# 11404 TAYLORSVILLE ROAD APARTMENTS

KY 155 Louisville, Kentucky

# TRAFFIC IMPACT STUDY

September 2016

Prepared for:



Prepared by:



Architecture Engineering Planning

Groundbreaking by Design.

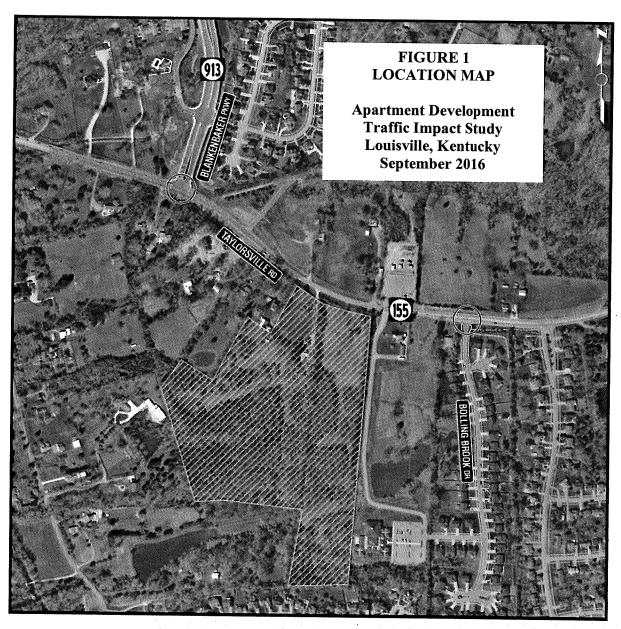
815 West Market Street, Suite 300 Louisville, Kentucky 40202 Phone: 502-585-2222 • Fax: 502-566-3058

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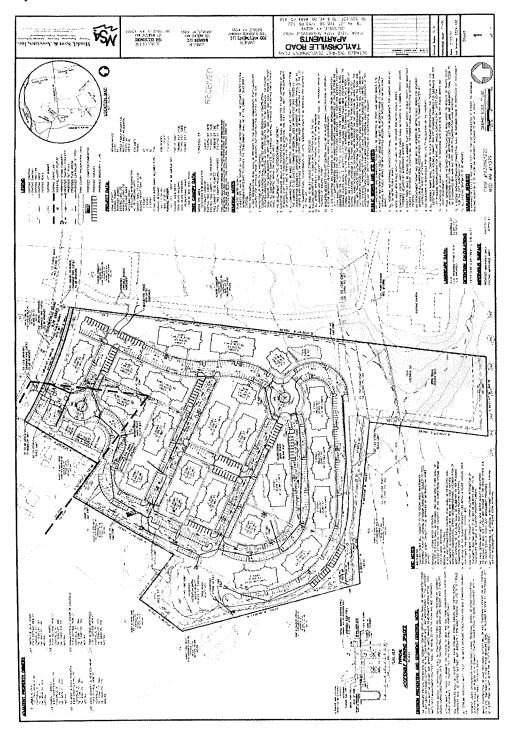
### 1.0 INTRODUCTION

Qk4, Inc. was retained to perform a Traffic Impact Study (TIS) for the proposed apartment development located south of Taylorsville Rd (KY 155) and east of Blankenbaker Pkwy (KY 913) in Jefferson County, Kentucky. The location of the site is illustrated below.



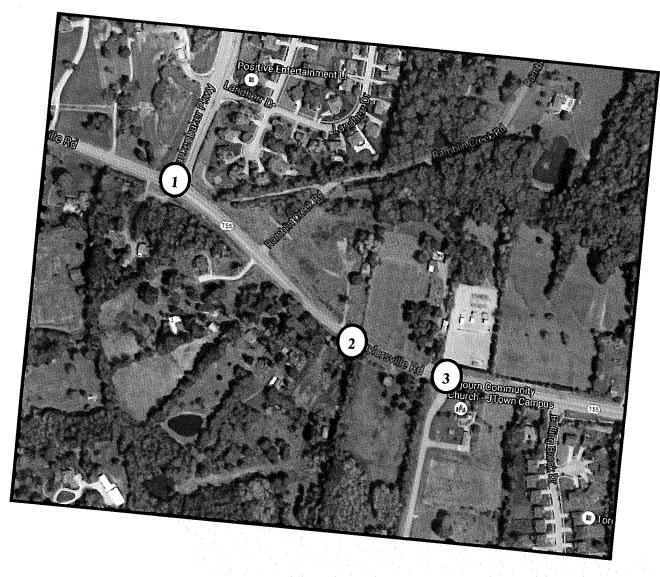
## 2.0 PROPOSED DEVELOPMENT

The proposed apartment development will include a total of 424 units and cover just over 29 acres. The site plan below shows details of the development as well as the proposed internal roadway network and roadway access.

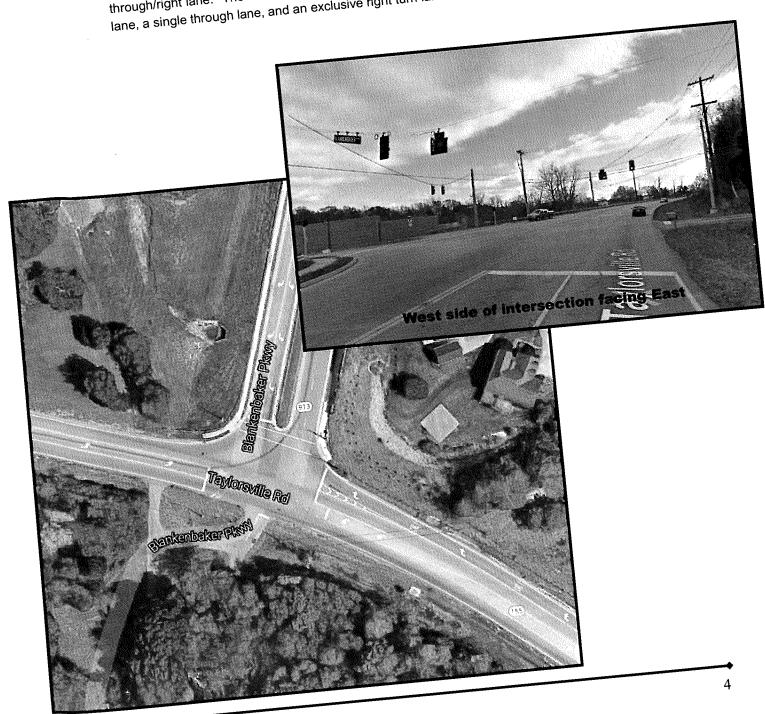


# 3.0 STUDY AREA

The study area for this traffic impact study includes the following intersections: (1) KY 155 & KY 913, (2) KY 155 & Proposed Site Entrance, and (3) KY 155 & Church Entrance. The map below shows the approximate location of these intersections.



The intersection of KY 155 & KY 913 is currently signal-controlled. The northbound approach to the intersection consists of a single shared left/through/right lane. The southbound approach to KY 155 & KY 913 the intersection consists of an exclusive right turn lane and an exclusive left turn lane. The eastbound approach to the intersection consists of an exclusive left turn lane and a shared through/right lane. The westbound approach to the intersection consists of an exclusive left turn lane, a single through lane, and an exclusive right turn lane.



#### **KY 155 & SOJOURN CHURCH ENTRANCE**

The intersection of KY 155 & Sojourn Church entrance is currently stop-controlled with the northbound approach to the intersection required to stop. The northbound approach to the intersection consists of an exclusive left turn lane and an exclusive right turn lane. The eastbound approach to the intersection consists of a shared through/right lane. The westbound approach to the intersection consists of a shared left/through lane.



Study Name KV 155 & Blankenhaker Pkivi

Lights

Other Vehicle

Total

PHF

Pank 2

Specified Period

12:00 PM - 7:00 PM

One Hour Peak

5:00 PM - 6:00 PM

#### **TURNING MOVEMENT COUNTS** 4.0

592 0 1201 394 253

10 0 14

602 0 1215 412 270 510

0.91

0.94 0.77 0.9 0.89

0

613

17 13 0 0 30 16

All turing movement data was collected on Tuesday, September 13<sup>th</sup> between the hours of 7AM and 7PM. Truck data was collected independently of passenger car data to determine peak hour truck percentages. These intersections were counted with a Miovision data collection units. AM and PM peak hour miovision summaries for both peak hours can be seen below. This existing turning movement data is summarized graphically on Figures 3 and 4.

Site Code															MORNING.	and the same of	A STATE OF THE PARTY OF		Section 19	***************************************					
leport Sum	maray																							9	
				South	iemai.					West	bound					(V or th	iound					Eastb	olijitel		1
Time Period	Class.	R	Ť	1	U		٥	R	Ť	L	U		o	Ř	T	Ŀ	:		a	F	Ţ		0.		6
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pedfled Period	*	95%	3%	36%	Ø6	1886	22%	28%	92%	縧	<b>(%</b>	瓣	勃胺	<b>36</b> 6	884	\$96	部	\$86	. #s	\$35	鞭隊	1996	3%	36%	38%
0 AM - 12:00 PM	Other Vehicle	6	0	14	0	20	15	11	14	0	0	25	29	0	0	0	0	0	0	0	15	4	0	19	20
		366	386	14%	2%	1 24	286	3%	#4	8	486	*	78	0%	(#S)	des.	뾿		ē4s	<b>5%</b>	2%	186	瓣	in its	36
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White the state of	Testal	10000011	0	101		169	1050	507	521		180 Y 180	4 then												墨	
One Hour Peak 15 AM - 8:15 AM	Total PHF	<b>68</b> 0.68	0	101 0.81	0	169	0.89	0.89	0.9	0	0	0.89	0.95	ø	0	0	0	0	0	0	0.89	0.86	0	0.97	0.9

751 1150

0.89 0.95 0

0 0 0

0

0

0

1836

0.25

564 142

0.93

Study Name	KY 155 & Bolling Brook Dr
Start Date	Tuesday, September 13, 2016 7:00 AM
End Date	Tuesday, September 13, 2016 7:00 PM
Site Code	
Report Sum	mary
William Strategic According to the Second Sec	

0 781 1166

0.25

7.00			Vi)	TIME	175			No	thool	nd			E	Ti-bour	į.		
Time Period	Class.	т	i.	U	- 1	•	R	t.	U	1	o	R	Ť	U	1	ō	C
Peak 1	Lights	1009	3	O.	1012	400	12	27	9	39	10	7	388		396	1037	144
Specified Period		1984	\$6KPR	###	36%	198	0.7%	169676	186	1886	1988	抽締	988	1000		986	120
1:00 AM 12:00 PM	Other Vehicle	20	0	0	20	21	1	٥	0	1	1	1	26	0	71	20	42
One Hour Peak		2%	建幅	100	150	1	6%	6%	15%	19	精	13%	186		- 186	建幅	100
700 AM - 8:00 AM	Total	1029	3	٥	1032	421	13	27	0	40	11	8	408	1	417	1057	148
	PHF	0.9	0.38	0	0.9	0.88	0.65	0.75	0	0.71	0.46	0.5	0.88	0.25	0.89	0.9	0.9
	Supposed to the				186	1891	andress defines			esta esta esta esta esta esta esta esta	蹲。						uscenturioriem.
Peak 2	Lights	757	7	0	764	1137	6	15	0	21	22	15	1131	0	1146	772	193
Specified Period		多點	编辑等	62%	- 67%	10%	\$181%	648	6/%	100	18656	SIA75	學學	额	1886	- 東海	*
(2:00 PM - 7:00 PM	Other Vehicle	22	1	0	23	15	0	1	0	1	1	0	15	0	15	23	19
One Hour Peak	177 18 1 1	18	188	超極	15	15%	橋	46萬	摊	100	44	· (#)	1%	88	15	3%	
5:15 PM - 6:15 PM	Total	779	8	0	787	1152	6	16	0	22	23	15	1146	٥	1161	795	197
	PHF	0.93	0.5	Ö	0.9	0.98	0.75	0.67	Ĵ	0.79	0.64	0.75	0.98	Ō	0.99	0.91	0.9
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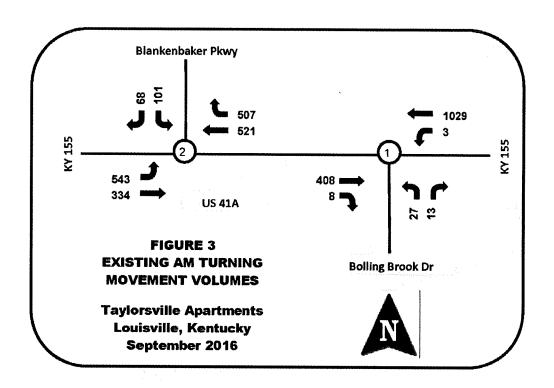
1106 2651

