

Traffic Study

East Cherokee Drive Access Study *for* *Chatham Residential Development*

Cherokee County, Georgia

Keck & Wood Project No.
220119.00

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Prepared by:



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1. INTRODUCTION

1.1. Study Overview

A new residential development is planned for construction along East Cherokee Drive opposite of Little Shoals Drive and Mill Creek Drive. The development is proposed to feature 59 single-family homes. The neighborhood will be served by a single access point.

This study summarizes the analysis of three (3) alternatives for placement and configuration of the proposed access point for the subject development. The three (3) alternatives featured in the study include:

Alternative 1 — Full Access Driveway (w/ Right-turn deceleration lane) for the new development; Located opposite of Little Shoals Drive featuring the installation of southbound (SB) left turn lanes at Little Shoals Drive and Mill Creek Drive

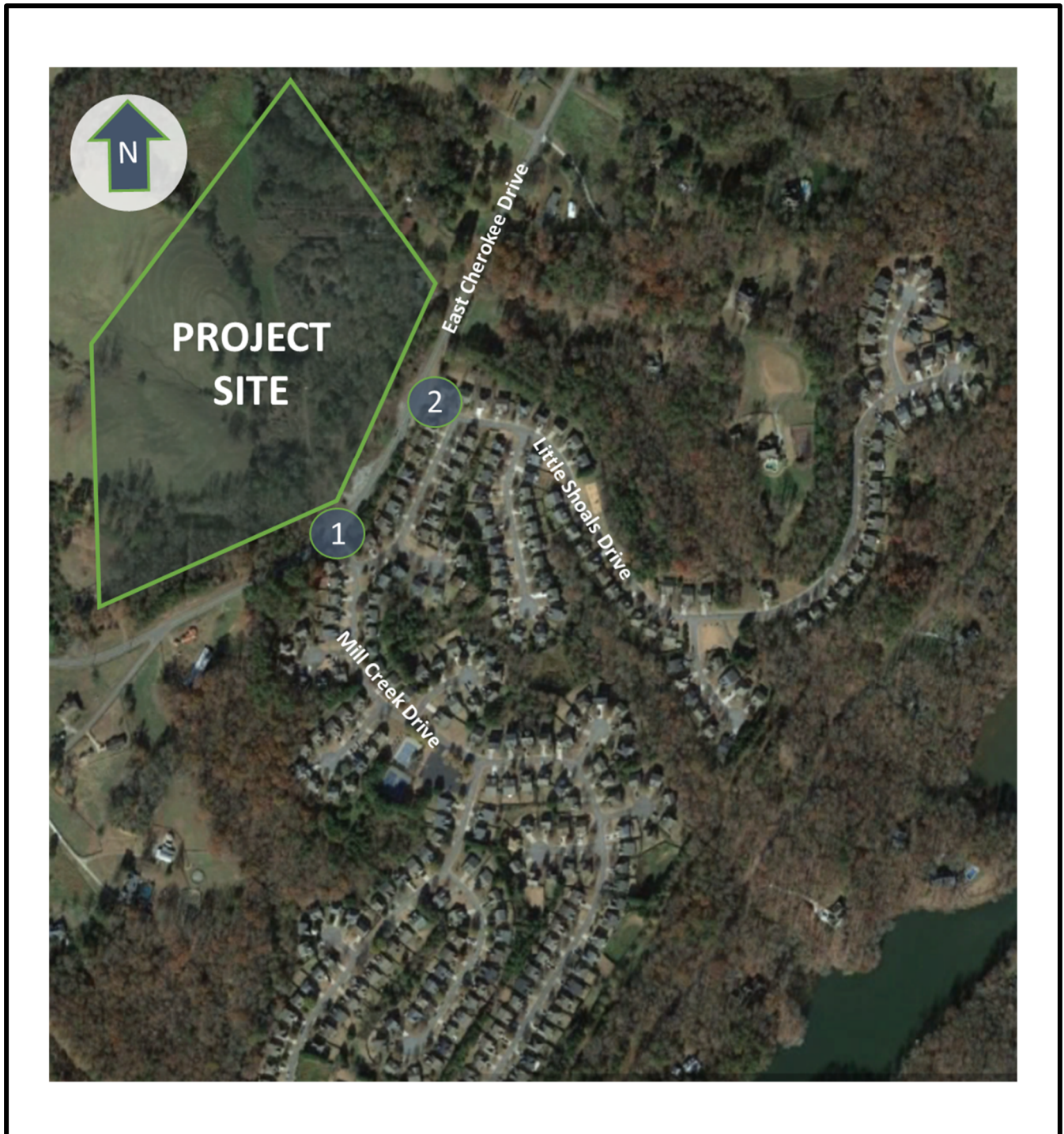
Alternative 2 — Single Lane Roundabout on East Cherokee Drive aligned with Little Shoals Drive and the driveway for the proposed development

Alternative 3 — Single Lane Roundabout on East Cherokee Drive aligned with Mill Creek Drive and the driveway for the proposed development

The study will outline the traffic operations associated with each alternative with the existing volume data provided by Cherokee County. The study does not include any future year traffic projections.

