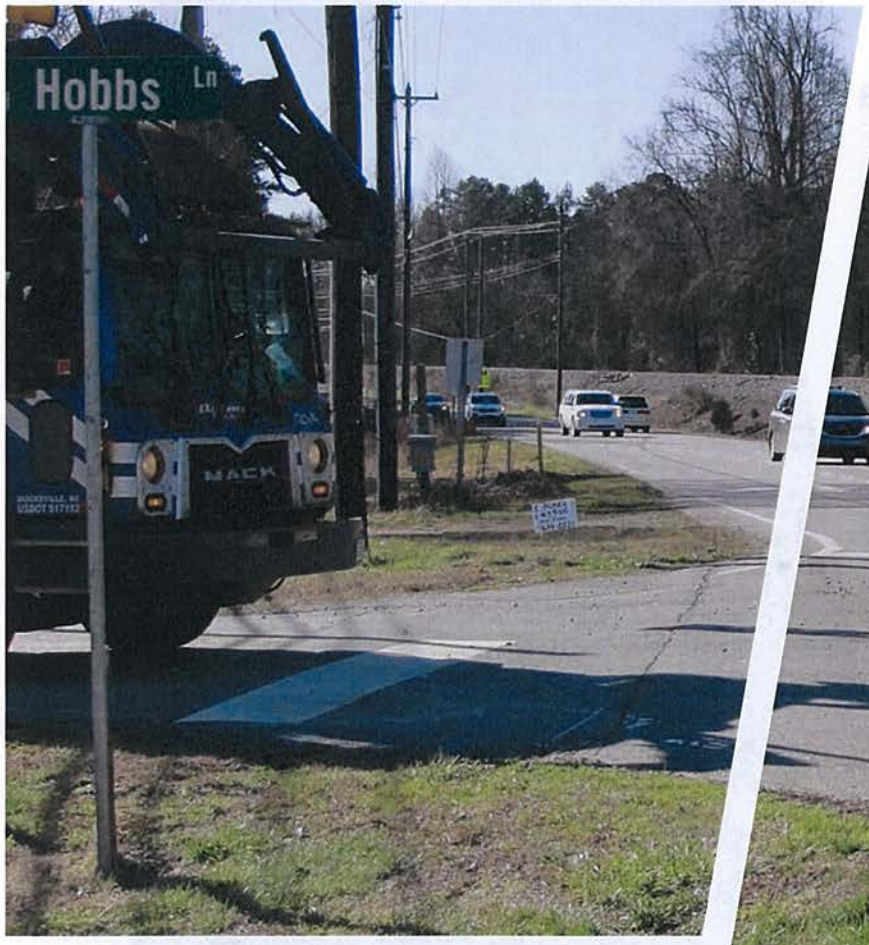

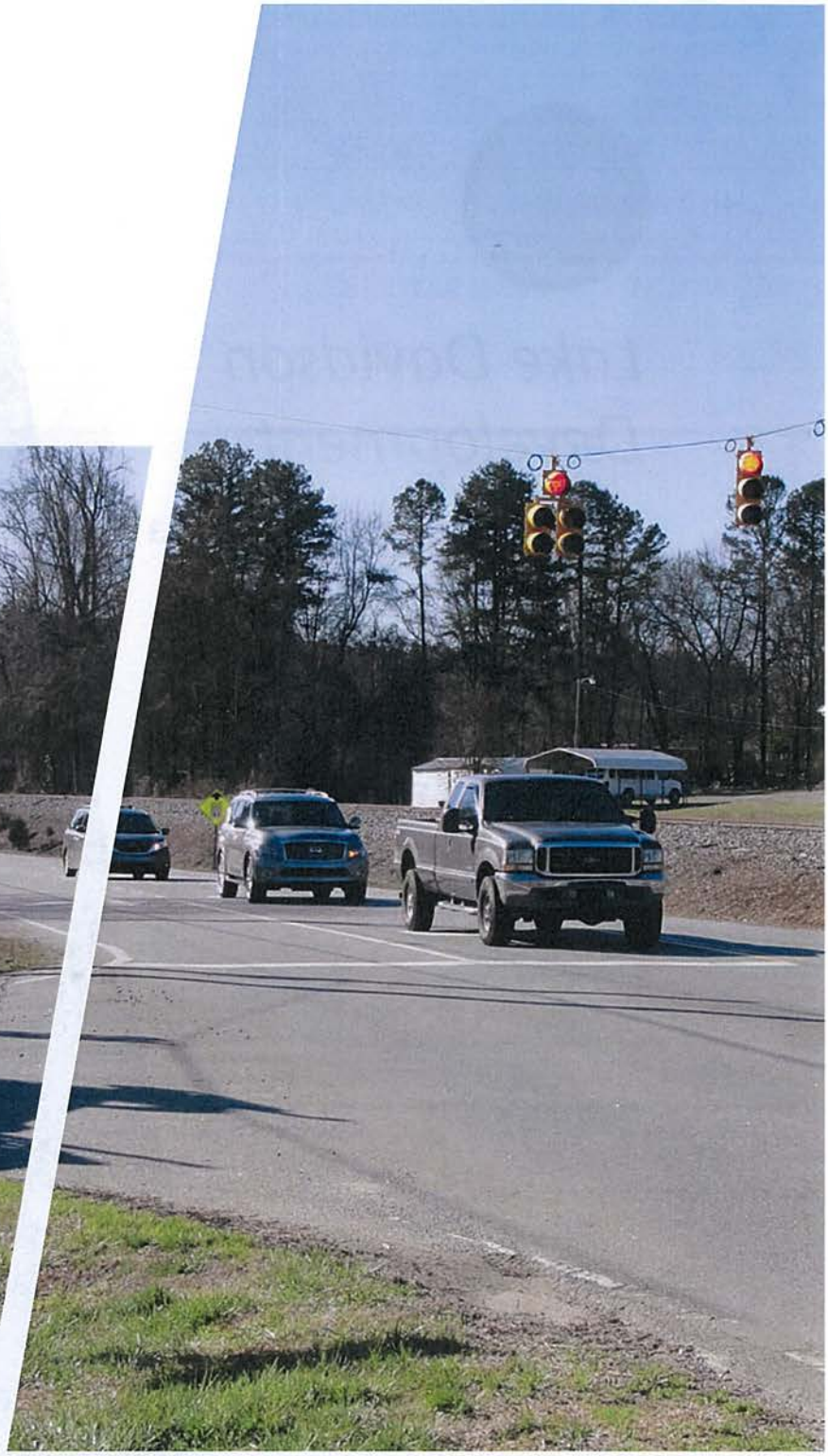

REVISED DRAFT

Lake Davidson Development

Mooresville, North Carolina

Transportation Impact Analysis

November 2016

RS&H

Lake Davidson Development

Mooresville, North Carolina

Transportation Impact Analysis

Applicant information:
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Hinckley Gauvain
P.O. Box 3965
Mooresville, NC 28117

November 2016

REVISED DRAFT

RS&H

Table of Contents

List of Tables

EXECUTIVE SUMMARY

This report summarizes the findings of the Traffic Impact Analysis (TIA) completed for the proposed Lake Davidson Development. The development is proposed to be located west of the intersection of NC 115 and Bridges Farm Road in Mooresville, North Carolina. The proposed development land uses are 115 single-family homes, 300 residential condos, 120 townhomes, 300 apartments, 65,000 square feet of general office space, and 65,000 square feet of retail space. The anticipated completion date is the year 2026. There are three phases under consideration for this analysis.

Four site access driveways are proposed for this development along existing Bridges Farm Road. Traffic will then be distributed to the network through the intersection of NC 115 and Bridges Farm Road.

The purpose of this analysis is to determine the potential impact of the Lake Davidson Development on the intersections of NC 115 at Bridges Farm Road, NC 115 at Langtree Road/Hobbs Lane, NC 115 at Yellow Wood Circle (AM Only), NC 115 at Presbyterian Road, Presbyterian Road at Franks Crossing Road (AM Only), Presbyterian Road/Vista Drive at Shearers Road, NC 115 at Beaty Street, and Beaty Street/Sloan Street at Griffith Street. The traffic analysis was completed in five scenarios:

1. **2015 Existing Conditions:** Evaluated current performance of the intersection to establish a baseline for comparison.
2. **2027 Future Year Conditions:** Evaluated the future performance of the intersections assuming Lake Davidson Development is not built. Relevant adjacent developments' traffic volumes, Legacy Village and Stafford Subdivision, provided by the Town were incorporated into this scenario. Comparison of build scenarios to the no build shows the impacts of the development.
3. **2021 Future Year Phase 1 Build Conditions (Partial Build-Out):** Evaluated the future performance of the intersections assuming the first phase of the Lake Davidson Development is built with 115 single-family detached homes, 38 residential condos/townhomes, and 300 apartment units.
4. **2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):** Evaluated the future performance of the intersections assuming the Lake Davidson Development is built with an additional 382 residential condos/townhomes.
5. **2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):** Evaluated the future performance of the intersections assuming the Lake Davidson Development is built with an additional 65,000 square feet of shopping center space and 65,000 square feet of general office space.

List of Figures

2015 Existing Conditions Analysis

The 2015 Existing Conditions traffic operations function at acceptable Levels of Service at the following intersections:

- NC 115 and Yellow Wood Circle
- Presbyterian Road/Vista Drive and Shearers Road

The remaining six intersections function at Level of Service E or F in at least one peak hour:

- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

2027 Future Year Conditions Analysis

The 2027 Future Year Conditions traffic operations would function at acceptable Levels of Service at the following intersections:

- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Yellow Wood Circle
- Presbyterian Road/Vista Drive and Shearers Road

The remaining five intersections function at Level of Service E or F in at least one peak hour:

- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

2021 Future Year Phase 1 Build Conditions (Partial Build-Out)

The 2021 Future Year Phase 1 Build Conditions traffic operations would not degrade from the 2027 Future Year Conditions at the following intersections:

- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Yellow Wood Circle

Six intersections would operate at worsened conditions from the 2027 Future Year Conditions in at least one peak hour:

- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- Presbyterian Road/Vista Drive and Shearers Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)

The 2024 Future Year Phase 1 & 2 Build Conditions traffic operations would not degrade from the 2027 Future Year Conditions at the following intersections:

- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Yellow Wood Circle

Six intersections would operate at worsened conditions from the 2027 Future Year Conditions in at least one peak hour:

- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- Presbyterian Road/Vista Drive and Shearers Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)

The 2027 Future Year Phase 1, 2 & 3 Build Conditions traffic operations would not degrade from the 2027 Future Year Conditions at the following intersections:

- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Yellow Wood Circle

Six intersections would operate at worsened conditions from the 2027 Future Year Conditions in at least one peak hour:

- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- Presbyterian Road/Vista Drive and Shearers Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

Mitigation Measure Recommendations

The findings of this study indicate that the Lake Davidson Development traffic would degrade the operations of the following existing intersections from the 2027 Future Year Conditions:

- NC 115 and Bridges Farm Road would experience increased delay while remaining Level of Service F in the AM Peak Hour and would degrade from Level of Service C to F in the PM Peak Hour.
- NC 115 and Presbyterian Road would experience increased delay while remaining Level of Service F in the AM Peak Hour and would degrade from Level of Service B to F in the PM Peak Hour.
- Presbyterian Road and Franks Crossing Road would degrade from Level of Service E to F in the AM Peak Hour.

- Presbyterian Road/Vista Drive and Shearers Road would degrade Level of Service C to D in the AM and PM Peak Hours.
- NC 115 and Beaty Street would degrade from Level of Service E to F in the AM Peak Hour and would experience increased delay while remaining Level of Service F in the PM Peak Hour.
- Beaty Street/Sloan Street and Griffith Street would degrade from Level of Service D to E in the AM Peak Hour and would experience increased delay and degrade to Level of Service E to F in the PM Peak Hour.

In addition to the NCDOT Congestion Management Capacity Analysis Guidelines, the Town of Mooresville's Transportation Impact Analysis Procedures Manual, guidelines were followed. As described in the Town's manual, mitigation is required when the Build conditions exceeds the No Build conditions by any of the following thresholds:

Capacity

- Degrades the overall intersection Level of Service for signalized intersections, or Level of Service for the critical movement of unsignalized intersections, or
- Increases the delay for signalized or unsignalized intersections operating at Level of Service E or F.

Queue

- Turn lanes for site driveways should follow NCDOT's Policy of Street and Driveway Access to North Carolina Highways, and
- No Build queues are accommodated in existing storage bay and Build queue exceeds existing storage bay

Mitigations, shown by intersection for each scenario, are recommended for the intersections experiencing degraded operations with the addition of the Lake Davidson Development.

NC 115 and Langtree Road/Hobbs Lane

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- In order to accommodate queues, the following improvements are recommended:
    - Extend the eastbound right turn lane to provide 425 feet of storage. Queuing analysis indicates that the traffic demand would require additional storage length than is provided in the 2027 No Build Conditions. Therefore, this improvement should not be the sole responsibility of the Lake Davidson developer.
    - Extend the northbound left turn lane to provide 500 feet of storage. Queuing analysis indicates that the traffic demand would require additional storage length than is provided in the 2027 No Build Conditions. Therefore, this improvement should not be the sole responsibility of the Lake Davidson developer.
    - While the Level of Service on the westbound approach would degrade in these conditions, an additional through lane along NC 115 would be required to restore the Level of Service

for the approach. The addition of a second through lane along NC 115 would need to be a corridor-wide improvement with far reaching impacts and is not considered a reasonable improvement as a result of this development.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional changes are recommended from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional changes are recommended from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

NC 115 and Yellow Wood Circle

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- No improvements are recommended for these conditions.
    - While the queuing analysis results indicate that the traffic demand would require additional storage length than is currently provided for the northbound right turn lane, it is likely due to vehicles being unable to access the separate turn lane due to backups in the through lane. Therefore, the improvement is not considered to be necessary as a part of the Lake Davidson Development mitigation measures.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No improvements are recommended for these conditions.

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No improvements are recommended for these conditions.
    - While the Levels of Service would degrade for the westbound and northbound approaches in these conditions, the overall intersection would continue to function at Level of Service D. In order to restore each approach Level of Service, an additional northbound right turn lane as well as an additional southbound left turn lane would be required. These improvements are not considered reasonable for the following reasons:
        - Potential right-of-way and environmental impacts.
        - The signal would need to be modified to have protected phasing for the northbound and southbound turning movements, causing unnecessary delays during the majority of the day, whilst only providing benefits during the school peak hours.

NC 115 and Bridges Farm Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Convert to a signalized intersection, assuming that warrants are met upon opening of Phase 1. Based on the projected peak hour traffic volumes, a signal is warranted (MUTCD Warrant 3); however, additional traffic counts and Full Warrant Analysis is recommended.
- Provide an eastbound left turn lane with 350 feet of storage.

- Provide a northbound left turn lane with 450 feet of storage.
- Provide a southbound right turn lane with 250 feet of storage.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

NC 115 and Presbyterian Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a westbound left turn lane with 225 feet of storage.
- Provide a northbound right turn lane with 250 feet of storage.
- Provide a southbound left turn lane with 225 feet of storage.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Presbyterian Road and Franks Crossing Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- In order to reduce the delay increase caused by the additional vehicles from the Lake Davidson Development, a traffic signal would need to be installed. However, the traffic volumes at this intersection do not meet the Peak Hour Warrants so it is not recommended that a signal be installed.
- In lieu of a traffic signal, a separate northbound right turn lane with 100 feet of storage could be provided to reduce delay for the northbound traffic at the stop sign. This improvement is recommended but it should be noted that the volumes do not meet the turn lane warrants per the NCDOT Driveway Manual. Even with the addition of a northbound right turn lane, the delay would increase from the 2027 No Build Conditions. No additional improvements are feasible.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Presbyterian Road/Vista Drive and Shearers Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide an eastbound shared through/right turn lane with 100 feet of storage, converting the existing lane to an exclusive left turn lane.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

NC 115 and Beaty Street

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- In order to maintain the Level of Service F, without increasing delay, improve the eastbound approach Level of Service, a separate southbound right turn lane with 100 feet is recommended.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- In addition to the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out) improvement, convert to a signalized intersection, assuming that warrants are met upon opening of Phase 2. Based on the projected peak hour traffic volumes, a signal is warranted (MUTCD Warrant 3); however, additional traffic counts and Full Warrant Analysis is recommended. In addition, it is the recommendation of the Division 10 Traffic Engineer that, should the signal be warranted, a northbound left turn lane should be installed. As the intersection would function at an acceptable Level of Service with the addition of the southbound right turn lane and the conversion to a signal, a northbound left turn lane is not shown in the analysis. It should be discussed as part of the mitigation measures meeting what the appropriate action should be for this location.

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out).

Beaty Street/Sloan Street and Griffith Street

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Extend the eastbound left turn lane to provide 425 feet of storage. Queuing analysis indicates that the traffic demand would require additional storage length than is provided in the 2027 No Build Conditions. Therefore, this improvement should not be the sole responsibility of the Lake Davidson developer.
- Provide a southbound right turn lane with 300 feet of storage. While the queuing analysis results indicate that the traffic demand would require additional storage length than is currently provided for the northbound right turn lane, it is likely due to vehicles being unable to access the separate

turn lane due to backups in the through lane. Therefore, the improvement is not considered to be necessary as a part of the Lake Davidson Development mitigation measures.
    - While the configuration of the left turn/through shared lane is not ideal, due to the high traffic demand of the right turning movement, it is recommended that the right turn lane be exclusive. Though the traffic demand does not indicate a need for separate through and left turn lanes, the configuration should be discussed as part of the mitigation measures meeting.
- While the northbound approach Level of Service degrades in these conditions, it is Level of Service D. In order to improve it further, additional lanes would be needed but based on the traffic demand of the approach, none are recommended.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).
- While the northbound approach Level of Service degrades in these conditions, it is Level of Service D. In order to improve it further, additional lanes would be needed but based on the traffic demand of the approach, none are recommended.

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).
- While the northbound approach Level of Service degrades in these conditions to Level of Service D and E, additional lanes would be needed to improve the approach but based on the traffic demand, none are recommended.

Bridges Farm Road and Driveway #1

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane with a minimum of 200 feet of storage before the first intersection within the Lake Davidson Development.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- In addition to the previous improvement, provide a westbound right turn lane with 100 feet of storage.

Bridges Farm Road and Driveway #2

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane with a minimum of 400 feet of storage before the first intersection within the Lake Davidson Development.
- Provide a westbound right turn lane with 100 feet of storage.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Bridges Farm Road and Driveway #3

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Bridges Farm Road and Driveway #4

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

The proposed improvements will improve the Level of Service and/or delay at the locations to acceptable levels, unless noted above. Where new traffic signal installation is recommended, alternative mitigation measures without a traffic signal do not maintain or improve operations of the intersection when compared to the 2027 Future Year Conditions.

1.0 INTRODUCTION

Lake Davidson Development is a mixed-use development proposed to be located west of the intersection of NC 115 and Bridges Farms Rd in Mooresville, North Carolina. This report presents the traffic operation impacts of this new development. The site plan is shown in Figure 1.

1.1 Project Description

The Lake Davidson Development will be located on a 137 acre parcel and will use all 137 acres for the development. The existing use is a vacant lot with mixed woods and farmland, which is also adjacent to single family homes, Davidson Pointe Subdivision and The Estates at Lake Davidson development. The proposed uses are 115 single-family homes, 300 residential condos, 120 townhomes, 300 apartments, 65,000 square feet of general office space, and 65,000 square feet of retail space. The anticipated completion date is the year 2026. There are three phases under consideration for this analysis. The Approved Memorandum of Understanding (MOU) for the subject project is included in Appendix A. Relevant email and written correspondence is included in Appendix H.

Existing Project Site Use

1.2 Site Description

The site is located west of NC 115 and Norfolk-Southern Railroad directly north of Bridges Farm Road to the east of I-77. This is south of the Mooresville municipal limits, in the Mount Mourne area, and the eastern edge of Lake Norman. The site is also in the northern area of the Charlotte Regional Transportation Planning Organization's (CRTPO) planning boundary. The existing zoning codes are residential R3, corridor overlay, and residential-agricultural (RA) for the parcels, however, the site is currently undeveloped. The proposed development would be built in the proposed zoning TND-C (traditional neighborhood district). The site is heavily wooded in areas, as well as partial farmland, with a small stream running through the northern portion of the development. Generally, the parcel slopes northwest towards Lake Norman. In addition to the stream, a gas easement runs diagonally through the development.

1.3 Site Access

The Lake Davidson Development is planned to include four site access driveways connecting to Bridges Farm Road. The permanent access driveways would be stop-controlled. The current control at Bridges Farm Road and NC 115 is stop-controlled.

Site Data:

Tax Parcels:	4645908695.000, 4655011284.000, & 4655102752.000
Total Acreage:	+/- 136.98 Acres
Location:	Town of Mooresville, NC & Iredell County, NC
Existing Zoning:	R-3, Corridor Overlay (Town of Mooresville) & RA (Iredell County)
Proposed Zoning:	TND-C (Town of Mooresville)
Watershed:	WS-IV Critical Area

High Impervious Surface Option:
- Nonresidential Impervious Coverage shall not exceed 50%
- A 100' Riparian Buffer shall be provided (50' Undisturbed Buffer + additional 50' Landscaped Buffer)

Phase 1	
Single-Family Detached Housing	±115 DU
Residential Condo/Townhouse	± 38DU
Apartment	±300DU
Phase 2	
Residential Condo/Townhouse	±382 DU
Phase 3	
Shopping Center	±65,000 SF
General Office Building	±65,000 SF
Proposed Density:	5.2 DU/Acre
Required Density:	4 DU/Acre minimum

General Notes
1. Base information provided by Iredell County GIS Data and Lake Davidson GIS map. Base information should be verified for accuracy.
2. All zoning and wetland information utilized in the preparation of this Preliminary Concept Sketch is considered to be preliminary in nature and subject to change and final verification.
3. Draft - Do not rely on this document.

Floodplain Information
Floodplain information obtained from FEMA FIRM Panels 4655 & 4645, effective date of study March 18, 2009 and 4644 & 4654, effective date of study March 2, 2009.

Stream/Wetland Information
Stream/Wetland information is based on preliminary information provided to ESP by Iredell County GIS data. For purposes of preparation of this Preliminary Concept Sketch, any potential wetland areas and stream features depicted on this plan are considered to be preliminary in nature and approximate in location.

Access Points/Driveways/Streets
1. Proposed project site entrance locations are considered preliminary in nature and need to be verified for adequate sight distance.
2. All roadway and street systems are considered to be preliminary and will need to be verified for sufficiency to satisfy or exceed minimum requirements established in the Mooresville Zoning Ordinance and applicable standards identified by NCDOT. Street connections are conceptual and may be subject to change based on agency input and review.

Open Space / Tree Save
Open Space and Tree Save areas are conceptual and preliminary. The exact location of these areas may change as the client finalizes decisions regarding final layout, product allocation, and as other spatially dependent project components such as stormwater areas, wetland areas, utility features, and buffers, (as applicable) for this project are better defined.

Potential Stormwater Quality Areas
Location of proposed stormwater areas are conceptual and preliminary and still need to be determined. The exact size and location of these areas will change as the client finalizes decisions regarding final layout, product allocation, and as other proposed changes to the project are better defined. Layout and unit count subject to change based on final design of stormwater areas.

Public Information
ESP Associates is not responsible for omissions created by incorrect, incomplete, missing or outdated information derived from public sources such as GIS, Planning and Zoning departments.

Watershed Protection Overlay District
Overall density and impervious surface area rates subject to the Watershed Protection Overlay District regulations as found in the Mooresville Zoning Ordinance and based on coordination with appropriate agencies. Layout subject to change, unit loss may occur.

