November 17, 2025

Mr. Tim Crockett, P.E.
Crockett Engineering
1000 West Nifong Boulevard, Building 1
Columbia, MO 65203

RE: Traffic Impact Study – Multi-Family Development
Richland Road and Rolling Hills Road
Columbia, Missouri
CBB Job No. 101-25

Dear Mr. Crockett:

As requested, CBB has completed a traffic impact study pertaining to a proposed multi-family residential development in Columbia, Missouri. The development site is located in the southeast and southwest quadrants of Richland Road and Rolling Hills Road. The location of the site relative to the surrounding area is depicted in **Figure 1**.

Figure 1: Project Location Map

Based on the site plan provided by you, the proposed development will include approximately 240 multi-family apartment units. Access for the portion of the development on the west side of Rolling Hills Road is proposed via two new drives on Rolling Hills Road, while access for the portion of the development on the east side of Rolling Hills Road is proposed via one new drive on Rolling Hills Road and one new drive on Richland Road. A schematic of the concept plan provided is shown in **Exhibit 1**.

The purpose of this study was to determine the number of additional trips that would be generated by the proposed development, assign the trips to the adjoining roadways, evaluate the impact of the additional trips on the operating conditions for the adjacent roadways, and determine the ability of motorists to safely enter and exit the site. The focus of this study was the AM and PM peak hours of a typical weekday.

As requested, the following key intersections were included in the study:

- Richland Road and Rolling Hills Road;
- Richland Road and the proposed site access drive; and
- Rolling Hills Road and the proposed site access drives.

As requested, the traffic impact study evaluated the following analysis scenarios for the weekday AM and PM peak hours:

- 2025 Base Conditions (Existing plus approved area developments); and
- 2025 Build Conditions (2025 Base plus proposed site trips).

The following report presents the methodology and findings relative to the 2025 Existing/Base and 2025 Build conditions.

Exhibit 1: Preliminary Site Plan (provided by others)

EXISTING CONDITIONS

Area Roadway System: Richland Road is a local east-west roadway owned by Boone County, east of subject site and the City of Columbia adjacent to the subject site and further west of Rolling Hills Road. Within the study area, Richland Road provides two travel lanes, one lane in each direction, and connects St. Charles Road on the west to Rangeline Road to the east. Richland Road has a posted speed limit of 45 miles per hour (mph). Shoulders, sidewalks, and marked bike lanes are not provided along the roadway.

Rolling Hills Road is a two-lane roadway that runs north/south along the east side of Columbia and connects to Highway 63 approximately 4.25 miles to the south. Rolling Hills Road is owned by the City of Columbia. Rolling Hills Road consists of a 30-foot cross-section with two travel lanes, one lane in each direction, with curb and gutter. A sidewalk is provided along the east side of the roadway to near Highway WW. The posted speed on Rolling Hills Road south of Richland Road is 35 mph.

Rolling Hills Road north of Richland Road changes names to **Grace Lane** to the north to St. Charles Road and is owned by Boone County. Sidewalk is provided adjacent to some of the developed areas. Grace Lane has two travel lanes, one lane in each direction. The posted speed on Grace Lane is 30 mph.

The intersection of Rolling Hills Road/Grace Lane and Richland Road is currently controlled as an All-Way STOP. A separate left-turn lane and one shared through/right-turn lane are provided on northbound Rolling Hills Road and eastbound Richland Road, while a single lane approach (shared left/through/right-turn lane) is provided for the westbound Richland Road and southbound Grace Lane approaches. **Figure 2** provides an aerial view of the Richland Road and Rolling Hills Road/Grace Lane intersection.