Figure 1 depicts an aerial view of the study area. A concept plan for the proposed development is included in **Appendix A**.

FIGURE 1 – OVERVIEW OF STUDY AREA



2. EXISTING CONDITIONS

2.1. Roadways

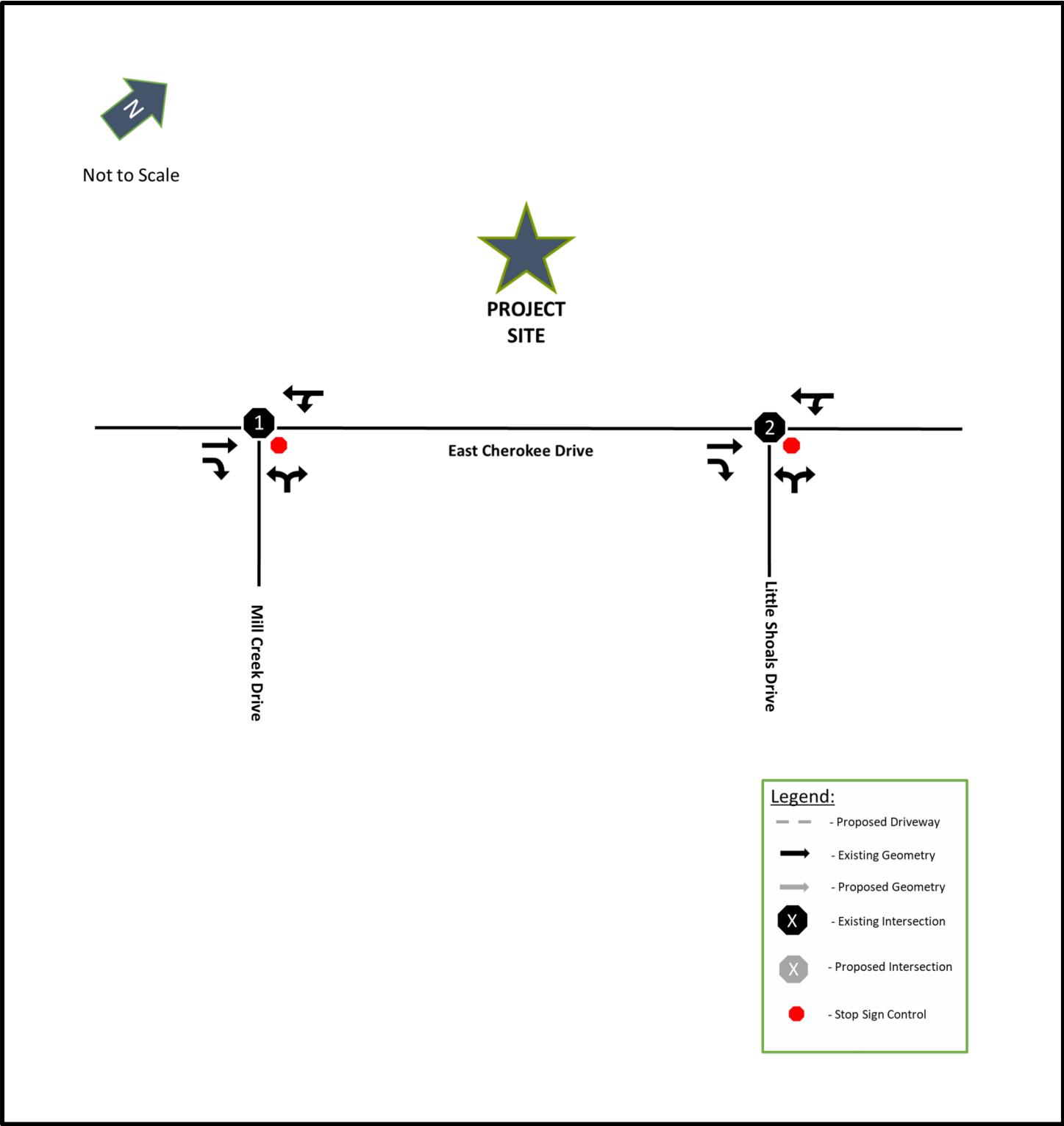
East Cherokee Drive is a two-lane minor collector with a posted speed of 45 MPH in the vicinity of the project. The roadway has GDOT reported AADT of 7,310 vehicles per day (2021). East Cherokee provides access to primarily residential developments. There is limited sidewalk and no bike lanes along the roadway. The roadway was the subject of a Corridor Study completed in January 2021.