ESP Associates, P.A.
P.O. Box 7030, Charlotte, NC 28241 / 3475 Lakemont Blvd, Suite 100, Fort Mill, SC 29708
NC - 704.583.4949 / SC - 803.802.2440
www.espassociates.com

NORTH

Lake Davidson Site
Preliminary Concept Sketch B

ESP Job# DS44.100 October 26, 2016

FIGURE 1

GRAPHIC SCALE

300 0 150 300 600

1 INCH = 300 FT.

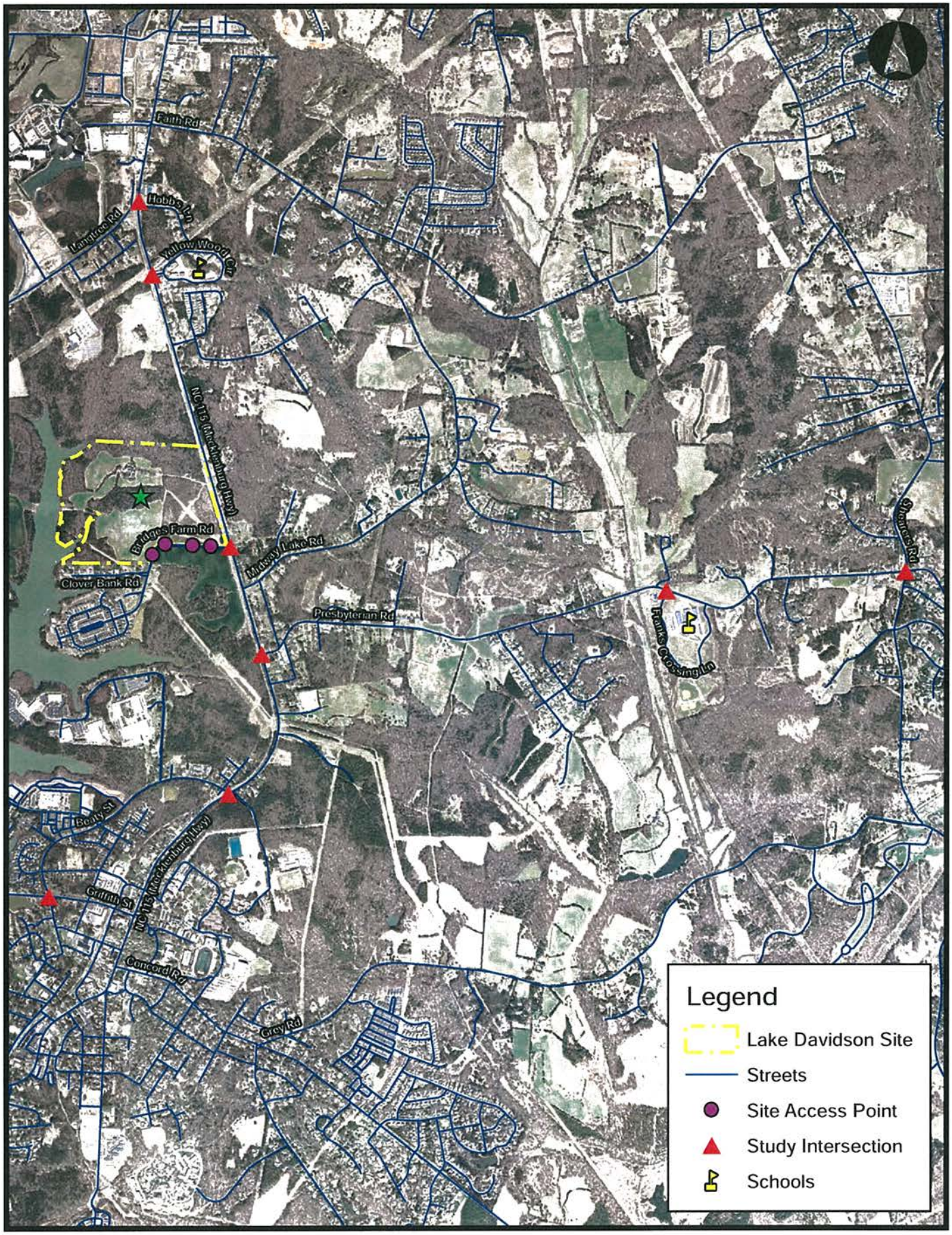
nest HOMES
236 Raceway Drive #7
Mooresville, NC 28117

2.0 STUDY AREA

The study area encompasses the existing intersections of NC 115 at Bridges Farm Road, NC 115 at Langtree Road/Hobbs Lane, NC 115 at Yellow Wood Circle, NC 115 at Presbyterian Road, Presbyterian Road at Franks Crossing Road, Presbyterian Road/Vista Drive at Shearers Road, NC 115 at Beaty Street, and Beaty Street/Sloan Street at Griffith Street. This study area has been evaluated for capacity, queuing, and collision issues. A field investigation was completed for all study area intersections on February 5, 2016. The field investigation notes are included in Appendix C.

Langtree Road and NC 115 are identified in Mooresville's Comprehensive Transportation Plan (CTP) as Community Strategic Corridors.

Adjacent land uses include the Davidson Point subdivision and The Estates at Lake Davidson, both to the southwest of the proposed Lake Davidson Development which are accessed from Bridges Farm Road. To the east of NC 115 are other single family homes. Nearby traffic generators include Davidson College to the south and Lowe's Home Improvement Corporate Office to the north. Other features in the vicinity can be found in Figure 2.



Prepared by:
RS&H
Prepared for the Town of Mooresville

LAKE DAVIDSON DEVELOPMENT

VICINITY MAP

FIGURE 2

3.0 EXISTING CONDITIONS

The 2015 Existing Conditions analysis was performed for the AM and PM Peak Hours for a typical weekday. The peak hour is defined as the highest four continuous 15-minute traffic count intervals in each respective peak period. The scope of this study includes the AM and PM Peak Hour counts which were collected by the subconsultant. The traffic counts were obtained during a weekday from 7 to 9 AM and from 4 to 6 PM. The peak hours were determined based on the collected traffic counts and occurred at varying times, beginning from 7:00 AM to 7:15 AM and again from 4:30 PM to 5 PM. The Traffic Count Worksheets are included in Appendix B. The measurement used to evaluate the intersections is Level of Service (LOS). Level of Service is a measurement of average delay of vehicles using the intersection. Level of Service is defined by the Highway Capacity Manual 2010 (HCM) as shown in Table 1.

Table 1 – Intersection Level of Service Criteria

Level of Service	Mean Delay Time per Vehicle (seconds)		Description
	With Signal	Without Signal	
A	Less than 10	Less than 10	Little or no delay
B	10 to 20	10 to 15	Short traffic delays
C	20 to 35	15 to 25	Average traffic delays
D	35 to 55	25 to 35	Longer but acceptable delays
E	55 to 80.0	35 to 50	Very long traffic delays
F	More than 80.0	More than 50	Unacceptably long traffic delays

Source: Highway Capacity Manual, Transportation Research Board, Washington, D.C., 2010.

The 2015 Existing Conditions analysis includes the four signalized intersections of NC 115 at Langtree Road/Hobbs Lane, NC 115 at Yellow Wood Circle (AM Peak Hour only), NC 115 at Presbyterian Road, and Beaty Street/Sloan Street at Griffith Street. The four stop-controlled intersections analyzed in the 2015 Existing Conditions include NC 115 at Bridges Farm Road, Presbyterian Road and Franks Crossing Road (AM Peak Hour only), Presbyterian Road/Vista Drive at Shearers Road, and NC 115 at Beaty Street.

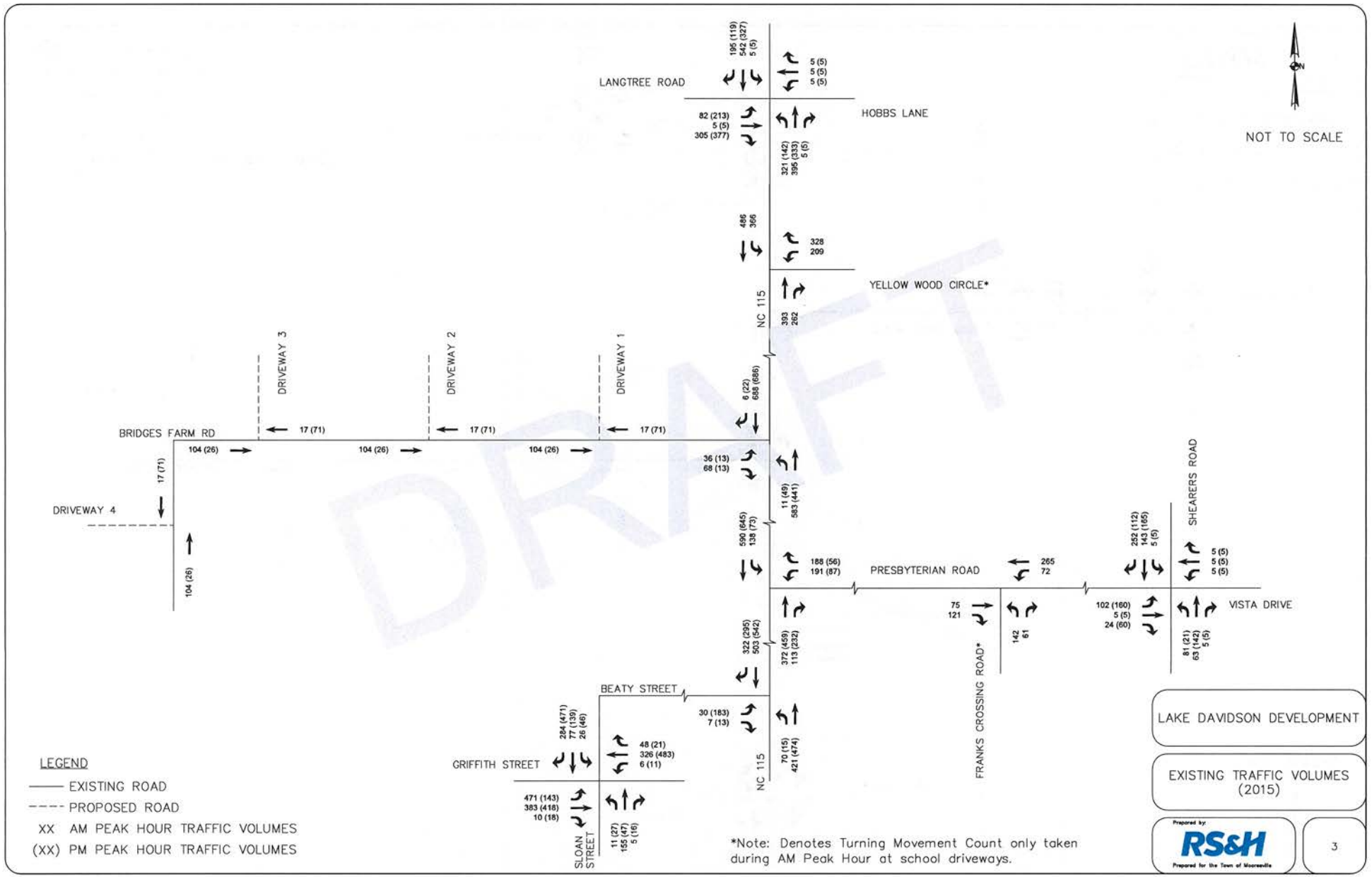
The 2015 Existing Conditions traffic operations function at acceptable Levels of Service at the following intersections:

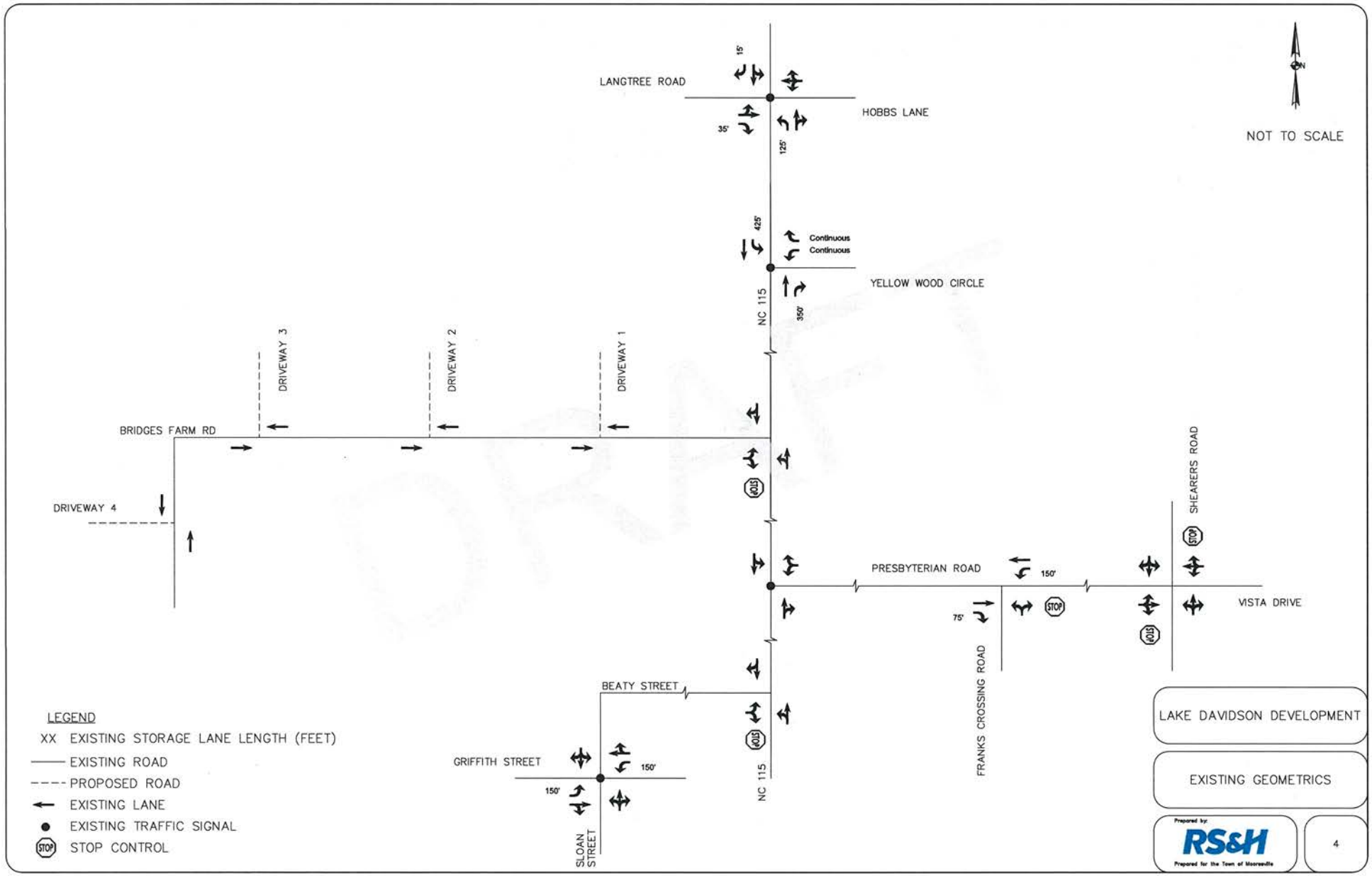
- NC 115 and Yellow Wood Circle
- Presbyterian Road/Vista Drive and Shearers Road

The remaining six intersections function at Level of Service E or F in at least one peak hour:

- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

Existing turning movement volumes for these intersections are presented in Figure 3 and existing geometrics are presented in Figure 4. All capacity analysis worksheets are included in Appendix E.


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD*
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX AM PEAK HOUR TRAFFIC VOLUMES
(XX) PM PEAK HOUR TRAFFIC VOLUMES
*Note: Denotes Turning Movement Count only taken during AM Peak Hour at school driveways.
LAKE DAVIDSON DEVELOPMENT
EXISTING TRAFFIC VOLUMES (2015)
Prepared by
RS&H
Prepared for the Town of Mooresville
3


LANGTREE ROAD
HOBBS LANE
15'
35'
125'
425'
Continuous
Continuous
YELLOW WOOD CIRCLE
NC 115
350'
DRIVEWAY 3
DRIVEWAY 2
DRIVEWAY 1
BRIDGES FARM RD
DRIVEWAY 4
PRESBYTERIAN ROAD
150'
75'
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD
BEATY STREET
GRIFFITH STREET
150'
150'
SLOAN STREET
NC 115
NOT TO SCALE
LEGEND
XX EXISTING STORAGE LANE LENGTH (FEET)
EXISTING ROAD
PROPOSED ROAD
EXISTING LANE
EXISTING TRAFFIC SIGNAL
STOP CONTROL
LAKE DAVIDSON DEVELOPMENT
EXISTING GEOMETRICS
Prepared by:
RS&H
Prepared for the Town of Mooresville
4

4.0 FUTURE YEAR CONDITIONS

The proposed Lake Davidson Development is scheduled to be completed in three phases:

- Phase 1 – 115 single family homes, 300 apartments, and 38 townhomes. Complete in 2020.
- Phase 2 – 300 condominiums, 82 townhomes. Complete in 2023.
- Phase 3 – 65,000 square feet of office space, 65,000 square feet of retail space. Complete in 2026.

The analysis for the Future Year Conditions was therefore performed for one year past Full Build-Out (2027) to assume normalized traffic patterns in the study area. In lieu of an annual growth rate, background site traffic from the Legacy Village development and Stafford Subdivision were added to the Existing Conditions traffic volumes to determine the 2027 Future Year Conditions traffic volumes without the subject project. Full copies of the Legacy Village development and Stafford Subdivision TIAs are included in Appendix I (electronically).

For the year 2020, the following improvements are anticipated to be in place at the intersection of NC 115 and Langtree Road/Hobbs Lane according to the Stafford Subdivision TIA, dated August 2015:

- Modify the signal plan to provide protective/permissive phasing for the northbound left turn lane movement and an overlap for the eastbound right turn lane movement.
- Extend left turn lane to 275 feet on the northbound approach of NC 115.
- Extend right turn lane to 1,000 feet on southbound approach of NC 115 (continuous lane to tie into Campus Lane/Faith Road intersection).
- Extend right turn lane to 110 feet on the eastbound approach of Langtree Road.

The above improvements were assumed to be in place for the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out) for the Lake Davidson Development.

For the year 2022, the following improvements are anticipated to be in place at the intersection of NC 115 and Langtree Road/Hobbs Lane according to the Stafford Subdivision TIA, dated August 2015:

- Modify the signal plan to provide protective/permissive phasing for the northbound left turn lane movement and an overlap for the eastbound right turn lane movement.
- Extend left turn lane to 350 feet on the northbound approach of NC 115.
- Re-stripe left-thru lane to thru lane on the southbound approach of NC 115.
- New left turn lane in unused/available space (approximately 50 feet) on the southbound approach of NC 115.
- Extend right turn lane to 400 feet on southbound approach of NC 115.
- Extend right turn lane to 300 feet on the eastbound approach of Langtree Road.

The above improvements were assumed to be in place for the 2027 Future Year Conditions, the 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out), and the 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out) for the Lake Davidson Development.

No additional geometric changes are anticipated in the 2027 Future Year Conditions.

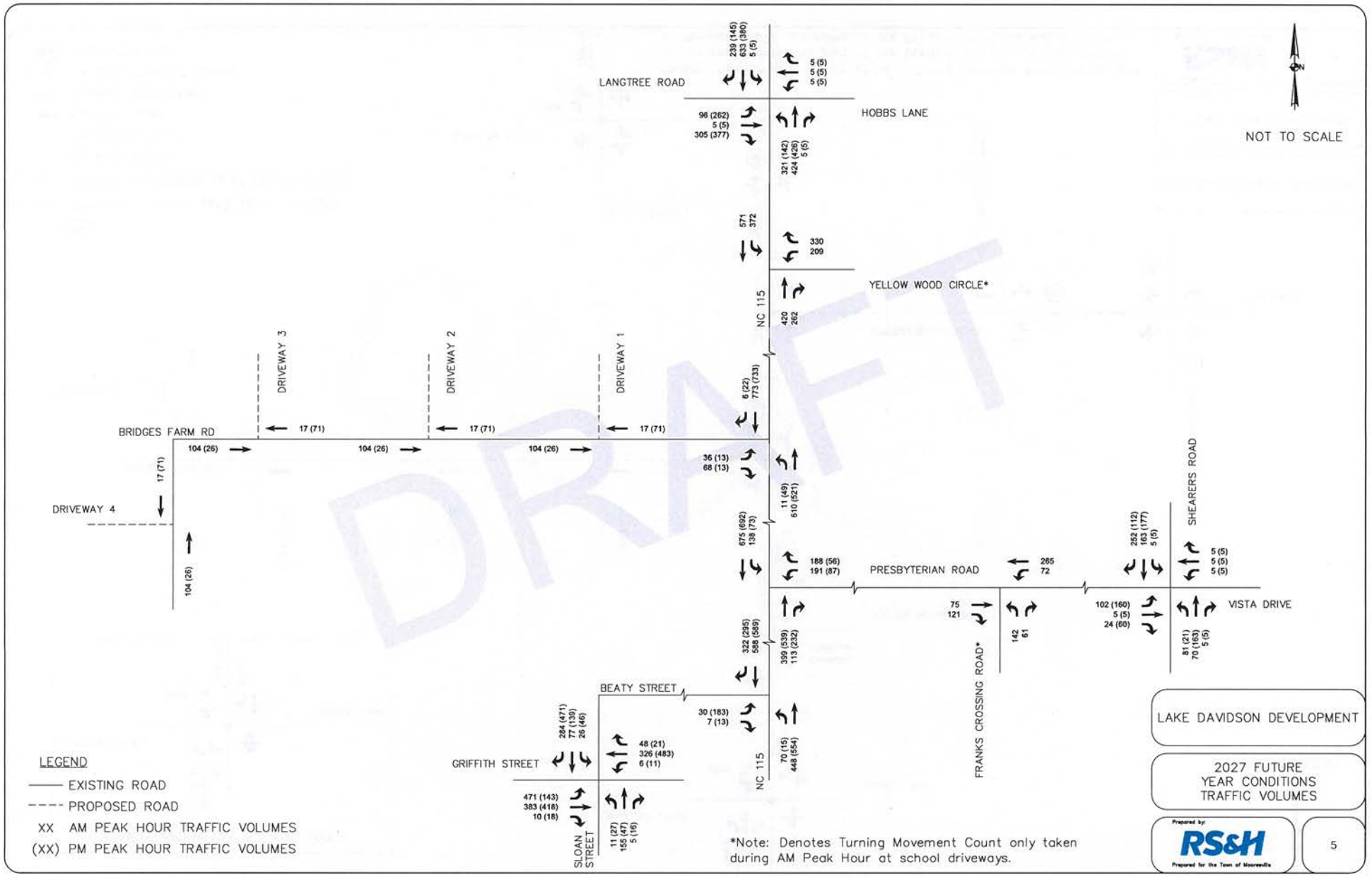
The 2027 Future Year Conditions traffic operations would function at acceptable Levels of Service at the following intersections:

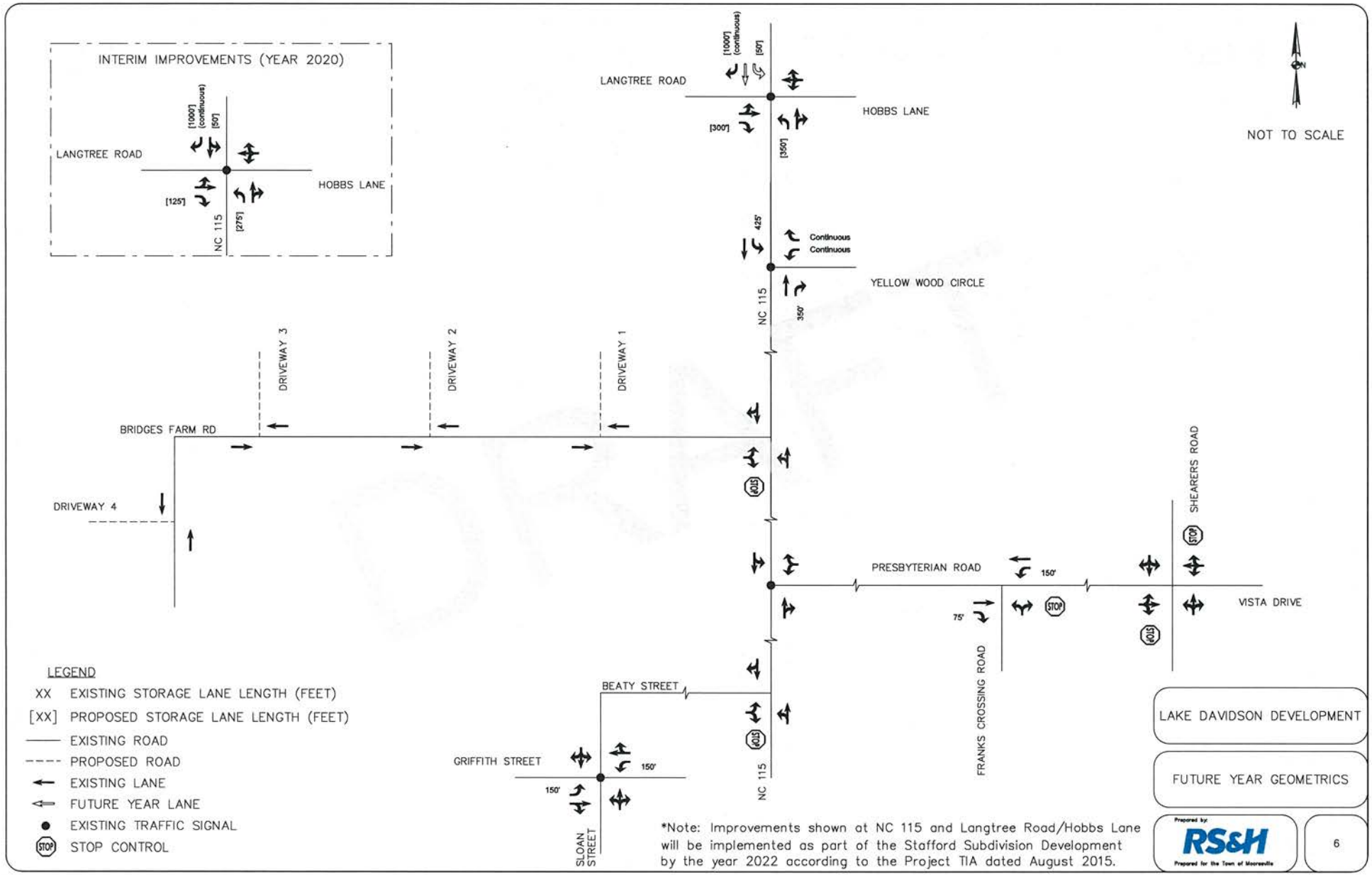
- NC 115 and Langtree Road/Hobbs Lane
- NC 115 and Yellow Wood Circle
- Presbyterian Road/Vista Drive and Shearers Road

The remaining five intersections function at Level of Service E or F in at least one peak hour:

- NC 115 and Bridges Farm Road
- NC 115 and Presbyterian Road
- Presbyterian Road and Franks Crossing Road
- NC 115 and Beaty Street
- Beaty Street/Sloan Street and Griffith Street

2027 Future Year Conditions turning movement volumes are presented in Figure 5. All capacity analysis worksheets are included in Appendix E.