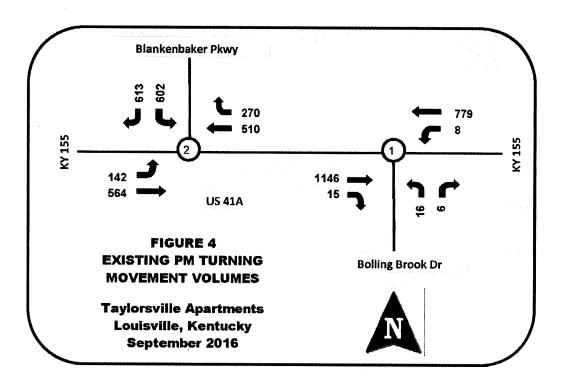
17 51

699

706 1123 2702

0 0.91 0.95 0.97

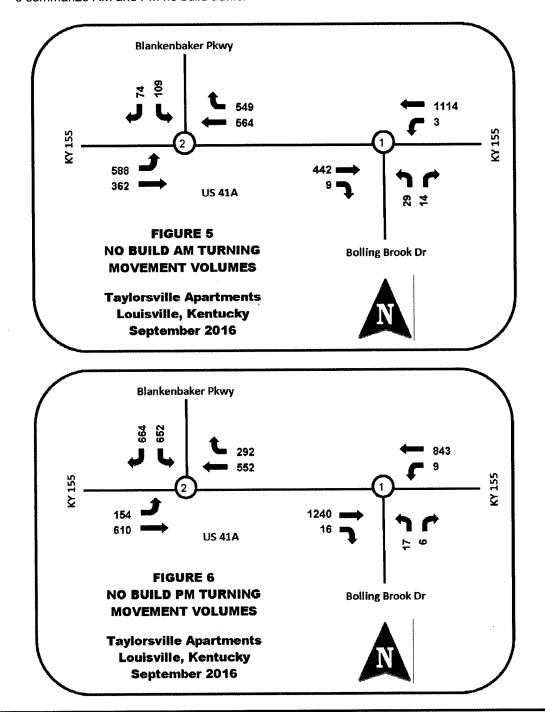




#### 5.0 PROJECTED TRAFFIC

#### 5.1 BACKGROUND TRAFFIC

Traffic was analyzed for no build and build scenarios for the future year of 2020. Existing turning movements were grown by 2% annually to determine 2020 no build traffic volumes. Figures 5 & 6 summarize AM and PM no build traffic.



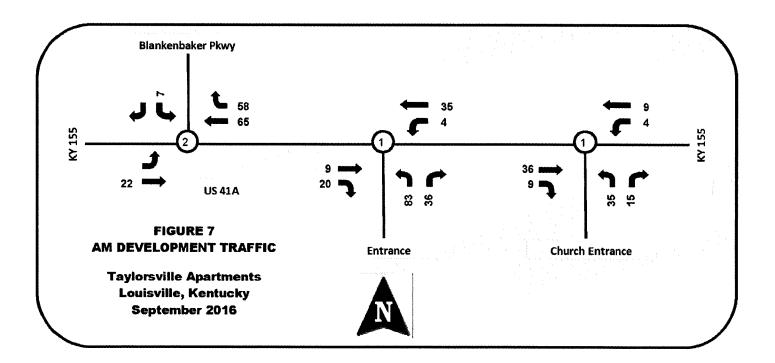
#### 5.2 TRIP GENERATION

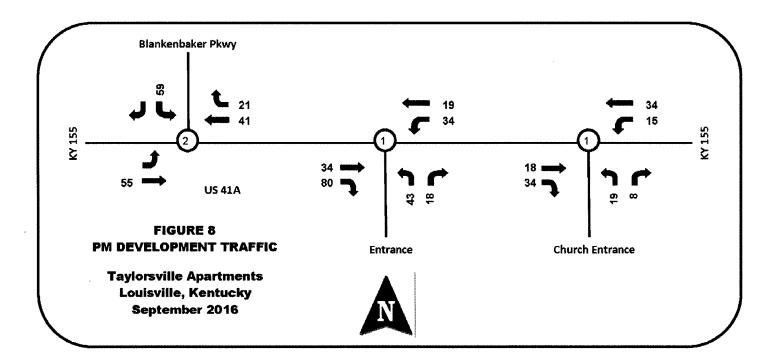
Trips were generated for this site based on information from the 9<sup>th</sup> edition of the *Trip Generation Manual* distributed by the Institute of Transportation Engineers (ITE). ITE site code 220 "Apartment" was used for these calculactions. The following summarizes trips generation calculations for daily, AM, and PM trips.

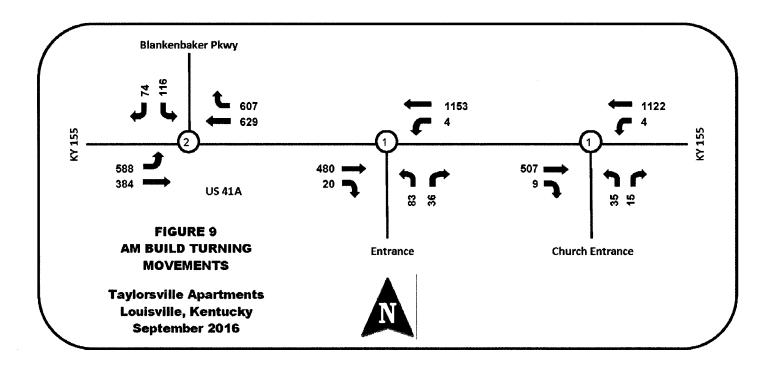
<u>Weekday</u>	AM Peak Hour	PM Peak Hour
T = 6.06(X)+123.56	T = 0.49(X) + 3.73	T = 0.55(X) + 17.65
T = 6.06(424)+123.56	T = 0.49(424)+3.73	T = 0.55(424)+17.65
T = 2693 (50% in / 50% out)	T = 211 (20% in / 80% out)	T = 251 (65% in / 35% out)
T(in) = 1,347	T(in) = 42	T(in) = 163
T(out) = 1,347	T(out) = 169	T(out) = 88

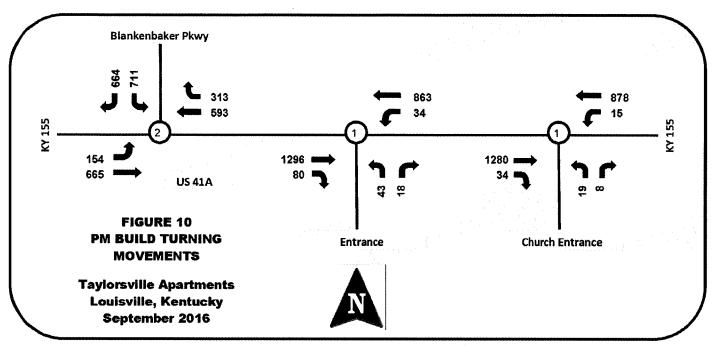
#### 5.3 TRIP DISTRIBUTION / ASSIGNMENT

Traffic was distributed to and from the proposed development based on existing traffic patterns in the study area. Figures 7 & 8 summarize AM and PM peak hour primary trips generated by the development. Figures 9 & 10 summarize AM and PM peak hour build turning movements.









6.0 ANALYSIS

#### 6.1 TURN LANE ANALYSIS

Turning movements at the intersection of KY 155 with the proposed site entrance were compared to KYTC turn lane warrants to determine where turn lanes would be required per KYTC policy. 2020 build volumes were used for all turn lane analysis. As seen below both right and left turn lanes would be warranted at the proposed entrance to the development.

#### **Eastbound Right Turn Analysis**

AM Peak Hour PM Peak Hour

Right Turn Volume: 29 Right Turn Volume: 96

Advancing Volume: 1,376

Warranted: NO Warranted: YES

#### **Westbound Left Turn Lane Analysis**

AM Peak Hour PM Peak Hour

Left Turn Volume: 7 Left Turn Volume: 43

Advancing Volume: 1,125 Advancing Volume: 889

Opposing Volume: 500 Opposing Volume: 1,376

Warranted: YES Warranted: YES

#### 6.2 CAPACITY ANALYSIS

Level of service (LOS) is a term that is commonly used to evaluate roadway functions. Level of service is defined as a qualitative measure of operational conditions and the perception of these conditions by motorists. These conditions are usually defined in terms of factors such as speed and travel time, maneuverability, delay, and safety. There are six levels of service, which are designated by the letters "A" through "F." Level of service "A" represents the best operating conditions, while level of service "F" defines the worst.

The methodology used to analyze the capacity and level of service was based on standard traffic engineering procedures outlined in the *Highway Capacity Manual* (HCM 2010). The analysis was performed using the latest version of the Highway Capacity software. The procedure considers traffic and geometric conditions of the facility, such as traffic volumes, percent of large vehicles, design speed, lane and shoulder widths, grades, and directional distributions to determine the LOS.

Delay is a critical performance measure on interrupted-flow facilities. Delay is measured as the time a vehicle is slowed by a signalized or stop-controlled intersection compared to the average travel time of a vehicle if it were unimpeded by the intersection. Delay includes the time a vehicle decelerates approaching the intersection and accelerating as it leaves the intersection. Although the definition of delay is the same for both signalized and stop-controlled intersections, the thresholds used to determine LOS differ. LOS thresholds for signalized and unsignalized intersections are summarized below.

LOS Threshold for Signalized Intersections

Delay (sec)	LOS	Description
1-10	Α	Free Flow
10-20	В	Reasonable Unimpeded Flow
20-35	O	Stable Operation
35-55	۵	*Approaching Unstable Flow
55-80	Е	Unstable Flow
>80	F	Congested Flow

<sup>\*</sup>Considered acceptable For urban areas

#### LOS Threshold for Unsignalized Intersections

Delay (sec)	LOS	Description
1-10	Α	Free Flow
10-15	В	Reasonable Unimpeded Flow
15-25	С	Stable Operation
25-35	D	*Approaching Unstable Flow
35-50	E	Unstable Flow
>50	F	Congested Flow

<sup>\*</sup>Considered acceptable for urban areas.

Capacity analyses were performed for all study area intersections for both the AM and PM peak hours, including the following scenarios: existing, no build 2017, and build 2017.

The capacity analyses included a comparison—expressed as a volume to capacity (v/c) ratio—of the traffic volume to the operating capacity of the road based on its characteristics (number of lanes, shoulder width, grades, etc.). The v/c ratio ranges from zero (0) to (1.0), defined as follows:

- v/c = 0: the flow rate is zero—this is the starting point for the comparison.
- v/c = 0- 0.999: the volume of traffic is less than the road's capacity to handle it.
- **v/c** = **1.0**: the flow rate equals the roadway's capacity; i.e., the road is approaching the limits of its ability (capacity) to handle the traffic volume.
- v/c = > 1.0: the traffic volume exceeds the road's capacity, producing unacceptable delays and LOS "F."

#### **KY 155 & KY 913**

All movements at this intersection would operate at a LOS E or above for existing conidtions. Both southbound movments approach capacity during the PM peak hour. Currently, congestion at this intersection is exacerbated by back ups east of the study area that spill back into the study area during the PM peak hour. These spill backs were seen on the miovision cameras during the PM peak hour and cause congestion levels over those reported from the highway capacity software.

The southbound left movments drops to a LOS F during the PM peak hour for both the no build and build scenarios. The v/c ratio for this movement also exceeds a 1.0 in the PM peak hour for the no build and build scenarios. Existing signal timing was used for all scenarios.

Time v/c Ratio LOS Average Queue Build Existing Build Build Movement Period Existing No Build Existing Build No Build Existing No Build 0.948 42.6 AM 0.843 0.922 79 214 408 16.1 29.5 Ð Eastbound, Left 0.55 0.43 0.502 20.1 AM 0.245 0.265 0.279 17 22 27 3.2 3.3 Α Α Eastbound, Through PM 0.591 0.637 0.694 240 AM 0.553 0.637 0.752 151 293 15 19.4 206 Westbound, Through 285 370 31.3 37.2 PM 0.686 0.746 0.801 327 ΑM 0.549 166 11.3 16.3 0.622 0.6 111 158 14.7 В Westbound, Right PM 27 0.227 0.246 0.264 31 AM 0.733 0.753 53 61 70 39.6 41.9 44.4 D D 0.73 Southbound, Left PM 0.956 1.041 1.135 483 608 756 81.3 113.7 AM 0.177 25 22.8 0.165 0.146 21.6 Southbound, Right

KY 155 & KY 913 Capacity Summary

Note average queues are reported in feet

#### **KY 155 & Proposed Site Entrance**

This intersection would have some congestion associated with the northbound left turn movement out of the development onto KY 155. During both peak hours this movement would experience a LOS F. The 95% queue for this movement would reach five vehicles during either peak hour. KY 155 traffic would experience little if any delay caused by the addition of development traffic. As noted on the previous intersection, traffic from east of this intersection backs past this intersections during parts of the PM peak hour.

