

final report

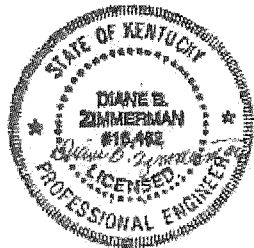
November 29, 2017

Traffic Impact Study

Colonial Gardens
New Cut Road and Kenwood Drive
Louisville, KY

Prepared for

Louisville Metro Planning Commission
Kentucky Transportation Cabinet



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INTRODUCTION

The development plan for Colonial Gardens at the corner of New Cut Road and Kenwood Drive in Louisville, KY shows four restaurants with a total of 18,754 square feet. **Figure 1** displays a map of the site. Access to the site will be from New Cut Road and Kenwood Drive. The purpose of this study is to examine the traffic impacts of the development upon the adjacent highway system. For this study, the impact area was defined to be the intersections of New Cut Road and Kenwood Drive, and the entrances.

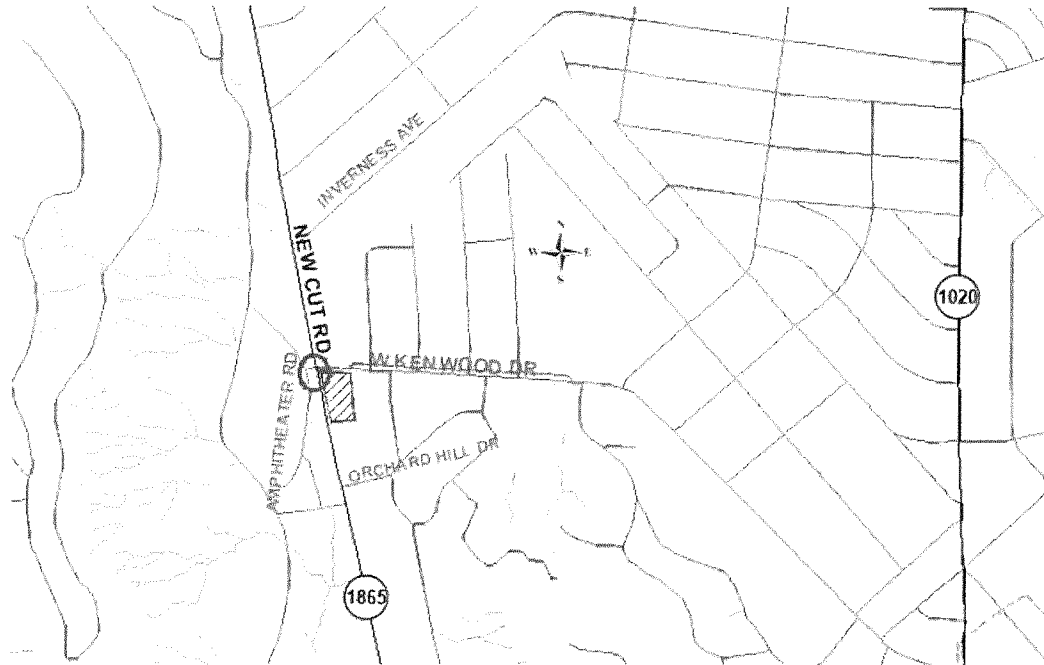


Figure 1. Site Map

EXISTING CONDITIONS

New Cut Road (KY 1865) is a state maintained road with an estimated 2017 ADT of 24,900 vehicles per day between Palatka Road (KY 1142) and Southern Parkway, as provided by a Kentucky Transportation Cabinet 2015 count at station 725. The road has four twelve-foot lanes, curb and gutter, and a mountable median at the proposed entrance. The speed limit is 35 mph. There are sidewalks. The intersection with Kenwood Road, is controlled with a traffic signal. There are left turn lanes at the intersection. New Cut Road is served by TARC.