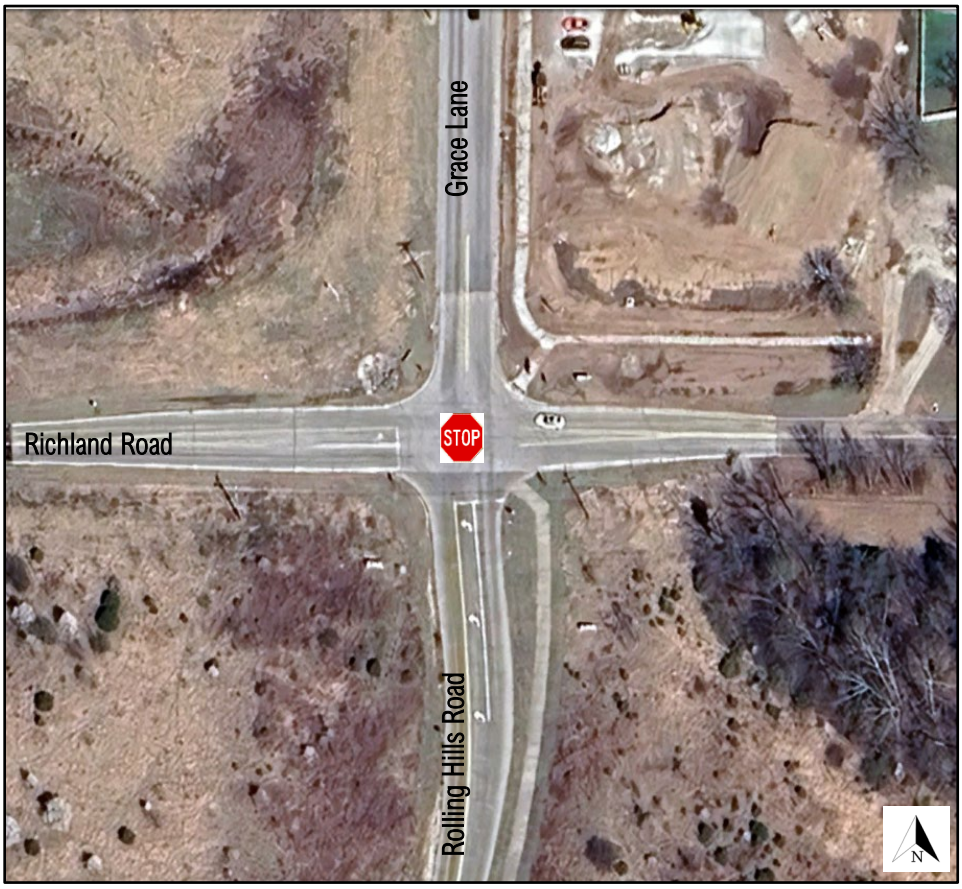

Figure 2: Aerial View of the Richland Road and Rolling Hills Road Intersection

Existing Traffic Volumes: Video, turning movement traffic counts were conducted at the intersection of Richland Road and Rolling Hills Road during the weekday morning (6:00 - 9:00 a.m.) and weekday afternoon (3:00 - 6:00 p.m.) peak periods on Tuesday, October 14, 2025.

Based on the traffic data collected, the morning peak hour occurred between 7:30 and 8:30 a.m. and the afternoon peak hour occurred between 4:30 and 5:30 p.m. The existing peak hour traffic volumes are summarized in **Exhibit 2**.

Given the traffic characteristics in the area and the anticipated trip generation for the proposed development, the weekday AM and PM peak periods would represent a “worst-case scenario” with regards to the traffic impact. If traffic operations are acceptable during these peak periods, it can be reasoned that conditions would be acceptable throughout the remainder of the day.

Exhibit 2: 2025 Existing Traffic Volumes

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AREA APPROVED DEVELOPMENTS

At the time of the October 2025 traffic counts, there were several approved developments in the immediate area that were approved but not fully built out, including the following:

- The Vineyards;
- Brooks Phase II;
- Old Hawthorne North;
- Richland Estates;
- Silver Lakes; and
- Five Pines.

For reference, the approved developments are graphically shown in **Figure 3**.

