



**RESOLUTION TITLE: ZONING MAP CHANGE: CONDITIONAL DISTRICT REZ-23-01-06-00138, RIVERBEND PRESERVE LLC (APPLICANT); PROPERTY PARCELS: PORTION OF 202649, 226548, AND 304413 (RESIDENTIAL AND COMMERCIAL DEVELOPMENT AREA), LOCATED AT NC 16 AND KILLIAN RD., STANLEY, NC, REZONE FROM (R-1) SINGLE FAMILY LIMITED ZONING DISTRICT WITH SPECIAL HIGHWAY (SH) AND URBAN STANDARDS (US) OVERLAYS TO THE (CD/C-1) CONDITIONAL LIGHT COMMERCIAL AND (CD/RS-8) CONDITIONAL SINGLE FAMILY 8,000 SQFT. ZONING DISTRICTS WITH SPECIAL HIGHWAY (SH) AND URBAN STANDARDS (US) OVERLAYS**

WHEREAS, a County Zoning Ordinance was adopted on April 24, 2008 and a public hearing was held on March 28, 2023, by the County Commission, to take citizen comment into a map change application, as follows:

Tax Parcel Number(s): Portion of 202649, 226548, and 304413  
Applicant(s): Riverbend Preserve LLC  
Owner(s): Riverbend Preserve LLC  
Property Location: NC 16 and Killian Rd.  
Request: Rezone from (R-1) Single Family Limited Zoning District with Special Highway (SH) and Urban Standards (US) Overlays to the (CD/C-1) Conditional Light Commercial and (CD/RS-8) Conditional Single Family 8,000 Sqft. Zoning Districts with Special Highway (SH) and Urban Standards (US) Overlays

public hearing comments are on file in the Commission Clerk's Office as a part of the minutes of the meeting; and,

WHEREAS, the Planning Board recommended disapproval of the map change for parcels: portion of 202649, 226548, and 304413 (Residential and Commercial Development Area), located at NC 16 and Killian Rd., Stanley, NC, from (R-1) Single Family Limited Zoning District with Special Highway (SH) and Urban Standards (US) Overlays to the (CD/C-1) Conditional Light Commercial and (CD/RS-8) Conditional Single Family 8,000 Sqft. Zoning Districts with Special Highway (SH) and Urban Standards (US) Overlays on March 6, 2023 based on: the request is not reasonable, not in the public interest and is inconsistent with the Comprehensive Land Use Plan; the site plan not being representative of the surrounding area and community; the lack of information from the developer and potential impacts to the area; their disappointment in the traffic improvements approved by NCDOT; and, concern over the Mountain Island Watershed.

Motion: Sadler Second: Hurst Vote: Unanimous  
Aye: Harris, Brooks, Magee, Horne, Sadler, Hurst  
Nay: None  
Absent: Houchard, Vinson, Crane  
Abstain: None

DO NOT TYPE BELOW THIS LINE

I, Donna S. Buff, Clerk to the County Commission, do hereby certify that the above is a true and correct copy of action taken by the Board of Commissioners as follows:

NO.	DATE	M1	M2	CBrown	CCloninger	AFraley	BHovis	KJohnson	TKelgher	RWorley	Vote
2023-085	03/28/2023	CB	AF	A	A	A	A	A	N	A	6 - 1

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Zoning Map Change: Conditional District REZ-23-01-06-00138, Riverbend Preserve LLC (Applicant);  
Property Parcels: Portion of 202649, 226548, and 304413 (Residential and Commercial Development Area), Located at NC 16 and Killian Rd., Stanley, NC, Rezone from (R-1) Single Family Limited Zoning District with Special Highway (SH) and Urban Standards (US) Overlays to the (CD/C-1) Conditional Light Commercial and (CD/RS-8) Conditional Single Family 8,000 Sqft. Zoning Districts with Special Highway (SH) and Urban Standards (US) Overlays  
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NOW, THEREFORE, BE IT RESOLVED by the County Commission, upon consideration of the map change application, public hearing comment and recommendation from the Planning Board and Planning staff, finds:

- 1) The map change request is consistent with the County's approved Comprehensive Land Use Plan. In considering the conditional rezoning request REZ-23-01-06-00138, the Board of Commissioners finds: This is a reasonable request and in the public interest because it is consistent with the following goals and vision of the Comprehensive Land Use Plan:
  - Key issues for citizens in the Riverfront Gaston / Northeast Gaston area are being met. These key issues include:
    - i. Preservation of open space, road improvements, and better connectivity to other areas of the county, increased job opportunities, maintaining the rural "feel" of the area, and increased commercial opportunities
  - This development meets the vision of the Suburban development future land use as it will create a significant presence of single-family residences around commercial pockets representing a standard suburban center.
  - Goal 3: This development meets goal 3 of the CLUP as the provision of utilities from Lincoln County meets the following objectives:
    - i. Target funding for utilities to strategic areas where the return on investment will be the greatest
    - ii. Provide utilities in underserved areas to help increase improvement momentum
  - Goal 4: This development meets goal 4 of the CLUP as the development of commercial spaces near residential areas meets the following objective:
    - i. Work to create a network of walkable communities that can support each other economically
  - Goal 5: This development meets goal 5 of the CLUP as the coordination with Lincoln County meets the following objectives:
    - i. Encourage county-wide partnerships to support local and regional objectives
    - ii. Take a regional approach to improve utilities
    - iii. Municipalities working together with Gaston County to target areas for development
  - Goal 7: This development meets goal 7 of the CLUP as the developer/applicant is proposing large buffers and protective measures for the existing natural resources on the site. A portion of the development site is also being dedicated towards the expansion of the Catawba Thread Trail.

Zoning Map Change: Conditional District REZ-23-01-06-00138, Riverbend Preserve LLC (Applicant);  
Property Parcels: Portion of 202649, 226548, and 304413 (Residential and Commercial Development  
Area), Located at NC 16 and Killian Rd., Stanley, NC, Rezone from (R-1) Single Family Limited Zoning  
District with Special Highway (SH) and Urban Standards (US) Overlays to the (CD/C-1) Conditional Light  
Commercial and (CD/RS-8) Conditional Single Family 8,000 Sqft. Zoning Districts with Special Highway  
(SH) and Urban Standards (US) Overlays  
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The Commission considers this action to be reasonable and in the public interest, based on: compatibility with existing land uses in the immediate area. Therefore, the map change request for Property parcels: portion of 202649, 226548, and 304413 (Residential and Commercial Development Area), is hereby approved as conditioned {Exhibit A}, effective with the passage of this Resolution.

- 2) The County Manager is authorized to make necessary notifications in this matter to appropriate parties.



Chad Brown, Chairman  
Gaston County Board of Commissioners

ATTEST:

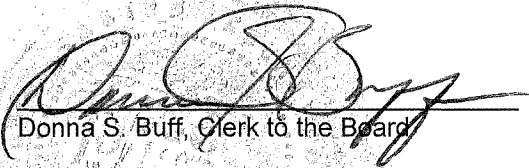
  
Donna S. Buff, Clerk to the Board

Exhibit A  
Conditions of Approval  
REZ-23-01-06-00138

1. The development shall meet all federal, state, and local codes and the requirements and conditions outlined in the attached site plan.
2. A reduced setback from Hwy NC 16 may be granted administratively for all residential and commercial uses but shall never be less than 75'. This setback area shall be heavily landscaped or left as wooded area.
3. Sidewalks shall be a minimum of 5' in width and built to NCDOT standards. The location of sidewalks may be reviewed by staff during the final site plan phase. Staff may waive the sidewalk requirement in specific areas of the development if the proposed sidewalk location is not feasible or will not serve a logical purpose for the development's residents.
4. Engineered and approved by NCDOT plans for all TIA mitigation infrastructure will be required during the final site plan review phase.
5. Block lengths within the PRD shall be reviewed by Building and Development Planning staff during the final site plan and final plat review phase. The block length requirement in Section 8.1.11 Section 12.e may be waived administratively.
6. Architectural requirements for single-family homes and attached residences shall meet the standards in Section 8.1.11. The applicant/development team shall provide an architectural package to the Building and Development Planning and Zoning staff once a builder has been selected for the residential development areas. The architectural package shall be reviewed and approved administratively prior to the issuance of any zoning permits.
7. A cultural resources inventory/assessment shall be conducted during final site plan review phase. If evidence of a cemetery is produced, the developer shall provide a maintenance and protection plan to be reviewed and approved by Building and Development Services Planning and Zoning staff.
8. Slab on grade will not be allowed for any residential products.
9. A copy of the proposed and actual timbering plan shall be provided to Building and Development Services prior to final site plan review to allow staff the opportunity to review the limits of disturbance. If disturbance exceeded the 100' buffer from top of stream bank on each side, the developer shall restore the riparian area using native species as approved by Gaston County Natural Resources Department.
10. If the environmental site survey returns any evidence of species of special concern, then the developer shall follow all recommendations of the environmental impact study and shall obtain Wildlife Friendly Development Certification through North Carolina Wildlife Resources Commission.
11. Reword condition 11 under the Overall Notes Section on page RZ-5 to ensure that 2 and 10-year postconstruction stormwater detention requirements as outlined in the NCDEQ stormwater design manual.



# GASTON COUNTY REZONING APPLICATIONS

REZ-23-01-06-00138

## STAFF REPORT

### APPLICATION SUMMARY

#### Requests:

REZ-23-01-06-00138: (Residential and Commercial Sites) -

#### Applicant(s):

Riverbend Preserve LLC

#### Property Owner(s):

Riverbend Preserve LLC

#### Parcel Identification (PID):

Portion of 202649, 226548, and 304413

#### Property Location:

NC 16 and Killian Rd.

#### Total Property Acreage:

All three parcels combined, according to tax records:  
447.32 acres

#### Acreage for Map Change:

Total acreage for development areas B, C, D, and E:  
324.75 acres

#### Current Zoning:

(R-1) Single Family Limited with (SH) Special Highway and (US) Urban Standards overlays

#### Proposed Zoning:

(CD/C-1) Conditional Light Commercial and (CD/RS-8) Conditional Single Family 8,000 sqft. zoning districts with Special Highway (SH) and Urban Standards (US) overlays.

#### Existing Land Use:

Vacant and undeveloped

#### Proposed Land Use:

Planned Residential Development (PRD) and Commercial Retail

### COMPREHENSIVE LAND USE PLAN

#### Area 3: Riverfront Gaston / Northeast Gaston

This area has the potential for suburban development. The region is unique in that there are high numbers of trips along Highway 27 and NC 16; however, travelers either continue into Lincoln County or into other areas of Gaston County. There are pockets of rural communities and then the comprehensive land use plan envisioned this specific area (the project area) to consist of suburban development.

Key issues for citizens in this area include: the preservation of open space, road improvements and better connectivity to other areas of the County and throughout the region, increased job opportunities, maintaining the rural "feel" of the area, and increased commercial opportunities.

#### Comprehensive Plan Future Land Use: Suburban Development

The Suburban Development future land use envisions a significant presence of single-family residences that exist around commercial pockets representing a standard suburban center. This typically looks like subdivisions built around services for these communities.

#### Comprehensive Land Use Goals:

This rezoning meets the following goals of the Comprehensive Land Use Plan:

#### Goal 3: Improve energy, water, and telecommunication throughout Gaston County.

This development/request meets Goal 3 of the CLUP as the provision of utilities from Lincoln County into Gaston County meets the objectives of this goal.

**Objectives include:**

- Target funding for utilities to strategic areas where the return on investment will be the greatest
- Provide utilities in underserved areas to help increase improvement momentum.

**Goal 4: Enhance quality of life to absorb growth while focusing on commercial and community resources, walkability, and agricultural preservation.**

This development/request meets Goal 4 of the CLUP as the development of industrial and commercial uses near residential uses meet the objectives of this goal. The CLUP states that the County seeks to encourage resources being expanded into the unincorporated areas of the County to support the overall health and well-being of the County. Examples of this include creating different types of neighborhoods to suit different residents and creating better quality communities instead of just increasing quantity.

**Objectives include:**

- Set aside quality commercial areas along corridors for development to reduce pressure on sensitive natural resources areas
- Work to create a network of walkable communities that can support each other economically

**Goal 5: Foster communication and collaboration among the leadership of municipalities and the County to coordinate strategic investments.**

This development/request meets Goal 5 of the CLUP as the coordination with Lincoln County that will take place as a result of this development meets the objectives of Goal 5.

**Objectives include:**

- Encourage a county-wide partnership to support local and regional initiatives
- Take a regional approach to updating utilities for EPA requirements, maintenance needs, and expansion
- Municipalities working together with Gaston County to target areas for development

**Goal 7: Emphasize the importance of our natural resources through highlighting natural environments and encouraging the use of environmental recreation.**

This development/request meets Goal 7 of the CLUP as the developer/applicant is proposing large buffers and protective measures for the existing natural resources on the lot. They have also agreed to work with the Carolina Thread Trail to create a portion of the trail within the proposed development.

**Goal 8: Increase economic development throughout the County by supporting municipalities and improving viable job opportunities.**

The provision of space for industrial and commercial uses in the overall development site meet the objectives of goal 8 as the uses will allow for an increase in economic development and provide new job opportunities for Gaston County residents.

**Staff Recommendation:**

Staff finds that the application, as presented, is consistent with the goals and future land use designation listed in the Comprehensive Land Use Plan. Staff has provided a list of recommended conditions of approval for consideration by the Board of Commissioners.

**UTILITIES AND ROAD NETWORK INFRASTRUCTURE****Water/Sewer Provider:**

Public water and sewer systems will be provided by Lincoln County.

**Road Maintenance:**

All proposed streets shall be built to NCDOT standards and petitioned to be turned over to NCDOT for maintenance. If NCDOT does not accept the roads, all roads will be recorded as private roads with maintenance to be completed by the tenants or the development team.