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
BEATY STREET
GRIFFITH STREET
SLOAN STREET
PRESBYTERIAN ROAD
FRANKS CROSSING ROAD*
SHEARERS ROAD
VISTA DRIVE
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX AM PEAK HOUR TRAFFIC VOLUMES
(XX) PM PEAK HOUR TRAFFIC VOLUMES
*Note: Denotes Turning Movement Count only taken during AM Peak Hour at school driveways.
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR CONDITIONS TRAFFIC VOLUMES
Prepared by: RS&H Prepared for the Town of Mooresville
5


INTERIM IMPROVEMENTS (YEAR 2020)
LANGTREE ROAD
HOBBS LANE
NC 115
[1000'] (continuous)
[50']
[125']
[275']
LANGTREE ROAD
HOBBS LANE
[1000'] (continuous)
[50']
[300']
[350']
NOT TO SCALE
425'
Continuous
Continuous
YELLOW WOOD CIRCLE
NC 115
350'
DRIVEWAY 3
DRIVEWAY 2
DRIVEWAY 1
BRIDGES FARM RD
DRIVEWAY 4
SHEARERS ROAD
PRESBYTERIAN ROAD
150'
75'
VISTA DRIVE
FRANKS CROSSING ROAD
BEATY STREET
GRIFFITH STREET
150'
150'
NC 115
SLOAN STREET
LEGEND
XX EXISTING STORAGE LANE LENGTH (FEET)
[XX] PROPOSED STORAGE LANE LENGTH (FEET)
EXISTING ROAD
PROPOSED ROAD
EXISTING LANE
FUTURE YEAR LANE
EXISTING TRAFFIC SIGNAL
STOP CONTROL
*Note: Improvements shown at NC 115 and Langtree Road/Hobbs Lane will be implemented as part of the Stafford Subdivision Development by the year 2022 according to the Project TIA dated August 2015.
LAKE DAVIDSON DEVELOPMENT
FUTURE YEAR GEOMETRICS
Prepared by:
RS&H
Prepared for the Town of Mooresville
6

5.0 PROJECT TRAFFIC

Project Traffic was generated for the proposed Lake Davidson Development using the traditional three step process of trip generation, distribution, and assignment. These steps are described in detail below.

5.1 Trip Generation

The Institute of Transportation Engineers' (ITE) *Trip Generation Manual* 9th Edition was used to estimate future trips from the planned development. According to the NCDOT Congestion Management Guidelines, the rate method is preferred for Single Family Detached Housing (Land Use Code 210) and Residential Condo/Townhouse (230) while using the peak hour of the adjacent traffic. The equation method is preferred for Apartments (220) while using the peak hour of the adjacent traffic. These estimations use the independent variable of dwelling units. Whereas for General Office Building (710) and Shopping Center (820), the equation method was preferred and the estimation uses an independent variable of 1,000 square feet of Gross Floor Area. There are no schools in the development. Trip generation results are shown in Table 2.

Internal Capture

As this is a mixed-use development, the internal capture between residential, retail, and office land uses was calculated to be 10% in the PM Peak Hour. The internal capture worksheet depicting the calculations based on the *Trip Generation Manual* 9th Edition is shown in Appendix D.

Pass-by Trips

Due to the adjacent land use along Bridges Farm Road, it was assumed that no pass-by trips would occur for the Lake Davidson Development.

5.2 Trip Distribution

Existing travel patterns were used to determine the trip distribution of the future development as per the Memorandum of Understanding. Distribution values were agreed upon with the Town of Mooresville, as well as NCDOT Divisions 10 and 12, for the area. Trip distribution volumes are presented in Figures 7 through 12.

Table 2 – Trip Generation

	Intensity	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	In	Out	Total	In	Out
Land Use								
Phase 1								
Single-Family Detached Housing	115 DU	1,095	86	22	64	115	72	43
Residential Condo/Townhouse	38 DU	221	17	3	14	20	13	7
Apartment	300 DU	1,995	151	30	121	183	119	64
Phase 2								
Residential Condo/Townhouse	382 DU	2,219	168	29	139	199	133	66
Phase 3								
Shopping Center	65,000 SF	5,133	120	74	46	449	216	233
General Office Building	65,000 SF	946	136	120	16	151	26	125
	Subtotal	**11,609**	**678**	**278**	**40**	**1,117**	**579**	**538**
Internal Capture								
Residential		387	0	0	0	50	30	19
Retail		359	0	0	0	59	24	35
Office		66	0	0	0	14	7	7
	Subtotal	**812**	**0**	**0**	**0**	**122**	**61**	**61**
Net New External Trips		**10,797**	**680**	**279**	**401**	**998**	**520**	**478**

Notes:

Adjacent Street Traffic (NC 115) = 1,288 AM Peak Hour / 2,486 PM Peak Hour

Trip generation was calculated using the following data:

Daily Traffic Generation

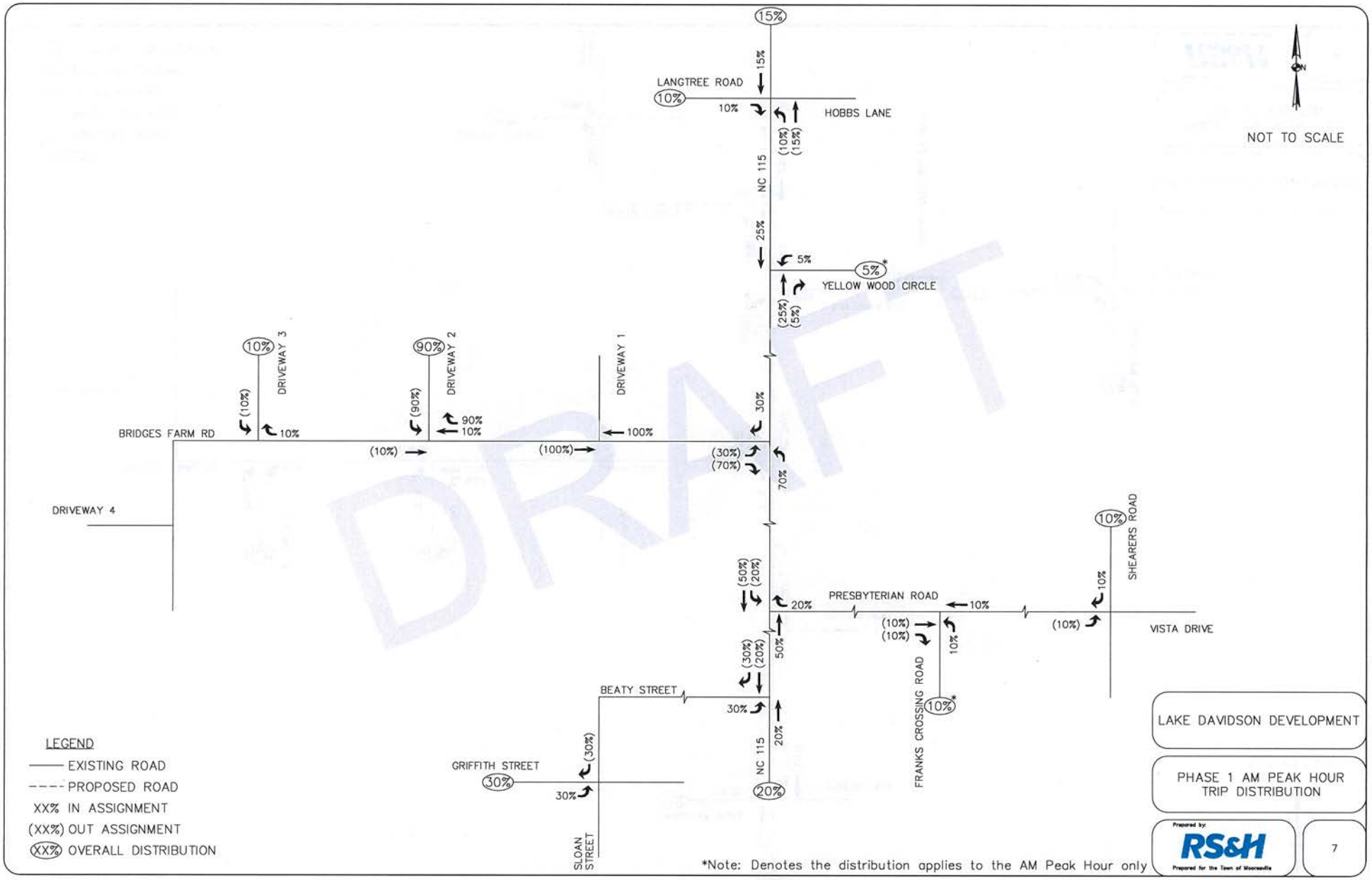
Single-Family Detached Housing	[ITE 210]	=	T = 9.52(X); (50% in, 50% out)
Residential Condo/Townhouse	[ITE 230]	=	T = 5.81(X); (50% in, 50% out)
Apartment	[ITE 220]	=	T = 6.06(X)+123.56; (50% in, 50% out)
Shopping Center	[ITE 820]	=	LN((T) = 0.65LN(X)+5.83; (50% in, 50% out)
General Office Building	[ITE 710]	=	LN(T) = 0.76LN(X)+3.68; (50% in, 50% out)

AM Peak-Hour Traffic Generation

Single-Family Detached Housing	[ITE 210]	=	T = 0.75(X); (25% in, 75% out)
Residential Condo/Townhouse	[ITE 230]	=	T = 0.44(X); (17% in, 83% out)
Apartment	[ITE 220]	=	T = 0.49(X)+3.73; (20% in, 80% out)
Shopping Center	[ITE 820]	=	LN(T) = 0.61LN(X)+2.24; (62% in, 38% out)
General Office Building	[ITE 710]	=	LN(T) = 0.80LN(X)+1.57; (88% in, 12% out)

PM Peak-Hour Traffic Generation

Single-Family Detached Housing	[ITE 210]	=	T = 1.00(X); (63% in, 37% out)
Residential Condo/Townhouse	[ITE 230]	=	T = 0.52(X); (67% in, 33% out)
Apartment	[ITE 220]	=	T = 0.55(X)+17.65; (65% in, 35% out)
Shopping Center	[ITE 820]	=	LN(T) = 0.67LN(X)+3.31; (48% in, 52% out)
General Office Building	[ITE 710]	=	T = 1.12(X)+78.45; (17% in, 83% out)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XX% OVERALL DISTRIBUTION
*Note: Denotes the distribution applies to the AM Peak Hour only
NOT TO SCALE
LAKE DAVIDSON DEVELOPMENT
PHASE 1 AM PEAK HOUR TRIP DISTRIBUTION
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Prepared for the Town of Mooresville
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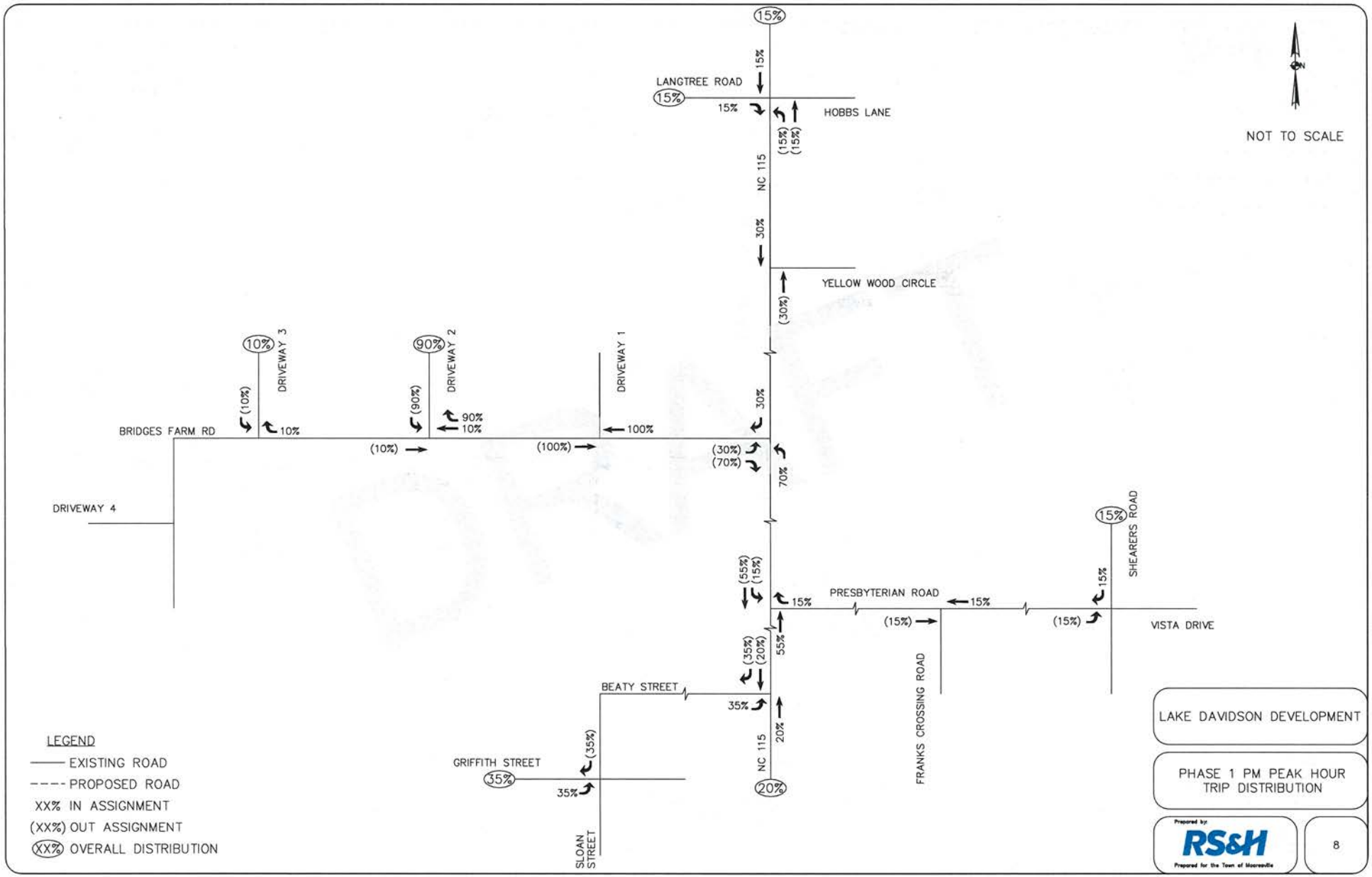
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(XX%) OVERALL DISTRIBUTION
LAKE DAVIDSON DEVELOPMENT
PHASE 1 PM PEAK HOUR TRIP DISTRIBUTION
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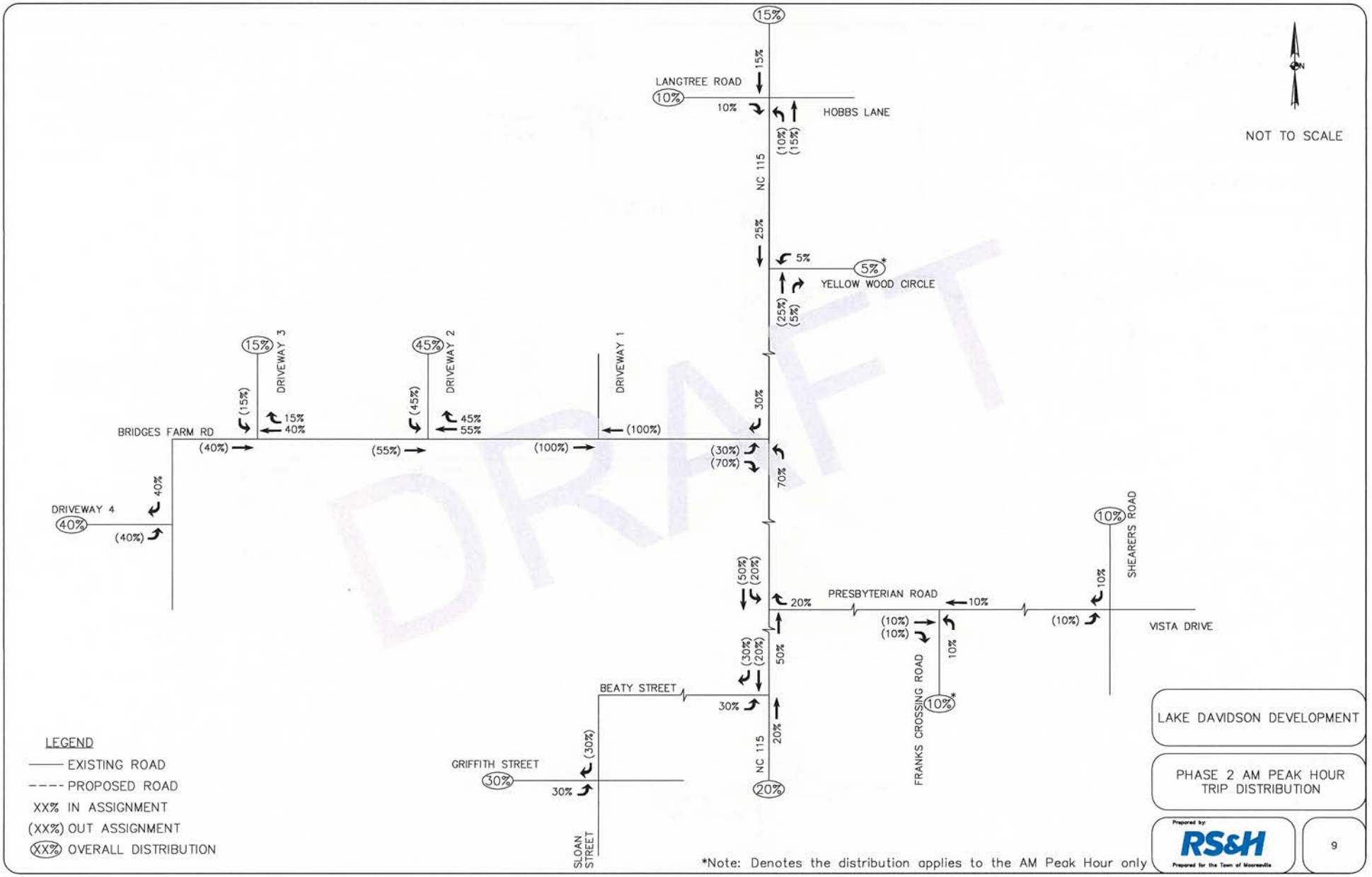
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XX% OVERALL DISTRIBUTION
*Note: Denotes the distribution applies to the AM Peak Hour only
LAKE DAVIDSON DEVELOPMENT
PHASE 2 AM PEAK HOUR TRIP DISTRIBUTION
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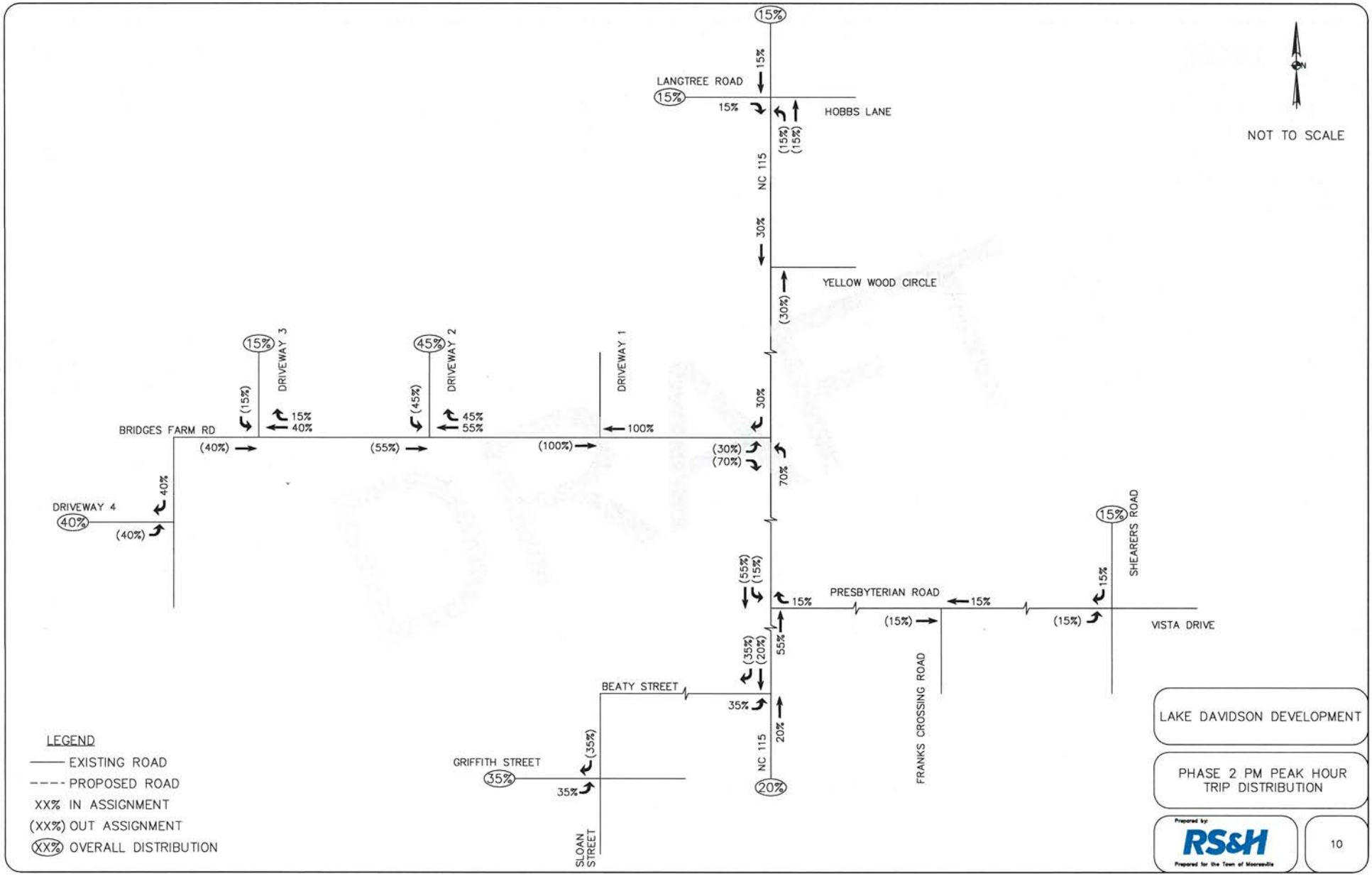
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LAKE DAVIDSON DEVELOPMENT
PHASE 2 PM PEAK HOUR TRIP DISTRIBUTION
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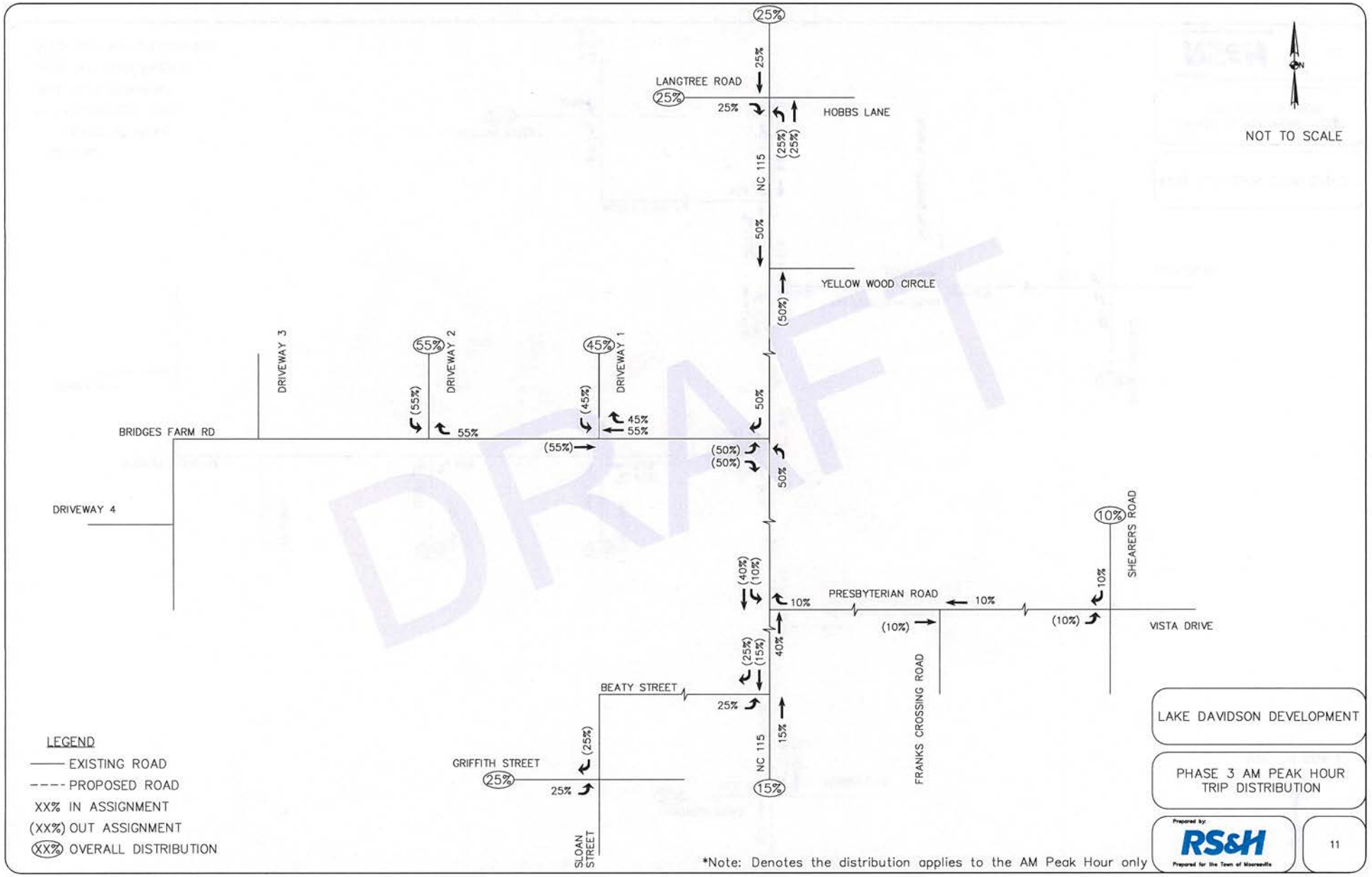
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LEGEND
EXISTING ROAD
PROPOSED ROAD
XX% IN ASSIGNMENT
(XX%) OUT ASSIGNMENT
XX% OVERALL DISTRIBUTION
*Note: Denotes the distribution applies to the AM Peak Hour only
LAKE DAVIDSON DEVELOPMENT
PHASE 3 AM PEAK HOUR TRIP DISTRIBUTION
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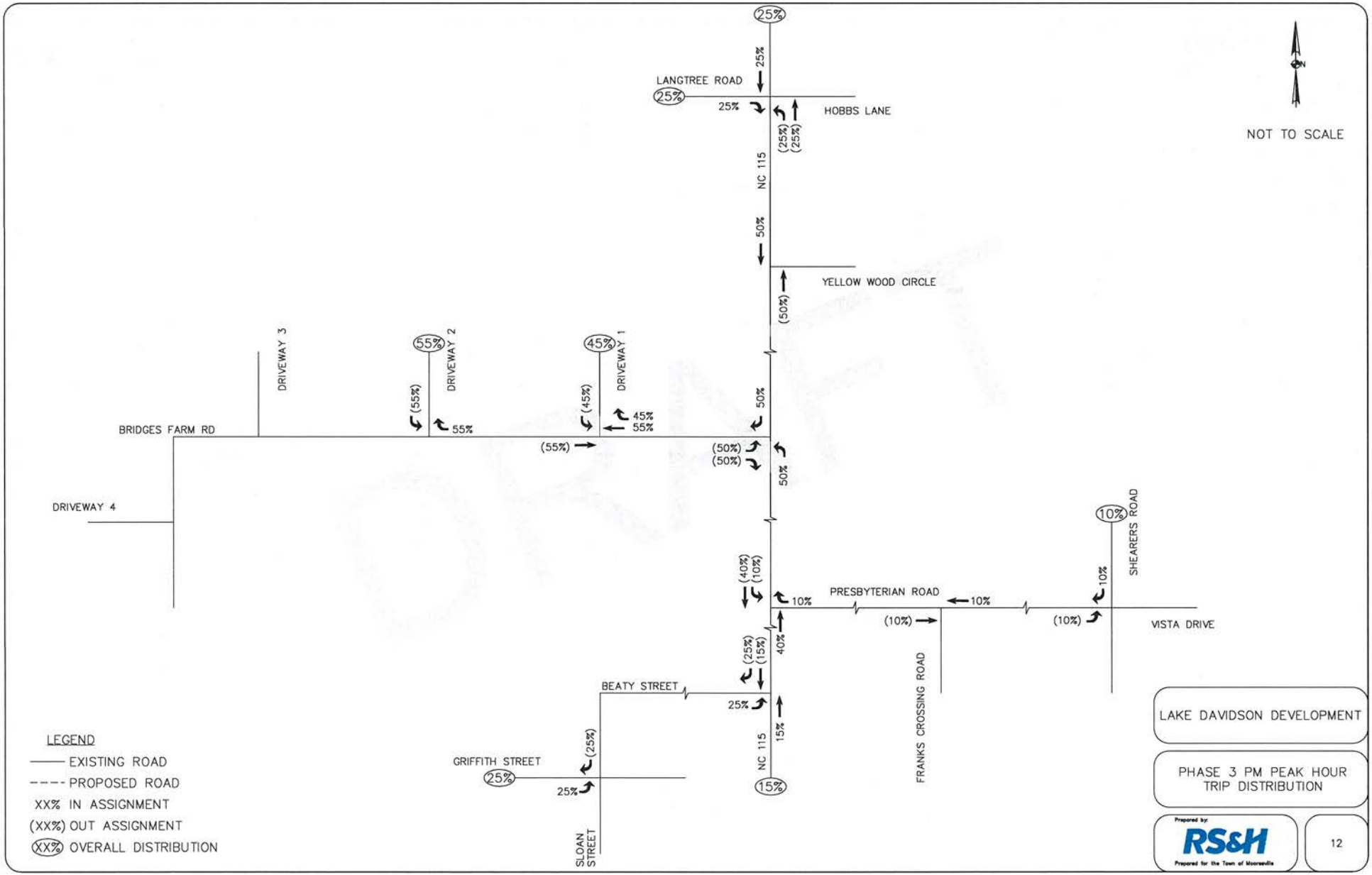
Prepared for the Town of Mooresville
11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XX% OVERALL DISTRIBUTION
LAKE DAVIDSON DEVELOPMENT
PHASE 3 PM PEAK HOUR TRIP DISTRIBUTION
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12