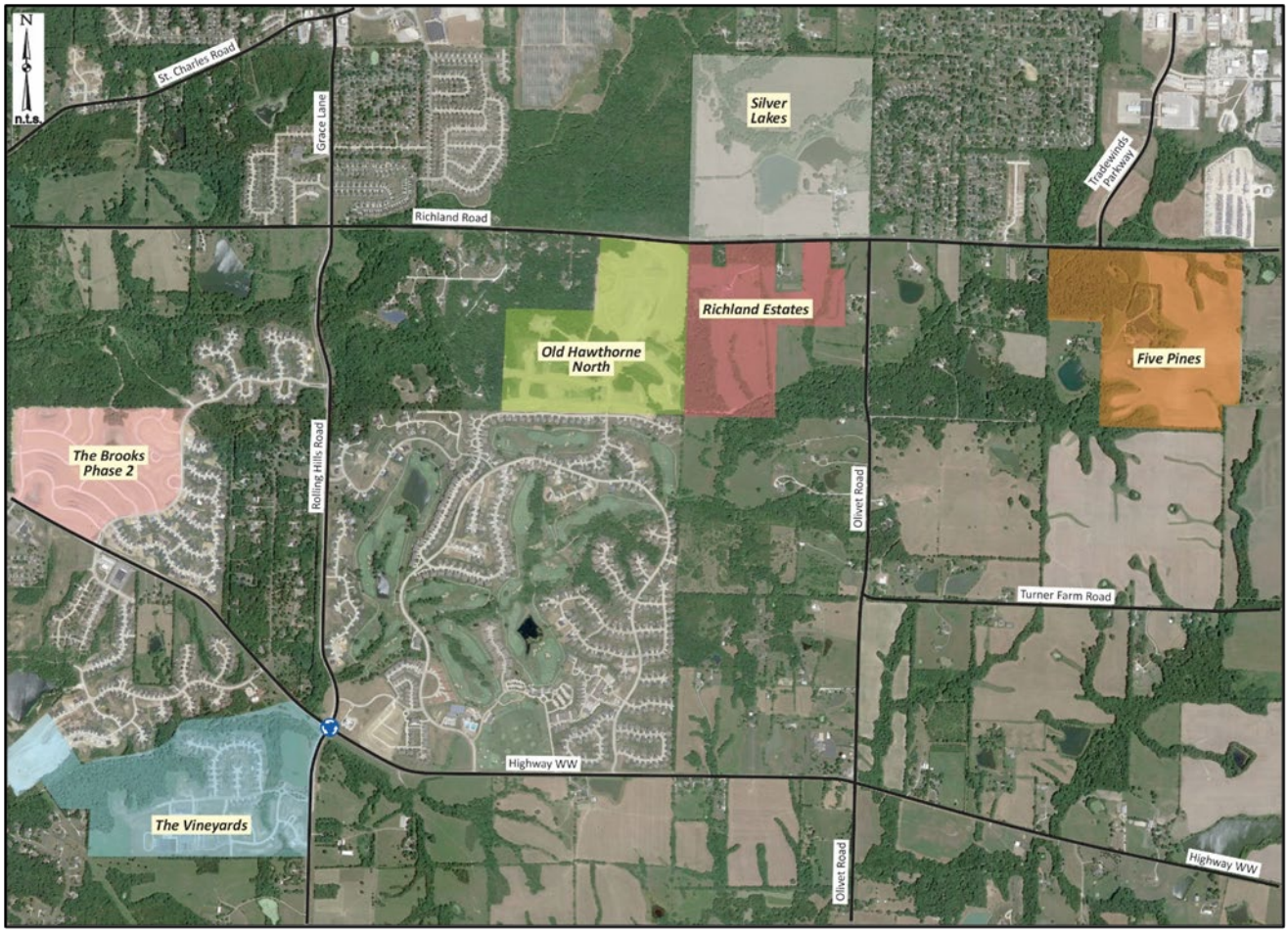


Figure 3: Approved Developments in Area

Based on information provided by Crockett Engineering and prior traffic impact studies completed by CBB for the area planned developments, it is our understanding that as of October 14, 2025 (the time of the traffic counts) the following approximate number of homes within the respective developments are yet to be built:

- The Vineyards – 200 homes
- Brooks Phase II – 100 homes
- Old Hawthorne North – 100 homes
- Richland Estates – 152 homes
- Silver Lakes – 348 homes
- Five Pines – 370 homes

In summary, this study considers the potential build-out of an additional 1,270 homes in the Base conditions.

To account for these approved/proposed but not built developments, the trip generation for the remaining homes within the six developments were estimated and assigned to the study intersections based on the respective traffic studies for each development. The amount of traffic the approved but not built residential developments would generate during the weekday AM and PM peak hours is shown in **Table 1** as previously presented in the respective traffic studies.

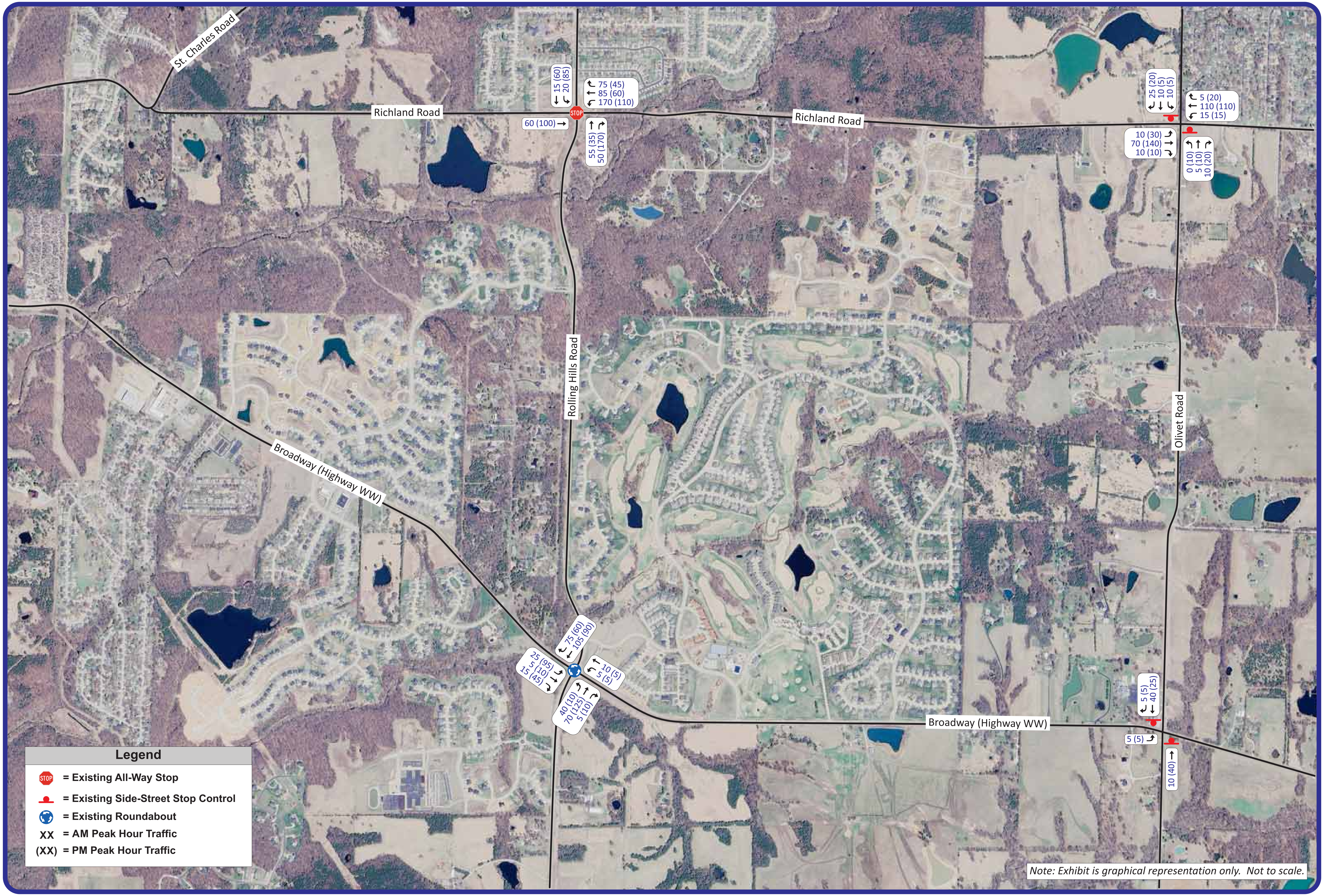
Table 1: Trip Estimate – Approved/Proposed Residential Developments