NC 16 is an NCDOT-owned and maintained right-of-way.

**Technical Review Committee (TRC) comments:**

The following departments did not have any comments at this time:

- Building and Development Services Site Plan Review Team
- Health Department

Comments from the Natural Resources Department:

- All development will need erosion control approval and stormwater approval
- Chewacla Loam soils are on the site. This soil is generally not used for building sites, sanitary facilities, and recreational development as it is frequently flooded
- The Soil & Water Conservation District Board has concerns with the density of this development in the Mountain Island Watershed – IV – they would like to see reduced density and increased stream buffers

*Planning and Zoning Staff Input: The comments from the Natural Resources Department have been addressed in the proposed conditions for each of the rezoning requests for this development.*

Comments from the Gaston Cleveland Lincoln MPO:

- Letter from the GCLMPO has been included in the staff packet

Gaston County Police and GEMS:

No objections to land dedication for a potential substation.

*Planning and Zoning Staff Input: The condition stating that one acre shall be given to Gaston County for the purpose of a police and/or EMS station has been left in the Overall Notes of the site plan. (Item 7)*

Gaston County Fire did not have comments, however they received comments from the Fire Chief of the Lucia Riverbend Volunteer Fire Department.

Comments/Concerns from David Toomey:

- Need for another fire station
- Need 6 additional personnel
- Will need at least 1,000 gal/min. on the last fire hydrant \*
- Concerns over traffic
- Poor access to the different parcels with no road upgrades
- Hydrant Placement \*

*Planning and Zoning Staff Input:*

*\*These items are required by fire code and will be addressed during the construction/final site plan review if the rezoning requests are approved.*

## STAFF SUMMARY

**Prepared By: Jamie Mendoza Kanburoglu, Director of Planning and Zoning**

Development Areas B, C, and D will have access off of Killian Rd. Development area E will have access off of NC Business 16. The proposed uses for these areas are residential and light commercial.

This project was originally brought before the county in 2019, however no action was taken on the request. Since the initial submittal, the following changes have been made:

- Eliminated multi-family housing
- Decreased from 1,100 residential units
- Enhanced water quality measures
- Relocated access on Killian Rd. (east side of NC 16)

The applicant/developer's team advertised and held two public interest meetings as required by the UDO. The first meeting was held on-site on February 22<sup>nd</sup> from 4 pm to 6 pm. The second meeting was held on March 3<sup>rd</sup> from 6 pm to 8 pm at the Mount Holly Municipal Building. The following topics were brought up by the neighbors who attended the meetings in regard to Development Areas B, C, D, and E:

Planning and Zoning Staff Comments are in Blue

- **Stormwater Runoff** – The applicant's team is proposing what is required for a high-density development without knowing if a high-density permit will be required. If the development ends up being high-density, then all requirements for stormwater and erosion control measures will be reviewed during the construction plan phase and all requirements will have to be met before permits will be issued by the Natural Resources Department
- **Concerns about the existing traffic on NC 16** – The TIA that was completed in 2019 and 2020 takes into account pre Covid-19 pandemic traffic numbers and mitigation efforts were based on the development's original proposal which included 1,100 residential units
- **Concerns about water being brought in from Lincoln County** – the UDO requires public water and sewer systems for a development of this size and does not restrict where the utilities come from
- **Concerns as to whether or not there will be a bike lane on NC 16** (Traffic consultant stated that this would be up to NCDOT to require) – this would have to be required by NCDOT since NC 16 is their road
- **Proposed lot width** – The proposed lot width meets the required road frontage for lots within the county. The required lot width for lots in the (RS-8) zoning district is 60'. The 60' is measured at the front building plane of the house, however, lots in the (RS-8) district (and any district) are only required 50' of road frontage.
- **Entrances on Killian Rd. on the east side of NC 16 being dangerous** – Killian Rd. is owned and maintained by NCDOT, so any changes to it would have to be required by NCDOT
- **Potential Cemetery on the east side of the residential development area** – the applicant has offered to have a cultural survey completed to look for any signs of an existing cemetery on the land. If evidence of a cemetery is found then the applicant/developer will take all necessary measures to protect and maintain the existing cemetery.
- **Overall TIA Concerns and what is being recommended by NCDOT** – the NCDOT approved the TIA that was completed by the applicant's traffic engineer
- **Potential House Sizes** – The UDO does not have a minimum/maximum on square footage for single family dwellings. It does cap building height, but that was not brought up as a concern during the PIMs
- **Impact this development will have on schools** – Staff reached out to Gaston County Schools and shared the proposed site plan. Gaston County Schools stated that they are able and prepared to handle any students that could come from this development.
- **EMS/Police Response Times** – The applicant is proposing to give one acre of land to Gaston County to be used for a police and/or EMS station
- **BMP locations** – These will be reviewed during the construction plan and final site plan review phase only if the rezoning requests are approved

- Construction material of the proposed houses – The applicant has agreed that vinyl will not be used as a siding option for the residential structures. Because a builder has not been selected, staff recommended a condition that states at least two materials will need to be used on the front facade of the residential structures, and an architectural package will need to be submitted for review once a builder has been selected.
- Impact development will have on the existing wells in the area – Staff does not believe that the development will have a significant impact on the existing well and septic systems in the area.
- Location of potential construction entrances – This is something that can be addressed in the conditions of approval if the developer is okay with it.
- Potential sound barriers – The UDO only requires landscape buffers, not sound barriers.
- Killian Rd. not being large enough for commercial vehicles – This is not something staff can regulate as Killian Rd. is a NCDOT maintained road.
- Potential endangered species in the development project site – The applicant is proposing to have an Environmental Phase 1 survey of the land completed. Staff has also recommended a condition of approval that states if species of special concern are found within the development site then the applicant/developer will need to obtain Wildlife Development Friendly Certification through the North Carolina Wildlife Resources Commission.

### **Traffic Impact Analysis (TIA)**

This project was first brought to the County in 2019. A Traffic Impact Study for the development was completed between 2019 and 2020. Lincoln County and NCDOT both accepted the study. They did not require a new study to be completed as the traffic numbers used in the original TIA were higher than what the numbers would have been if they redid the study as the newer data would have reflected traffic counts during the Covid-19 pandemic and the “Great Recession”, where there was significantly less traffic. The original TIA was also completed with the original number of proposed housing units which was 1,100. The number of proposed lots has come down to 725.

Since the NCDOT has reviewed and accepted the proposed traffic improvements, Gaston County staff did not require a new TIA to be completed. A copy of the TIA documents are available for review. The TIA does reflect the original site entrances that were being proposed in 2019. The access roads on Killian, east of NC 16, have been adjusted since the original TIA was completed.

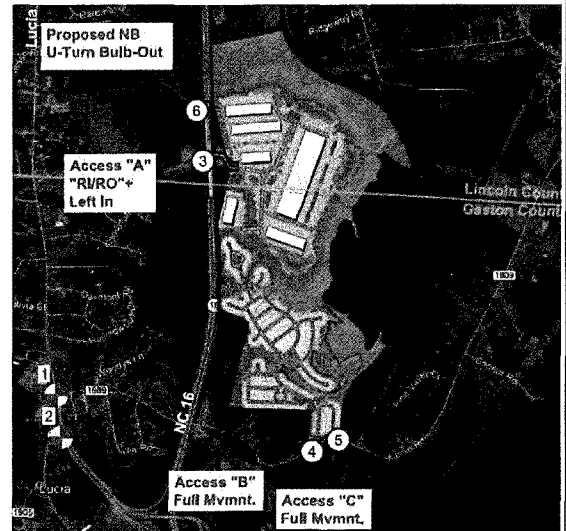


Figure 1 - Access Points for East Side of the Development  
- the Industrial site will only have access off if NC 16 on the Lincoln County side of the County Line

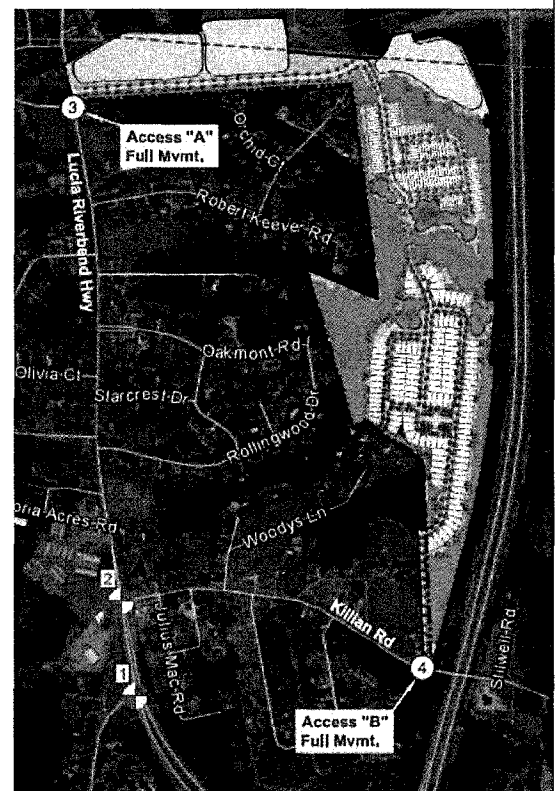


Figure 2 - Access Points for West Side of the Development

### **Open Space**

The applicant is providing more than the required amount of open space for the development as a whole. A breakdown of the required and proposed open space is provided in the table below.

### **Stormwater and Erosion Control Measures**

The applicant is providing what is required for a high-density development in the Mountain Island Protected IV Watershed. If the development is not classified as high density (which will be determined during final site plan/construction document review), then the proposed measures will exceed what is required by the ordinance.

### **Schools**

The applicant is proposing to provide \$1,000.00 for each single-family home that is built on the development site to go towards Gaston County Schools. Planning and Zoning staff reached out to Gaston County Schools, who stated, *"Gaston County Schools remain prepared to accommodate and adjust to meet the needs of a changing population and look forward to a growing and diverse student population."*

### **Proposed Features and Relief Requests**

<b><u>UDO Section</u></b>	<b><u>Required</u></b>	<b><u>Proposed</u></b>
Section 7.5 – Bulk and Dimensional Standards	<u>Zoning District: (C-1)</u> Lot Area: 5,000 sqft. Lot Width: 70' Front Yard Setback: 30' Side Yard setback: 7' Rear Yard Setback: 20'  <u>Zoning District: (RS-8)</u> Minimum Lot Size: 8,000 sqft. Lot Width: 60' Front Yard Setback: 30' Side Yard Setback: 7' Rear Yard Setback: 20'  Note: The by-right minimum lot size for single-family homes in the (R-1) zoning district with access to public water and sewer systems is 12,000 sqft.	All required dimensional standards will be met for the commercial uses in Development Area E  Relief is being requested for the residential development areas:  <u>Zoning District: (RS-8)</u> Minimum Lot Size: 6,000 sqft. Lot Width: 50' Front Yard Setback: 20' Side Yard Setback: 5' – 10' on corner lots Rear Yard Setback: 25' (greater than what is required – no relief)
Section 7.6.5 - Special Highway (SH) Overlay Standards		Relief <i>may</i> be needed from Section 7.5.6 (E) for Yard Requirements of the residential lots that will be against the Special Highway Overlay. These measurements will be reviewed by staff during the final site plan and plat phase. A minimum of 75' shall be required from the road right-of-way- to the property lines of the residential areas.
Section 7.6.3 – Urban Standards (US) Overlay Standards	Residential Uses: Sidewalks are required on one side of existing	Residential Uses: Sidewalks are being shown on both sides of the streets in the residential areas.

	principal or minor arterial streets and both sides of extensions thereof	All standards in the (US) overlay for commercial uses will be met and reviewed during site plan review for each individual structure in Development Area E.
Section 8.1.11 – Planned Residential Development (PRD) Supplemental Regulations	<p>Utilities: Shall be served by a public or community water and sewer system</p> <p><b>Density</b> Max. Density for high development in the Mountain Island IV watershed for a development with a curb and gutter system is 3 dwelling units per acre or 36%.</p> <p><b>Open Space</b> 20% of the gross acreage</p> <p><u>Development Area B:</u> Total Acreage: 193.24 AC Required Open Space: 38.65 AC</p> <p><u>Development Area C:</u> Total Acreage: 65.02 AC Required Open Space: 13.00 AC</p> <p><u>Development Area D:</u> Total Acreage: 33.31 AC Required Open Space: 6.66 AC</p> <p><b>Screening</b> Type B at the fringes of the PRD – Type B Option 1 requires a 20' width buffer, Option 2 requires a 10' width, and Option 3 requires a 5' width</p>	<p>Development is proposing public utilities</p> <p><b>Density</b> Applicant is proposing the following dwelling units per acre:</p> <p>Area B: 193.24 acres - 400 units = 2.07 du/a Area C: 65.02 acres - 175 units = 2.69 du/a Area D: 33.18 acres - 150 units = 4.52 du/a</p> <p><u>The overall residential density for Areas B, C, and D is 2.49</u></p> <p><b>Open Space</b></p> <p><u>Development Area B:</u> Proposed Open Space: 39 AC</p> <p><u>Development Area C:</u> Proposed Open Space: 13 AC</p> <p><u>Development Area D:</u> Proposed Open Space: 7 AC</p> <p><b>Screening</b> Applicant is proposing a buffer that exceeds the requirements outlined in the UDO for PRDs – Type D and 50' landscape buffers in certain areas</p>
Section 9.5 – Minimum Lot Width	<p>50' road frontage to a depth on the lot at which the required minimum lot width is established</p> <p>Minimum lot width required in (RS-8) zoning district: 60'</p>	<p>50' road frontage and lot widths for all single-family homes in Development Areas B, C, and D.</p> <p>Lot widths and road frontage may vary in Development Area D if townhomes are built. (Note: Townhomes are an exception to the lot width requirement)</p>

Signage – Chapter 10		Applicant will submit a separate signage package to be reviewed and approved by Building and Development Services Planning and Zoning staff during the final site plan review phase. Signage for this project may allow for up to 200 sqft. Per sign, landscape lighting, and a height up to 10' for primary/entrance signage – secondary signage for this project may allow for up to 150 sqft. Per sign, landscape lighting, and a height up to 8'
PLANNING BOARD MEETING DATE		
<b>Meeting Date: March 6, 2023</b> The Planning Board unanimously did not recommend approval of this request.		