Kenwood Road is a Metro maintained road with an estimated 2017 ADT of 9,000 vehicles per day between New Cut Road (KY 1865) and Orchard Hill Drive, as provided by a Kentucky Transportation Cabinet 2016 count at station. The road has two ten-foot lanes, curb and gutter. The speed limit is 25 mph. There are sidewalks. There is a left turn lane at the intersection with New Cut Road. Kenwood Road is served by TARC.

A turning movement count was made at the intersection of New Cut Road and Kenwood Road on November 7, 2017. **Figure 2** illustrates the a.m. and p.m. peak hour traffic volumes.

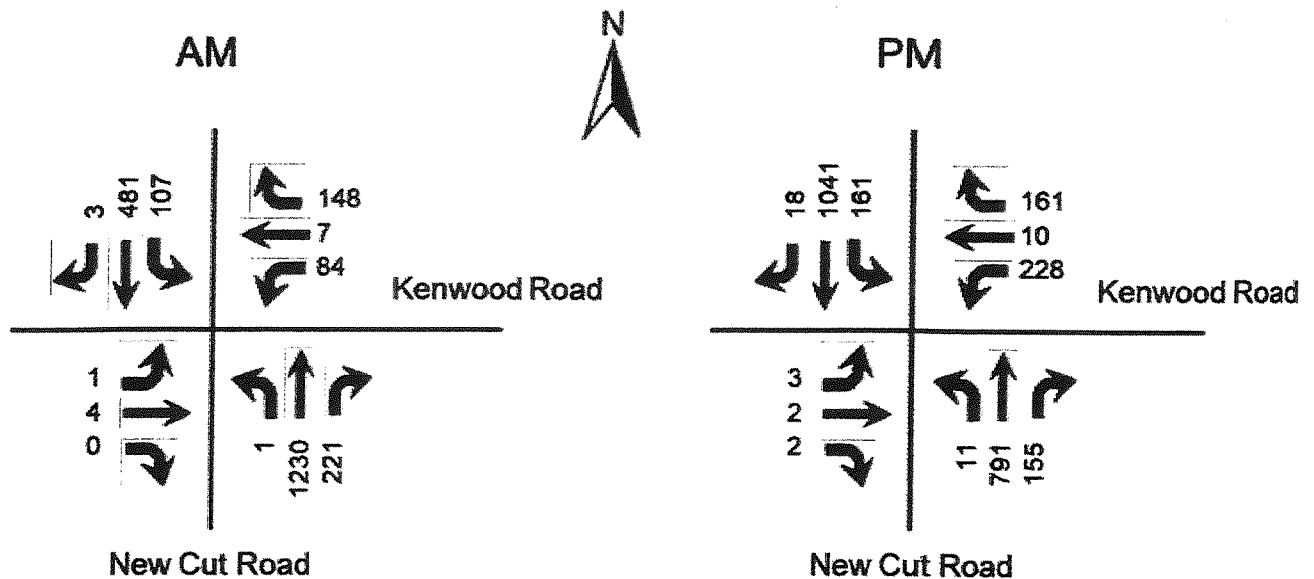


Figure 2. Existing Peak Hour Volumes

FUTURE CONDITIONS

The requested analysis year for this project is 2029. To predict traffic volumes in 2029, one percent annual growth in traffic was added to the count volumes. This was determined by reviewing the count history at station 776. Figure 3 displays the 2029 No Build volumes.