Land Use (ITE Code)	# Homes	ADT (VPD)	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
The Vineyards	200	1,910	35	105	140	120	70	190
Brooks Phase II	100	1,010	20	55	75	65	35	100
Old Hawthorne North	100	1,010	20	55	75	65	35	100
Richland Estates	152	1,485	25	85	110	95	55	150
Silver Lakes	348	3,275	65	190	255	210	125	335
Five Pines	370	3,465	65	200	265	225	130	355
Total Approved/Proposed Residential Developments	**1,270**	**12,155**	**230**	**690**	**920**	**780**	**450**	**1,230**

* Trips rounded to nearest 5

The site-generated trips for the approved but not built developments were assigned to the study intersections based on the respective trip distribution estimates from the traffic studies for each development, if available. The site-generated trips for the approved residential developments are shown in **Exhibit 3**.

The site-generated trips for the area approved developments (Exhibit 3) were added to the 2025 Existing Traffic Volumes (Exhibit 2) to develop the 2025 Base Traffic Volumes. The 2025 Base Traffic Volumes for the AM and PM peak hours are shown in **Exhibit 4**.



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Proposed Multi-Family Development - Traffic Impact Study
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Exhibit 3: Area Approved Development Trips

Exhibit 4: 2025 Base Traffic Volumes

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PROPOSED SITE

Once the base traffic volumes within the study area were established, we then considered the traffic associated with the proposed multi-family development.

Proposed Land Use: Based upon the concept plan provided by Crockett Engineering, previously shown in Exhibit 1, the proposed development will include approximately 240 multi-family apartment units.

Site Access: Access for the portion of the development on the west side of Rolling Hills Road is proposed via two new drives on Rolling Hills Road, while access for the portion of the development on the east side of Rolling Hills Road is proposed via one new drive on Rolling Hills Road and one new drive on Richland Road.

Intersection Sight Distance: Based on guidelines published in *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO) often referred to as the *Green Book,* the intersection sight distance requirement for the proposed drive on Richland Road is 555 feet (assuming a 45 mph posted speed limit and 50 mph design speed) and the proposed drives on Rolling Hills Road is 445 feet (assuming a 35 mph posted speed limit and 40 mph design speed). Note that the sight distance was not measured in the field to evaluate the available sight distance at the proposed site drive. It is recommended the site design engineer verify adequate sight distance is provided at the proposed site drives.

Furthermore, careful consideration should be given to sight distance obstructions when planning any future aesthetic enhancements, such as berms, fencing and landscaping, at any of the subdivision entrances to ensure that these improvements do not obstruct the view of entering and exiting traffic at the site intersections with the public roads. It is generally recommended that all improvements wider than two inches (posts, tree trunks, etc.) and higher than 3.5 feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway.

Trip Generation: Forecasts were prepared to estimate the amount of traffic the proposed development would generate during the weekday AM and PM peak periods. These forecasts were based upon information provided in the *Trip Generation Manual,* 12th Edition. Estimates for the proposed development were based upon Land Use 220 – Multifamily Housing (Low-Rise).

The peak hour of adjacent street traffic (one hour between 7 and 9 a.m.) was utilized for the AM peak hour and the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.) was utilized for the PM peak hour trip generation.

Based on this data, the trip generation forecast for the proposed multi-family development is shown in **Table 2**. As shown, the proposed development would generate a total of 100 new trips during the weekday AM peak hour and 125 new trips during the weekday PM peak hour.

Table 2: Trip Estimate – Multi-Family Development

ITE Code	Land Use	Unit	ADT (VPD)	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
220	Multi-Family	240 Units	1,490	25	75	100	75	50	125

* Rounded to nearest 5

Trip Distribution*:* The site-generated trips for the proposed multi-family development were then assigned into and out of the site based upon an estimated directional distribution. Based upon the existing travel patterns and the surrounding area and roadway network, it is anticipated that the distribution of the site-generated trips would be as summarized in **Table 3**.

Table 3: Trip Distribution Assumptions

Direction of Travel	Trip Distribution
To/from the north via Rolling Hills	20%
To/from the south via Rolling Hills	40%
To/from the east on Richland Road	10%
To/from the west on Richland Road	30%

2025 Build Traffic Volumes (2025 Base plus Site Trips): The assigned traffic volumes resulting from the trip distribution for the proposed multi-family development (Exhibit 5) were added to the 2025 Base traffic volumes (Exhibit 4) to determine the total volumes in the forecasted scenario. The forecasted, or 2025 Build, traffic volumes for the weekday AM and PM peak hours are shown in **Exhibit 6**.