Little Shoals Drive is a no-outlet local roadway that provides access to the Mill Creek subdivision. The roadway provides to approximately 100 lots within the subdivision of approximately 360 homes.

Mill Creek Drive is a no-outlet local roadway (south of Little Shoals Drive) that provides access to the Mill Creek subdivision. The roadway provides to approximately 260 lots within the subdivision of approximately 360 homes.

Figure 2 depicts the existing geometries for the subject intersections and roadways.

FIGURE 2 – EXISTING INTERSECTION GEOMETRIES



2.2. Existing Traffic Counts

The existing traffic volumes were developed from a conglomerate of traffic data obtained from Cherokee County Staff. The volumes consist of data collected in February 2020 (prior to the pandemic) and September 2022 at the following locations:

- **AM & PM Peak Hour TMC (Turning Movement Count)**
 - East Cherokee Drive & Johnson Brady Road
- **AM Peak Hour TMC**
 - East Cherokee Drive & Little Shoals Drive
 - East Cherokee Drive & Mill Creek Drive
- **24-Hour Bi-Directional Tube Counts**
 - Mill Creek Drive
 - Little Shoals Drive

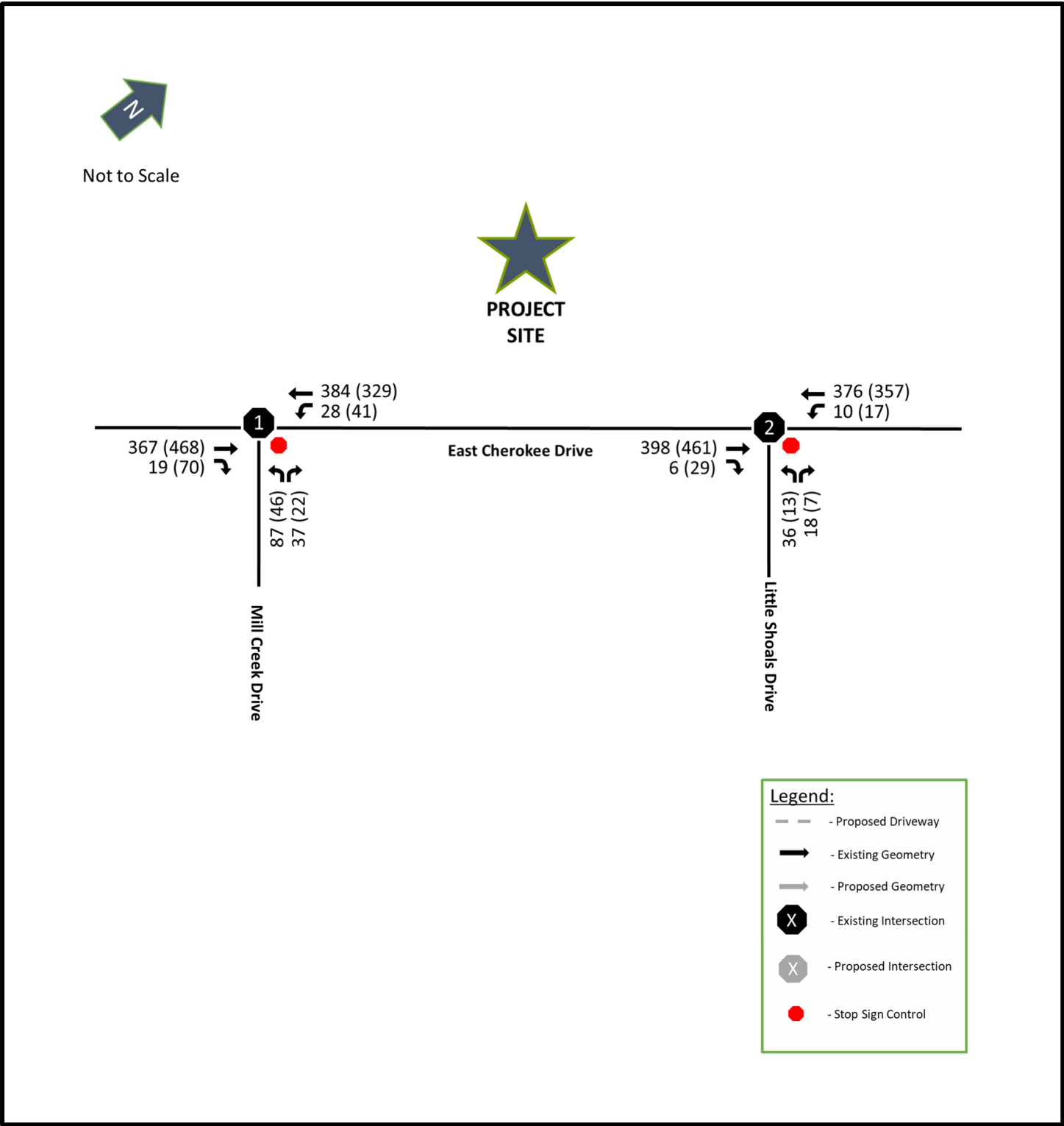
The data for the 24-Hour bi-directional counts along both Mill Creek Drive and Little Shoals Drive did not account for traffic generated from 26 homes in the Mill Creek Subdivision. To account for the generated traffic, the bi-directional counts were assessed and resulted in a 10% increase in traffic at Little Shoals Drive and a 5% increase in volumes along Mill Creek Drive.

