TRAFFIC IMPACT STUDY (TIS)

FOR

PROPOSED
BUSINESS PARK
(FORMERLY FARMLAND INDUSTRIES)

LAWRENCE, KS

MAY 23, 2012

PREPARED BY:

BRIAN AUSTIN, PE, PTOE
BARTLETT & WEST
544 COLUMBIA
LAWRENCE, KS 66049
W.O. 17586.001

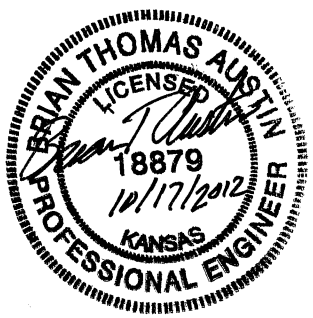


TABLE OF CONTENTS

INTRODUCTION

The City of Lawrence, Kansas is developing a 435 acre business park on the east side of Lawrence with approximately 260 new acres available for development. The site is generally bound by East Hills Business Park on the east, the Union Pacific Railroad on the north, E 1575 Road on the west, and 23rd Street, also known as K-10 highway, on the south.

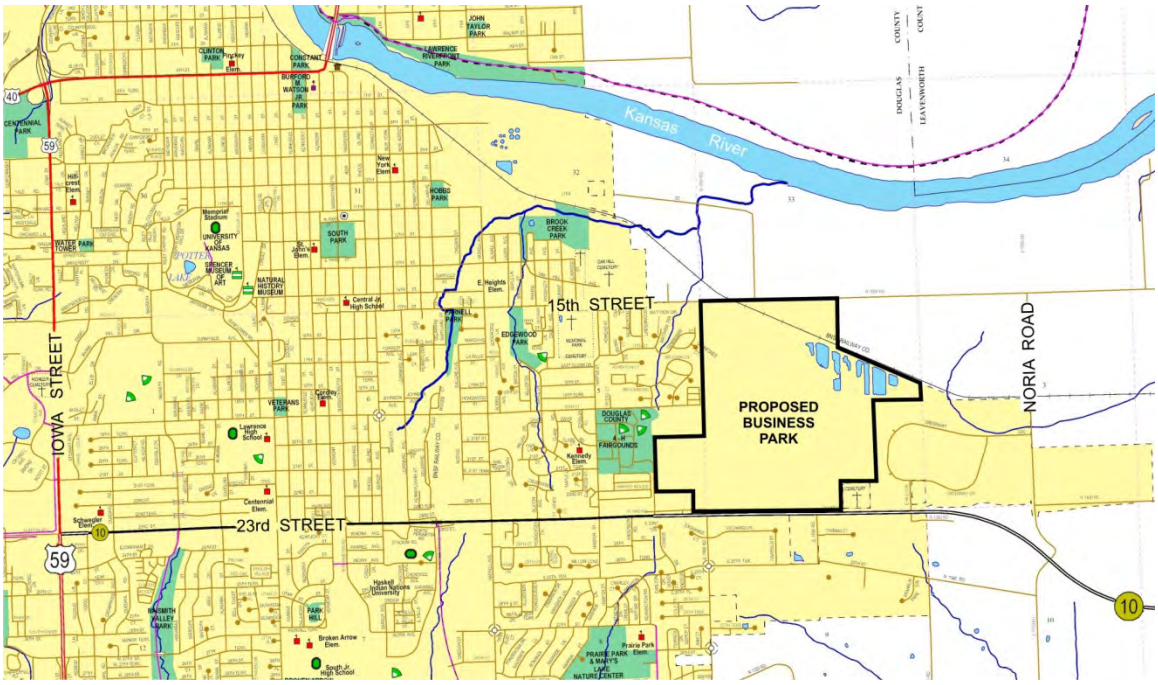


Figure 1: Vicinity Map for proposed business park.

The proposed development will initially have three access points. The main access point will be at the intersection of O'Connell Road and 23rd Street. A second access point will be through a connection to East Hills Business Park; this access point will connect to 23rd Street at the existing East Hills Business Park Drive. A third access point to 23rd street will be approximately 3,300 feet east of the main access point at the intersection of 23rd Street & O'Connell Road. This access will be right-in/right-out only and will not provide access to eastbound 23rd Street/K-10. A fourth access point is planned at the business park by connecting 19th Street with O'Connell Road.

This Traffic Impact Study will analyze two scenarios. The first scenario will assume that half of the business park is developed and is generating traffic. For this scenario, it is assumed that the connection at 19th & O'Connell has not been constructed. The second scenario assumes full development of the business park and that the connection of O'Connell to 19th Street has been constructed.

The limits of this Traffic Impact Study are constrained to the following intersections:

19th & Harper
23rd & Harper
23rd & O'Connell
23rd/K-10 & Proposed Right-In/Right-Out Access point
23rd/K-10 & East Hills Drive
O'Connell Road & Proposed East/West Business Park Road

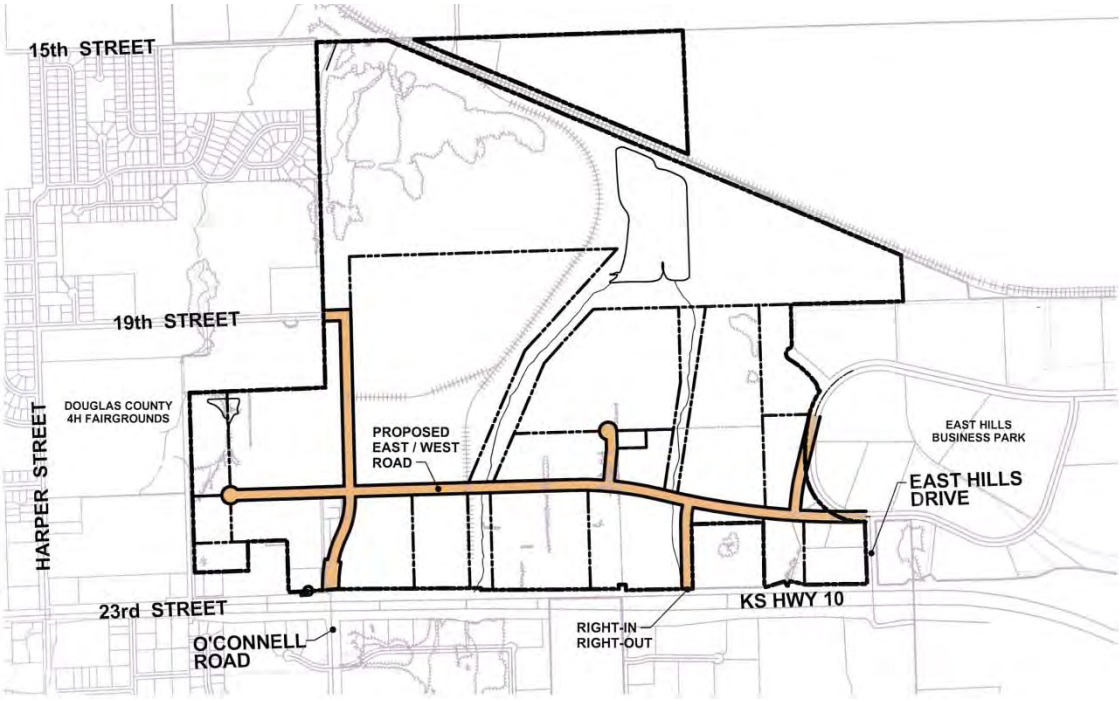


Figure 2: Street layout of proposed business park.

EXISTING CONDITIONS

The Average Annual Daily Traffic (AADT) volumes for 23rd Street in Lawrence were obtained from the City of Lawrence KDOT Traffic Count Map. Figure 3 shows the AADT for 23rd Street near the intersection of O'Connell Road to be 27,500 vpd.

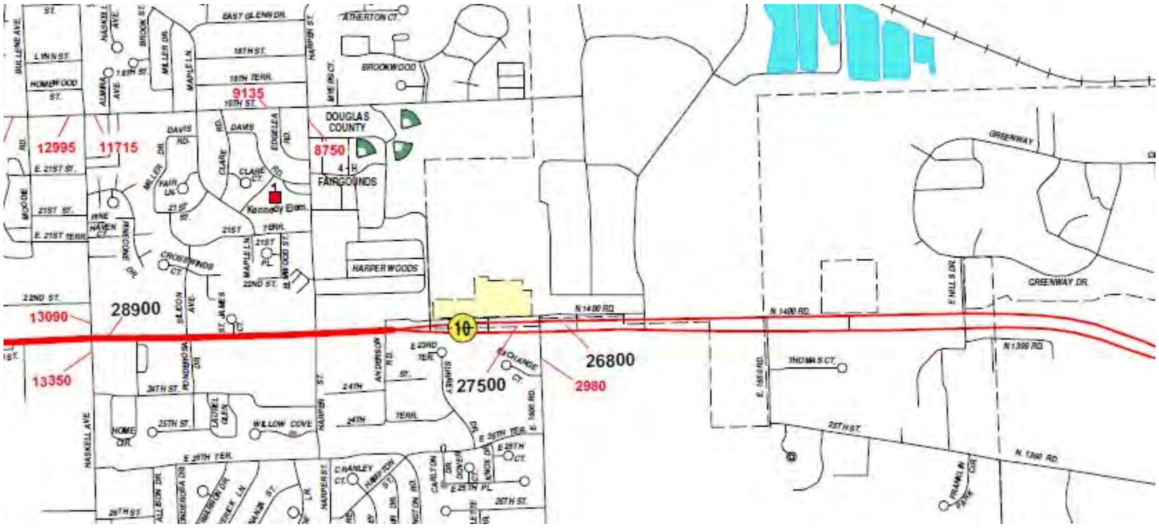


Figure 3: Daily Traffic volumes from City of Lawrence KDOT Traffic count map.

Existing daily traffic counts for 19th & Harper, 23rd & Harper, 23rd & O'Connell, and K-10 & East Hills Drive were taken on April 4th & 5th, 2012. The traffic counts were taken between the hours of 7:00 AM – 9:00 AM and from 4:00 PM – 6:00 PM to determine the afternoon AM and PM peak hours for the intersections. The turning movement counts and Synchro analysis with Level of Service (LOS) summaries are as follows:

19th & Harper

Period	Start Time	End Time	Harper NB Left	Harper NB Thru	Harper NB Right	19th Street EB Left	19th Street EB Thru	19th Street EB Right	Harper SB Left	Harper SB Thru	Harper SB Right	19th Street WB Left	19th Street WB Thru	19th Street WB Right	Int. Totals
AM Peak	7:00 AM	8:00 AM	89	85	22	14	28	113	12	81	43	24	46	12	569
	7:15 AM	8:15 AM	93	94	24	20	29	115	12	84	39	23	43	9	585
	7:30 AM	8:30 AM	90	91	27	22	51	99	13	77	30	16	38	5	559
	7:45 AM	8:45 AM	95	84	26	21	48	114	9	63	28	14	34	4	540
	8:00 AM	9:00 AM	71	57	21	15	59	98	8	43	16	9	34	5	436
PM Peak	4:00 PM	5:00 PM	106	80	38	29	48	154	16	51	12	26	37	15	612
	4:15 PM	5:15 PM	115	100	33	33	42	161	22	63	14	28	37	17	665
	4:30 PM	5:30 PM	118	112	26	35	40	180	20	78	14	25	43	12	703
	4:45 PM	5:45 PM	128	110	24	38	40	185	21	85	21	28	40	13	733
	5:00 PM	6:00 PM	135	123	28	48	37	190	16	93	23	27	46	12	778

Table 1: Existing AM and PM Traffic Counts at 19th & Harper.

Level of Service Summary 19th & Harper Existing Traffic																		
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM									
Intersection		Approach			Movement				Intersection		Approach			Movement				
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	
A	6.3	EB	A	5.6	Left	A	6.6	76	A	7.3	EB	A	7.4	Left	A	9.5	101	
					Thru	A	7.9	76						Thru	A	9.7	101	
					Right	A	4.8	76						Right	A	6.2	101	
		WB	A	6.0	Left	A	6.9	55			WB	A	6.4	Left	A	5.8	56	
					Thru	A	6.4	55						Thru	A	7.0	56	
					Right	A	2.7	55						Right	A	4.3	56	
		NB	A	7.3	Left	A	7.2	82			NB	A	8.0	Left	A	7.3	73	
					Thru	A	7.4	82						Thru	A	9.4	73	
					Right	A	7.0	82						Right	A	5.5	73	
		SB	A	5.9	Left	A	4.9	53			SB	A	6.0	Left	A	5.9	52	
					Thru	A	7.3	53						Thru	A	7.6	52	
					Right	A	3.9	53						Right	A	3.4	52	

Table 2: Existing LOS Summary for 19th & Harper.

The AM Peak Hour for 19th & Harper is from 7:15-8:15 AM and the PM Peak Hour is from 5:00-6:00 PM. All four approaches to the existing All-Way Stop Control (AWSC) intersection operate at LOS A.

23rd & Harper

Period	Start Time	End Time	Harper NB			23rd St EB			Harper SB			23rd St WB			Int. Totals
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	7:00 AM	8:00 AM	105	116	116	43	1012	15	109	70	60	20	1060	60	2786
	7:15 AM	8:15 AM	108	116	100	48	1033	16	100	80	69	22	1153	65	2910
	7:30 AM	8:30 AM	103	117	95	42	964	17	77	80	71	15	1161	61	2803
	7:45 AM	8:45 AM	84	82	83	39	918	13	82	66	85	12	1150	57	2671
	8:00 AM	9:00 AM	60	46	60	46	897	12	78	46	86	6	1092	48	2477
PM Peak	4:00 PM	5:00 PM	41	70	76	78	1252	21	106	96	93	27	1199	86	3145
	4:15 PM	5:15 PM	35	83	64	70	1299	30	129	92	90	30	1219	98	3239
	4:30 PM	5:30 PM	31	78	67	64	1393	33	153	103	81	32	1286	106	3427
	4:45 PM	5:45 PM	34	81	61	56	1398	40	144	112	70	28	1288	99	3411
	5:00 PM	6:00 PM	36	82	63	81	1455	41	150	109	62	36	1318	100	3533

Table 3: Existing AM and PM Traffic Counts at 23rd & Harper.

Level of Service Summary
23rd & Harper
Existing Traffic

AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
B	19.7	EB	B	16.6	Left	D	36.3	72	C	22.9	EB	C	22.9	Left	F	80.4	147
					Thru	B	15.9	207						Thru	C	20.0	297
					Right	A	8.5	219						Right	C	22.1	365
		WB	C	22.9	Left	D	41.0	47			WB	C	22.6	Left	D	39.8	118
					Thru	C	22.8	315						Thru	C	22.1	370
					Right	B	19.9	369						Right	C	24.1	389
		NB	C	21.0	Left	B	19.8	81			NB	C	24.5	Left	C	21.6	57
					Thru	C	26.8	166						Thru	C	28.4	128
					Right	B	17.4	166						Right	C	21.3	128
		SB	B	16.4	Left	B	17.5	72			SB	C	23.0	Left	C	24.2	124
					Thru	B	17.7	98						Thru	C	22.6	116
					Right	B	13.8	98						Right	C	20.3	116

Table 4: Existing LOS Summary for 23rd & Harper.

The AM and PM peak hours for 23rd & Harper are also 7:15-8:15 AM and 5:00-6:00 PM. The intersection operates at LOS B for the AM Peak Hour and LOS C for the PM Peak Hour. All four approaches operate at LOS C or better for both the AM and PM peak hours, although the LOS for the east and westbound left turns range from LOS D to LOS F.

23rd & O'Connell

Period	Start Time	End Time	O'Connell NB			23rd St EB			O'Connell SB			23rd St WB			Int. Totals
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	7:00 AM	8:00 AM	43	0	80	0	1020	11	2	0	1	18	1013	1	2189
	7:15 AM	8:15 AM	43	0	81	0	1003	17	1	0	0	15	1096	1	2257
	7:30 AM	8:30 AM	42	0	79	0	1012	16	1	0	0	11	1079	1	2241
	7:45 AM	8:45 AM	33	0	50	0	925	21	1	0	0	12	1020	1	2063
	8:00 AM	9:00 AM	27	0	41	0	892	22	0	0	0	17	998	0	1997
PM Peak	4:00 PM	5:00 PM	26	0	18	0	1102	54	0	0	0	45	1374	1	2620
	4:15 PM	5:15 PM	20	0	19	0	1106	47	0	0	0	50	1501	0	2743
	4:30 PM	5:30 PM	19	0	25	0	1155	47	0	0	0	58	1619	1	2924
	4:45 PM	5:45 PM	18	0	27	0	1226	61	0	0	0	80	1530	1	2943
	5:00 PM	6:00 PM	22	0	31	0	1224	56	0	0	0	82	1607	1	3023

Table 5: Existing AM and PM Traffic Counts at 23rd & O'Connell.

Level of Service Summary 23rd & O'Connell Existing Traffic																
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	2.8	EB	A	1.5	Left	A	0.0	0	A	2.9	EB	A	1.6	Left	A	0.0	0
					Thru	A	1.5	0						Thru	A	1.6	0
					Right	A	0.8	0						Right	A	1.5	0
		WB	A	2.6	Left	A	5.3	11			WB	A	3.3	Left	C	20.7	44
					Thru	A	2.6	5						Thru	A	3.1	0
					Right	A	6.1	5						Right	A	0.0	0
		NB	C	15.5	Left	D	30.3	60			NB	D	32.5	Left	F	72.1	57
					Thru	A	0.0	60						Thru	F	72.1	57
					Right	A	7.7	61						Right	A	8.4	43
		SB	D	28.0	Left	C	28.0	12			SB	C	18.2	Left	C	18.2	8
					Thru	A	0.0	12						Thru	A	0.0	0
					Right	A	0.0	12						Right	A	0.0	0

Table 6: Existing LOS Summary for 23rd & O'Connell.

The existing traffic counts show the intersection at 23rd & O'Connell also has an AM Peak Hour from 7:15-8:15 and a PM Peak Hour from 5:00-6:00. The intersection is Two-Way Stop Control with the north/south movement being stop controlled. The delays for the north/south approaches result in a LOS in the C and D range while the free east/west movements operate with minimal delay.

K-10 & East Hills Drive

Period	Start Time	End Time	East Hills Dr NB			23rd St (K-10) EB			East Hills Dr SB			23rd St (K-10) WB			Int. Totals
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
AM Peak	7:00 AM	8:00 AM	7	0	4	142	1249	9	3	0	20	1	1095	12	2542
	7:15 AM	8:15 AM	4	1	4	146	1187	7	3	0	19	1	1145	13	2530
	7:30 AM	8:30 AM	3	1	5	157	1090	7	2	0	18	2	1093	12	2390
	7:45 AM	8:45 AM	4	1	4	144	969	6	2	0	17	2	1078	11	2238
	8:00 AM	9:00 AM	4	1	6	121	919	3	1	0	16	1	1039	9	2120
PM Peak	4:00 PM	5:00 PM	6	0	1	32	1223	9	10	0	119	0	1202	1	2603
	4:15 PM	5:15 PM	7	0	4	31	1238	7	15	0	135	0	1301	2	2740
	4:30 PM	5:30 PM	7	1	5	24	1306	7	12	0	133	0	1412	2	2909
	4:45 PM	5:45 PM	5	1	5	26	1377	8	9	0	124	0	1460	3	3018
	5:00 PM	6:00 PM	5	1	4	26	1360	8	8	0	127	0	1462	4	3005

Table 7: Existing AM and PM Traffic Counts at K-10 & East Hills Dr.

Level of Service Summary
K-10 EB & East Hills Dr.
Existing Traffic

AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	4.1	EB	A	4.0	Left	A	1.5	0	A	4.8	EB	A	4.2	Left	A	0.9	0
					Thru	A	4.2	0						Thru	A	4.3	0
					Right	A	1.8	0						Right	A	1.2	0
		WB	N/A	N/A	Left	N/A	N/A	N/A			WB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		NB	C	24.2	Left	N/A	N/A	N/A			NB	D	31.3	Left	N/A	N/A	N/A
					Thru	C	24.2	27						Thru	D	31.7	29
					Right	C	24.2	27						Right	D	31.0	29
		SB	C	16.3	Left	C	16.3	19			SB	E	41.4	Left	D	37.6	37
					Thru	A	0.0	19						Thru	F	91.6	37
					Right	A	0.0	19						Right	A	0.0	37

Table 8: Existing LOS Summary for K-10 EB & East Hills Drive.

Level of Service Summary
K-10 WB & East Hills Dr.
Existing Traffic

AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	1.0	EB	N/A	N/A	Left	N/A	N/A	N/A	A	3.5	EB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		WB	A	1.1	Left	A	0.0	0			WB	A	3.2	Left	A	0.0	N/A
					Thru	A	1.0	0						Thru	A	3.1	N/A
					Right	A	5.6	0						Right	A	6.4	N/A
		NB	A	0.4	Left	A	4.8	27			NB	C	16.5	Left	A	3.8	53
					Thru	A	0.1	27						Thru	C	18.8	53
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		SB	A	3.6	Left	N/A	N/A	N/A			SB	A	4.3	Left	N/A	N/A	N/A
					Thru	C	15.1	19						Thru	D	28.1	39
					Right	A	1.1	19						Right	A	1.7	39

Table 9: Existing LOS Summary for K-10 WB & East Hills Drive.