**KY 155 & Proposed Site Entrance Capacity Summary** 

	Time				
Movement	Period	v/c Ratio	95% Queue	Delay	LOS
Westbound, Left	AM	0	0	8.6	A
westbourid, Left	PM	0.09	0.3	14.1	В
Northbound, Left	AM	0.81	4.7	108.6	F
Northboand, tert	PM	1.07	4,4	296.5	F
Northbound, Right	AM	0.07	0.2	12.1	В
Noi tribodria, Night	PM	0.12	0.4	30.3	D

Note 95% queues are reported in vehicles

#### **KY 155 & Church Entrance**

This intersection would also have some congestion associated with the northbound left turn movement out of the development onto KY 155. During both peak hours this movement would experience a LOS F. The 95% queue for this movement would only reach two vehicles during either peak hour. KY 155 traffic would experience little if any delay caused by the addition of development traffic. As noted on the previous intersection, traffic from east of this intersection backs past this intersections during parts of the PM peak hour.

**KY 155 & Church Entrance Capacity Summary** 

	Time				
Movement	Period	v/c Ratio	95% Queue	Delay	LOS
Westbound, Left	AM	0	0	8.6	Α
westboard, tert	PM	0.04	0.1	13.1	В
Northbound, Left	AM	0.34	1.4	52.2	F
Northbound, Left	PM	0.43	1.6	125	F
Northbound Dight	AM	0.03	0.1	12.2	В
Northbound, Right	PM	0.06	0.2	28.6	D

Note 95% queues are reported in vehicles

#### 7.0 CONCLUSIONS

Traffic added by the proposed apartment development would have impacts to the existing roadway network. To minimize these impacts, both right and left turn lanes from KY 155 into the proposed development should be constructed. The site entrance approach to KY 155 should consist of separated right and left turn lanes. Although the analysis does show traffic leaving the development will experience heavy delays, this congestion should have little affect on KY 155.

**REPORT** 

Taylorsville Road Apartments Louisville, KY

**Traffic Impact Study** 

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May 9, 2016



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# Introduction

The proposed apartment development in Louisville, KY is located on Taylorsville Road west of Bolling Brook Drive. The apartment community will have 424 units. **Figure 1** displays a map of the site. Access to the tract will be from an entrance on Taylorsville Road and a secondary access from the adjacent Sojourn Community Church campus. The purpose of this study is to examine the traffic impacts of the proposed development upon the adjacent highway system. For this study the impact area was defined to be the intersection of Taylorsville Road at the apartment community and at Blankenbaker Parkway.

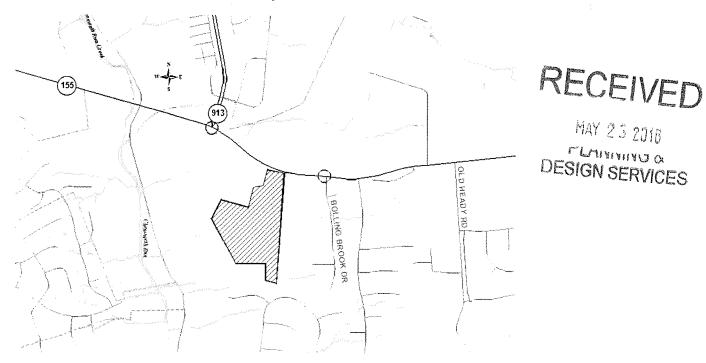


Figure 1
Site Location

# **Existing Conditions**

Taylorsville Road is maintained by the Kentucky Transportation Cabinet with an estimated 2015 ADT of 18,500 vehicles per day east of Bolling Brook Drive, as provided by a Metro Public Works count. The road is a two lane road with eleven-foot lanes with four foot shoulders. The posted speed limit is 55 mph. There are no sidewalks.

A.m. and p.m. peak hour traffic counts were obtained at the intersection on April 26, 2016 (see Appendix A). The a.m. peak hour occurred between 7:15 and 8:15 and the p.m. peak hour occurred between 4:45 and 5:45 p.m. **Figure 2** illustrates the existing peak hour traffic volumes.

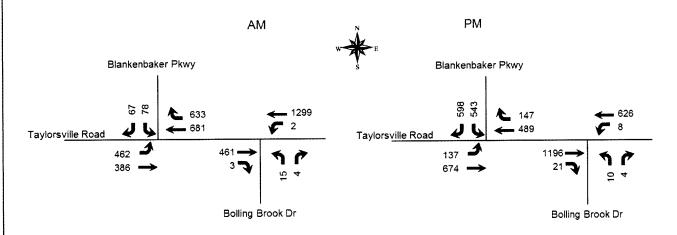
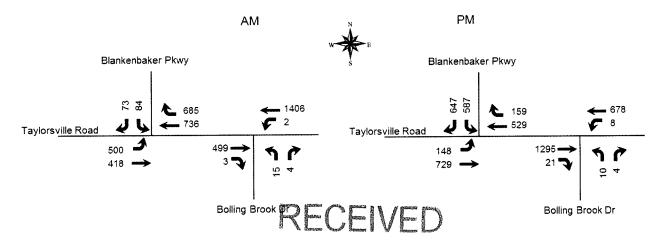


Figure 2 2016 Peak Hour Counts

## **Future Conditions**

The projected completion year for this development is 2020, so the analysis year for this study is 2020. To predict traffic conditions in 2020, two percent annual growth in traffic was added. This growth is based upon a review of the count data along Taylorsville Road. **Figure 3** displays the 2020 No Build volumes.



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Figure 3 2020 No Build Peak Hour Volumes

# **Trip Generation**

The Institute of Transportation Engineers <u>Trip Generation Manual</u>, 9th Edition contains trip generation rates for a wide range of developments. The land uses of "Apartments (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 211 a.m. peak hour trips and 251 p.m. peak hour trips. The trips were assigned to the highway network with 70 percent to/from the west and 30 percent to/from the east. This is based upon the existing traffic pattern on Taylorsville Road. **Figure 4** shows the trips generated by this development and distributed

throughout the road network for the year 2020during the peak hours. Figure 5 displays the individual turning movements for the year 2020 for the peak hours when the development is completed.

Table 1 - Trip Generation

	AM	Peak Ho	our	PM	Peak Ho	our
	Total	Enter	Exit	Total	Enter	Exit
Apartments (424 units)	211	42	169	251	163	88

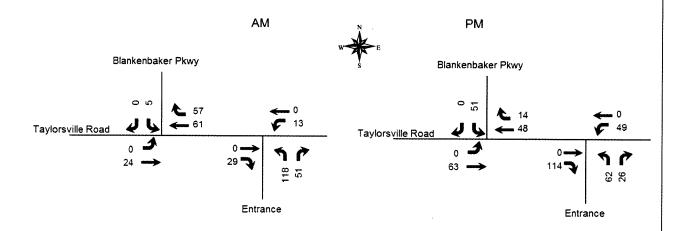
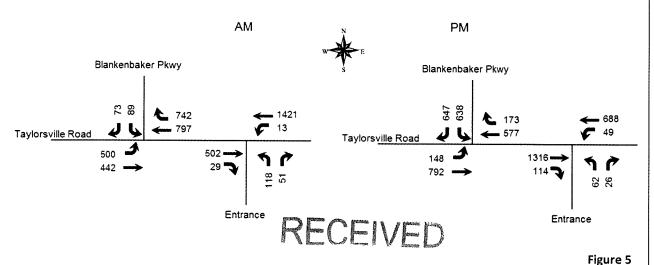


Figure 4 **Trip Distribution for Site** 



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2020 Build Peak Hour Volumes

# **Analysis**

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service" or LOS. Level of Service is a ranking scale from A through F with each level representing a range. LOS results depend upon the type of facility that is analyzed. In



this case, the LOS is based upon the average vehicle delay each movement experiences at an intersection.

To evaluate the impact of the proposed development, the vehicle delays at the intersection were determined using procedures detailed in the <u>Highway Capacity Manual</u>, 2010 edition. Future delay and Level of Service were determined for the intersection using HCS 2010 TWSC and Streets software (version 6.70). **Table 2** shows the results of the analysis for the three scenarios analyzed. The full printouts are included in Appendix B.

**Table 2 - Level of Service Results** 

	l Al	VI Peak Hour		181	√ Peak Hour	
	2016	2020	2020	2016	2020	2020
	Existing	No Build	Build	Existing	No Build	Build
Taylorsville Road at Blankenbaker	B	C	C	C	D	D
Parkway	17.6	26.2	32.7	31.5	44.0	52.5
Taylorsville Road Eastbound	B	C	D	C	C	D
	17.6	30.4	43.9	23.9	24.4	36.4
Taylorsville Road Westbound	B	C	C	C	C	C
	16.0	22.1	24.7	25.0	25.1	28.8
Blankenbaker Parkway Southbound	C	D	D	D	E	E
	32.1	39.3	43.5	40.5	68.6	78.2
Taylorsville Road at Entrance						
Taylorsville Road Westbound (left turn)			A 8.7			B 14.6
Entrance Northbound			E 39.3			E 49.4

Note: Level of Service, delay in seconds

The 2020 PM Build conditions are achieved with an increase in the southbound (Blankenbaker Parkway) phase from 40 to 55 seconds.

Using the Kentucky Transportation Cabinet <u>Auxiliary Turn Lane</u> Policy dated 7/20/2009 and the volumes in **Figure 5**, the volumes do meet the warrants for an eastbound right turn lane and a westbound left turn lane on Taylorsville Road.

# Conclusions

Based upon the volume of traffic generated by the development and the amount of traffic forecasted for the year 2020, there will be an impact to the existing highway network. At the main entrance to the apartment community an eastbound right turn lane and a westbound left turn lane will be constructed. The exit will have a dedicated left and right turn lane.

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# Appendix A<br/>Traffic Counts

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Interval	Bolling	Brook	Drive	Taylo	rsville l	Road	Taylo	rsville l	Road
Start Time	Fre	om Sou	th	F	rom Eas	st	Fr	om We	st
otare rine	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:00	4		5	1	206			57	0
7:15	4		1	0	367			101	2
7:30	6		3	1	339			131	1
7:45	5		0	0	328			114	0
8:00	0		0	1	265			115	0
8:15	3		0	1	215			103	1
8:30	4		3	0	264			98	1
8:45	0		2	0	273			127	0
AM TOTALS	26		14	4	2257			846	5
16:00	1		2	1	122			172	2
16:15	0		3	1	123			227	4
16:30	3		0	5	128			266	2
16:45	3		1	2	134			313	4
17:00	0		3	0	154			310	2
17:15	2		0	3	149			275	6
17:30	5		0	3	189			298	9
17:45	2		0	0	125			304	4
PM TOTALS	16		9	15	1124			2165	33

Interval	Bolling	Brook	Drive	Taylo	rsville l	Road	Taylo	rsville l	Road
Start Time	Fro	om Sout	th	F	rom Eas	st	Fr	om We	st
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
7:15	4		1.	0	367			101	2
7:30	6		3	1	339			131	1
7:45	5		0	0	328			114	0
8:00	0		0	1	265			115	0
TOTAL	15	0	4	2	1299	0	0	461	3

TOTAL	10	0	4	8	626	0	0	1196	21
17:30	5		0	3	189			298	9
17:15	2		0	3	149			275	6
17:00	0	***************************************	3	0	154			310	2
16:45	3		1	2	134			313	4

CDM Smith File Name: Taylorsville Rd & Blankenbaker Pkwy

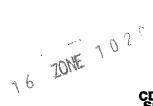
Start Date: 2/25/2014

			Blanke	nbaker		Ta	ylorsv	lle Roa	ad	Ta	ylorsvi	lle Roa	ıd
			From	North			From	East			From	West	
Start	Time	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
7:00	AM	12	0	10	0	115	135	0	0	0	65	72	0
7:15	AM	16	0	17	0	104	144	0	0	0	85	91	0
7:30	AM	17	0	17	0	152	158	0	0	0	115	98	0
7:45	AM	13	0	15	0	151	142	0	0	0	83	136	0
8:00	AM	15	0	22	0	130	133	0	0	0	66	93	0
8:15	AM	15	0	17	0	102	134	0	0	0	61	83	0
8:30	AM	14	0	15	0	70	105	0	0	0	63	55	0
8:45	AM	29	0	20	0	60	127	0	0	0	73	49	0
4:00	PM	63	0	70	0	25	118	0	0	0	131	18	0
4:15	PM	60	0	74	0	18	129	0	0	0	132	27	0
4:30	PM	93	0	95	1	42	122	0	0	0	146	24	0
4:45	PM	89	0	103	0	24	94	0	0	0	143	24	0
5:00	PM	115	0	112	0	33	110	0	0	0	136	25	0
5:15	PM	150	0	95	0	40	107	0	0	0	113	34	0
5:30	PM	113	0	114	0	35	128	0	0	0	134	24	0
5:45	PM	71	0	93	1	31	111	0	0	0	132	29	0