**Recommended Conditions of Approval for REZ-23-01-06-00138 (Residential and Commercial Site):**

1. The development shall meet all federal, state, and local codes and the requirements and conditions outlined in the attached site plan.
2. A reduced setback from Hwy NC 16 may be granted administratively for all residential and commercial uses but shall never be less than 75'. This setback area shall be heavily landscaped or left as wooded area.
3. Sidewalks shall be a minimum of 5' in width and built to NCDOT standards. The location of sidewalks may be reviewed by staff during the final site plan phase. Staff may waive the sidewalk requirement in specific areas of the development if the proposed sidewalk location is not feasible or will not serve a logical purpose for the development's residents.
4. Engineered and approved by NCDOT plans for all TIA mitigation infrastructure will be required during the final site plan review phase.
5. Block lengths within the PRD shall be reviewed by Building and Development Planning staff during the final site plan and final plat review phase. The block length requirement in Section 8.1.11 Section 12.e may be waived administratively.
6. Architectural requirements for single-family homes and attached residences shall meet the standards in Section 8.1.11. The applicant/development team shall provide an architectural package to the Building and Development Planning and Zoning staff once a builder has been selected for the residential development areas. The architectural package shall be reviewed and approved administratively prior to the issuance of any zoning permits.
7. A cultural resources inventory/assessment shall be conducted during final site plan review phase. If evidence of a cemetery is produced, the developer shall provide a maintenance and protection plan to be reviewed and approved by Building and Development Services Planning and Zoning staff.
8. Slab on grade will not be allowed for any residential products.
9. A copy of the proposed and actual timbering plan shall be provided to Building and Development Services prior to final site plan review to allow staff the opportunity to review the limits of disturbance. If disturbance exceeded the 100' buffer from top of stream bank on each side, the developer shall restore the riparian area using native species as approved by Gaston County Natural Resources Department.
10. If the environmental site survey returns any evidence of species of special concern, then the developer shall follow all recommendations of the environmental impact study and shall obtain Wildlife Friendly Development Certification through North Carolina Wildlife Resources Commission.
11. Reword condition 11 under the Overall Notes Section on page RZ-5 to ensure that 2 and 10-year post-construction stormwater detention requirements as outlined in the NCDEQ stormwater design manual.



## GASTON COUNTY PLANNING BOARD

### Statement of Consistency

In considering the conditional rezoning case REZ-23-01-06-00138, the planning board finds:

1. This is not a reasonable request and in the public interest because of the following:
  - a. The proposed plan does not represent the surrounding area and community
  - b. The developer's presentation lacked information on the potential development's impacts
  - c. The board was disappointed in the traffic mitigation efforts approved by NCDOT
  - d. There is concern about the impact of the development on the Mountain Island Watershed
2. This request is inconsistent with the goals of the comprehensive land use plan in the area of land use because the suburban development future land use designation is intended for single-family residential areas around commercial pockets representing a standard suburban center.

These findings are supported by a 6-0 vote by the Gaston County Planning Board during its March 6, 2023, meeting.



# GASTON COUNTY

Department of Planning & Development Services

Street Address: 128 W. Main Avenue, Gastonia, North Carolina 28052

Phone: (704) 866-3195

Mailing Address: P.O. Box 1578, Gastonia, N.C. 28053-1578

Fax: (704) 866-3966

## CONDITIONAL ZONING (CD) APPLICATION

Complete by either typing or printing legibly in black or blue ink

Application Number: CD \_\_\_\_\_

### A.

#### APPLICANT INFORMATION

Name of Applicant: RIVERBEND PRESERVE, LLC

Mailing Address: 1031 SOUTH CALDWELL ST., STE 110 CHARLOTTE NC 28203

Telephone Numbers: 704-527-0204

843-540-3866 MOBILE

(Area Code) Business

(Area Code) Home

### B.

#### OWNER INFORMATION

Name of Owner: RIVERBEND PRESERVE, LLC

Mailing Address: 1031 SOUTH CALDWELL ST., STE 110 CHARLOTTE NC 28203

Telephone Numbers: 704-527-0204

843-540-3866 MOBILE

(Area Code) Business

(Area Code) Home

### C.

#### PROPERTY INFORMATION

Physical Address or General Street Location of Property: KILLIAN RD. STANLEY

Property Identification Number (PID): PORTION 202649,226548,304413

Acreage of Parcel: APPROX 328.7 AC +/- Acreage to be Rezoned: 328.7AC +/-

Current Zoning: (R-1)(SC)(CH)(US) Overlay Proposed Zoning: (CD/RS-8) (CD/C-1)

Current Use: VACANT/UNDEVELOPED Proposed Use(s): INDUSTRIAL USES, Comm Uses, Residential Use

### D.

#### ADDITIONAL INFORMATION REQUIRED

☐ Copy of Plot Plan or Area Map

☐ PIM 1st. Meeting Date: \_\_\_\_\_

☐ Copy of Deed

☐ PIM 2nd. Meeting Date: \_\_\_\_\_

☐ Notarized Authorization

☐ PIM Comments to Planning \_\_\_\_\_

☐ Payment of Fee

### E.

#### CONDITIONS SETFORTH BY APPLICANT

### F.

#### APPLICATION CERTIFICATION

(I/We), the undersigned being the property owner/authorized representative, hereby certify that the information submitted on the application and any applicable documents is true and accurate.

7.16.20 Sh. Mendenhall, Mayor  
Signature of property owner or authorized representative

1/27/23  
Date

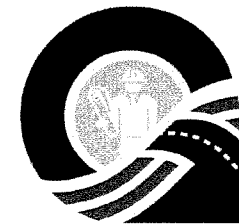
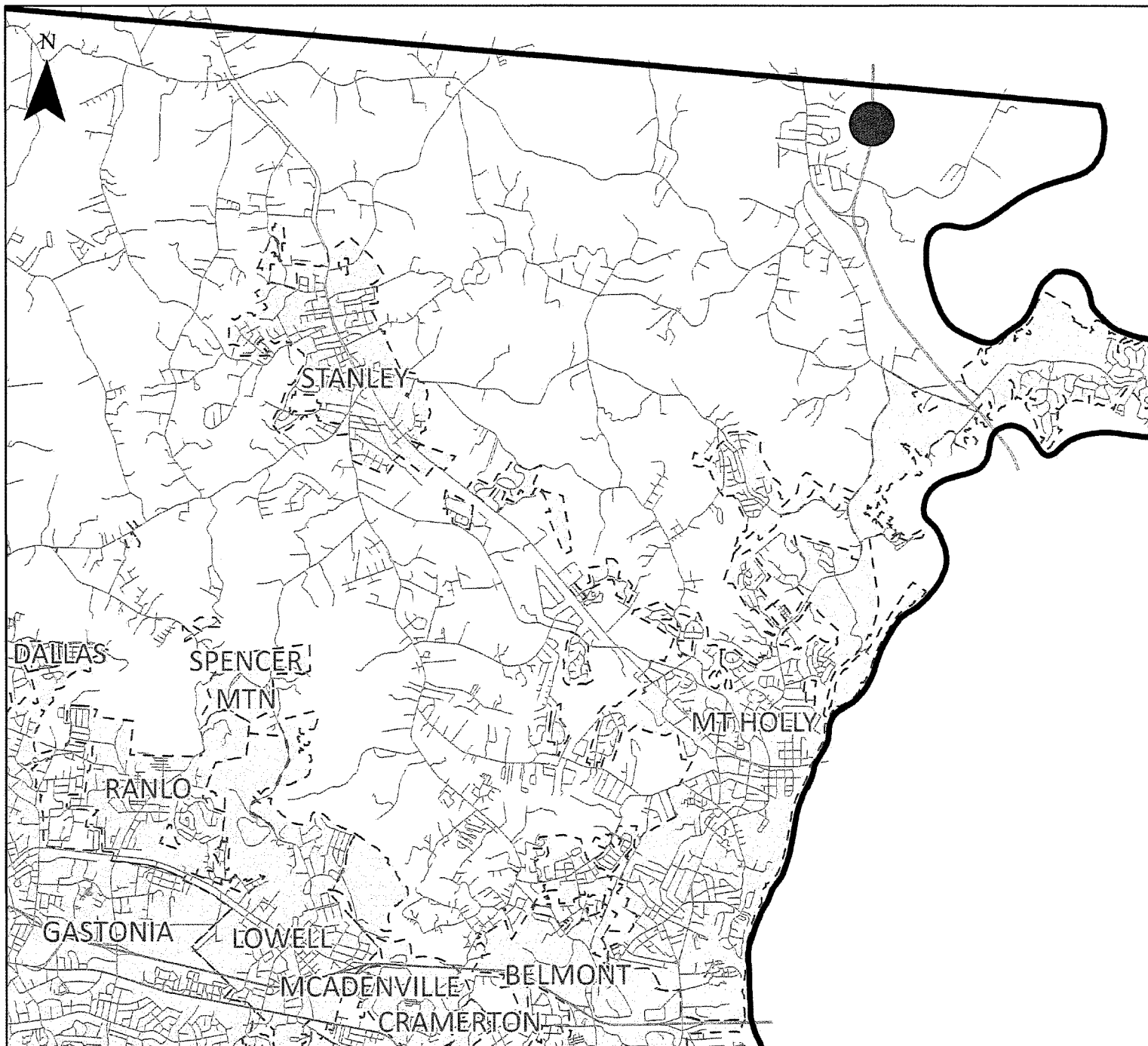
FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

FOR OFFICIAL USE ONLY

Date Received: \_\_\_\_\_ Application Number: PCUP: \_\_\_\_\_ Fee: \_\_\_\_\_

Received by Member of Staff: \_\_\_\_\_ Date of Payment: \_\_\_\_\_ Receipt Number: \_\_\_\_\_  
(Initial)



**GASTON COUNTY**  
BUILDING AND DEVELOPMENT SERVICES

VICINITY MAP  
REZ-00137 and  
REZ-00138

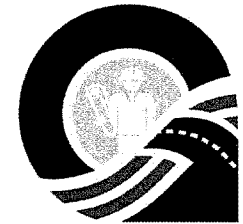
Riverbend Preserve  
Conditional Districts

## Legend

- Roads
- [ - - ] Municipalities
- Subject Property

Although strict standards have been employed in the compilation of this map, Gaston County does not make or imply any warranties or assume any responsibility for the information presented on this map or its use.



This map may not be resold or otherwise used for trade of commercial purposes without the expressed written consent of Gaston County, in accordance with North Carolina General Statute 132-10.



**GASTON COUNTY**  
BUILDING AND DEVELOPMENT SERVICES

**ORTHOPHOTO MAP**  
**REZ-00137 and**  
**REZ-00138**

**LEGEND**

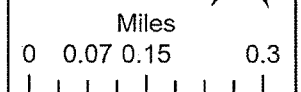
-  Subject Parcels  
 Property Parcels

This map is intended for use by the Gaston County Board of Commissioners, in the review of rezoning requests.

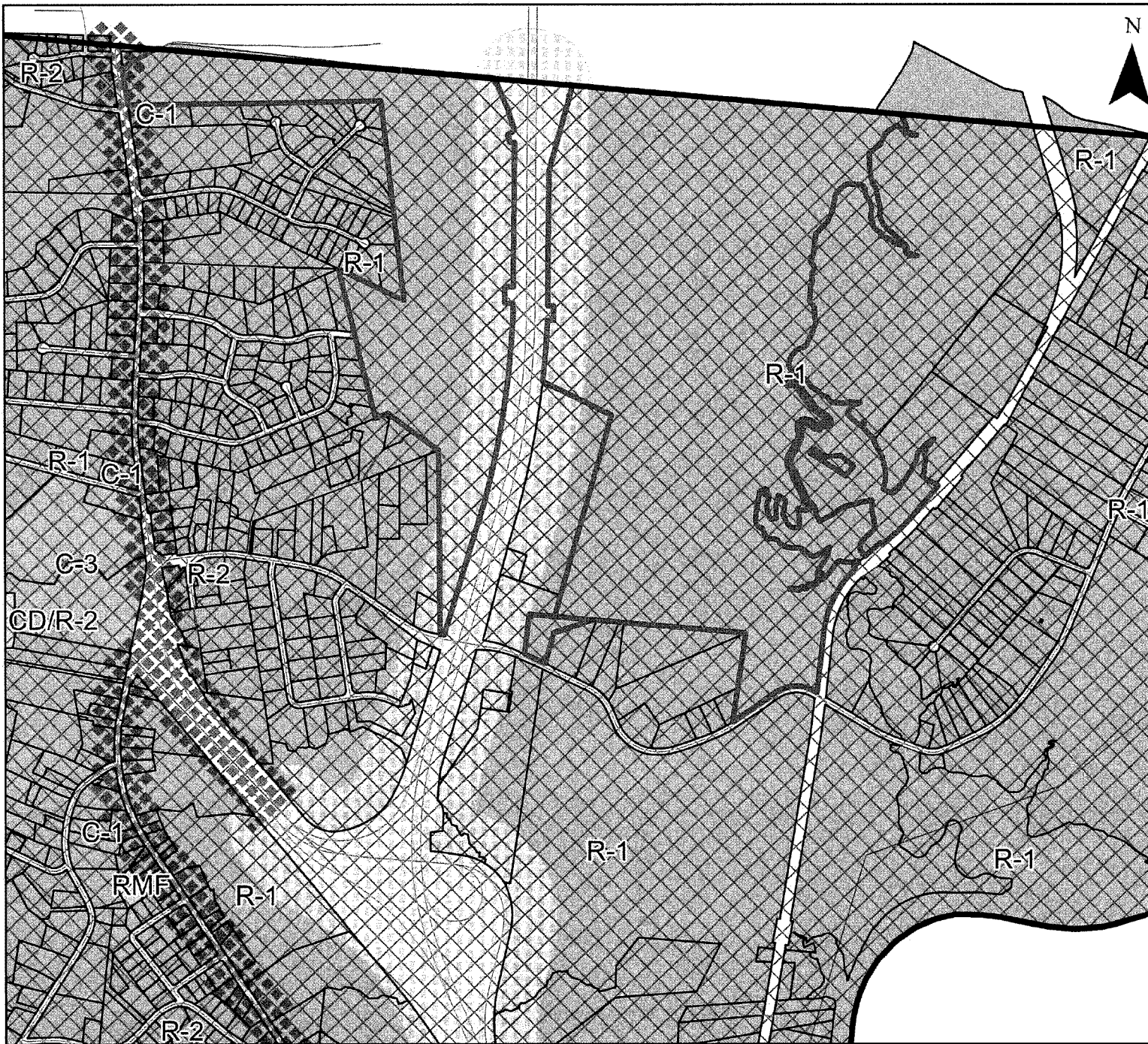
Property parcels, zoning, transportation, and other map information were compiled from one or more data layers. The data is periodically updated, however, all data layers may not be displayed. Street names are subject to change.

