July 23, 2015

Mr. Roger Cox
Consort Homes
16640 Chesterfield Grove Road, Suite 130
Chesterfield, Missouri 63005

RE: Traffic Impact Study
Proposed Brightleaf Residential Development – Jones Property
Wildwood, Missouri
CBB Job Number 049-15

Dear Mr. Cox:

In accordance with your request, CBB has completed a traffic impact study for a proposed residential development on a tract of land in the northwest quadrant of Missouri Route 100 and Taylor Road/Overlook Hill Drive in Wildwood, Missouri. It is our understanding that the property will be developed with the construction of 189 single-family residences.

The existing site consists of an undeveloped tract of land bordered by Missouri Route 100 to the south, Eatherton Road to the west, Overlook Hill Drive to the east and existing residential developments to the north. As part of the City's master plan, this project will support the extension of the Pond Grover Loop Road from its current terminus to Missouri Route 100 as a fourth, northern leg to the existing signalized intersection at Taylor Road. Access to the homes will be provided via the new connection to Missouri Route 100, the existing and planned connections of Pond Grover Loop Road to Missouri Route 109 and other internal streets as well as Missouri Route 109 via the ¾ access of Eatherton Road/Lafayette Trails Drive. The site location and surrounding properties are shown in **Figure 1**.

It should be noted that after the Technical Memorandum was originally complete in June 2015, the City requested that additional access to Missouri Route 100 be investigated. CBB found that Missouri Route 100 is access limited, and therefore, no additional access is permitted by right. A break-in-access request will be required by MoDOT to consider any break, and that break must be requested by the City. This traffic study addresses the break-in-access criteria for use by the City in their sponsored request to MoDOT, as described in more detail below.

Figure 1: Site Location Map

The purpose of this study was to identify the potential traffic impacts associated with the proposed site development on the existing signalized intersection at Missouri Route 100 and Taylor Road/Overlook Hill Drive, the existing ¾ access restricted stop controlled intersection of Missouri Route 109 and Eatherton Road/Lafayette Trails Drive and the side-street stop controlled intersection of Pond Grover Loop Road and Hickory Manor Drive/Paradise Peak Circle.

Specifically, the amount of traffic generated by the proposed development and the redistribution of existing traffic for the proposed cross-access connections were estimated. Using these estimates, the need for improvements to the adjoining public road system was evaluated, and the roadway classification (residential or collector) for the extended Pond Grover Loop Road was established. The focus of our analyses was the a.m. and p.m. commuter peak hours of a typical weekday which represent both the peak in existing traffic levels as well as the expected peak for the proposed residential land use.

The study also includes analyses related to the City's interest in additional access on Missouri Route 100, the break-in-access request in the form of a proposed right in/right out entrance approximately 1,325 feet west of the Taylor Road/Pond Grove Loop Road signalized intersection. Additionally, analyses pertaining to options for the on-site intersection of Pond Grove Loop Road and Eatherton Road were completed.

Analysis Scenarios

In order to address the current and forecasted conditions, the following off-site scenarios have been evaluated:

- Existing conditions (2015);
- Base conditions with the proposed road connections and approved southern development only (2020);
- Forecasted condition – Base plus proposed residential development build-out (2020);
- 20-Year Design Horizon Base conditions – Base plus background traffic growth (2040); and
- 20-Year Design Horizon Forecasted conditions – 20-Year Design Horizon Base plus proposed residential development build-out (2040).

Existing Conditions (2015)

Missouri Route 100 is a four-lane divided east/west principle arterial road maintained by the Missouri Department of Transportation (MoDOT). The posted speed limit is 55 miles per hour. According to current counts provided on MoDOT's website, the average daily traffic (ADT) along Missouri Route 100 was approximately 20,170 vehicles per day (vpd) in 2013. Taylor Road intersects Missouri Route 100 at a signalized intersection that services a few single family homes to the north and several large commercial developments to the south. Further south, Taylor Road connects to Old Manchester Road.

Missouri Route 109 is a north/south minor arterial road also maintained by MoDOT. The posted speed limit is 45 miles per hour. According to current counts provided by MoDOT, the ADT along Route 109 was approximately 16,500 vpd in 2013.

Both Pond Grover Loop Road and Eatherton Road are City maintained roads that serve existing single-family residences with connections to local streets.

In order to establish existing traffic conditions, manual turning movement counts were conducted during the a.m. (7:00 - 9:00) and p.m. (4:00 - 6:00) peak periods at the following study intersections on May 7th and 8th, 2015 which are considered to be typical weekdays for the adjacent roadway system with area schools in normal session.

- Missouri Route 100 at Taylor Road/Overlook Hill Drive (signalized);
- Missouri Route 109 at Eatherton Road/Lafayette Trails Drive (3/4 access side street stop);
- Pond Grover Loop Road at Hickory Manor Drive/Paradise Peak Circle (side street stop);
- Forest Leaf Parkway at Fullerton Meadows Drive/Winter Leaf Drive (all-way stop); and
- Forest Leaf Parkway at Green Pines Drive (all-way stop).

This data revealed the weekday peak hours of the adjacent roadway were from 7:15 - 8:15 a.m. and 4:45 - 5:45 p.m. The existing peak hour traffic volumes are summarized in **Exhibit 1**.

Forecasted 25-Year No-Build Traffic Conditions

A 25-Year No-Build scenario was developed to evaluate a base condition for a comparison of the 25-Year Base and Build conditions. Since the area is mostly built out, a 0.5% growth rate per year for the next 25 years will be assumed for all roadways in the study area. This represents a global increase of approximately 13.28% for the study area. **Exhibit 2** illustrates the 25-Year No-Build Traffic Volumes (2040).

Existing (2015) and 25-Year No-Build (2040) Traffic Analysis and Operations

The existing and forecasted no-build operating conditions were analyzed using SYNCHRO 8, 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, established 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 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 different 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 1** summarizes the thresholds used in the analysis for signalized and unsignalized intersections.

Exhibit 1: Existing Traffic Volumes

Job# 049-15
07/23/15

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Exhibit 2: 25-Year No-Build Traffic Volumes

Job# 049-15
07/23/15

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Table 1: 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

The study intersections were evaluated using the methodologies described above. **Table 2** summarizes the results of the existing and 25-year no-build operating conditions analyses with average delays at the study intersections during the a.m. and p.m. weekday peak hours.

The intersections are currently functioning at acceptable level of services. Currently the v/c ratio for the signalized intersection is 0.63 in the a.m. peak hour and 0.55 in the p.m. peak hour for existing, and 0.67 in the a.m. peak hour and 0.60 in the p.m. peak hour for the 2040 No-Build Condition. It should be noted that due to the low southbound traffic volume at Overlook Hill Drive, the existing signal essentially functions as a three legged signalized intersection.