The bi-directional counts were also used to develop the PM peak hour turning movement counts at the subject intersections, whereas the PM directional distribution followed the travel patterns evidenced in the traffic counts. Assessment of travel patterns from nearby residential access points/ driveways along East Cherokee Drive depicted similar directional distributions in both the AM and PM peak hours.

Traffic Count Data can be found in **Appendix B**.

The existing volumes analyzed in the study are depicted in **Figure 3**.

FIGURE 3 – EXISTING 2022 - PEAK HOUR TRAFFIC



2.3. Existing Conditions – Capacity Analysis

A capacity analysis was performed to evaluate the AM and PM peak hour periods for the Existing conditions. The analyses were performed for peak hour conditions based on the methodology outlined in the *Highway Capacity Manual, 6th Edition (HCM 6th)* using Synchro® 11 analysis software. The results of the analysis are listed in Table 1 and depict the analysis of the volumes presented in **Figure 3**. Synchro reports with capacity and 95th percentile back of queue data are included in **Appendix C**.

TABLE 1 – EXISTING 2021 – CAPACITY ANALYSIS RESULTS

ID	Intersection	Control	Approach/ Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	East Cherokee Drive at Mill Creek Drive	Side Street Stop Control	WB	C	20.5	C	19.3
			SBL	A	8.2	A	8.8
2	East Cherokee Drive at Little Shoals Drive	Side Street Stop Control	WB	C	16.1	C	15.9
			SBL	A	8.2	A	8.5

As seen in Table 1, the intersections operate adequately at an LOS C or better during both the AM and PM peak hours. The analysis does not report any queues on the side street approaches longer than 50 feet (approximately two (2) vehicles assuming vehicles of approximately 25 feet) during any peak hour.

3. PROPOSED DEVELOPMENT TRAFFIC

3.1. Trip Generation – Proposed Development

The traffic projected to be generated by the proposed development was estimated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The trips expected to be generated by this development were determined using ITE Land Use Code 210 – Single-Family Detached Housing with an independent variable of 59 dwelling units. Pass-by trips are not applicable to this land use.

Table 2 provides a breakdown of the anticipated trip generation.

TABLE 2 – PROPOSED DEVELOPMENT TRIP GENERATION

Land Use Code 210 - Single-Family Detached Housing 59 Dwelling Units	Weekday			AM Peak Hour			PM Peak Hour		
	Total	Entering	Exiting	Total	Entering	Exiting	Total	Entering	Exiting
Total New Trips	622	311	311	46	12	34	61	38	23

3.1. Trip Distribution – Proposed Development

The trips for the proposed residential development were distributed through an assessment of the directional distribution depicted in the existing volumes. Approximately 65% of the traffic will travel to and from the south along East Cherokee Drive and the remaining 35% will travel to and from the north along East Cherokee Drive.

4. OPERATIONAL ANALYSES

4.1. Traffic Analyses

Capacity analyses for the side-street, stop controlled intersections were performed for peak hour conditions based on the methodology outlined in the *Highway Capacity Manual, 6th Edition (HCM 6th)* using Synchro® 11 analysis software. The roundabouts were analyzed according to HCM 6th methodology using SIDRA analysis software.