		Blanke	nbaker	•	Та	ylorsv	ille Ro	ad	Ta	ylorsv	ille Roa	ad
		From	North			From	East			From	West	
Start Time	Rght	Thru	Left	Other	Rght	Thru	Left	Other	Rght	Thru	Left	Other
7:15 AM	16	0	17	0	104	144	0	0	0	85	91	0
7:30 AM	17	0	17	0	152	158	0	0	0	115	98	0
7:45 AM	13	0	15	0	151	142	0	0	0	83	136	0
8:00 AM	15	0	22	0	130	133	0	0	0	66	93	0
TOTAL	61	0	71	0	537	577	0	0	0	349	418	0
		· · · · · · · · · · · · · · · · · · ·										· · · · · · · · · · · · · · · · · · ·
4:45 PM	89	0	103	0	24	94	0	0	0	143	24	0
5:00 PM	115	0	112	0	33	110	0	0	0	136	25	0
5:15 PM	150	0	95	0	40	107	0	0	0	113	34	0
5:30 PM	113	0	114	0	35	128	0	0	0	134	24	0
TOTAL	467	0	424	0	132	439	0	0	0	526	107	0



MAY 23 2016
PLAINING &
DESIGN SERVICES





# Appendix B HCS Reports



	HCS 2010	Signa	lized l	nters	sectio	n Re	sults :	Summ	агу				O all d'anni a Characan a reachagh a ta
									-				
General Information	and the state of t	indichano na manana n	s commentations of		elienipuose de procupación.		AND DESCRIPTION OF THE PERSONS ASSESSED.	ction Inf	Nacque and an artist of	on 			
Agency Analyst	CDM Smith DBZ	***************************************	***************************************	migroumore residen			Duration	ercontractor constraints	0.25	менентичный принципа			
Jurisdiction	NDC Comprehensive construction of the construc	nianinglavaransessonen	sis Date	authorization and the	Actional constitution and an artist	**************************************	Area Ty	pe	Other	·	[		
Urban Street	Taylorsville Road	waxiofstatististenen	Period	AM F	1965/TEX.0009/95/A/A	MANAGEMENT OF THE PARTY OF THE	PHF	en e	0.90	er-manananavasca	=	**	-
Intersection	Blankenbaker Pkwy	mana magazina da para d	/sis Year Vame	ويوندون والمحاولات وأكباه	ROSERRAS SERVICE	* ************************************	Analysis	s Period	1> 7:1	30 			
Project Description	Apartments	FILE	varie	Biani	kenbake	PLAIM 1	o.xus	NEW CONTRACTOR OF THE PARTY OF	elektriken kalanda kal	on decree on the second			
,	у фанилена												
<b>Demand Information</b>			EB			W	В		NB			SB	
Approach Movement		L	T	│ R	L	T	makes in region was to the partie	T L	TT	∏ R	L	ΤT	R
Demand ( v ), veh/h		462	386	an ann an t-American	****	68	1 633	1	Celebrate Strategy and Colors	erneden en graen de gelonie.	78	ele de la constanta de la cons	67
C:													
Signal Information Cycle, s 83.4	TD-f			3	님사		desagrapas	Aucherina			_		人
Cycle, s   83.4 Offset, s   0	Reference Phase 2		<b>-</b>	Bertanania Bertanania Bertanania	- Constitution	and the second	enductorists	Garanness			4		<b>.</b> .
Uncoordinated Yes	Reference Point End	Gree	n 16.7	43.3	6.2	0.0	PHYSIOLOGICAL PROPERTY.	0.0	لا	o se estado de estad	<u>K</u>	ΙĹ	en en en en en en en en
Force Mode Fixed	Simult. Gap E/W   On Simult. Gap N/S   On	Yellov Red	v 3.5 2.0	5.0 1.5	3.6	0.0		0.0		<b>,</b>	•	\_	
Torce mode Trace	Simul Gap 14/3 On	Reu	{ <b>2.</b> U	[1.0	1.5	0.0	0.0	10.0	- Mariana de la composición dela composición de la composición de la composición de la composición dela composición de la composición dela composición dela composición de la				
Timer Results		EB	1 1	EBT	WE	21	WBT	ND		NOT	CD)		
Assigned Phase		5		2	VYL	)L	4 <b>4</b> 01	NBL		NBT	SBL	********	SBT
Case Number		1.0		4.0			7.3						4
Phase Duration, s		22.		72.0	i		49.8		nor-management reason			and a second	9.0
Change Period, (Y+R	e <b>1.</b> 5	5.6	newsproper and the second	6.5			6.5					energe de la company	11.3 5.1
Max Allow Headway (	PYNAMES IN PRINCIPAL AND	4.	POTATOR DESIGNATION OF THE PERSON OF THE PER	4.4	A Proposition of the Party of t		4.4			and-re-co-co-co-st-co-co-co	Constituting the Assessment Land	-	3.2
Queue Clearance Time	≘(a+),s	15	lateria interioriale de la contrata del contrata de la contrata de la contrata del contrata de la contrata del la contrata del la contrata de la contrata del la contrata de la contrata del	7.4			29.9		+				6.0
Green Extension Time		1.5	ereservice exercises	4.1		Hotels Harris States	13.2			Methodological policy	Paris - paratro estre en estado		0.3
Phase Call Probability		1.0	0   1	.00		oonsoods.	1.00			o consequences			0.98
Max Out Probability		0.1	2 0	0.01		terminator di proces	0.11		_	Printelinian printelinian in			0.00
Movement Group Res	sults		EB			WB			NB			SB	
Approach Movement		L	T	R	L	T	R	L	T	R	L	T	l R
Assigned Movement		5	2			6	16	and the second		PMPM statement statement	7	- CONTRACTOR OF THE STREET	14
Adjusted Flow Rate ( v		513	429	rantindra range at a		757	703			rana ana ana ana ana ana ana	87	Selder Selection State Selection Sel	74
Adjusted Saturation Flo		1757	1845	est-control or on on order		1845	1563				1757		1563
Queue Service Time (		13.1	5.4	September 1900		27.9	27.7				4.0	en-en-en-en-en-en-en-en-en-en-en-en-en-e	3.0
Cycle Queue Clearance	e Time (g ₀), s	13.1	5.4	Gept-considerate value	-	27.9	27.7		······································		4.0		3.0
Green Ratio (g/C)		0.75	0.79	Richard Barbaran		0.52	ned terminal entre		50545764646464646	in the late to the second	0.07		0.28
Capacity ( c ), veh/h Volume-to-Capacity Ra	4-1V)	569	1451		MANAGE PROTECTION OF STREET	959	930				131	nannananan,	431
Available Capacity ( c .	MSTONESTED PROPERTY PORTER CONTROL OF THE PROPERTY OF THE PROP	0.902	to compression and a	sidesides <del>es</del> tata		0.789	and a series of the series of		elektronen paranagan da		0.660	es-andronomentonomen	0.173
id American Charles and Charle	eh/In ( 95 th percentile)	740	2204	er en	Andrewski anderson	Sandara de la composição	1517		September Septem		839	n angere de la constant de la const	1061
	RQ) (95 th percentile)	11.1 0.54	2.0 0.05			16.1 <b>0.64</b>	13.2			***************************************	3.2	e in Milde Street, or	1.9
Uniform Delay ( d + ), s		18.3	2.5	OMERICA DA		16.3	0.56 12.5				0.22	Daniel State of the State of th	0.13
Incremental Delay ( d 2		11.9	0.1	SISSINAL MEMORIA		1.6	1.4			Marini Salahan da Salahan	37.7 2.1		23.1
Initial Queue Delay ( d		0.0	0.0	Port Property	Personal Control	0.0	0.0				0.0	- Secretario de la companio de la c	0.1
Control Delay ( d ), s/ve		30.2	2.6		Armonista Automorphis	18.0	13.9				39.8	enterna en enterna de la	0.0 23.1
Level of Service (LOS)		С	A			В	В		1		D D	Colony of the second	23.1 C
Approach Delay, s/veh		17.6	เลาสาราชาธารณสาขายกระที่สาขายการเสียง	8	16.0	Anantomigrations	В	0.0	515-315-11-08-1-08- <b>4</b> 1		32.1	energy control control	c
Intersection Delay, s/ve	h/LOS		NO PORTUGUIS AND PROPERTY.	17	ROTATION CHICAGO CONTRACTOR CONTR	and the confinence of	auto v Amustan su cicio di	Process Commenced Commence	PARTY NEW YORK CONSTRUCTION	inconstantini I	3	an sawahatan an	CONTRACTOR STATE
										•			
Multimodal Results			ĘB	and the second		WB			NB			SB	
Pedestrian LOS Score	ethologisch die einste der der der der der der der der der de	0.6		A	2.2	and the second second second	В	2.3		В	2.3		В
Bicycle LOS Score / LO	)5	2.0		В	2.9		C			7	- Constitution of the		F

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HER PROPERTY OF THE PROPERTY O	DM Smith	νουσιαστουσιαστοιο Λ το	o Dot-	May 9,	2012	equisions Services	ea Type	OURSESSESSESSESSESSESSESSESSESSESSESSESSES	Other	underweiselenber von ver			
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and the second s	ankenbaker Pkwy	File Na	me	Вапке	noaker/	AIVI ZU	ND.XUS	ducos parameters	resciona di Antonio Antonio	aleden HOOF FIRST PART	- 4		
Project Description A	partments												
Demand Information			EB			WB			NB			SB	
Approach Movement		L	T	ΓR	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h		500	418		Annual residence of the	736	685		ediconsciones de la conscione	order-resources	84	AUGUSTOSADADASA	73
Demand ( v ), versi													
Signal Information			6.	\$-	IJŢ.	1							人
	Reference Phase 2		Control Control	A CONTRACTOR OF THE PARTY OF TH	-machwill		1	e control de la		-	4		E 3
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nton proprieta de la companya de la	Simult. Gap E/W On	Yellow		5.0	3.6	0.0	00	0.0		<b>,</b>	<del></del>	5	
and the second s	Simult, Gap N/S On	Red	20	15	1.5	0.0	0.0	0.0	- Control of the Cont	A CONTRACTOR OF THE CONTRACTOR			
Timer Results		EBL		EBT	WBL		NBT	NBL		NBT	SBL		SBT
Assigned Phase	aki kapangka kabana kapangka kabana kabana mengka pangkan kanaman kaban kenala kenala kenala kenala kenala ken Kabana	5	erandonipasinonis	2	- Marchard America and		6			esimple sinche Sende de Sende		emenon@enterone	4
Case Number		1.0		4.0			7.3		a de la companya de l				9.0
Phase Duration, s		30.0		92.1	N-19-19-19-19-19-19-19-19-19-19-19-19-19-	1	62.0						12.8
Change Period, (Y+R a)		5.5		6.5			6.5						5.1
Max Allow Headway ( MA	Friedrichte Geschaft der Strieber der Strieb	4.1	principal and pr	4.4	ternesia substitute de cui principale cui en es	SHOWEN STREET	4.4	reindenden der Anders			Total Control		3.2
Queue Clearance Time (	Michigan Philiphian and Chair Angele (Angele philiphia) and chair and chair and chair and chair and chair and chair	24.3	esencederenne L	8.5			41.5						7.5
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Adjusted Saturation Flov		1757	1845			1845	1563		-	-	1757		1563
Queue Service Time ( g	s ), 5	22.3	6.5	I description of the second	Control of the Control	39.3	39.5	hannanin engles intil ethe			5.5	ciestestestestestestestes	4.0
Cycle Queue Clearance	Time ( g $_{\circ}$ ), s	22.3	6.5			39.3	39.5		- Company of the Comp		5.5	hande on the contract of the	4.0
Green Ratio (g/C)		0.78	0.82			0.53	0.60				0.07	en-arrennen en en en en en	0.31
Capacity ( c ), veh/h		581	1505			977	943		and the second s		130		481
Volume-to-Capacity Rati	o(X)	0.956	0.309		- Company of the Comp	0.837	0.807	CONTRACTOR			0.719	planiplanianinkolopalia	0.169
Available Capacity ( c .)	inderstational exterior in the second contraction of the second contra	589	1757			1318	1232				669		961
Back of Queue (Q). vel	PARTICAL CALIFORNIA POR CONTRACTOR CO	24.5	2.6			23.3	19.4		Lancascanor		4.4	dependent of the second	2.6
Queue Storage Ratio ( F		1 19	0.07			0.92	0.83				0.30	Kelonik de denombre de	0.18
Uniform Delay ( d + ). s/v	ilipining kangalang kangang kangang kanang kanang kangang kangang kangang kanang kanang kang k	27.4	2.4			20.9	16.1	CONTROL CONTROL	all and a second		47.6	şıoşışının səsəsənə	26.5
Incremental Delay ( d 2)	productiva de tradição de comprehensivo de destructivos de tradições de tradições de tradições de tradições de	26.3	0.1			3.8	3.2				2.8		0.1
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Control Delay ( d ), s/vel		53.7	2.5	and the second s		24.7	19.3				50.3		26.6
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and the state of t	Taylorsville Road	Anah	sis Yea	r 2020	Build	CANDA AND AND A	Analysi	s Period	1>7	': <b>00</b>	Manager 1		
The second secon	Blankenbaker Pkwy	File I	lame	Blani	kenbake	er AM :	20 B.xus		- Store and Application	Reference Charge in			_
Project Description  Demand Information	Apartments		EB			W	'B		NE			SE	
Approach Movement	And the second s	L	T	│ R	L	1	「	L	i T	COLONIA CONTRACTOR	T L	T	
Demand ( v ), veh/h Signal Information		500	442			79	เหตุคระบบริการเกษตรและ	ครองเรื่องเราเกรายก			89		73
Cycle, s 113.7	Reference Phase   2	anned (g)	7	2	7~	il Continue	Opposite	à l'irginomana			А		人
Offset, s 0	Reference Point End	1	1,				No.	***************************************					
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Force Mode Fixed	Simult Gap N/S On	Red	2.0	1.5	3.6 1.5	0.0		0.0	u-a-ov	<i>f</i>		``	
					,		. , , , ,	, 0.0				1965-78613-886140-444	
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Change Period, (Y+R :	l.s	5.6	rainteachine <mark>d</mark> hanna an	6.5			6.5			internacional de la companya del companya del companya de la compa			13.7
Max Allow Headway ( M		4.1	www.cocceptoromes.co	4.4			4.4	Printing Printing and Constitution of the Cons		t-rec-kapaja-petagaa	- Interest Contraction	Description of the same	5.1
Queue Clearance Time	Entelepennentelepenenenenenenenen errorren error	27	SHIRENSHIP FOR PRINCIPLE	9.3		-	49.0	Transcription of the second	-	5915050-040-0400			3.2
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,		a 1.0	, ,	U.U.J			U.47						0.00
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Cycle Queue Clearance		25.0	7.3	oroko eskilokolistaliasies	***************************************	46.8	and a resemble of		n-m-minus de marcos	Patricular de Aconomica de	6.3 6.3	Orania (Charles and a	4.4
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Capacity ( c ), veh/h		538	1517			1023	HOENSHEWNWARMSONS		elistrations,	erke storical breas	0.08	bransa a a a a a a a a a a a a a a a a a a	0.30
olume-to-Capacity Rati	o ( X )	1.033	0.324			0.866			eserciones de la constante de	-	133	na ana ana ana ana ana ana ana ana ana	462
wailable Capacity ( c . )		538	1622	Section of the sectio	and the state of t	Commencers	na n	Parameter and the second	okuwakokokowowi		0.745	CONTRACTOR CONTRACTOR	0.176
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Queue Storage Ratio ( R		1 46	nemanana.			27.8	22.9	an terromonal and			5.1	MATERIAL SERVICE	3.0
Iniform Delay ( d 1 ), s/v		32.8	0.08 2.4			1.09	0.98		and the second	<b></b>	0.35		0.20
ncremental Delay ( d 2 )		47.6	0.1	en our a comment	The second second	21.7	16.5	West Common Comm	Market Hall Section of Contract		51.5	and the second s	29.8
nitial Queue Delay ( d 3		A SHINGH SHOWN CHOOS	chelicaemikokonoloka	of Control of the Control of Cont	and and the second	6.0	5.0	NORMAN PROPERTY AND			3.1	C-PO-CONTROL CONTROL C	0.1
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evel of Service (LOS)		804 F	2.6			27.8	21.5				54.6		29.9
pproach Delay, s/veh / I	ns	43.9	_A	D	3°4 A	C_	C		Haling and a second as	DELICORES ON THE PROPERTY OF T	D	dalamingassions	l c
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ntersection Delay, s/veh													
lultimodal Results edestrian LOS Score / L		0.6	EB	Α	2.3	WB	В		NB			SB	