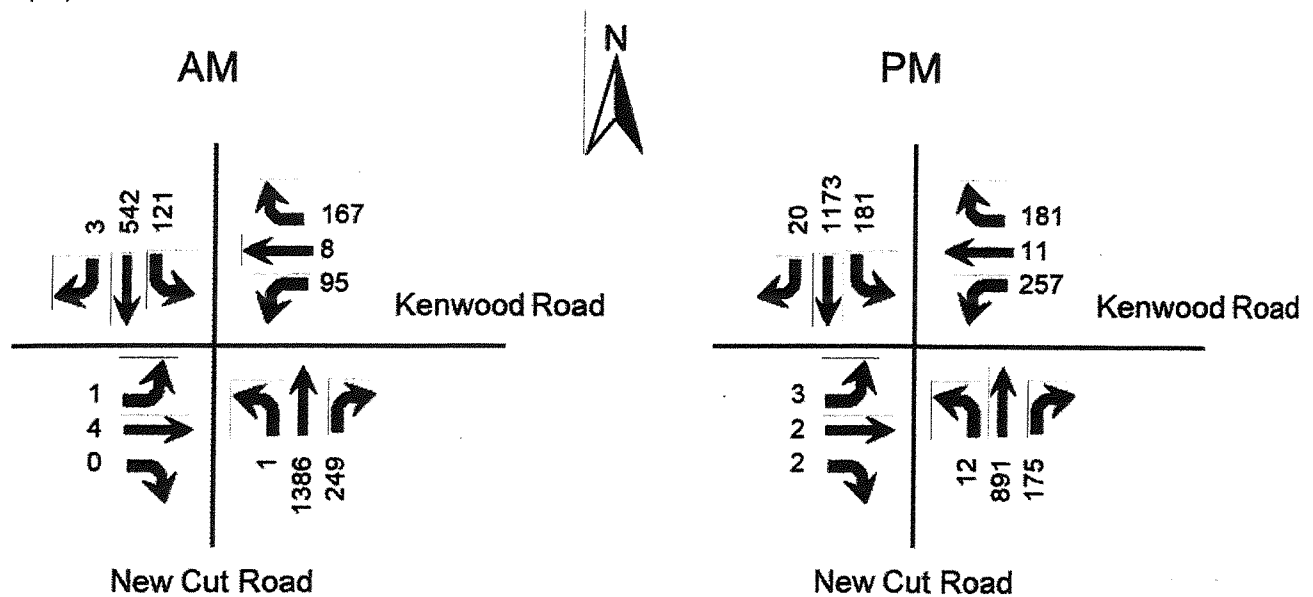


Figure 3. No Build Peak Hour Volumes

TRIP GENERATION

The Institute of Transportation Engineers Trip Generation Manual, 10th Edition contains trip generation rates for a wide range of developments. The land use of “High-Turnover (Sit-Down) Restaurant (932)” was reviewed and determined to be the best match. The trip generation results are listed in **Table 1**. The four proposed restaurants will not all be open simultaneously. The size used for the a.m. peak hour is 4,150 square feet and the size for the p.m. peak is 14,460 square feet. The trips were assigned to the highway network using the percentages shown in **Figure 4**. Pass-by trips are trips already on the road that choose to visit the site. They are assigned using the peak hour directional traffic. These trips are shown in parenthesis. **Figure 4** shows the trips generated by this development and distributed throughout the road network during the peak hours.

Table 1. Peak Hour Trips Generated by Site

Land Use	A.M. Peak Hour			P.M. Peak Hour		
	Trips	In	Out	Trips	In	Out
High-Turnover (Sit-Down) Restaurant	41	23	18	141	87	54
Pass-by Trips				61	38	23
New Trips	41	23	18	80	49	31