Proposed Development

As previously discussed, it is our understanding that the property will be developed with the construction of 189 single-family residences. A preliminary site plan provided by the site civil engineer is shown in **Exhibit 3**.

Base Conditions with the Proposed Road Connections and Approved Southern Development Only (2020 & 2040)

Since the site plan proposes an extension of Pond Grover Loop Road to Missouri Route 100 and several cross-access connections to existing subdivisions via various roadway stubs, it was assumed that the existing traffic patterns utilized by existing travelers will be altered when those other access opportunities are provided to Missouri Route 100 and Missouri Route 109. Using the manual counts at the three internal subdivision intersections, traffic volumes were re-assigned across the roadway system assuming only the new roadway system reflected on the site plan (Exhibit 3).

Table 2: Existing and 25-Year No-Build Operating Conditions

Traffic Movement	*AM Peak Hour*		*PM Peak Hour*	
	2015 Existing	*2040 No-Build*	*2015 Existing*	*2040 No-Build*
MO Route 100 & Taylor Road/Overlook Hill Drive (Signalized Intersection)				
Eastbound Approach	B (17.0)	B (17.6)	B (17.5)	B (19.1)
Westbound Approach	B (13.3)	B (14.2)	B (13.3)	B (14.7)
Northbound Approach	C (26.9)	C (31.1)	C (24.3)	C (27.6)
Southbound Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)
Overall Intersection	**B (16.8)**	**B (17.9)**	**B (16.1)**	**B (17.8)**
MO Route 109 & Lafayette Trails Dr/Eatherton Rd (Side Street Stop Controlled)				
Eastbound Approach	B (11.2)	B (11.8)	B (13.4)	B (14.7)
Westbound Approach	B (13.8)	C (15.1)	B (11.7)	B (12.4)
Southbound Left	B (11.2)	B (12.2)	A (9.9)	B (10.5)
Overall Intersection	**A (0.4)**	**A (0.4)**	**A (0.4)**	**A (0.4)**
Pond Grover Loop Road & Hickory Manor Drive/Paradise Peak Circle (Side Street Stop Controlled)				
Northbound Approach	B (11)	B (11.5)	B (11.5)	B (12.2)
Southbound Approach	A (9.4)	A (9.6)	A (9.3)	A (9.4)
Overall Intersection	**A (4.8)**	**A (4.9)**	**A (3.9)**	**A (4.0)**

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

Also, it was been brought to our attention that 35 acres along Missouri Route 109 south of Missouri Route 100 has been approved for development with approximately 117 single-family homes, 10,000 square feet of medial office space and two commercial outlots. After reviewing the Traffic Impact Study prepared for that adjacent development, the additional anticipated through traffic was added to this study's intersections of Missouri Route 100 at Taylor Road/Overlook Hill Drive and Missouri Route 109 at Eatherton Road/Lafayette Trails Drive.

Exhibit 4 shows both the anticipated change in existing traffic patterns.

Exhibit 5 and 6 show the 2020 and 2040 traffic growth projections with the proposed road connections and trips from the approved southern development. Those exhibits do not include any added traffic from the proposed Brightleaf residential development.

Exhibit 3: Proposed Site Plan (Provided by Others)

Job# 049-15
07/23/15

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Legend

- = Existing Traffic Signal
- = Existing Roundabout
- = Existing All-Way Stop
- = Existing Side-Street Stop Control
- XX = AM Peak Hour Traffic (7:15 - 8:15 AM)
- (XX) = PM Peak Hour Traffic (4:45 - 5:45 PM)
- XX (XX) = Redistributed Traffic Volumes
- XX (XX) = Additional Traffic Volumes from Approved Southern Development

Exhibit 4: Existing Traffic Pattern Re-Assignment and Additional Traffic

Job# 049-15
07/23/15

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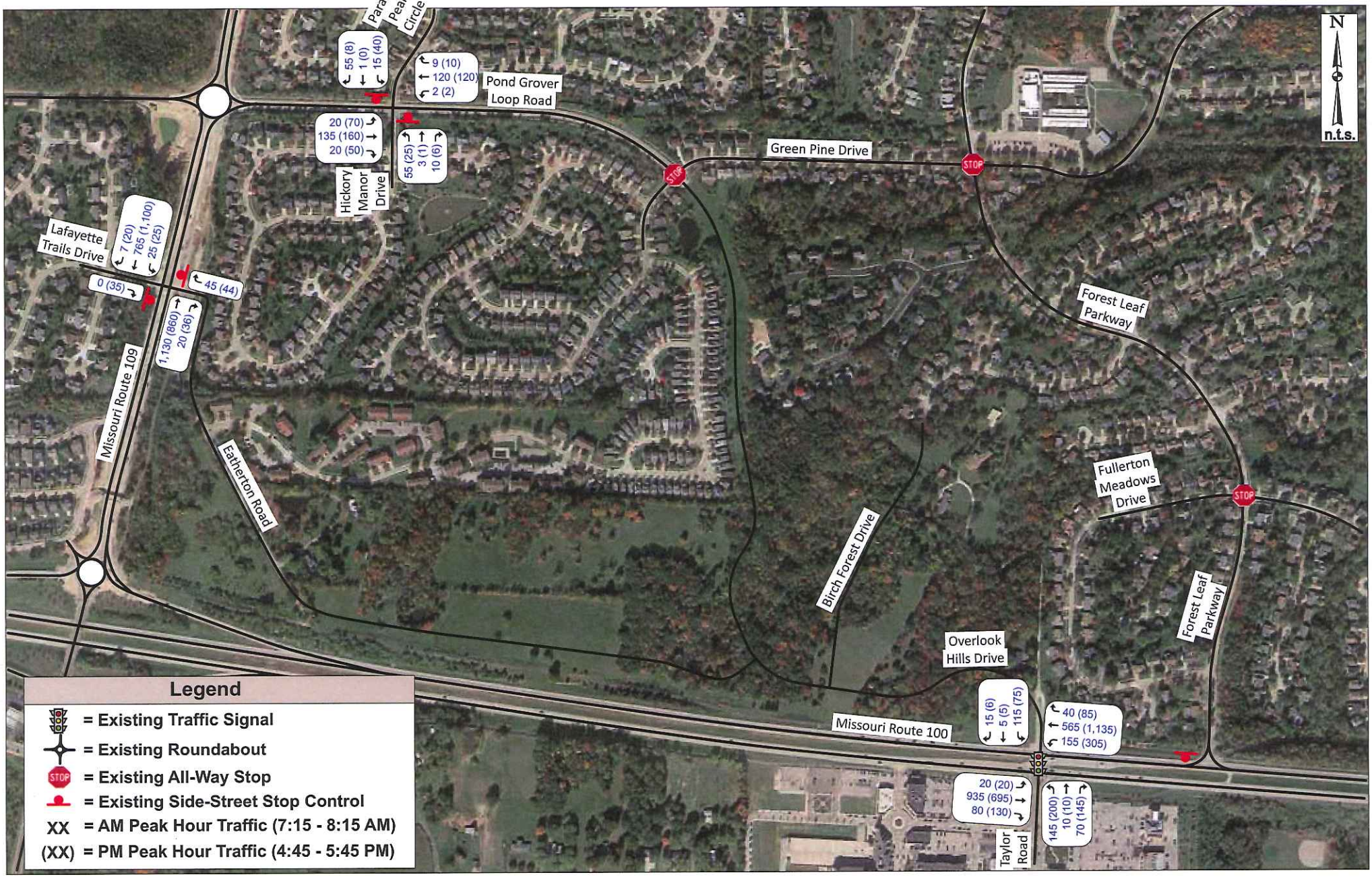

