Name	2022 aNo-Build_US 36 at SB Ramps AM.xus		
Project Description	2022 No-Build AM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h		507		773	834					37		207

Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	54.0	29.0	19.0	0.0	0.0	0.0				
		Yellow	4.0	4.0	4.0	0.0	0.0	0.0				
		Red	2.0	2.0	2.0	0.0	0.0	0.0				

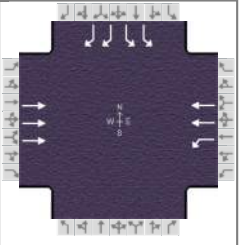
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		8.3	1.0	4.0				9.0
Phase Duration, s		35.0	60.0	95.0				25.0
Change Period, ($Y+R_c$), s		6.0	6.0	6.0				6.0
Max Allow Headway (MAH), s		0.0	2.9	0.0				3.2
Queue Clearance Time (g_s), s			44.1					11.7
Green Extension Time (g_e), s		0.0	1.4	0.0				0.4
Phase Call Probability			1.00					1.00
Max Out Probability			0.06					0.02

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6					7		14
Adjusted Flow Rate (v), veh/h		539		822	887					39		220
Adjusted Saturation Flow Rate (s), veh/h/ln		1527		1602	1601					1555		1261
Queue Service Time (g_s), s		12.1		42.1	11.9					1.3		9.7
Cycle Queue Clearance Time (g_c), s		12.1		42.1	11.9					1.3		9.7
Green Ratio (g/C)		0.24		0.71	0.74					0.16		0.16
Capacity (c), veh/h		1107		900	2375					492		399
Volume-to-Capacity Ratio (X)		0.487		0.914	0.374					0.080		0.551
Back of Queue (Q), ft/ln (95 th percentile)		207.2		564.7	139					22.5		138.2
Back of Queue (Q), veh/ln (95 th percentile)		8.0		21.7	5.3					0.9		5.3
Queue Storage Ratio (RQ) (95 th percentile)		0.00		0.56	0.00					0.09		0.31
Uniform Delay (d_1), s/veh		39.1		16.3	5.5					43.0		46.6
Incremental Delay (d_2), s/veh		1.5		13.3	0.5					0.0		1.0
Initial Queue Delay (d_3), s/veh		0.0		0.0	0.0					0.0		0.0
Control Delay (d), s/veh		40.6		29.7	6.0					43.1		47.5
Level of Service (LOS)		D		C	A					D		D
Approach Delay, s/veh / LOS	40.6		D	17.4		B	0.0			46.9		D
Intersection Delay, s/veh / LOS	25.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.42	A	2.04	B	2.48	B	2.33	B
Bicycle LOS Score / LOS	0.78	A	1.90	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Kleingers Group			Duration, h	0.250
Analyst	Dave M	Analysis Date	1/4/2021	Area Type	CBD
Jurisdiction	ODOT	Time Period	No-Build PM	PHF	0.94
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	I-71 SB Ramps	File Name	2022 aNo-Build_US 36 at SB Ramps PM.xus		
Project Description	2022 No-Build PM				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		795		398	1737					66		314

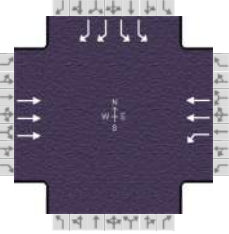
Signal Information			
Cycle, s	120.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		8.3	1.0	4.0				9.0
Phase Duration, s		50.0	40.0	90.0				30.0
Change Period, ($Y+R_c$), s		6.0	6.0	6.0				6.0
Max Allow Headway (MAH), s		0.0	2.9	0.0				3.2
Queue Clearance Time (g_s), s			18.6					18.6
Green Extension Time (g_e), s		0.0	0.7	0.0				0.5
Phase Call Probability			1.00					1.00
Max Out Probability			0.00					0.17