4.2. Alternative 1 – Full Access Driveway with Left Turn Lanes on Mainline

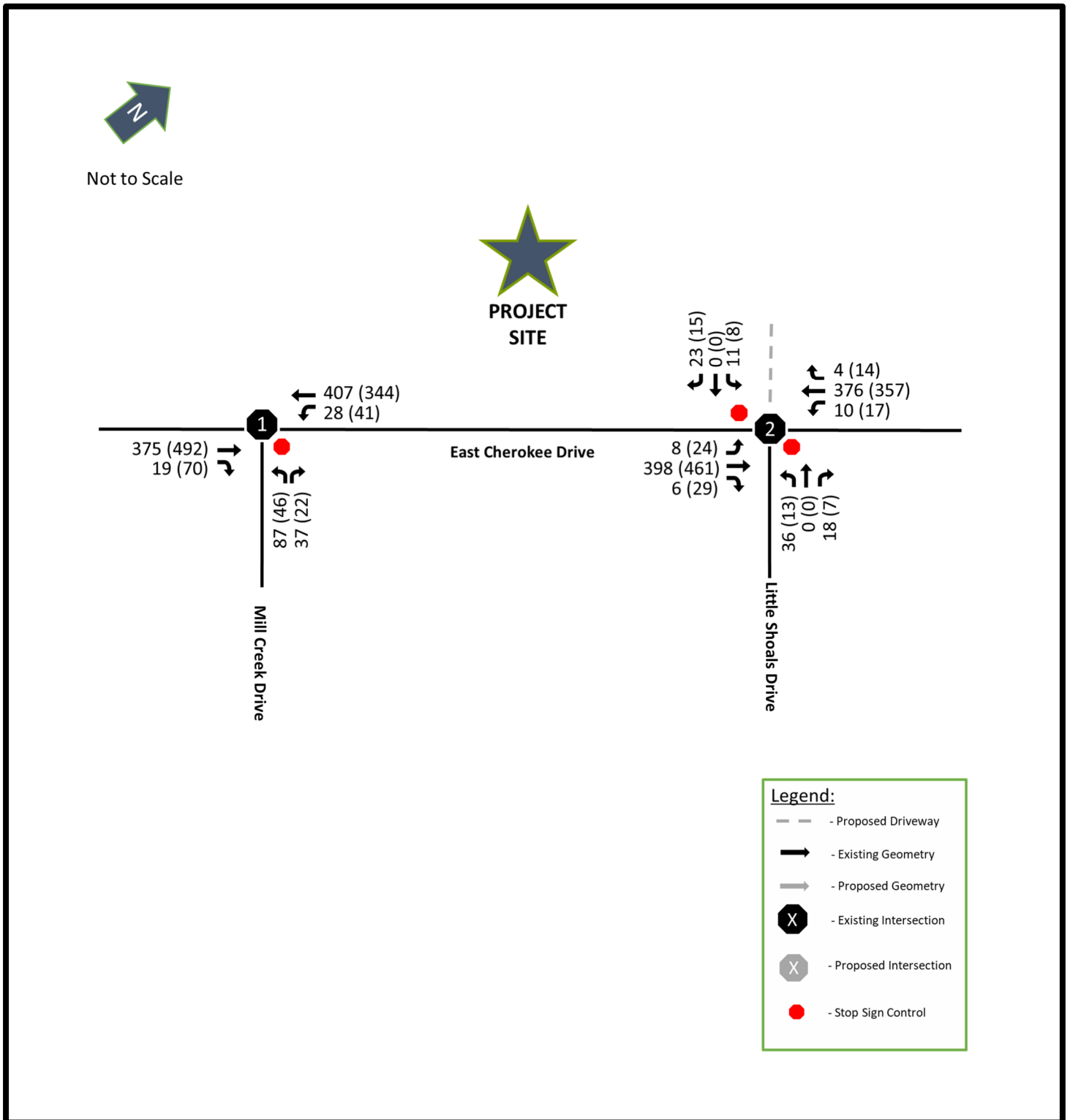
Alternative 1 consists of a full access driveway for the new development that would be located opposite of Little Shoals Drive, creating a four-legged, side-street stop-controlled intersection with East Cherokee Drive. The alternative features the installation of SB left turn lanes at both Mill Creek Drive and Little Shoals Drive and a right-turn deceleration lane at the new driveway. The volumes analyzed for Alternative 1 are depicted in **Figure 4**. The results of the analysis are listed in **Table 3**. Synchro reports with capacity and 95th percentile back of queue data are included in **Appendix D**.

TABLE 3 – ALTERNATIVE 1 – CAPACITY ANALYSIS RESULTS

ID	Intersection	Control	Approach/ Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	East Cherokee Drive at Mill Creek Drive	Side Street Stop Control	WB	C	21.3	C	20.1
			SBL	A	8.3	A	8.9
2	East Cherokee Drive at Little Shoals Drive	Side Street Stop Control	EB	B	14.3	C	15.1
			WB	C	19.4	C	19.4
			NBL	A	8.2	A	8.2
			SBL	A	8.2	A	8.5

As seen in Table 4, the addition of the new driveway opposite Little Shoals Drive does not significantly affect the operations of the intersection compared to existing conditions. The introduction of turn lanes at the intersections also does not significantly affect the operations of the intersections compared to existing conditions.