5.3 Trip Assignment

The Phased Future Year Conditions trips were developed from the trip generation step and distributed based on entry and exit percentages outlined in Section 5.2. The development would add 254 total trips in the AM Peak Hour and 318 total trips for the PM Peak Hour for Phase 1 of the development. These totals were then distributed by the distribution patterns in Figures 7 and 8. The resulting volumes are shown in Table 3. The 2021 Future Year Phase 1 Build Conditions (Partial Build-Out) traffic volumes are presented in Figures 13 and 14.

Table 3 – 2021 Future Year Phase 1 Build Conditions (Partial Build-Out) Traffic Assignment

	Northbound			Southbound			Eastbound			Westbound		
Peak Hour	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
	NC 115			**NC 115**			**Langtree Road**			**Hobbs Lane**		
AM Peak	341	454	5	5	641	239	96	5	310	5	5	5
PM Peak	159	443	5	5	411	145	262	5	407	5	5	5
	NC 115			**NC 115**			**-**			**Yellow Wood Circle**		
AM Peak	0	470	272	372	584	0	0	0	0	212	0	330
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-
	NC 115			**NC 115**			**Bridges Farm Road**			**-**		
AM Peak	50	610	0	0	773	22	96	0	207	0	0	0
PM Peak	192	521	0	0	733	83	47	0	93	0	0	0
	NC 115			**NC 115**			**-**			**Presbyterian Road**		
AM Peak	0	427	113	178	774	0	0	0	0	191	0	199
PM Peak	0	651	232	90	755	0	0	0	0	87	0	87
	Franks Crossing Road			**-**			**Presbyterian Road**			**Presbyterian Road**		
AM Peak	147	0	61	0	0	0	0	95	141	72	271	0
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-
	Shearers Road			**Shearers Road**			**Presbyterian Road**			**Vista Drive**		
AM Peak	81	70	5	5	163	258	122	5	24	5	5	5
PM Peak	21	163	5	5	177	143	177	5	60	5	5	5
	NC 115			**NC 115**			**Beaty Street**			**-**		
AM Peak	70	459	0	0	627	382	47	0	7	0	0	0
PM Peak	15	595	0	0	612	335	254	0	13	0	0	0
	Sloan Street			**Beaty Street**			**Griffith Street**			**Griffith Street**		
AM Peak	11	155	5	26	77	344	488	383	10	6	326	48
PM Peak	27	47	16	46	139	511	214	418	18	11	483	21
	-			**Driveway #1**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	0	0	0	0	303	0	0	72	0
PM Peak	0	0	0	0	0	0	0	140	0	0	275	0

	Northbound			Southbound			Eastbound			Westbound		
Peak Hour	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
	-			**Driveway #2**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	179	0	0	0	124	0	0	22	50
PM Peak	0	0	0	103	0	0	0	37	0	0	91	184
	-			**Driveway #3**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	20	0	0	0	104	0	0	17	5
PM Peak	0	0	0	11	0	0	0	26	0	0	71	20
	Bridges Farm Road			**Bridges Farm Road**			**Driveway #4**			-		
AM Peak	0	104	0	0	17	0	0	0	0	0	0	0
PM Peak	0	26	0	0	71	0	0	0	0	0	0	0

For Phase 2, the development would add 168 total trips in the AM Peak Hour and 199 total trips for the PM Peak Hour. These totals were then distributed by the distribution patterns in Figures 9 and 10. The resulting volumes are shown in Table 4. The 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out) traffic volumes are presented in Figures 15 and 16.

Table 4 – 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out) Traffic Assignment

	Northbound			Southbound			Eastbound			Westbound		
Peak Hour	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
	NC 115			**NC 115**			**Langtree Road**			**Hobbs Lane**		
AM Peak	355	475	5	5	645	239	96	5	313	5	5	5
PM Peak	169	453	5	5	431	145	262	5	427	5	5	5
	NC 115			**NC 115**			-			**Yellow Wood Circle**		
AM Peak	0	505	279	372	591	0	0	0	0	213	0	330
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-
	NC 115			**NC 115**			**Bridges Farm Road**			-		
AM Peak	71	610	0	0	773	30	138	0	304	0	0	0
PM Peak	285	521	0	0	733	123	67	0	139	0	0	0
	NC 115			**NC 115**			-			**Presbyterian Road**		
AM Peak	0	442	113	205	844	0	0	0	0	191	0	205
PM Peak	0	724	232	100	791	0	0	0	0	87	0	107
	Franks Crossing Road			-			**Presbyterian Road**			**Presbyterian Road**		
AM Peak	150	0	61	0	0	0	0	109	154	72	274	0
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-
	Shearers Road			**Shearers Road**			**Presbyterian Road**			**Vista Drive**		
AM Peak	81	70	5	5	163	261	136	5	24	5	5	5
PM Peak	21	163	5	5	177	163	187	5	60	5	5	5

Peak Hour	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
	NC 115			**NC 115**			**Beaty Street**			**-**		
AM Peak	70	465	0	0	655	424	56	0	7	0	0	0
PM Peak	15	621	0	0	625	358	301	0	13	0	0	0
	Sloan Street			**Beaty Street**			**Griffith Street**			**Griffith Street**		
AM Peak	11	155	5	26	77	386	497	383	10	6	326	48
PM Peak	27	47	16	46	139	534	261	418	18	11	483	21
	-			**Driveway #1**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	0	0	0	0	442	0	0	101	0
PM Peak	0	0	0	0	0	0	0	206	0	0	408	0
	-			**Driveway #2**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	242	0	0	0	200	0	0	38	63
PM Peak	0	0	0	133	0	0	0	73	0	0	164	244
	-			**Driveway #3**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	41	0	0	0	159	0	0	29	9
PM Peak	0	0	0	21	0	0	0	52	0	0	124	40
	Bridges Farm Road			**Bridges Farm Road**			**Driveway #4**			**-**		
AM Peak	0	104	0	0	17	12	55	0	0	0	0	0
PM Peak	0	26	0	0	71	53	26	0	0	0	0	0

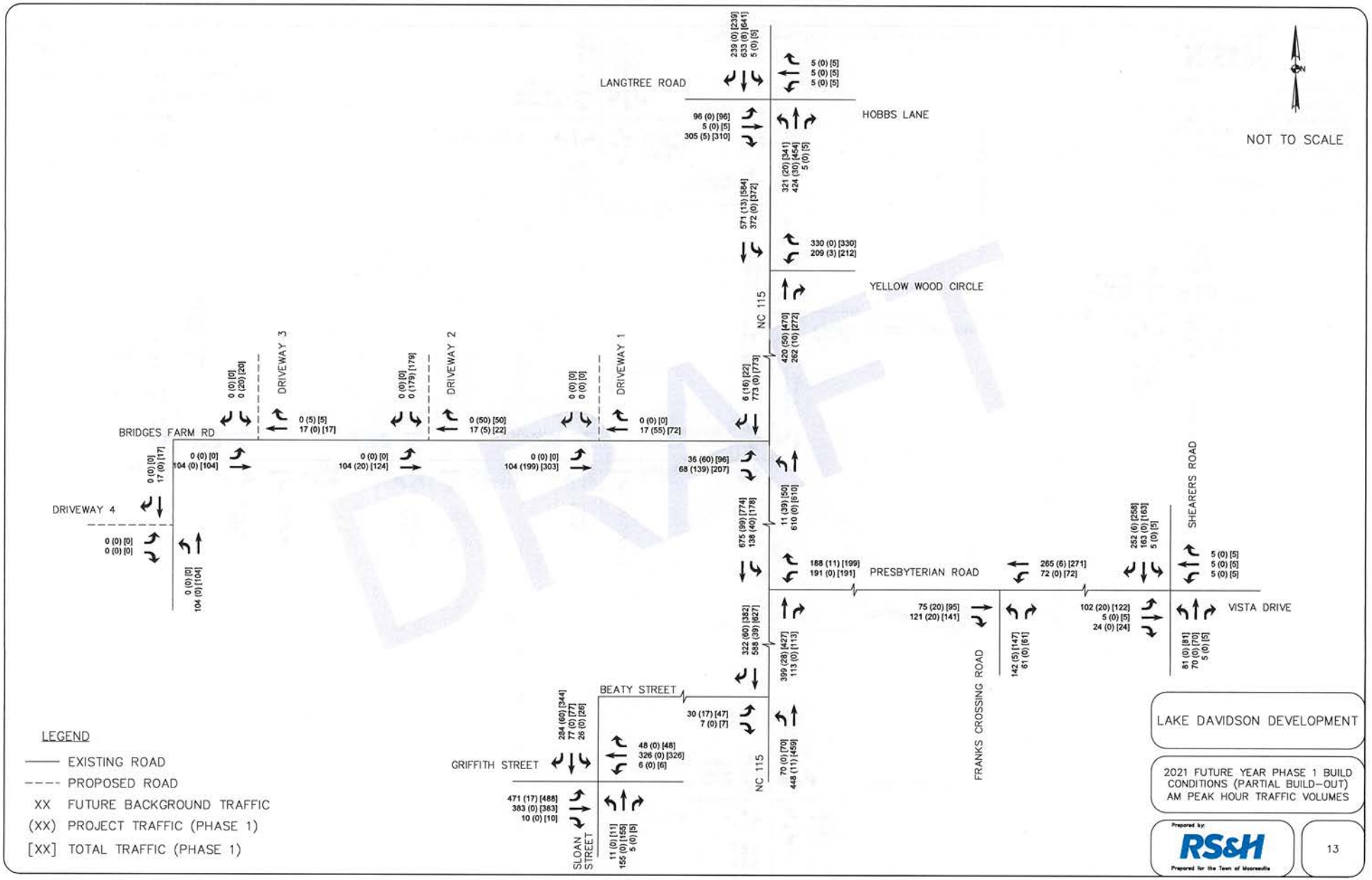
For Phase 3, the development would add 256 total trips in the AM Peak Hour and 600 total trips for the PM Peak Hour, minus the 10% internal capture. These totals were then distributed by the distribution patterns in Figures 11 and 12. The resulting volumes are shown in Table 5. The 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out) traffic volumes are presented in Figures 17 and 18.

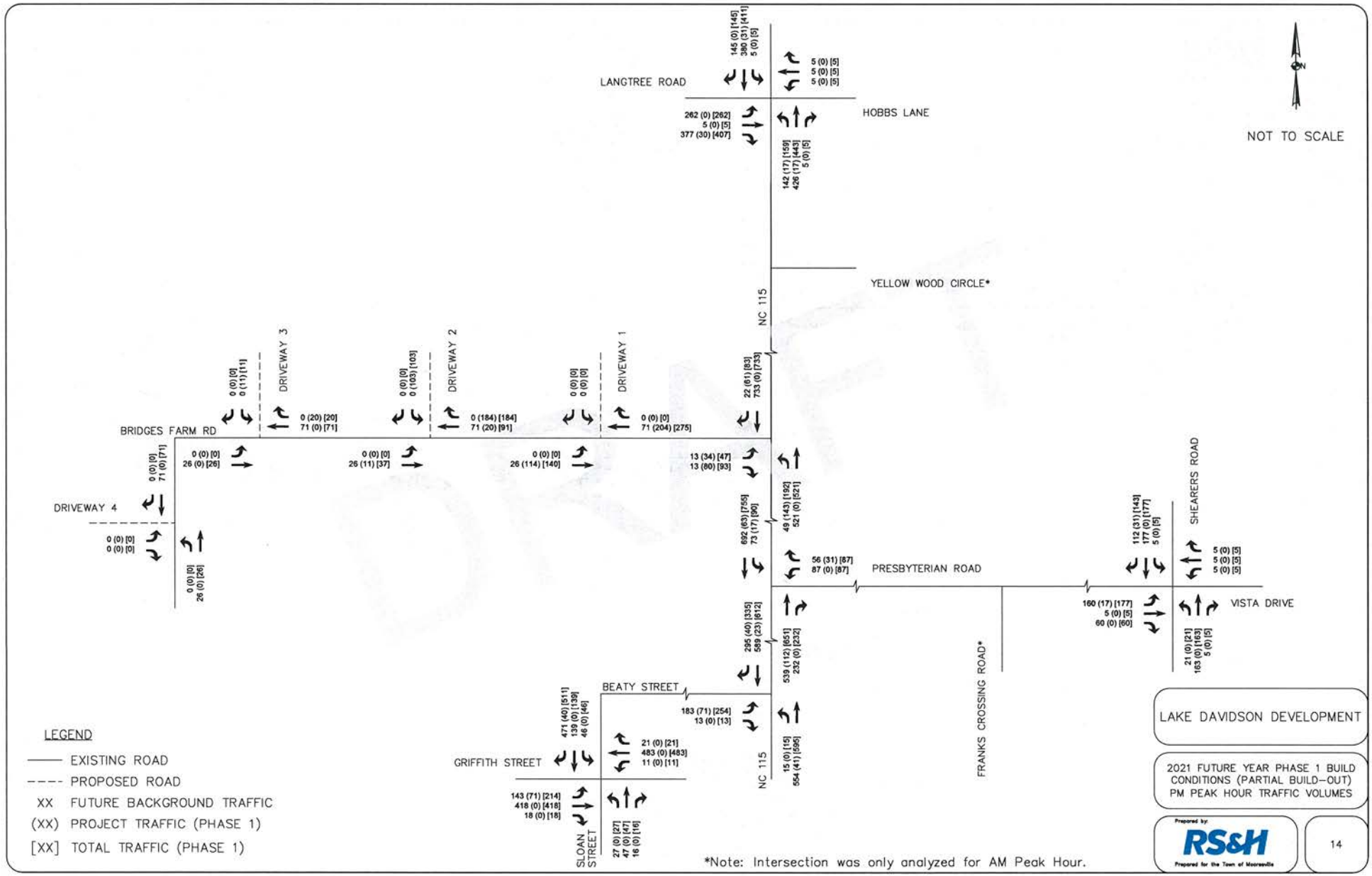
Table 5 – 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out) Traffic Assignment

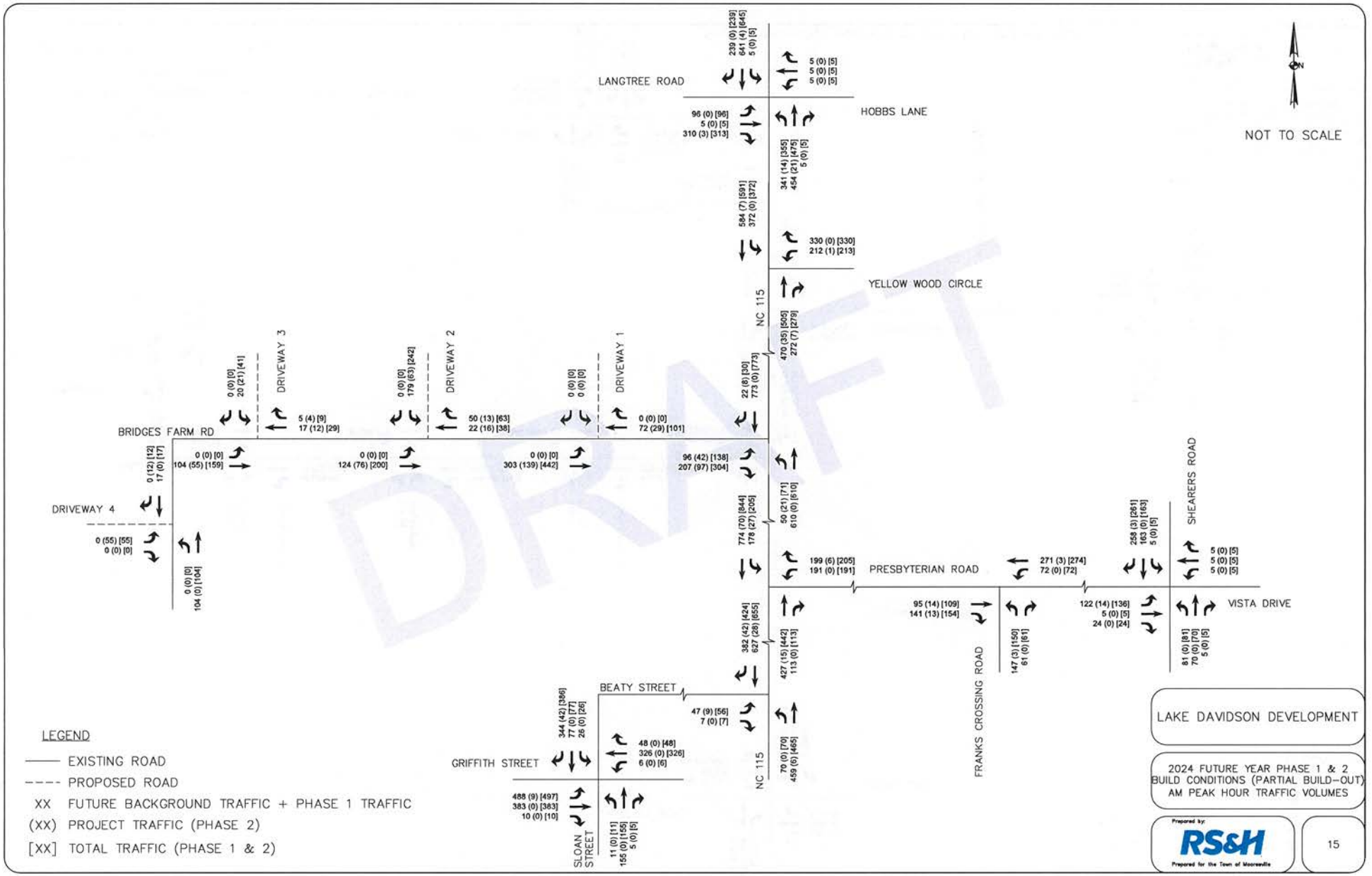
Peak Hour	Northbound			Southbound			Eastbound			Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
	NC 115			**NC 115**			**Langtree Road**			**Hobbs Lane**		
AM Peak	370	491	5	5	694	239	96	5	361	5	5	5
PM Peak	243	527	5	5	476	145	262	5	472	5	5	5
	NC 115			**NC 115**			**-**			**Yellow Wood Circle**		
AM Peak	0	536	279	372	688	0	0	0	0	213	0	330
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-
	NC 115			**NC 115**			**Bridges Farm Road**			**-**		
AM Peak	168	610	0	0	773	127	169	0	335	0	0	0
PM Peak	376	521	0	0	733	213	215	0	288	0	0	0
	NC 115			**NC 115**			**-**			**Presbyterian Road**		