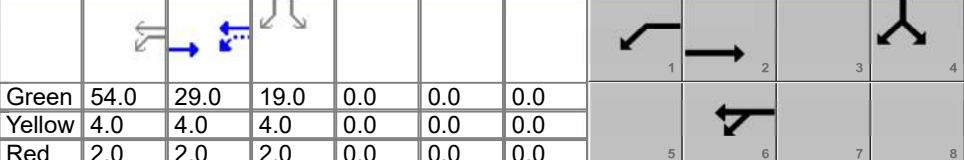
Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6					7		14
Adjusted Flow Rate (v), veh/h		846		423	1848					70		334
Adjusted Saturation Flow Rate (s), veh/h/ln		1374		1442	1441					1400		1135
Queue Service Time (g_s), s		19.6		16.6	64.3					2.5		16.6
Cycle Queue Clearance Time (g_c), s		19.6		16.6	64.3					2.5		16.6
Green Ratio (g/C)		0.37		0.67	0.70					0.20		0.20
Capacity (c), veh/h		1512		585	2017					560		454
Volume-to-Capacity Ratio (X)		0.559		0.724	0.916					0.125		0.736
Back of Queue (Q), ft/ln (95 th percentile)		269.8		220	639.6					38.2		217.2
Back of Queue (Q), veh/ln (95 th percentile)		10.4		8.5	24.6					1.5		8.4
Queue Storage Ratio (RQ) (95 th percentile)		0.00		0.22	0.00					0.15		0.48
Uniform Delay (d_1), s/veh		30.3		14.9	15.1					39.4		45.0
Incremental Delay (d_2), s/veh		1.5		3.9	8.0					0.0		5.4
Initial Queue Delay (d_3), s/veh		0.0		0.0	0.0					0.0		0.0
Control Delay (d), s/veh		31.8		18.8	23.1					39.4		50.4
Level of Service (LOS)		C		B	C					D		D
Approach Delay, s/veh / LOS	31.8	C		22.3	C		0.0			48.5		D
Intersection Delay, s/veh / LOS			27.6						C			

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.41	A	2.06	B	2.48	B	2.33	B
Bicycle LOS Score / LOS	0.95	A	2.36	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	The Kleingers Group			Duration, h	0.250	
Analyst	Dave M	Analysis Date	1/4/2021	Area Type	Other	
Jurisdiction	ODOT	Time Period	Build AM	PHF	0.94	
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00	
Intersection	I-71 NB Ramps	File Name	2022 Build_US 36 at SB Ramps AM.xus			
Project Description	2022 Build AM					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h		533		773	853					37		210

Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	54.0	29.0	19.0	0.0	0.0	0.0				
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	0.0	0.0	0.0				
Uncoordinated	No	Simult. Gap E/W	On	Red	2.0	2.0	2.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