The intersection at East Hills Drive and K-10 was modeled as two separate intersections because of the median width between the eastbound and westbound lanes. Both the AM and PM Peak Hours for this intersection are 15 minutes earlier than the other three intersections. This is likely due to a higher percentage of commuter traffic to/from the Kansas City metropolitan area than the other three intersections. The intersections operate at LOS A overall for the AM and PM peak hours, although the north and southbound approaches have a LOS of D and E respectively for the PM peak hour.

GENERATED TRAFFIC

Projected generated traffic from the development was estimated using the Institute of Transportation Engineer's Trip Generation Manual, 8th Edition. The fitted curve equations from the Trip Generation Manual were used in calculating the Daily, AM, and PM peak hour trips. The daily trips, AM Peak Hour, and PM Peak Hour generations were determined based off of the anticipated Industrial Park Land Use classification for the proposed development. The trip generation for the first scenario assumes that 50% of the business park is developed and the connection of the business park to 19th Street does not exist. The Total, AM, and PM generated traffic volumes for the first scenario are shown below in Table 10.

TRIP GENERATION - HALF DEVELOPMENT										
Proposed Development	Lot	ITE Code	Area (Acres)	Daily Traffic	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Industrial Park	Lots 1-17	130	128.8	6,770	796	661	135	764	160	604

Table 10: Estimated Trip Generation at 50% development.

The second scenario assumes the entire site has been developed and the connection of the business park to 19th Street does exist. The second scenario also assumes a 10% reduction in the through traffic on 23rd St/K-10 due to the completion of the South Lawrence Trafficway. The fully developed trip generation estimates are shown below in Table 11.

TRIP GENERATION										
Proposed Development	Lot	ITE Code	Area (Acres)	Daily Traffic	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
Industrial Park	Lots 1-17	130	257.6	12,945	1,367	1,134	233	1,258	264	994

Table 11: Estimated Trip Generation at 100% development.

TRAFFIC DISTRIBUTION

Once the volume of generated traffic was determined, the distribution of the traffic both in and out of the development was determined. The distribution of the generated traffic was estimated using engineering judgment based upon existing traffic patterns, the existing street network, the location of the development relative to employment and business centers, and the street layout within the development itself.

To determine the distribution of traffic at the access points, the origin and destinations of the generated trips had to be determined. For the purposes of this traffic study, the adjacent streets associated with the major origin/destination directions were the origin/destinations used for the study. The origin/destinations include:

- Northwest (19th & Harper)
- West (23rd & Harper, West on 23rd St)
- Southwest (23rd & Harper, South on Harper)
- South (O'Connell)
- East (K-10)

<u>50% Development</u>

Figure 4: Origin/Destination Distribution for 50% development scenario.

The percentage of generated trips traveling to/from the origin/destinations for the first scenario assuming 50% development is shown above in Figure 4. Table 12 and 13 below further defines the traffic movement by estimating the percentage of traffic using each access point.

AM DISTRIBUTION - HALF DEVELOPMENT								
Generated Traffic		Origin/Destination	Origin/Destination %	Access Point	Access Distribution		Access Volume	
In	Out				In	Out	In	Out
661	135	NW (19th Street)	15%		15%	15%		
				O'Connell	12%	5%	79	7
				Right In/Out	0%	5%	0	7
				E. Hills Bus. Pk	3%	5%	20	7
		W (23rd St)	45%		45%	45%		
				O'Connell	35%	20%	231	27
				Right In/Out	0%	15%	0	20
				E. Hills Bus. Pk	10%	10%	66	13
		SW (Harper)	5%		5%	5%		
				O'Connell	4%	2%	26	3
				Right In/Out	0%	2%	0	3
				E. Hills Bus. Pk	1%	1%	7	1
		S (O'Connell)	5%		5%	5%		
				O'Connell	4%	3%	26	4
				Right In/Out	0%	1%	0	1
				E. Hills Bus. Pk	1%	1%	7	1
		E (K-10)	30%		30%	30%		
				O'Connell	5%	15%	33	20
				Right In/Out	10%	0%	66	0
				E. Hills Bus. Pk	15%	15%	99	20
		Totals	100%		100%	100%	660	134

Table 12: AM Peak Hour Traffic Distribution assuming 50% development.

PM DISTRIBUTION - HALF DEVELOPMENT								
Generated Traffic		Origin/Destination	Origin/Destination %	Access Point	Access Distribution		Access Volume	
In	Out				In	Out	In	Out
160	604	NW (19th Street)	15%		15%	15%		
				O'Connell	12%	5%	19	30
				Right In/Out	0%	5%	0	30
				E. Hills Bus. Pk	3%	5%	5	30
		W (23rd St)	45%		45%	45%		
				O'Connell	40%	20%	64	121
				Right In/Out	0%	15%	0	91
				E. Hills Bus. Pk	5%	10%	8	60
		SW (Harper)	5%		5%	5%		
				O'Connell	4%	2%	6	12
				Right In/Out	0%	2%	0	12
				E. Hills Bus. Pk	1%	1%	2	6
		S (O'Connell)	5%		5%	5%		
				O'Connell	4%	3%	6	18
				Right In/Out	0%	1%	0	6
				E. Hills Bus. Pk	1%	1%	2	6
		E (K-10)	30%		30%	30%		
				O'Connell	5%	25%	8	151
				Right In/Out	10%	0%	16	0
				E. Hills Bus. Pk	15%	5%	24	30
		Totals	100%		100%	100%	160	603

Table 13: PM Peak Hour Traffic Distribution assuming 50% development.

Full Development

Figure 5: Origin/Destination Distribution for full development scenario.

As with the 50% development scenario, the percentage of generated trips traveling to/from the origin/destinations for the full development scenario is shown above in Figure 5. Table 14 and 15 below further defines the traffic movement by estimating the percentage of traffic using each access point.

AM DISTRIBUTION								
Generated Traffic		Origin/Destination	Origin/Destination %	Access Point	Access Distribution		Access Volume	
In	Out				In	Out	In	Out
1134	233	NW (19th Street)	30%		30%	30%		
				19th Street	30%	30%	340	70
				O'Connell	0%	0%	0	0
				Right In/Out	0%	0%	0	0
				E. Hills Bus. Pk	0%	0%	0	0
		W (23rd St)	30%		30%	30%		
				O'Connell	25%	10%	284	23
				Right In/Out	0%	10%	0	23
				E. Hills Bus. Pk	5%	10%	57	23
		SW (Harper)	5%		5%	5%		
				O'Connell	4%	2%	45	5
				Right In/Out	0%	2%	0	5
				E. Hills Bus. Pk	1%	1%	11	2
		S (O'Connell)	5%		5%	5%		
				O'Connell	4%	3%	45	7
				Right In/Out	0%	1%	0	2
				E. Hills Bus. Pk	1%	1%	11	2
		E (K-10)	30%		30%	30%		
				O'Connell	5%	15%	57	35
				Right In/Out	10%	0%	113	0
				E. Hills Bus. Pk	15%	15%	170	35
		Totals	100%		100%	100%	793	162

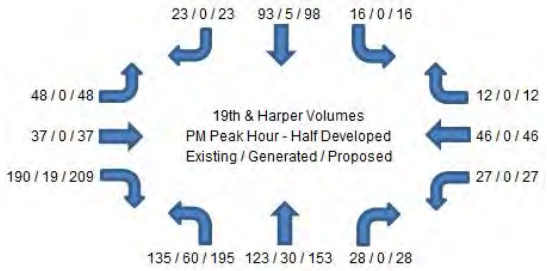
Table 14: AM Peak Hour Traffic Distribution at Full Development.

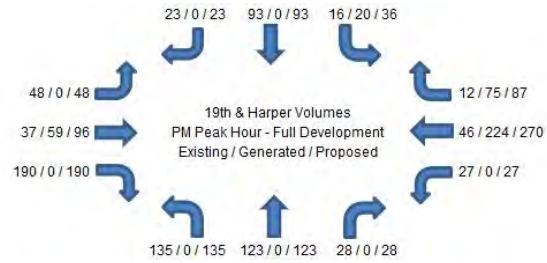
PM DISTRIBUTION								
Generated Traffic		Origin/Destination	Origin/Destination %	Access Point	Access Distribution		Access Volume	
In	Out				In	Out	In	Out
264	994	NW (19th Street)	30%		30%	30%		
				19th Street	30%	30%	79	298
				O'Connell	0%	0%	0	0
				Right In/Out	0%	0%	0	0
				E. Hills Bus. Pk	0%	0%	0	0
		W (23rd St)	30%		30%	30%		
				O'Connell	25%	10%	66	99
				Right In/Out	0%	10%	0	99
				E. Hills Bus. Pk	5%	10%	13	99
		SW (Harper)	5%		5%	5%		
				O'Connell	4%	2%	11	20
				Right In/Out	0%	2%	0	20
				E. Hills Bus. Pk	1%	1%	3	10
		S (O'Connell)	5%		5%	5%		
				O'Connell	4%	3%	11	30
				Right In/Out	0%	1%	0	10
				E. Hills Bus. Pk	1%	1%	3	10
		E (K-10)	30%		30%	30%		
				O'Connell	5%	25%	13	248
				Right In/Out	10%	0%	26	0
				E. Hills Bus. Pk	15%	5%	40	50
		Totals	100%		100%	100%	186	695

Table 15: PM Peak Hour Traffic Distribution at Full Development.

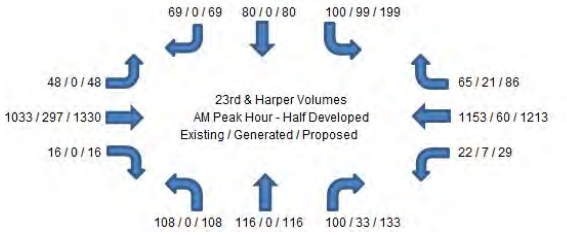
To determine the design volumes at the intersections within the scope of the study, the generated traffic was routed along the street network to or from the access points to their origins and destinations and added to the existing volumes at the intersections. The resulting design volumes for the intersections are summarized below.

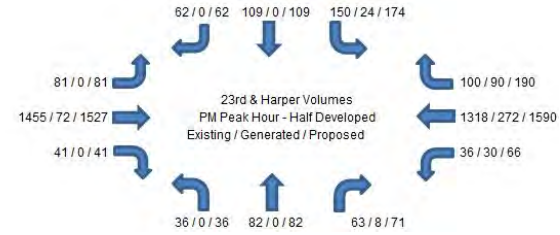
<u>19th & Harper</u>

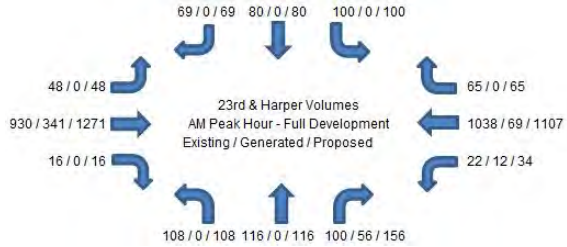


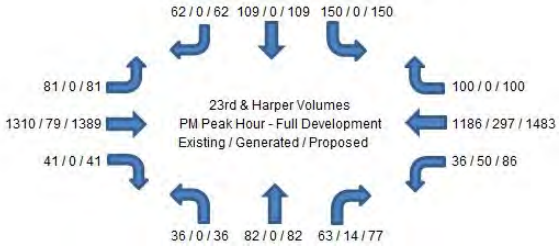


23rd & Harper

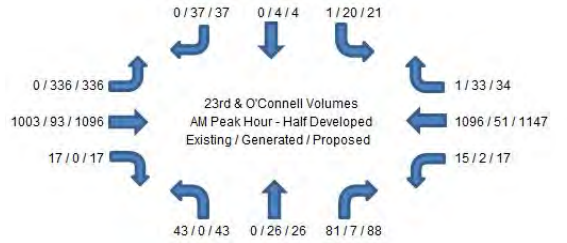


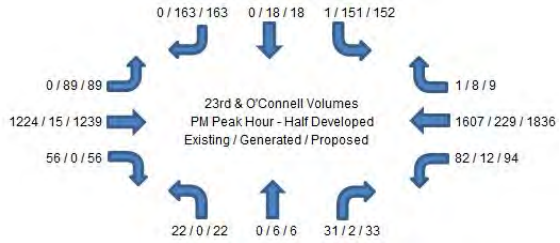


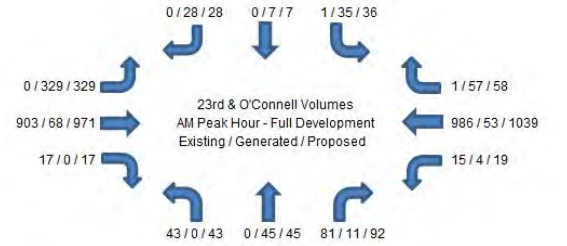


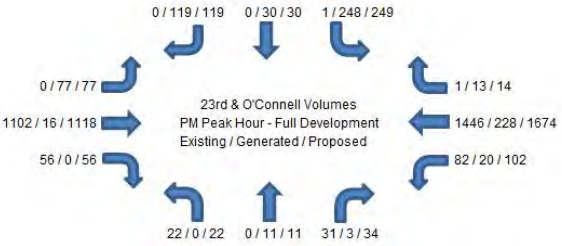


23rd & O'Connell

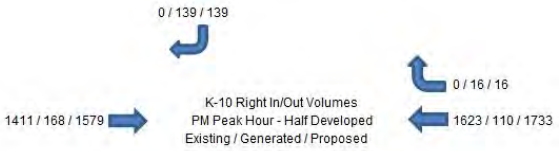




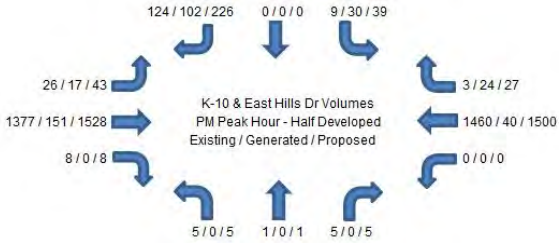


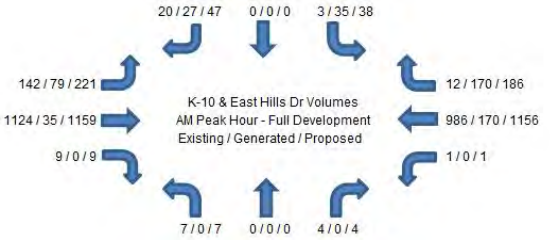


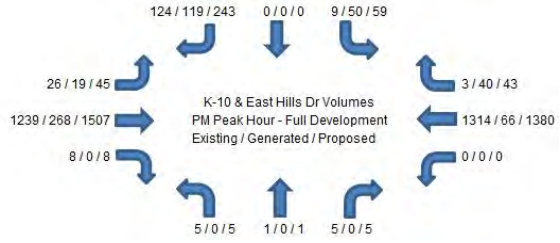
K-10 & Right In/Right Out



K-10 & East Hills Drive







TRAFFIC ANALYSIS

The traffic analysis for the existing conditions and the two design scenarios was performed at all four existing intersections within the scope of the study, the proposed right-in/right-out access point on K-10, and the internal intersection within the proposed development. The details of the traffic analysis are as follows:

19th & Harper

Level of Service Summary 19th & Harper Existing Traffic																
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	6.3	EB	A	5.6	Left	A	6.6	76	A	7.3	EB	A	7.4	Left	A	9.5	101
					Thru	A	7.9	76						Thru	A	9.7	101
					Right	A	4.8	76						Right	A	6.2	101
		WB	A	6.0	Left	A	6.9	55			WB	A	6.4	Left	A	5.8	56
					Thru	A	6.4	55						Thru	A	7.0	56
					Right	A	2.7	55						Right	A	4.3	56
		NB	A	7.3	Left	A	7.2	82			NB	A	8.0	Left	A	7.3	73
					Thru	A	7.4	82						Thru	A	9.4	73
					Right	A	7.0	82						Right	A	5.5	73
		SB	A	5.9	Left	A	4.9	53			SB	A	6.0	Left	A	5.9	52
					Thru	A	7.3	53						Thru	A	7.6	52
					Right	A	3.9	53						Right	A	3.4	52

Table 16: Existing Traffic LOS Summary for 19th & Harper.

Level of Service Summary 19th & Harper Existing Traffic + Half Development Traffic																	
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	7.1	EB	A	6.7	Left	A	8.5	81	A	8.2	EB	A	7.6	Left	A	9.2	91
					Thru	A	8.5	81						Thru	B	10.6	91
					Right	A	6.3	81						Right	A	6.7	91
		WB	A	6.0	Left	A	6.3	59			WB	A	5.4	Left	A	5.7	55
					Thru	A	6.6	59						Thru	A	6.3	55
					Right	A	3.4	59						Right	A	4.0	55
		NB	A	8.0	Left	A	8	74			NB	A	9.6	Left	A	8.9	84
					Thru	A	8.2	74						Thru	B	11.0	84
					Right	A	6.4	74						Right	A	8.2	84
		SB	A	7.0	Left	A	5.2	67			SB	A	7.4	Left	A	6.7	66
					Thru	A	7.6	67						Thru	A	8.1	66
					Right	A	5.1	67						Right	A	5.7	66

Table 17: Existing plus Half Development LOS Summary for 19th & Harper.

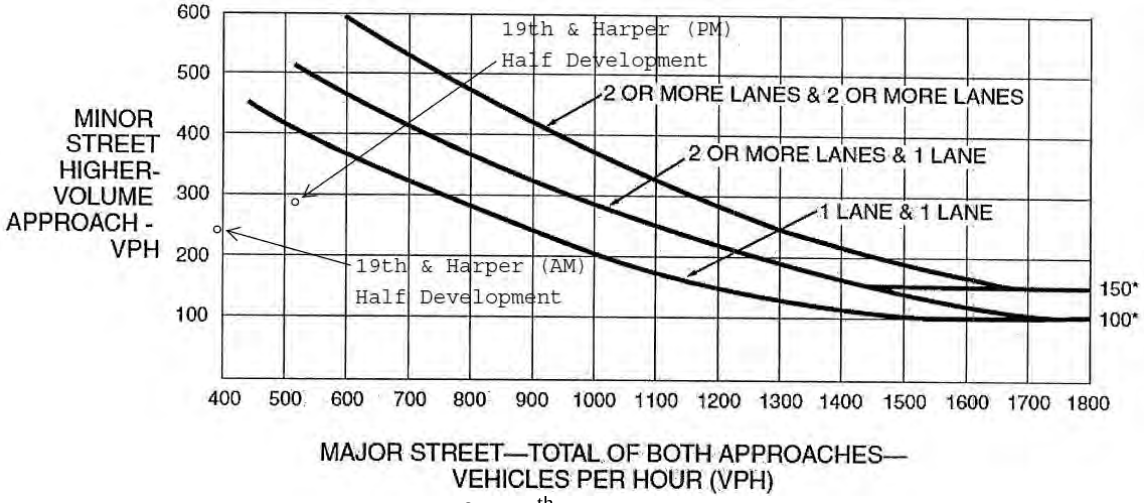


Figure 6: Peak Hour Signal Warrant for 19th & Harper, 50% Development.

The intersection at 19th & Harper is All-Way Stop Control (AWSC). It operates at LOS A for the existing conditions in the AM and PM peak hour. In the first design scenario when the proposed business park is 50% developed but no connection exists between 19th Street and the development, the generated traffic will introduce eastbound right turns and southbound through movements during the AM peak hour and northbound left turn and through movements in the PM peak hour. Table 17 shows the intersection will continue to operate at LOS A for both the AM and PM Peak Hour. The existing plus half development generated traffic volumes were used to perform a Peak Hour Signal Warrant analysis under this scenario. The Peak Hour Signal Warrant is not met for the AM or PM peak hours. Figure 7 below shows the estimated PM peak hour volumes for the 50% development scenario are within the range recommended for All-Way Stop Control.

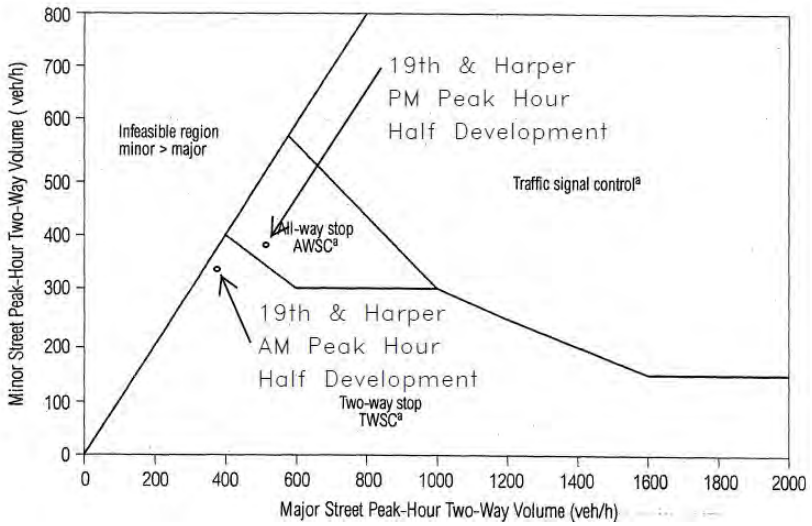


Figure 7: Highway Capacity Manual Intersection Control Diagram.