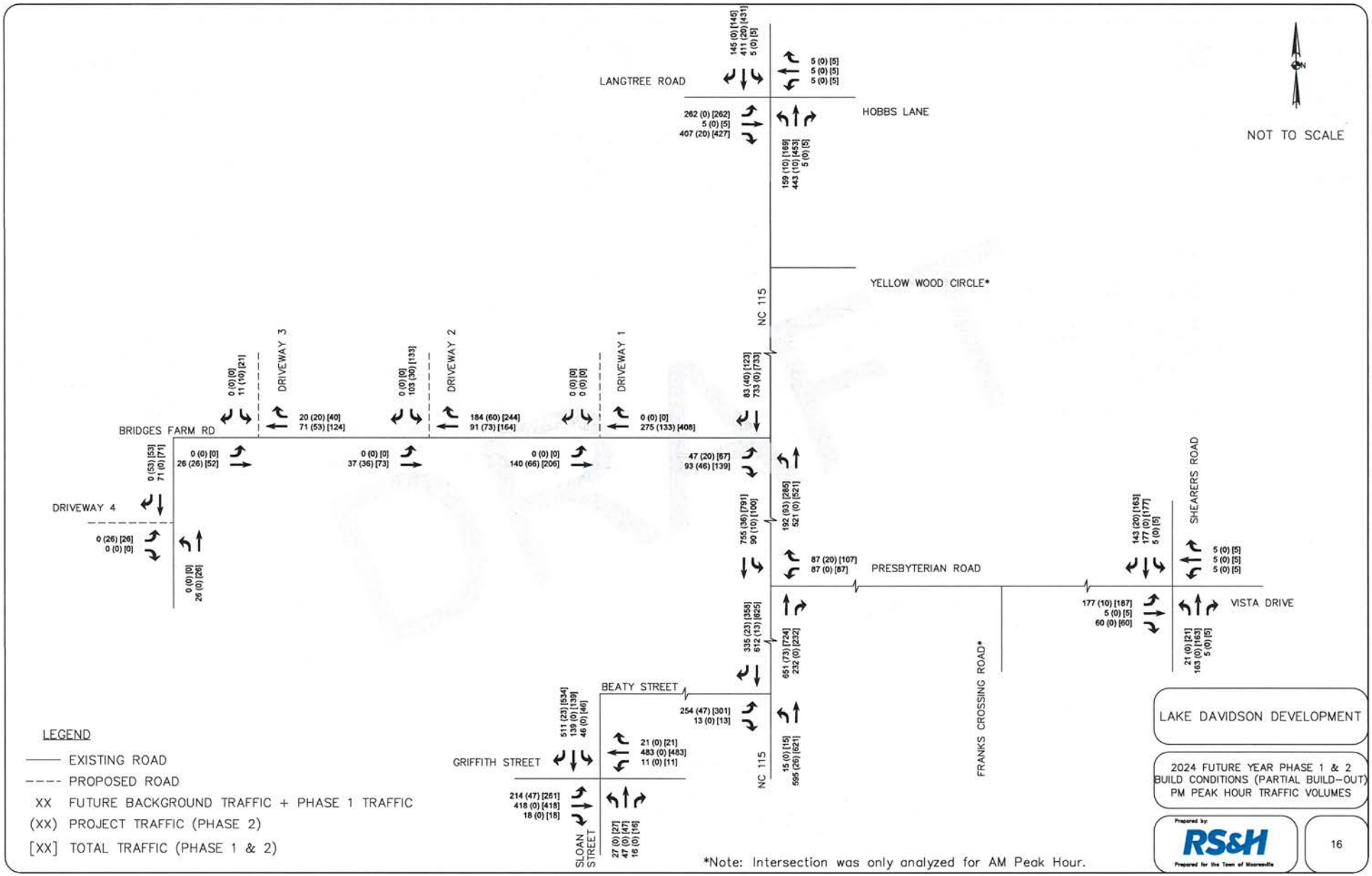
	Northbound			Southbound			Eastbound			Westbound		
Peak Hour	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
AM Peak	0	520	113	211	869	0	0	0	0	191	0	224
PM Peak	0	797	232	130	910	0	0	0	0	87	0	125
	Franks Crossing Road			**-**			**Presbyterian Road**			**Presbyterian Road**		
AM Peak	150	0	61	0	0	0	0	115	154	72	293	0
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-
	Shearers Road			**Shearers Road**			**Presbyterian Road**			**Vista Drive**		
AM Peak	81	70	5	5	163	280	142	5	24	5	5	5
PM Peak	21	163	5	5	177	181	217	5	60	5	5	5
	NC 115			**NC 115**			**Beaty Street**			**-**		
AM Peak	70	494	0	0	664	440	105	0	7	0	0	0
PM Peak	15	649	0	0	670	432	346	0	13	0	0	0
	Sloan St			**Beaty Street**			**Griffith Street**			**Griffith Street**		
AM Peak	11	155	5	26	77	402	546	383	10	6	326	48
PM Peak	27	47	16	46	139	608	306	418	18	11	483	21
	-			**Driveway #1**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	28	0	0	0	476	0	0	208	87
PM Peak	0	0	0	133	0	0	0	370	0	0	508	81
	-			**Driveway #2**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	276	0	0	0	200	0	0	38	170
PM Peak	0	0	0	297	0	0	0	73	0	0	164	344
	-			**Driveway #3**			**Bridges Farm Road**			**Bridges Farm Road**		
AM Peak	0	0	0	41	0	0	0	159	0	0	29	9
PM Peak	0	0	0	21	0	0	0	52	0	0	124	40
	Bridges Farm Road			**Bridges Farm Road**			**Driveway #4**			**-**		
AM Peak	0	104	0	0	17	12	55	0	0	0	0	0
PM Peak	0	26	0	0	71	53	26	0	0	0	0	0

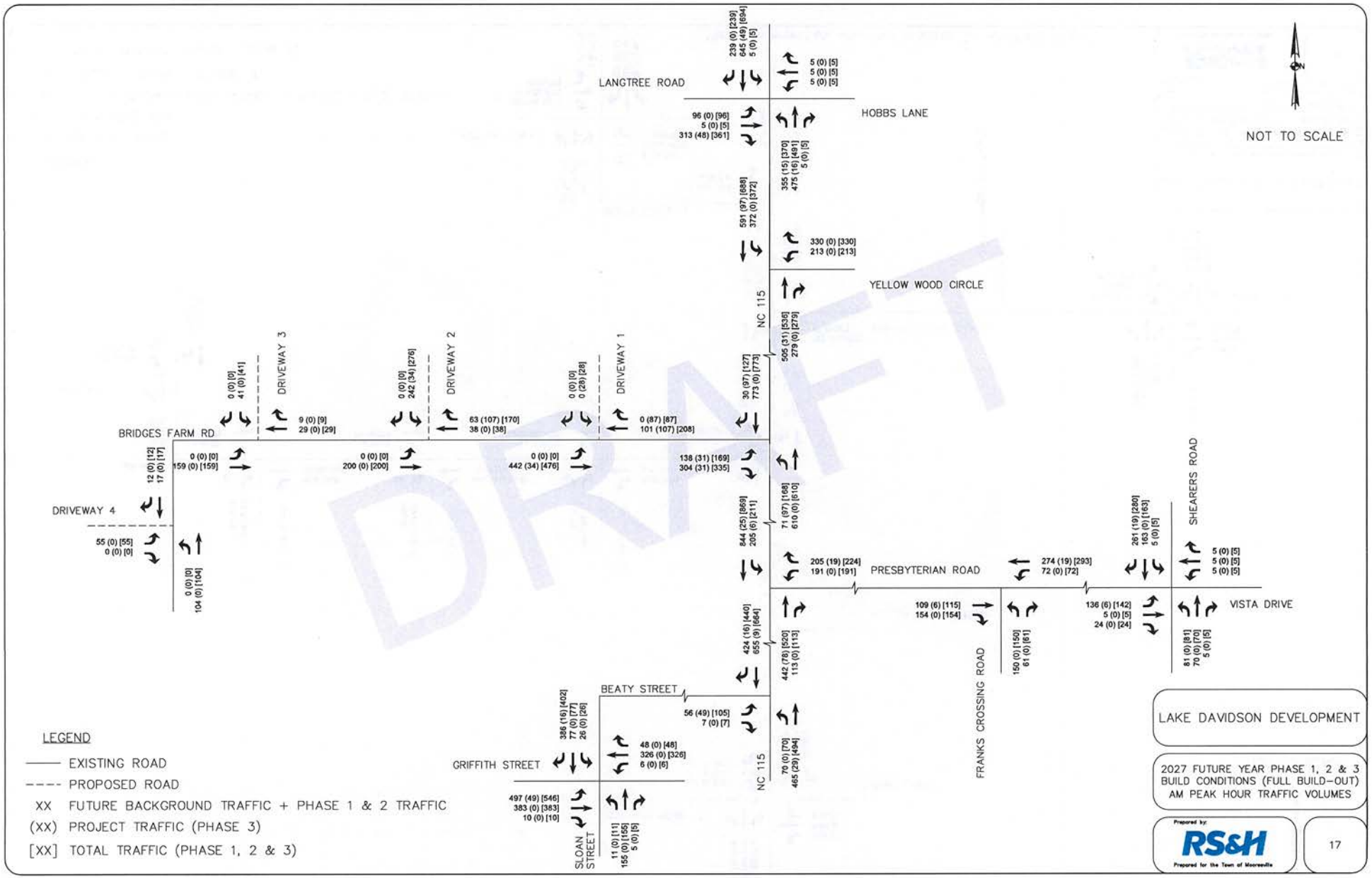
At the completion of the Full Build-Out of the Lake Davidson Development (Phases 1, 2, and 3), the development would add 678 total trips in the AM Peak Hour and 995 total trips in the PM Peak Hour. The resulting volumes are shown in Figure 19.

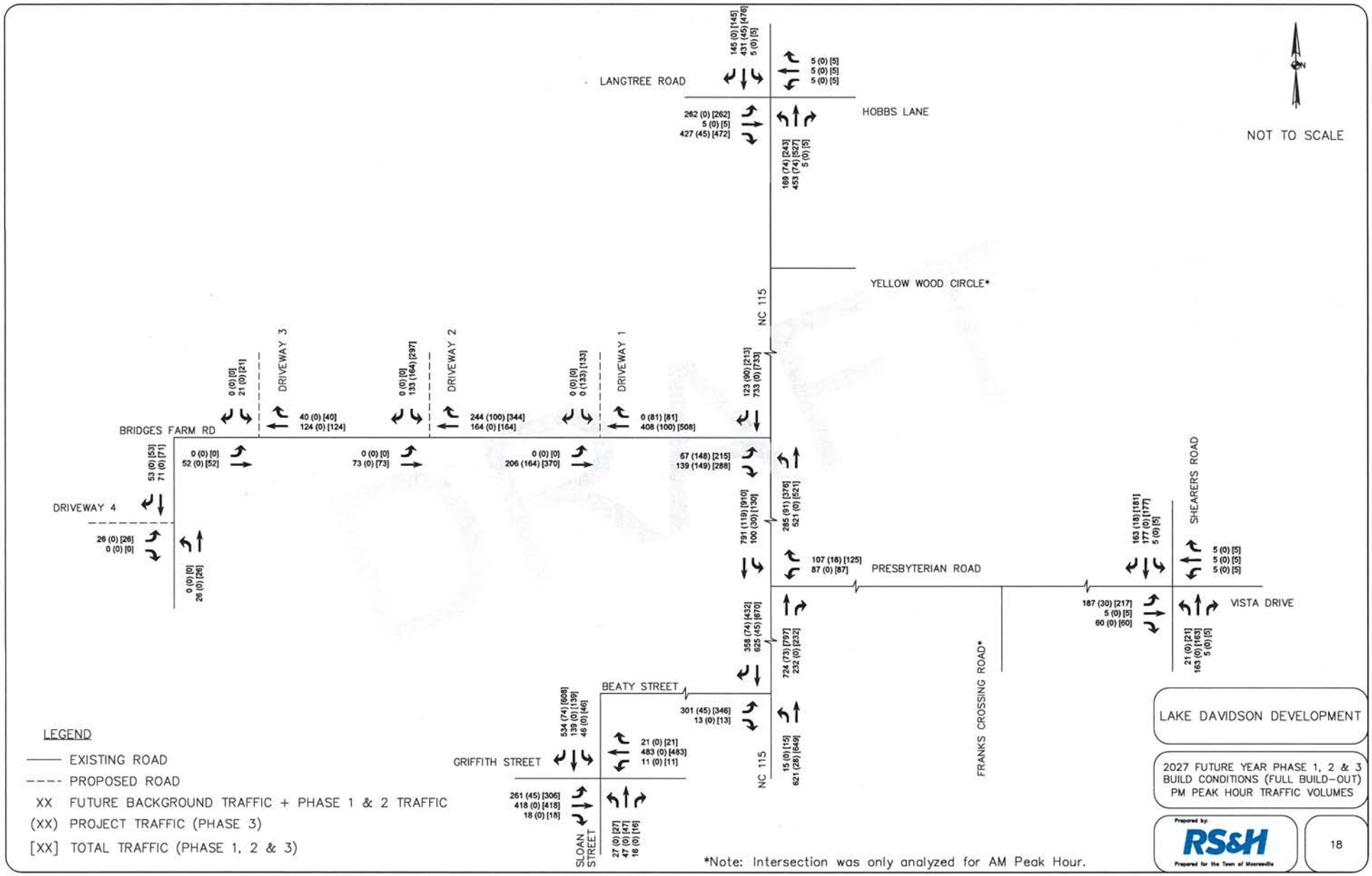

LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX FUTURE BACKGROUND TRAFFIC
(XX) PROJECT TRAFFIC (PHASE 1)
[XX] TOTAL TRAFFIC (PHASE 1)
LAKE DAVIDSON DEVELOPMENT
2021 FUTURE YEAR PHASE 1 BUILD CONDITIONS (PARTIAL BUILD-OUT) AM PEAK HOUR TRAFFIC VOLUMES
Prepared by:
RS&H
Prepared for the Town of Mooresville
13

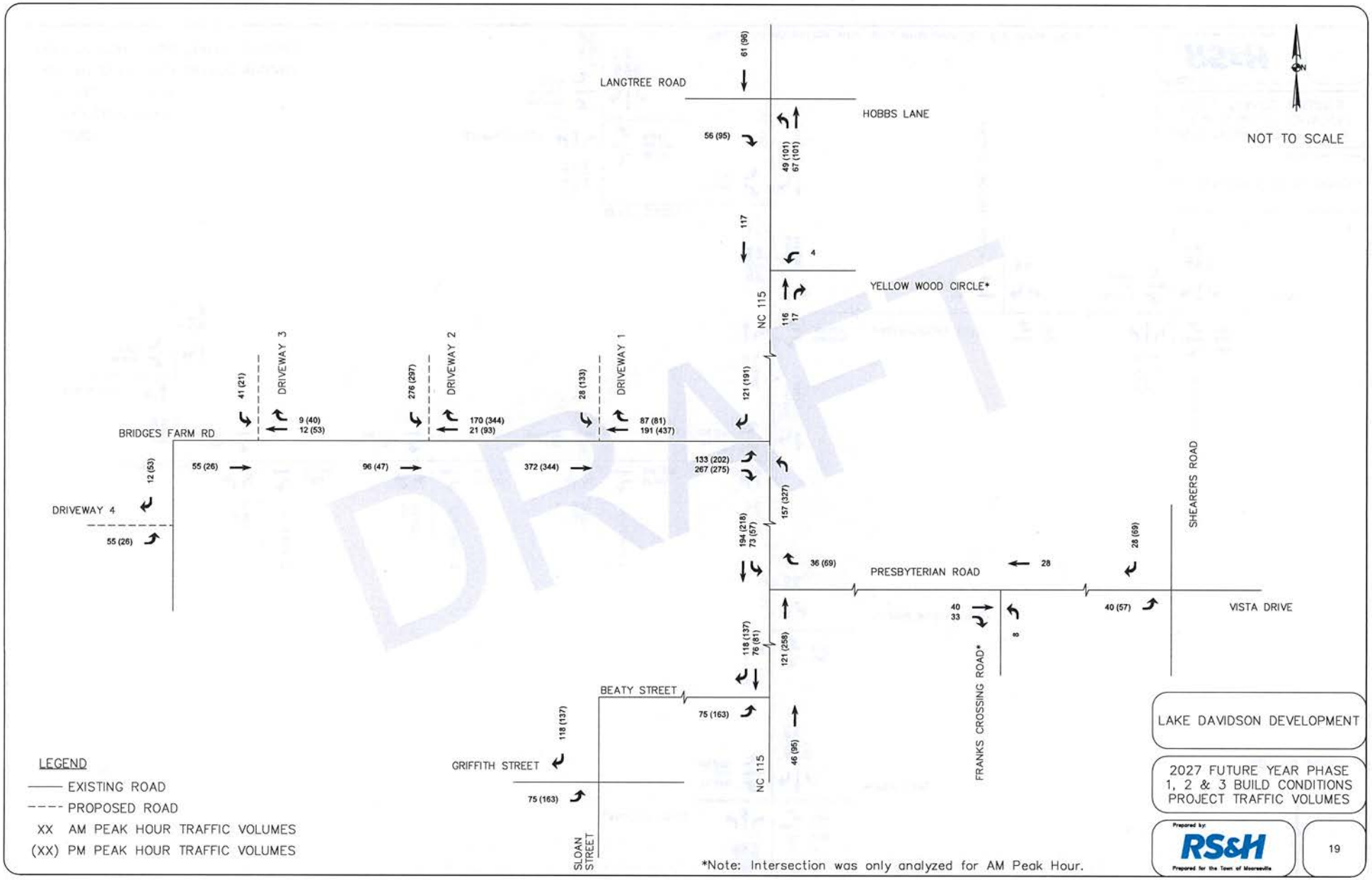

LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD*
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX FUTURE BACKGROUND TRAFFIC
(XX) PROJECT TRAFFIC (PHASE 1)
[XX] TOTAL TRAFFIC (PHASE 1)
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2021 FUTURE YEAR PHASE 1 BUILD CONDITIONS (PARTIAL BUILD-OUT) PM PEAK HOUR TRAFFIC VOLUMES
Prepared by: RS&H
Prepared for the Town of Mooresville
14

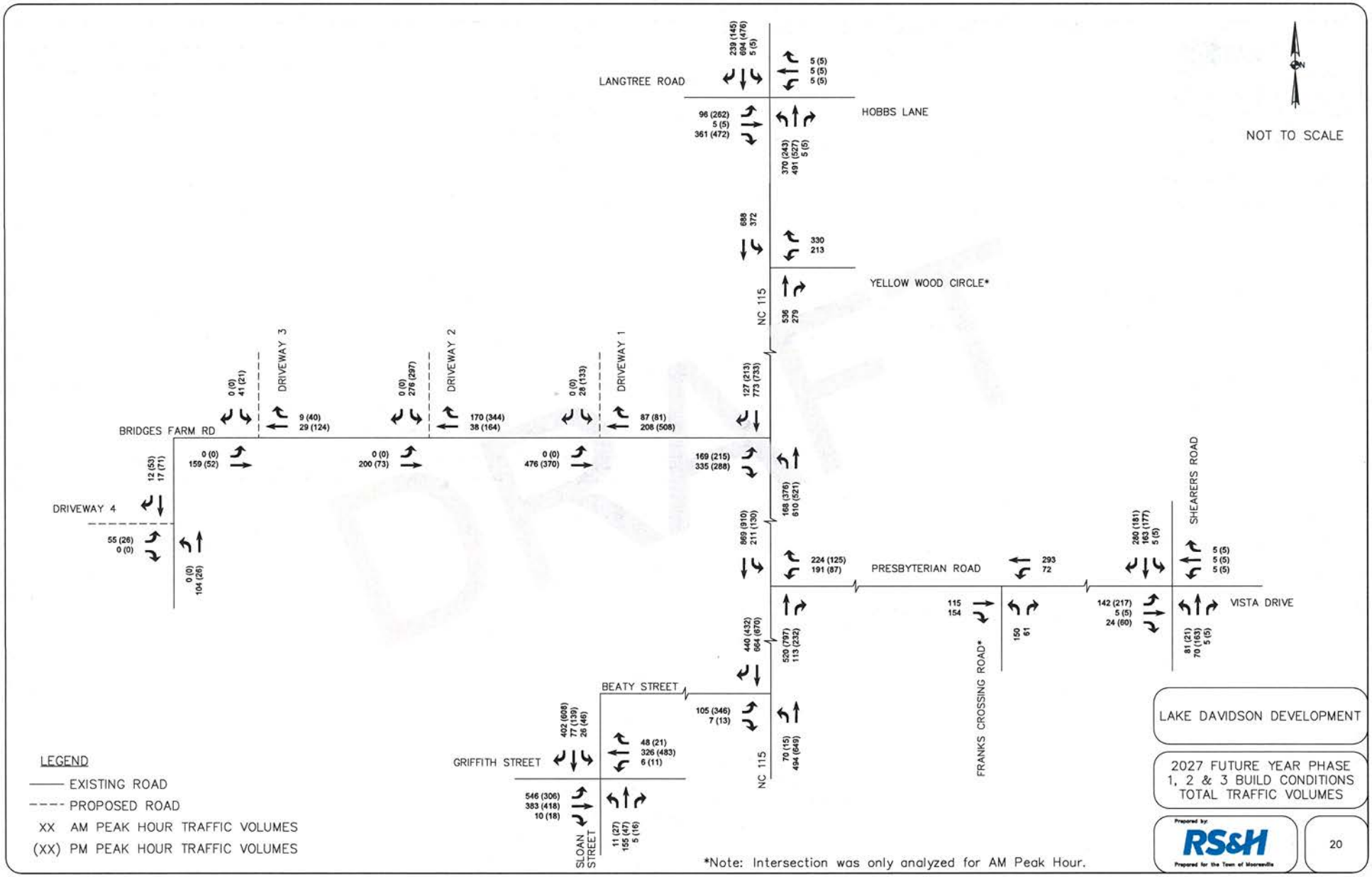

LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX FUTURE BACKGROUND TRAFFIC + PHASE 1 TRAFFIC
(XX) PROJECT TRAFFIC (PHASE 2)
[XX] TOTAL TRAFFIC (PHASE 1 & 2)
LAKE DAVIDSON DEVELOPMENT
2024 FUTURE YEAR PHASE 1 & 2 BUILD CONDITIONS (PARTIAL BUILD-OUT) AM PEAK HOUR TRAFFIC VOLUMES
Prepared by: RS&H
Prepared for the Town of Mooresville
15


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
FRANKS CROSSING ROAD*
SHEARERS ROAD
VISTA DRIVE
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX FUTURE BACKGROUND TRAFFIC + PHASE 1 TRAFFIC
(XX) PROJECT TRAFFIC (PHASE 2)
[XX] TOTAL TRAFFIC (PHASE 1 & 2)
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2024 FUTURE YEAR PHASE 1 & 2 BUILD CONDITIONS (PARTIAL BUILD-OUT) PM PEAK HOUR TRAFFIC VOLUMES
Prepared by: RS&H Prepared for the Town of Mooresville
16


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
FRANKS CROSSING ROAD
SHEARERS ROAD
VISTA DRIVE
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX FUTURE BACKGROUND TRAFFIC + PHASE 1 & 2 TRAFFIC
(XX) PROJECT TRAFFIC (PHASE 3)
[XX] TOTAL TRAFFIC (PHASE 1, 2 & 3)
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR PHASE 1, 2 & 3
BUILD CONDITIONS (FULL BUILD-OUT)
AM PEAK HOUR TRAFFIC VOLUMES
Prepared by:
RS&H
Prepared for the Town of Mooresville
17


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD*
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX FUTURE BACKGROUND TRAFFIC + PHASE 1 & 2 TRAFFIC
(XX) PROJECT TRAFFIC (PHASE 3)
[XX] TOTAL TRAFFIC (PHASE 1, 2 & 3)
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR PHASE 1, 2 & 3 BUILD CONDITIONS (FULL BUILD-OUT) PM PEAK HOUR TRAFFIC VOLUMES
Prepared by: RS&H
Prepared for the Town of Mooresville
18


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD*
BEATY STREET
GRIFFITH STREET
SLOAN STREET
61 (96)
56 (95)
49 (101)
67 (101)
117
4
116
17
121 (191)
41 (21)
9 (40)
12 (53)
276 (297)
170 (344)
21 (93)
28 (133)
87 (81)
191 (437)
55 (26)
96 (47)
372 (344)
133 (202)
267 (275)
12 (53)
55 (26)
157 (327)
194 (218)
73 (57)
36 (69)
28
28 (69)
40 (57)
40
33
8
118 (137)
76 (81)
121 (258)
75 (163)
46 (95)
118 (137)
75 (163)
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX AM PEAK HOUR TRAFFIC VOLUMES
(XX) PM PEAK HOUR TRAFFIC VOLUMES
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR PHASE
1, 2 & 3 BUILD CONDITIONS
PROJECT TRAFFIC VOLUMES
Prepared by:
RS&H
Prepared for the Town of Mooresville
19


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE*
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
FRANKS CROSSING ROAD*
SHEARERS ROAD
VISTA DRIVE
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
EXISTING ROAD
PROPOSED ROAD
XX AM PEAK HOUR TRAFFIC VOLUMES
(XX) PM PEAK HOUR TRAFFIC VOLUMES
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR PHASE 1, 2 & 3 BUILD CONDITIONS TOTAL TRAFFIC VOLUMES
Prepared by: RS&H
Prepared for the Town of Mooresville
20

6.0 CAPACITY ANALYSIS

6.1 2021 Future Year Phase 1 Build Conditions (Partial Build-Out)

Capacity analysis for the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out) indicates that the intersections of NC 115 at Bridges Farm Road, NC 115 at Presbyterian Road, Presbyterian Road at Franks Crossing Road, NC 115 at Beaty Street, and Beaty Street/Sloan Street at Griffith Street would degrade the Level of Service or increase delay for intersections already operating at a poor Level of Service when compared to the 2027 Future Year Conditions.