Exhibit 5: 2020 Base Conditions Traffic Volumes

Job# 049-15
07/23/15

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Exhibit 6: 2040 Base Conditions Traffic Volumes

Job# 049-15
07/23/15

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Base Conditions – 2020 No-Build and 2040 No-Build Traffic Analyses and Operations

The study intersections were evaluated for the Base Conditions in the 2020 No-Build and 2040 No-Build Design Year using the methodologies described above. **Table 3** summarizes the results of those analyses with average delays at the study intersections during the a.m. and p.m. weekday peak hours.

The summaries below assume roadway improvements and retiming to Missouri Route 100 at Taylor Road/Overlook Hill Drive, as discussed below. As can be seen, all approaches and intersections operate at an acceptable LOS. The v/c ratio for the signalized intersection in the 2020 Base Condition is 0.78 in the a.m. peak hour and 0.66 in the p.m. peak hour, and for the 2040 Base Condition is 0.82 in the a.m. peak hour and 0.79 in the p.m. peak hour.

Table 3: 2020 and 2040 Base Operating Conditions

Traffic Movement	*AM Peak Hour*		*PM Peak Hour*	
	2020 Base	*2040 Design Year Base*	*2020 Base*	*2040 Design Year Base*
MO Route 100 & Taylor Road/Overlook Hill Drive (Signalized Intersection)				
Eastbound Approach	C (30.4)	C (34.1)	C (27.4)	C (29.6)
Westbound Approach	C (22.7)	C (26.0)	C (25.3)	C (31.2)
Northbound Approach	D (37.8)	D (43.0)	C (33.9)	C (39.5)
Southbound Approach	D (48.5)	D (52.9)	D (50.5)	D (54.2)
Overall Intersection	**C (29.6)**	**C (33.4)**	**C (27.8)**	**C (32.5)**
MO Route 109 & Lafayette Trails Dr/Eatherton Rd (Side Street Stop Controlled)				
Eastbound Approach	A (0.0)	B (11.9)	B (14)	B (15)
Westbound Approach	B (14.3)	C (15.5)	B (12.3)	B (13)
Southbound Left	A (0.4)	B (12.8)	B (10.3)	B (10.9)
Overall Intersection	**A (0.5)**	**A (0.6)**	**A (0.6)**	**A (0.6)**
Pond Grover Loop Road & Hickory Manor Drive/Paradise Peak Circle (Side Street Stop Controlled)				
Northbound Approach	B (12.5)	B (13.1)	B (12.8)	B (13.7)
Southbound Approach	A (9.9)	B (10.1)	B (13.1)	B (10.1)
Overall Intersection	**A (3.9)**	**A (4.1)**	**A (3.4)**	**A (3.4)**

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

Trip Generation

As a primary step in this analysis, traffic forecasts were prepared to estimate the amount of traffic that the proposed Brightleaf residential development would generate during the a.m. and p.m. weekday peak hours. The traffic was forecasted based upon information provided in the "Trip Generation Manual", Ninth Edition, published by the Institute of Transportation Engineers (ITE). This manual, which is a standard resource for transportation engineers, is based on a compilation of nationwide studies documenting the characteristics of various land uses.

Based on the trip generation rates provided by the ITE publication for Land Use Code (210) Single Family Dwelling Unit, the development of the site is expected to generate the trips shown in **Table 4**. Due to the configuration of the internal street network, the trips for the different geographic areas within the subdivision were estimated individually for ease of assignment later.

Table 4: Trip Generation Estimate

Area Designation	*Estimated # of Lots*	*AM Peak Hour*			*PM Peak Hour*		
		In	*Out*	*Total*	*In*	*Out*	*Total*
A	54	10	30	40	35	20	55
B1	12	5	10	15	10	5	15
B2	10	5	10	15	10	5	15
B3, C & E	81	10	35	45	40	30	70
D	32	5	20	25	20	10	30
Total (Full Build Out)	**189**	**35**	**105**	**140**	**115**	**70**	**185**

ITE Code (210) Single Family Dwelling Unit

As can be seen in Table 4, it is estimated that the overall development will **generate *140 total trips during the a.m. peak hour and 185 total trips during the p.m. peak hour***.

Trip Distribution

The traffic generated by the residential development was assigned to the adjoining roadway system based on existing and projected traffic patterns, as well as the proximity of other similar uses and the proposed access points for the site. The anticipated directional distribution during the a.m. and p.m. peak hours for the residential trips was as follows:

- 50% to/from the east on Missouri Route 100;
- 20% to/from the north on Missouri Route 109 via Pond Grover Loop Road;
- 15% to/from the west on Missouri Route 100;
- 10% to/from the south on Missouri Route 109 (half via Taylor Road and half via Eatherton Road); and
- 5% to/from the south via Taylor Road.

Forecasted Build Condition with Residential Development (2020 and 2040)

The above discussed site-generated traffic volumes and trip distribution were applied as shown in **Exhibit 7**. This site-generated traffic was added to the 2020 and 2040 Base Conditions as shown in Exhibit 5 and 6 to reflect the forecasted traffic volumes for the a.m. and p.m. weekday peak hour build conditions as shown in **Exhibit 8 and 9**.

Forecasted Build Condition with Residential Traffic Analyses and Operations (2020 and 2040)

The study intersections were re-evaluated for the Forecasted Build Conditions in the 2020 Build and 2040 Design Year Build using the methodologies described above. **Table 5** summarizes the results of the build analyses with average delays at the study intersections during the a.m. and p.m. weekday peak hours.