Level of Service Summary 19th & Harper Existing + Full Development Traffic																	
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
B	10.1	EB	B	11.7	Left	B	12.7	137	B	10.7	EB	A	9.8	Left	B	10.8	114
					Thru	B	12.5	137						Thru	B	12.0	114
					Right	A	9.2	137						Right	A	8.2	114
		WB	A	8.9	Left	A	9.5	96			WB	B	12.5	Left	C	17.8	125
					Thru	A	9.4	96						Thru	B	13.0	125
					Right	A	6.3	96						Right	B	10.6	125
		NB	A	9.2	Left	B	10.1	80			NB	B	10.4	Left	A	10.0	101
					Thru	A	8.5	80						Thru	B	11.3	101
					Right	A	8.7	80						Right	A	8.2	101
		SB	A	8.7	Left	A	8.3	84			SB	A	9.5	Left	A	8.0	84
					Thru	A	9.8	84						Thru	B	11.0	84
					Right	A	7.3	84						Right	A	5.3	84

Table 18: Existing plus Full Development LOS Summary for 19th & Harper.

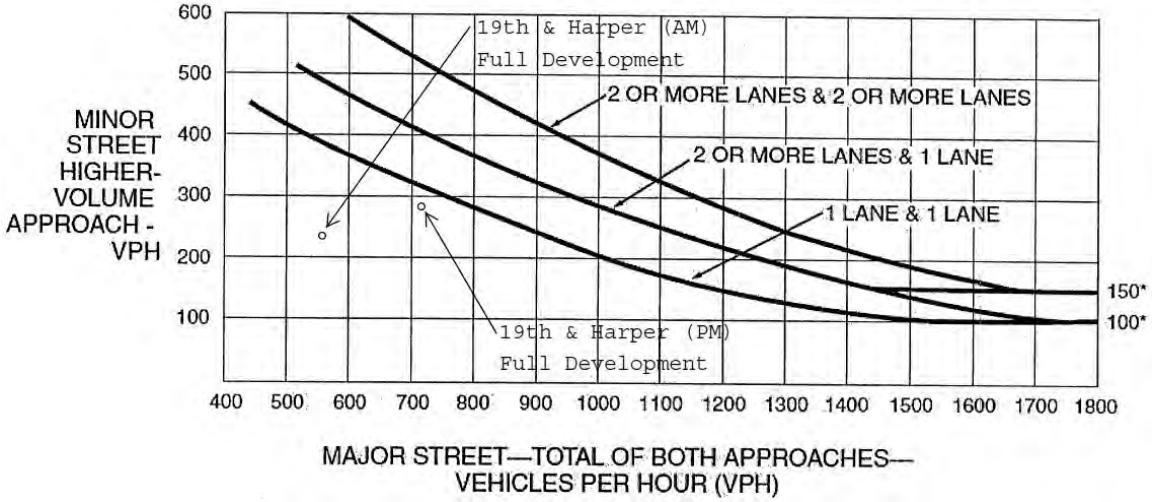


Figure 7: Peak Hour Signal Warrant for 19th & Harper, Full Development.

In the second scenario when the business park is fully developed and the connection between 19th Street and O'Connell Road does exist, the generated traffic will introduce primarily eastbound through and southbound left turn movements to the intersection in the AM Peak Hour. In the PM Peak Hour, the intersection will experience more westbound through and westbound right turn movements. The result of this additional traffic is shown on Table 18. Under this scenario, the intersection will operate at LOS B in the AM and PM peak hours. The Peak Hour Signal Warrant is also not met for the AM or PM peak hour in the full development scenario. Figure 8 , taken from the Highway Capacity Manual, confirms that All-Way Stop Control remains the appropriate intersection control for full development.

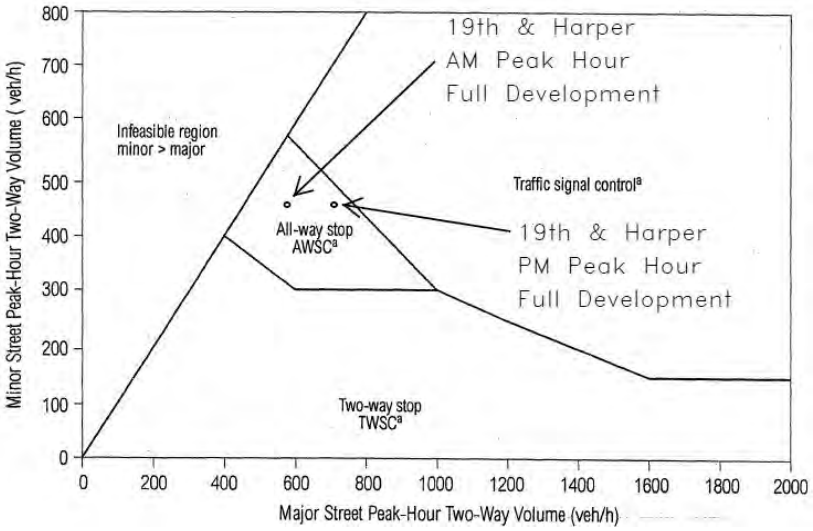


Figure 8: Highway Capacity Manual Intersection Control Diagram.

<u>23rd & Harper</u>

Level of Service Summary 23rd & Harper Existing Traffic																	
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
B	19.7	EB	B	16.6	Left	D	36.3	72	C	22.9	EB	C	22.9	Left	F	80.4	147
					Thru	B	15.9	207						Thru	C	20.0	297
					Right	A	8.5	219						Right	C	22.1	365
		WB	C	22.9	Left	D	41.0	47			WB	C	22.6	Left	D	39.8	118
					Thru	C	22.8	315						Thru	C	22.1	370
					Right	B	19.9	369						Right	C	24.1	389
		NB	C	21.0	Left	B	19.8	81			NB	C	24.5	Left	C	21.6	57
					Thru	C	26.8	166						Thru	C	28.4	128
					Right	B	17.4	166						Right	C	21.3	128
		SB	B	16.4	Left	B	17.5	72			SB	C	23.0	Left	C	24.2	124
					Thru	B	17.7	98						Thru	C	22.6	116
					Right	B	13.8	98						Right	C	20.3	116

Table 19: Existing Traffic LOS Summary for 23rd & Harper.

Level of Service Summary 23rd & Harper Existing Traffic + Half Development Traffic																	
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
C	23.3	EB	C	20.5	Left	D	45.8	80	C	31.1	EB	C	23.9	Left	E	67.8	122
					Thru	B	19.6	268						Thru	C	21.8	368
					Right	B	15.5	290						Right	C	21.3	388
		WB	C	26.0	Left	D	50.6	64			WB	D	36.7	Left	E	61.0	218
					Thru	C	25.4	403						Thru	C	34.9	630
					Right	C	28.2	126						Right	D	44.7	752
		NB	C	23.6	Left	B	19.8	95			NB	C	30.8	Left	C	30.8	62
					Thru	C	28.7	150						Thru	D	37.0	159
					Right	C	23.1	150						Right	C	24.4	159
		SB	C	24.0	Left	C	26.3	148			SB	C	33.7	Left	D	36.1	146
					Thru	C	25.5	137						Thru	D	37.2	175
					Right	B	15.9	137						Right	C	23.5	175

Table 20: Existing plus Half Development LOS Summary for 23rd & Harper.

Level of Service Summary 23rd & Harper Existing + Full Development Traffic																	
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
C	20.4	EB	B	19.4	Left	D	47.6	97	C	28.6	EB	C	25.4	Left	E	72.0	143
					Thru	B	18.4	273						Thru	C	23.0	358
					Right	B	13.8	262						Right	B	19.2	378
		WB	B	19.7	Left	D	36.0	55			WB	C	30.7	Left	D	44.8	179
					Thru	B	19.3	327						Thru	C	29.6	560
					Right	C	21.9	364						Right	C	34.8	565
		NB	C	24.8	Left	C	24.0	82			NB	C	27.7	Left	C	26.9	60
					Thru	C	27.6	185						Thru	C	33.0	119
					Right	C	23.4	185						Right	C	23.4	119
		SB	C	21.4	Left	C	24.4	93			SB	C	32.2	Left	D	37.2	155
					Thru	C	24.1	115						Thru	C	31.9	172
					Right	B	14.2	115						Right	C	24.1	172

Table 21: Existing plus Full Development LOS Summary for 23rd & Harper.

The existing intersection at 23rd & Harper operates at LOS B for the AM Peak Hour and LOS C for the PM peak hour. When the industrial park is 50% developed and the connection of 19th Street & O'Connell Road is not made, nearly all of the generated traffic coming from west of the proposed business park will need to travel through the intersection at 23rd & Harper. This results in the intersection operating at LOS C for the AM peak hour and PM peak hour. The eastbound and westbound left turns for the intersection are at LOS D or E. Upon completion of the 19th Street/O'Connell Road connection under the full development scenario, much of the generated traffic for the proposed development will travel through the intersection at 19th & Harper rather than 23rd & Harper. When this happens, the overall delays for the intersection will decrease, but LOS for the intersection will remain at LOS C for the AM and PM peak hour.

23rd & O'Connell

Level of Service Summary 23rd & O'Connell Existing Traffic																
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	2.8	EB	A	1.5	Left	A	0.0	0	A	2.9	EB	A	1.6	Left	A	0.0	0
					Thru	A	1.5	0						Thru	A	1.6	0
					Right	A	0.8	0						Right	A	1.5	0
		WB	A	2.6	Left	A	5.3	11			WB	A	3.3	Left	C	20.7	44
					Thru	A	2.6	5						Thru	A	3.1	0
					Right	A	6.1	5						Right	A	0.0	0
		NB	C	15.5	Left	D	30.3	60			NB	D	32.5	Left	F	72.1	57
					Thru	A	0.0	60						Thru	F	72.1	57
					Right	A	7.7	61						Right	A	8.4	43
		SB	D	28.0	Left	C	28.0	12			SB	C	18.2	Left	C	18.2	8
					Thru	A	0.0	12						Thru	A	0.0	0
					Right	A	0.0	12						Right	A	0.0	0

Table 22: Existing Traffic LOS Summary for 23rd & O'Connell.

Level of Service Summary 23rd & O'Connell Existing Traffic + Half Development Traffic																
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
C	21.1	EB	B	15.1	Left	D	38.0	252	C	21.4	EB	B	12.2	Left	F	120.8	203
					Thru	A	9.7	201						Thru	A	7.0	175
					Right	A	1.6	22						Right	A	1.9	17
		WB	C	29.7	Left	D	49.0	41			WB	C	29.5	Left	D	46.5	66
					Thru	C	30.1	384						Thru	C	29.4	552
					Right	A	5.6	44						Right	A	2.1	22
		NB	B	18.1	Left	C	21.7	49			NB	B	16.5	Left	C	24.1	35
					Thru	C	28.0	80						Thru	C	31.1	27
					Right	B	13.5	80						Right	A	5.6	27
		SB	B	19.9	Left	C	26.2	39			SB	C	25.2	Left	C	30.6	139
					Thru	D	45.3	49						Thru	C	25.2	43
					Right	B	13.6	49						Right	C	20.6	43

Table 23: Existing plus Half Development LOS Summary for 23rd & O'Connell.

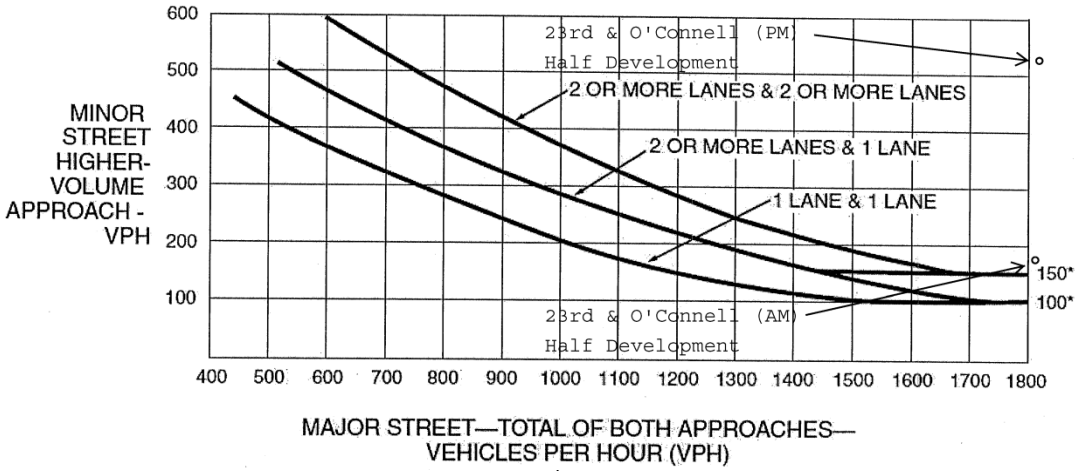


Figure 9: Peak Hour Signal Warrant for 23rd & O'Connell, 50% Development.

Level of Service Summary 23rd & O'Connell Existing + Full Development Traffic																
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
C	25.5	EB	C	22.7	Left	E	59.7	363	C	25.5	EB	B	15.2	Left	E	71.4	133
					Thru	B	12.4	261						Thru	B	12.7	283
					Right	A	1.8	9						Right	A	2.6	17
		WB	C	31.2	Left	D	44.4	42			WB	C	34.7	Left	D	48.6	401
					Thru	C	32.2	360						Thru	C	34.7	645
					Right	A	6.3	45						Right	A	4.7	281
		NB	B	15.2	Left	C	21.8	49			NB	B	19.6	Left	C	22.6	35
					Thru	C	21.4	93						Thru	D	36.2	44
					Right	A	9.5	93						Right	A	9.5	44
		SB	C	21.2	Left	C	28.9	49			SB	C	26.5	Left	C	32.0	214
					Thru	C	33.2	26						Thru	B	19.6	36
					Right	A	9.6	33						Right	B	19.0	57

Table 24: Existing plus Full Development LOS Summary for 23rd & O'Connell.

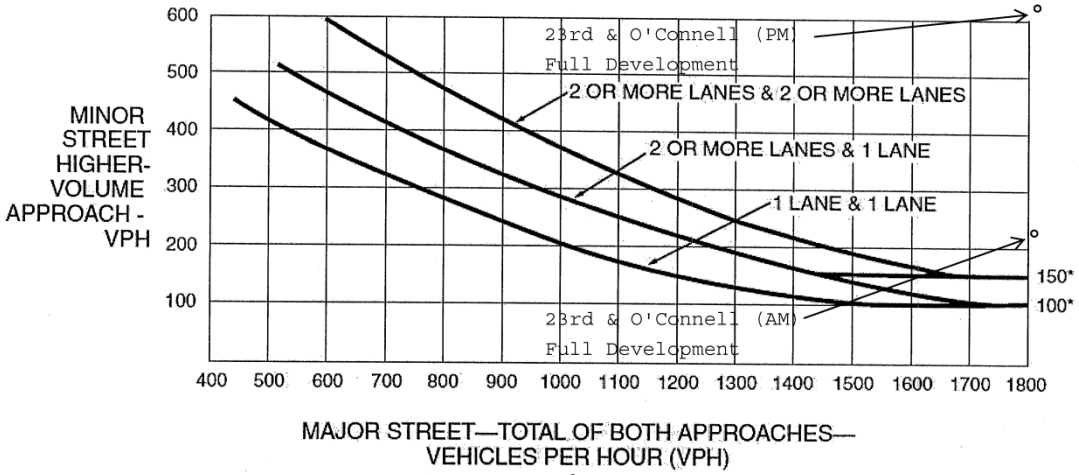


Figure 10: Peak Hour Signal Warrant for 23rd & O'Connell, Full Development.

The intersection at 23rd & O'Connell is currently a Two-Way Stop Control intersection with the north-south movement being stop controlled. The traffic speeds and volumes along 23rd Street at this location are such that is difficult for drivers approaching from the frontage road on the north or from O'Connell on the south to make through or left turn movements. For the existing intersection, the northbound left turn operates at LOS D for the AM peak hour and LOS F for the PM peak hour. The median width at the intersection is also a problem because it is just wide enough for a north or southbound car to cross one direction of traffic and wait in the median before a gap occurs in the opposite direction of traffic before proceeding. When this occurs the vehicle waiting in the median effectively blocks the east and westbound left turn movements.

A peak hour signal warrant analysis was performed to verify that the intersection volumes met the signal warrant analysis for the 50% development scenario. As can be seen on Figure 9, both the AM and PM traffic volumes greatly exceed the threshold for the peak hour signal warrant. Therefore, the intersection was modeled as a signalized intersection for both the 50% development and full development scenarios. In addition to modeling the signalized intersection, base geometric improvements were made to the

model. These geometric improvements included adding a left turn lane for the eastbound left turn movement. The proposed southbound approach to the intersection was also input into the Synchro model. These inputs included a southbound left turn lane, a southbound through lane, and a southbound right turn lane. Additional geometric changes to the model included separating the northbound left turn movement from the through and right movement to allow for better operational efficiencies in coordinating the north and southbound left turn phases.

Using the Synchro traffic modeling software to optimize the signal phasing with the proposed geometric layout for the 50% development scenario, the proposed signalized intersection would operate at LOS C for the AM and PM peak hours.

In the full development scenario, the intersection continues to operate at LOS C for the AM and PM peak hours. The maximum 95% queue for both scenarios in the AM and PM peak hours is 363 feet. Using the KDOT Corridor Management Guidelines for the recommended deceleration distance of 570 feet for a posted speed of 65 mph, the required left turn lane length is 933 feet.

<u>K-10 & Right In/Right Out</u>

Level of Service Summary
K-10 & Right In/Right Out
Existing Traffic + Half Development Traffic

AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	0.1	EB	A	0.0	Left	N/A	N/A	N/A	A	0.1	EB	A	0.0	Left	N/A	N/A	N/A
					Thru	A	0.0	0						Thru	A	0.0	0
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		WB	A	0.0	Left	N/A	N/A	N/A			WB	A	0.0	Left	N/A	N/A	N/A
					Thru	A	0.0	0						Thru	A	0.0	0
					Right	A	0.0	0						Right	A	0.0	0
		NB	N/A	N/A	Left	N/A	N/A	N/A			NB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		SB	A	1.0	Left	N/A	N/A	N/A			SB	A	1.7	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	A	1.0	0						Right	A	1.7	26

Table 25: Existing plus Half Development LOS Summary for K-10 Right In/Right Out.

Level of Service Summary K-10 & Right In/Out Existing + Full Development Traffic																	
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	0.1	EB	A	0.0	Left	A	0.0	0	A	0.1	EB	A	0.0	Left	A	0.0	0
					Thru	A	0.0	0						Thru	A	0.0	0
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		WB	A	0.0	Left	N/A	N/A	N/A			WB	A	0.0	Left	N/A	N/A	N/A
					Thru	A	0.0	0						Thru	A	0.0	0
					Right	A	0.0	0						Right	A	3.5	0
		NB	N/A	N/A	Left	N/A	N/A	N/A			NB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		SB	A	1.3	Left	N/A	N/A	N/A			SB	A	2.2	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	A	1.3	0						Right	A	2.2	24

Table 26: Existing plus Full Development LOS Summary for K-10 Right In/Right Out.

As can been seen from the K-10 & Right-In/Right-Out LOS summaries, the proposed access point will not have a significant traffic impact on the existing or proposed street network. The westbound right turn movement will be a free flow movement and the deceleration lane for this movement already exists. The southbound right turn movement may be yield control as it has an existing acceleration lane.

<u>K-10 EB & East Hills Drive</u>

Level of Service Summary K-10 EB & East Hills Dr. Existing Traffic																	
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	4.1	EB	A	4.0	Left	A	1.5	0	A	4.8	EB	A	4.2	Left	A	0.9	0
					Thru	A	4.2	0						Thru	A	4.3	0
					Right	A	1.8	0						Right	A	1.2	0
		WB	N/A	N/A	Left	N/A	N/A	N/A			WB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		NB	C	24.2	Left	N/A	N/A	N/A			NB	D	31.3	Left	N/A	N/A	N/A
					Thru	C	24.2	27						Thru	D	31.7	29
					Right	C	24.2	27						Right	D	31.0	29
		SB	C	16.3	Left	C	16.3	19			SB	E	41.4	Left	D	37.6	37
					Thru	A	0.0	19						Thru	F	91.6	37
					Right	A	0.0	19						Right	A	0.0	37

Table 26: Existing LOS Summary for K-10 EB & East Hills Drive.