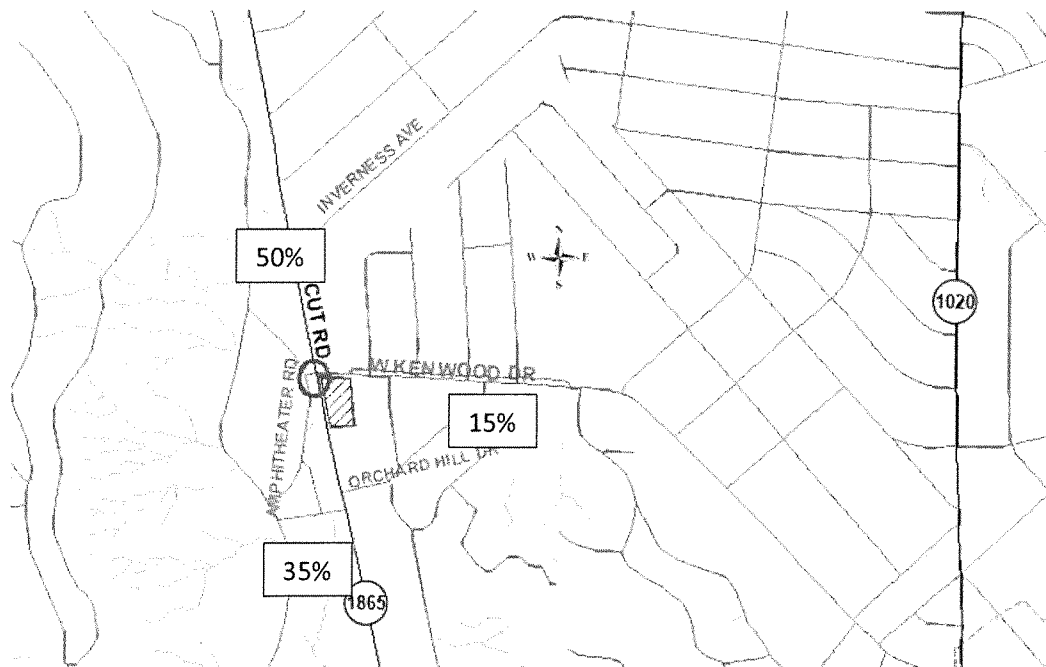


Figure 4. Trip Distribution Percentages

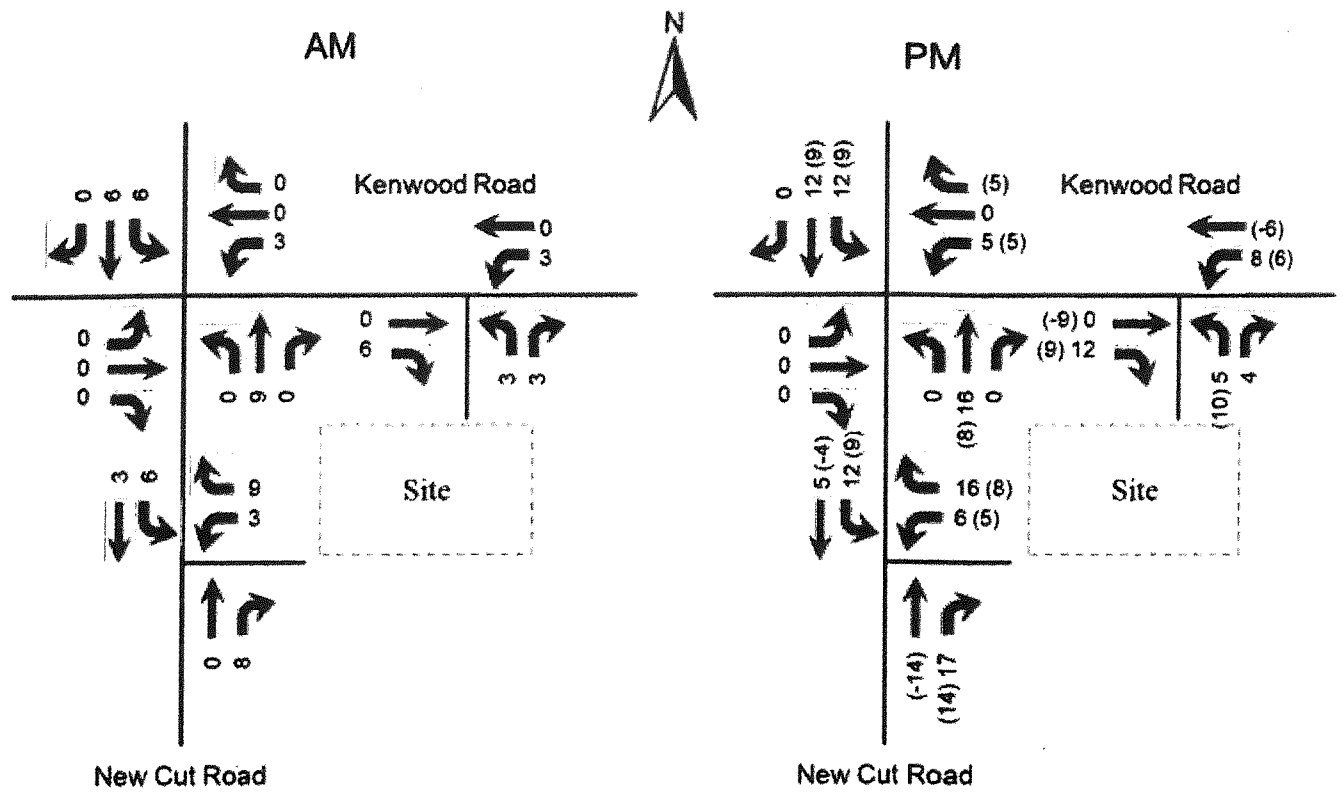


Figure 4. Peak Hour Trips Generated by Site

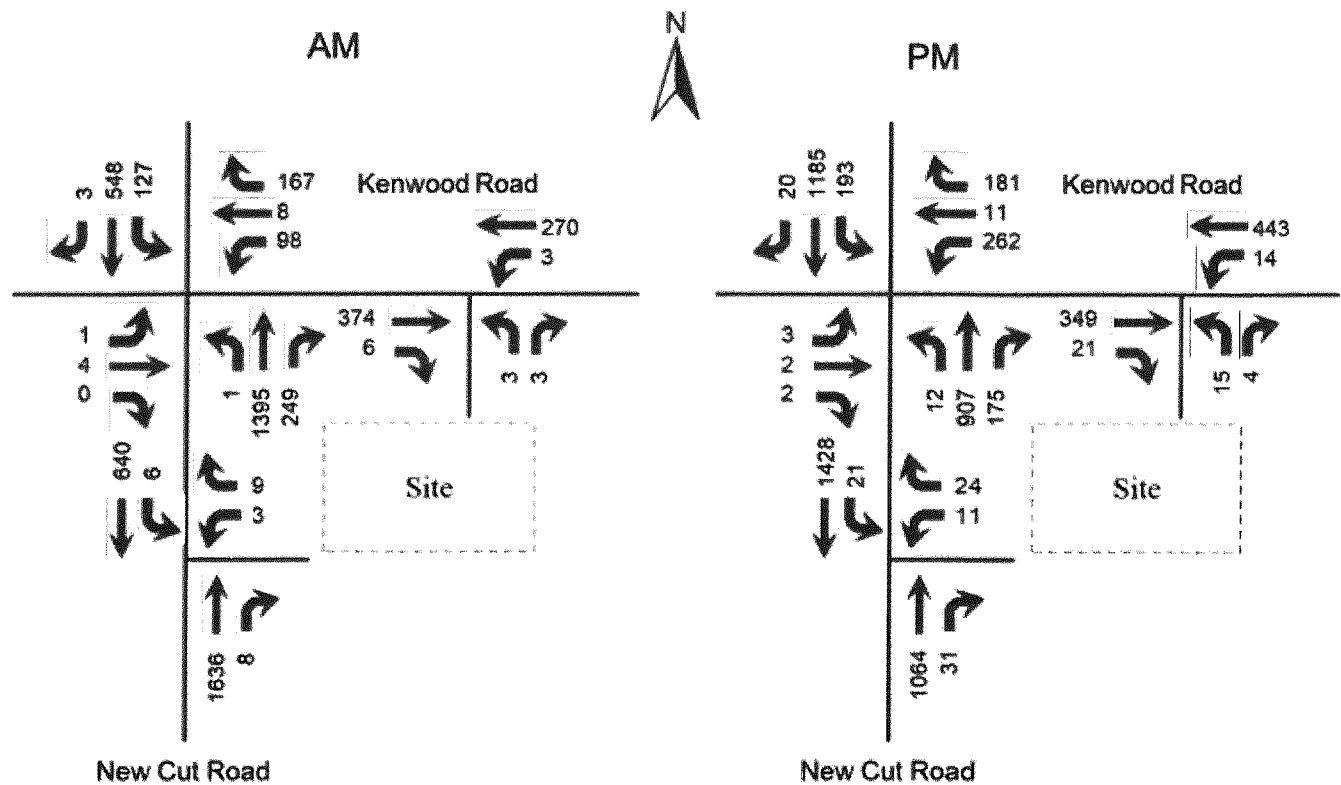


Figure 5. Build Peak Hour Trips

ANALYSIS

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service". Level of Service is a ranking scale from A through F, "A" is the best operating condition and "F" is the worst. Level of Service results depend upon the facility that is analyzed. In this case, the Level of Service is based upon the total delay experienced at an intersection.

To evaluate the impact of the proposed development, the vehicle delays at the intersections were determined using procedures detailed in the Highway Capacity Manual, 6th edition. Future delays and Level of Service were determined