The analyses assume roadway improvements and retiming to Missouri Route 100 at Taylor Road/Overlook Hill Drive, as discussed below. As can be seen, all approaches and intersections operate at an acceptable LOS. The v/c ratio for the signalized intersection in 2020 Build Condition is 0.79 in the a.m. peak hour and 0.78 in the p.m. peak hour, and for the 2040 Design Year Build Condition 0.83 in the a.m. peak Hour and 0.90 in the p.m. peak hour.

Exhibit 7: Site Generated Trips

Job# 049-15
07/23/15

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Exhibit 8: 2020 Build Traffic Volumes

Job# 049-15
07/23/15

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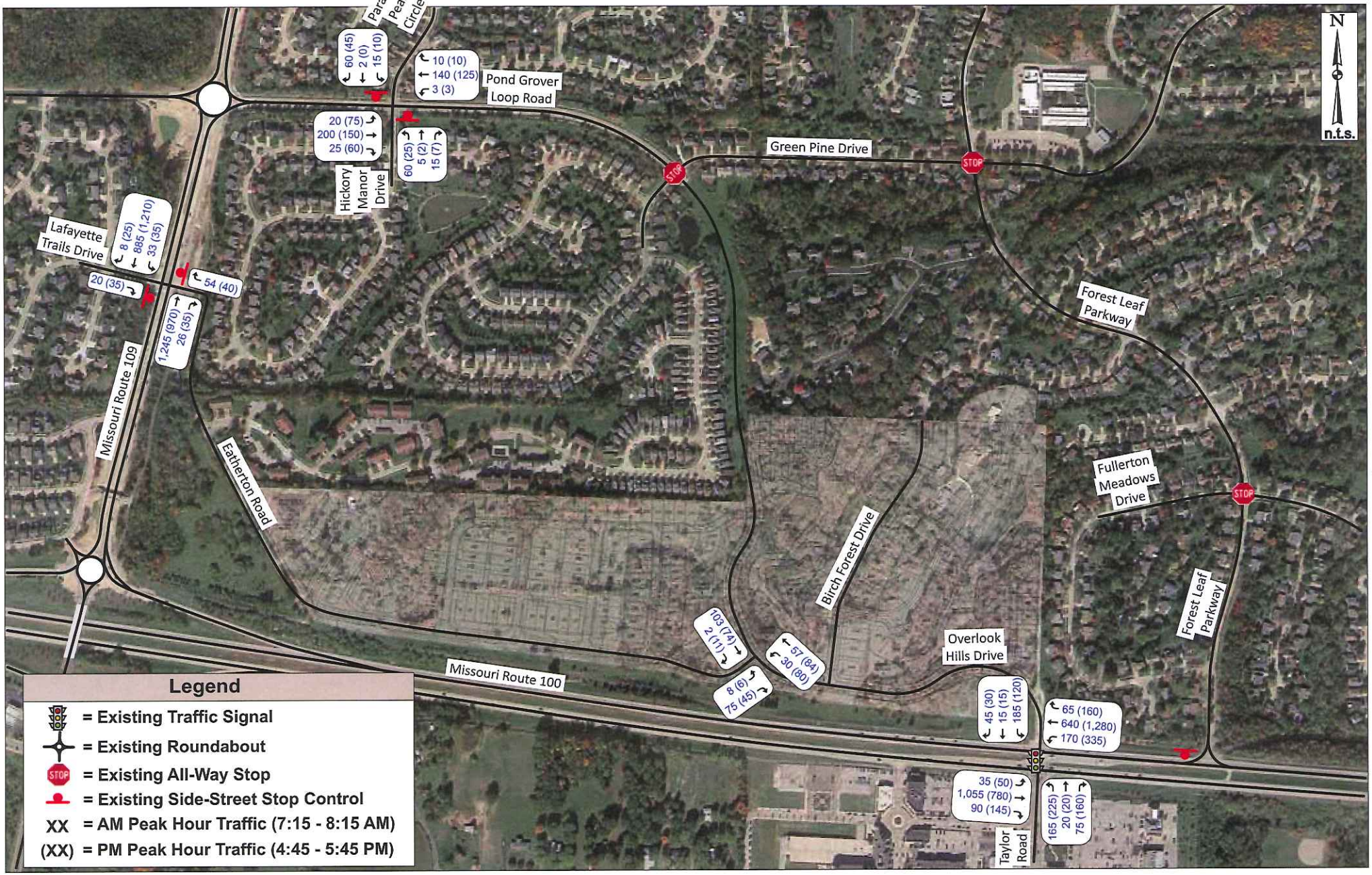

Exhibit 9: 2040 Build Traffic Volumes

Job# 049-15
07/23/15

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Table 5: 2020 and 2040 Build Operating Conditions

Traffic Movement	*AM Peak Hour*		*PM Peak Hour*	
	2020 Build	*2040 Design Year Build*	*2020 Build*	*2040 Design Year Build*
MO Route 100 & Taylor Road/Overlook Hill Drive (Signalized Intersection)				
Eastbound Approach	C (32.9)	D (36.7)	C (29.5)	C (31.4)
Westbound Approach	C (25.7)	C (27.5)	C (32.3)	D (38.2)
Northbound Approach	D (40.7)	D (46.0)	D (38.4)	D (43.6)
Southbound Approach	D (47.8)	D (53.2)	D (50.1)	D (53.5)
Overall Intersection	**C (32.6)**	**C (36.1)**	**C (33.1)**	**D (37.6)**
MO Route 109 & Lafayette Trails Dr/Eatherton Rd (Side Street Stop Controlled)				
Eastbound Approach	A (0.0)	B (12.1)	B (14)	B (15.0)
Westbound Approach	B (14.5)	C (15.8)	B (12.3)	B (13.0)
Southbound Left	B (11.9)	B (12.8)	B (10.3)	B (11.1)
Overall Intersection	**A (0.5)**	**A (0.7)**	**A (0.6)**	**A (0.6)**
Pond Grover Loop Road & Hickory Manor Drive/Paradise Peak Circle (Side Street Stop Controlled)				
Northbound Approach	B (13.1)	B (13.4)	B (13.2)	B (14.2)
Southbound Approach	B (10.2)	B (10.2)	B (13.5)	B (10.3)
Overall Intersection	**A (3.6)**	**A (4.0)**	**A (3.3)**	**A (3.3)**