The operations at the intersection of NC 115 at Langtree Road/Hobbs Lane, NC 115 at Yellow Wood Circle, and Presbyterian Road/Vista Drive at Shearers Road would maintain a minimum of Level of Service D between 2027 No Build Conditions and these conditions.

During the 2015 Existing Conditions, the intersection of NC 115 at Bridges Farm Road would function at Level of Service F in the AM Peak Hour. However, with the introduction of the first phase of the Lake Davidson Development, the eastbound approach of the intersection would carry all of the vehicular traffic leaving the proposed development, resulting in an increased delay of over 300 seconds.

The capacity analysis results are shown in Table 6 and Figures 25 and 26. All capacity analysis worksheets are included in Appendix E.

6.2 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)

Capacity analysis for the 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out) indicates that the intersections of NC 115 at Bridges Farm Road, NC 115 at Presbyterian Road, Presbyterian Road at Franks Crossing Road, Presbyterian Road/Vista Drive at Shearers Road, NC 115 at Beaty Street, and Beaty Street/Sloan Street at Griffith Street would degrade the Level of Service or increase delay for intersections already operating at a poor Level of Service when compared to the 2027 Future Year Conditions.

The operations at the intersection of NC 115 at Langtree Road/Hobbs Lane and NC 115 at Yellow Wood Circle, would maintain a minimum of Level of Service D between 2027 No Build Conditions and these conditions.

The capacity analysis results are shown in Table 6 and Figures 27 and 28. All capacity analysis worksheets are included in Appendix E.

6.3 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)

Capacity analysis for the 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out) indicates that the intersections of NC 115 at Bridges Farm Road, NC 115 at Presbyterian Road, Presbyterian Road at Franks Crossing Road, Presbyterian Road/Vista Drive at Shearers Road, NC 115 at Beaty Street, and Beaty

Street/Sloan Street at Griffith Street would degrade the Level of Service or increase delay for intersections already operating at a poor Level of Service when compared to the 2027 Future Year Conditions.

The operations at the intersection of NC 115 at Langtree Road/Hobbs Lane and NC 115 at Yellow Wood Circle, would maintain a minimum of Level of Service D between 2027 No Build Conditions and these conditions.

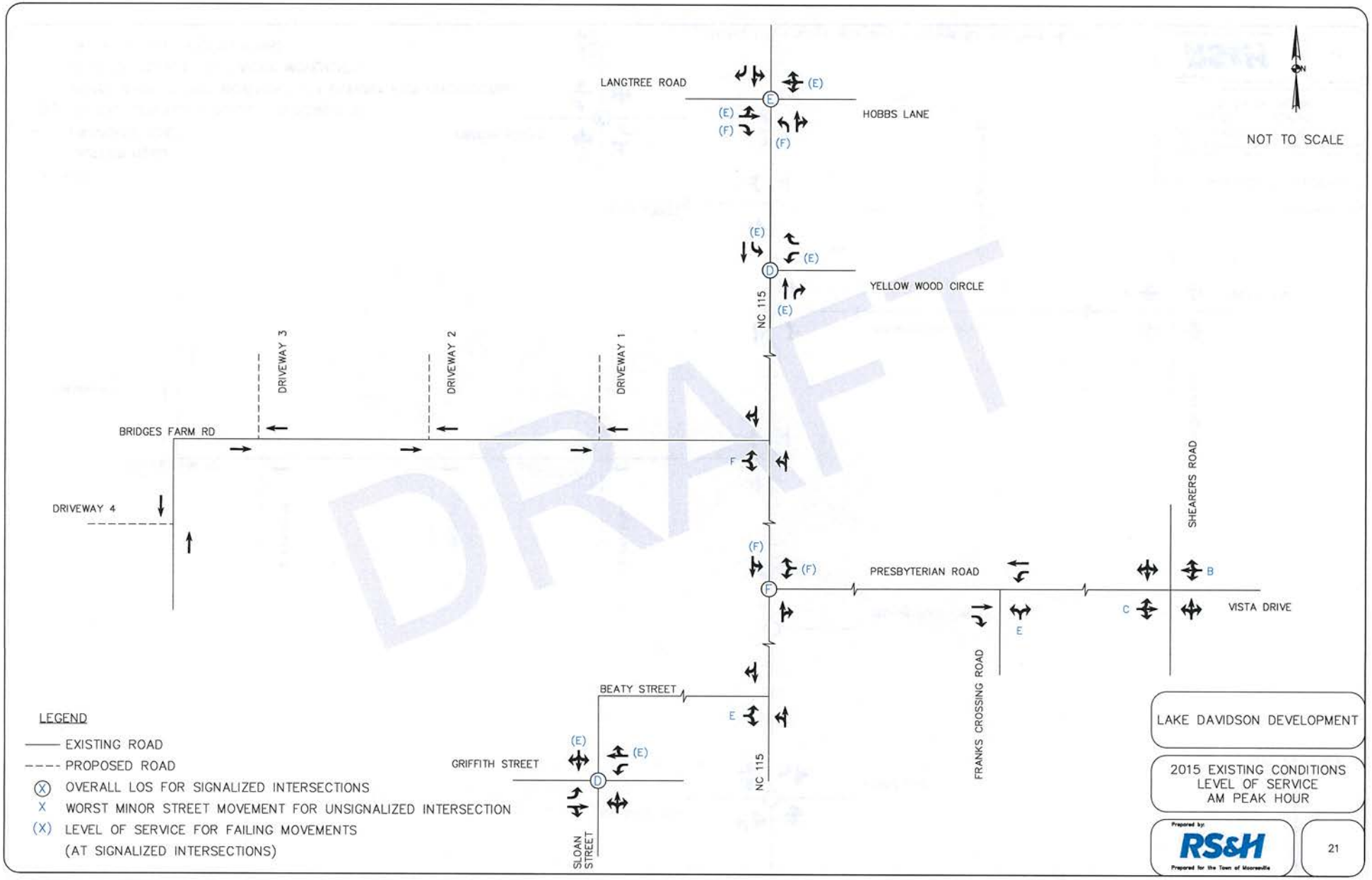
The capacity analysis results are shown in Table 6 and Figures 29 and 30. All capacity analysis worksheets are included in Appendix E.

Table 6 – Summary of Level of Service Measurements

Location and Conditions	AM Peak Hour (Seconds of Delay)	PM Peak Hour (Seconds of Delay)
NC 115 and Langtree Road/Hobbs Lane		
2015 Existing Conditions	E (69.7)	C (26.0)
2027 No Build Conditions	D (42.8)	C (27.0)
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	D (43.2)	C (26.5)
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	D (39.1)	C (27.9)
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	D (49.6)	C (28.8)
NC 115 and Yellow Wood Circle (AM Peak Hour Only)		
2015 Existing Conditions	D (40.3)	-
2027 No Build Conditions	D (39.0)	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	D (49.6)	-
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	D (51.7)	-
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	D (54.2)	-
NC 115 and Bridges Farm Road		
2015 Existing Conditions	F (70.0)*	C (24.3)*
2027 No Build Conditions	F (114.8)*	D (28.8)*
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	F (300+)*	F (300+)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	F (300+)*	F (300+)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	F (300+)*	F (300+)*
NC 115 and Presbyterian Road		
2015 Existing Conditions	F (90.7)	B (11.6)
2027 No Build Conditions	F (112.0)	B (17.4)
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	F (167.1)	C (28.9)
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	F (212.9)	D (48.2)
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	F (267.2)	F (135.8)
Presbyterian Road and Franks Crossing Road (AM Peak Hour Only)		
2015 Existing Conditions	E (44.3)*	-
2027 No Build Conditions	E (44.3)*	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	F (57.1)*	-
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	F (66.4)*	-
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	F (76.2)*	-
Presbyterian Road/Vista Drive and Shearers Road		
2015 Existing Conditions	C (21.8)*	C (17.2)*
2027 No Build Conditions	C (23.2)*	C (18.4)*
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	D (26.8)*	C (20.3)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	D (30.0)*	C (21.8)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	D (32.8)*	D (26.1)*

Location and Conditions	AM Peak Hour (Seconds of Delay)	PM Peak Hour (Seconds of Delay)
NC 115 and Beaty Street		
2015 Existing Conditions	E (35.1)*	F (300+)*
2027 No Build Conditions	F (59.0)*	F (300+)*
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	F (71.4)*	F (300+)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	F (103.7)*	F (300+)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	F (300+)*	F (300+)*
Beaty Street/Sloan Street and Griffith Street		
2015 Existing Conditions	D (39.2)	E (57.3)
2027 No Build Conditions	D (39.2)	E (57.3)
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	D (45.4)	E (65.9)
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	D (51.2)	E (76.1)
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	E (61.9)	F (97.9)
Bridges Farm Road and Driveway #1		
2015 Existing Conditions	-	-
2027 No Build Conditions	-	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	A (0.0)*	A (0.0)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	A (0.0)*	A (0.0)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	C (16.3)*	E (35.1)*
Bridges Farm Road and Driveway #2		
2015 Existing Conditions	-	-
2027 No Build Conditions	-	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	B (11.2)*	B (10.8)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	B (13.2)*	B (12.3)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	B (14.6)*	C (17.9)*
Bridges Farm Road and Driveway #3		
2015 Existing Conditions	-	-
2027 No Build Conditions	-	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	A (9.3)*	A (9.2)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	A (9.9)*	A (9.8)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	A (9.9)*	B (10.0)*
Bridges Farm Road and Driveway #4		
2015 Existing Conditions	-	-
2027 No Build Conditions	-	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	A (0.0)*	A (0.0)*
2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)	A (9.6)*	A (9.4)*
2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)	A (9.6)*	A (9.4)*