for the intersections using the HCS Streets (version 7.3) software. The delays and Level of Service are summarized in **Table 2**.

Table 2. Level of Service Results

Approach	A.M.			P.M.		
	2017	2029 No Build	2019 Build	2017	2019 No Build	2019 Build
New Cut Road at Kenwood Road	B 16.1	B 19.5	D 35.9	B 19.2	C 21.6	C 23.0
Iroquois Park Eastbound	D 44.3	D 43.0	D 37.4	D 40.3	D 38.3	D 48.0
Kenwood Road Westbound	D 45.3	D 44.5	D 37.9	D 48.8	D 48.9	D 51.3
New Cut Road Northbound	B 15.0	B 19.5	D 43.9	B 15.3	B 18.1	B 19.5
New Cut Road Southbound	A 6.8	A 9.2	A 9.2	B 12.5	B 15.4	B 16.5
New Cut Road at Entrance						
Entrance Westbound			D 28.2			D 33.7
New Cut Road Southbound (left)			C 15.8			B 11.3
Kenwood Road at Entrance						
Kenwood Road Westbound (left)			A 8.1			A 8.1
Entrance Northbound			B 12.5			C 16.1

Key: Level of Service, Delay in seconds per vehicle

The Kentucky Transportation Cabinet evaluates the need and length of auxiliary turn lanes using the Highway Design Guidance Manual dated March, 2017. Using the volumes in **Figure 4**, neither a right turn lane on New Cut Road nor a left turn lane on Kenwood Road will be required. The existing mountable median on New Cut Road should remain.

CONCLUSIONS

Based upon the volume of traffic generated by the development and the amount of traffic forecasted, there will be a minimal impact to the existing highway network. The current delays experienced at the intersections evaluated will increase, with all intersections functioning at Level of Service D or better. On Kenwood Road, the existing flared thru/right lane will be narrowed for increased safety for pedestrians.