FIGURE 4 – ALTERNATIVE 1 - PEAK HOUR TRAFFIC



4.3. Alternative 2 – Roundabout aligned with Little Shoals Drive

Alternative 2 features a single lane roundabout along East Cherokee Drive that would be aligned with *Little Shoals Drive* (WB approach) and the new driveway (EB approach). The volumes analyzed for Alternative 2 are depicted in **Figure 5**. The results of the analysis are listed in **Table 4**. Synchro and SIDRA reports with capacity and 95th percentile back of queue data are included in **Appendix E**.

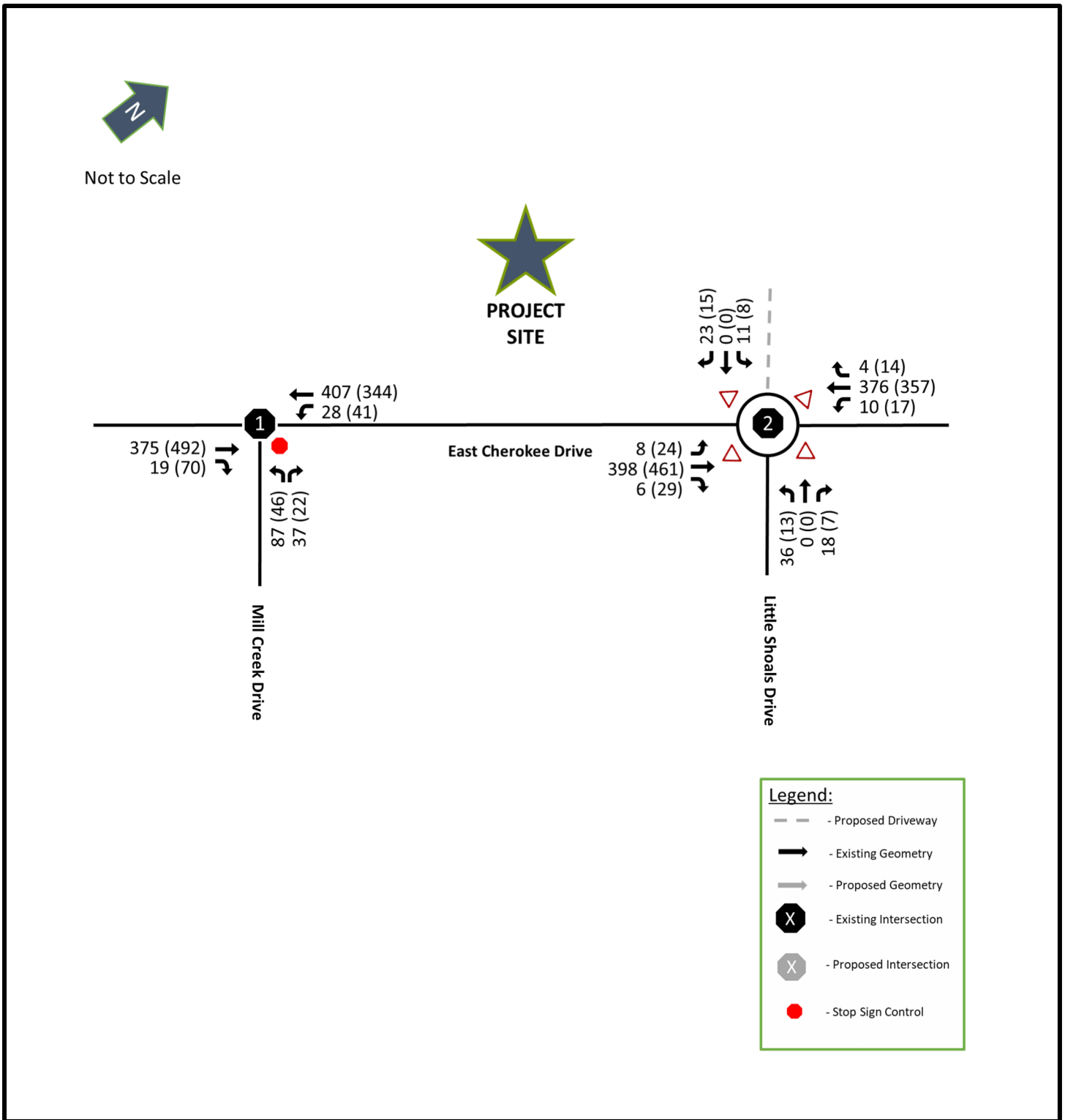
TABLE 4 – ALTERNATIVE 2 – CAPACITY ANALYSIS RESULTS