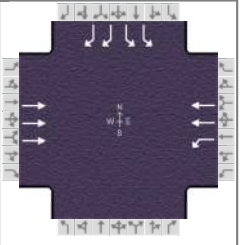
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		8.3	1.0	4.0				9.0
Phase Duration, s		35.0	60.0	95.0				25.0
Change Period, ($Y+R_c$), s		6.0	6.0	6.0				6.0
Max Allow Headway (MAH), s		0.0	2.9	0.0				3.2
Queue Clearance Time (g_s), s			45.3					11.8
Green Extension Time (g_e), s		0.0	1.3	0.0				0.4
Phase Call Probability			1.00					1.00
Max Out Probability			0.10					0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6					7		14
Adjusted Flow Rate (v), veh/h		567		822	907					39		223
Adjusted Saturation Flow Rate (s), veh/h/ln		1527		1602	1601					1555		1261
Queue Service Time (g_s), s		12.9		43.3	12.3					1.3		9.8
Cycle Queue Clearance Time (g_c), s		12.9		43.3	12.3					1.3		9.8
Green Ratio (g/C)		0.24		0.71	0.74					0.16		0.16
Capacity (c), veh/h		1107		892	2375					492		399
Volume-to-Capacity Ratio (X)		0.512		0.922	0.382					0.080		0.559
Back of Queue (Q), ft/ln (95 th percentile)		216.7		590.1	142.9					22.5		140.6
Back of Queue (Q), veh/ln (95 th percentile)		8.3		22.7	5.5					0.9		5.4
Queue Storage Ratio (RQ) (95 th percentile)		0.00		0.59	0.00					0.09		0.31
Uniform Delay (d_1), s/veh		39.4		17.2	5.6					43.0		46.6
Incremental Delay (d_2), s/veh		1.7		14.5	0.5					0.0		1.1
Initial Queue Delay (d_3), s/veh		0.0		0.0	0.0					0.0		0.0
Control Delay (d), s/veh		41.1		31.7	6.1					43.1		47.7
Level of Service (LOS)		D		C	A					D		D
Approach Delay, s/veh / LOS	41.1		D	18.3		B	0.0			47.0		D
Intersection Delay, s/veh / LOS	26.3						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.42	A	2.04	B	2.48	B	2.33	B
Bicycle LOS Score / LOS	0.80	A	1.91	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Kleingers Group			Duration, h	0.250
Analyst	Dave M	Analysis Date	1/4/2021	Area Type	CBD
Jurisdiction	ODOT	Time Period	Build PM	PHF	0.94
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	I-71 SB Ramps	File Name	2022 Build_US 36 at SB Ramps PM.xus		
Project Description	2022 No-Build PM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h		810		398	1796					66		324

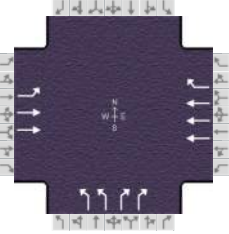
Signal Information												
Cycle, s	120.0	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	No	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									
		Green	34.0	46.0	22.0	0.0	0.0	0.0				
		Yellow	4.0	4.0	4.0	0.0	0.0	0.0				
		Red	2.0	2.0	2.0	0.0	0.0	0.0				

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase		2	1	6				4
Case Number		8.3	1.0	4.0				9.0
Phase Duration, s		52.0	40.0	92.0				28.0
Change Period, (Y+R _c), s		6.0	6.0	6.0				6.0
Max Allow Headway (MAH), s		0.0	2.9	0.0				3.2
Queue Clearance Time (g _s), s			17.8					19.5
Green Extension Time (g _e), s		0.0	0.7	0.0				0.3
Phase Call Probability			1.00					1.00
Max Out Probability			0.00					1.00

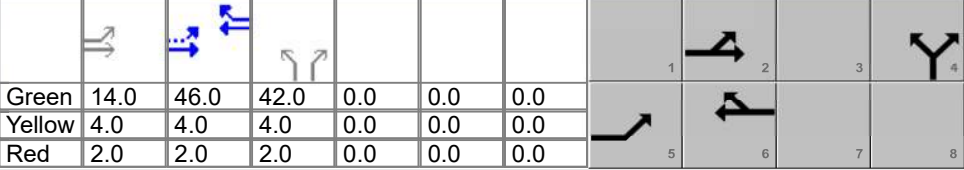
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement		2		1	6					7		14
Adjusted Flow Rate (v), veh/h		862		423	1911					70		345
Adjusted Saturation Flow Rate (s), veh/h/ln		1374		1442	1441					1400		1135
Queue Service Time (g _s), s		19.6		15.8	66.9					2.5		17.5
Cycle Queue Clearance Time (g _c), s		19.6		15.8	66.9					2.5		17.5
Green Ratio (g/C)		0.38		0.68	0.72					0.18		0.18
Capacity (c), veh/h		1580		593	2065					513		416
Volume-to-Capacity Ratio (X)		0.545		0.714	0.925					0.137		0.828
Back of Queue (Q), ft/ln (95 th percentile)		267.3		206.4	645.2					39.2		240.2
Back of Queue (Q), veh/ln (95 th percentile)		10.3		7.9	24.8					1.5		9.2
Queue Storage Ratio (RQ) (95 th percentile)		0.00		0.21	0.00					0.16		0.53
Uniform Delay (d ₁), s/veh		28.8		14.2	14.3					41.0		47.2
Incremental Delay (d ₂), s/veh		1.4		3.5	8.6					0.0		12.3
Initial Queue Delay (d ₃), s/veh		0.0		0.0	0.0					0.0		0.0
Control Delay (d), s/veh		30.2		17.7	22.9					41.1		59.5
Level of Service (LOS)		C		B	C					D		E
Approach Delay, s/veh / LOS	30.2	C		21.9	C		0.0			56.4		E
Intersection Delay, s/veh / LOS	27.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.41	A	2.05	B	2.48	B	2.33	B
Bicycle LOS Score / LOS	0.96	A	2.41	B				F