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This map is for zoning purposes only - Not to be used for conveyance.







**GASTON COUNTY**  
BUILDING AND DEVELOPMENT SERVICES

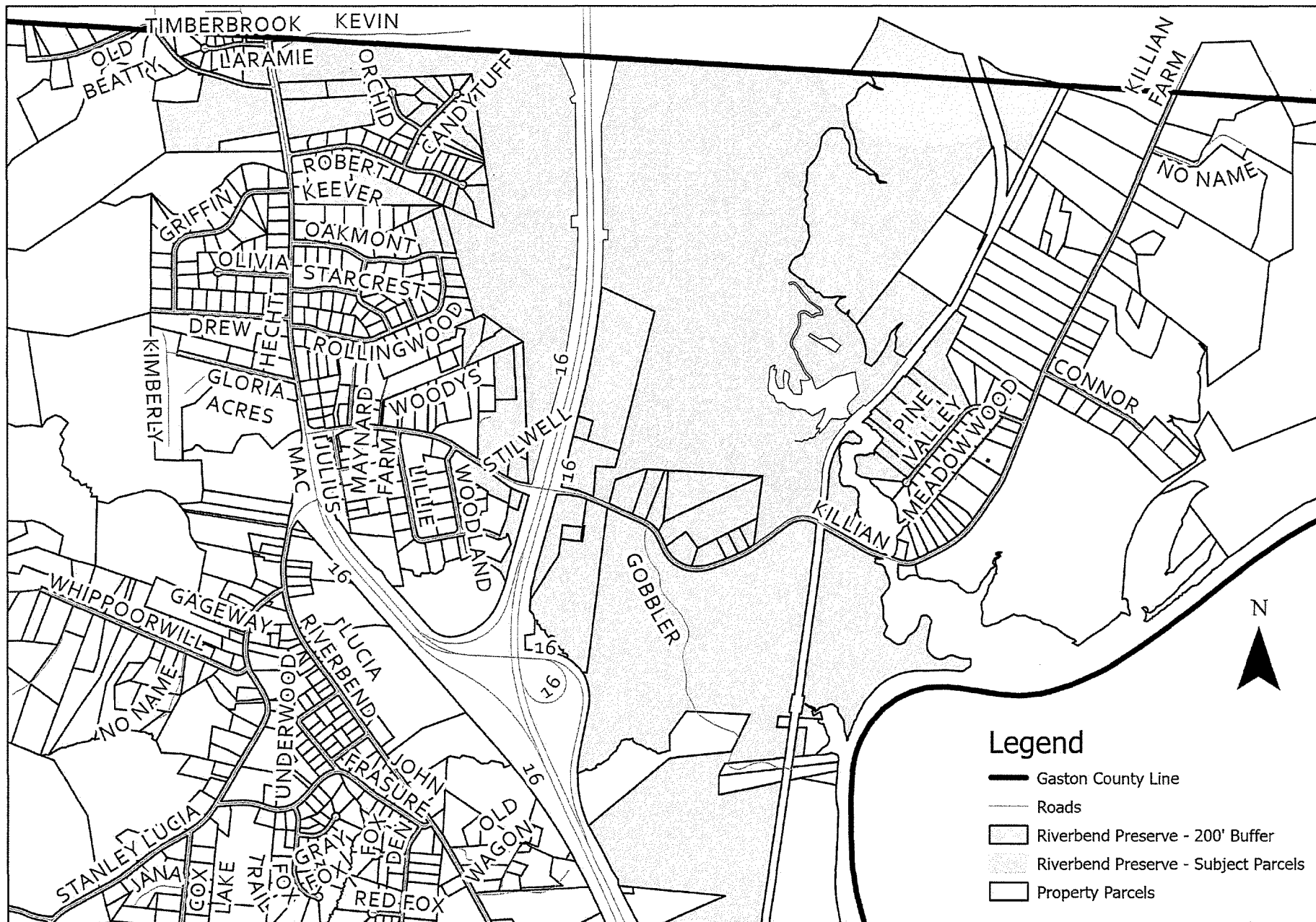
**ZONING MAP**  
**REZ-00137 and**  
**REZ-00138**  
**Riverbend Preserve**  
**Conditional Districts**

**Legend**

- Roads
- Parcels
- ▬ Subject Properties

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## Riverbend Preserve - Subject Parcels and Properties within a 200' Buffer

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**Riverbend Preserve Project - Property Owners within 200' Buffer of Subject Parcels**

PARCEL ID	NAME 1	NAME 2	MAILING ADDRESS	CITY	STATE	ZIPCODE
172676	KILLIAN REBECCA KAY		1624 KILLIAN RD	STANLEY	NC	28164
172720	HUBERT MICHAEL D	HUBERT MEGAN L	233 OAKMONT RD	STANLEY	NC	28164
172723	GREEN KYRA	GREEN DAVID L	334 ROLLINGWOOD DRIVE	STANLEY	NC	28164
172748	STOTTLEMYER TARA RUSSELL	STOTTLEMYER VERNON RAY JR	224 CANDYTUFF LN	STANLEY	NC	28164
172762	THE GRACE SCHOOL INC		15447 LUCIA RIVERBEND HWY	STANLEY	NC	28164
172790	SCHULTZ JERE	SCHULTZ LESLIE	314 ROBERT KEEVER RD	STANLEY	NC	28164
172802	BROOKSHIRE GREGORY D	BROOKSHIRE BILLIE T	504 ORCHID CT	STANLEY	NC	28164
173600	COCHRAN DARREN		520 KILLIAN RD	STANLEY	NC	28164
173601	GASTON COUNTY		PO BOX 1578	GASTONIA	NC	28053
173617	MOORE RODNEY DALE	GARZA CELESTE	717 KILLIAN ROAD	STANLEY	NC	28164
173618	ZELENZ JOHN	ZELENZ CHERYL	637 KILLIAN RD	STANLEY	NC	28164
173620	THOMAS SCOTTIE R	THOMAS DELORES W	733 KILLIAN ROAD	STANLEY	NC	28164
173621	GASTON COUNTY		PO BOX 1578	GASTONIA	NC	28053
173622	GASTON COUNTY		PO BOX 1578	GASTONIA	NC	28053
173637	CATAWBA LANDS CONSERVANCY		4530 PARK ROAD SUITE 420	CHARLOTTE	NC	28209
172721	HUBERT MICHAEL D	HUBERT MEGAN L	233 OAKMONT RD	STANLEY	NC	28164
172724	BOYLES FAMILY REVOCABLE TRUST		326 ROLLINGWOOD DR	STANLEY	NC	28164
172735	BROWN PATSY MEACHAM		312 ROLLINGWOOD DR	STANLEY	NC	28164
172745	MARTIN CARLA R		223 CANDYTUFF LN	STANLEY	NC	28164
172747	METHOT CHRISTOPHER		226 CANDYTUFF LN	STANLEY	NC	28164
172791	BARRY THOMAS BRASWELL & PATRICIA SANDERS BRASWELL IRREVOCABLE TRUST		310 ROBERT KEEVER RD	STANLEY	NC	28164
172797	PICKETT MARSHALL KEITH	PICKETT BARBARA A	517 ORCHID COURT	STANLEY	NC	28164
172800	BEACHAM TIMOTHY ROYCE	BEACHAM MELINDA SPRINKLE	522 ORCHID CT	STANLEY	NC	28164
173613	CORE MELVIN D	CORE DEBRA	631 KILLIAN RD	STANLEY	NC	28164
173615	THOMAS SCOTTIE R	THOMAS DELORES W	733 KILLIAN ROAD	STANLEY	NC	28164
173666	YOUNG JOEL D		164 PINE VALLEY DR	STANLEY	NC	28164
173668	MINTKEN RANDALL DEAN		1448 GROVE PARK DR APT 1505	COLUMBUS	GA	31904
172719	ANTHES DAVID	ANTHES KRISTY	315 WOODYS LANE	STANLEY	NC	28164
172727	BOYLES FAMILY REVOCABLE TRUST		326 ROLLINGWOOD DR	STANLEY	NC	28164
172736	SMITH MARCUS ALLEN	SMITH WANDA	318 ROBERT KEEVER RD	STANLEY	NC	28164
172744	PARAMORE DARWIN EARL	PARAMORE KATHY CREECH	219 CANDY TUFF LANE	STANLEY	NC	28164
172746	MCGUIRE WILLIAM B	MCGUIRE SHELBY J	225 CANDYTUFF LN	STANLEY	NC	28164
172794	REAL LIFE CHURCH OF NC		15434 LUCIA RIVERBEND HWY	STANLEY	NC	28164
172799	HELLE ROBERT J	HELLE ANGELA K	525 ORCHID CT	STANLEY	NC	28164
172801	SCHNEIDER WALTER	SCHNEIDER MARY	514 ORCHID CT	STANLEY	NC	28164
173581	WARREN APRIL M LIFE ESTATE	DELLINGER MARCUS ANDREW	433 KILLIAN RD	STANLEY	NC	28164
173616	HEWINS JAMES R		721 KILLIAN RD	STANLEY	NC	28164
173659	RICH FRANK	RICH ANGELA	128 PINE VALLEY DRIVE	STANLEY	NC	28164
173660	WILLIAM D LUCKEY REVOC TR &	LUCKEY DIANE M	130 PINE VALLEY DR	STANLEY	NC	28164
173667	NAPOLITANO CARRIE M	BORNHAUSER MARCUS	170 PINE VALLEY DRIVE	STANLEY	NC	28164
208365	BEATTY THOMAS CALVIN	BEATTY RANDALL GRIFFIN	6632 ALEXANDER HALL DR	CHARLOTTE	NC	28270
211202	FALLETTI ANTHONY		306 ROLLINGWOOD DRIVE	STANLEY	NC	28164
203284	HARRIS DOROTHY LOUISE		15402 LUCIA RIVERVEND HWY	STANLEY	NC	28164
209859	UPRIGHT MARTHA		154 HELTON HARRIS RD	STANLEY	NC	28164
225092	DRUM GREY LEE		1601 KILLIAN FARM RD	STANLEY	NC	28164
225095	PAUL WAYNE AND BETTY JEAN T GALES REVOCABLE TRUST		506 KILLIAN RD	STANLEY	NC	28164
212713	KILLIAN REBECCA KAY		1624 KILLIAN RD	STANLEY	NC	28164
301315	BEARD RANDY DEAN JR	BEARD LAUREN PERNELL	415 KILLIAN RD	STANLEY	NC	28164
304412	CORE MELVIN D	CORE DEBRA M	631 KILLIAN RD	STANLEY	NC	28164
304396	COOK JERRY J		17553 JULEES WALK LN	DAVIDSON	NC	28036



218232 MORRIS JOHN WAYNE  
 301316 KEEP ROBIN STILWELL  
 172647 GIBSON SUMTER A  
 172648 WELCH CLAUD W HEIRS  
 172714 PELT LINDA A  
 172728 TINSLEY ALBERT  
 172737 BLACK LARRY KEITH  
 172738 BLACKWELDER CLIFF  
 172739 HENLEY RICKIE DOYLE  
 172740 AUTEN CHAISE DAVIS  
 172741 BROWN GEORGE A  
 172742 KENNEY DAVID  
 172743 MURPHY DAVID SCOTT  
 172751 JONES ADAM CHRISTOPHER  
 172753 BELCHER CHAD T  
 172754 SULLIVAN MARC C  
 172798 REAL LIFE CHURCH OF NC  
 173607 ZINNERMAN GEORGE LEON  
 173610 HENDERSON MICHAEL LEE JR  
 173611 CORE MELVIN D  
 173612 CORE MELVIN D  
 173665 CARROLL GREGORY THOMAS  
 198243 PELT LINDA ALLEN  
 214196 HENSON JAMES RONALD JR  
 217725 DELLINGER MARCUS ANDREW  
 218233 MCCLURE STEPHEN W  
 305977 STROUD NECODIA L  
 305978 ZINNERMAN WILLIE MAE GIBSON