**Note: Unsignalized capacity analysis results provided for the worst minor street movement*


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE
NC 115
DRIVEWAY 3
DRIVEWAY 2
DRIVEWAY 1
BRIDGES FARM RD
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD
BEATY STREET
GRIFFITH STREET
SLOAN STREET
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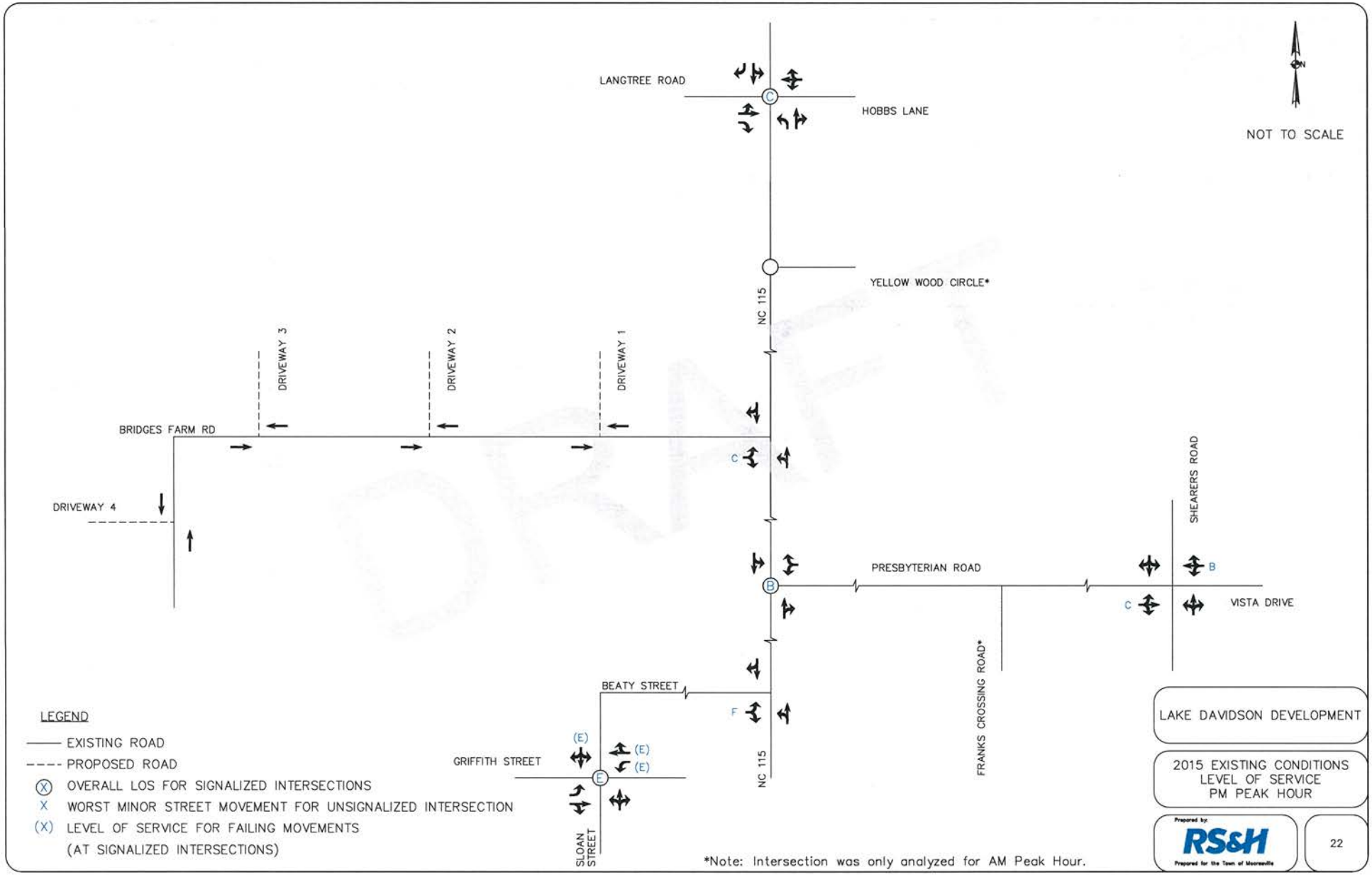
LAKE DAVIDSON DEVELOPMENT
2015 EXISTING CONDITIONS LEVEL OF SERVICE AM PEAK HOUR
Prepared by: RS&H
Prepared for the Town of Mooresville
21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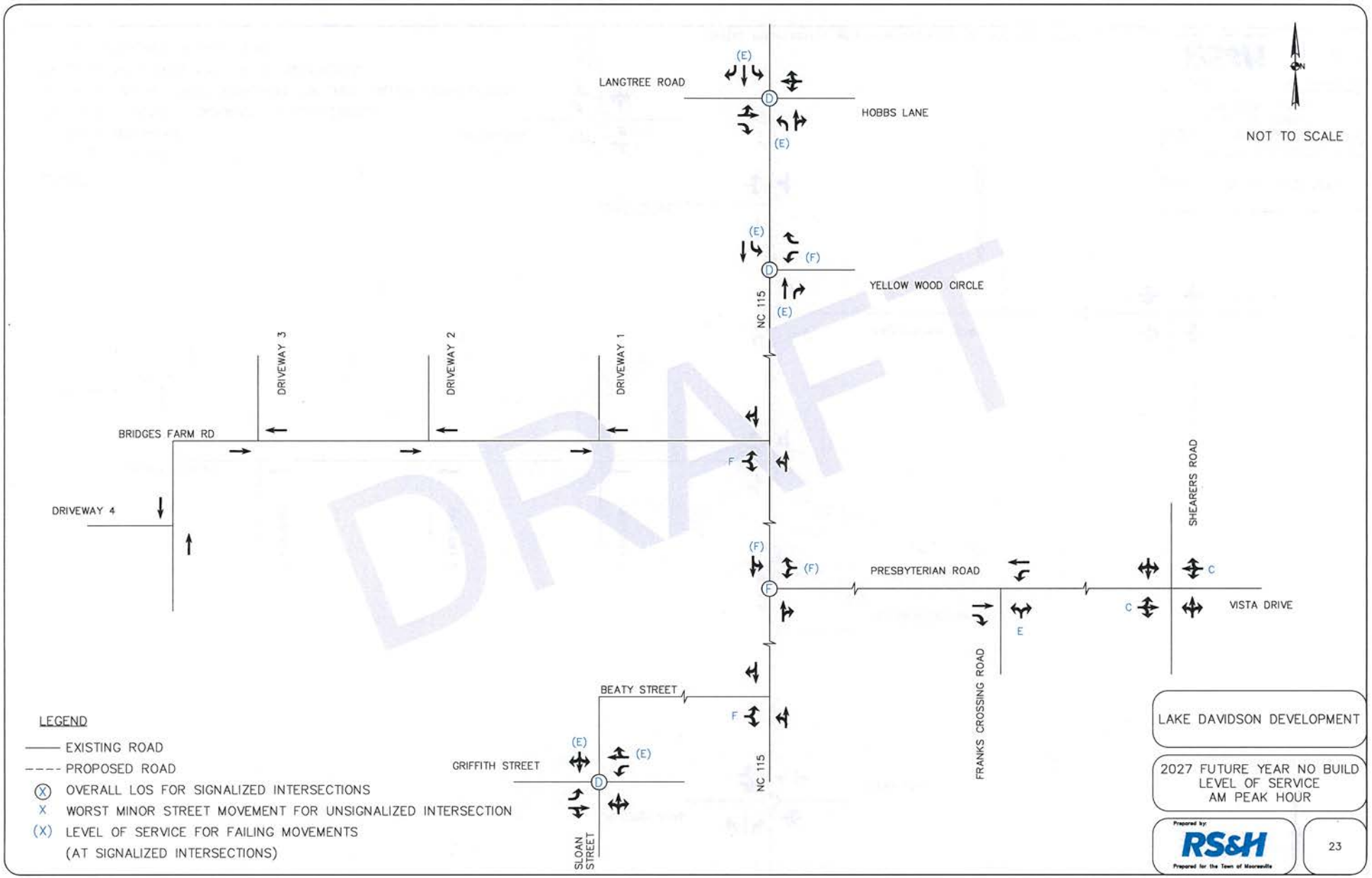
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2015 EXISTING CONDITIONS
LEVEL OF SERVICE
PM PEAK HOUR
Prepared by:
RS&H
Prepared for the Town of Mooresville
22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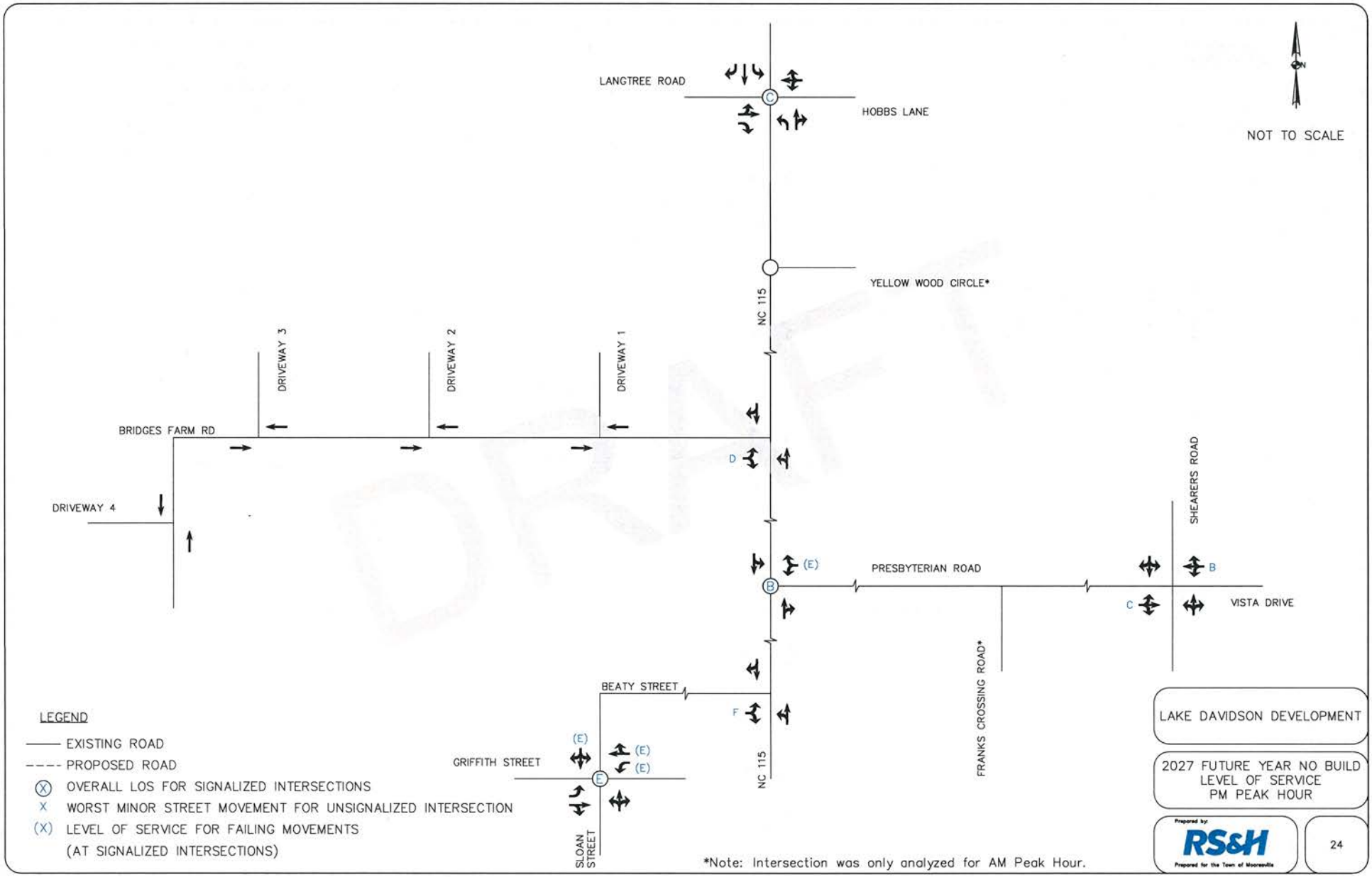
2027 FUTURE YEAR NO BUILD LEVEL OF SERVICE AM PEAK HOUR
Prepared by: RS&H Prepared for the Town of Mooresville
23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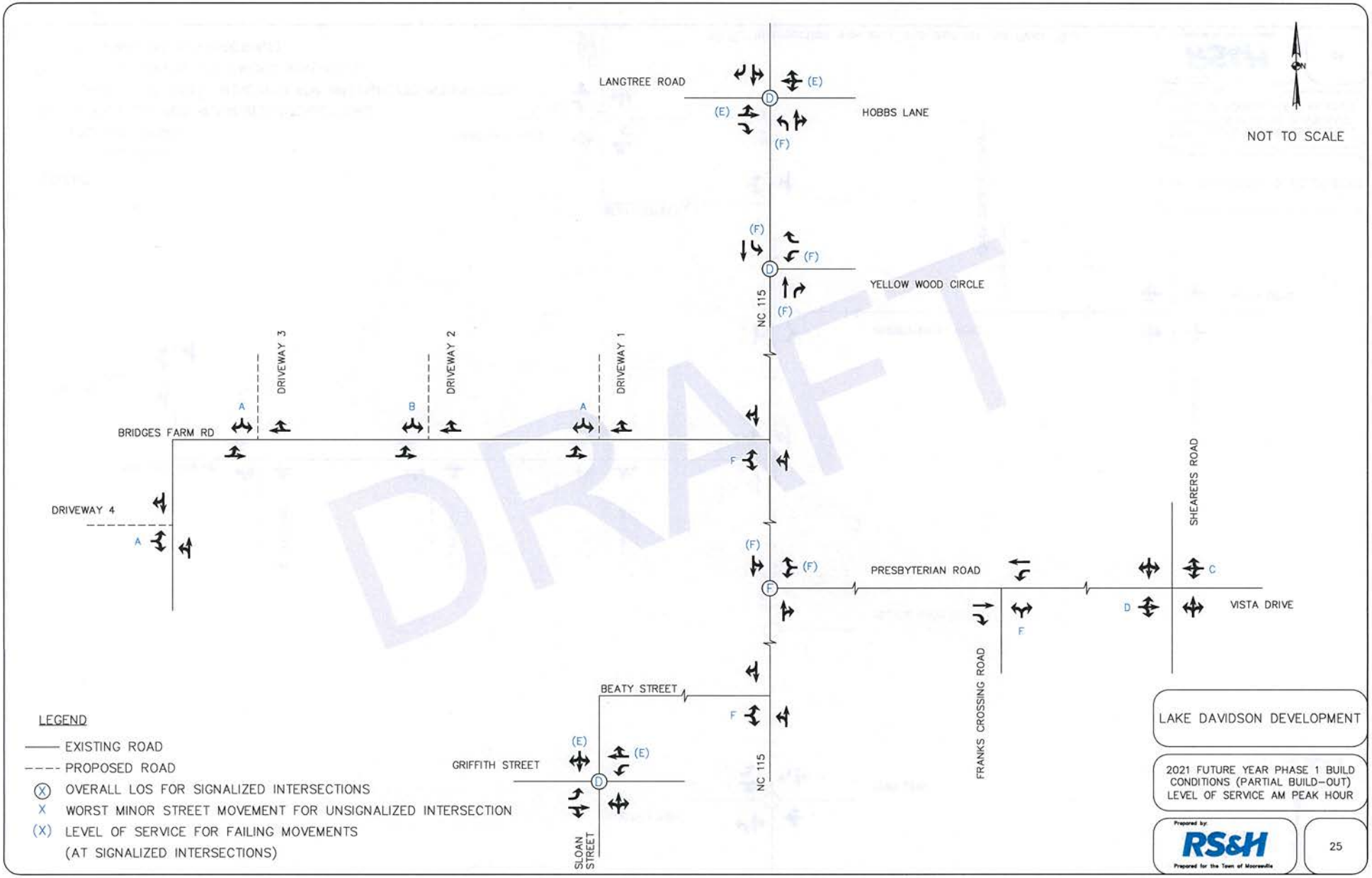
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR NO BUILD
LEVEL OF SERVICE
PM PEAK HOUR
Prepared by:
RS&H
Prepared for the Town of Mooresville
24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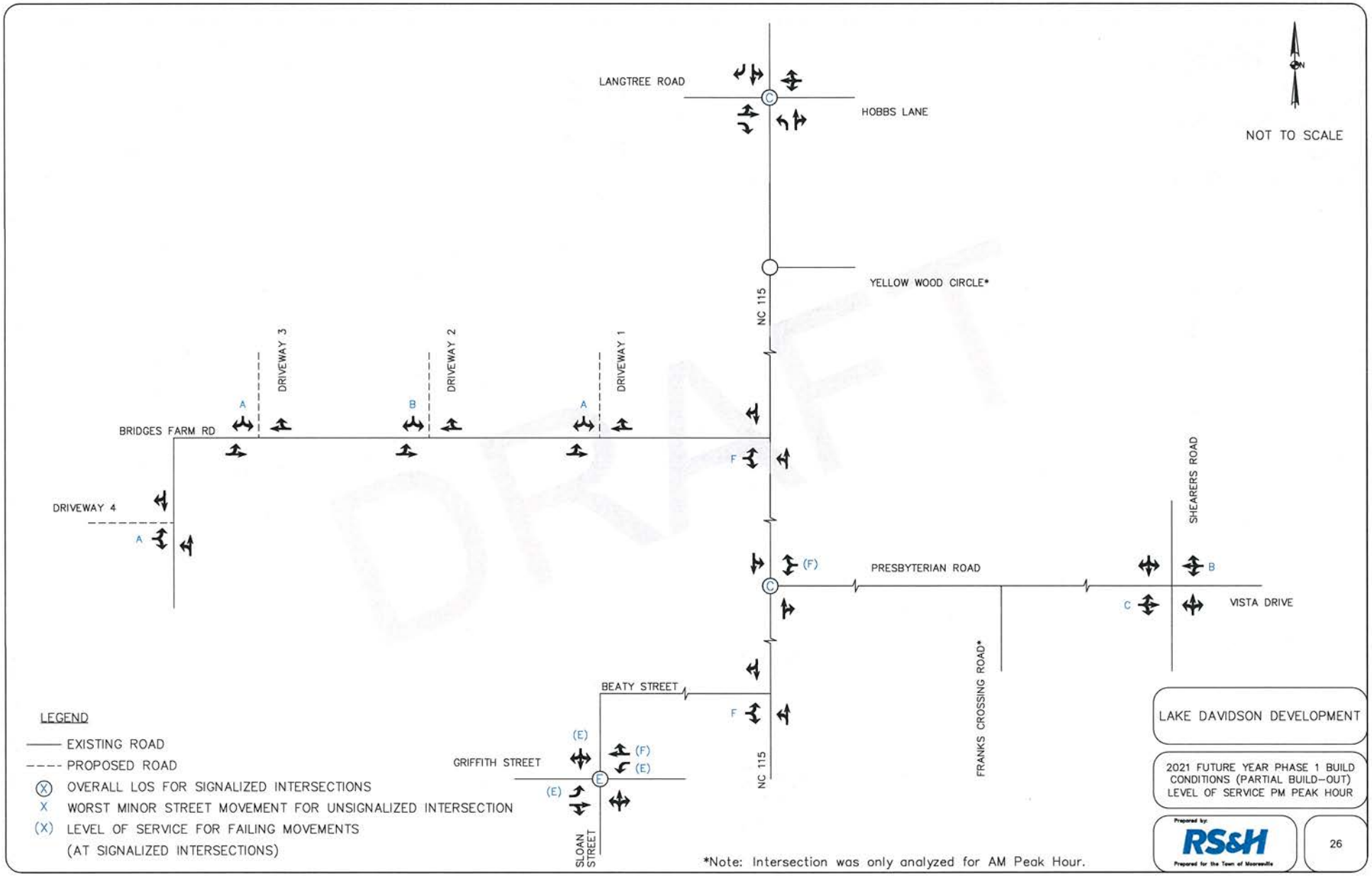
LAKE DAVIDSON DEVELOPMENT
2021 FUTURE YEAR PHASE 1 BUILD CONDITIONS (PARTIAL BUILD-OUT) LEVEL OF SERVICE AM PEAK HOUR
Prepared by: RS&H
Prepared for the Town of Mooresville
25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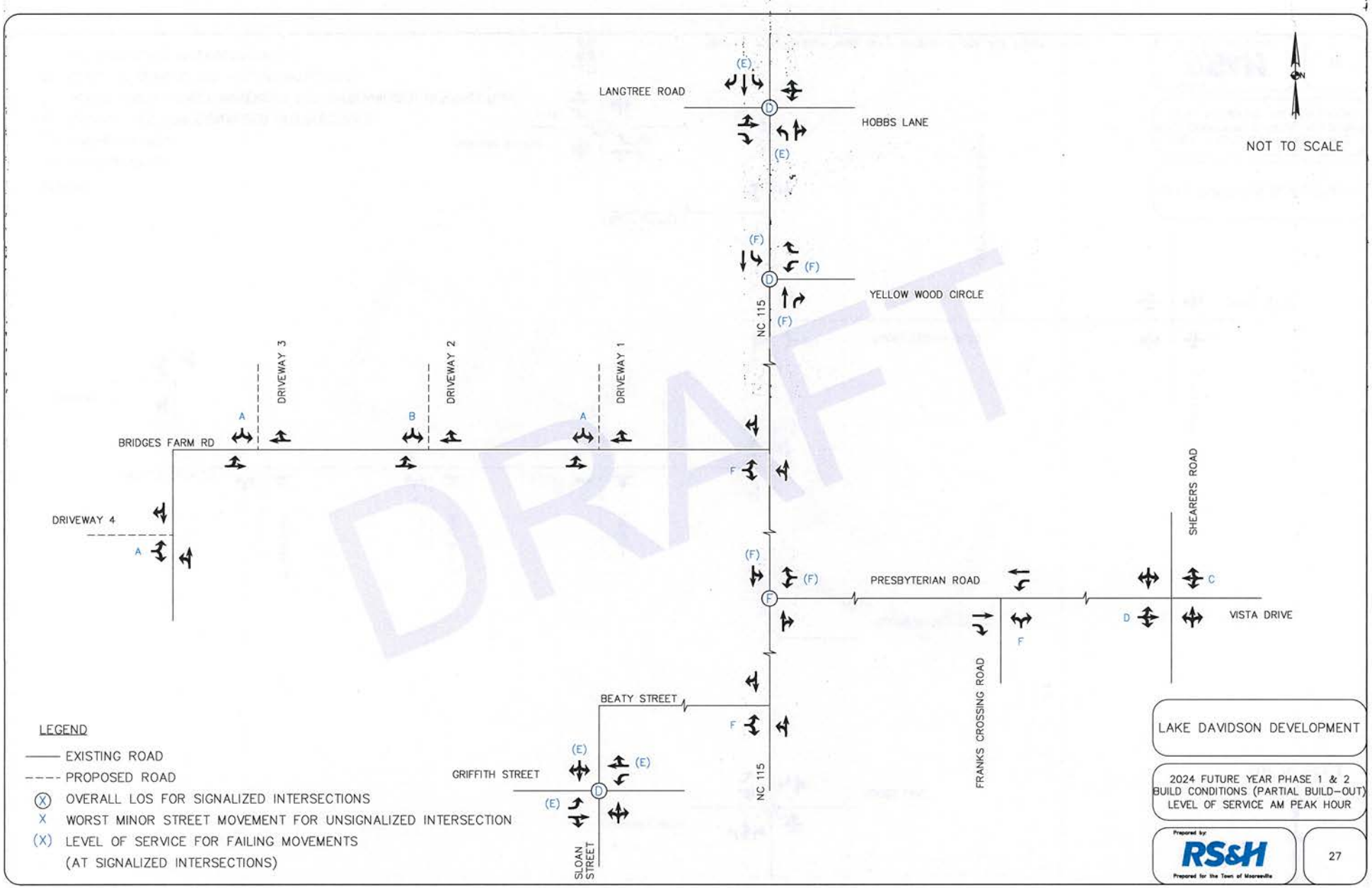
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2021 FUTURE YEAR PHASE 1 BUILD CONDITIONS (PARTIAL BUILD-OUT) LEVEL OF SERVICE PM PEAK HOUR
Prepared by: RS&H
Prepared for the Town of Mooresville
26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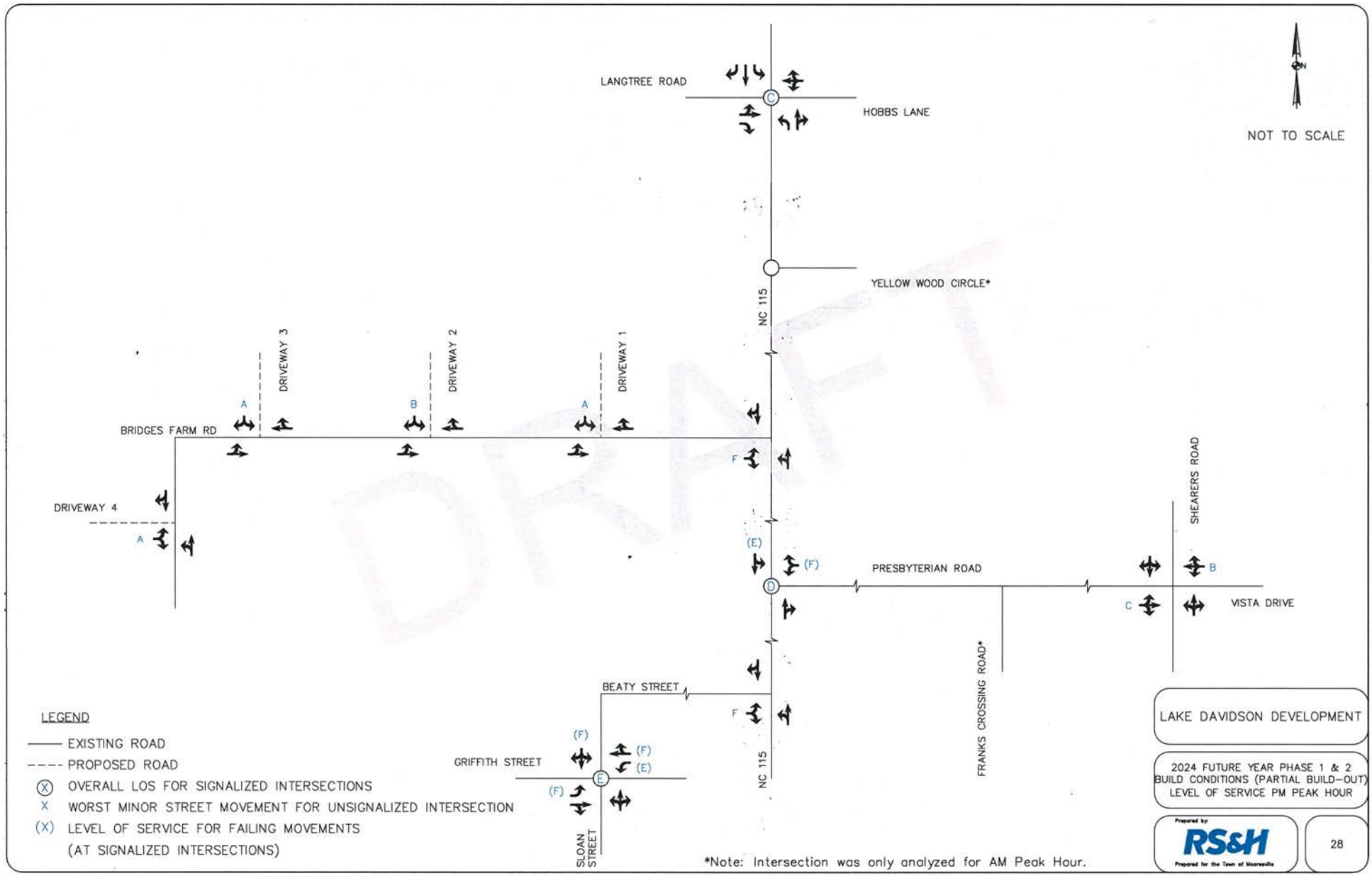
LAKE DAVIDSON DEVELOPMENT
2024 FUTURE YEAR PHASE 1 & 2 BUILD CONDITIONS (PARTIAL BUILD-OUT) LEVEL OF SERVICE AM PEAK HOUR
Prepared by RS&H
Prepared for the Town of Mooresville
27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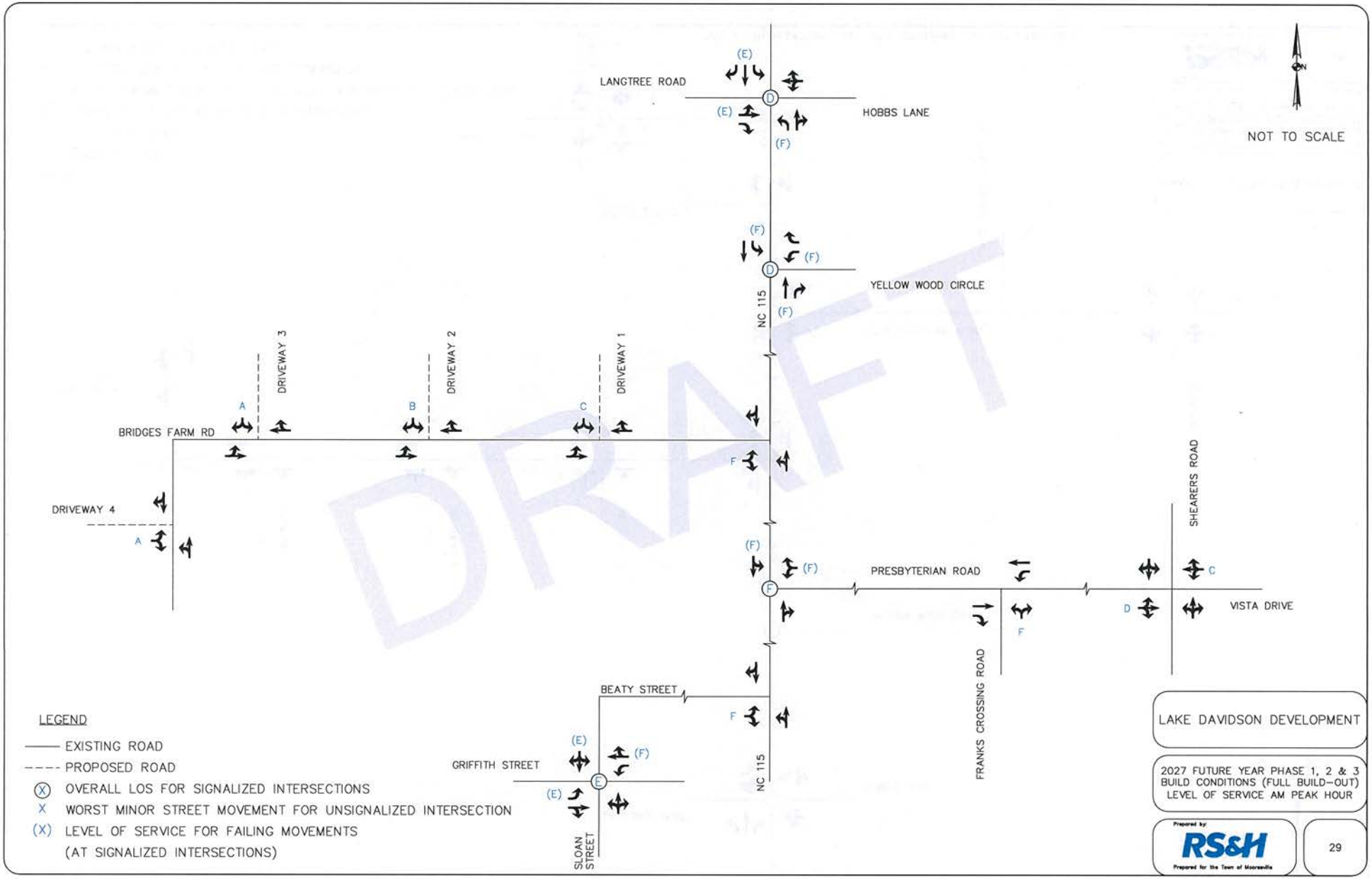
*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2024 FUTURE YEAR PHASE 1 & 2 BUILD CONDITIONS (PARTIAL BUILD-OUT) LEVEL OF SERVICE PM PEAK HOUR
Prepared by: RS&H
Prepared for the Town of Mooresville
28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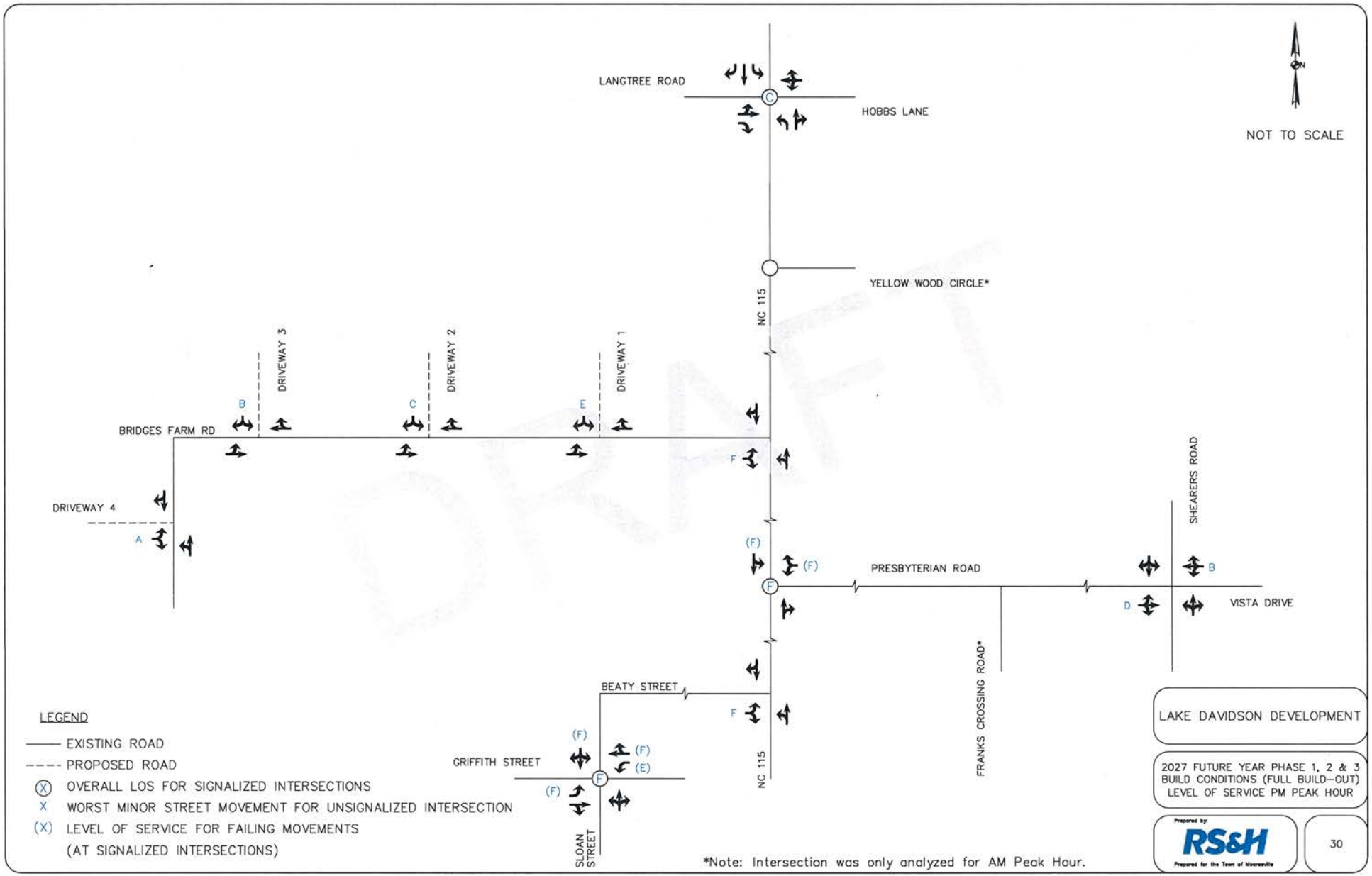
WORST MINOR STREET MOVEMENT FOR UNSIGNALIZED INTERSECTION
LEVEL OF SERVICE FOR FAILING MOVEMENTS (AT SIGNALIZED INTERSECTIONS)
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR PHASE 1, 2 & 3 BUILD CONDITIONS (FULL BUILD-OUT) LEVEL OF SERVICE AM PEAK HOUR
Prepared by: RS&H
Prepared for the Town of Mooresville
29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*Note: Intersection was only analyzed for AM Peak Hour.
LAKE DAVIDSON DEVELOPMENT
2027 FUTURE YEAR PHASE 1, 2 & 3 BUILD CONDITIONS (FULL BUILD-OUT) LEVEL OF SERVICE PM PEAK HOUR
Prepared by:
RS&H
Prepared for the Town of Mooresville
30

It should be noted that at times a higher queue than would occur is reported if the vehicles are unable to access the separate turning lane due to backups in the through lane. Queuing analysis results are shown in Table 8 for the 2027 No Build Conditions.

Table 8 – Queuing Results – 2027 No Build Conditions

Intersection	Approach		Existing Storage Length (ft)	AM Peak Hour Queue Length (ft)	PM Peak Hour Queue Length (ft)
NC 115 at Langtree Rd/ Hobbs Ln	Signalized	EBR	300*	290	342
		NBL	350*	356+	148
		SBL	50*	66	25
NC 115 at Yellow Wood Cir (AM Peak Hour Only)	Signalized	NBR	350	232	-
		SBL	425	308	-
Presbyterian Rd at Franks Crossing Rd (AM Peak Hour Only)	Unsignalized	EBR	75	11	-
		WBL	150	52	-
Beaty St/Sloan St at Griffith St	Signalized	EBL	150	458+	250
		WBL	150	67	176

Note: Reported queue length is higher result from either 95th percentile queue in Synchro or maximum queue in SimTraffic.

** Storage lengths from existing increased per Stafford Subdivision TIA.*

+Volume exceeds capacity, queue may be longer.

In the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out), queuing analysis indicates that the existing storage lengths provided for designated turn lanes would be sufficient, aside from the following locations:

- NC 115 at Langtree Road/Hobbs Lane – eastbound right turn lane and northbound left turn lane
- NC 115 at Yellow Wood Circle – northbound right turn lane
- Beaty Street/Sloan Street at Griffith Street – eastbound left turn lane and westbound left turn lane

Queuing analysis results are shown in Table 9 for these conditions. Recommended storage lengths and turning lanes for mitigation of the Lake Davidson Development are described further in Section 9.0.

Table 9 – Queuing Results – 2021 Future Year Phase 1 Build Conditions (Partial Build-Out)

Intersection	Approach		Existing Storage Length (ft)	AM Peak Hour Queue Length (ft)	PM Peak Hour Queue Length (ft)
NC 115 at Langtree Rd/ Hobbs Ln	Signalized	EBR	110*	356	341
		NBL	275*	410	183
NC 115 at Yellow Wood Cir (AM Peak Hour Only)	Signalized	NBR	350	378	-
		SBL	425	368	-
Presbyterian Rd at Franks Crossing Rd (AM Peak Hour Only)	Unsignalized	EBR	75	4	-
		WBL	150	48	-
Beaty St/Sloan St at Griffith St	Signalized	EBL	150	532+	372+
		WBL	150	102	152

Note: Reported queue length is higher result from either 95th percentile queue in Synchro or maximum queue in SimTraffic.

** Storage lengths from existing increased per Stafford Subdivision TIA.*

+Volume exceeds capacity, queue may be longer.