ID	Intersection	Control	Approach/ Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	East Cherokee Drive at Mill Creek Drive	Side Street Stop Control	WB	C	21.5	C	20.4
			SBL	A	8.3	A	8.9
2	East Cherokee Drive at Little Shoals Drive	Roundabout	Overall	A	6.1	A	6.7
			EB	A	4.6	A	4.3
			WB	A	4.8	A	4.7
			NB	A	6.2	A	7.4
			SB	A	6.2	A	6.1

As seen in Table 4, the proposed roundabout operates adequately at an overall LOS A in both the AM and PM peak hours. With the installation of a roundabout there are queues of no more than three (3) vehicles (63 – 87 feet, assuming vehicles of approximately 25 feet) in the AM or PM peak hours

Without the presence of a left turn lane and the introduction of traffic from the new development, the intersection of East Cherokee Drive & Mill Creek Drive continues to operate similarly to existing conditions with minor increases in delay (no more than 2 seconds).

FIGURE 5 – ALTERNATIVE 2 - PEAK HOUR TRAFFIC



4.4. Alternative 3 – Roundabout aligned with Mill Creek Drive

Alternative 2 features a single lane roundabout along East Cherokee Drive that would be aligned with *Mill Creek Drive* (WB approach) and the new driveway (EB approach). The volumes analyzed for Alternative 2 are depicted in **Figure 6**. The results of the analysis are listed in **Table 5**. Synchro and SIDRA reports with capacity and 95th percentile back of queue data are included in **Appendix F**.

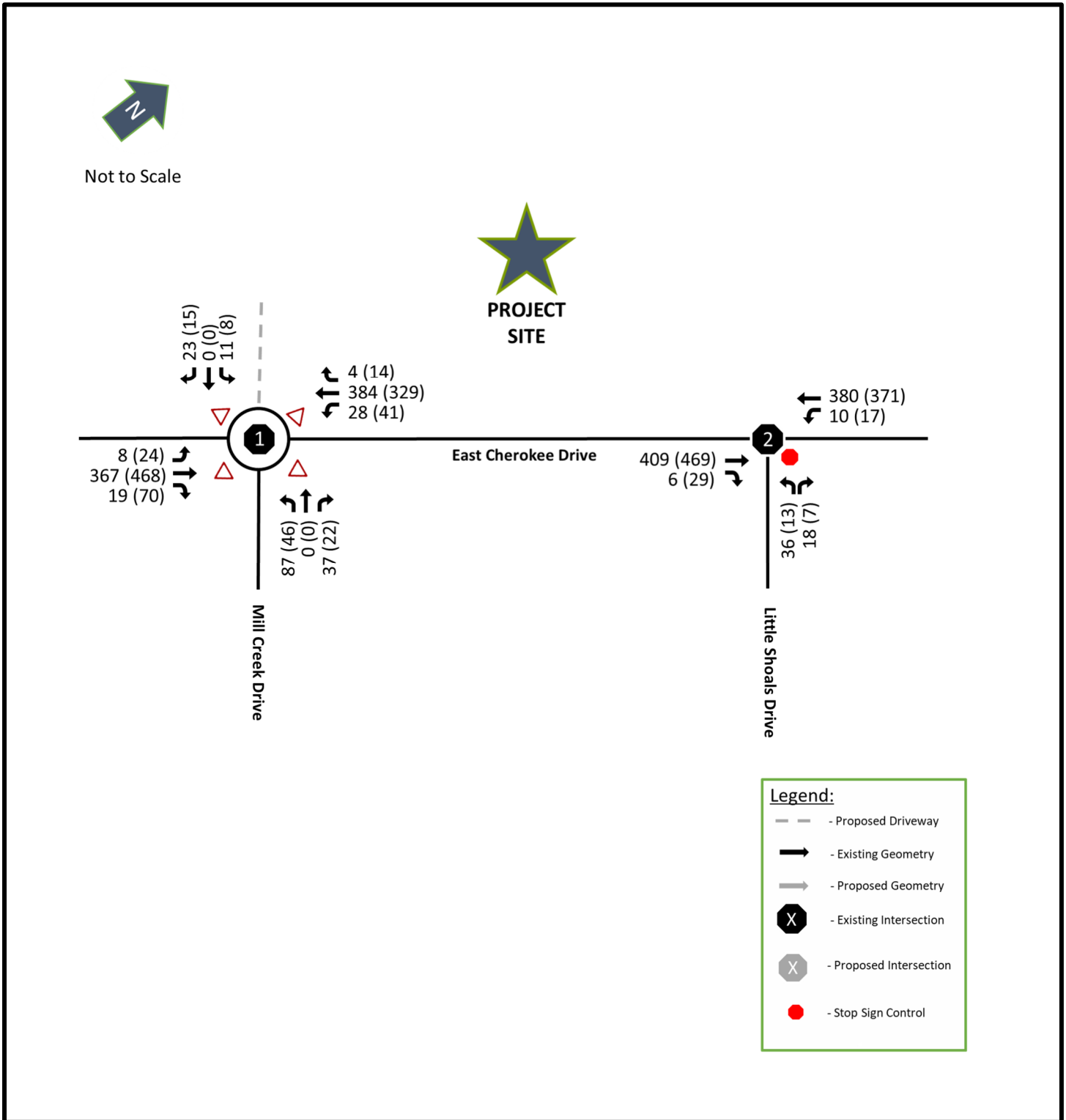
TABLE 5 – ALTERNATIVE 3 – CAPACITY ANALYSIS RESULTS