MORRIS DIANE K  
 KEEP WILLIAM RANDALL  
 GIBSON LINDA H

BLACK JULIE GLAZE  
 BLACKWELDER KATHLEEN  
 HENLEY MARY ANN  
 AUTEN HEATHER A  
 BROWN DEBORAH H

MURPHY RUTH RENEE DANNER  
 JONES WYNTER NICOLE  
 BELCHER GINA E  
 SULLIVAN DONNA M

ZINNERMAN WILLIE MAE GIBSON  
 HENDERSON KRISTEN DANIELLE  
 CORE DEBRA L  
 CORE DEBRA M  
 CARROLL ELAINE GAY

HENSON TERESA BLACK

MCCLURE MARIA H

140 PINE VALLEY	STANLEY	NC	28164
425 KILLIAN RD	STANLEY	NC	28164
700 RIDGECREST DRIVE	STANLEY	NC	28164
105 LARAMIE DR	STANLEY	NC	28164
306 WOODY'S LN	STANLEY	NC	28164
3784 OAKWOOD CIRCLE	IRON STATION	NC	28080
322 ROBERT KEEVER RD	STANLEY	NC	28164
326 ROBERT KEEVER RD	STANLEY	NC	28164
328 ROBERT KEEVER RD	STANLEY	NC	28164
327 ROBERT KEEVER RD	STANLEY	NC	28164
325 ROBERT KEEVER RD	STANLEY	NC	28164
321 ROBERT KEEVER RD	STANLEY	NC	28164
215 CANDYTUFF LN	STANLEY	NC	28164
210 CANDYTUFF LANE	STANLEY	NC	28164
200 CANDYTUFF LN	STANLEY	NC	28164
114 CANDYTUFF LN	STANLEY	NC	28164
15434 LUCIA RIVERBEND HWY	STANLEY	NC	28164
503 KILLIAN RD	STANLEY	NC	28164
619 KILLIAN RD	STANLEY	NC	28164
631 KILLIAN RD	STANLEY	NC	28164
631 KILLIAN RD	STANLEY	NC	28164
158 PINE VALLEY DR	STANLEY	NC	28164
306 WOODY'S LANE	STANLEY	NC	28164
119 GRAND CANYON RD	STANLEY	NC	28164
PO BOX 1148	DENVER	NC	28037
148 PINE VALLEY DR	STANLEY	NC	28164
507 KILLIAN ROAD	STANLEY	NC	28164
503 KILLIAN RD	STANLEY	NC	28164





PROPERTY LINE  
PROP. ZONING BOUNDARY  
COUNTY LINE  
EX. CREEK  
CRITICAL WATERSHED  
POTENTIAL THREAT  
TRAIL ALIGNMENT  
50' BUFFER  
TYPE D BUFFER  
TYPE E BUFFER  
POTENTIAL AMENITY  
LOCATION  
EX. WETLANDS  
EX. 100 YEAR FLOODPLAIN  
100' STREAM BUFFER  
OPEN SPACE AREA  
PROPOSED STORMWATER  
FACILITY

400 LOTS IN DEV. AREA B  
175 LOTS IN DEV. AREA C  
150 LOTS IN DEV. AREA D

1. ONCE APPROVED, ALL IMPERVIOUS CALCULATIONS WILL BE REQUIRED FOR WATERSHED REVIEW ONE PAGE WITH CALCULATIONS AND APPLICATIONS; IF HIGH DENSITY WILL NEED TO GO TO WATERSHED BOARD FOR APPROVAL WITH HIGH DENSITY APPLICATION.
2. ENSURE NOT WITHIN THE NON-ENCROACHMENT AREAS FOR FLOOD - ALONG JOHNSON CREEK VERIFY WITH DETAIL FLOOD HAZARD DATA; IF WITHIN WILL REQUIRE A NO-RISE, CADDING WILL BE REQUIRED FOR FLOOD REVIEW AND FLOOD DEVELOPMENT APPLICATION.

Diagram of a rectangular lot with dimensions and labels:

- Top boundary: 120' 0"
- Right boundary: 120' 0"
- Bottom boundary: 6' 0" TYPICAL SETBACK
- Left boundary: 120' 0"
- Center label: 120' 0" TYPICAL SETBACK
- Bottom center label: 6' 0" TYPICAL SETBACK

A diagram of a rectangular lot with the following specifications:

- Lot Dimensions:** 100' (width) by 150' (depth).
- Setbacks:**
  - 10' SIDEWALK SETBACK (on the left side)
  - 10' SIDEWALK SETBACK (on the right side)
  - 10' SIDEWALK SETBACK (on the bottom side)
  - 10' SIDEWALK SETBACK (on the top side)
- Internal Dimensions:**
  - 80' (width of the inner rectangle)
  - 130' (depth of the inner rectangle)
- Area:** MINIMUM LOT SIZE 15,000 S.F.

**RIVERBEND  
PRESERVE**

GASTON COUNTY, NC  
REZONING # REZ-23-01-06-00138  
# REZ-23-01-06-00137

NO.	DESCRIPTION	DATE
1	INITIAL SUBMITTAL	01.06.23
2	SUBMITTAL	02.21.23
3	SUBMITTAL	02.27.23
4	SUBMITTAL	03.06.23

DESIGNED BY: JST  
DRAWN BY: JRY  
CHECKED BY: JST

Scale: 1"=500'

VERT: 1"=500'

HORIZ: 1"=500'

0 250' 500' 1000'


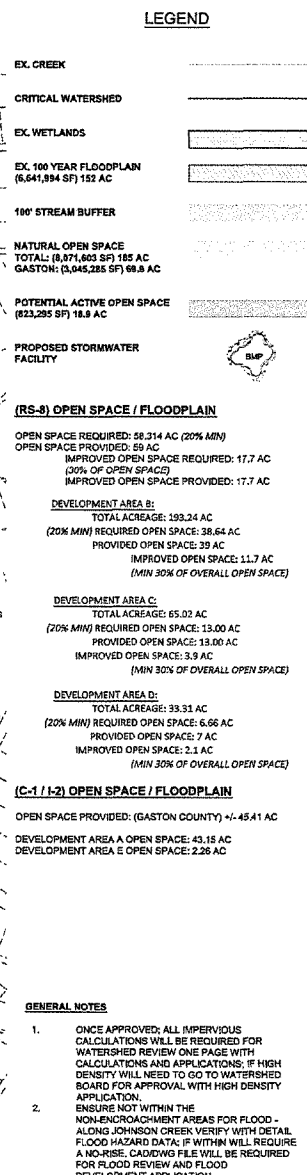


Figure 10-10: A plan view of a road layout with a scale bar and a north arrow. The scale bar shows distances of 0, 250, 500, and 1000 feet. The north arrow points upwards.

## RZ-2



**NOT FOR  
CONSTRUCTION**

**RIVERBEND  
PRESERVE**

GASTON COUNTY, NC  
REZONING # REZ-23-01-08-00138  
# REZ-23-01-08-00137

[illegible]

DESIGNED BY: KST  
DRAWN BY: JRY  
CHECKED BY: KST

### OPEN SPACE PLAN

RZ-3







Post Office Box 1748  
Gastonia, North Carolina 28053  
Phone (704) 866-6837

150 South York Street  
Gastonia, North Carolina 28052  
Fax (704) 869-1960

## Memorandum

**To:** Jamie Mendoza Kanburoglu—Director of Planning and Zoning, Building and Development Services  
**From:** Julio Paredes, Planner, Gaston—Cleveland—Lincoln MPO  
**Date:** February 27, 2023  
**Subject:** Riverbend Preserve Site Plan —GCLMPO Comments

Thank you for the opportunity to provide transportation comments on a proposed development located within the Gaston-Cleveland-Lincoln Metropolitan Planning Organization (GCLMPO) geographic area. My comments are based on the review of the proposed site in accordance with the adopted Comprehensive Transportation Plan (CTP), the adopted 2050 Metropolitan Transportation Plan (MTP), and the current State Transportation Improvement Program (STIP).

On behalf of the GCLMPO I offer the following comments:

1. According to the 2020-2029 STIP and the 2050 MTP, there are no planned transportation improvement projects in the immediate vicinity of this development.
2. The CTP does not show any future highway improvements on any streets adjacent to the subject properties.

The CTP does include a recommended multiuse path along Johnson Creek as part of the Carolina Thread Trail. It is noted on the site plan to work with Catawba Lands Conservancy and Carolina Thread Trail on actual trail location.

3. Please note that any site plan that requires a driveway permit on an NCDOT roadway, or is adjacent to NCDOT roadways, the developer should work with NCDOT on any required driveway permits or any TIA requirements.

If you have any questions regarding my comments, please do not hesitate to contact me at 704-866-6980 or [juliop@cityofgastonia.com](mailto:juliop@cityofgastonia.com).

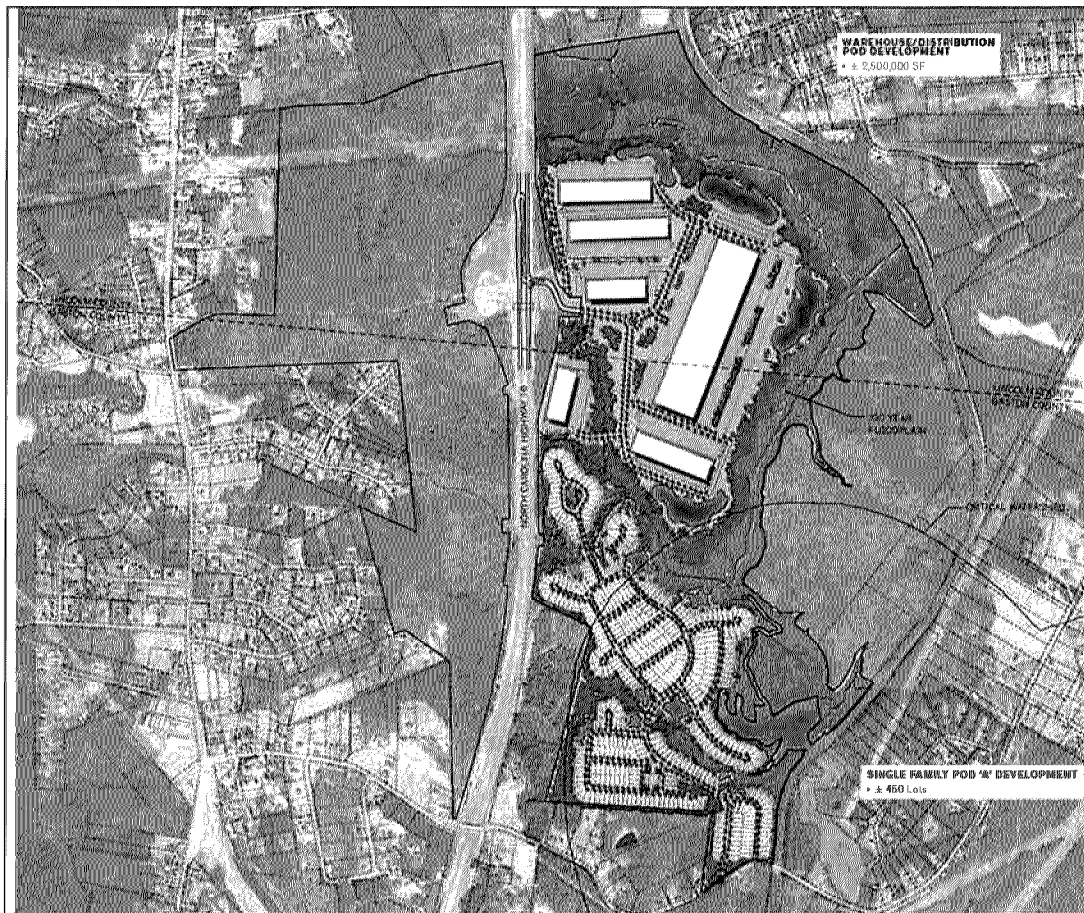


# TRAFFIC IMPACT ANALYSIS

## RIVERBEND PRESERVE

North of Killian Road and East of NC 16

Gaston and Lincoln County, North Carolina



for

The Shaw Tate Group

August 2019

811-001 (C-2165)

2459 Wilkinson Boulevard, Suite 200  
Charlotte, NC 28208

704.343.0608  
www.drgrp.com





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## **EXECUTIVE SUMMARY**

The Shaw Tate Group proposes to develop a site with the following land uses:

- 2,500,000 square feet of Warehousing
- 450 Single-Family Homes

The proposed site is located north of Killian Road and east of NC 16 within both Gaston and Lincoln Counties, NC (see Figure 1). The development is expected to be completed in 2024.



**NC 16 Facing north towards Proposed Site**

This report provides analysis of the traffic operations within the area of influence, according to the standards set by the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C", Lincoln County Unified Development Ordinance (UDO) Section 9.8 and Gaston County's UDO Section 5.11. It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2019 Existing Conditions
- 2024 No Build Conditions
- 2024 Build-out Conditions
- 2034 Build-out + 10 years Conditions (Lincoln Co. Requirement)

The area of influence of the site as defined by North Carolina Department of Transportation (NCDOT), Lincoln County, and Gaston County staff includes the following two existing intersections and four proposed intersections: (See Appendix 1 for the approved scoping information)

1. Killian Road & NC 16 Business (signalized)
2. Lucia Riverbend Highway & NC 16 Business (signalized)
3. NC 16 & Proposed Warehouse Access "A" (unsignalized Cross-Over)
4. Killian Road & Proposed Residential Access "B" (unsignalized)
5. Killian Road & Proposed Residential Access "C" (unsignalized)
6. NC 16 & Proposed Northbound U-Turn Bulb-Out (unsignalized)



According to the preliminary site plan (Concept Exhibit), access to the warehouse is expected to occur via one unsignalized directional cross-over (X-Over) on NC 16 (at a previously approved in control-of-access (C/A)) and access to the residential development is expected to occur via two full-movement unsignalized locations on Killian Road:

- Proposed Access “A” (X-Over): unsignalized access allowing for right-in/right-out and left-in movements located on NC 16 approximately 1 mile north of the Killian Road overpass.
- Proposed Access “B” (Full-Movement): unsignalized access allowing for full movement access located on Killian Road approximately 3,200 feet east of NC 16 overpass.
- Proposed Access “C” (Full-Movement): unsignalized access allowing for full movement located on Killian Road approximately 3,900 feet east of NC 16 overpass.