Level of Service Summary K-10 EB & East Hills Dr. Existing Traffic + Half Development Traffic																	
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
B	13.5	EB	B	11.6	Left	E	49.1	291	A	6.3	EB	A	4.6	Left	A	1.3	10
					Thru	A	4.4	0						Thru	A	4.8	0
					Right	A	1.2	0						Right	A	2.0	0
		WB	N/A	N/A	Left	N/A	N/A	N/A			WB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		NB	F	221.5	Left	N/A	N/A	N/A			NB	E	39.6	Left	N/A	N/A	N/A
					Thru	F	475.7	38						Thru	D	34.8	19
					Right	F	94.3	38						Right	E	43.2	19
		SB	E	49.8	Left	F	53.0	64			SB	F	59.3	Left	F	59.3	74
					Thru	C	21.9	64						Thru	F	59.2	74
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A

Table 27: Existing plus Half Development LOS Summary for K-10 EB & East Hills Dr.

Level of Service Summary K-10 EB & East Hills Dr. Existing + Full Development Traffic																	
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
B	12.5	EB	B	11.4	Left	E	48.0	317	A	7.7	EB	A	5.0	Left	B	10.5	38
					Thru	A	4.3	0						Thru	A	4.8	0
					Right	A	1.4	0						Right	A	2.2	0
		WB	N/A	N/A	Left	N/A	N/A	N/A			WB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		NB	F	96.1	Left	N/A	N/A	N/A			NB	E	46.6	Left	N/A	N/A	N/A
					Thru	F	198.1	32						Thru	F	66.5	35
					Right	B	10.6	32						Right	E	38.6	35
		SB	D	26.7	Left	D	27.1	58			SB	F	61.1	Left	F	61.1	86
					Thru	B	11.2	58						Thru	A	0.0	86
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A

Table 28: Existing plus Full Development LOS Summary for K-10 EB & East Hills Dr.

<u>K-10 WB & East Hills Drive</u>

Level of Service Summary K-10 WB & East Hills Dr. Existing Traffic																	
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	1.0	EB	N/A	N/A	Left	N/A	N/A	N/A	A	3.5	EB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		WB	A	1.1	Left	A	0.0	0			WB	A	3.2	Left	A	0.0	N/A
					Thru	A	1.0	0						Thru	A	3.1	N/A
					Right	A	5.6	0						Right	A	6.4	N/A
		NB	A	0.4	Left	A	4.8	27			NB	C	16.5	Left	A	3.8	53
					Thru	A	0.1	27						Thru	C	18.8	53
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		SB	A	3.6	Left	N/A	N/A	N/A			SB	A	4.3	Left	N/A	N/A	N/A
					Thru	C	15.1	19						Thru	D	28.1	39
					Right	A	1.1	19						Right	A	1.7	39

Table 29: Existing LOS Summary for K-10 WB & East Hills Dr.

Level of Service Summary K-10 WB & East Hills Dr. Existing Traffic + Half Development Traffic																
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	6.9	EB	N/A	N/A	Left	N/A	N/A	N/A	A	5.7	EB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		WB	A	3.2	Left	A	4.2	0			WB	A	4.3	Left	A	0.0	0
					Thru	A	2.8	7						Thru	A	4.3	0
					Right	A	7.6	30						Right	A	7.0	0
		NB	D	26.2	Left	C	19.3	88			NB	D	30.1	Left	A	8.6	70
					Thru	D	26.4	88						Thru	D	31.4	70
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		SB	A	8.3	Left	N/A	N/A	N/A			SB	A	8.4	Left	N/A	N/A	N/A
					Thru	C	18.8	50						Thru	E	42.1	63
					Right	A	1.5	50						Right	A	1.8	0

Table 30: Existing plus Half Development LOS Summary for K-10 WB & East Hills Dr.

Level of Service Summary K-10 WB & East Hills Dr. Existing + Full Development Traffic																
AM Peak Hour 7:00-8:00 AM									PM Peak Hour 4:45-5:45 PM							
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	7.4	EB	N/A	N/A	Left	N/A	N/A	N/A	A	8.8	EB	N/A	N/A	Left	N/A	N/A	N/A
					Thru	N/A	N/A	N/A						Thru	N/A	N/A	N/A
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		WB	A	4.6	Left	B	11.4	0			WB	A	4.7	Left	A	2.2	0
					Thru	A	3.8	5						Thru	A	4.6	6
					Right	A	8.8	67						Right	A	8.6	0
		NB	C	24.5	Left	D	26.3	86			NB	F	50.1	Left	E	45.9	79
					Thru	C	24.5	86						Thru	F	50.7	79
					Right	N/A	N/A	N/A						Right	N/A	N/A	N/A
		SB	A	7.1	Left	N/A	N/A	N/A			SB	C	20.1	Left	N/A	N/A	N/A
					Thru	C	16.0	51						Thru	F	94.7	151
					Right	A	1.2	0						Right	A	1.9	0

Table 31: Existing plus Full Development LOS Summary for K-10 WB & East Hills Dr.

The existing intersections at K-10 & East Hills Drive are Two-Way Stop Control with the east-west movement on K-10 being the free movement. At the intersection, the median width is approximately 75 feet which allows three cars to stack in the median when making a left turn or through movement across K-10. This median width requires that two separate coordinated signals systems be installed if the intersection was converted from Two-Way Stop Control.

The intersection at EB K-10 & East Hills Drive operates at LOS B for the AM peak hour and LOS A for the PM Peak hour for the 50% development scenario. However, the northbound through movement is at LOS F and is virtually impossible to make due the continual presence of a peak hour queue in the eastbound left turn lane. For the same reason, the southbound left turn movement is at LOS F. The intersection continues to have high delays for the northbound and southbound movements in the 50% and full development scenarios.

The intersection at WB K-10 & East Hills Road operates at LOS A for the existing AM and PM peak hour. For the 50% development and full development scenarios, the

intersection continues to operate at LOS A for both the AM and PM peak hours. The LOS results show the PM peak hour southbound through movement is at LOS F. This is due to the high number of southbound through movements at the intersection along with a high number of westbound through movements. When long queue lengths occur for the southbound through and left turn movement at East Hills Drive, local outbound drivers will become accustomed to using the signalized intersection at 23rd & O'Connell rather than East Hills Drive and the Level of Service for that movement will improve.

East-West Road & O'Connell

Level of Service Summary O'Connell & East/West Road Existing + Full Development Traffic																	
AM Peak Hour 7:15-8:15 AM									PM Peak Hour 5:00-6:00 PM								
Intersection		Approach			Movement				Intersection		Approach			Movement			
LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)	LOS	Delay (sec)	Direction	LOS	Delay (sec)	Movement	LOS	Delay (sec)	95% Queue (feet)
A	5.5	EB	A	5.3	Left	A	8.5	48	A	6.3	EB	A	4.9	Left	A	6.3	69
					Thru	A	2.9	48						Thru	A	9.1	69
					Right	A	2.9	48						Right	A	4.2	69
		WB	A	6.9	Left	B	12.9	56			WB	A	9.5	Left	B	10.5	136
					Thru	A	3.9	56						Thru	B	13.5	136
					Right	A	3.9	56						Right	A	8.5	136
		NB	A	2.9	Left	A	3.4	35			NB	A	1.8	Left	A	2.7	0
					Thru	A	1.3	35						Thru	A	1.5	0
					Right	A	3.1	20						Right	A	1.6	0
		SB	A	7.9	Left	B	10.4	126			SB	A	1.8	Left	A	3.5	32
					Thru	A	3.0	126						Thru	A	0.6	32
					Right	A	6.0	126						Right	A	1.5	32

Table 32: Full Development LOS Summary for O'Connell Road & proposed East/West Rd.

The Synchro traffic models show the intersection at O'Connell Road and the proposed East/West Road operate at LOS A for the full development scenario.

SUMMARY AND RECOMENDATIONS

19th & Harper

Based on the results from Synchro analysis, the intersection at 19th & Harper will operate at LOS A in the AM and PM peak hours for the 50% development scenario and at LOS B in the AM and PM peak hours for the full development scenario. The Peak Hour Traffic Signal Warrant was not met for the either peak hour in either scenario. The peak hour traffic signal volumes fall within the range recommended for All-Way Stop Control as shown on Figure 7 and 8 from the Highway Capacity Manual. It is recommended the intersection at 19th & Harper remain as All-Way Stop Control through the course of development for the proposed business park. Geometric improvements are not necessary.

23rd & Harper

The intersection at 23rd & Harper will operate at LOS C in the AM and PM peak hour in both the 50% and full development scenarios. Although the intersection operates with LOS C in both peak hours in the 50% development scenario, the delays for the intersection will be higher in the 50% development scenario than in the full development scenario. This is due to the alternative route that will be available to drivers in the full development scenario when 19th Street in connected to the proposed business park. The completion of the South Lawrence Trafficway will also reduce traffic through the intersection. Geometric improvements are not required as the intersection will operate at LOS C in the AM and PM peak hours.

23rd & O'Connell

Based on the estimated traffic at 23rd & O'Connell in the half development and full development scenario, it is recommended that traffic signals be installed at the intersection. The 50% development traffic model showed a 95% queue length of 363 feet with the assumption that one eastbound left turn lane is constructed. This queue length would require the construction of a 933 feet long turn lane to accommodate the 95% queue and the required deceleration length for a 65 mph road. Other geometric improvements to the intersection include separating the northbound left turn and through/right movements, constructing two northbound receiving lanes on the north approach of the intersection, and constructing a left turn, through, and right turn only lane for the southbound approach. Additional median pavement may also be required for the westbound left turn to allow simultaneous eastbound and westbound left turning movements in addition to providing a pedestrian waiting area of the median to allow for two-stage pedestrian crossings of 23rd Street/K-10.

23rd/K-10 & Right-In/Right Out

The proposed Right-In/Right-Out access point shall be constructed with a median that channelizes both the entry westbound right turn movement and the southbound exit right

turn movement. The median shall be constructed to prohibit both left turns into and out of the proposed business park. An auxiliary lane on K-10 already exists that can used as an acceleration and deceleration lane for this access point.

23rd/K-10 & East Hills Drive

The median width at K-10 & East Hills Drive would require two signal systems if signals were to be installed at this intersection. Based on the existing deceleration lanes already provided at this intersection along with the 4-lane configuration of East Hills Drive, it is recommended that this access point remain Two-Way Stop Control to minimize the overall delay at the intersection. North and southbound through and left turn movements will continue to have long delays and poor levels of service with the benefit being minimal delay for the dominant east-west movements.

O'Connell & East/West Road

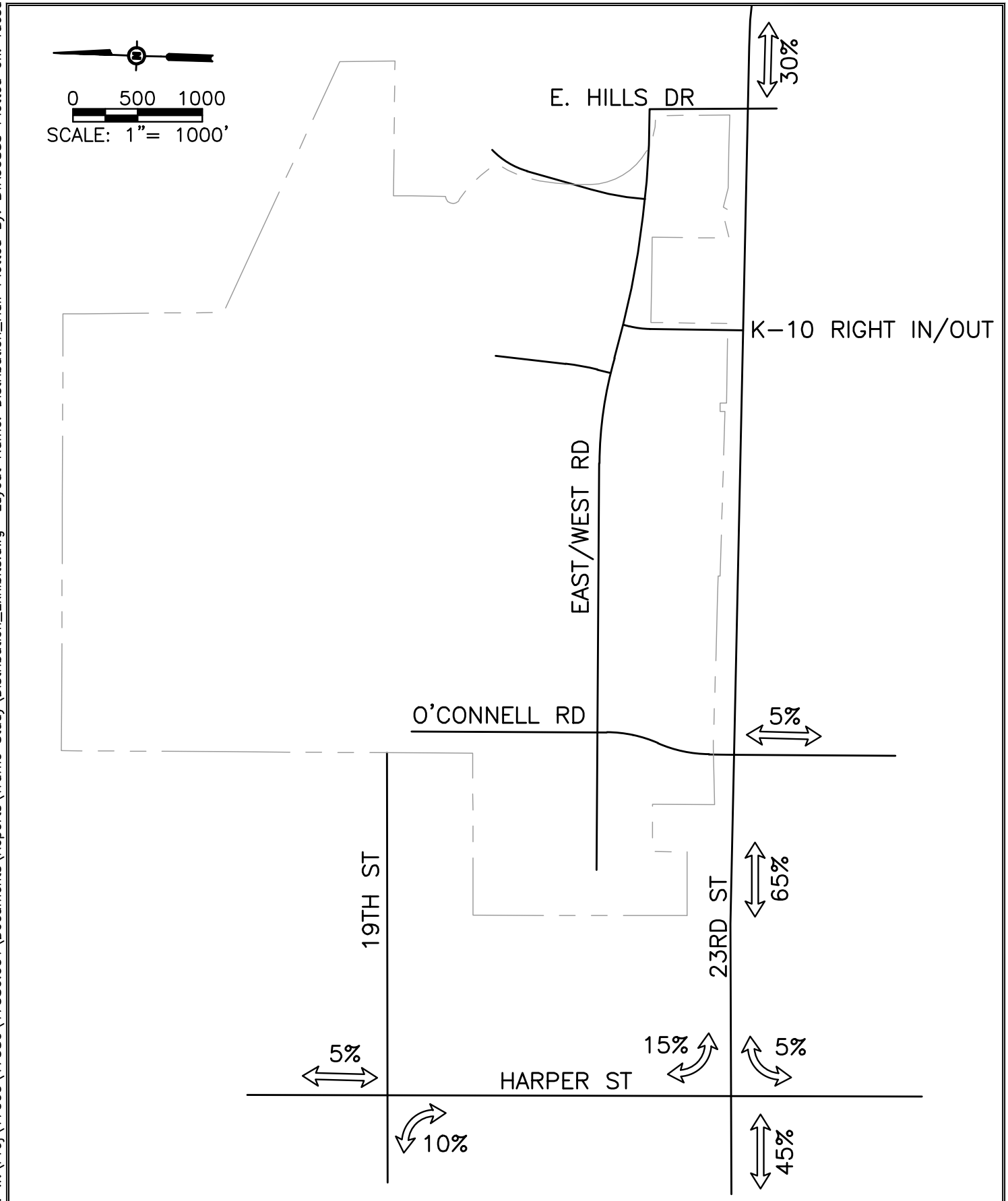
The intersection at O'Connell and the proposed East/West Road shall be constructed as Two-Way Stop Control. It is recommended the northbound approach have a right turn only lane and a through/left turn lane. The traffic models showed acceptable levels of service for the eastbound, southbound, and westbound lanes as single lane approaches. However, consideration should be given to constructing a left turn lane at all approaches to provide added capacity to the intersection. If left turn lanes are added to all approaches of the intersection, the northbound left turn lane should be separated from the through/right lane. It is recommended the east and west approaches be stop controlled.

East/West Road

It is recommended that the East/West Road be 2 or 3 lanes. If the East/West Road is constructed as a two lane road, consideration should be given to adding a left turn lane at side roads and access points to the proposed businesses to reduce rear-end crashes and reduce delay along the street network.

Appendix

Synchro/SimTraffic Traffic Model Results



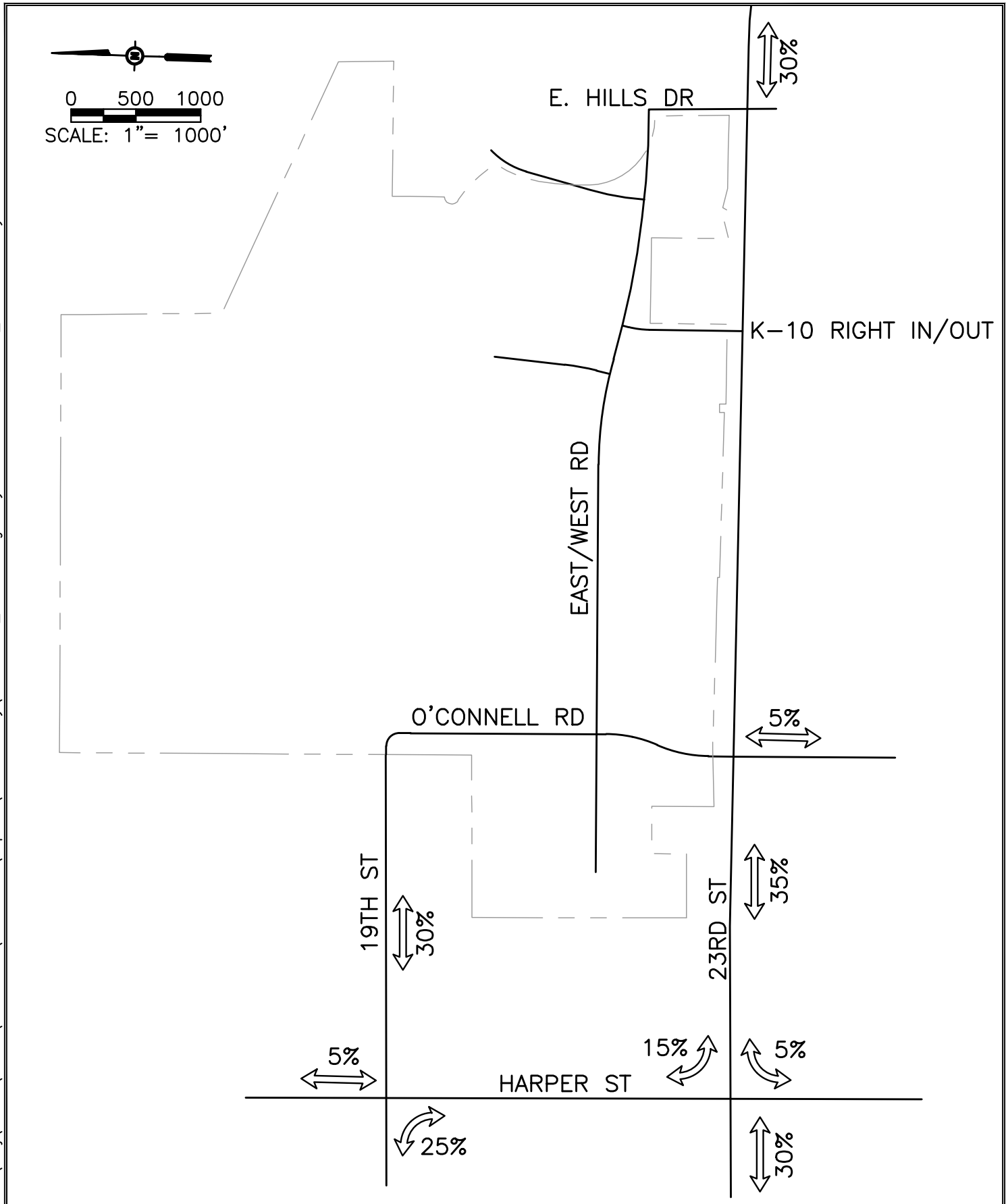
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

HALF DEVELOPMENT TRAFFIC DISTRIBUTION

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 1 OF 12



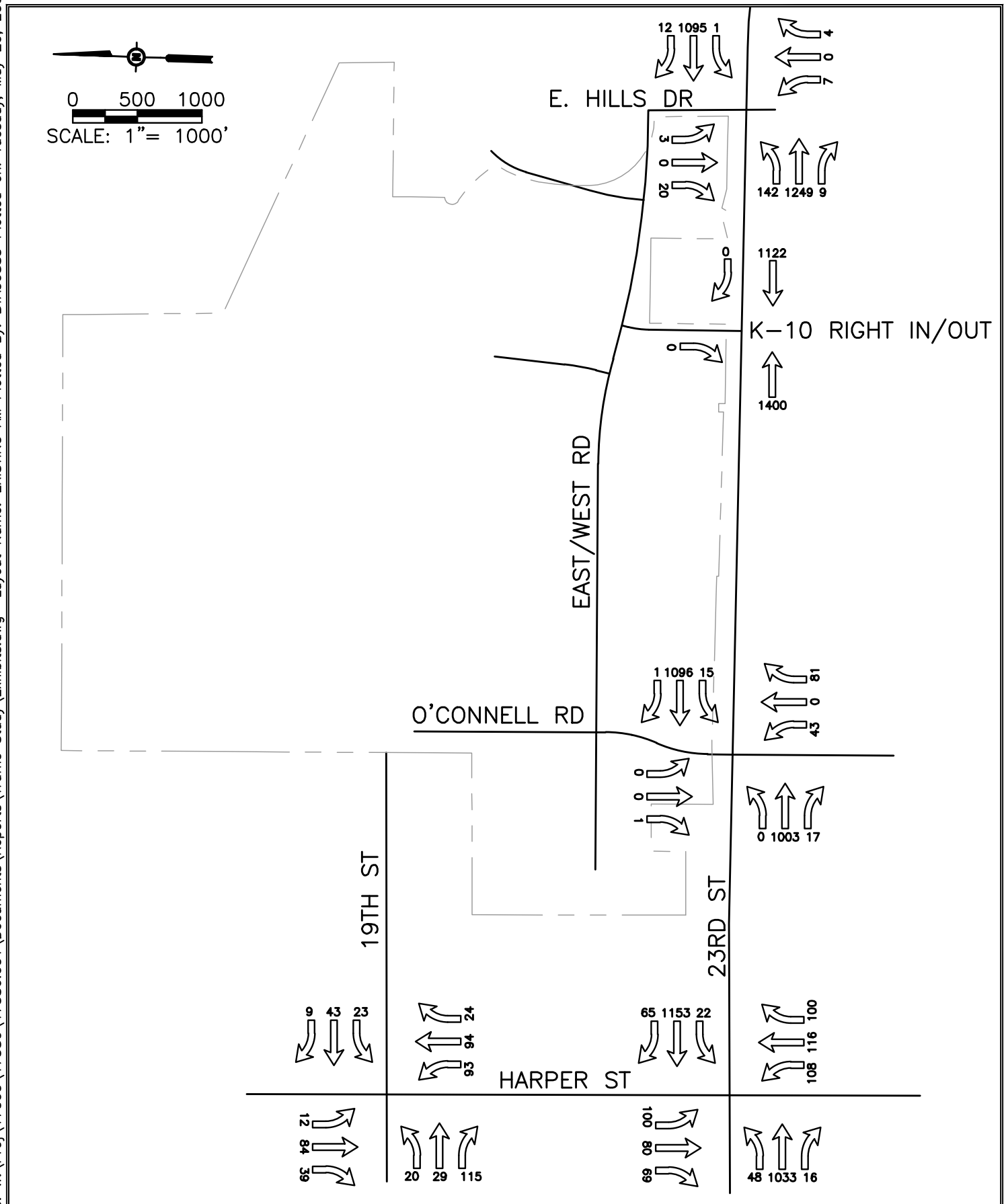
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