ID	Intersection	Control	Approach/ Movement	AM		PM	
				LOS	Delay	LOS	Delay
1	East Cherokee Drive at Mill Creek Drive	Roundabout	Overall	A	6.5	A	7.4
			EB	A	5.1	A	4.5
			WB	A	5.6	A	5.5
			NB	A	6.2	A	6.4
			SB	A	7.1	A	8.4
2	East Cherokee Drive at Little Shoals Drive	Side Street Stop Control	WB	C	16.4	A	16.2
			SBL	A	8.3	B	8.6

As seen in Table 5, the proposed roundabout operates adequately at an overall LOS A in both the AM and PM peak hours. With the installation of a roundabout there are queues of no more than four (4) vehicles (87 – 106 feet, assuming vehicles of approximately 25 feet) in the AM or PM peak hours.

Without the presence of a left turn lane and the introduction of traffic from the new development, the intersection of East Cherokee Drive & Little Shoals Drive continues to operate similarly to existing conditions with minor increases in delay (no more than 2 seconds).

FIGURE 6 – ALTERNATIVE 3 - PEAK HOUR TRAFFIC



5. CONCLUSIONS

A new residential development is planned for construction along East Cherokee Drive opposite of Little Shoals Drive and Mill Creek Drive. The development is proposed to feature 59 single-family homes. The development will generate a total of 622 daily trips with 46 occurring during the AM peak hour (12 inbound, 34 outbound) and 61 occurring during the PM peak hour (38 inbound, 23 outbound).

In existing operations, both intersections of East Cherokee Drive at Mill Creek Drive and East Cherokee Drive at Little Shoals Drive operate at an overall LOS C or better.

This study analyzed three (3) alternatives for placement and configuration of the proposed access point for the subject development. The traffic operations for the three (3) alternatives are summarized below:

Alternative 1 — Full Access Driveway (w/ Right-turn deceleration lane) for the new development located opposite of Little Shoals Drive featuring the installation of left turn lanes at Little Shoals Drive and Mill Creek Drive.

In Alternative 1, the introduction of SB left turn lanes along East Cherokee Drive at both Mill Creek Drive and Little Shoals Drive and new trips from the subject development does not significantly affect operations at the intersections, whereas, there are minor increases in delay and no changes in LOS. The new four-legged intersection of the East Cherokee Drive at Little Shoals Drive/ New Site Driveway operates at an LOS C or better in both the AM and PM peak hour with queues no longer than two (2) vehicles.

Alternative 2 — Single Lane Roundabout on East Cherokee Drive aligned with Little Shoals Drive and the driveway for the proposed development

In Alternative 2, the installation of a single lane roundabout aligned with Little Shoals Drive does not significantly affect the operations of the study intersections. The roundabout is projected to operate at an LOS A during the AM and PM peak hours with delays between 4 and 7 seconds and queues between 63 and 87 feet.

Alternative 3 — Single Lane Roundabout on East Cherokee Drive aligned with Mill Creek Drive and the driveway for the proposed development

In Alternative 3, the installation of a single lane roundabout aligned with Mill Creek Drive does not significantly affect the operations of the study intersections. The roundabout is projected to operate at an LOS A during the AM and PM peak hours with delays between 5 and 7 seconds and queues between 87 and 106 feet.

6. REFERENCES

1. Trip Generation, 10th Edition + Supplement, Institute of Transportation Engineers, Washington, DC, 2020.
2. Synchro, Version 11, Trafficware Ltd., Sugar Land, TX, 2019.
3. Highway Capacity Manual, 6th Edition, Transportation Research Board, Washington, DC, 2016

APPENDIX A – PROPOSED DEVELOPMENT CONCEPT PLANS

APPENDIX B – TRAFFIC COUNTS

APPENDIX C – EXISTING CONDITIONS OPERATIONAL ANALYSIS REPORTS

**APPENDIX D –
ALTERNATIVE 1
OPERATIONAL ANALYSIS REPORTS**

APPENDIX E – ALTERNATIVE 2 OPERATIONAL ANALYSIS REPORTS

APPENDIX F –
ALTERNATIVE 3
OPERATIONAL ANALYSIS REPORTS