APPENDIX

Colonial Gardens
Traffic Impact Study

Traffic Counts

Date: 11/7/17



Prepared by: D. Zimmerman

	New Cut Rd Southbound					Kenwood Rd Westbound					New Cut Rd Northbound					Kenwood Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App Tc	Right	Thru	Left	U-Turn	App Tc	Right	Thru	Left	U-Turn	App Tc	Right	Thru	Left	U-Turn	App Tc	Int Tot
7:00	0	99	20	0	119	43	4	11	0	58	35	285	0	0	320	0	0	1	0	1	498
7:15	3	126	24	0	153	33	1	25	0	59	40	329	0	0	369	0	0	0	0	0	581
7:30	0	140	37	0	177	34	2	28	0	64	78	315	0	0	393	0	3	0	0	3	637
7:45	0	116	26	0	142	38	0	20	0	58	68	301	1	0	370	0	1	0	0	1	571
8:00	4	96	21	0	121	38	0	15	0	53	31	253	0	0	284	0	3	1	0	4	462
8:15	2	114	14	0	130	28	3	12	0	43	35	205	0	0	240	1	1	0	0	2	415
8:30	2	115	18	0	135	51	2	28	0	81	27	240	1	0	268	0	4	1	0	5	489
8:45	3	122	30	0	155	26	1	28	0	55	21	197	1	0	219	0	0	1	0	1	430
16:00	6	274	41	0	321	52	2	64	0	118	50	208	4	0	262	1	0	0	0	1	702
16:15	4	242	37	0	283	33	3	50	0	86	37	216	2	0	255	1	0	0	0	1	625
16:30	3	264	33	0	300	31	3	46	0	80	39	184	1	0	224	0	0	3	0	3	607
16:45	5	261	50	0	316	45	2	68	0	115	29	183	4	0	216	0	2	0	0	2	649
17:00	3	256	40	0	299	39	2	72	0	113	36	207	0	0	243	3	0	1	0	4	659
17:15	5	240	43	0	288	39	2	60	0	101	43	208	3	0	254	1	1	3	0	5	648
17:30	2	233	47	0	282	35	4	62	0	101	38	195	3	0	236	1	0	3	0	4	623
17:45	5	214	39	0	258	56	6	54	0	116	43	176	0	0	219	0	2	2	0	4	597
Grand Total	47	2912	520	0	3479	621	37	643	0	1301	650	3702	20	0	4372	8	17	16	0	41	9193
% Approach	1.3%	83.1%	15.6%	0.0%		48.3%	2.9%	48.8%	0.0%		14.6%	85.0%	0.4%	0.0%		19.5%	41.5%	39.0%	0.0%		
% Total	0.5%	31.5%	5.9%	0.0%	37.9%	6.9%	0.4%	7.0%	0.0%	14.4%	6.9%	40.2%	0.2%	0.0%	47.3%	0.1%	0.2%	0.2%	0.0%	0.4%	
Lights and N	44	2948	546	0	3538	628	38	646	0	1312	651	3754	20	0	4425	8	11	15	0	34	9309
% Lights and N	93.6%	97.4%	96.1%	0.0%	97.2%	94.2%	95.0%	95.8%	0.0%	95.0%	98.2%	97.0%	100.0%	0.0%	97.2%	100.0%	64.7%	93.8%	0.0%	82.9%	96.8%
Heavy	3	77	22	0	102	39	2	28	0	69	12	115	0	0	127	0	6	1	0	7	305
% Heavy	6.4%	2.5%	3.9%	0.0%	2.8%	5.8%	5.0%	4.2%	0.0%	5.0%	1.8%	3.0%	0.0%	0.0%	2.8%	0.0%	35.3%	6.3%	0.0%	17.1%	3.2%
Bicycles on	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Bicycles on	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

	New Cut Rd Southbound					Kenwood Rd Westbound					New Cut Rd Northbound					Kenwood Rd Eastbound					
Start Time	Right	Thru	Left	U-Turn	App T	Right	Thru	Left	U-Turn	App T	Right	Thru	Left	U-Turn	App T	Right	Thru	Left	U-Turn	App T	Int Tot
7:00	0	99	20	0	119	43	4	11	0	58	35	285	0	0	320	0	0	1	0	1	498
7:15	3	126	24	0	153	33	1	25	0	59	40	329	0	0	369	0	0	0	0	0	581
7:30	0	140	37	0	177	34	2	28	0	64	78	315	0	0	393	0	3	0	0	3	637
7:45	0	116	26	0	142	38	0	20	0	58	68	301	1	0	370	0	1	0	0	1	571
AM PEAK	3	481	107	0	591	148	7	84	0	239	221	1230	1	0	1452	0	4	1	0	5	2287
16:00	6	274	41	0	321	52	2	64	0	118	50	208	4	0	262	1	0	0	0	1	702
16:15	4	242	37	0	283	33	3	50	0	86	37	216	2	0	255	1	0	0	0	1	625
16:30	3	264	33	0	300	31	3	46	0	80	39	184	1	0	224	0	0	3	0	3	607
16:45	5	261	50	0	316	45	2	68	0	115	29	183	4	0	216	0	2	0	0	2	649
PM PEAK	18	1041	161	0	1220	161	10	228	0	399	155	791	11	0	957	2	2	3	0	7	2583

HCS Reports