FULL DEVELOPMENT TRAFFIC DISTRIBUTION

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 2 OF 12



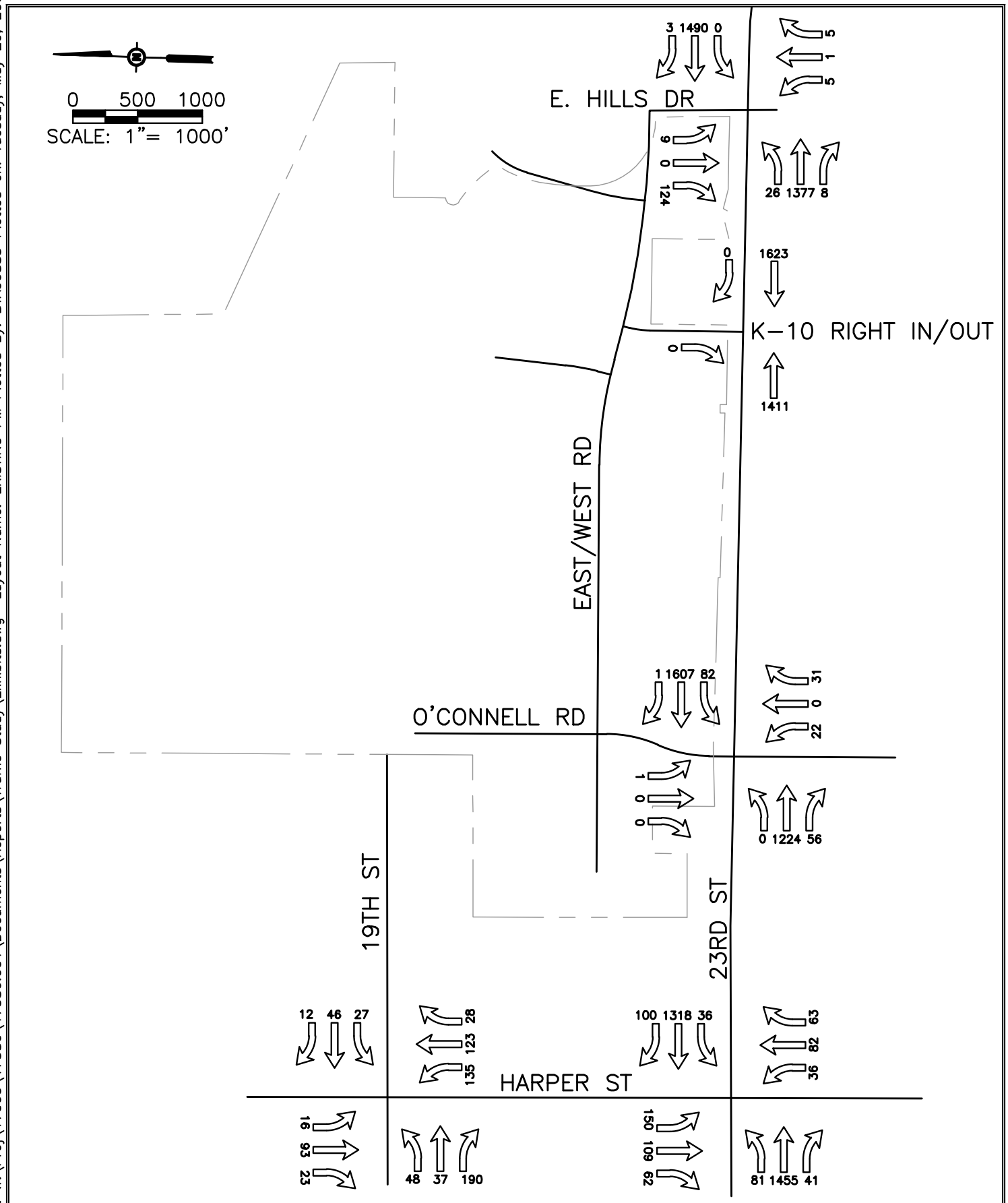
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

EXISTING TRAFFIC
AM PEAK HOUR

PROJ NO: 175836.001

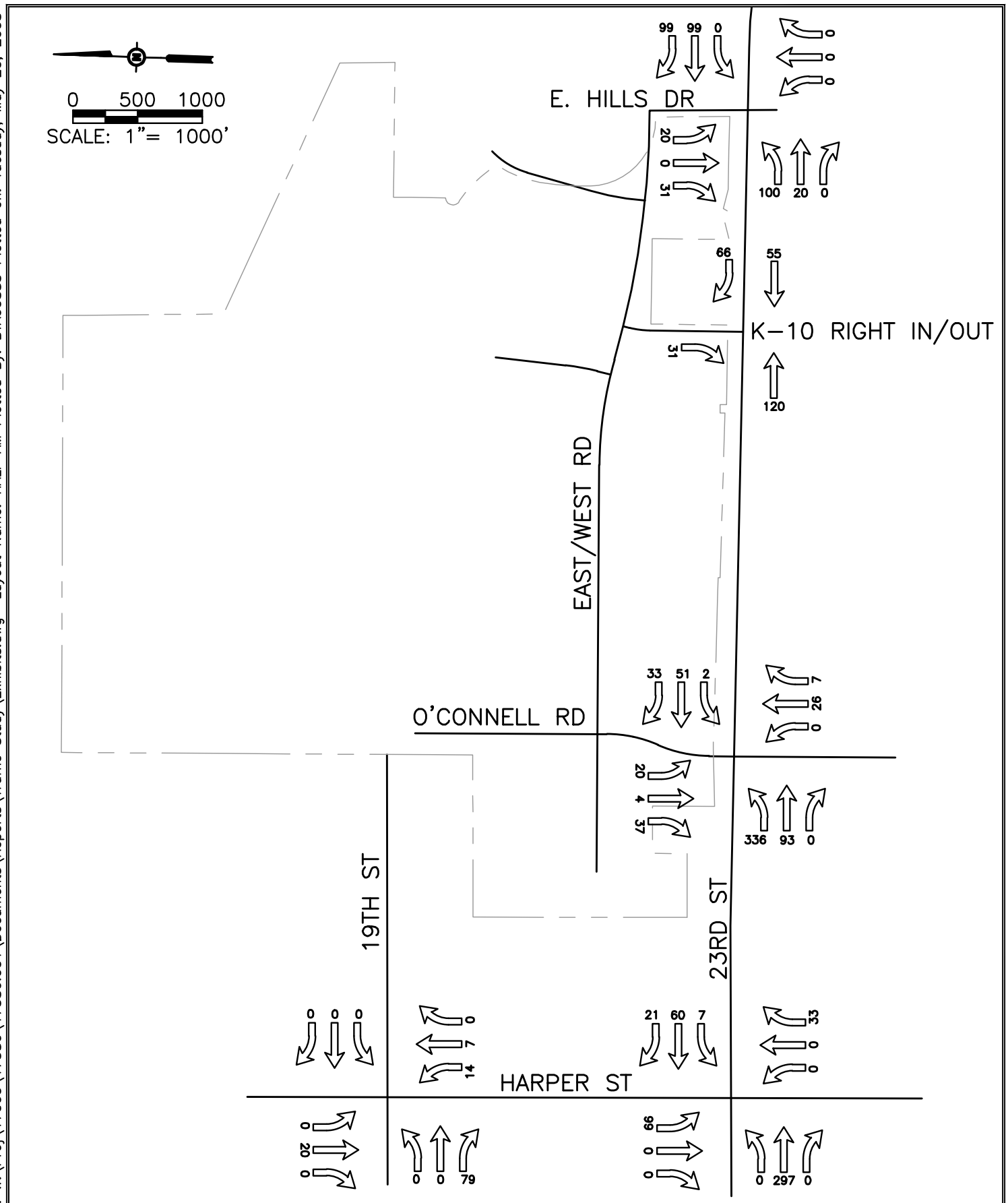
DATE: MAY 2012

SHEET NUMBER 3 OF 12



BARTLETT & WEST 544 COLUMBIA DRIVE LAWRENCE, KANSAS 66049 PHONE 785-749-9452	**EXISTING TRAFFIC PM PEAK HOUR**	PROJ NO: 175836.001 DATE: MAY 2012	SHEET NUMBER **4** OF 12

Drawing Name: W:\Proj\17000\17586\17586.001\Documents\Reports\Traffic Study\Exhibits.dwg Layout Name: EXISTING PM Plotted By: BTA00883 Plotted on: Tuesday, May 20, 2008



Drawing Name: W:\Proj\17000\17586\17586.001\Documents\Reports\Traffic Study\Exhibits.dwg Layout Name: HALF AM Plotted By: BTA00883 Plotted on: Tuesday, May 20, 2008

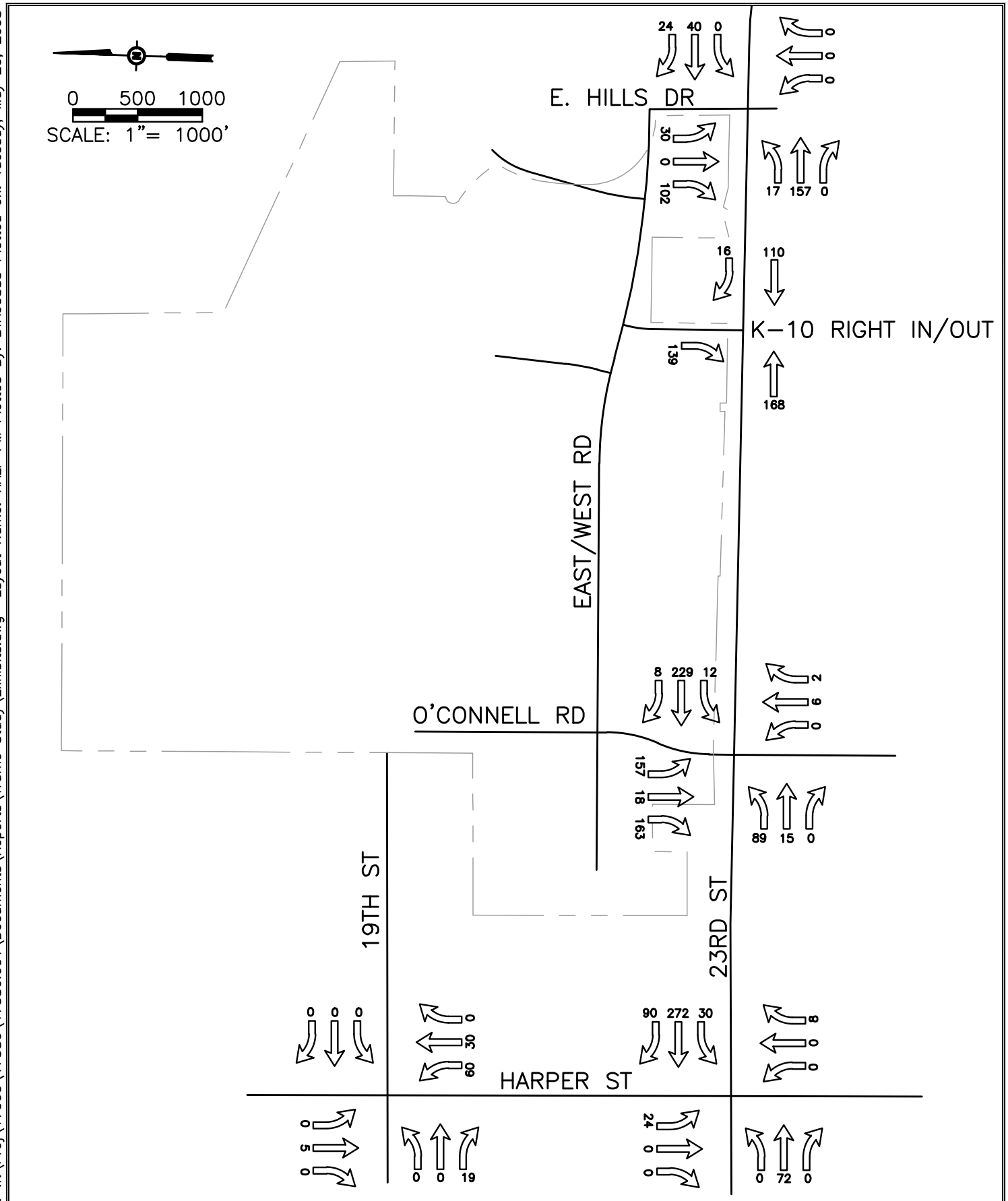
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

HALF DEVELOPMENT GENERATED TRAFFIC AT AM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 5 OF 12



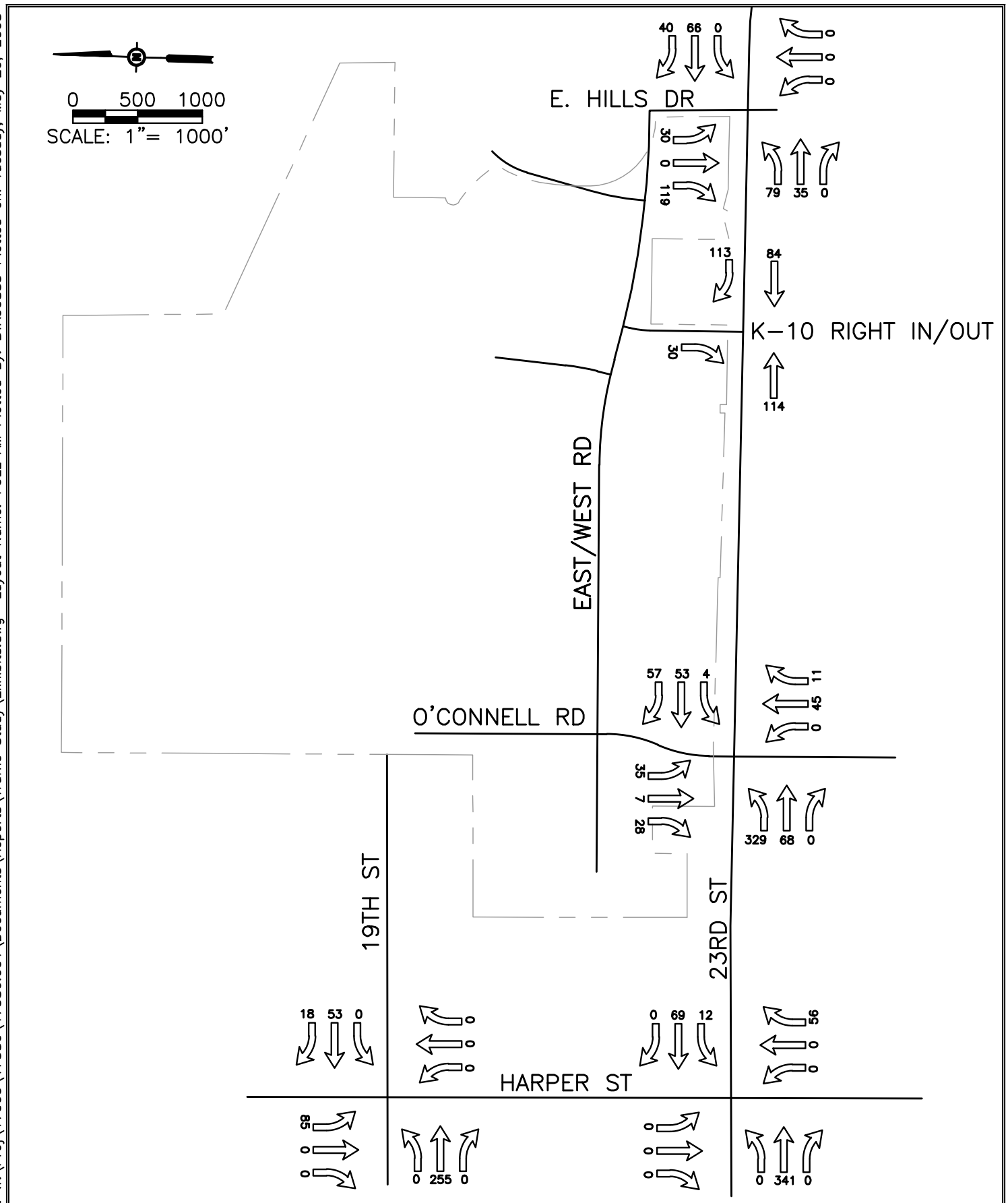
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

HALF DEVELOPMENT GENERATED TRAFFIC AT PM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 6 OF 12



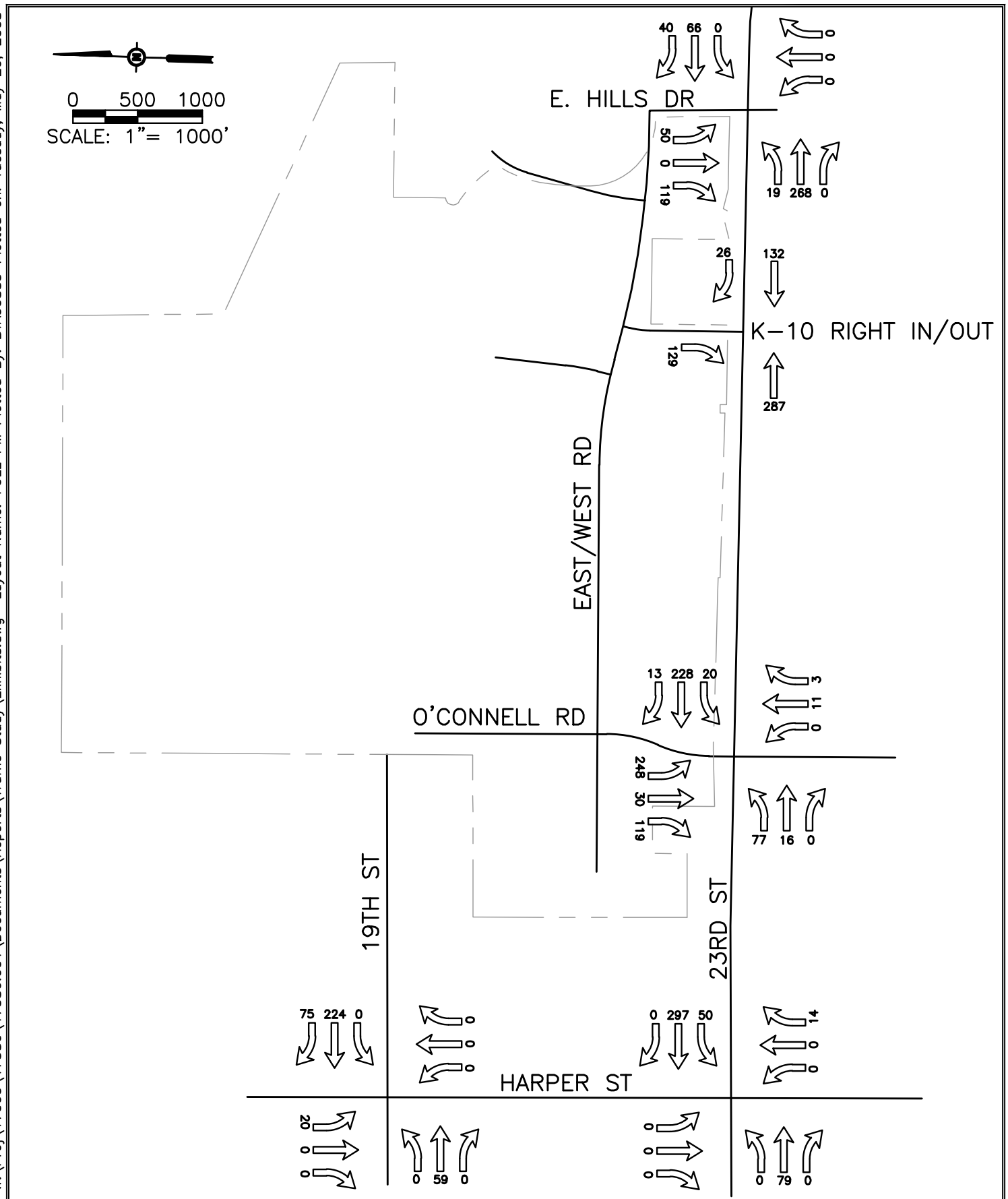
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