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	The Kleingers Group			Duration, h	0.250	
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other	
Jurisdiction	ODOT	Time Period	No-Build AM	PHF	0.94	
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00	
Intersection	I-71 NB Ramps	File Name	2022 aNo-Build_US 36 at NB Ramps AM.xus			
Project Description	2022 No-Build AM					

Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	182	364			1116	101	495		307			

Signal Information													
Cycle, s	120.0	Reference Phase	2										
Offset, s	0	Reference Point	End	Green	14.0	46.0	42.0	0.0	0.0	0.0			
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	4.0	4.0	0.0	0.0	0.0			
Force Mode	Fixed	Simult. Gap N/S	On	Red	2.0	2.0	2.0	0.0	0.0	0.0			

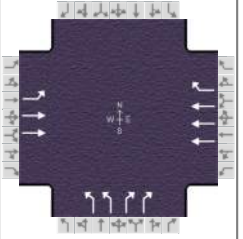
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		4		
Case Number	1.0	4.0		7.3		9.0		
Phase Duration, s	20.0	72.0		52.0		48.0		
Change Period, ($Y+R_c$), s	6.0	6.0		6.0		6.0		
Max Allow Headway (MAH), s	2.9	0.0		0.0		3.0		
Queue Clearance Time (g_s), s	10.0					17.9		
Green Extension Time (g_e), s	0.1	0.0		0.0		2.0		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.31					0.00		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Assigned Movement	5	2			6	16	7		14			
Adjusted Flow Rate (v), veh/h	194	387			1187	107	527		327			
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1601			1527	1425	1555		1261			
Queue Service Time (g_s), s	8.0	7.4			25.9	6.0	15.9		11.6			
Cycle Queue Clearance Time (g_c), s	8.0	7.4			25.9	6.0	15.9		11.6			
Green Ratio (g/C)	0.52	0.55			0.38	0.38	0.35		0.35			
Capacity (c), veh/h	324	1761			1756	546	1089		883			
Volume-to-Capacity Ratio (X)	0.597	0.220			0.676	0.197	0.484		0.370			
Back of Queue (Q), ft/ln (95 th percentile)	133	116.6			367.5	95.5	247		155.3			
Back of Queue (Q), veh/ln (95 th percentile)	5.1	4.5			14.1	3.7	9.5		6.0			
Queue Storage Ratio (RQ) (95 th percentile)	0.17	0.00			0.00	0.60	0.51		0.32			
Uniform Delay (d_1), s/veh	21.5	13.8			30.8	24.7	30.5		29.1			
Incremental Delay (d_2), s/veh	2.1	0.3			2.1	0.8	0.1		0.1			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	23.6	14.1			32.9	25.5	30.6		29.2			
Level of Service (LOS)	C	B			C	C	C		C			
Approach Delay, s/veh / LOS	17.3		B	32.3		C	30.1		C	0.0		
Intersection Delay, s/veh / LOS	28.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	1.41	A	2.48	B	2.48	B
Bicycle LOS Score / LOS	0.97	A	1.20	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Kleingers Group			Duration, h	0.250
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other
Jurisdiction	ODOT	Time Period	No-Build PM	PHF	0.94
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	I-71 NB Ramps	File Name	2022 aNo-Build_US 36 at NB Ramps PM.xus		
Project Description	2022 No-Build PM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	217	568			828	93	1304		857			

