



## **Brentwood Commons Apartments**

Redwood Acquisitions, LLC

### **Trip Generation and Distribution**

August 4, 2015

Prepared for: Metro Louisville

## Trip Generation and Distribution



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## 1. Introduction

Redwood Acquisitions is proposing a residential development with 135 apartment units on the east side of Bardstown Road in Louisville, KY. **Figure 1** displays a map of the site. Access to the development will be from Bardstown Bluff Road. The sole purpose of this study is to develop the trip generation and distribution for the proposed development.



**Figure 1 : Location Map**

## 2. Existing Conditions

Bardstown Road, US 31E, is maintained by the Kentucky Transportation Cabinet (KYTC) with an estimated 2015 Average Annual Daily Traffic (AADT) volume of 30,200 vehicles per day between the Bullitt County line and Thixton Lane (KY 2053), as estimated from the KYTC 2013 count at station 257. The road is a four-lane highway with 12 foot lanes, a depressed 32 foot median and 10 foot paved shoulders. The speed limit is 55 mph. There are no sidewalks. The intersection with Bardstown Bluff Road has a southbound left turn lane. Bardstown Bluff Road is controlled with a stop sign.

Jacobs Engineering Group, Inc. obtained a.m. and p.m. peak hour traffic counts at the intersection of Bardstown Bluff Road and Bardstown Road (US 31E) on July 29, 2015 (see Appendix A). The a.m. peak hour occurred between 7:45 and 8:45 a.m. and the p.m. peak hour occurred between 5:00 and 6:00 p.m. **Figure 2** illustrates the existing a.m. and p.m. peak hour traffic volumes.



Figure 2 : Peak Hour Counts

### 3. Trip Generation and Distribution

The Institute of Transportation Engineers Trip Generation Manual, 9<sup>th</sup> Edition contains trip generation rates for a wide range of developments. The land use of "Apartment (220)" best describes this development. The trip generation results are listed in **Table 1**. The results of the trip generation analysis are that this development will generate 70 a.m. peak hour trips and 92 p.m. peak hour trips. The trips were assigned to the highway network with 70 percent to/from the north and 30 percent to/from the south. **Figure 4** shows the trips generated by this development and distributed throughout the road network for the year 2017 during the peak hours.

Table 1. Trip Generation Results

	A.M.			P.M.		
	Total Trips	Entering	Exiting	Total Trips	Entering	Exiting
135 Apartment units	70	14	56	92	60	32

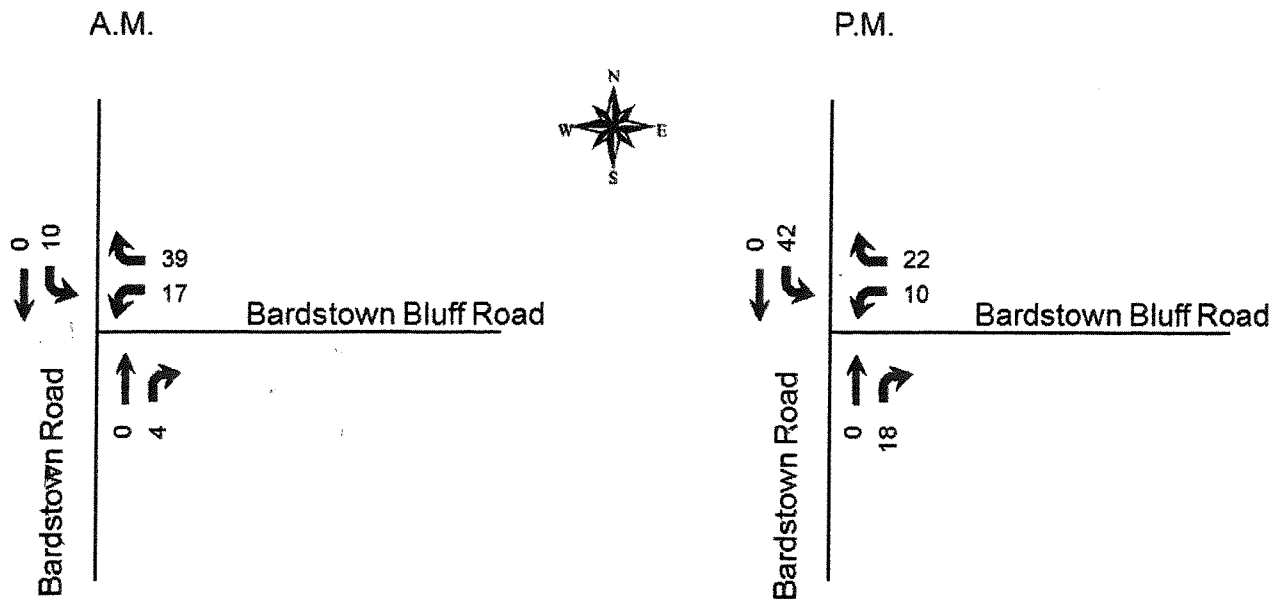


Figure 3 : Site Trip Distribution

## Appendix A. Traffic Counts

7.29.15

Interval Start Time	Bardstown Road			Bardstown Road			Bardstown Bluff		
	From North			From South			From East		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00	0	76			459	1	0		0
7:15	0	108			505	0	0		0
7:30	0	130			451	1	0		0
7:45	0	162			416	0	1		0
8:00	0	119			425	1	0		1
8:15	0	148			441	1	0		0
8:30	0	134			478	0	1		0
8:45	0	135			371	2	0		0
<b>AM TOTALS</b>	<b>0</b>	<b>1012</b>			<b>3546</b>	<b>6</b>	<b>2</b>		<b>1</b>
16:00	0	433			303	0	0		0
16:15	0	343			282	0	0		0
16:30	2	373			267	1	0		0
16:45	0	342			284	0	2		0
17:00	0	508			291	1	0		1
17:15	0	374			315	0	0		0
17:30	0	454			355	0	0		0
17:45	0	516			319	0	0		0
<b>PM TOTALS</b>	<b>2</b>	<b>3343</b>			<b>2416</b>	<b>2</b>	<b>2</b>		<b>1</b>

A.M. Peak	From North			From South			From East		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:45	0	162			416	0	1		0
8:00	0	119			425	1	0		1
8:15	0	148			441	1	0		0
8:30	0	134			478	0	1		0
<b>Total</b>	<b>0</b>	<b>563</b>	<b>0</b>	<b>0</b>	<b>1760</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>1</b>
P.M. Peak									
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
17:00	0	508			291	1	0		1
17:15	0	374			315	0	0		0
17:30	0	454			355	0	0		0
17:45	0	516			319	0	0		0
<b>Total</b>	<b>0</b>	<b>1852</b>	<b>0</b>	<b>0</b>	<b>1280</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>

## Appendix B. Signal Warrant Chart from MUTCD

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

## Condition A—Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

## Condition B—Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>	100% <sup>a</sup>	80% <sup>b</sup>	70% <sup>c</sup>	56% <sup>d</sup>
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

<sup>a</sup> Basic minimum hourly volume<sup>b</sup> Used for combination of Conditions A and B after adequate trial of other remedial measures<sup>c</sup> May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000<sup>d</sup> May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

Sect. 4C.02

December 2009

As shown in Condition B, an absolute minimum of 42 vehicles per hour for each of eight (8) hours is required to meet Warrant 1 for installing a traffic signal. The intersection of Bardstown Bluff Road will only meet this warrant during the a.m. peak hour.