Exhibit 5: Site-Generated Trips

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Exhibit 6: 2025 Build Traffic Volumes

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TRAFFIC ANALYSIS

Study Procedures: The 2025 Base and Build operating conditions were analyzed using SYNCHRO 11, a macro-level analytical traffic flow model. SYNCHRO is based on study procedures outlined in the *Highway Capacity Manual*, published by the Transportation Research Board. This manual, which is used universally by traffic engineers to measure roadway capacity, establishes six levels of traffic service: Level A ("Free Flow"), to Level F ("Fully Saturated"). Levels of service (LOS) are measures of traffic flow, which consider such factors as speed, delay, traffic interruptions, safety, driver comfort, and convenience. Level C, which is normally used for highway design, represents a roadway with volumes ranging from 70% to 80% of its capacity. However, Level D is often considered acceptable for peak period conditions in urban and suburban areas.

The thresholds that define level of service at an intersection are based upon the type of control used (i.e., whether it is signalized or unsignalized) and the calculated delay. For signalized and all-way stop intersections, the average control delay per vehicle is estimated for each movement and aggregated for each approach and then the intersection as a whole. At intersections with partial (side-street) stop control, delay is calculated for the minor movements only since motorists on the main road are not required to stop.

Level of service is directly related to control delay. At signalized intersections, the level of service criteria differ from that at unsignalized intersections primarily because varying transportation facilities create different driver expectations. The expectation is that a signalized intersection is designed to carry higher traffic volumes, and consequently may experience greater delay than an unsignalized intersection. **Table 4** summarizes the thresholds used in the analysis for signalized and unsignalized intersections.

Table 4: Level of Service Thresholds

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (SEC/VEH)	
	SIGNALIZED INTERSECTIONS	UNSIGNALIZED INTERSECTIONS
A	≤ 10	0-10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Auxiliary Left-Turn Lane Warrants: The need for left-turn lanes on Richland Road and Rolling Hills Road at the proposed driveways were evaluated using the *Left-Turn Guidelines for Two-lane Roadway* nomograph which is based on criteria using MoDOT's Engineering Policy Guidelines (EPG), commonly used by the City. The MoDOT criteria provides guidelines for separate left-turn lanes on the through roadway by comparing the total advancing volume (which includes all turning traffic) to the total opposing volume (which includes opposing through and right-turn movements) during the design hour with respect to the number of mainline left-turns. Then, the percentage of left-turns is determined by dividing the number of left-turns by the total advancing volume. If the point lies to the right of the percentage line, then a left-turn lane should be considered.

Based on the site-generated trip assignment, the forecasted left-turn volumes at the proposed site drives are 10 or less vph. The MoDOT EPG provides guidance that a left-turn lane is typically not necessary for left-turn volumes of 10 vph or less. As such, separate left-turn lanes would not be required at the proposed site drives.

Auxiliary Right-Turn Lane Warrants: The need for right-turn lanes on Richland Road and Rolling Hills Road at the proposed driveways were evaluated using the *Right-Turn Guidelines for Two-Lane Roadway* nomograph which is based on criteria from MoDOT's EPG. The MoDOT EPG provides guidelines for separate right-turn lanes on the through roadway by comparing the total advancing volume (which includes all turning traffic) to the number of mainline right-turns. The operating speed (posted speed limit) of the major roadway is used to determine if a right-turn lane is warranted. If the point lies to the right of the operating speed line, then a right-turn lane should be considered. If the plotted point is to the left of the line, then a left-turn lane is not necessary. Richland Road is 45 mph, so the 50-mph graph line was used and the posted speed on Rolling Hills Road is 35 mph, so the 40-mph graph line was used.

Note, that the MoDOT EPG provides guidance that a right-turn lane is typically not necessary for right-turn volumes less than 10 vph. As such, a separate right-turn lane would not be required on Richland Road at the proposed north drive given the low traffic volume.

Figure 4 graphically illustrates the northbound/southbound Rolling Hills Road right-turn lane evaluations at the proposed site drives assuming the 2025 Build traffic volumes. As can be seen in Figure 4, separate northbound/southbound right-turn lanes on Rolling Hills Road are not warranted at the proposed site drives in the 2025 Build conditions.