FULL DEVELOPMENT GENERATED TRAFFIC AT AM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 7 OF 12



Drawing Name: W:\Proj\17000\17586\17586.001\Documents\Reports\Traffic Study\Exhibits.dwg Layout Name: FULL PM Plotted By: BTA00883 Plotted on: Tuesday, May 20, 2008

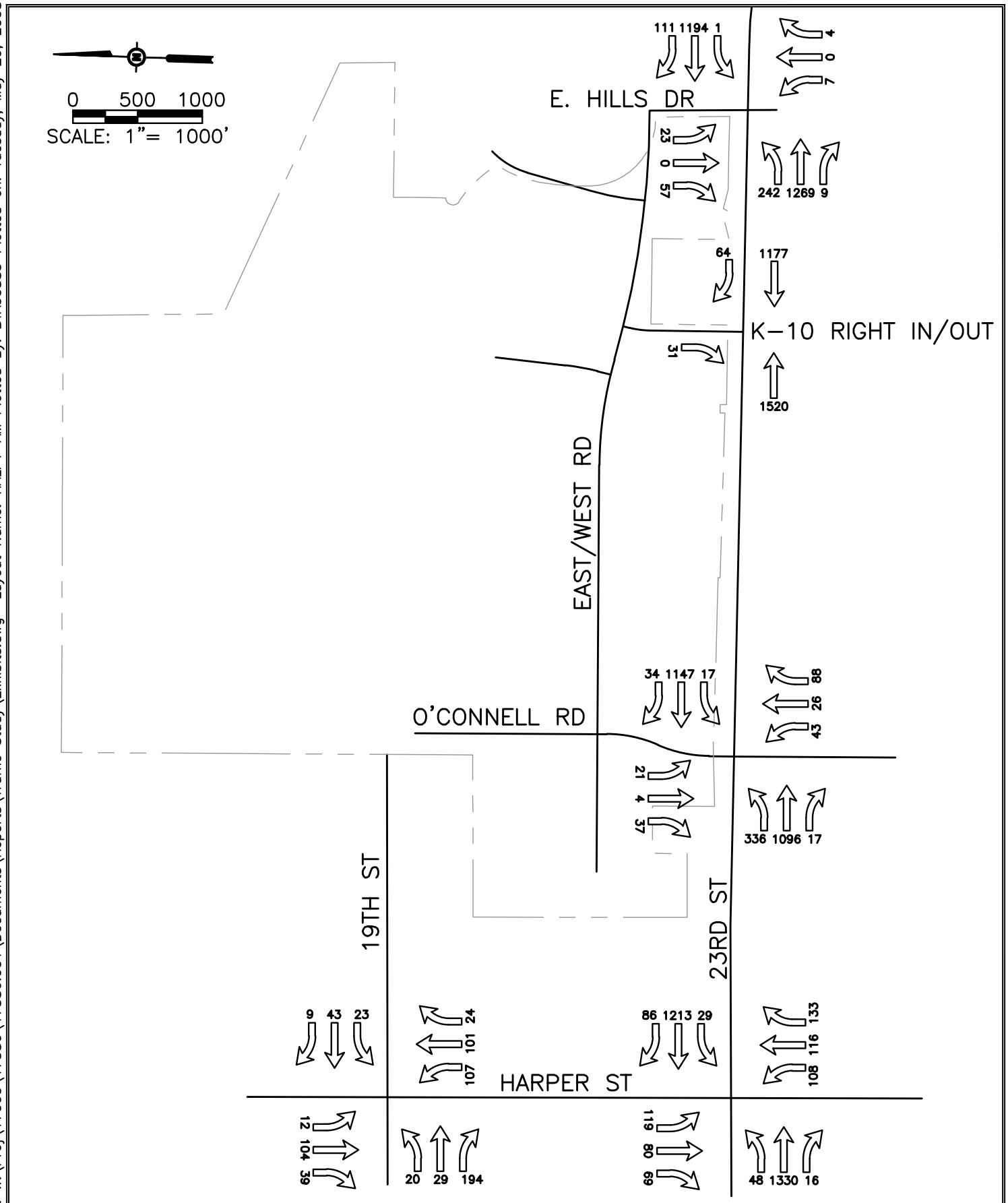
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

FULL DEVELOPMENT GENERATED TRAFFIC AT PM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 8 OF 12



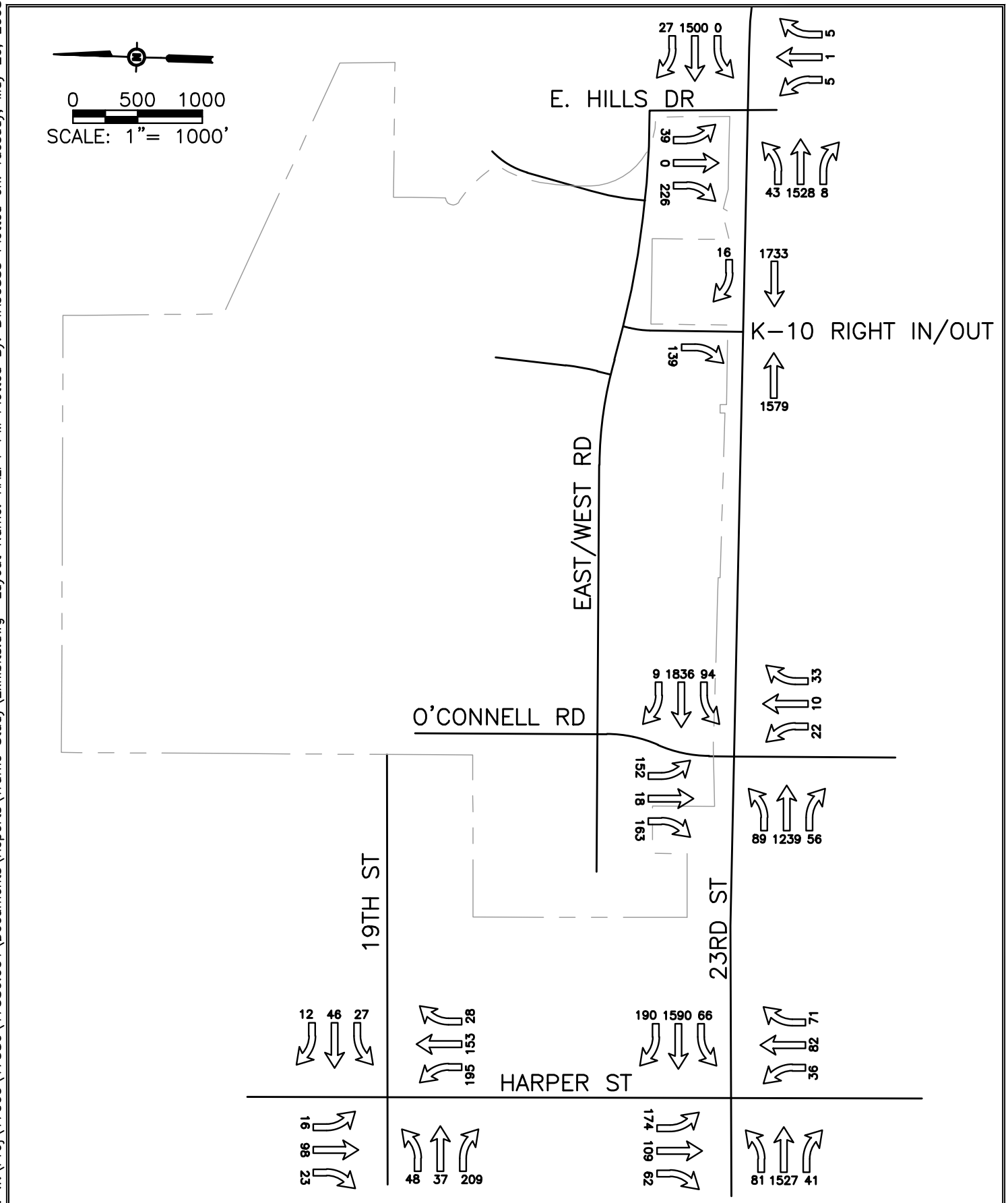
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

HALF DEVELOPMENT GENERATED TRAFFIC PLUS EXISTING TRAFFIC AT AM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 9 OF 12



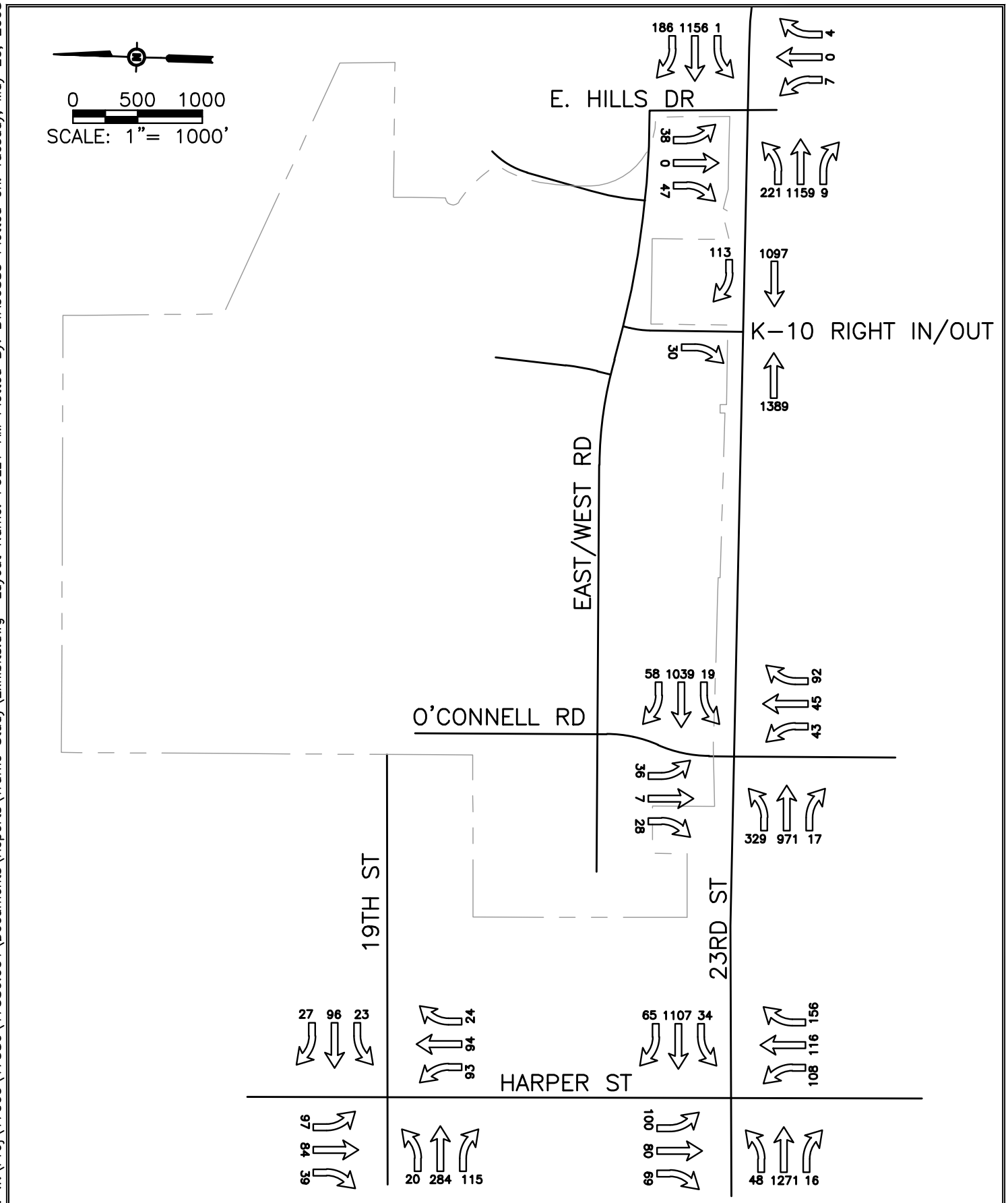
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

HALF DEVELOPMENT GENERATED TRAFFIC PLUS EXISTING TRAFFIC AT PM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 10 OF 12



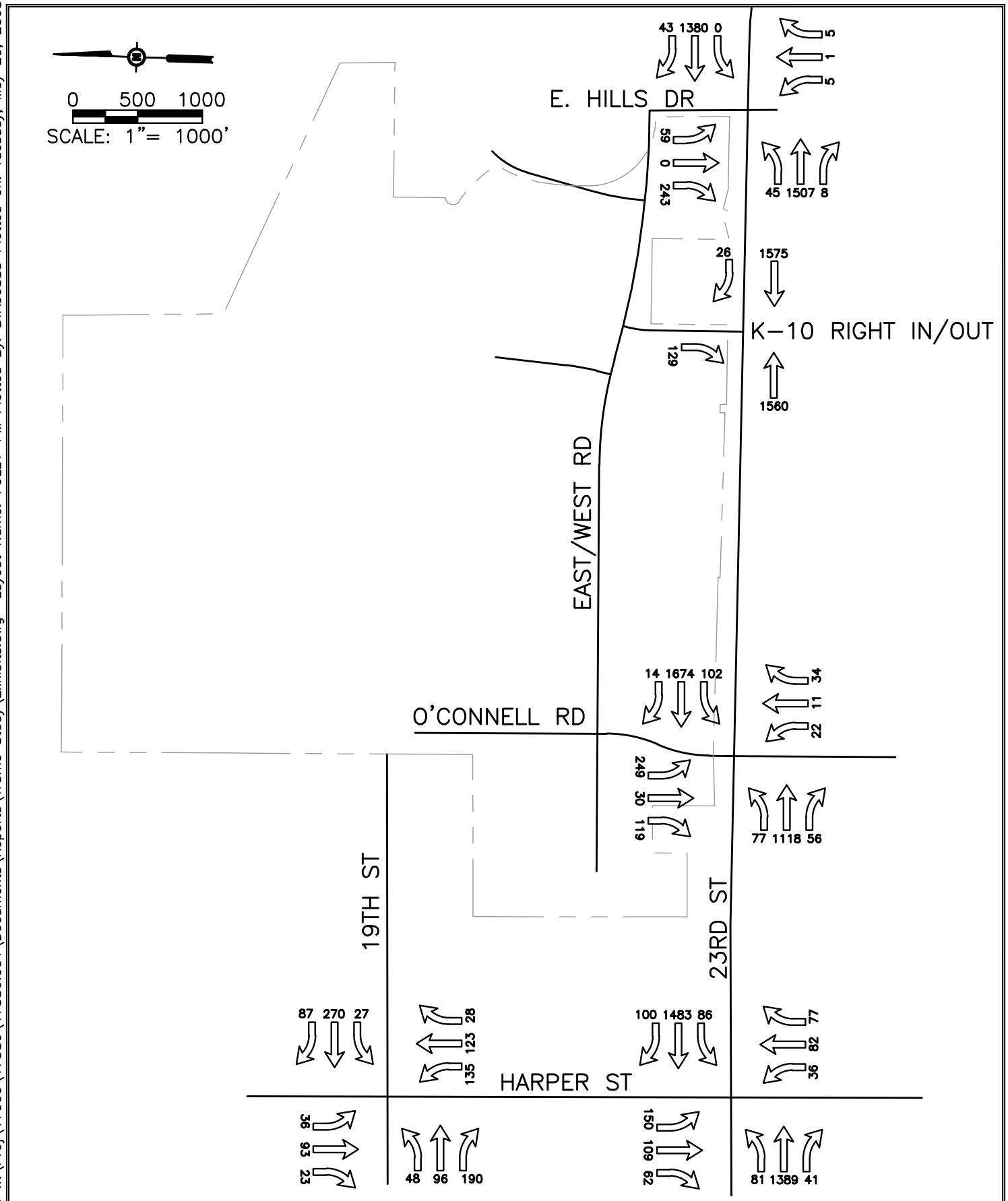
BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

FULL DEVELOPMENT GENERATED TRAFFIC PLUS EXISTING TRAFFIC AT AM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 11 OF 12



Drawing Name: W:\Proj\17000\17586\17586.001\Documents\Reports\Traffic Study\Exhibits.dwg Layout Name: FULL+ PM Plotted By: BTA00883 Plotted on: Tuesday, May 20, 2008

BARTLETT & WEST
544 COLUMBIA DRIVE
LAWRENCE, KANSAS 66049
PHONE 785-749-9452

FULL DEVELOPMENT GENERATED TRAFFIC PLUS EXISTING TRAFFIC AT PM PEAK HOUR

PROJ NO: 175836.001

DATE: MAY 2012

SHEET NUMBER 12 OF 12

1: 23rd St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	5.3	7.9	1.9	1.1	16.1
Delay / Veh (s)	16.6	22.9	21.0	16.4	19.7

2: 23rd St & O'Connell (South) Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.5	0.8	0.6	0.0	2.0
Delay / Veh (s)	1.5	2.6	15.5	28.0	2.8

6: K-10 WB & East Hills Dr (North) Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	0.3	0.0	0.0	0.4
Delay / Veh (s)	1.1	0.4	3.6	1.0

11: 19th St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.3	0.1	0.4	0.2	1.0
Delay / Veh (s)	5.6	6.0	7.3	5.9	6.3

18: K-10 EB & East Hills Dr Median Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	1.6	0.1	0.0	1.7
Delay / Veh (s)	4.0	24.2	16.3	4.1

24: 23rd St & Right In/Out Performance by approach

Approach	EB	WB	All
Total Delay (hr)	3.1	1.5	4.6
Delay / Veh (s)	7.5	4.8	6.4

Total Network Performance

Total Delay (hr)	30.9
Delay / Veh (s)	31.4

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	93	231	242	53	380	415	95	204	77	97
Average Queue (ft)	35	133	154	19	215	248	47	91	43	56
95th Queue (ft)	72	207	219	47	315	369	81	166	72	98
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					4			1		
Queuing Penalty (veh)					1			1		

Intersection: 2: 23rd St & O'Connell (South)

Movement	WB	WB	NB	NB	SB
Directions Served	L	T	LT	R	LR
Maximum Queue (ft)	25	15	87	82	24
Average Queue (ft)	2	0	28	33	2
95th Queue (ft)	11	5	60	61	12
Link Distance (ft)		3245	756	756	255
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	750				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	NB	SB
Directions Served	LT	T
Maximum Queue (ft)	30	28
Average Queue (ft)	7	4
95th Queue (ft)	27	19
Link Distance (ft)	64	675
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	96	56	103	55
Average Queue (ft)	49	35	52	37
95th Queue (ft)	76	55	82	53
Link Distance (ft)	2608	2594	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	44	29
Average Queue (ft)	7	4
95th Queue (ft)	27	19
Link Distance (ft)	201	64
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	19	76
Average Queue (ft)	1	10
95th Queue (ft)	6	40
Link Distance (ft)	3245	3245
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

1: 23rd St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.4	4.8	0.0	0.2	7.3	0.4	0.6	0.7	0.6	0.4	0.4	0.3
Delay / Veh (s)	36.3	15.9	8.5	41.0	22.8	19.9	19.8	26.8	17.4	17.5	17.7	13.8

1: 23rd St & Harper Performance by movement

Movement	All
Total Delay (hr)	16.1
Delay / Veh (s)	19.7

2: 23rd St & O'Connell (South) Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	All
Total Delay (hr)	0.5	0.0	0.0	0.8	0.0	0.4	0.2	0.0	2.0
Delay / Veh (s)	1.5	0.8	5.3	2.6	6.1	30.3	7.7	28.0	2.8

6: K-10 WB & East Hills Dr (North) Performance by movement

Movement	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	0.3	0.0	0.0	0.0	0.0	0.0	0.4
Delay / Veh (s)	1.0	5.6	4.9	0.1	15.1	1.1	1.0

11: 19th St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.0	0.1	0.2	0.0	0.1	0.0	0.2	0.2	0.1	0.0	0.1	0.0
Delay / Veh (s)	6.6	7.9	4.8	6.9	6.4	2.7	7.2	7.4	7.0	4.9	7.3	3.9