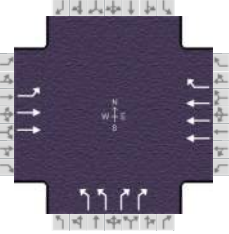
Signal Information				Signal Timing (s)														
Cycle, s	120.0	Reference Phase	2	Green	14.0	28.0	60.0	0.0	0.0	0.0	Yellow	4.0	4.0	4.0	0.0	0.0	0.0	
Offset, s	0	Reference Point	End	Red	2.0	2.0	2.0	0.0	0.0	0.0	Uncoordinated	No	Simult. Gap E/W	On	Force Mode	Fixed	Simult. Gap N/S	On

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		4		
Case Number	1.0	4.0		7.3		9.0		
Phase Duration, s	20.0	54.0		34.0		66.0		
Change Period, (Y+R _c), s	6.0	6.0		6.0		6.0		
Max Allow Headway (MAH), s	2.9	0.0		0.0		3.0		
Queue Clearance Time (g _s), s	14.8					50.3		
Green Extension Time (g _e), s	0.0	0.0		0.0		5.0		
Phase Call Probability	1.00					1.00		
Max Out Probability	1.00					0.45		

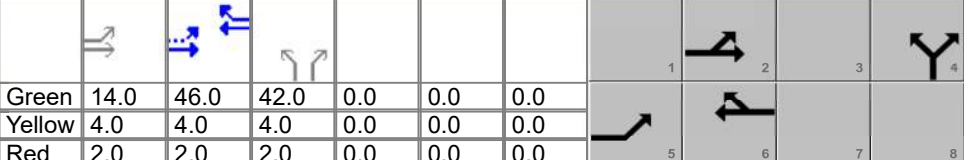
Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	7		14			
Adjusted Flow Rate (v), veh/h	231	604			881	99	1387		912			
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1521			1527	1425	1555		1261			
Queue Service Time (g _s), s	12.8	17.8			21.9	6.9	48.3		34.0			
Cycle Queue Clearance Time (g _c), s	12.8	17.8			21.9	6.9	48.3		34.0			
Green Ratio (g/C)	0.37	0.40			0.23	0.23	0.50		0.50			
Capacity (c), veh/h	278	1217			1069	333	1555		1261			
Volume-to-Capacity Ratio (X)	0.830	0.497			0.824	0.298	0.892		0.723			
Back of Queue (Q), ft/ln (95 th percentile)	259.3	269.5			346.8	116.8	626.9		373.3			
Back of Queue (Q), veh/ln (95 th percentile)	10.0	10.4			13.3	4.5	24.1		14.4			
Queue Storage Ratio (RQ) (95 th percentile)	0.32	0.00			0.00	0.73	1.31		0.78			
Uniform Delay (d ₁), s/veh	31.5	27.0			43.7	37.9	27.1		23.5			
Incremental Delay (d ₂), s/veh	17.6	1.5			7.2	2.3	6.7		1.8			
Initial Queue Delay (d ₃), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	49.1	28.4			50.9	40.2	33.8		25.3			
Level of Service (LOS)	D	C			D	D	C		C			
Approach Delay, s/veh / LOS	34.1	C		49.8	D		30.4	C	0.0			
Intersection Delay, s/veh / LOS	35.8						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.11	B	1.42	A	2.48	B	2.48	B
Bicycle LOS Score / LOS	1.18	A	1.03	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information		
Agency	The Kleingers Group			Duration, h	0.250	
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other	
Jurisdiction	ODOT	Time Period	Build AM	PHF	0.94	
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00	
Intersection	I-71 NB Ramps	File Name	2022 Build_US 36 at NB Ramps AM.xus			
Project Description	2022 Build AM					

Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	192	380			1121	101	509		307			

Signal Information														
Cycle, s	120.0	Reference Phase	2	Green	14.0	46.0	42.0	0.0	0.0	0.0	1	2	3	4
Offset, s	0	Reference Point	End	Yellow	4.0	4.0	4.0	0.0	0.0	0.0	5	6	7	8
Uncoordinated	No	Simult. Gap E/W	On	Red	2.0	2.0	2.0	0.0	0.0	0.0				
Force Mode	Fixed	Simult. Gap N/S	On											

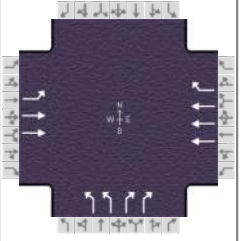
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		4		
Case Number	1.0	4.0		7.3		9.0		
Phase Duration, s	20.0	72.0		52.0		48.0		
Change Period, ($Y+R_c$), s	6.0	6.0		6.0		6.0		
Max Allow Headway (MAH), s	2.9	0.0		0.0		3.0		
Queue Clearance Time (g_s), s	10.5					18.4		
Green Extension Time (g_e), s	0.1	0.0		0.0		2.0		
Phase Call Probability	1.00					1.00		
Max Out Probability	0.54					0.00		

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	7		14			
Adjusted Flow Rate (v), veh/h	204	404			1193	107	541		327			
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1601			1527	1425	1555		1261			
Queue Service Time (g_s), s	8.5	7.8			26.0	6.0	16.4		11.6			
Cycle Queue Clearance Time (g_c), s	8.5	7.8			26.0	6.0	16.4		11.6			
Green Ratio (g/C)	0.52	0.55			0.38	0.38	0.35		0.35			
Capacity (c), veh/h	323	1761			1756	546	1089		883			
Volume-to-Capacity Ratio (X)	0.632	0.230			0.679	0.197	0.497		0.370			
Back of Queue (Q), ft/ln (95 th percentile)	144.7	122.5			369.4	95.5	253.9		155.3			
Back of Queue (Q), veh/ln (95 th percentile)	5.6	4.7			14.2	3.7	9.8		6.0			
Queue Storage Ratio (RQ) (95 th percentile)	0.18	0.00			0.00	0.60	0.53		0.32			
Uniform Delay (d_1), s/veh	21.9	13.9			30.8	24.7	30.7		29.1			
Incremental Delay (d_2), s/veh	3.0	0.3			2.1	0.8	0.1		0.1			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	25.0	14.2			33.0	25.5	30.8		29.2			
Level of Service (LOS)	C	B			C	C	C		C			
Approach Delay, s/veh / LOS	17.8		B	32.4		C	30.2		C	0.0		
Intersection Delay, s/veh / LOS	28.5						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.09	B	1.41	A	2.48	B	2.48	B
Bicycle LOS Score / LOS	0.99	A	1.20	A		F		

HCS7 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	The Kleingers Group			Duration, h	0.250
Analyst	Dave M	Analysis Date	Feb 11, 2021	Area Type	Other
Jurisdiction	ODOT	Time Period	Build PM	PHF	0.94
Urban Street	US36 SR37	Analysis Year	2022	Analysis Period	1 > 7:00
Intersection	I-71 NB Ramps	File Name	2022 Build_US 36 at NB Ramps PM.xus		
Project Description	2022 Build PM				



Demand Information	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Approach Movement												
Demand (v), veh/h	223	577			843	93	1348		857			