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

Pond Grove Loop Road Classification and Annual Daily Traffic

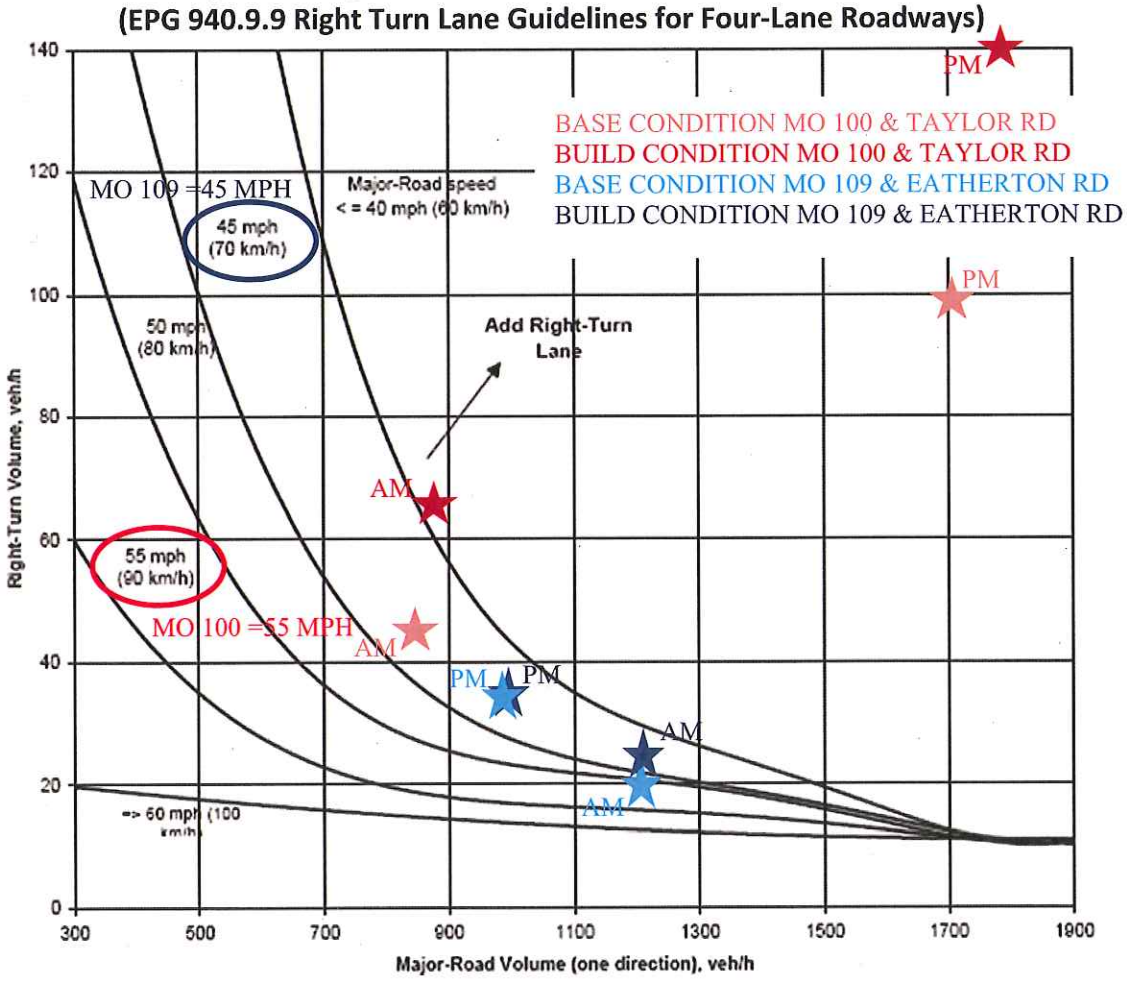
It is generally accepted that the forecasted design hourly volumes (DHV) estimated above is 10% of the anticipated annual daily traffic (ADT). Therefore, the forecasted ADT for Pond Grove Loop Road can be estimated as 3,030 in the 2020 Build Condition and 3,860 in the 2040 Build Condition. Given these estimates and the intended use, we would classify Pond Grove Loop Road as a Residential Minor Collector.

Right-Turn Lane Warrants

The need for separate right-turn lanes was considered using MoDOT's EPG methods. Right-turn lanes are considered as asset to promote safety and improved traffic flow at relatively high conflict locations. Separate right-turn lanes are intended to remove turning vehicles from the through lanes which reduces the potential for rear-end collisions at intersections.

Figure 2 graphically illustrates the right-turn lane needs analysis for the 2040 Design Year for both the Base and Build Condition. Given the estimated right-turning movement for northbound Missouri Route 109 at Eatherton Road verses the estimated northbound through movements, a separate westbound right turn lane *is **warranted** in the p.m. peak hour of the **Base Condition** due to the increase traffic expected on Missouri Route 109. After development of the residential site, the p.m. peak hour warrants a right turn lane. As well, a separate westbound right-turn lane is **warranted** at the signalized intersection of Missouri Route 100 and Taylor Road in the **Base Condition** due to the construction of the proposed roads.*

Figure 2 – Right-Turn Lane Warrants (2040 Design Year)
(EPG 940.9.9 Right Turn Lane Guidelines for Four-Lane Roadways)



Left-Turn Lane Warrants

Auxiliary left-turn lanes are also intended to remove turning vehicles from the through traffic flow. This reduces the frequency of rear-end collisions at locations where there is considerable left-turn ingress activity, such as major driveways and public road intersections.

A 200 foot left-turn lane is already provided for eastbound Missouri Route 100 at Taylor Road. Based on the low number of turns coming from the west, the existing lane length appears to be adequate to accommodate current and future demands.

On-Site Conceptual Intersection Alternatives

As requested by the City, CBB performed a cursory investigation of the following conceptual alternatives for the intersection of Pond Grove Road and Eatherton Road:

- Three-Legged Side-Street Stop-Controlled Intersection (as shown in the current site plan);
- Three-Legged Roundabout **(Exhibit 10)**;
- Four-Legged Intersection with an Additional Right-In/Right-Out Connection on Missouri Route 100 **(Exhibit 11)**; and
- Four-Legged Roundabout with an Additional Right-In/Right-Out Connection Missouri Route 100 **(Exhibit 12)**.

Exhibits 10, 11 and **12** show the alternative concepts with the projected traffic volumes. The standard three- and four-legged intersections were analyzed using Synchro as previously described. To allow better accuracy, the proposed roundabout was analyzed using SIDRA software, a traffic analysis program that is the most widely recognized tool available for evaluating roundabouts. The SIDRA software calculates vehicular delay times and operational levels of service that are consistent with methods supported by the "Highway Capacity Manual"; however, they should not be compared directly.

Table 7 compares the analysis results of the conceptual alternatives with average delays during the a.m. and p.m. weekday peak hours for the 2040 Design Year Build condition.