The trip generation results indicate that the development is expected to generate 652 total AM peak hour trips and 761 total PM peak hour trips.

With the results of our analyses (the specifics are described in the Traffic Analysis section of this report) we suggest the following improvements/modifications at the study intersections/proposed accesses:

#### **2024 Build Suggested Recommendations:**

##### **1. Killian Road & NC 16 Business (signalized)**

- Construct a separate westbound right turn lane with 175' storage on Killian Road
- Remark the existing combined left-thru-right lane to a combined left-thru lane
- Extend southbound left turn lane storage to 125' on NC 16 Business

##### **2. Lucia Riverbend Highway & NC 16 Business (signalized)**

- Implement southbound right turn overlap phasing on NC 16 Business
- Extend eastbound right turn lane to 150' on Lucia Riverbend Highway

##### **3. NC 16 & Proposed Warehouse Access “A” (unsignalized)**

We propose the following intersection configuration:

- Convert NC 16 full median opening to a southbound directional X-over with a minimum storage of 150' (or as required to accommodate the appropriate design vehicles)
- Two ingress lanes and one egress lane (a terminating westbound right turn lane on Proposed Access “A”)
- Channelized northbound right turn lane with 100' storage on NC 16
- Minimum internal protected stem of 500'



#### **4. Killian Road & Proposed Residential Access “B” (unsignalized)**

We propose the following intersection configuration:

- One ingress and two egress lanes (a terminating southbound right turn lane and left turn lane with 100' storage) on Proposed Access “B”
- Construct an eastbound left turn lane with 100' storage on Killian Road
- Minimum internal protected stem of 100'

#### **5. Killian Road & Proposed Residential Access “C” (unsignalized)**

We propose the following intersection configuration:

- One ingress and two egress lanes (a southbound right turn lane and left turn lane with 100' storage on Proposed Access “C”)
- Construct an eastbound left turn lane with 100' storage on Killian Road
- Minimum internal protected stem of 100'

#### **6. NC 16 & Future U-Turn Bulb-Out (unsignalized)**

- Convert NC 16 full median opening to a northbound channelized U-turn lane with a minimum storage of 250' (or as required to accommodate the appropriate design vehicles)

**In summary, even though the Riverbend Preserve development will increase the amount of vehicular and truck traffic on the adjacent roadways/corridors, the suggested intersection improvements/enhancements will help mitigate the additional site generated trips on the adjacent roadway network. In addition, the suggested recommendations will improve the conditions for the general traveling public as well as the users of the warehouse and the residents of the residential community.**



## **PROPOSED DEVELOPMENT**

The Shaw Tate Group proposes to develop a site with the following land uses:

- 2,500,000 square feet of Warehousing
- 450 Single-Family Homes

The proposed site is located north of Killian Road and east of NC 16 within both Gaston and Lincoln Counties, NC (see Figure 1). The development is expected to be completed in 2024.



**NC 16 Facing north towards Proposed Site**

According to the preliminary site plan (Concept Exhibit), access to the warehouse is expected to occur via one unsignalized directional cross-over (X-Over) on NC 16 (at a previously approved break in control-of-access (C/A)) and access to the residential development is expected to occur via two full-movement unsignalized locations on Killian Road:

- Proposed Access "A" (X-Over): unsignalized access allowing for right-in/right-out and left-in movements located on NC 16 approximately 1 mile north of the Killian Road overpass.
- Proposed Access "B" (Full-Movement): unsignalized access allowing for full movement access located on Killian Road approximately 3,200 feet east of NC 16 overpass.
- Proposed Access "C" (Full-Movement): unsignalized access allowing for full movement located on Killian Road approximately 3,900 feet east of NC 16 overpass.

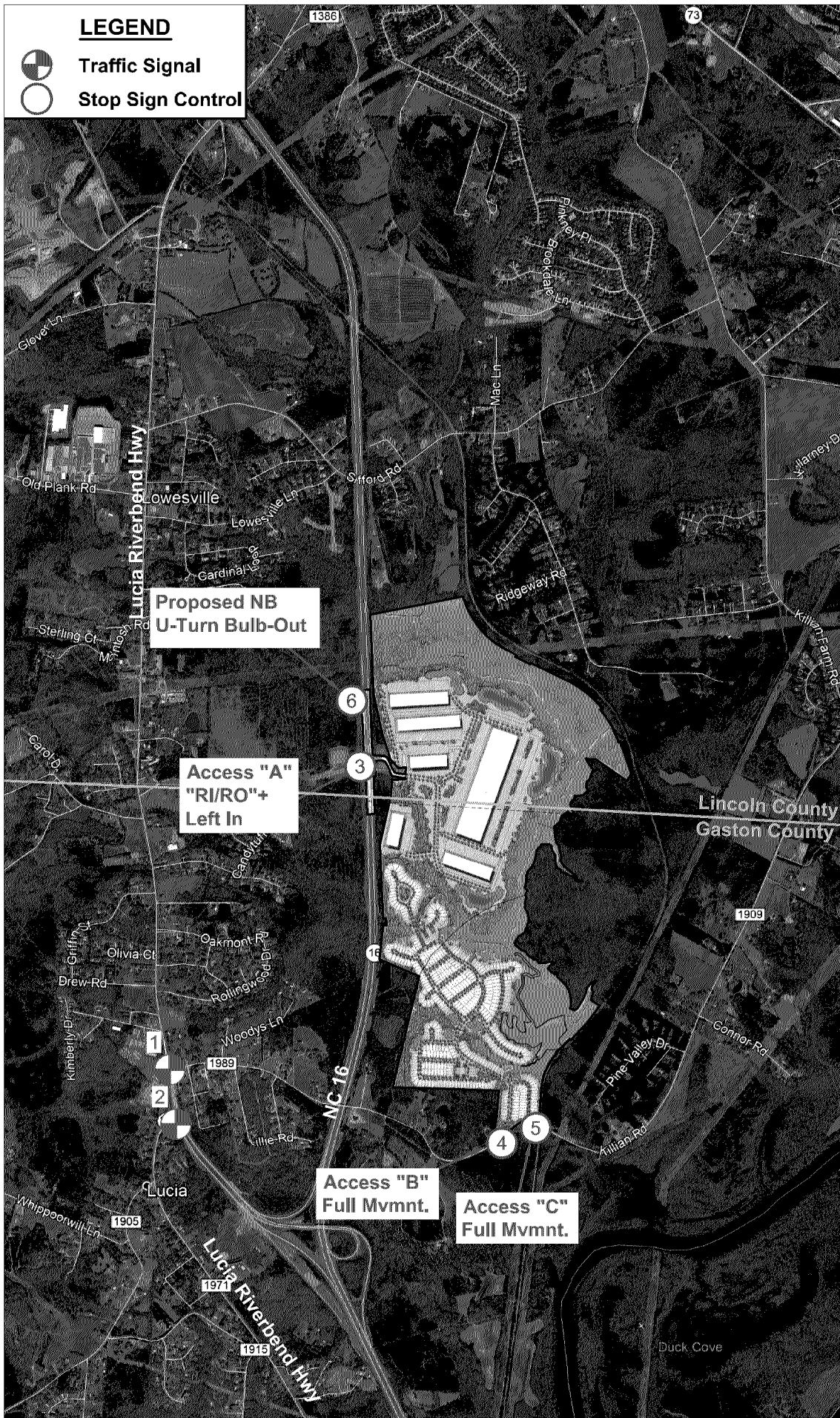
## LEGEND



Traffic Signal



Stop Sign Control



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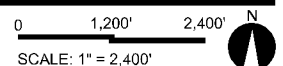
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## RIVERBEND PRESERVE

GASTON/ LINCOLN COUNTY, NC

THE SHAW TATE GROUP  
1030 S. CALDWELL STREET  
CHARLOTTE, NC 28203

## AREA OF INFLUENCE



PROJECT #: 811-001  
DRAWN BY: SA  
CHECKED BY: MW

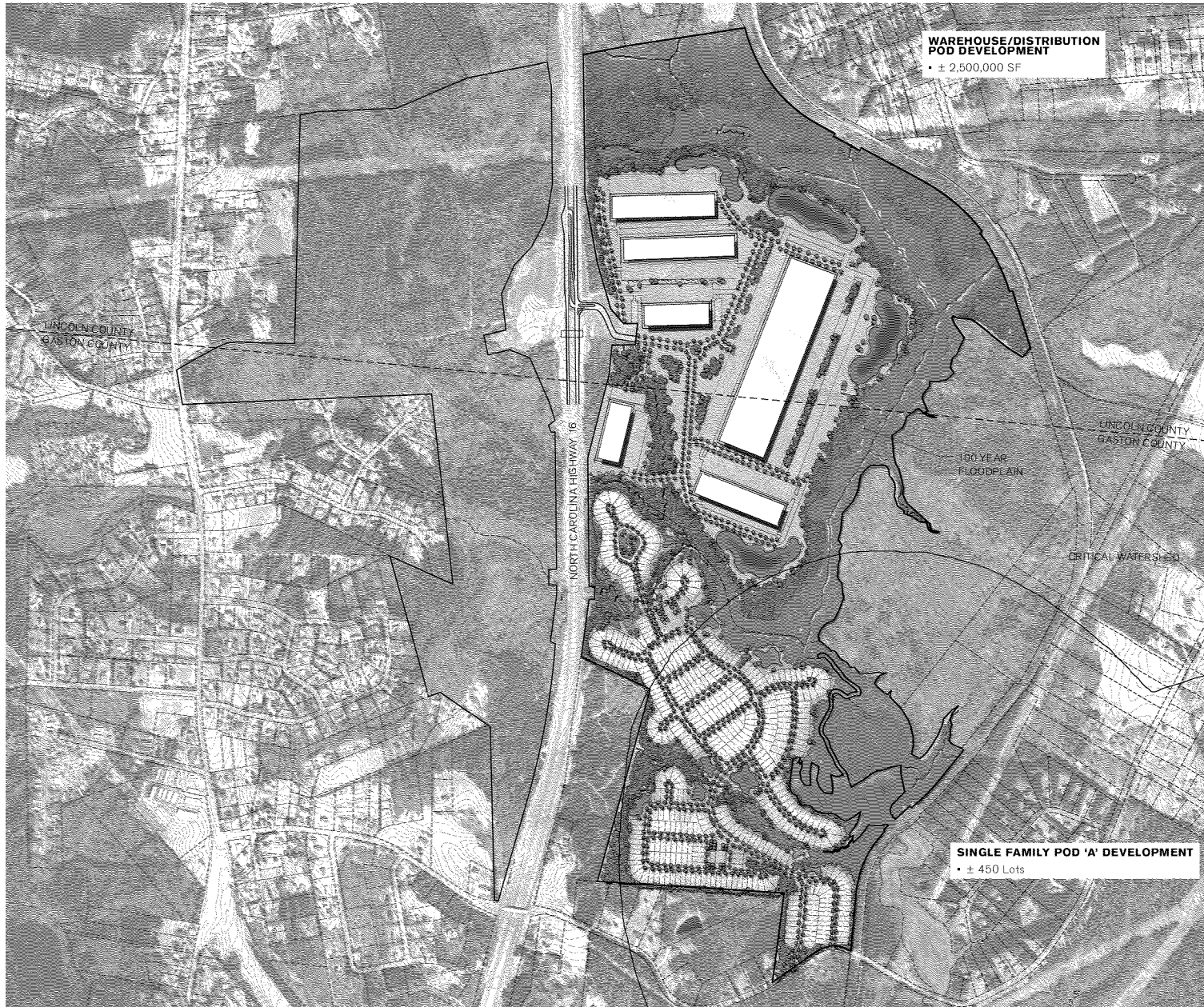
AUGUST 2019

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1.	

Figure 1









## **AREA CONDITIONS**

The area of influence of the site as defined by North Carolina Department of Transportation (NCDOT) staff includes the following two existing intersections and four proposed intersections: (See Appendix 1 for the approved scoping information)

1. Killian Road & NC 16 Business (signalized)
2. Lucia Riverbend Highway & NC 16 Business (signalized)
3. NC 16 & Proposed Warehouse Access "A" (unsignalized Cross-Over)
4. Killian Road & Proposed Residential Access "B" (unsignalized)
5. Killian Road & Proposed Residential Access "C" (unsignalized)
6. NC 16 & Proposed Northbound U-Turn Bulb-Out (unsignalized)



**NC 16 Facing south towards Proposed Site**



**Killian Road Facing west towards Proposed Site**

Morning (7:00-9:00 AM) and afternoon (4:00-6:00 PM) peak period turning movement counts (TMCs) were conducted at the existing two study intersections on Tuesday May 14, 2019. In addition, 24-hour tube counts were taken on Killian Road east of Stilwell Road, where the residential access points are anticipated. See Appendix 2 for raw count data sheets.

According to the latest NCDOT Roadway Functional Classification data, NC 16 is a Principal Arterial with a posted speed limit of 65 mph. The roadway is a two-lane median divided facility, with no bike lanes, curb/gutter, planting strip, or sidewalk present on either side of the roadway in the vicinity of the site.

Killian Road is a secondary route with a posted speed limit of 55 mph. The roadway is a one-lane undivided facility, with no bike lanes, curb/gutter, planting strip, or sidewalk present on either side of the roadway in the vicinity of the site.

In addition to the intersection TMCs, geospatial information provided by NCDOT's ArcGIS portal (*Go! NC*), such as Annual average daily traffic (AADT) and crash data were collected.