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Jurisdiction	Time P	Community Services of Services	PM Pe	ak	a secretarista de la compa	HF		0.90	europoienienienienienienienienienienienienieni	- T		-
Urban Street Taylorsville Road	Analysi	s Year		per-sanchinestinistin	arranandrosera	nalysis F	eriod	1> 4:4	5 ***********			
Intersection Blankenbaker Pkwy	File Na	me	Blanke	nbaker l	PM 16.	XUS	payment and a second second	na a la constitución de la const	nanagirinininini			
Project Description Apartments  Demand Information		EB			WB			NB			SB	
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand ( v ), veh/h  Signal Information  Cycle, s   102.0   Reference Phase   2	137	674	And the second s		489	147				543 <b>4</b>	en e	598
Offset, s 0 Reference Point En	erinorem E	7.5	37.3	40.0	0.0	0.0	0.0	1			1 🛊	
Uncoordinated Yes Simult Gap E/W O	www Ureen	135	50	40.0 3.6	10.0	0.0	0.0		<b>,</b>	<b>(—</b> 1	<b>\</b> _	
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Total made												
Timer Results	EBL		EBT	WBL		WBT	NBL	-	NBT	SBL	secretories de la company	SBT
Assigned Phase	5		2			6	ncays no minerior in this first	eranaman da manaman	nienienienienienienienienienien	Andreas Charles Control Control	and the same of	4
Case Number	1.0		4.0		and the second	7.3						9.0
Phase Duration, s	13.0		56.9			43.8	una-ara-araranten		الماران		sinteriories de l'esperiente	45.1
Change Period, ( Y+R .), s	5.5		6.5			6.5	and property the second		esesses de destruición	Carried Halling Street	ercenting timber	5.1
Max Allow Headway ( MAH ), s	4.1	and the second second	4.3			4.3					monomina deserva	3.3
Queue Clearance Time ( g . ), s	7.2		37.3		and the second	29.0			kasas salas ista ka		en en en en en en en en	42.0
Green Extension Time ( g . ), s	0.4		8.4		- Anna Anna Anna Anna Anna Anna Anna Ann	8.3			univioleteleteletelet			0.0
Phase Call Probability	0.99		1.00	Section and the section of the secti	erricument	1.00		The second		Suppose a service de la companya de	ensemble de la company	1.00
Max Out Probability	0.00	hankalakerandhanninin	0.00	A STATE OF THE PROPERTY OF THE		0.02						1.00
,											20	
Movement Group Results	angana di manananananan	EB	ingayan kepangan kenangan ken		MB	-	and the second second	NB			SB	
Approach Movement	L	T	R	L	T promovenesia sustaine	R	L	T	R	Į L	T	l R
Assigned Movement	5	2			6	16		and the second s		7		14
Adjusted Flow Rate ( v ), veh/h	152	749			543	163				603		664
Adjusted Saturation Flow Rate ( s ), veh/h/in	1757	1845			1845	eligiente de la contraction de		Parameterane		1757	erianjanjanjanjanjanjanjan	1563
Queue Service Time ( g s ), s	5.2	35.3	manufacture and the same of th		27.0	2.9	and a contract of the contract	Samuelanian		32.4	paroteolecisco-cisco	40.0
Cycle Queue Clearance Time ( g = ), s	5.2	35.3			27.0	2.9	and the second second	and the second		32.4	San	40.0
Green Ratio ( g/C )	0.46	0.49			0.37	0.76		agreement enterent enterent		0.39		0.47
Capacity ( c ), veh/h	287	911		1	675	1185				689	ar in the second second second	729
Volume-to-Capacity Ratio (X)	0.530	0.822	value and a second second		Co-ci-o-carantenino	0.138	-		- Company of the Comp	0.875	-	0.911
Available Capacity ( c . ), vet/h	588	1809			1357	en e	and the second second		a granina in internation	689	September 2000	729
Back of Queue (Q) veh/ln (95 th percentile)	3.9	21.0			17.6	MONTH CALLACTE CALCALON CALCAL	il Bransansansansa		-	21.6	ii E Balantialiste Month	23.7
Queue Storage Ratio ( RQ ) ( 95 th percentile)	0.19	0.52			0.69			-	a grant and a second	1.47	Beresensesense	1.62
Uniform Delay ( d + ). s/veh	21.3	22.0	- Constitution of the cons		29.1	3.3		-	A PARTIE AND A PAR	28.7		25.3
Incremental Delay ( d 2 ), s/veh	1.5	2.1	- Company of the Comp		2.5	0.1	and the second s	- Jacobson - Control		11.7	anacecularies	15.4
Initial Queue Delay ( d 3 ), s/veh	0.0	0.0			0.0	0.0			adjonnersmenterstere	0.0	1	0.0
Control Delay ( d ), s/veh	22.8	24.1	1		31.6	insightenining in the second				40.4	-	40.6
Level of Service (LOS)	C	C	eduracione	e di periodo de la compania	C	A	and the second	and the second second	padaman menengan	D	ļ dammer pro	D
Approach Delay, s/veh / LOS	23	9	С	25.	0 [	C	0.0	<b>)</b>		40.5	) [	D
Intersection Delay, s/veh / LOS			3	81.5						С		
		EB			WB			NB			Se	
Multimodal Results		સંસાસસોસાસમાજી	**************************************	ci, Britishini da kalendari	Haliahahahatik	в В	2.3		В	2.3	de la la companyante	. В
Pedestrian LOS Score / LOS	0.7		<b>A</b>	2.3	) Sentententententententen	A	<b>₫</b>		en e		economic market	F

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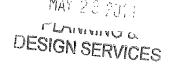


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General Information						e de la companya de l	Interse	ction Ir	forn	natio	n		CONTRACTOR OF THE PARTY OF THE	
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Demand Information			EB	<b>.</b>		W	В			NB			S	iB
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Demand ( v ), veh/h  Signal Information		148	728			52	9 159					587		64
Cycle, s   107.2	Reference Phase 2	1		-		7	everabilities.	Septionies.	,			А		人
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			_			, 5.0	, 5.5	,						
Timer Results		EB	L	EBT	WB	l	WBT	NE	li	٨	IBT	SB	ı	SBT
Assigned Phase		5	Z	2			6		************	Commence of		_ JD	L. Westerner	- 301 4
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Change Period, (Y+R a		5.5	hearing an ann a	6.5			6.5		SecSycles wilder	-	t-conservations		-	45.1
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Queue Clearance Time	and the second s	7.7	ocoonialisco	42.4			4.3	-		ļ	tirales son the court		nere e e e e e	3.3
Green Extension Time (		7.7 0.5	-	9.7			32.5			Communication	- Service de La Companyo	and other processes	anaman da	42.0
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	), verum	164	810					8				en contration and a service and a	diaminimini	
Adjusted Saturation Flor		Programme Co.	g-c-c-sandanaec	4		588	177		-		Francisco Barrio Barrio Barrio	652	gostorene	719
	w Rate (s), veh/h/in	1757	1845	re-distance-outless-ou		1845	1563					1757		156
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Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C )	s ), S	5.7 5.7 0.49	40.4 40.4 0.52	re-distance-outless-ou		1845 30.5 30.5 0.39	1563 3.2 3.2 0.76					1757 39.7	Prince of the Control	156 40.
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Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity Rati	s), S Time (gs), S	5.7 5.7 0.49 288 0.572	40.4 40.4 0.52 956 0.847			1845 30.5 30.5 0.39 722 0.814	1563 3.2 3.2 0.76 1196					1757 39.7 39.7 0.37	Aberratory (I)	156 40. 40. 0.4
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Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity Rati Available Capacity ( c • Back of Queue ( Q ), vel	s), S Time (gs), S  io (X) ), veh/h h/ln (95 th percentile)	5.7 5.7 0.49 288 0.572 565 4.2	40.4 40.4 0.52 956 0.847 1721 23.6	,		1845 30.5 30.5 0.39 722 0.814	1563 3.2 3.2 0.76 1196 0.148					1757 39.7 39.7 0.37 656 0.995	Andrewson (Inc.)	156 40. 40. 0.4 702 1.02
Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity Rati Available Capacity ( c » Back of Queue ( Q ), vel Queue Storage Ratio ( F	s), s Time (g s), s  io (X) ), veh/h h/ln (95 th percentile) RQ) (95 th percentile)	5.7 5.7 0.49 288 0.572 565	40.4 40.4 0.52 956 0.847 1721 23.6 0.59	,		1845 30.5 30.5 0.39 722 0.814 1291	1563 3.2 3.2 0.76 1196 0.148 1678					1757 39.7 39.7 0.37 656 0.995 656		156 40. 40. 0.4 702 1.02 702
Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity ( c » Back of Queue ( Q ), vel Queue Storage Ratio ( F Uniform Delay ( d 1), s/v	s), S Time (g s), S  io (X) ), veh/h h/in (95 th percentile) RQ) (95 th percentile)	5.7 5.7 0.49 288 0.572 565 4.2	40.4 40.4 0.52 956 0.847 1721 23.6	,		1845 30.5 30.5 0.39 722 0.814 1291 19.4	1563 3.2 3.2 0.76 1196 0.148 1678 1.4					1757 39.7 39.7 0.37 656 0.995 656 30.0		156 40. 40. 0.4 702 1.02 702 33.
Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity Rati Available Capacity ( c » Back of Queue ( Q ), vel Queue Storage Ratio ( F Uniform Delay ( d 1), s/s Incremental Delay ( d 2)	s), S Time (g s), S  io (X) ), veh/h h/ln (95 th percentile) RQ) (95 th percentile) /eh	5.7 5.7 0.49 288 0.572 565 4.2 0.21	40.4 40.4 0.52 956 0.847 1721 23.6 0.59	,		1845 30.5 30.5 0.39 722 0.814 1291 19.4 0.77	1563 3.2 3.2 0.76 1196 0.148 1678 1.4 0.06					1757 39 7 39 7 0.37 656 0.995 656 30.0 2.05		156 40. 40. 0.4 702 1.02 702 33.
Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity ( c » Back of Queue ( Q ), vel Queue Storage Ratio ( f Uniform Delay ( d 1 ), s/v Incremental Delay ( d 2 ) Initial Queue Delay ( d 3	s), S Time (g s), S  io (X) ), veh/h h/ln (95 th percentile) RQ) (95 th percentile) veh ), s/veh ), s/veh	5.7 5.7 0.49 288 0.572 565 4.2 0.21 21.8	40.4 40.4 0.52 956 0.847 1721 23.6 0.59 22.1	,		1845 30.5 30.5 0.39 722 0.814 1291 19.4 0.77 29.1	1563 3.2 3.2 0.76 1196 0.148 1678 1.4 0.06					1757 39.7 39.7 0.37 656 0.995 656 30.0 2.05 33.5		156 40. 40. 0.4 702 1.02 702 33. 2.29
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Queue Service Time ( g Cycle Queue Clearance Green Ratio ( g/C ) Capacity ( c ), veh/h Volume-to-Capacity Rati Available Capacity ( c » Back of Queue ( Q ), vel Queue Storage Ratio ( f Uniform Delay ( d 1 ), s/v Incremental Delay ( d 2 ) Initial Queue Delay ( d 3 Control Delay ( d ), s/vel Level of Service (LOS)	s), S Time (g a), s  io (X) ), veh/h h/ln (95 th percentile) RQ) (95 th percentile) veh l, s/veh h.	5.7 5.7 0.49 288 0.572 565 4.2 0.21 21.8 1.8 0.0 23.6 C	40.4 40.4 0.52 956 0.847 1721 23.6 0.59 22.1 2.4 0.0 24.5 C		the sound to be seen the sound	1845 30.5 30.5 0.39 722 0.814 1291 19.4 0.77 29.1 2.5 0.0 31.6 C	1563 3.2 3.2 0.76 1196 0.148 1678 1.4 0.06 3.3 0.1 0.0 3.4 A	0.0				1757 39 7 0 37 656 0 995 656 30 0 2 05 33.5 33.7 0 0 67 2 E 68.6		156 40. 40. 0.4 702 702 333. 2 2 29. 40. 69.8
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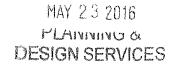