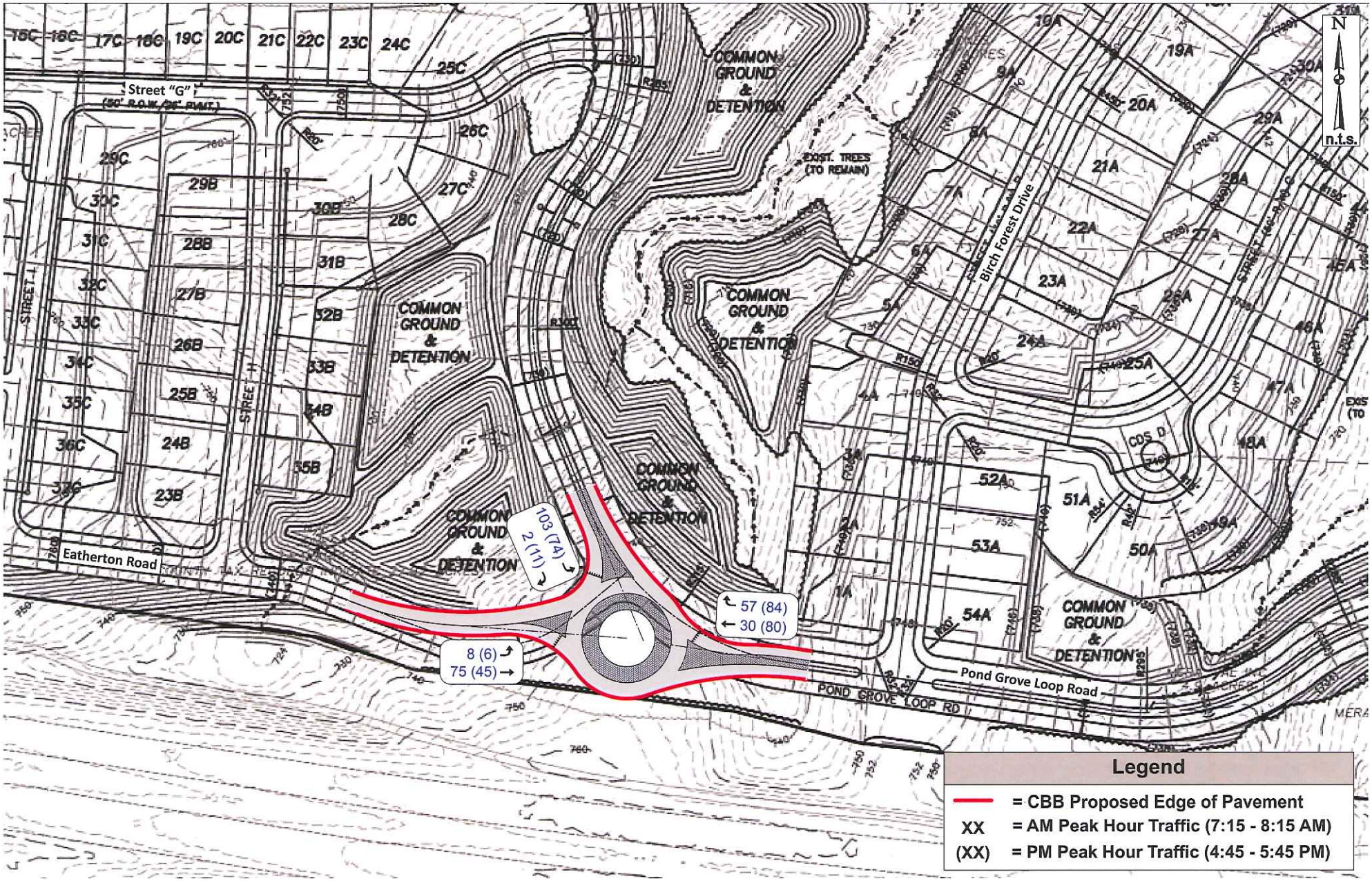


Exhibit 10: Three Legged Roundabout Concept with Traffic Volumes

Job# 049-15
07/23/15

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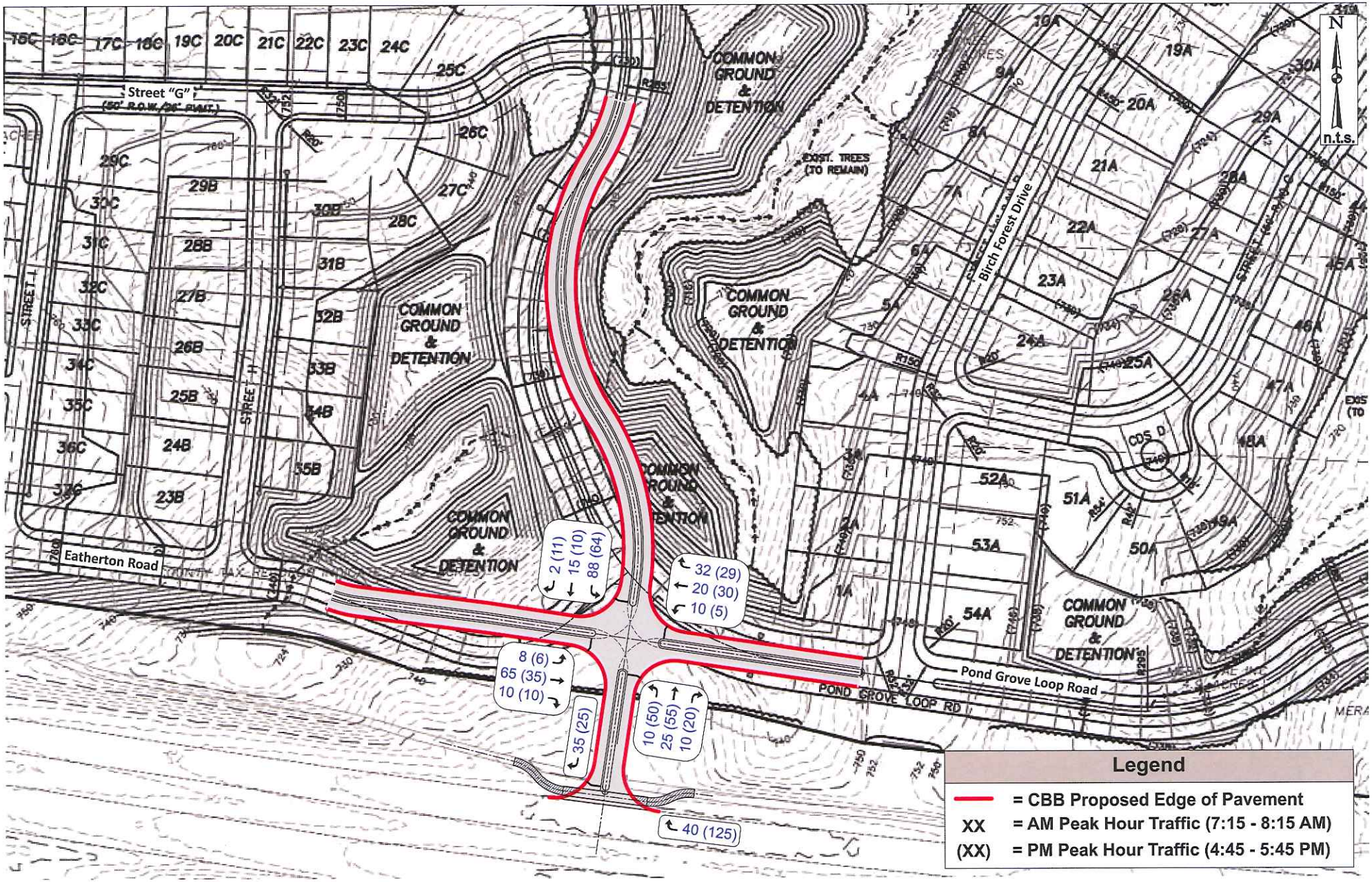