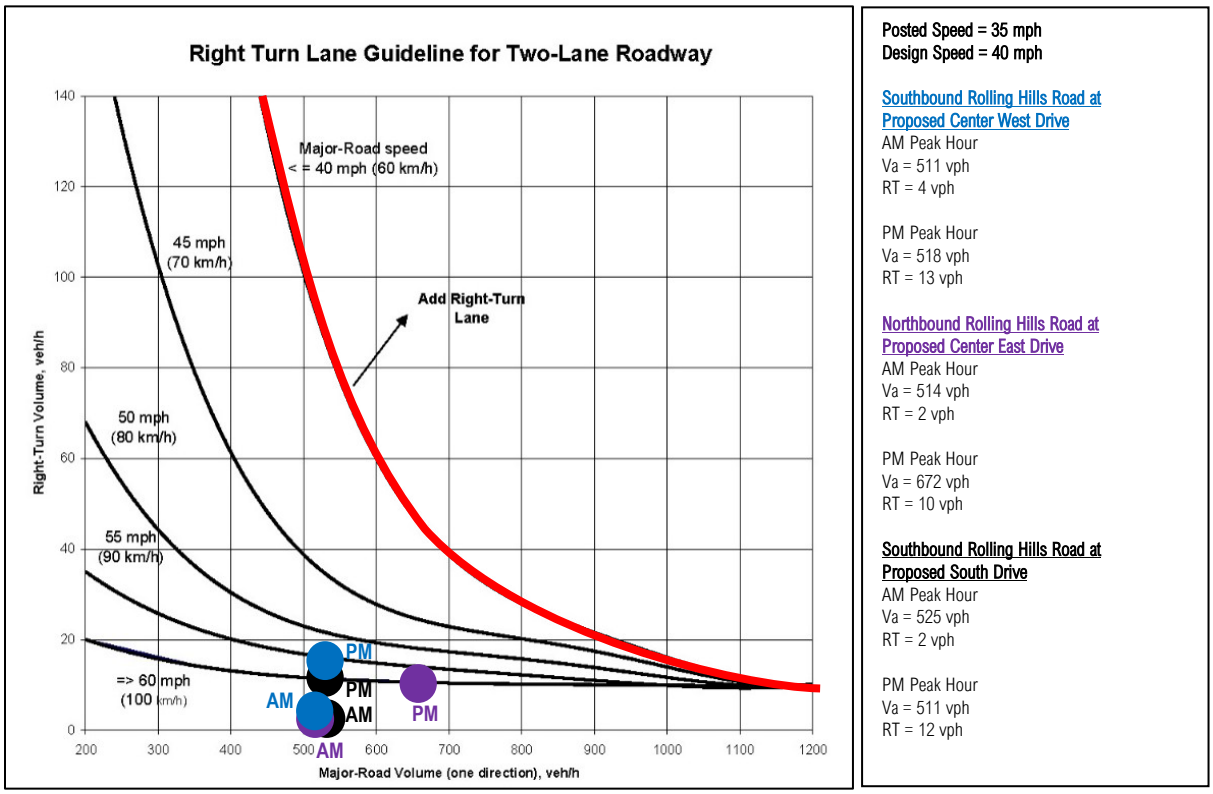

Figure 4: Rolling Hills Road Right-Turn Warrant at Proposed Site Drives – 2025 Build

Operating Conditions: The study intersections were evaluated using the methodologies described previously. The existing lane configurations and traffic control were used in the analysis (i.e., no roadway or traffic control improvements). The proposed site drives were assumed to have one lane exiting and one lane entering.

Table 5 summarizes the results of these analyses, which reflect the 2025 Base and 2025 Build operating conditions and average delay for each of the study intersections during the weekday AM and PM peak hours. The maximum volume to capacity ratio (v/c) is also noted in the table to better understand the available capacity of the intersection and the impact of the proposed multi-family development on the overall capacity. The 95th percentile Synchro estimated queues for movements with a queue greater than 50 feet is also noted in the table.

The v/c ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. A v/c ratio less than 0.85 generally indicates that adequate capacity is available, and vehicles are not expected to experience significant queues and delays. As the v/c ratio approaches 1.0, traffic flow may become unstable, and delay and queuing conditions may occur. Once the demand exceeds the capacity (i.e., a v/c ratio greater than 1.0), traffic flow is unstable and excessive delay and queuing is expected.

Table 5: 2025 Capacity Analysis Summary

Intersection / Approach	AM Peak Hour		PM Peak Hour	
	2025 Base	2025 Build	2025 Base	2025 Build
Richland Road and Rolling Hills Road/Grace Lane (All-Way STOP)				
Eastbound Richland Road Approach	B (14.3) 95th Queue: 30'	B (14.6) 95th Queue: 30'	C (17.2) 95th Queue: 55'	C (18.7) 95th Queue: 65'
Westbound Richland Road Approach	F (155.3) 95th Queue: 565'	F (164.8) 95th Queue: 570'	F (65.2) 95th Queue: 260'	F (74.3) 95th Queue: 280'
Northbound Rolling Hills Road Approach	F (128.3) 95th Queue: 480'	F (143.9) 95th Queue: 535'	F (272.3) 95th Queue: 880'	F (294.0) 95th Queue: 920'
Southbound Grace Lane Approach	F (55.1) 95th Queue: 245'	F (58.3) 95th Queue: 255'	F (158.3) 95th Queue: 505'	F (186.7) 95th Queue: 550'
Overall	**F (111.1) v/c: 0.90**	**F (120.7) v/c: 0.92**	**F (165.6) v/c: 1.01**	**F (183.4) v/c: 1.05**

X (XX.X) - Level of Service (Vehicular delay in seconds per vehicle)

As shown in the table, in the AM peak hour, the v/c ratio for the Richland Road and Rolling Hills Road intersection increases from 0.90 to 0.92 with the proposed site trips utilizing about two percent of the intersection capacity. In the PM peak hour, the v/c ratio increases from 1.01 to 1.05 with the proposed site trips utilizing about four percent of the Richland Road and Rolling Hills Road intersection capacity.

More importantly, in the PM peak hour base conditions, the v/c ratio at the intersection of Richland Road and Rolling Hills Road is 1.01 which is "over capacity" and will likely result in long delays without roadway and/or traffic control improvements should the full build-out of the area approved developments, an additional 1,270 homes, occur prior to improvements at the Richland Road and Rolling Hills Road.