In the 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out), queuing analysis indicates that the existing storage lengths provided for designated turn lanes would be sufficient, aside from the following locations:

- NC 115 at Langtree Road/Hobbs Lane – eastbound right turn lane, northbound left turn lane, and southbound left turn lane
- Beaty Street/Sloan Street at Griffith Street – eastbound left turn lane and westbound left turn lane

Queuing analysis results are shown in Table 10 for these conditions. Recommended storage lengths and turning lanes for mitigation of the Lake Davidson Development are described further in Section 9.0.

Table 10 – Queuing Results – 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out)

Intersection	Approach		Existing Storage Length (ft)	AM Peak Hour Queue Length (ft)	PM Peak Hour Queue Length (ft)
NC 115 at Langtree Rd/ Hobbs Ln	Signalized	EBR	300*	315	355
		NBL	350*	373+	153
		SBL	50*	88	67
NC 115 at Yellow Wood Cir (AM Peak Hour Only)	Signalized	NBR	350	321	-
		SBL	425	331	-
Presbyterian Rd at Franks Crossing Rd (AM Peak Hour Only)	Unsignalized	EBR	75	3	-
		WBL	150	56	-
Beaty St/Sloan St at Griffith St	Signalized	EBL	150	567+	442+
		WBL	150	176	249

Note: Reported queue length is higher result from either 95th percentile queue in Synchro or maximum queue in SimTraffic.

** Storage lengths from existing increased per Stafford Subdivision TIA.*

+Volume exceeds capacity, queue may be longer.

In the 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out), queuing analysis indicates that the existing storage lengths provided for designated turn lanes would be sufficient, aside from the following locations:

- NC 115 at Langtree Road/Hobbs Lane – eastbound right turn lane, northbound left turn lane, and southbound left turn lane
- NC 115 at Yellow Wood Circle – northbound right turn lane
- Beaty Street/Sloan Street at Griffith Street – eastbound left turn lane and westbound left turn lane

Queuing analysis results are shown in Table 11 for these conditions. Recommended storage lengths and turning lanes for mitigation of the Lake Davidson Development are described further in Section 9.0.

Table 11 – Queuing Results – 2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out)

Intersection	Approach		Existing Storage Length (ft)	AM Peak Hour Queue Length (ft)	PM Peak Hour Queue Length (ft)
NC 115 at Langtree Rd/ Hobbs Ln	Signalized	EBR	300*	389	406
		NBL	350*	450+	189
		SBL	50*	22	83
NC 115 at Yellow Wood Cir (AM Peak Hour Only)	Signalized	NBR	350	382	-
		SBL	425	364	-
Presbyterian Rd at Franks Crossing Rd (AM Peak Hour Only)	Unsignalized	EBR	75	7	-
		WBL	150	56	-
Beaty St/Sloan St at Griffith St	Signalized	EBL	150	666+	537+
		WBL	150	214	250

Note: Reported queue length is higher result from either 95th percentile queue in Synchro or maximum queue in SimTraffic.

** Storage lengths from existing increased per Stafford Subdivision TIA.*

+Volume exceeds capacity, queue may be longer.

8.0 COLLISION ANALYSIS

Crash data was obtained from the NCDOT for the 36-month period (3 years) from June 1, 2013 to May 31, 2016 for the following roadway segment:

- NC 115 between the Mecklenburg County Line (north of Beaty Street) and Faith Road (north of Langtree Road)

The Traffic Engineering Accident Analysis System (TEAAS) Report is included in Appendix G. During the three-year period, on NC 115 between the Mecklenburg County Line and Faith Road, 76 crashes were reported during the study period. Of these, 36 were rear-end crashes, three were sideswipe crashes, eighteen were angle/left/right-turning crashes, and nineteen were categorized as "other" crashes. The rear-end and turning collisions could have been caused by the number of driveways along the corridor. These crashes were most likely due to vehicles turning onto side roads. Drivers may have been traveling too fast along the NC 115 corridor and may not have had ample time to reduce speed for slow-moving vehicles either turning off the road or entering the road. The "other" crashes include seven fixed object, most likely due to overcorrection or time of day/weather. Of these 76 collisions, 23 were non-fatal injury and 53 were property damage only crashes.

Table 12 presents the number of crashes by type in the study area.

Table 12 – Number of Crashes by Type
June 1, 2013 – May 31, 2016

Location	Total	Rear-end	Sideswipe	Angle/ Turning	Other*
Roadway Segments					
NC 115 between the Mecklenburg County Line and Faith Road	**76**	36	3	18	19

**Other crashes include crashes caused by backing up, fixed object, pedestrian, animal, overturn/rollover, or other non-collision.*
Source: Collision Data, North Carolina Department of Transportation from June 1, 2013 to May 31, 2016

9.0 MITIGATION MEASURE RECOMMENDATIONS

The findings of this study indicate that the Lake Davidson Development traffic would degrade the operations of the following existing intersections from the 2027 Future Year Conditions:

- NC 115 and Bridges Farm Road would experience increased delay while remaining Level of Service F in the AM Peak Hour and would degrade from Level of Service C to F in the PM Peak Hour.
- NC 115 and Presbyterian Road would experience increased delay while remaining Level of Service F in the AM Peak Hour and would degrade from Level of Service B to F in the PM Peak Hour.
- Presbyterian Road and Franks Crossing Road would degrade from Level of Service E to F in the AM Peak Hour.
- Presbyterian Road/Vista Drive and Shearers Road would degrade Level of Service C to D in the AM and PM Peak Hours.
- NC 115 and Beaty Street would degrade from Level of Service E to F in the AM Peak Hour and would experience increased delay while remaining Level of Service F in the PM Peak Hour.
- Beaty Street/Sloan Street and Griffith Street would degrade from Level of Service D to E in the AM Peak Hour and would experience increased delay and degrade to Level of Service E to F in the PM Peak Hour.

In addition to the NCDOT Congestion Management Capacity Analysis Guidelines, the Town of Mooresville's Transportation Impact Analysis Procedures Manual, guidelines were followed. As described in the Town's manual, mitigation is required when the Build conditions exceeds the No Build conditions by any of the following thresholds:

Capacity

- Degrades the overall intersection Level of Service for signalized intersections, or Level of Service for the critical movement of unsignalized intersections, or
- Increases the delay for signalized or unsignalized intersections operating at Level of Service E or F.

Queue

- Turn lanes for site driveways should follow NCDOT's Policy of Street and Driveway Access to North Carolina Highways, and
- No Build queues are accommodated in existing storage bay and Build queue exceeds existing storage bay

Mitigations, shown by intersection for each scenario, are recommended for the intersections experiencing degraded operations with the addition of the Lake Davidson Development.

NC 115 and Langtree Road/Hobbs Lane

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- In order to accommodate queues, the following improvements are recommended:

- Extend the eastbound right turn lane to provide 425 feet of storage. Queuing analysis indicates that the traffic demand would require additional storage length than is provided in the 2027 No Build Conditions. Therefore, this improvement should not be the sole responsibility of the Lake Davidson developer.
- Extend the northbound left turn lane to provide 500 feet of storage. Queuing analysis indicates that the traffic demand would require additional storage length than is provided in the 2027 No Build Conditions. Therefore, this improvement should not be the sole responsibility of the Lake Davidson developer.
- While the Level of Service on the westbound approach would degrade in these conditions, an additional through lane along NC 115 would be required to restore the Level of Service for the approach. The addition of a second through lane along NC 115 would need to be a corridor-wide improvement with far reaching impacts and is not considered a reasonable improvement as a result of this development.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional changes are recommended from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional changes are recommended from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

NC 115 and Yellow Wood Circle

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- No improvements are recommended for these conditions.
  - While the queuing analysis results indicate that the traffic demand would require additional storage length than is currently provided for the northbound right turn lane, it is likely due to vehicles being unable to access the separate turn lane due to backups in the through lane. Therefore, the improvement is not considered to be necessary as a part of the Lake Davidson Development mitigation measures.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No improvements are recommended for these conditions.

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No improvements are recommended for these conditions.
  - While the Levels of Service would degrade for the westbound and northbound approaches in these conditions, the overall intersection would continue to function at Level of Service D. In order to restore each approach Level of Service, an additional northbound right turn lane as well as an additional southbound left turn lane would be required. These improvements are not considered reasonable for the following reasons:
    - Potential right-of-way and environmental impacts.

- The signal would need to be modified to have protected phasing for the northbound and southbound turning movements, causing unnecessary delays during the majority of the day, whilst only providing benefits during the school peak hours.

NC 115 and Bridges Farm Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Convert to a signalized intersection, assuming that warrants are met upon opening of Phase 1. Based on the projected peak hour traffic volumes, a signal is warranted (MUTCD Warrant 3); however, additional traffic counts and Full Warrant Analysis is recommended.
- Provide an eastbound left turn lane with 350 feet of storage.
- Provide a northbound left turn lane with 450 feet of storage.
- Provide a southbound right turn lane with 250 feet of storage.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

NC 115 and Presbyterian Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a westbound left turn lane with 225 feet of storage.
- Provide a northbound right turn lane with 250 feet of storage.
- Provide a southbound left turn lane with 225 feet of storage.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Presbyterian Road and Franks Crossing Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- In order to reduce the delay increase caused by the additional vehicles from the Lake Davidson Development, a traffic signal would need to be installed. However, the traffic volumes at this intersection do not meet the Peak Hour Warrants so it is not recommended that a signal be installed.

- In lieu of a traffic signal, a separate northbound right turn lane with 100 feet of storage could be provided to reduce delay for the northbound traffic at the stop sign. This improvement is recommended but it should be noted that the volumes do not meet the turn lane warrants per the NCDOT Driveway Manual. Even with the addition of a northbound right turn lane, the delay would increase from the 2027 No Build Conditions. No additional improvements are feasible.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Presbyterian Road/Vista Drive and Shearers Road

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide an eastbound shared through/right turn lane with 100 feet of storage, converting the existing lane to an exclusive left turn lane.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

NC 115 and Beaty Street

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- In order to maintain the Level of Service F, without increasing delay, improve the eastbound approach Level of Service, a separate southbound right turn lane with 100 feet is recommended.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- In addition to the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out) improvement, convert to a signalized intersection, assuming that warrants are met upon opening of Phase 2. Based on the projected peak hour traffic volumes, a signal is warranted (MUTCD Warrant 3); however, additional traffic counts and Full Warrant Analysis is recommended. In addition, it is the recommendation of the Division 10 Traffic Engineer that, should the signal be warranted, a northbound left turn lane should be installed. As the intersection would function at an acceptable Level of Service with the addition of the southbound right turn lane and the conversion to a signal, a northbound left turn lane is not shown in the analysis. It should be discussed as part of the mitigation measures meeting what the appropriate action should be for this location.

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out).

Beaty Street/Sloan Street and Griffith Street

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Extend the eastbound left turn lane to provide 425 feet of storage. Queuing analysis indicates that the traffic demand would require additional storage length than is provided in the 2027 No Build Conditions. Therefore, this improvement should not be the sole responsibility of the Lake Davidson developer.
- Provide a southbound right turn lane with 300 feet of storage. While the queuing analysis results indicate that the traffic demand would require additional storage length than is currently provided for the northbound right turn lane, it is likely due to vehicles being unable to access the separate turn lane due to backups in the through lane. Therefore, the improvement is not considered to be necessary as a part of the Lake Davidson Development mitigation measures.
    - While the configuration of the left turn/through shared lane is not ideal, due to the high traffic demand of the right turning movement, it is recommended that the right turn lane be exclusive. Though the traffic demand does not indicate a need for separate through and left turn lanes, the configuration should be discussed as part of the mitigation measures meeting.
- While the northbound approach Level of Service degrades in these conditions, it is Level of Service D. In order to improve it further, additional lanes would be needed but based on the traffic demand of the approach, none are recommended.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).
- While the northbound approach Level of Service degrades in these conditions, it is Level of Service D. In order to improve it further, additional lanes would be needed but based on the traffic demand of the approach, none are recommended.

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).
- While the northbound approach Level of Service degrades in these conditions to Level of Service D and E, additional lanes would be needed to improve the approach but based on the traffic demand, none are recommended.

Bridges Farm Road and Driveway #1

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane with a minimum of 200 feet of storage before the first intersection within the Lake Davidson Development.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- In addition to the previous improvement, provide a westbound right turn lane with 100 feet of storage.

Bridges Farm Road and Driveway #2

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane with a minimum of 400 feet of storage before the first intersection within the Lake Davidson Development.
- Provide a westbound right turn lane with 100 feet of storage.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Bridges Farm Road and Driveway #3

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

Bridges Farm Road and Driveway #4

2021 Future Year Phase 1 Build Conditions (Partial Build-Out):

- Provide a southbound left/right turn shared lane.

2024 Future Year Phase 1 & 2 Build Conditions (Partial Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

2027 Future Year Phase 1, 2 & 3 Build Conditions (Full Build-Out):

- No additional improvements from the 2021 Future Year Phase 1 Build Conditions (Partial Build-Out).

These mitigation measures improve operations to acceptable Levels of Service and delay, unless otherwise noted above. All capacity analysis worksheets are included in Appendix E. Turn lane warrant worksheets are included in Appendix F. The full results of the mitigation measures are in Table 13 and the Recommended Roadway Laneage for the Full Build-Out is presented in Figure 31.

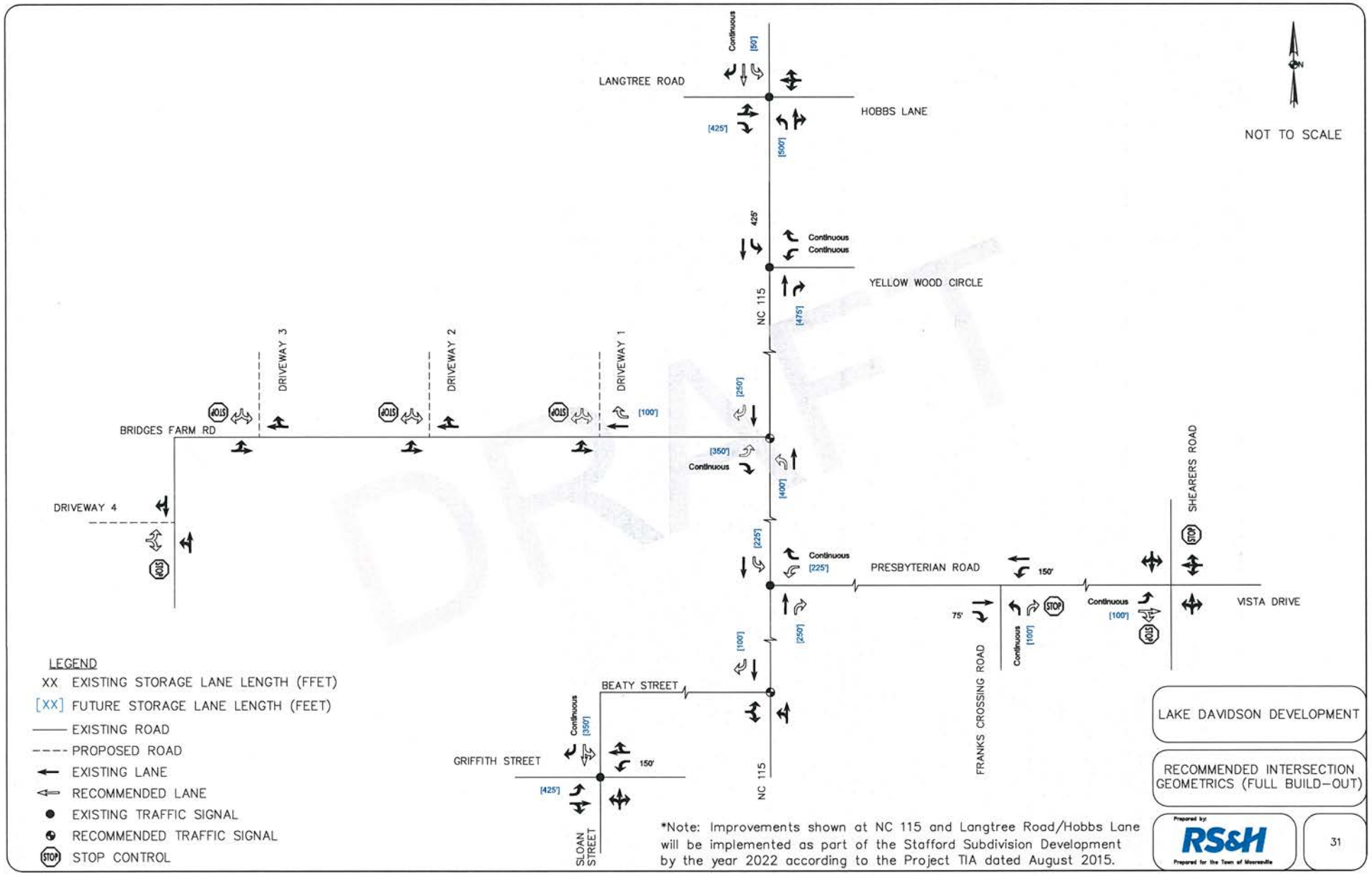
Table 13 – Mitigation Measures Level of Service Measurements

Location and Conditions *(Mitigation Recommendations)*	AM Peak Hour (Seconds of Delay)	PM Peak Hour (Seconds of Delay)
NC 115 and Langtree Road/Hobbs Lane		
2027 Future Year No Build Conditions	D (42.8)	C (27.0)
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Increase EBR lane storage to 425' and NBL lane storage to 500')*	D (43.2)	C (26.5)
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Increase EBR lane storage to 425' and NBL lane storage to 500')*	D (39.1)	C (27.9)
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Increase EBR lane storage to 425' and NBL lane storage to 500')*	D (49.6)	C (28.8)
NC 115 and Yellow Wood Circle (AM Peak Hour Only)		
2027 Future Year No Build Conditions	D (39.0)	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	D (49.6)	-
2024 Future Year Phase 2 Build Conditions (Partial Build-Out)	D (51.7)	-
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Increase NBR lane storage to 475')*	D (54.2)	-
NC 115 and Bridges Farm Road		
2027 Future Year No Build Conditions	F (114.8)*	D (28.8)*
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Add traffic signal, add EBL land with 350' storage, NBL lane with 450' storage, and SBR lane with 250' storage)*	C (22.3)	C (20.5)
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Add traffic signal, add EBL land with 350' storage, NBL lane with 450' storage, and SBR lane with 250' storage)*	C (27.3)	C (25.2)
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add traffic signal, add EBL land with 350' storage, NBL lane with 450' storage, and SBR lane with 250' storage)*	C (33.8)	D (39.3)
NC 115 and Presbyterian Road		
2027 Future Year No Build Conditions	F (112.0)	B (17.4)
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Add WBL lane with 225' storage, NBR lane with 250' storage, and SBL lane with 225' storage)*	C (22.2)	B (18.6)
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Add WBL lane with 225' storage, NBR lane with 250' storage, and SBL lane with 225' storage)*	C (24.0)	B (16.4)
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add WBL lane with 225' storage, NBR lane with 250' storage, and SBL lane with 225' storage)*	C (25.6)	C (22.1)

Location and Conditions *(Mitigation Recommendations)*	AM Peak Hour (Seconds of Delay)	PM Peak Hour (Seconds of Delay)
Presbyterian Road and Franks Crossing Road (AM Peak Hour Only)		
2027 Future Year No Build Conditions	E (44.3)*	-
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Add NBR lane with 100' storage)*	E (44.1)*	-
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Add NBR lane with 100' storage)*	E (49.7)	-
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add NBR lane with 100' storage)*	F (56.4)*	-
Presbyterian Road/Vista Drive and Shearers Road		
2027 Future Year No Build Conditions	C (23.2)*	C (18.4)*
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Add EBTR lane with 100' storage)*	D (25.9)*	C (19.2)*
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Add EBTR lane with 100' storage)*	D (28.4)	C (20.3)
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add EBTR lane with 100' storage)*	D (30.8)*	C (23.3)
NC 115 and Beaty Street		
2027 Future Year No Build Conditions	F (59.0)*	F (300+)*
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Add SBR lane with 100' storage)*	E (41.5)*	F (300+)*
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Add SBR lane with 100' storage and convert to signal)*	A (9.9)	B (14.8)
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add SBR lane with 100' storage and convert to signal)*	B (10.7)	B (17.6)
Beaty Street/Sloan Street and Griffith Street		
2027 Future Year No Build Conditions	D (39.2)	E (57.3)
2021 Future Year Phase 1 Build Conditions (Partial Build-Out) *(Increase EBR lane storage to 425', and add SBLT lane with 300' storage)*	C (23.3)	C (25.3)
2024 Future Year Phase 2 Build Conditions (Partial Build-Out) *(Increase EBR lane storage to 425', and add SBLT lane with 300' storage)*	C (23.7)	C (26.9)
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Increase EBR lane storage to 425', and add SBLT lane with 300' storage)*	C (25.6)	C (30.5)
Bridges Farm Road and Driveway #1		
2027 Future Year No Build Conditions	N/A	N/A
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	A (0.0)*	A (0.0)*

Location and Conditions *(Mitigation Recommendations)*	AM Peak Hour (Seconds of Delay)	PM Peak Hour (Seconds of Delay)
Bridges Farm Road and Driveway #1		
2024 Future Year Phase 2 Build Conditions (Partial Build-Out)	A (0.0)*	A (0.0)*
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add WBR lane with 100' storage)*	C (15.5)*	D (31.6)*
Bridges Farm Road and Driveway #2		
2027 Future Year No Build Conditions	N/A	N/A
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	B (11.0)*	B (10.1)*
2024 Future Year Phase 2 Build Conditions (Partial Build-Out)	B (12.9)*	B (11.1)*
2027 Future Year Phase 3 Build Conditions (Full Build-Out) *(Add WBR lane with 100' storage)*	B (14.6)*	B (13.8)*
Bridges Farm Road and Driveway #3		
2027 Future Year No Build Conditions	N/A	N/A
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	A (9.3)*	A (9.2)*
2024 Future Year Phase 2 Build Conditions (Partial Build-Out)	A (9.9)*	A (9.8)*
2027 Future Year Phase 3 Build Conditions (Full Build-Out)	A (9.9)*	D (9.8)*
Bridges Farm Road and Driveway #4		
2027 Future Year No Build Conditions	N/A	N/A
2021 Future Year Phase 1 Build Conditions (Partial Build-Out)	A (0.0)*	A (0.0)*
2024 Future Year Phase 2 Build Conditions (Partial Build-Out)	A (9.6)*	A (9.4)*
2027 Future Year Phase 3 Build Conditions (Full Build-Out)	A (9.6)*	B (9.4)*

**Note: Unsignalized capacity analysis results provided for the worst minor street movement*


LANGTREE ROAD
HOBBS LANE
YELLOW WOOD CIRCLE
NC 115
BRIDGES FARM RD
DRIVEWAY 1
DRIVEWAY 2
DRIVEWAY 3
DRIVEWAY 4
PRESBYTERIAN ROAD
SHEARERS ROAD
VISTA DRIVE
FRANKS CROSSING ROAD
BEATY STREET
GRIFFITH STREET
SLOAN STREET
NOT TO SCALE
LEGEND
XX EXISTING STORAGE LANE LENGTH (FFET)
[XX] FUTURE STORAGE LANE LENGTH (FEET)
EXISTING ROAD
PROPOSED ROAD
EXISTING LANE
RECOMMENDED LANE
EXISTING TRAFFIC SIGNAL
RECOMMENDED TRAFFIC SIGNAL
STOP CONTROL
*Note: Improvements shown at NC 115 and Langtree Road/Hobbs Lane will be implemented as part of the Stafford Subdivision Development by the year 2022 according to the Project TIA dated August 2015.
LAKE DAVIDSON DEVELOPMENT
RECOMMENDED INTERSECTION GEOMETRICS (FULL BUILD-OUT)
Prepared by:
RS&H
Prepared for the Town of Mooresville
31

10.0 COMPLIANCE WITH ADOPTED TRANSPORTATION PLANS

The completion of the Lake Davidson Development will comply with the Town of Mooresville's CTP. Langtree Road and NC 115 are designated as Community Strategic Corridors. Langtree Road is identified as a boulevard in need of improvements, specifically widening of the roadway. The Lake Davidson Development should not interfere with this designation. NC 115 is identified as other major thoroughfare in need of improvements. It is recommended the facility remain two lanes and multi-use path be constructed. In addition, it is recommended that turn lanes be constructed at key intersections. Based on the site plan for the Lake Davidson Development, an area of land (75 foot Common Open Space/Landscaped Area) has been set aside adjacent to NC 115 which will be available for a future multi-use path, and the mitigation measures recommended in this report support the recommendations of the CTP regarding laneage. The Lake Davidson Development is also in line with the Mount Mourne Master Plan and is located south of the proposed East-West Connector as depicted in the East-West Connector Feasibility Study.

11.0 APPENDICES

- ***A. Approved Memorandum of Understanding (MOU)***
- ***B. Traffic Counts Worksheets***
- ***C. Field Investigation Notes***
- ***D. Internal Capture***
- ***E. Capacity Analysis Worksheets***
- ***F. Turn Lane Warrants***
- ***G. Traffic Engineering Accident Analysis System (TEAAS) Report***
- ***H. Email and Written Correspondence***
- ***I. Background Traffic Reports***

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