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Queue Service	Serventeriorisettettette	ericanimistrativa de la contrativa de la c	sananananananan	6.9	60.8	Secure contracts		41.5	3.2		jaskijamskijamskajieskojeski	-	55.0	entra de la constante de la co	55.0
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		veh/In ( 95 th percen	tile)	5.3	36.7	Linguistation		26.2	1.3	Berneyaria-Neckschenbert	Desta Carron Serior Desta Carron Serior		41.3	persion bestemmenters or	39.8
		( RQ ) ( 95 th percer		0.26	0.92	No.		1.03	0.06		la management		2.82		2.71
Uniform Delay (				26.0	30.3	1		33.2	2.1		Bostonous and a second	- desperanse and a	42.6		37.9
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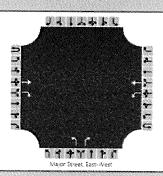
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General Information		Site Information	
Analyst	DBZ	Intersection	Entrance
Agency/Co.	CDM Smith	Jurisdiction	
Date Performed	5/6/2016	East/West Street	Taylorsville Road
Analysis Year	2020	North/South Street	Entrance
Time Analyzed	AM Peak Build	Peak Hour Factor	0.93
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Taylorsville Road Apartments		

#### Lanes



### **Vehicle Volumes and Adjustments**

Approach		East!	bound			Westbound				North	bound	William Control	Southbound				
Movement	T v	T	7	R	Tu		TT	Ř	Tu	L	7	F	ĺυ	Ti	T	T R	
Priority	10	1	2	3	4U	4	5	6	1	7	8	9	T	10	11	12	-
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Volume (veh/h)			502	29		13	1114	1	* CONTROL TO SOME	118	DAMESTON STATEMENT	51	en and the letters that the letter	-		1	
Percent Heavy Vehicles	Security Company of the Company of t		-			3	-			3		3	1			-	-
Proportion Time Blocked			A CONTRACTOR OF THE PARTY OF TH						- Contract of the Contract of	**************************************	and the second second	<b>t</b> —	<b>†</b>				Section 2
Right Turn Channelized		No				No				٨	I. √o		No No				
Median Type		Left Only								PHOTO CONTRACTOR CONTR		P. M. S.	Secure Charles Constitute	- Contract			

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Median Storage

#### Delay, Queue Length, and Level of Service

Flow Rate (veh/h)					14				127	of profession profession	55		-		
Capacity				9	196				198		540				
v/c Ratio				0	.C1		Bearing Control of the Control of th		0.64	· Control of the cont	0.10		<u> </u>		<b>†</b>
95% Queue Length					1.0			***************************************	3.8	İ	0.3				
Control Delay (s/veh)				1	3.7				50.9		12.4			T	
Level of Service (LOS)					A				F		8	enskin prezidenta			
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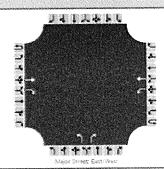
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DESIGN SERVICES



HCS 2010 Two-W	Vay Stop Control Summary Report								
	Site Information								
DBZ	Intersection	Entrance							
CDM Smith	Jurisdiction								
5/6/2016	East/West Street	Taylorsville Road							
2020	Narth/South Street	Entrance							
PM Peak Build	Peak Hour Factor	0.93							
East-West	Analysis Time Period (hrs)	0.25							
Taylorsville Road Apartments	ing kalandahan da Kalandah (Perlamban) kemandilan sakerak da Kalandahan (Perlamban) kemandahan da Perlamban da Kalandahan da Kalandah (Perlamban) kemandilan sakerak da Kalandahan (Perlamban) kemandahan da Perlamban da Per								
	DBZ CDM Smith 5/6/2016 2020 PM Peak Build East-West	DBZ Intersection  CDM Smith Jurisdiction  5/6/2016 East/West Street  2020 North/South Street  PM Peak Build Peak Hour Factor  East-West Analysis Time Period (hrs)							

#### Lanes



100 BB (1985 BB				
11-1-1-1-11-			SECREMENTS.	
Vehicle Vo	umes	anu mu	Mannella	

Approach	Eastbound					West	bound			North	bound		Southbound				
Movement	Ìυ	L	*	1 8	U	L	-	1 8	U	L	T	8	U	L	T	R	
reconstructive productive constructive const	10	1	2	3	4U	4	5	6	1 Doboviti in passessesses.	7	8	9		10	11	12	
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Delay, Queue Length,	and Level	of Se	rvice												
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95% Queue Length						0.4		and the same		2.4		0.5			
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Level of Service (LOS)					and the same of th	В				F		C	and the second	p de company of season	The Control of the Co
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Approach LOS							A		Approximation of the control of the		E				

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### Summary of Neighborhood Meetings 16ZONE1020

Neighborhood meetings were called to order by Bill Bardenwerper, counsel for applicant, on April 11 and May 19, 2016 beginning at 7:00 at Sojourn Community Church located at 11412 Taylorsville Road. He was assisted at the first meeting by David Mindel with Mindel, Scott, land planners and engineers. He was assisted at the second meeting by David Mindel, Diane Zimmerman with CBM Smith, Traffic engineers, and by George Chapman with Integra Realty Resources (IRR).

At the first meeting, the room was full, and at the second meeting, the room was half full, of property owners living along Taylorsville Road and in nearby subdivisions, or along nearby roads where all those people present stated that traffic is the overriding issue, arguing against any new development in this area. Most of the questions and speeches after the initial presentations involved traffic. Some involved storm water. Some involved why this location instead of others.

So the meetings began with Bill Bardenwerper showing a powerpoint presentation with images of the area, nearby road networks, nearby workplaces and nearby residential communities and homes. He explained that this site was chosen because of its good access to the large business park generally known as Bluegrass Industrial Park, Commonwealth Industrial Park, Blankenbaker Crossings and Blankenbaker Station – one of the largest business parks in the country. He said that this site was just a few hundred yards from Blankenbaker Parkway within easy access to all of that vast acreage. He said that people residing at this apartment community are not likely to be people working in downtown Louisville, off Bardstown Road or Hurstbourne Parkway. Rather the apartment community is intended for people who want to live in close proximity to these business parks. That means, he said, that this development's impact on Taylorsville Road will be hardly more significant than at present because people residing here to a large extent already travel Taylorsville Road into Jeffersontown or to the Snyder Freeway to access the places where they live. He said that the main traffic issues that he had the applicant's traffic engineer, Diane Zimmerman, have identified will be making left turns into and out of the proposed apartment community. He said this will be accommodated with a center left turn lane.

Diane Zimmerman, at the second meeting, presented her traffic impact study (TIS). As she showed the numbers and explained them, levels of service are acceptable in 2020 post development conditions and hardly change at all from what is otherwise projected considering normal growth conditions.

George Chapman, also at the second meeting, presented his market analysis with these conclusions. First, he said that this apartment community tested as the second highest rated apartment community he has ever analyzed. Second, he said that rental rates will be comparable to other nearby high-end apartment communities. Third, he said that market demand at this location is projected to be greater than the rate at which the builders can actually construct these apartment buildings. Fourth, he said that the above-referenced business parks are the primary attraction to people wanting to live at this location. He said that those workers are already of this road system and that apartments at this location will reduce their commuting distance.



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At the first meeting, there were lots of speeches about traffic and some about storm water. Those regarding storm water had to do with the fact that Chenoweth Run carries more water today than apparently every before. Mr. Bardenwerper and Mr. Mindel explained that this project will include detention facilities such that post development peak rates of run off will not exceed predevelopment conditions. These detention basins are intended to fully mitigate all adverse impacts of storm water. Few people who heard this believed it, even though this standard, as Mr. Bardenwerper explained, is one set by MSD, and accordingly the development plan will be carefully scrutinized by MSD to assure that these measures are met.

At the second meeting, virtually all of the speeches were about traffic and the desire that this apartment community be located somewhere else than along Taylorsville Road or that new housing like this not be built until roads are improved.

After considerable talk on both occasions about traffic in particular, Mr. Bardenwerper explained the process and likely schedule for official filing and planning commission committee meeting followed by full public hearing and final vote by Metro Council.

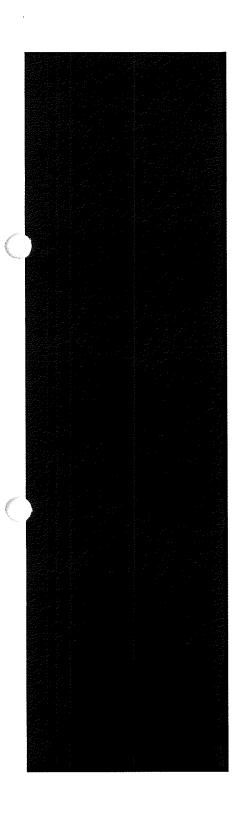
Respectfully submitted,

William B. Bardenwerper

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### Traffic Impact Analysis



**REPORT** 

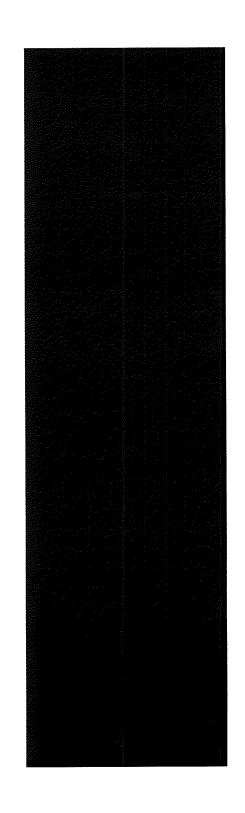
Taylorsville Road Apartments Louisville, KY