As shown, during the AM peak hour, the Richland Road and Rolling Hills Road intersection is forecasted to continue to operate at overall LOS F with approximately 111 seconds of delay per vehicle on average for the 2025 Base conditions to LOS F with approximately 120 seconds of delay per vehicle on average for the 2025 Build conditions. As shown, during the PM peak hour, the Richland Road and Rolling Hills Road intersection is forecasted to continue to operate at overall LOS F with approximately 165 seconds of delay per vehicle on average for the 2025 Base conditions to LOS F with approximately 183 seconds of delay per vehicle on average for the 2025 Build conditions.

With the full build-out of the area approved developments the intersection of Richland Road and Rolling Hills Road will operate poorly (i.e., LOS F) in the base conditions without any additional trips from the proposed multi-family developments. As such, improvement

alternatives were considered at the intersection of Richland Road and Rolling Hills Road/Grace Lane as follows:

- Maintain All-Way Stop control with the addition of a southbound left-turn lane on Grace Lane and a westbound left-turn lane on Richland Road; and
- Construct a single-lane roundabout at the intersection.

Tables 6 and **7** respectively summarize the analysis results of the improved All-Way STOP and roundabout alternatives for the intersection of Richland Road and Rolling Hills Road/Grace Lane during the weekday AM and PM peak hours for the 2025 Base and 2025 Build conditions.

Table 6: 2025 Capacity Analysis Summary – Improved All-Way STOP Control

Intersection / Approach	AM Peak Hour		PM Peak Hour	
	2025 Base	2025 Build	2025 Base	2025 Build
Richland Road and Rolling Hills Road/Grace Lane (All-Way STOP w/ SB and WB Lefts Added)				
Eastbound Richland Road Approach	B (12.6) 95th Queue: 25'	B (12.9) 95th Queue: 30'	B (14.5) 95th Queue: 50'	C (15.5) 95th Queue: 60'
Westbound Richland Road Approach	C (20.2) 95th Queue: 115'	C (20.8) 95th Queue: 115'	C (16.2) 95th Queue: 65'	C (16.9) 95th Queue: 70'
Northbound Rolling Hills Road Approach	F (91.8) 95th Queue: 480'	F (106.5) 95th Queue: 545'	F (195.7) 95th Queue: 845'	F (215.7) 95th Queue: 915'
Southbound Grace Lane Approach	C (22.9) 95th Queue: 145'	C (23.9) 95th Queue: 150'	D (25.2) 95th Queue: 175'	D (29.0) 95th Queue: 200'
Overall	**E (44.6) v/c: 0.58**	**F (51.3) v/c: 0.60**	**F (87.7) v/c: 0.73**	**F (96.7) v/c: 0.75**

X (XX.X) - Level of Service (Vehicular delay in seconds per vehicle)

Table 7: 2025 Capacity Analysis Summary – Improved Roundabout Control

Intersection / Approach	AM Peak Hour		PM Peak Hour	
	2025 Base	2025 Build	2025 Base	2025 Build
Richland Road and Rolling Hills Road/Grace Lane (Roundabout)				
Eastbound Richland Road Approach	A (6.9)	A (7.1)	A (9.7) 95th Queue: 35'	B (10.7) 95th Queue: 45'
Westbound Richland Road Approach	C (15.8) 95th Queue: 180'	C (17.7) 95th Queue: 200'	B (12.1) 95th Queue: 90'	B (13.0) 95th Queue: 100'
Northbound Rolling Hills Road Approach	A (8.4) 95th Queue: 85'	A (9.0) 95th Queue: 95'	C (18.8) 95th Queue: 330'	C (20.9) 95th Queue: 385'
Southbound Grace Lane Approach	A (9.9) 95th Queue: 75'	B (10.5) 95th Queue: 80'	B (10.4) 95th Queue: 110'	B (11.3) 95th Queue: 130'
Overall	**B (11.2) v/c: 0.66**	**B (12.1) v/c: 0.70**	**B (13.9) v/c: 0.76**	**B (15.3) v/c: 0.80**

X (XX.X) - Level of Service (Vehicular delay in seconds per vehicle)

As shown in Table 6, the improved All-Way stop control with adding the southbound and westbound left-turn lanes provides a significant improvement over the existing lane configuration. However, with the full build-out of all the approved area developments the intersection of Richland Road and Rolling Hills Road will operate poorly (i.e., LOS F) in the base conditions without any additional trips from the proposed multi-family developments.

Ultimately, it is our understanding that the City plans to improve the intersection of Richland Road and Rolling Hills Road/Grace Lane to a roundabout in the next 5 to 10 years. As shown in Table 7, a single-lane roundabout provides a significant improvement over the existing lane configuration with all approaches operating at LOS C or better in the peak hours.

As shown in Table 7, the northbound Rolling Hills Road approach has a maximum queue of approximately 385 feet in the PM peak hour. The East and West Site Drives for the proposed multi-family development are located approximately 300 feet south of Richland Road. Consequently, in the build-out condition with the area 1,270 homes, there is a potential for the East and West Site Drives to periodically be blocked by the northbound queues from the roundabout during the PM peak hour. As such, it is recommended that consideration be given to shifting the proposed East and West Site Drives further to the south, away from the roundabout.