11: 19th St & Harper Performance by movement

Movement	All
Total Delay (hr)	1.0
Delay / Veh (s)	6.3

18: K-10 EB & East Hills Dr Median Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	All
Total Delay (hr)	0.1	1.6	0.0	0.0	0.0	0.0	1.7
Delay / Veh (s)	1.5	4.2	1.8	24.2	24.2	16.3	4.1

24: 23rd St & Right In/Out Performance by movement

Movement	EBR	WBT	All
Total Delay (hr)	3.1	1.5	4.6
Delay / Veh (s)	7.5	4.8	6.4

Total Network Performance

Total Delay (hr)	30.9
Delay / Veh (s)	31.4

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	93	231	242	53	380	415	95	204	77	97
Average Queue (ft)	35	133	154	19	215	248	47	91	43	56
95th Queue (ft)	72	207	219	47	315	369	81	166	72	98
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					4			1		
Queuing Penalty (veh)					1			1		

Intersection: 2: 23rd St & O'Connell (South)

Movement	WB	WB	NB	NB	SB
Directions Served	L	T	LT	R	LR
Maximum Queue (ft)	25	15	87	82	24
Average Queue (ft)	2	0	28	33	2
95th Queue (ft)	11	5	60	61	12
Link Distance (ft)		3245	756	756	255
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	750				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	NB	SB
Directions Served	LT	T
Maximum Queue (ft)	30	28
Average Queue (ft)	7	4
95th Queue (ft)	27	19
Link Distance (ft)	64	675
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	96	56	103	55
Average Queue (ft)	49	35	52	37
95th Queue (ft)	76	55	82	53
Link Distance (ft)	2608	2594	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	44	29
Average Queue (ft)	7	4
95th Queue (ft)	27	19
Link Distance (ft)	201	64
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	19	76
Average Queue (ft)	1	10
95th Queue (ft)	6	40
Link Distance (ft)	3245	3245
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 2

1: 23rd St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	9.8	8.8	1.3	2.1	21.9
Delay / Veh (s)	22.9	22.6	24.5	23.0	22.9

2: 23rd St & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.7	1.4	0.5	0.0	2.6
Delay / Veh (s)	1.6	3.3	32.5	18.2	2.9

6: K-10 WB & East Hills Dr (North) Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	1.2	0.1	0.2	1.6
Delay / Veh (s)	3.2	16.5	4.3	3.5

11: 19th St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.6	0.2	0.6	0.2	1.6
Delay / Veh (s)	7.4	6.4	8.0	6.0	7.3

17: Greenway & East Hills Dr (North) Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.0	0.1	0.1
Delay / Veh (s)	0.3	1.0	6.2	1.5

18: K-10 EB & East Hills Dr Median Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	1.7	0.1	0.2	1.9
Delay / Veh (s)	4.2	31.3	41.4	4.8

24: 23rd St & Right In/Out Performance by approach

Approach	EB	WB	All
Total Delay (hr)	2.8	3.2	6.0
Delay / Veh (s)	7.1	7.3	7.2

Total Network Performance

Total Delay (hr)	41.8
Delay / Veh (s)	36.7

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	181	307	386	275	373	409	72	162	157	136
Average Queue (ft)	71	201	247	37	251	283	28	68	77	69
95th Queue (ft)	147	297	365	118	370	389	57	128	124	116
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					5			1	0	0
Queuing Penalty (veh)					2			0	1	0

Intersection: 2: 23rd St & O'Connell

Movement	WB	NB	NB	SB
Directions Served	L	L	TR	L
Maximum Queue (ft)	51	88	61	24
Average Queue (ft)	14	18	19	1
95th Queue (ft)	44	57	43	8
Link Distance (ft)		756	756	256
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	750			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	NB	SB
Directions Served	LT	T
Maximum Queue (ft)	53	49
Average Queue (ft)	25	13
95th Queue (ft)	53	39
Link Distance (ft)	64	648
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	161	55	78	55
Average Queue (ft)	63	36	54	36
95th Queue (ft)	101	56	73	52
Link Distance (ft)	2608	2594	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: Greenway & East Hills Dr (North)

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	30	31	30
Average Queue (ft)	5	17	7
95th Queue (ft)	24	41	27
Link Distance (ft)	148	648	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	43	49
Average Queue (ft)	8	13
95th Queue (ft)	29	37
Link Distance (ft)	201	64
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	22	55
Average Queue (ft)	1	2
95th Queue (ft)	10	18
Link Distance (ft)	3251	3251
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 3

1: 23rd St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	1.6	7.9	0.2	0.4	7.8	0.6	0.2	0.7	0.4	1.1	0.7	0.4
Delay / Veh (s)	80.4	20.0	22.1	39.8	22.1	24.1	21.6	28.4	21.3	24.2	22.6	20.3

1: 23rd St & Harper Performance by movement

Movement	All
Total Delay (hr)	21.9
Delay / Veh (s)	22.9

2: 23rd St & O'Connell Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	All
Total Delay (hr)	0.7	0.0	0.1	1.3	0.0	0.4	0.1	0.0	2.6
Delay / Veh (s)	1.6	1.5	20.7	3.1	0.0	72.1	8.4	18.2	2.9

6: K-10 WB & East Hills Dr (North) Performance by movement

Movement	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	1.2	0.0	0.0	0.1	0.1	0.1	1.6
Delay / Veh (s)	3.1	6.4	3.8	18.8	28.1	1.7	3.5

11: 19th St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.1	0.1	0.3	0.1	0.1	0.0	0.3	0.3	0.0	0.0	0.1	0.0
Delay / Veh (s)	9.5	9.7	6.2	5.8	7.0	4.3	7.3	9.4	5.5	5.9	7.6	3.4

11: 19th St & Harper Performance by movement

Movement	All
Total Delay (hr)	1.6
Delay / Veh (s)	7.3

17: Greenway & East Hills Dr (North) Performance by movement

Movement	EBR	WBL	NBL	NBT	NBR	All
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1
Delay / Veh (s)	0.3	1.0	6.8	6.0	4.5	1.5

18: K-10 EB & East Hills Dr Median Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	0.0	1.6	0.0	0.0	0.1	0.1	0.0	1.9
Delay / Veh (s)	0.9	4.3	1.2	31.7	31.0	37.6	91.6	4.8

24: 23rd St & Right In/Out Performance by movement

Movement	EBR	WBT	All
Total Delay (hr)	2.8	3.2	6.0
Delay / Veh (s)	7.1	7.3	7.2

Total Network Performance

Total Delay (hr)	41.8
Delay / Veh (s)	36.7

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	181	307	386	275	373	409	72	162	157	136
Average Queue (ft)	71	201	247	37	251	283	28	68	77	69
95th Queue (ft)	147	297	365	118	370	389	57	128	124	116
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					5			1	0	0
Queuing Penalty (veh)					2			0	1	0

Intersection: 2: 23rd St & O'Connell

Movement	WB	NB	NB	SB
Directions Served	L	L	TR	L
Maximum Queue (ft)	51	88	61	24
Average Queue (ft)	14	18	19	1
95th Queue (ft)	44	57	43	8
Link Distance (ft)		756	756	256
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	750			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	NB	SB
Directions Served	LT	T
Maximum Queue (ft)	53	49
Average Queue (ft)	25	13
95th Queue (ft)	53	39
Link Distance (ft)	64	648
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	161	55	78	55
Average Queue (ft)	63	36	54	36
95th Queue (ft)	101	56	73	52
Link Distance (ft)	2608	2594	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: Greenway & East Hills Dr (North)

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	30	31	30
Average Queue (ft)	5	17	7
95th Queue (ft)	24	41	27
Link Distance (ft)	148	648	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	NB	SB
Directions Served	TR	LT
Maximum Queue (ft)	43	49
Average Queue (ft)	8	13
95th Queue (ft)	29	37
Link Distance (ft)	201	64
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	22	55
Average Queue (ft)	1	2
95th Queue (ft)	10	18
Link Distance (ft)	3251	3251
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 3

1: 23rd St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	7.5	9.2	2.5	2.5	21.8
Delay / Veh (s)	20.5	26.0	23.6	24.0	23.3

2: 23rd St & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	6.9	9.8	0.7	0.4	17.7
Delay / Veh (s)	15.1	29.7	18.1	19.9	21.1

3: East/West Rd & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.0	0.1	0.3	0.0	0.4
Delay / Veh (s)	2.3	5.6	3.1	0.1	3.0

6: K-10 WB & East Hills Dr (North) Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	1.1	1.8	0.2	3.1
Delay / Veh (s)	3.2	26.2	8.3	6.9

11: 19th St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.5	0.1	0.5	0.3	1.5
Delay / Veh (s)	6.7	6.0	8.0	7.0	7.1

17: East/West Rd & East Hills Dr (North) Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.0	0.7	0.7
Delay / Veh (s)	0.6	0.9	7.1	5.9

18: K-10 EB & East Hills Dr Median Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	4.9	0.6	0.4	5.8
Delay / Veh (s)	11.6	221.5	49.8	13.5

23: East/West Rd & Right In/Out Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.2	0.1	0.1	0.3
Delay / Veh (s)	1.9	0.9	5.6	2.0

24: 23rd St & Right In/Out Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	4.8	1.9	0.0	6.7
Delay / Veh (s)	11.4	5.6	1.0	8.7

Total Network Performance

Total Delay (hr)	64.8
Delay / Veh (s)	56.7

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	96	353	335	74	398	416	116	162	182	184
Average Queue (ft)	38	177	200	26	257	278	58	99	96	82
95th Queue (ft)	80	268	290	64	403	426	95	150	148	137
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					7			1	2	1
Queuing Penalty (veh)					2			1	3	2

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	264	224	244	24	50	373	408	50	70	100	47	68
Average Queue (ft)	175	114	133	6	15	250	277	15	21	41	15	22
95th Queue (ft)	252	199	201	22	41	357	384	44	49	80	39	49
Link Distance (ft)		1196	1196			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB
Directions Served	LR	LR
Maximum Queue (ft)	28	67
Average Queue (ft)	14	18
95th Queue (ft)	36	44
Link Distance (ft)	540	3225
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	WB	WB	NB	SB
Directions Served	T	R	LT	T
Maximum Queue (ft)	20	70	79	50
Average Queue (ft)	1	4	70	19
95th Queue (ft)	7	30	88	50
Link Distance (ft)	2459		64	648
Upstream Blk Time (%)			47	
Queuing Penalty (veh)			118	
Storage Bay Dist (ft)		525		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	97	56	78	79
Average Queue (ft)	56	36	53	46
95th Queue (ft)	81	59	74	67
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	28	74	56
Average Queue (ft)	1	40	32
95th Queue (ft)	9	61	49
Link Distance (ft)	148	648	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	313	44	72
Average Queue (ft)	123	14	27
95th Queue (ft)	291	38	64
Link Distance (ft)		201	64
Upstream Blk Time (%)			2
Queuing Penalty (veh)			1
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	NB
Directions Served	LR
Maximum Queue (ft)	78
Average Queue (ft)	31
95th Queue (ft)	58
Link Distance (ft)	814
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	22	60
Average Queue (ft)	4	7
95th Queue (ft)	17	34
Link Distance (ft)	3241	3241
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 126

1: 23rd St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.6	6.9	0.0	0.4	8.2	0.7	0.7	0.9	0.9	1.5	0.7	0.3
Delay / Veh (s)	45.8	19.6	15.5	50.6	25.4	28.2	19.8	28.7	23.1	26.3	25.5	15.9

1: 23rd St & Harper Performance by movement

Movement	All
Total Delay (hr)	21.8
Delay / Veh (s)	23.3

2: 23rd St & O'Connell Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	3.3	3.5	0.0	0.3	9.5	0.1	0.2	0.2	0.3	0.2	0.1	0.2
Delay / Veh (s)	38.0	9.7	1.6	49.0	30.1	5.6	21.7	28.0	13.5	26.2	45.3	13.6

2: 23rd St & O'Connell Performance by movement

Movement	All
Total Delay (hr)	17.7
Delay / Veh (s)	21.1

3: East/West Rd & O'Connell Performance by movement

Movement	EBR	WBL	NBL	NBT	NBR	SBT	All
Total Delay (hr)	0.0	0.1	0.0	0.0	0.3	0.0	0.4
Delay / Veh (s)	2.3	5.6	2.3	0.7	3.4	0.1	3.0

6: K-10 WB & East Hills Dr (North) Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	0.0	0.9	0.2	0.0	1.7	0.2	0.0	3.1
Delay / Veh (s)	4.2	2.8	7.6	19.3	26.4	18.8	1.5	6.9

11: 19th St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.0	0.1	0.4	0.1	0.1	0.0	0.2	0.3	0.0	0.0	0.3	0.0
Delay / Veh (s)	8.5	8.5	6.3	6.3	6.6	3.4	8.0	8.2	6.4	5.2	7.6	5.1

11: 19th St & Harper Performance by movement

Movement	All
Total Delay (hr)	1.5
Delay / Veh (s)	7.1

17: East/West Rd & East Hills Dr (North) Performance by movement

Movement	EBR	WBL	NBL	NBR	All
Total Delay (hr)	0.0	0.0	0.5	0.2	0.7
Delay / Veh (s)	0.6	0.9	7.7	5.9	5.9

18: K-10 EB & East Hills Dr Median Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	3.3	1.5	0.0	0.4	0.2	0.4	0.0	5.8
Delay / Veh (s)	49.1	4.4	1.2	475.7	94.3	53.0	21.9	13.5

23: East/West Rd & Right In/Out Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBT	NBR	All
Total Delay (hr)	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.3
Delay / Veh (s)	1.9	2.7	2.5	0.8	6.4	1.9	4.7	2.0

24: 23rd St & Right In/Out Performance by movement

Movement	EBR	WBT	WBR	SBT	SBR	All
Total Delay (hr)	4.8	1.9	0.1	0.0	0.0	6.7
Delay / Veh (s)	11.4	5.7	2.9	0.1	1.1	8.7

Total Network Performance

Total Delay (hr)	64.8
Delay / Veh (s)	56.7

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	96	353	335	74	398	416	116	162	182	184
Average Queue (ft)	38	177	200	26	257	278	58	99	96	82
95th Queue (ft)	80	268	290	64	403	426	95	150	148	137
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					7			1	2	1
Queuing Penalty (veh)					2			1	3	2

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	264	224	244	24	50	373	408	50	70	100	47	68
Average Queue (ft)	175	114	133	6	15	250	277	15	21	41	15	22
95th Queue (ft)	252	199	201	22	41	357	384	44	49	80	39	49
Link Distance (ft)		1196	1196			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB
Directions Served	LR	LR
Maximum Queue (ft)	28	67
Average Queue (ft)	14	18
95th Queue (ft)	36	44
Link Distance (ft)	540	3225
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	WB	WB	NB	SB
Directions Served	T	R	LT	T
Maximum Queue (ft)	20	70	79	50
Average Queue (ft)	1	4	70	19
95th Queue (ft)	7	30	88	50
Link Distance (ft)	2459		64	648
Upstream Blk Time (%)			47	
Queuing Penalty (veh)			118	
Storage Bay Dist (ft)		525		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	97	56	78	79
Average Queue (ft)	56	36	53	46
95th Queue (ft)	81	59	74	67
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	28	74	56
Average Queue (ft)	1	40	32
95th Queue (ft)	9	61	49
Link Distance (ft)	148	648	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	313	44	72
Average Queue (ft)	123	14	27
95th Queue (ft)	291	38	64
Link Distance (ft)		201	64
Upstream Blk Time (%)			2
Queuing Penalty (veh)			1
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	NB
Directions Served	LR
Maximum Queue (ft)	78
Average Queue (ft)	31
95th Queue (ft)	58
Link Distance (ft)	814
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	22	60
Average Queue (ft)	4	7
95th Queue (ft)	17	34
Link Distance (ft)	3241	3241
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 126

1: 23rd St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	10.7	19.7	1.7	3.2	35.2
Delay / Veh (s)	23.9	36.7	30.8	33.7	31.1

2: 23rd St & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	5.8	14.9	0.2	2.3	23.2
Delay / Veh (s)	12.2	29.5	16.5	25.2	21.4

3: East/West Rd & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.2	0.2	0.0	0.0	0.4
Delay / Veh (s)	3.8	5.2	1.4	0.3	3.1

6: K-10 WB & East Hills Dr (North) Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	1.8	0.4	0.6	2.8
Delay / Veh (s)	4.3	30.1	8.4	5.7

11: 19th St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.6	0.1	1.0	0.3	2.0
Delay / Veh (s)	7.6	5.4	9.6	7.4	8.2

17: East/West Rd & East Hills Dr (North) Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.0	0.1	0.2
Delay / Veh (s)	0.8	0.9	6.7	2.0

18: K-10 EB & East Hills Dr Median Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	2.0	0.1	0.7	2.8
Delay / Veh (s)	4.6	39.6	59.3	6.3

23: East/West Rd & Right In/Out Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.1	0.0	0.1
Delay / Veh (s)	1.2	2.7	5.8	2.2

24: 23rd St & Right In/Out Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	5.0	4.0	0.1	9.1
Delay / Veh (s)	11.8	8.5	1.7	9.7

Total Network Performance

Total Delay (hr)	85.9
Delay / Veh (s)	66.6

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	139	418	401	275	677	888	75	180	182	204
Average Queue (ft)	69	231	265	86	419	491	26	89	92	98
95th Queue (ft)	122	368	388	218	630	752	62	159	146	175
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)				0	25			1	2	4
Queuing Penalty (veh)				0	17			0	3	6

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	233	153	225	16	70	511	578	30	46	20	136	47
Average Queue (ft)	90	58	82	6	25	380	403	5	12	12	74	16
95th Queue (ft)	203	137	175	17	66	534	552	22	35	27	139	43
Link Distance (ft)		1184	1184			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: 23rd St & O'Connell

Movement	SB
Directions Served	R
Maximum Queue (ft)	152
Average Queue (ft)	71
95th Queue (ft)	123
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	2
Queuing Penalty (veh)	0

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (ft)	76	48
Average Queue (ft)	40	30
95th Queue (ft)	62	48
Link Distance (ft)	540	3225
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	NB	SB
Directions Served	LT	T
Maximum Queue (ft)	76	73
Average Queue (ft)	37	32
95th Queue (ft)	70	63
Link Distance (ft)	64	648
Upstream Blk Time (%)	3	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	100	73	92	77
Average Queue (ft)	61	34	65	41
95th Queue (ft)	91	55	84	66
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	30	70	52
Average Queue (ft)	5	25	22
95th Queue (ft)	23	51	47
Link Distance (ft)	148	648	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	31	23	72
Average Queue (ft)	1	5	39
95th Queue (ft)	10	19	74
Link Distance (ft)		201	64
Upstream Blk Time (%)			7
Queuing Penalty (veh)			3
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	36	31
Average Queue (ft)	2	14
95th Queue (ft)	16	38
Link Distance (ft)	1598	814
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB	SB
Directions Served	R	R	R
Maximum Queue (ft)	30	33	56
Average Queue (ft)	1	2	4
95th Queue (ft)	10	15	26
Link Distance (ft)	3241	3241	814
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 31

1: 23rd St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	1.4	9.0	0.3	1.0	16.3	2.4	0.3	0.8	0.5	1.5	1.2	0.5
Delay / Veh (s)	67.8	21.8	21.3	61.0	34.9	44.7	30.8	37.0	24.4	36.1	37.2	23.5

1: 23rd St & Harper Performance by movement

Movement	All
Total Delay (hr)	35.2
Delay / Veh (s)	31.1

2: 23rd St & O'Connell Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	2.7	3.0	0.0	0.4	14.5	0.0	0.1	0.1	0.0	1.2	0.2	0.9
Delay / Veh (s)	120.8	7.0	1.9	46.5	29.4	2.1	24.1	31.1	5.6	30.6	25.2	20.6

2: 23rd St & O'Connell Performance by movement

Movement	All
Total Delay (hr)	23.2
Delay / Veh (s)	21.4

3: East/West Rd & O'Connell Performance by movement

Movement	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	All
Total Delay (hr)	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Delay / Veh (s)	5.9	3.8	5.2	12.5	2.1	2.8	0.8	1.3	0.3	3.1

6: K-10 WB & East Hills Dr (North) Performance by movement

Movement	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	1.8	0.0	0.0	0.4	0.5	0.1	2.8
Delay / Veh (s)	4.3	7.0	8.6	31.4	42.1	1.8	5.7

11: 19th St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.1	0.1	0.4	0.0	0.1	0.0	0.5	0.4	0.1	0.0	0.2	0.1
Delay / Veh (s)	9.2	10.6	6.7	5.7	6.3	4.0	8.9	11.0	8.2	6.7	8.1	5.7

11: 19th St & Harper Performance by movement

Movement	All
Total Delay (hr)	2.0
Delay / Veh (s)	8.2

17: East/West Rd & East Hills Dr (North) Performance by movement

Movement	EBR	WBL	NBL	NBR	All
Total Delay (hr)	0.0	0.0	0.1	0.0	0.2
Delay / Veh (s)	0.8	0.9	7.7	4.9	2.0