Signal Information				Signal Timing (s)													
Cycle, s	120.0	Reference Phase	2	Green	14.0	28.0	60.0	0.0	0.0	0.0	Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Offset, s	0	Reference Point	End	Red	2.0	2.0	2.0	0.0	0.0	0.0							
Uncoordinated	No	Simult. Gap E/W	On														
Force Mode	Fixed	Simult. Gap N/S	On														

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6		4		
Case Number	1.0	4.0		7.3		9.0		
Phase Duration, s	20.0	54.0		34.0		66.0		
Change Period, ($Y+R_c$), s	6.0	6.0		6.0		6.0		
Max Allow Headway (MAH), s	2.9	0.0		0.0		3.0		
Queue Clearance Time (g_s), s	15.2					53.3		
Green Extension Time (g_e), s	0.0	0.0		0.0		4.0		
Phase Call Probability	1.00					1.00		
Max Out Probability	1.00					0.65		

Movement Group Results	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16	7		14			
Adjusted Flow Rate (v), veh/h	237	614			897	99	1434		912			
Adjusted Saturation Flow Rate (s), veh/h/ln	1602	1521			1527	1425	1555		1261			
Queue Service Time (g_s), s	13.2	18.2			22.4	6.9	51.3		34.0			
Cycle Queue Clearance Time (g_c), s	13.2	18.2			22.4	6.9	51.3		34.0			
Green Ratio (g/C)	0.37	0.40			0.23	0.23	0.50		0.50			
Capacity (c), veh/h	275	1217			1069	333	1555		1261			
Volume-to-Capacity Ratio (X)	0.862	0.504			0.839	0.298	0.922		0.723			
Back of Queue (Q), ft/ln (95 th percentile)	276.5	274.3			354.9	116.8	674.7		373.3			
Back of Queue (Q), veh/ln (95 th percentile)	10.6	10.5			13.6	4.5	26.0		14.4			
Queue Storage Ratio (RQ) (95 th percentile)	0.35	0.00			0.00	0.73	1.41		0.78			
Uniform Delay (d_1), s/veh	31.7	27.1			43.9	37.9	27.8		23.5			
Incremental Delay (d_2), s/veh	22.4	1.5			7.9	2.3	9.3		1.8			
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0	0.0		0.0			
Control Delay (d), s/veh	54.1	28.6			51.8	40.2	37.1		25.3			
Level of Service (LOS)	D	C			D	D	D		C			
Approach Delay, s/veh / LOS	35.7		D	50.6		D	32.5		C	0.0		
Intersection Delay, s/veh / LOS	37.5						D					

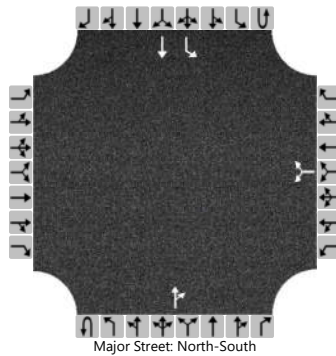
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.11	B	1.42	A	2.48	B	2.48	B
Bicycle LOS Score / LOS	1.19	A	1.04	A		F		

2038 HCS Capacity Analysis Reports

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Mike Penrod	Intersection	Fourwinds Dr At N. Access
Agency/Co.	The Kleingers Group	Jurisdiction	Delaware County
Date Performed	2/1/2021	East/West Street	North Access
Analysis Year	2038	North/South Street	Fourwinds Drive
Time Analyzed	Build AM Peak	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Four Winds Commons		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						30		18			407	8		6	208	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.43		6.23							4.13	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.53		3.33							2.23	

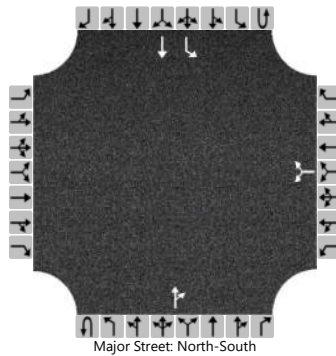
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						52									7	
Capacity, c (veh/h)						467									1104	
v/c Ratio						0.11									0.01	
95% Queue Length, Q ₉₅ (veh)						0.4									0.0	
Control Delay (s/veh)						13.7									8.3	
Level of Service (LOS)						B									A	
Approach Delay (s/veh)						13.7								0.2		
Approach LOS						B										