Exhibit 11: Four Legged Intersection Concept with a Proposed Right-In/Right-Out on Missouri Route 100 with Traffic Volumes

Job# 049-15
07/23/15

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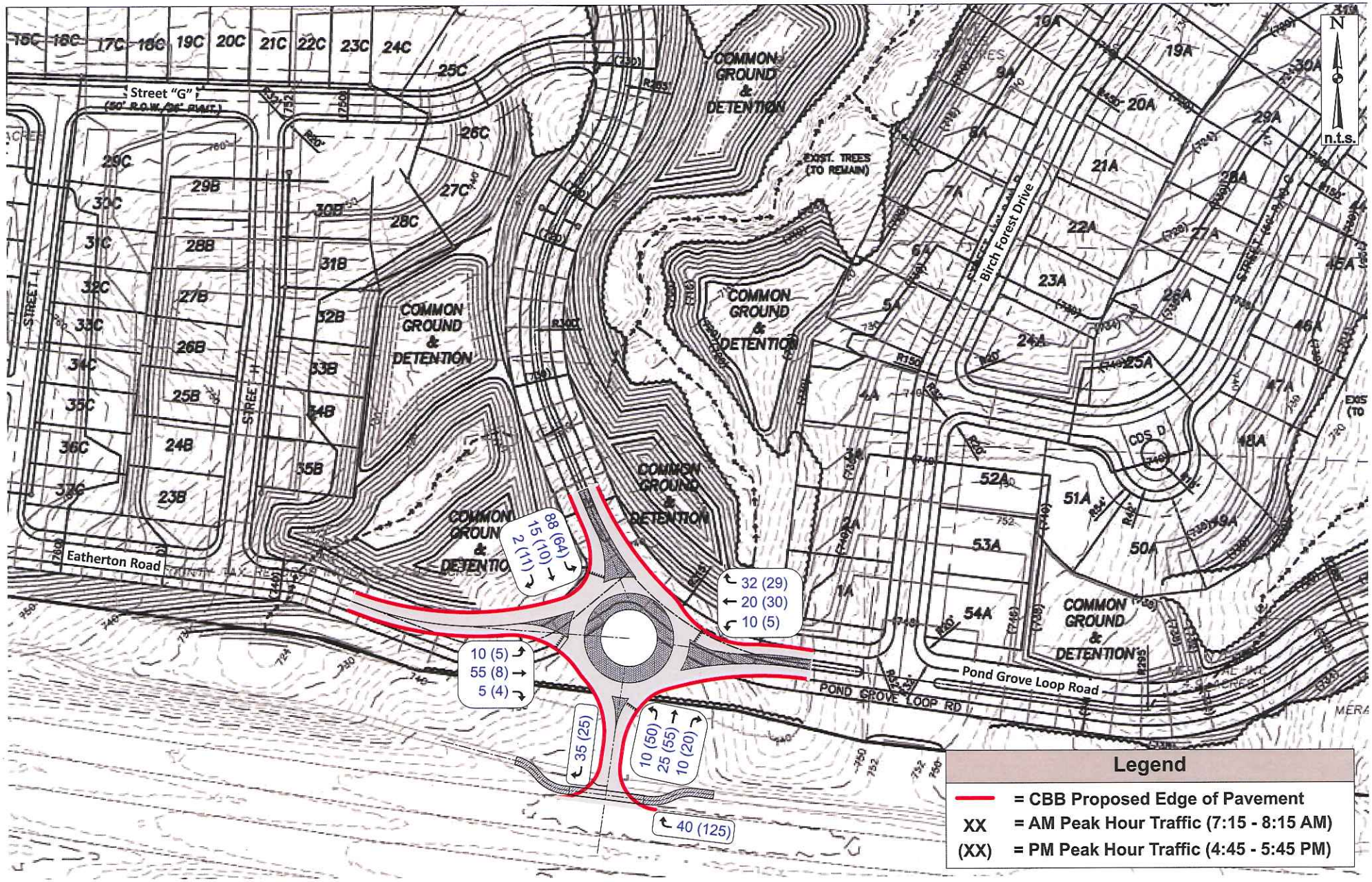

Exhibit 12: Four Legged Roundabout Concept with a Proposed Right-In/Right-Out on Missouri Route 100

Job# 049-15
07/23/15

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Table 7: Cursory Investigation of On-Site Intersection (2040 Design Year)

Traffic Movement	*AM Peak Hour*		*PM Peak Hour*	
	Side Street Stop Controlled	*Roundabout*	*Side Street Stop Controlled*	*Roundabout*
Pond Grove Loop Road & Eatherton Road (Three-Legged Intersections)				
Northbound Left Movement	A (7.5)	n/a	A (7.5)	n/a
Eastbound Approach	A (9.4)	A (5.2)	A (9.2)	A (5.2)
Westbound Approach	n/a	A (4.7)	n/a	A (4.5)
Southbound Approach	n/a	B (12.4)	n/a	B (11.9)
Overall Intersection	**A (3.6)**	**A (7.8)**	**A (3.6)**	**A (6.7)**
Pond Grove Loop Road & Eatherton Road (Four-Legged Intersections with Proposed MO 100 Right-In/Right-Out)				
Eastbound Approach	B (11.7)	n/a	B (11.9)	n/a
Westbound Approach	B (10.3)	A (6.1)	B (11.1)	A (6.1)
Northbound Approach	n/a	A (7.6)	n/a	A (7.6)
Southbound Approach	n/a	B (11.2)	n/a	B (11.2)
Overall Intersection	**A (7.9)**	**A (8.1)**	**A (6.7)**	**A (8.1)**

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

As can be seen above, the three-legged stop-controlled intersection with a northbound left-turn lane (as proposed by the current site plans) function very well due to the low traffic volumes expected at the on-site intersection. As well, the conceptual roundabout will also function at a very good LOS if this type of intersection is required by the City. However, since the side-street stop-controlled intersection will operate a very good levels of service, there does not appear to be a traffic justification to mandate a roundabout over a conventional intersection. Both will function well from a traffic operations perspective.