**Traffic Impact Study** 

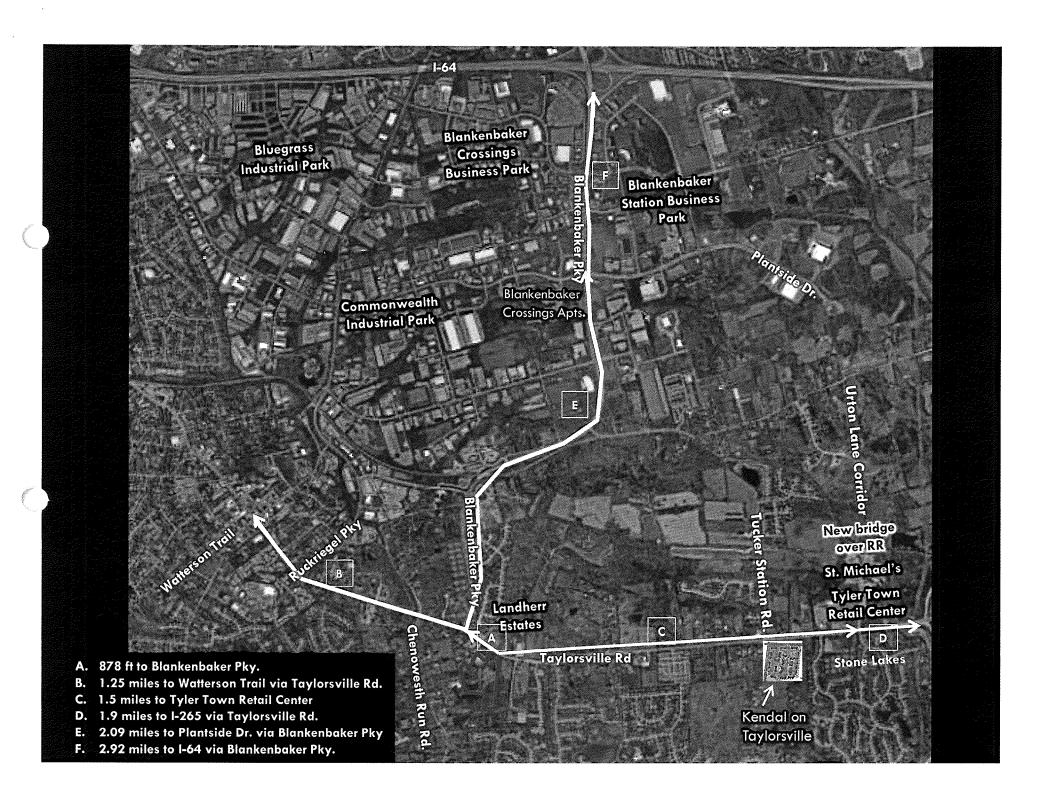
Louisville Metro Planning

May 9, 2016

CDM Smith



Sojourn Comm. Ch Taylorsville Road



#### **Existing Conditions**

Taylorsville Road is maintained by the Kentucky Transportation Cabinet with an estimated 2015 ADT of 18,500 vehicles per day east of Bolling Brook Drive, as provided by a Metro Public Works count. The road is a two lane road with eleven-foot lanes with four foot shoulders. The posted speed limit is 55 mph. There are no sidewalks.

A.m. and p.m. peak hour traffic counts were obtained at the intersection on April 26, 2016 (see Appendix A). The a.m. peak hour occurred between 7:15 and 8:15 and the p.m. peak hour occurred between 4:45 and 5:45 p.m. **Figure 2** illustrates the existing peak hour traffic volumes.

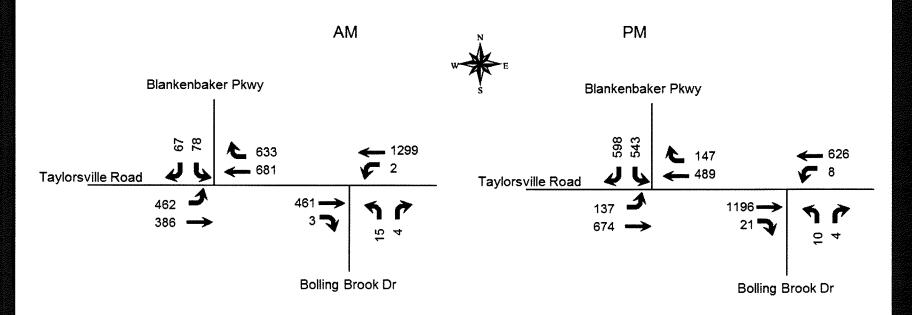


Figure 2 2016 Peak Hour Counts

#### **Future Conditions**

The projected completion year for this development is 2020, so the analysis year for this study is 2020. To predict traffic conditions in 2020, two percent annual growth in traffic was added. This growth is based upon a review of the count data along Taylorsville Road. **Figure 3** displays the 2020 No Build volumes.

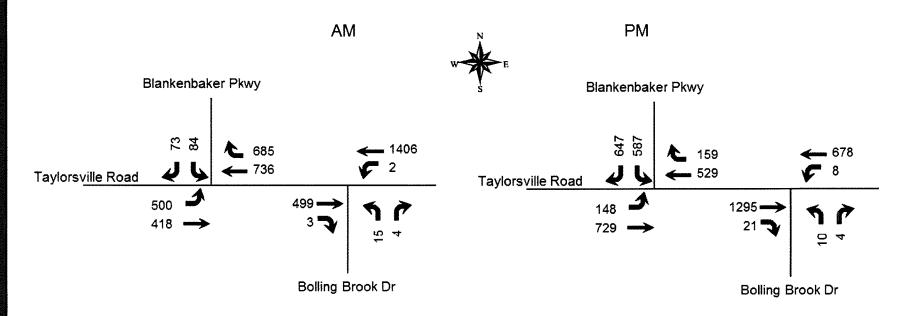


Figure 3 2020 No Build Peak Hour Volumes

#### Trip Generation

The Institute of Transportation Engineers <u>Trip Generation Manual</u>, 9th Edition contains trip generation rates for a wide range of developments. The land uses of "Apartments (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 211 a.m. peak hour trips and 251 p.m. peak hour trips. The trips were assigned to the highway network with 70 percent to/from the west and 30 percent to/from the east. This is based upon the existing traffic pattern on Taylorsville Road. **Figure 4** shows the trips generated by this development and distributed throughout the road network for the year 2020during the peak hours. **Figure 5** displays the individual turning movements for the year 2020 for the peak hours when the development is completed.

Table	1 -	<b>Trip</b>	Gene	ration
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	AM Peak Hour			PM	PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit	
Apartments (424 units)	211	42	169	251	163	88	

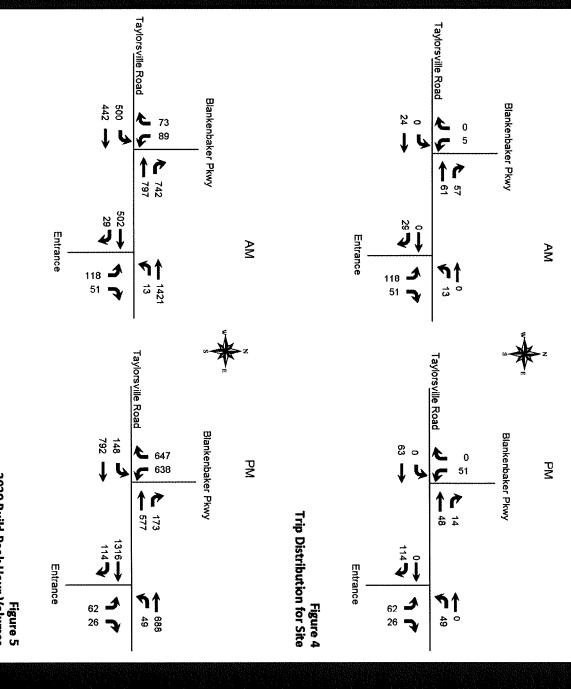


Figure 5 2020 Build Peak Hour Volumes

#### **Analysis**

The qualitative measure of operation for a roadway facility or intersection is evaluated by assigning a "Level of Service" or LOS. Level of Service is a ranking scale from A through F with each level representing a range. LOS results depend upon the type of facility that is analyzed. In this case, the LOS is based upon the average vehicle delay each movement experiences at an intersection.

To evaluate the impact of the proposed development, the vehicle delays at the intersection were determined using procedures detailed in the <u>Highway Capacity Manual</u>, 2010 edition. Future delay and Level of Service were determined for the intersection using HCS 2010 TWSC and Streets software (version 6.70). **Table 2** shows the results of the analysis for the three scenarios analyzed. The full printouts are included in Appendix B.

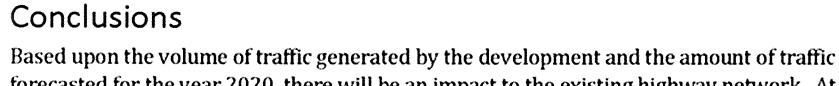
Table 2 - Level of Service Results

	AM Peak Hour			PM Peak Hour		
	2016	2020	2020	2016	2020	2020
	Existing	No Build	Build	Existing	No Build	Build
Taylorsville Road at Blankenbaker	B	C	C	C	D	D
Parkway	17.6	26.2	32.7	31.5	44.0	52.5
Taylorsville Road Eastbound	B	C	D	C	C	D
	17.6	30.4	43.9	23.9	24.4	36.4
Taylorsville Road Westbound	B	C	C	C	C	C
	16.0	22.1	24.7	25.0	25.1	28.8
Blankenbaker Parkway Southbound	C	D	D	D	E	E
	32.1	39.3	43.5	40.5	68.6	78.2
Taylorsville Road at Entrance						<u> </u>
Taylorsville Road Westbound (left turn)			A 8.7			B 14.6
Entrance Northbound			E 39.3			E 49.4

Note: Level of Service, delay in seconds

The 2020 PM Build conditions are achieved with an increase in the southbound (Blankenbaker Parkway) phase from 40 to 55 seconds.

Using the Kentucky Transportation Cabinet <u>Auxiliary Turn Lane</u> Policy dated 7/20/2009 and the volumes in **Figure 5**, the volumes do meet the warrants for an eastbound right turn lane and a westbound left turn lane on Taylorsville Road.



forecasted for the year 2020, there will be an impact to the existing highway network. At the main entrance to the apartment community an eastbound right turn lane and a westbound left turn lane will be constructed. The exit will have a dedicated left and right turn lane.