18: K-10 EB & East Hills Dr Median Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	0.0	2.0	0.0	0.0	0.0	0.7	0.0	2.8
Delay / Veh (s)	1.3	4.8	2.0	34.8	43.2	59.3	59.2	6.3

23: East/West Rd & Right In/Out Performance by movement

Movement	EBT	EBR	WBL	NBL	NBR	All
Total Delay (hr)	0.0	0.0	0.1	0.0	0.0	0.1
Delay / Veh (s)	1.1	1.3	2.7	6.3	4.5	2.2

24: 23rd St & Right In/Out Performance by movement

Movement	EBR	WBT	WBR	SBT	SBR	All
Total Delay (hr)	5.0	4.0	0.0	0.0	0.1	9.1
Delay / Veh (s)	11.8	8.5	4.0	1.2	1.7	9.7

Total Network Performance

Total Delay (hr)	85.9
Delay / Veh (s)	66.6

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	139	418	401	275	677	888	75	180	182	204
Average Queue (ft)	69	231	265	86	419	491	26	89	92	98
95th Queue (ft)	122	368	388	218	630	752	62	159	146	175
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)				0	25			1	2	4
Queuing Penalty (veh)				0	17			0	3	6

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	233	153	225	16	70	511	578	30	46	20	136	47
Average Queue (ft)	90	58	82	6	25	380	403	5	12	12	74	16
95th Queue (ft)	203	137	175	17	66	534	552	22	35	27	139	43
Link Distance (ft)		1184	1184			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: 23rd St & O'Connell

Movement	SB
Directions Served	R
Maximum Queue (ft)	152
Average Queue (ft)	71
95th Queue (ft)	123
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	2
Queuing Penalty (veh)	0

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB
Directions Served	LTR	LTR
Maximum Queue (ft)	76	48
Average Queue (ft)	40	30
95th Queue (ft)	62	48
Link Distance (ft)	540	3225
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	NB	SB
Directions Served	LT	T
Maximum Queue (ft)	76	73
Average Queue (ft)	37	32
95th Queue (ft)	70	63
Link Distance (ft)	64	648
Upstream Blk Time (%)	3	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	100	73	92	77
Average Queue (ft)	61	34	65	41
95th Queue (ft)	91	55	84	66
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	30	70	52
Average Queue (ft)	5	25	22
95th Queue (ft)	23	51	47
Link Distance (ft)	148	648	648
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	31	23	72
Average Queue (ft)	1	5	39
95th Queue (ft)	10	19	74
Link Distance (ft)		201	64
Upstream Blk Time (%)			7
Queuing Penalty (veh)			3
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	36	31
Average Queue (ft)	2	14
95th Queue (ft)	16	38
Link Distance (ft)	1598	814
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB	SB
Directions Served	R	R	R
Maximum Queue (ft)	30	33	56
Average Queue (ft)	1	2	4
95th Queue (ft)	10	15	26
Link Distance (ft)	3241	3241	814
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 31

1: 23rd St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	7.1	6.6	2.6	1.5	17.8
Delay / Veh (s)	19.4	19.7	24.8	21.4	20.4

2: 23rd St & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	9.5	9.9	0.8	0.4	20.6
Delay / Veh (s)	22.7	31.2	15.2	21.2	25.5

3: East/West Rd & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.1	0.2	0.4	0.9	1.5
Delay / Veh (s)	5.3	6.9	2.9	7.9	5.5

6: K-10 WB & East Hills Dr (North) Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	1.7	1.5	0.2	3.5
Delay / Veh (s)	4.6	24.5	7.1	7.4

11: 19th St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	1.3	0.4	0.6	0.6	2.9
Delay / Veh (s)	11.7	8.9	9.2	8.7	10.1

17: East/West Rd & East Hills Dr (North) Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.0	0.0	0.8	0.9
Delay / Veh (s)	0.3	0.6	7.2	5.9

18: K-10 EB & East Hills Dr Median Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	4.3	0.3	0.3	4.9
Delay / Veh (s)	11.4	96.1	26.7	12.5

23: East/West Rd & Right In/Out Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.3	0.1	0.2	0.6
Delay / Veh (s)	2.3	0.9	5.7	2.3

24: 23rd St & Right In/Out Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	4.3	1.9	0.0	6.2
Delay / Veh (s)	11.3	5.6	1.3	8.5

Total Network Performance

Total Delay (hr)	65.3
Delay / Veh (s)	52.8

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	137	380	324	74	336	354	97	226	116	134
Average Queue (ft)	42	179	179	21	187	218	49	106	48	64
95th Queue (ft)	97	273	262	55	327	364	82	185	93	115
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					3			3	0	0
Queuing Penalty (veh)					1			3	0	0

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	368	409	406	13	48	351	370	53	68	132	70	46
Average Queue (ft)	230	110	118	2	17	231	260	20	23	45	21	7
95th Queue (ft)	363	233	261	9	42	333	360	45	49	93	49	26
Link Distance (ft)		1184	1184			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: 23rd St & O'Connell

Movement	SB
Directions Served	R
Maximum Queue (ft)	40
Average Queue (ft)	14
95th Queue (ft)	33
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB	NB	NB	SB
Directions Served	LR	LR	LT	R	LTR
Maximum Queue (ft)	50	69	52	22	160
Average Queue (ft)	27	32	9	5	70
95th Queue (ft)	48	56	35	20	126
Link Distance (ft)	540	3225	790	790	1627
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	WB	WB	NB	SB
Directions Served	T	R	LT	T
Maximum Queue (ft)	16	70	79	53
Average Queue (ft)	1	22	68	26
95th Queue (ft)	5	67	86	51
Link Distance (ft)	2459		64	648
Upstream Blk Time (%)			38	
Queuing Penalty (veh)			87	
Storage Bay Dist (ft)		525		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	189	102	79	78
Average Queue (ft)	84	59	59	59
95th Queue (ft)	137	96	80	84
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	78	68
Average Queue (ft)	43	38
95th Queue (ft)	63	56
Link Distance (ft)	648	648
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	418	44	72
Average Queue (ft)	112	12	28
95th Queue (ft)	317	32	58
Link Distance (ft)		201	64
Upstream Blk Time (%)			1
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	68
Average Queue (ft)	1	33
95th Queue (ft)	10	54
Link Distance (ft)	1598	814
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	19	18
Average Queue (ft)	1	1
95th Queue (ft)	6	6
Link Distance (ft)	3241	3241
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 92

1: 23rd St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.7	6.3	0.1	0.2	5.9	0.4	0.7	0.9	1.1	0.7	0.6	0.3
Delay / Veh (s)	47.6	18.4	13.8	36.0	19.3	21.9	24.0	27.6	23.4	24.4	24.1	14.2

1: 23rd St & Harper Performance by movement

Movement	All
Total Delay (hr)	17.8
Delay / Veh (s)	20.4

2: 23rd St & O'Connell Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	5.5	4.0	0.0	0.3	9.6	0.1	0.2	0.3	0.3	0.3	0.1	0.1
Delay / Veh (s)	59.7	12.4	1.8	44.4	32.2	6.3	21.8	21.4	9.5	28.9	33.2	9.6

2: 23rd St & O'Connell Performance by movement

Movement	All
Total Delay (hr)	20.6
Delay / Veh (s)	25.5

3: East/West Rd & O'Connell Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Total Delay (hr)	0.1	0.0	0.1	0.1	0.1	0.0	0.3	0.7	0.1	0.2	1.5
Delay / Veh (s)	8.5	2.9	12.9	3.9	3.4	1.3	3.1	10.4	3.0	6.0	5.5

6: K-10 WB & East Hills Dr (North) Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	0.0	1.2	0.5	0.0	1.5	0.2	0.0	3.5
Delay / Veh (s)	11.4	3.8	8.8	26.3	24.5	16.0	1.2	7.4

11: 19th St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.1	1.0	0.3	0.1	0.3	0.1	0.3	0.3	0.1	0.2	0.2	0.1
Delay / Veh (s)	12.7	12.5	9.2	9.5	9.4	6.3	10.1	8.5	8.7	8.3	9.8	7.3

11: 19th St & Harper Performance by movement

Movement	All
Total Delay (hr)	2.9
Delay / Veh (s)	10.1

17: East/West Rd & East Hills Dr (North) Performance by movement

Movement	EBT	EBR	WBL	NBL	NBR	All
Total Delay (hr)	0.0	0.0	0.0	0.5	0.3	0.9
Delay / Veh (s)	0.2	0.4	0.6	8.1	6.0	5.9

18: K-10 EB & East Hills Dr Median Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Total Delay (hr)	3.0	1.4	0.0	0.3	0.0	0.3	0.0	4.9
Delay / Veh (s)	48.0	4.3	1.4	198.6	10.6	27.1	11.2	12.5

23: East/West Rd & Right In/Out Performance by movement

Movement	EBT	EBR	WBL	WBT	NBL	NBR	All
Total Delay (hr)	0.3	0.0	0.0	0.0	0.1	0.1	0.6
Delay / Veh (s)	2.3	2.1	2.5	0.8	6.6	4.9	2.3

24: 23rd St & Right In/Out Performance by movement

Movement	EBR	WBT	WBR	SBT	SBR	All
Total Delay (hr)	4.3	1.8	0.1	0.0	0.0	6.2
Delay / Veh (s)	11.3	5.8	3.3	0.1	1.3	8.5

Total Network Performance

Total Delay (hr)	65.3
Delay / Veh (s)	52.8

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	137	380	324	74	336	354	97	226	116	134
Average Queue (ft)	42	179	179	21	187	218	49	106	48	64
95th Queue (ft)	97	273	262	55	327	364	82	185	93	115
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					3			3	0	0
Queuing Penalty (veh)					1			3	0	0

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	368	409	406	13	48	351	370	53	68	132	70	46
Average Queue (ft)	230	110	118	2	17	231	260	20	23	45	21	7
95th Queue (ft)	363	233	261	9	42	333	360	45	49	93	49	26
Link Distance (ft)		1184	1184			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: 23rd St & O'Connell

Movement	SB
Directions Served	R
Maximum Queue (ft)	40
Average Queue (ft)	14
95th Queue (ft)	33
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB	NB	NB	SB
Directions Served	LR	LR	LT	R	LTR
Maximum Queue (ft)	50	69	52	22	160
Average Queue (ft)	27	32	9	5	70
95th Queue (ft)	48	56	35	20	126
Link Distance (ft)	540	3225	790	790	1627
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	WB	WB	NB	SB
Directions Served	T	R	LT	T
Maximum Queue (ft)	16	70	79	53
Average Queue (ft)	1	22	68	26
95th Queue (ft)	5	67	86	51
Link Distance (ft)	2459		64	648
Upstream Blk Time (%)			38	
Queuing Penalty (veh)			87	
Storage Bay Dist (ft)		525		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	189	102	79	78
Average Queue (ft)	84	59	59	59
95th Queue (ft)	137	96	80	84
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	NB	NB
Directions Served	L	R
Maximum Queue (ft)	78	68
Average Queue (ft)	43	38
95th Queue (ft)	63	56
Link Distance (ft)	648	648
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	418	44	72
Average Queue (ft)	112	12	28
95th Queue (ft)	317	32	58
Link Distance (ft)		201	64
Upstream Blk Time (%)			1
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	68
Average Queue (ft)	1	33
95th Queue (ft)	10	54
Link Distance (ft)	1598	814
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB
Directions Served	R	R
Maximum Queue (ft)	19	18
Average Queue (ft)	1	1
95th Queue (ft)	6	6
Link Distance (ft)	3241	3241
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 92

1: 23rd St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	10.7	15.8	1.4	3.0	30.9
Delay / Veh (s)	25.4	30.7	27.7	32.2	28.6

2: 23rd St & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	6.9	17.3	0.3	2.9	27.4
Delay / Veh (s)	15.2	34.7	19.6	26.5	25.5

3: East/West Rd & O'Connell Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.2	1.3	0.1	0.1	1.7
Delay / Veh (s)	4.9	9.5	1.8	1.8	6.3

6: K-10 WB & East Hills Dr (North) Performance by approach

Approach	WB	NB	SB	All
Total Delay (hr)	1.9	0.8	1.9	4.5
Delay / Veh (s)	4.7	50.1	20.1	8.8

11: 19th St & Harper Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	0.9	1.3	0.8	0.4	3.4
Delay / Veh (s)	9.8	12.5	10.4	9.5	10.7

17: East/West Rd & East Hills Dr (North) Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.0	0.2	0.3
Delay / Veh (s)	1.2	1.6	6.6	2.3

18: K-10 EB & East Hills Dr Median Performance by approach

Approach	EB	NB	SB	All
Total Delay (hr)	2.1	0.2	1.1	3.4
Delay / Veh (s)	5.0	46.6	61.1	7.7

23: East/West Rd & Right In/Out Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	0.1	0.1	0.0	0.2
Delay / Veh (s)	1.9	2.7	5.4	2.5

24: 23rd St & Right In/Out Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	6.0	4.1	0.1	10.2
Delay / Veh (s)	14.0	8.7	2.1	10.8

Total Network Performance

Total Delay (hr)	92.1
Delay / Veh (s)	66.3

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	160	419	407	274	556	586	74	140	184	209
Average Queue (ft)	73	247	271	81	392	427	21	75	91	94
95th Queue (ft)	143	358	378	179	560	565	60	119	155	172
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					20			0	4	4
Queuing Penalty (veh)					18			0	6	6

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	176	291	305	19	584	701	708	658	46	60	260	47
Average Queue (ft)	70	116	144	6	107	397	445	46	13	16	117	13
95th Queue (ft)	133	247	283	17	401	609	645	281	35	44	214	36
Link Distance (ft)		1184	1184			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: 23rd St & O'Connell

Movement	SB
Directions Served	R
Maximum Queue (ft)	150
Average Queue (ft)	57
95th Queue (ft)	117
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	2
Queuing Penalty (veh)	0

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	76	198	31
Average Queue (ft)	43	78	9
95th Queue (ft)	69	136	32
Link Distance (ft)	540	3225	1627
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	WB	NB	SB
Directions Served	T	LT	T
Maximum Queue (ft)	20	76	180
Average Queue (ft)	1	44	72
95th Queue (ft)	6	79	151
Link Distance (ft)	2459	64	648
Upstream Blk Time (%)		13	
Queuing Penalty (veh)		6	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	126	166	115	103
Average Queue (ft)	74	83	68	53
95th Queue (ft)	114	125	101	84
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	54	56	54	68
Average Queue (ft)	4	13	22	24
95th Queue (ft)	27	42	46	50
Link Distance (ft)	1598	148	648	648
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	74	44	72
Average Queue (ft)	7	12	51
95th Queue (ft)	38	35	86
Link Distance (ft)		201	64
Upstream Blk Time (%)			21
Queuing Penalty (veh)			13
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	31
Average Queue (ft)	3	16
95th Queue (ft)	19	40
Link Distance (ft)	1598	814
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB	SB
Directions Served	R	R	R
Maximum Queue (ft)	31	58	56
Average Queue (ft)	2	5	3
95th Queue (ft)	12	28	24
Link Distance (ft)	3241	3241	814
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 49

1: 23rd St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	1.6	9.0	0.2	1.1	13.7	1.0	0.2	0.6	0.5	1.5	0.9	0.5
Delay / Veh (s)	72.0	23.0	19.2	44.8	29.6	34.8	26.9	33.0	23.4	37.2	31.9	24.1

1: 23rd St & Harper Performance by movement

Movement	All
Total Delay (hr)	30.9
Delay / Veh (s)	28.6

2: 23rd St & O'Connell Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	1.6	5.2	0.0	0.6	16.8	0.0	0.1	0.1	0.1	2.0	0.2	0.7
Delay / Veh (s)	71.4	12.7	2.6	48.6	34.7	4.7	22.6	36.2	9.5	32.0	19.6	19.0

2: 23rd St & O'Connell Performance by movement

Movement	All
Total Delay (hr)	27.4
Delay / Veh (s)	25.5

3: East/West Rd & O'Connell Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.1	0.0	0.1	0.7	0.0	0.6	0.0	0.0	0.0	0.1	0.0	0.0
Delay / Veh (s)	6.3	9.1	4.2	10.5	13.5	8.5	2.7	1.5	1.6	3.5	0.6	1.5

3: East/West Rd & O'Connell Performance by movement

Movement	All
Total Delay (hr)	1.7
Delay / Veh (s)	6.3

6: K-10 WB & East Hills Dr (North) Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Total Delay (hr)	0.0	1.8	0.1	0.1	0.7	1.7	0.1	4.5
Delay / Veh (s)	2.2	4.6	8.6	45.9	50.7	94.7	1.9	8.8

11: 19th St & Harper Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.1	0.4	0.4	0.1	0.8	0.3	0.3	0.4	0.1	0.1	0.3	0.0
Delay / Veh (s)	10.8	12.0	8.2	17.8	13.0	10.6	10.0	11.3	8.2	8.0	11.0	5.3

11: 19th St & Harper Performance by movement

Movement	All
Total Delay (hr)	3.4
Delay / Veh (s)	10.7

17: East/West Rd & East Hills Dr (North) Performance by movement

Movement	EBR	WBL	NBL	NBR	All
Total Delay (hr)	0.1	0.0	0.1	0.1	0.3
Delay / Veh (s)	1.2	1.6	7.5	5.3	2.3

18: K-10 EB & East Hills Dr Median Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	All
Total Delay (hr)	0.2	2.0	0.0	0.1	0.1	1.1	3.4
Delay / Veh (s)	10.5	4.8	2.2	66.5	38.6	61.1	7.7

23: East/West Rd & Right In/Out Performance by movement

Movement	EBT	EBR	WBL	NBL	NBR	All
Total Delay (hr)	0.0	0.1	0.1	0.0	0.0	0.2
Delay / Veh (s)	1.0	2.7	2.7	6.5	4.6	2.5

24: 23rd St & Right In/Out Performance by movement

Movement	EBR	WBT	WBR	SBT	SBR	All
Total Delay (hr)	6.0	4.1	0.0	0.0	0.1	10.2
Delay / Veh (s)	14.0	8.8	4.7	0.1	2.2	10.8

Total Network Performance

Total Delay (hr)	92.1
Delay / Veh (s)	66.3

Intersection: 1: 23rd St & Harper

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	160	419	407	274	556	586	74	140	184	209
Average Queue (ft)	73	247	271	81	392	427	21	75	91	94
95th Queue (ft)	143	358	378	179	560	565	60	119	155	172
Link Distance (ft)	2537	2537	2537		1310	1310	1160		2528	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)				250				150		125
Storage Blk Time (%)					20			0	4	4
Queuing Penalty (veh)					18			0	6	6

Intersection: 2: 23rd St & O'Connell

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	176	291	305	19	584	701	708	658	46	60	260	47
Average Queue (ft)	70	116	144	6	107	397	445	46	13	16	117	13
95th Queue (ft)	133	247	283	17	401	609	645	281	35	44	214	36
Link Distance (ft)		1184	1184			3241	3241	3241	756	756	790	790
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	1000			550	750							
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: 23rd St & O'Connell

Movement	SB
Directions Served	R
Maximum Queue (ft)	150
Average Queue (ft)	57
95th Queue (ft)	117
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	100
Storage Blk Time (%)	2
Queuing Penalty (veh)	0

Intersection: 3: East/West Rd & O'Connell

Movement	EB	WB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	76	198	31
Average Queue (ft)	43	78	9
95th Queue (ft)	69	136	32
Link Distance (ft)	540	3225	1627
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: K-10 WB & East Hills Dr (North)

Movement	WB	NB	SB
Directions Served	T	LT	T
Maximum Queue (ft)	20	76	180
Average Queue (ft)	1	44	72
95th Queue (ft)	6	79	151
Link Distance (ft)	2459	64	648
Upstream Blk Time (%)		13	
Queuing Penalty (veh)		6	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 11: 19th St & Harper

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	126	166	115	103
Average Queue (ft)	74	83	68	53
95th Queue (ft)	114	125	101	84
Link Distance (ft)	2608	2566	2528	2586
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 17: East/West Rd & East Hills Dr (North)

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	54	56	54	68
Average Queue (ft)	4	13	22	24
95th Queue (ft)	27	42	46	50
Link Distance (ft)	1598	148	648	648
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: K-10 EB & East Hills Dr Median

Movement	EB	NB	SB
Directions Served	L	TR	LT
Maximum Queue (ft)	74	44	72
Average Queue (ft)	7	12	51
95th Queue (ft)	38	35	86
Link Distance (ft)		201	64
Upstream Blk Time (%)			21
Queuing Penalty (veh)			13
Storage Bay Dist (ft)	950		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 23: East/West Rd & Right In/Out

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	31	31
Average Queue (ft)	3	16
95th Queue (ft)	19	40
Link Distance (ft)	1598	814
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 24: 23rd St & Right In/Out

Movement	EB	EB	SB
Directions Served	R	R	R
Maximum Queue (ft)	31	58	56
Average Queue (ft)	2	5	3
95th Queue (ft)	12	28	24
Link Distance (ft)	3241	3241	814
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 49