Although a right-in/right-out entrance on Missouri Route 100, approximately 1,325 feet west of the signalized intersection, would alleviate some westbound right-turn volume into the site from the signal, the demand for a right-turn movement out from the site onto Missouri Route 100 would be low as described in the above sections. As well, the City would have to petition MoDOT to allow a break-in-access, see details below. **Table 8** shows the 2040 Build Operating Condition with a very slight increase in delays once the right-turning movements at the intersection of Missouri Route 100 and Taylor Road/Overlook Hill Drive are reassigned to through movements on westbound Missouri Route 100 to access the right-in/right-out further west.

Table 8: 2040 Build Operating Conditions with Proposed Right-In/Right-Out

Traffic Movement	*AM Peak Hour 2040 Build*	*PM Peak Hour 2040 Build*
MO Route 100 & Taylor Road/Overlook Hill Drive (Signalized Intersection)		
Eastbound Approach	D (36.7)	C (30.8)
Westbound Approach	C (28.9)	D (44.9)
Northbound Approach	D (46.0)	D (44.4)
Southbound Approach	E (60.1)	E (61.9)
Overall Intersection	**D (36.9)**	**D (41.5)**

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

Given the above, we believe there is little to no benefit of a right-in/right-on Missouri Route 100 to the state system. Therefore, the added connection may not meet the criteria to justify the break-in-access per MoDOT's requirements. We would not recommend an additional right-in/right-out entrance on Missouri Route 100.

Break-In-Access Alternative

As noted above, it is our understanding that the City has requested that additional access to the development be investigated via a right-in/right-out connection to Missouri Route 100, east of Taylor Road. However, our investigations have confirmed that the entire frontage of Missouri Route 100 has limited access rights owned by MoDOT. Section "941.2 Entrance Requests within Controlled Access Right-of-Way" in MoDOT's EPG details the process by which access requests can be considered.

Since Missouri Route 100 is a major road, approval from the State Traffic and Highway Safety Engineer in Jefferson City will likely be required if the local district recommends approval. Additional analysis work, not currently included in CBB's contracted scope of work could be required for consideration of the break-in-access. Also, a preliminary layout of the proposed access will be required, tied to MoDOT's stationing along Missouri Route 100 with property lines and deed information included for the adjacent property.

The most appropriate category would be "Breaks in Access for a City/County Road." In order for a break-in-access to be classified as such:

- *The request shall be made by a city or county;*
    - Probable – Wildwood would need be the sponsor/applicant

- *The request shall not solely benefit a developer or individual with commercial interests;*
    - Probable – This request would connect to various subdivisions through the stub street connections
- *A master roadway plan shall be provided which clearly shows the requested break in access and its connection to a city or county roadway system that provides circulation of traffic and relief to the state system;*
    - Possible – First Statement: While the City may not have the connection shown on their current master plan, their plan could potentially be amended to do so.
    - **Difficult –** Second Statement: The issue of providing "*circulation of traffic*," and more specifically, "*relief to the state system*" will be difficult to prove. Shifting the right-in and right-out traffic from the Taylor Road intersection 1,325 feet to the west is not be expected to significantly improve traffic flows along Missouri Route 100. There would be some benefit in convenience to residents north of the break for ingress from the east and egress to the west over the proposed condition without the break, but compared to the existing conditions, the extension of Pond Grover Loop Road to Missouri Route 100 and the other internal connections are expected to accommodate traffic very effectively.
- *If the entire connection is not planned to be constructed at one time, dedication of right of way for the city or county roadway may be required as assurance of the intent to connect this roadway at a future date; and*
    - Probable – I do not see this as a problem. The developer could provide the dedication at the time as the subdivision plat approval process. Since the bike trail generally follow the alignment of Missouri Route 100, we recommend the bike trail crossing of the proposed right in/right out entrance be pulled immediately adjacent to the westbound Missouri Route 100 lanes and through the island as shown in Exhibit 11 and 12. This would create an additional point of user conflict that is not currently present.
- *If the above criteria are met, then the break in access may be granted for no charge.*
    - Probable – No fee should be charged if the City is the applicant.

Summary

CBB has completed a traffic impact study for a proposed 189 single-family residential development on a tract of land in the northwest quadrant of Missouri Route 100 and Taylor Road/Overlook Hill Drive in Wildwood, Missouri. The following summary is provided:

- The signal at Missouri Route 100 and Taylor Road/Overlook Hill Drive will need to be retimed accordingly in order to accommodate the traffic generated rerouted by the new road connection and the additional traffic generated by the proposed residences.
- A separate southbound left-turn lane out of the site should be provided (on the new Pond Grover Loop Road at the intersection with Missouri Route 100 opposite Taylor Road).
- A separate westbound right-turn lane into the site should also be provided on Missouri Route 100 at the new Pond Grover Loop Road/Taylor Road intersection as a result of the proposed roadways built and the associated change in traffic patterns.
- The anticipated northbound right-turn volumes does warrant a right-turn lane on Missouri Route 109 at Eatherton Road as a result of the anticipated growth of traffic expected on Missouri Route 109 in the Base Condition.
- No improvements are recommended for the intersection of Pond Grover Loop Road at Hickory Manor Drive/Paradise Peak Circle.
- A three-legged stop-controlled intersection at Pond Grove Loop Road at Eatherton Road with a northbound left-turn lane (as proposed in the current site plan) appears to be the most appropriate intersection alternative of the four concepts investigated. However, a roundabout would also function very well if required by the City.
- An additional right-in/right-out access on Missouri Route 100 west of Taylor Road, as requested by the City to be investigated, does not appear to be warranted. Furthermore, any additional access will require a break-in-access from MoDOT due to the current limited access right-of-way. Based on our evaluations, the additional access is not recommended.

We trust that you will find this report useful in evaluating the traffic impacts associated with the proposed roadway connections as well as the proposed 189 single-family residential homes (known as Brightleaf) in Wildwood, Missouri. Please contact me in our St. Louis office (314) 878-6644, ext. 12 or Lcannon@cbbtraffic.com should you have any questions or comments concerning this material.

Sincerely,

Lee Cannon

Lee Cannon, P.E., PTOE
Principal – Traffic Engineer