AADT for two-way volumes on roadways within the area of influence are depicted in Table 1 based on latest 2016 data.

**Table 1: Average Annual Daily Traffic Volumes (vehicles per day)**

Roadway	AADT
NC 16 north of Killian Road	26,000
NC 16 Business south of NC 273	8,600
Lucia Riverbend Highway west of NC 16 Business	6,800
Killian Road east of NC 16 Business	1,100

Crash frequency per intersection is reported in Table 2 with data ranging from January 1, 2014 to December 31, 2018.

**Table 2: Crash Data from 2014-2018**

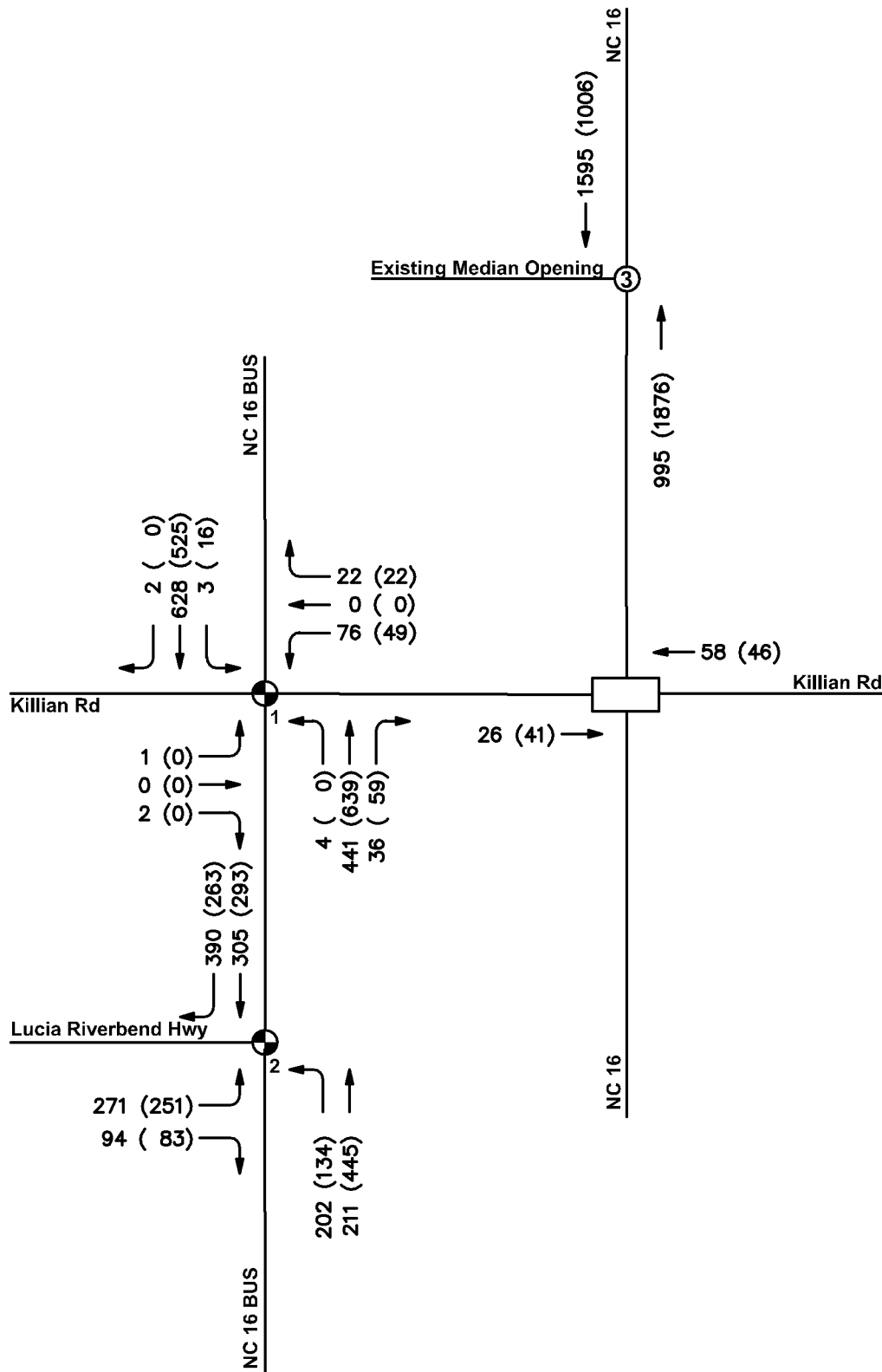
Intersection	Severity Type			Total Crashes
	K Injury	B & C Injury Crashes	PDO Crashes	
NC 16 Bus. & Lucia Riverbend Hwy.	1	4	16	21
Lucia Riverbend Hwy. & Stanley Lucia Rd.	0	1	5	6

Notes:

**K:** Fatality **B:** B injury type (evident), **C:** injury type (possible), **PDO:** Property Damage Only

Copies of the intersection investigation worksheets are in the Appendix 3 for further existing area conditions as reported in field analysis.

Figure 2 portrays the existing TMCs for the AM and PM peak hours. Figures 3A and 3B includes the directional distribution for the residential site and the warehousing site, respectively. These directional distribution percentages were approved by Division 12 District 3 and Lincoln County staff on June 4, 2019 and Gaston County staff on June 5, 2019 per existing traffic patterns.



Existing traffic volumes were collected on May 14, 2019.

**RIVERBEND PRESERVE**

GASTON/ LINCOLN COUNTY, NC

**THE SHAW TATE GROUP**  
 1030 S CALDWELL STREET  
 CHARLOTTE, NC 28203

**EXISTING PEAK  
 HOUR TRAFFIC  
 VOLUMES**

0 NTS  
 SCALE: NTS

PROJECT #: 811-001  
 DRAWN BY: SA  
 CHECKED BY: MW

AUGUST 2019

REVISIONS:

1.	

**Figure 2**

# RIVERBEND PRESERVE

GASTON/ LINCOLN COUNTY, NC

THE SHAW TATE GROUP  
 1030 S. CALDWELL STREET  
 CHARLOTTE, NC 28203

## RESIDENTIAL SITE DIRECTIONAL DISTRIBUTION



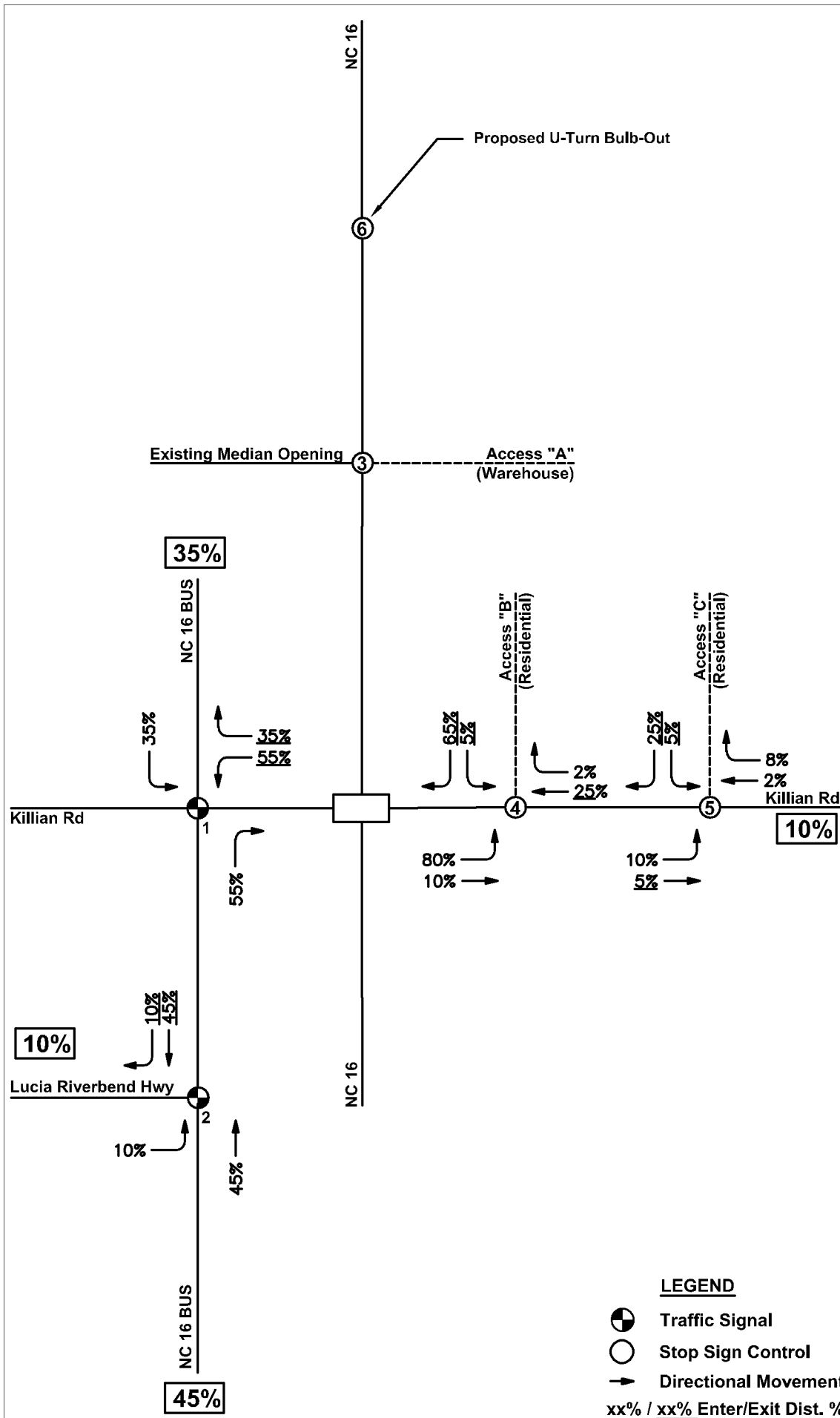
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Figure 3A

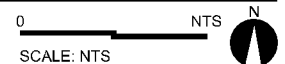


# RIVERBEND PRESERVE

GASTON/ LINCOLN COUNTY, NC

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## WAREHOUSE SITE DIRECTIONAL DISTRIBUTION






PROJECT #: 811-001  
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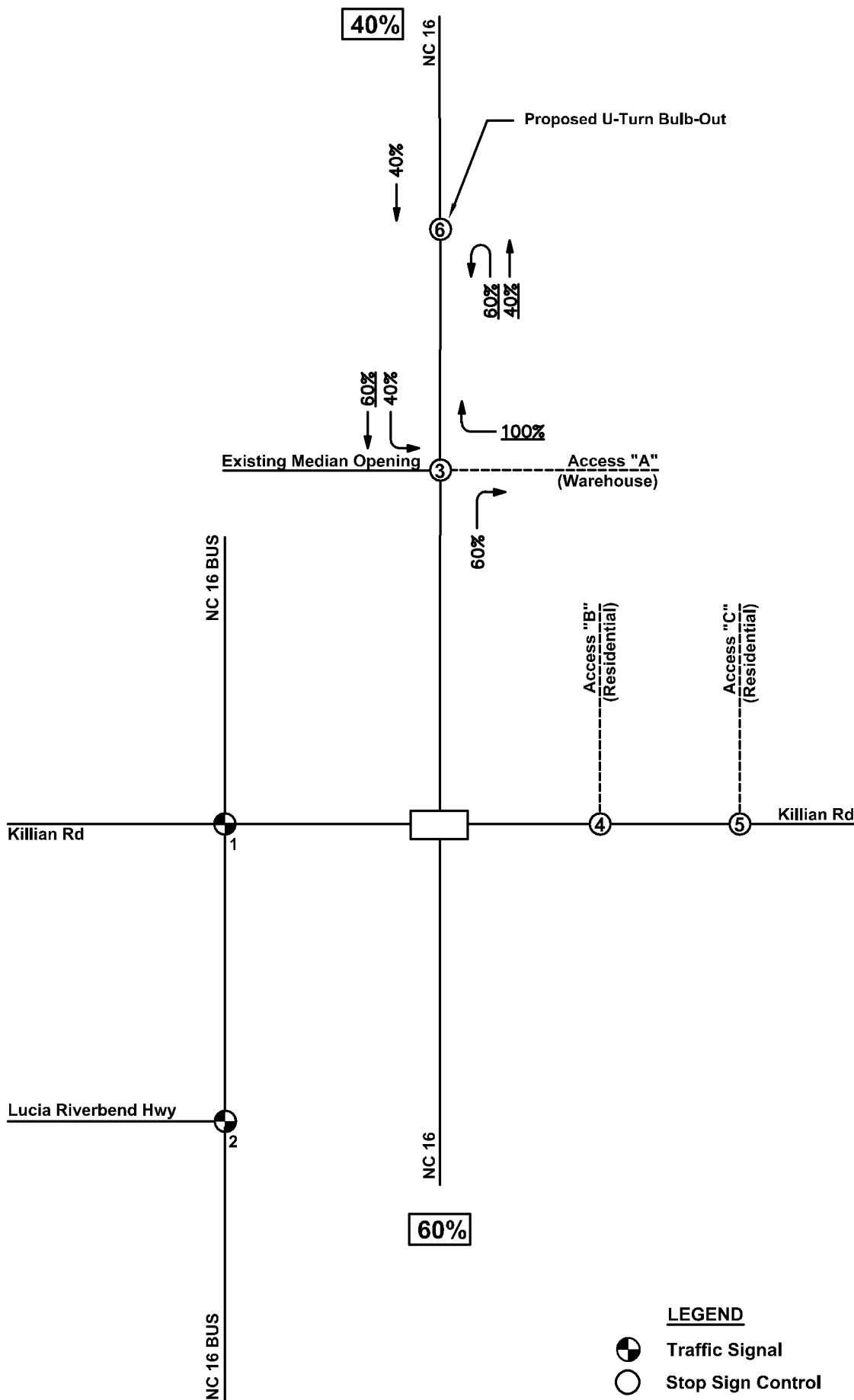
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### LEGEND

-  Traffic Signal
-  Stop Sign Control
-  Directional Movement
- xx% / xx% Enter/Exit Dist. %





## PROJECTED TRAFFIC

The daily and peak-hour trip generation data for the site is presented in Table 3. Values derived for the anticipated trips generated by the site are obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10<sup>th</sup> Edition, 2017.