Note, it is our understanding that the City intends to design the roundabout at Richland Road and Rolling Hills Road/Grace Lane as a two-lane roundabout, even though initially it would likely be a single lane roundabout. **Table 8** summarizes the results of a dual lane roundabout configuration at Richland Road and Rolling Hills Road/Grace Lane. As can be seen, with a two-lane roundabout configuration the maximum queue for northbound Rolling Hills Road approach is expected to be 95 in the PM peak hour, which is not anticipated to reach the proposed East and West Site Drives.

Table 8: 2025 Build Capacity Analysis Summary – Dual Lane Roundabout

Intersection / Approach	AM Peak Hour	PM Peak Hour
Richland Road and Rolling Hills Road/Grace Lane (Dual Lane Roundabout)		
Eastbound Richland Road Approach	A (7.1)	B (10.7) 95th Queue: 45'
Westbound Richland Road Approach	A (7.9) 95th Queue: 40'	A (7.2) 95th Queue: 95'
Northbound Rolling Hills Road Approach	A (6.5) 95th Queue: 60'	A (8.6) 95th Queue: 95'
Southbound Grace Lane Approach	A (9.0) 95th Queue: 60'	A (9.8) 95th Queue: 95'
Overall	A (7.6) v/c: 0.43	A (8.9) v/c: 0.52

X (XX.X) - Level of Service (Vehicular delay in seconds per vehicle)

Table 9 summarizes the 2025 Build operating conditions and average delay for the proposed site drive study intersections during the weekday AM and PM peak hours.

As shown, all of the site drive study intersections are forecasted to operate at acceptable levels of service in the 2025 Build conditions with most movements operating at LOS C or better in the peak hours.

Table 9: 2025 Build Capacity Analysis Summary – Site Drives

Intersection / Approach	AM Peak Hour	PM Peak Hour
Richland Road and Proposed North Site Drive (Side-Street STOP)		
Eastbound Richland Road Approach	A (<1.0)	A (1.1)
Westbound Richland Road Approach	A (<1.0)	A (<1.0)
Northbound Proposed Site Drive Approach	B (11.9)	B (13.7)
Rolling Hills Road and Proposed Center Drive (Side-Street STOP)		
Eastbound Center Drive Approach	C (21.6)	D (26.4)
Westbound Center Drive Approach	C (19.9)	C (23.7)
Northbound Rolling Hills Road Approach	A (<1.0)	A (<1.0)
Southbound Rolling Hills Road Approach	A (<1.0)	A (<1.0)
Rolling Hills Road and Proposed South Drive (Side-Street STOP)		
Eastbound South Drive Approach	C (18.3)	C (21.1)
Northbound Rolling Hills Road Approach	A (<1.0)	A (<1.0)
Southbound Rolling Hills Road Approach	Free Flow	Free Flow

X (XX.X) - Level of Service (Vehicular delay in seconds per vehicle)

SUMMARY

CBB completed the preceding study to address the anticipated traffic impacts associated with the proposed multi-family development located in the southeast and southwest quadrants of the Richland Road and Rolling Hills Road intersection in Columbia, Missouri.

In summary, the following findings and improvements should be considered in conjunction with the proposed multi-family development:

- The 2025 Base traffic volumes include the build-out of an additional 1,270 homes in the area.
- The proposed multi-family residential development is expected to add 100 trips during the weekday AM peak hour and 125 trips during the weekday PM peak hour to the adjacent roadways.
- It is recommended the site design engineer verify adequate sight distance is provided at all proposed site drives.
- Careful consideration should be given to sight distance obstructions when planning any future aesthetic enhancements, such as berms, fencing and landscaping, at any of the subdivision entrances to ensure that these improvements do not obstruct the view of entering and exiting traffic at the site intersections with the public roads. It is generally recommended that all improvements wider than two inches (posts, tree trunks, etc.) and higher than 3.5 feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway.
- In the existing configuration, the intersection of Richland Road and Rolling Hills Road/Grace Lane is forecasted to operate at LOS F under 2025 Base and 2025 Build conditions during the AM and PM peak hours.
- Improvement alternatives were considered at the intersection of Richland Road and Rolling Hills Road/Grace Lane including maintaining All-Way Stop control with the addition of southbound and westbound left-turn lanes and the provision of a single-lane roundabout.

  The improved All-Way stop control provides a significant improvement over the existing lane configuration. However, with the full build-out of all the approved area developments the intersection of Richland Road and Rolling Hills Road will operate poorly (i.e., LOS F) in the base conditions without any additional trips from the proposed multi-family developments.

  Ultimately, it is our understanding that the City plans to improve the intersection of Richland Road and Rolling Hills Road/Grace Lane to a roundabout in the next 5 to 10 years. A single-lane roundabout provides a significant improvement over the existing lane configuration with all approaches operating at LOS C or better in the peak hours for

the 2025 Base and Build conditions which would include the build-out of the area approved developments.

- Considering the full build-out of the area approved developments with a future roundabout at the Richland Road and Rolling Hills Road intersection, there is a potential for the proposed East and West Site Drives to be periodically blocked by the northbound queues from the roundabout during the PM peak hour. As such, it is recommended that consideration be given to shifting the proposed East and West Site Drives further to the south.

We trust this traffic impact study adequately describes the forecasted traffic conditions that should be expected as a result of the proposed multi-family development. If additional information is desired, please feel free to contact me at 314-449-9572 or swhite@cbbtraffic.com.

Sincerely,

Shawn Lerai White, P.E., PTOE
Associate - Senior Traffic Engineer