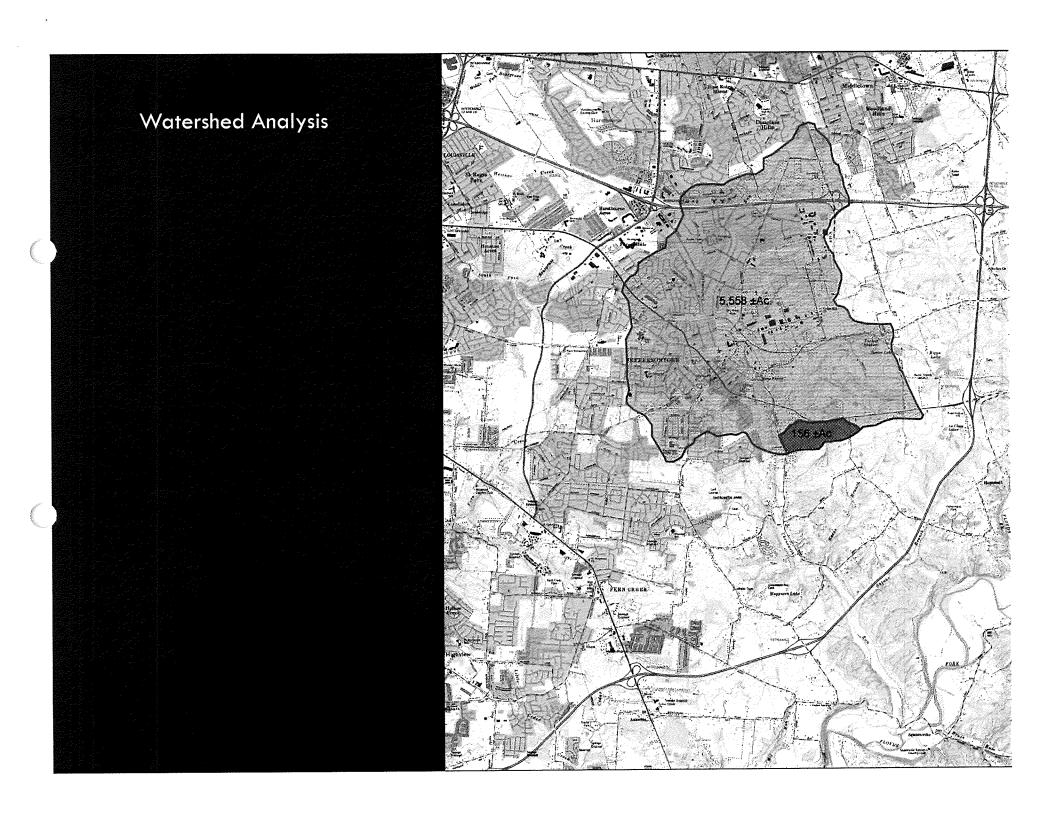
## Stormwater Analysis

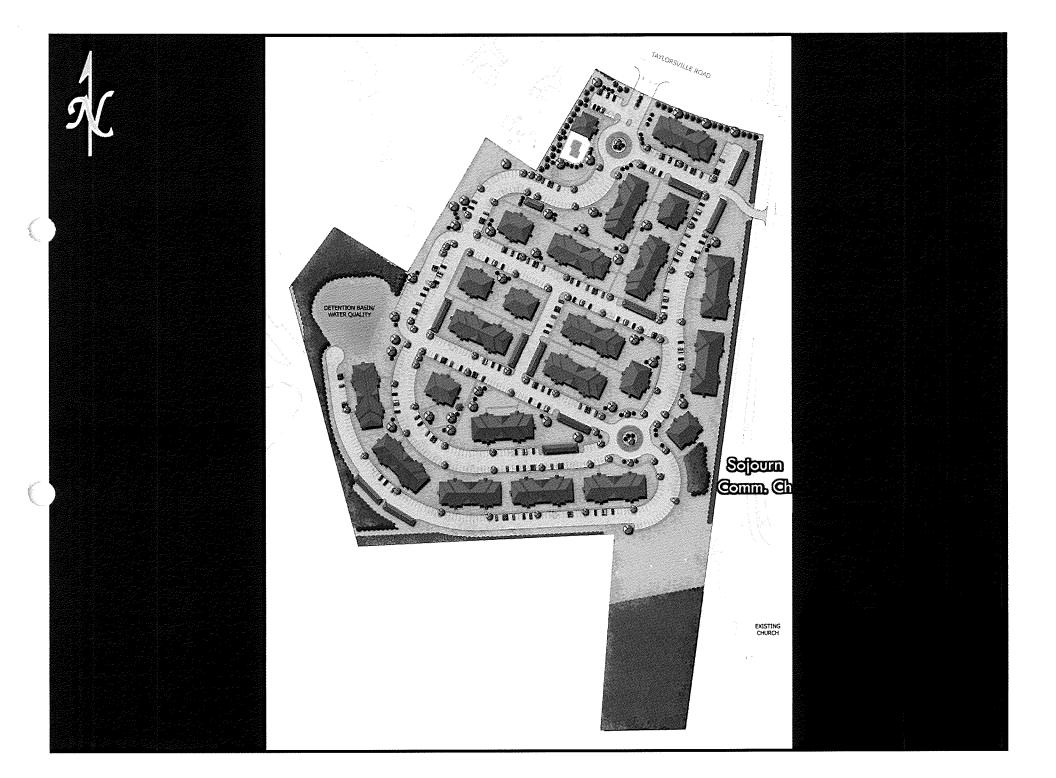
Taylorsville Road

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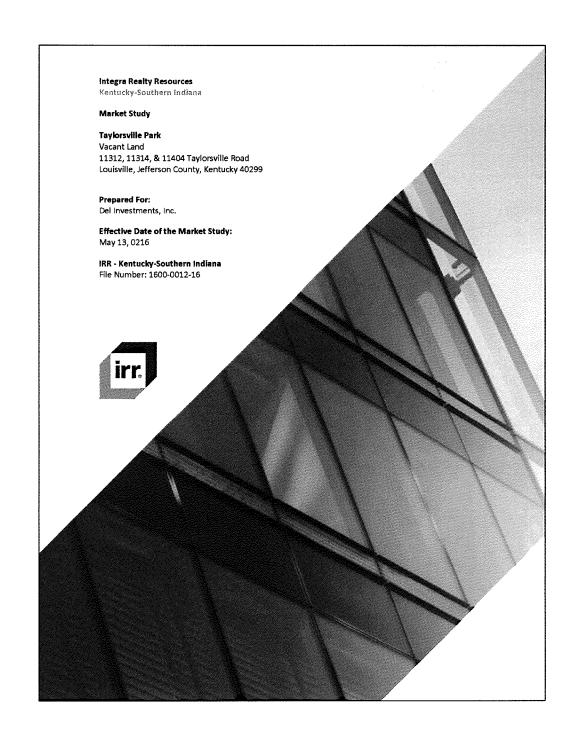
Bolling Brook Sub.

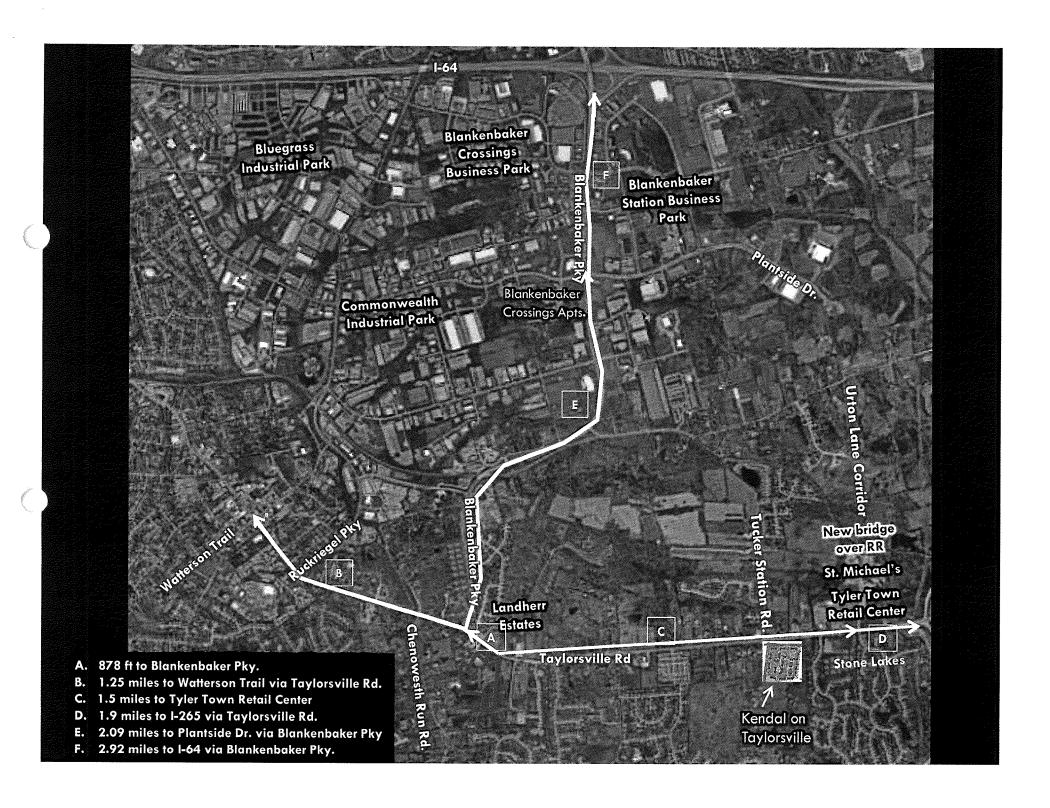
th Run Road



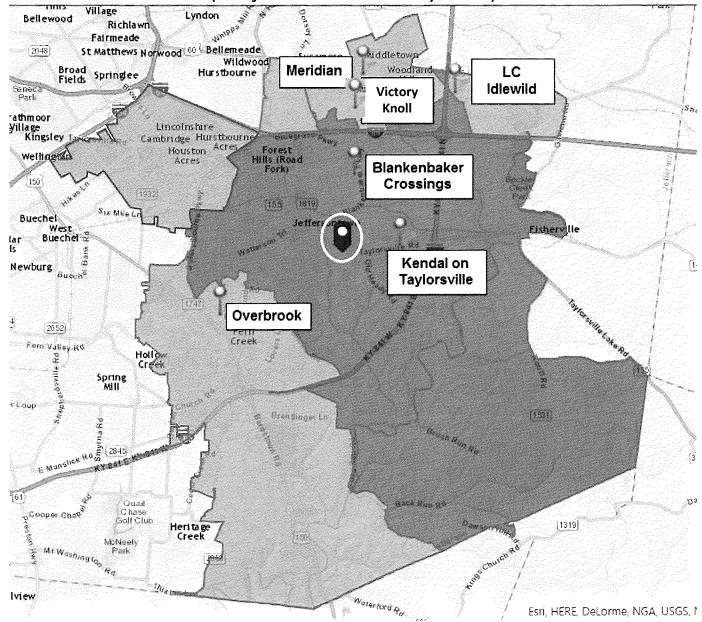


# Market Analysis





Major nearby newer/like-kind apartment communities (Subject site circled in yellow)



## Summary of rentals at major nearby newer/like-kind apartment communities (not including site fka Victory Knoll because construction slated to start next year)

No.	Property Name; Address	Yr Built; Stories	Unit Mix	# Units; % Occ.	Avg. Unit SF	Avg. Rent/ Month	Avg. Rent/ SF
1	Kendal on Taylorsville Apartments	2015-2016		309			
	4004 Keighley Park Ln.	3		100%			
	ζ ,		1BD/1BA	_	935	\$958	\$1.02
			2BD/2BA		1,290	\$1,190	\$0.92
			3BD/2.5BA Townhome	_	1,762	\$1,588	\$0.90
	Tenant-Paid Utilities:	Cable, In-Unit	Electric, Sewer, Water, Gas				
2	Meridian on Shelbyville	2014		304			
	12900 Observation Cir.	3		99%			
			1BR/1BA	80	830	\$995	\$1.20
			1BR/1BA w/ Study	25	1,043	\$1,065	\$1.02
			2BR/2BA	153	1,158	\$1,165	\$1.01
			2BR/2BA w/ Study	46	1,454	\$1,490	\$1.02
	Tenant-Paid Utilities:	Water, Sewer, Gas, In-Unit Electric, Cable					
3	LC Idlewild	2013-2014	360				
	700 Landis Ridge Dr.	3		99%			
			Bentley Flat I	_	698	\$940	\$1.35
			Bentley Flat II	-	772	\$965	\$1.25
			Greystone Flat I	-	748	\$945	\$1.26
			Greystone Flat II	-	1,104	\$1,050	\$0.95
	Tenant-Paid Utilities:	Water, Sewer	, Cable				
4	Overbrook Apartments	2012-2015		150			
	8901 Fairground Rd.	3		80%			
			1BD/1BA	42	850	\$825	\$0.97
			2BD/2BA	104	1,175	\$1,065	\$0.91
			3BD/2BA	4	1,300	\$1,299	\$1.00
	Tenant-Paid Utilities:	Cable, In-Uni	tric Cookii	ng			
5	Blankenbaker Crossings	2006		236			
	2515 Shining Water Dr.	3		99%			
	-		One Bedroom Flat	109	841	\$855	\$1.02
			Two Bedroom Flat	128	1,147	\$1,005	\$0.88
	Tenant-Paid Utilities:	Sewer, In-Uni					

<sup>\*</sup>Data provided as of First Quarter 2016

Competitive Market Product by Unit Type						
Apartment Community	Location	Bed/Bath	Average SF	Average Rent/SF		
Kendal at Taylorsville	40299	1, 1	935	\$1.02		
Meridian	40243	1, 1	880	\$1.15		
LC Idlewild	40245	1, 1	739	\$1.28		
Overbrook	40291	1, 1	850	\$0.97		
			Weighted Average	\$1.14		
Kendal at Taylorsville	40299	2,2	1290	\$0.92		
Meridian	40243	2,2	1226	\$1.01		
LC Idlewild	40245	2,2	1104	\$0.95		
Overbrook	40291	2, 2	1175	\$0.91		
			Weighted Average	\$0.96		
Kendal at Taylorsville	40299	3, 2.5 TH	1762	\$0.90		
Meridian	40243	NA	NA	NA		
LC Idlewild	40245	NA	NA	NA		
Overbrook	40291	3, 2	1300	\$1.00		
			Weighted Average	<i>\$0.94</i>		

<sup>\*</sup>Data provided as of First Quarter 2016

The following rents were used for the subject property survey:

• 1 bdrm: \$1.10 psf

• 2 bdrm: \$0.96 psf

• 3 bdrm: \$0.94 psf

## Subject apartment communities locational rank among 5 tested newer/like-kind apartment community locations

	Score*	Overall Rank
The intersection of Taylorsville Road and Blankenbaker Parkway, near Veterans Memorial Park	99	austrianistis in the state of t
The intersection of Bardstown Road and Hurstbourne Parkway, near the Fern Creek area	96	2
The intersection of Shelbyville Road and Hurstbourne Parkway, near the University of Louisville Shelby campus	93	3
The intersection of Blankenbaker Parkway and I-64, near Ellingsworth Lane	87	4
The intersection of Shelbyville Road and the Gene Snyder, near Middletown	75	5

<sup>\*</sup>Score is a weighted aggregate.

#### **Analysis Conclusions**

- Subject capture is estimated conservatively between 21 and 25 units per month and optimistically at 33 units per month.
- Demand is strongest for two bedroom units, with 50% of respondents choosing a two bedroom unit. Approximately 27% of respondents chose a three bedroom unit and 23% chose a one bedroom.
- The subject's location is considered strong, ranking 1<sup>st</sup> among five tested locations. This is a
  good sign for the subject property.
- The sample is heavily represented by the 25 to 44 age demographics and the \$60,000 to \$74,999 income demographic. The majority of respondent have an annual household income of over \$45,000. This is a positive indicator for the proposed apartment community.