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Mike Penrod	Intersection	Fourwinds Dr At N. Access
Agency/Co.	The Kleingers Group	Jurisdiction	Delaware County
Date Performed	2/1/2021	East/West Street	North Access
Analysis Year	2038	North/South Street	Fourwinds Drive
Time Analyzed	Build PM Peak	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Four Winds Commons		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						15		11			420	24		18	362	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.43		6.23							4.13	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.53		3.33							2.23	

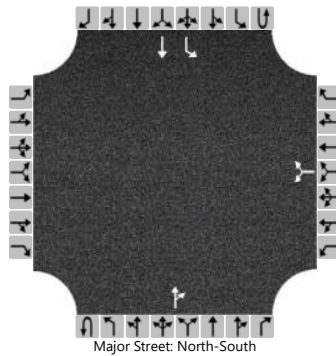
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						28								20		
Capacity, c (veh/h)						380								1075		
v/c Ratio						0.07								0.02		
95% Queue Length, Q ₉₅ (veh)						0.2								0.1		
Control Delay (s/veh)						15.2								8.4		
Level of Service (LOS)						C								A		
Approach Delay (s/veh)						15.2								0.4		
Approach LOS						C										

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Mike Penrod			Intersection	Fourwinds Dr At S. Access		
Agency/Co.	The Kleingers Group			Jurisdiction	Delaware County		
Date Performed	2/1/2021			East/West Street	South Access		
Analysis Year	2038			North/South Street	Fourwinds Drive		
Time Analyzed	Build AM Peak			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						44		12			403	14		3	235	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.43		6.23							4.13	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.53		3.33							2.23	

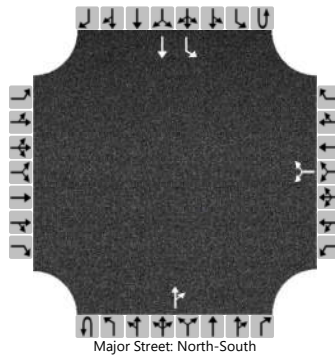
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						61									3	
Capacity, c (veh/h)						431									1102	
v/c Ratio						0.14									0.00	
95% Queue Length, Q ₉₅ (veh)						0.5									0.0	
Control Delay (s/veh)						14.7									8.3	
Level of Service (LOS)						B									A	
Approach Delay (s/veh)						14.7								0.1		
Approach LOS						B										

HCS7 Two-Way Stop-Control Report

General Information				Site Information			
Analyst	Mike Penrod			Intersection	Fourwinds Dr At S. Access		
Agency/Co.	The Kleingers Group			Jurisdiction	Delaware County		
Date Performed	2/1/2021			East/West Street	South Access		
Analysis Year	2038			North/South Street	Fourwinds Drive		
Time Analyzed	Build PM Peak			Peak Hour Factor	0.92		
Intersection Orientation	North-South			Analysis Time Period (hrs)	0.25		
Project Description	Phoenix Place						

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						25		7			437	35		12	365	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)					0											
Right Turn Channelized																
Median Type Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2							4.1	
Critical Headway (sec)						6.43		6.23							4.13	
Base Follow-Up Headway (sec)						3.5		3.3							2.2	
Follow-Up Headway (sec)						3.53		3.33							2.23	

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						35									13	
Capacity, c (veh/h)						332									1047	
v/c Ratio						0.10									0.01	
95% Queue Length, Q ₉₅ (veh)						0.3									0.0	
Control Delay (s/veh)						17.1									8.5	
Level of Service (LOS)						C									A	
Approach Delay (s/veh)					17.1								0.3			
Approach LOS					C											