**Table 3: Trip Generation**

Land Use [ITE Code]			Weekday Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Northeast									
Warehousing [150]	2,500,000	SF	3,996	251	75	326	89	240	329
Southeast									
Single Family Housing [210]	450	DU	4,149	82	244	326	272	160	432
Proposed Total			8,145	333	319	652	361	400	761
References: Trip Generation, 10th Edition, Institute of Transportation Engineers, Washington, DC. 2017.									

The trip generation results indicate that the development is expected to generate 652 total AM peak hour trips and 761 total PM peak hour trips.

The projected background traffic volumes used in the analyses were developed from the existing peak hour TMCs. Per NCDOT, a 1% per year growth rate was used for the 2024 background volumes. The No Build volumes for AM and PM peaks are presented in Figure 4.

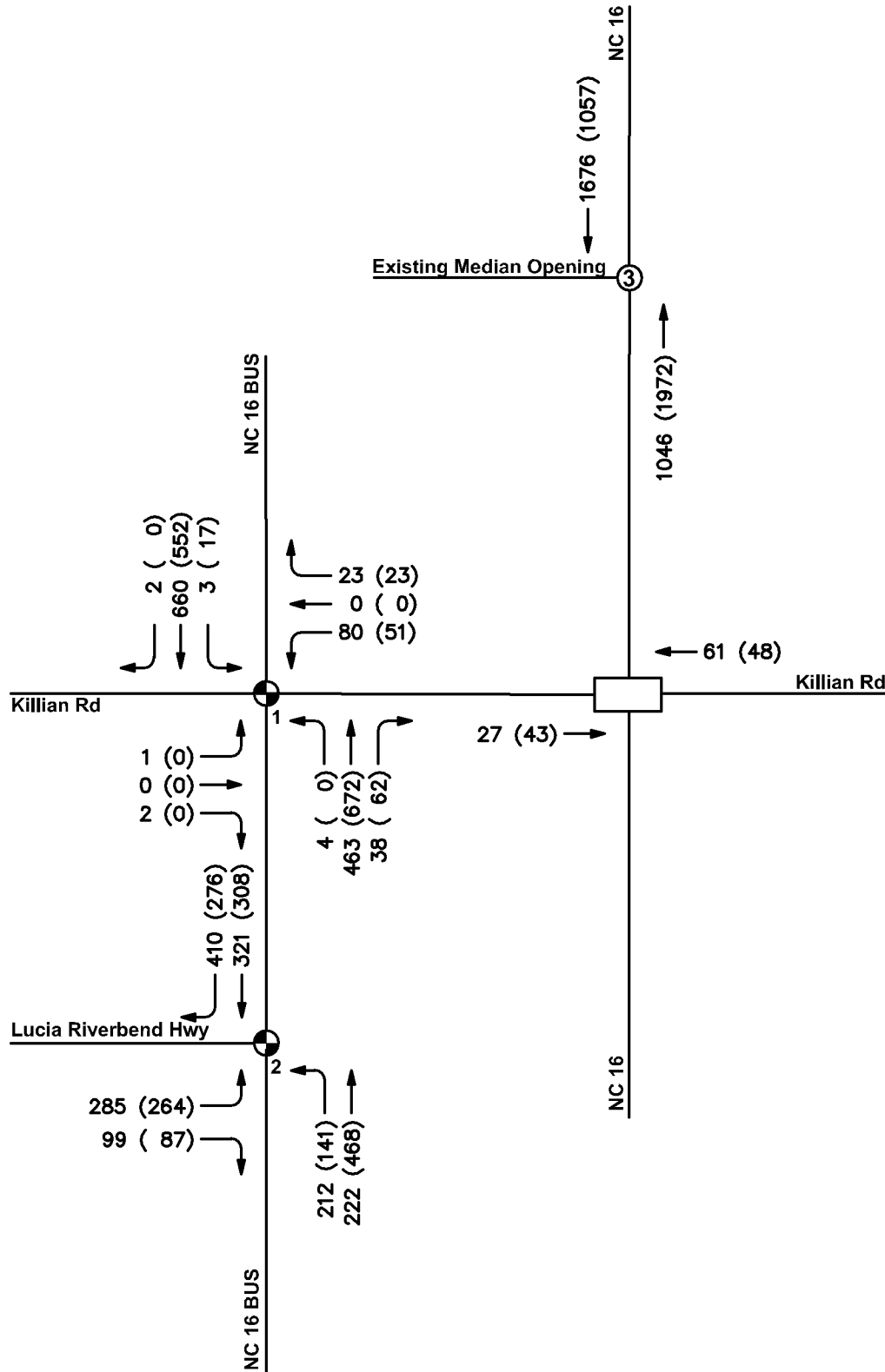
The trip assignments for the 2024 AM and PM peak hour Build traffic volumes are presented in Figures 5 and 6. The trip assignments for the 2034 (Build-out + 10 years per Lincoln County) AM and PM peak hour Build traffic volumes are presented in Figures 7 and 8, respectively. The background traffic is indicated to the far left of the movement arrows followed by the site traffic in parentheses. The two volumes are added to obtain the projected total traffic for that movement:

$$\text{Background} + (\text{Site}) = \text{Total}$$

## LEGEND

-  Traffic Signal
-  Stop Sign Control
-  Directional Movement

VOLUMES: AM (PM)



Existing count data were grown by a 1% compounded annual growth rate for No Build conditions.

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RIVERBEND PRESERVE

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CHARLOTTE, NC 28203

2024 NO BUILD  
PEAK HOUR  
TRAFFIC  
VOLUMES

0 NTS  
SCALE: NTS

PROJECT #: 811-001  
DRAWN BY: SA  
CHECKED BY: MW

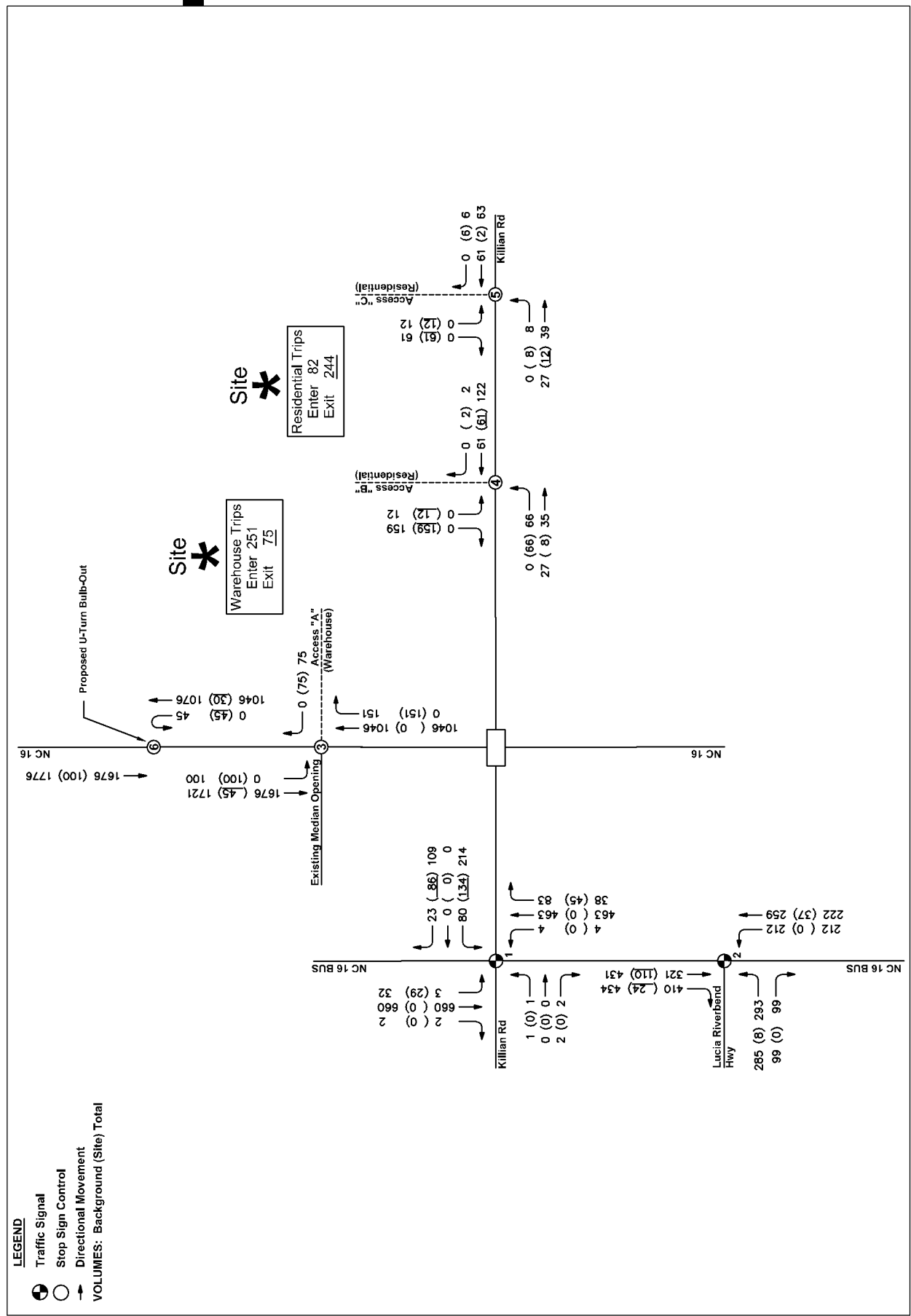
AUGUST 2019

REVISIONS:

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Figure 4

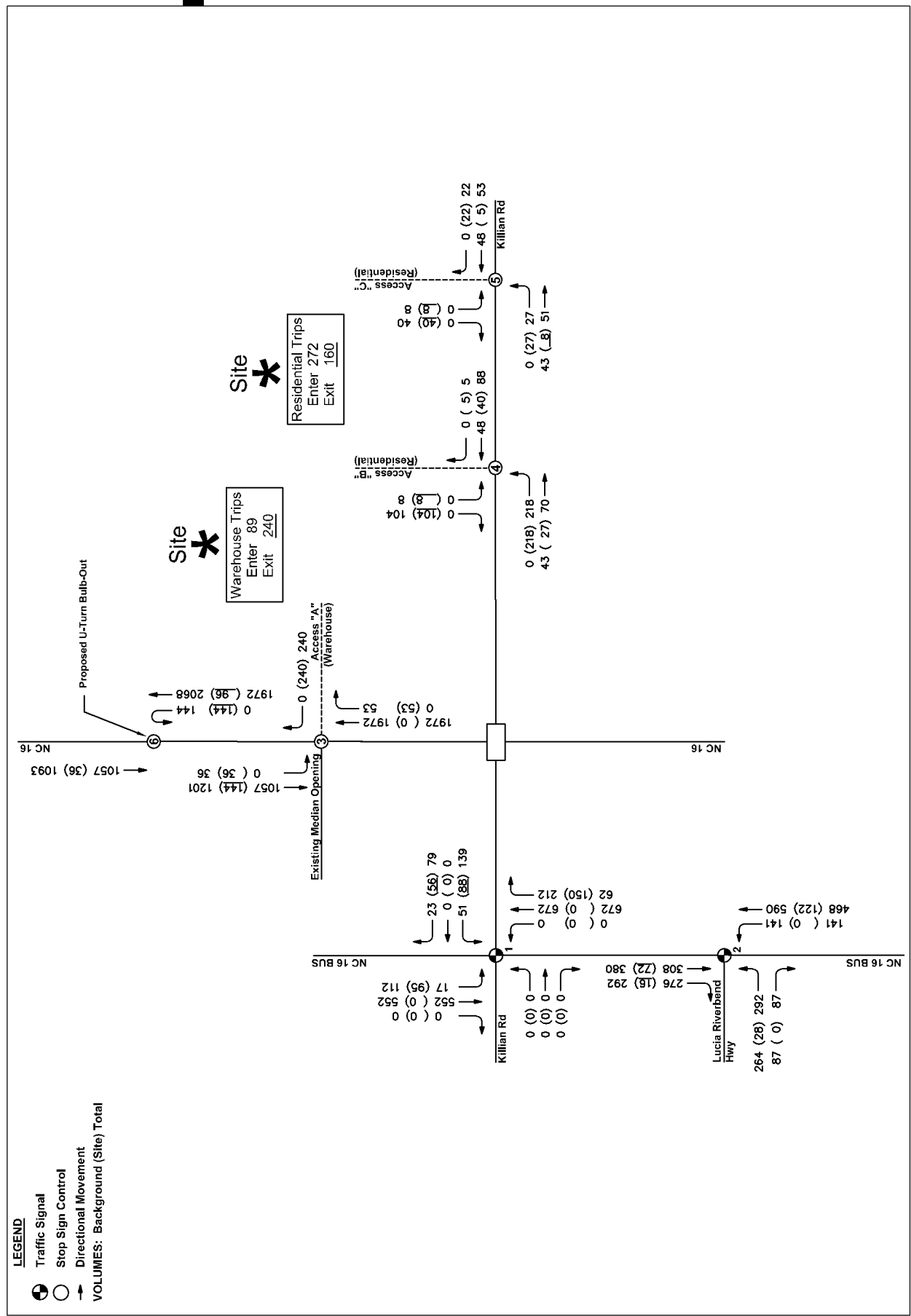
Figure 5



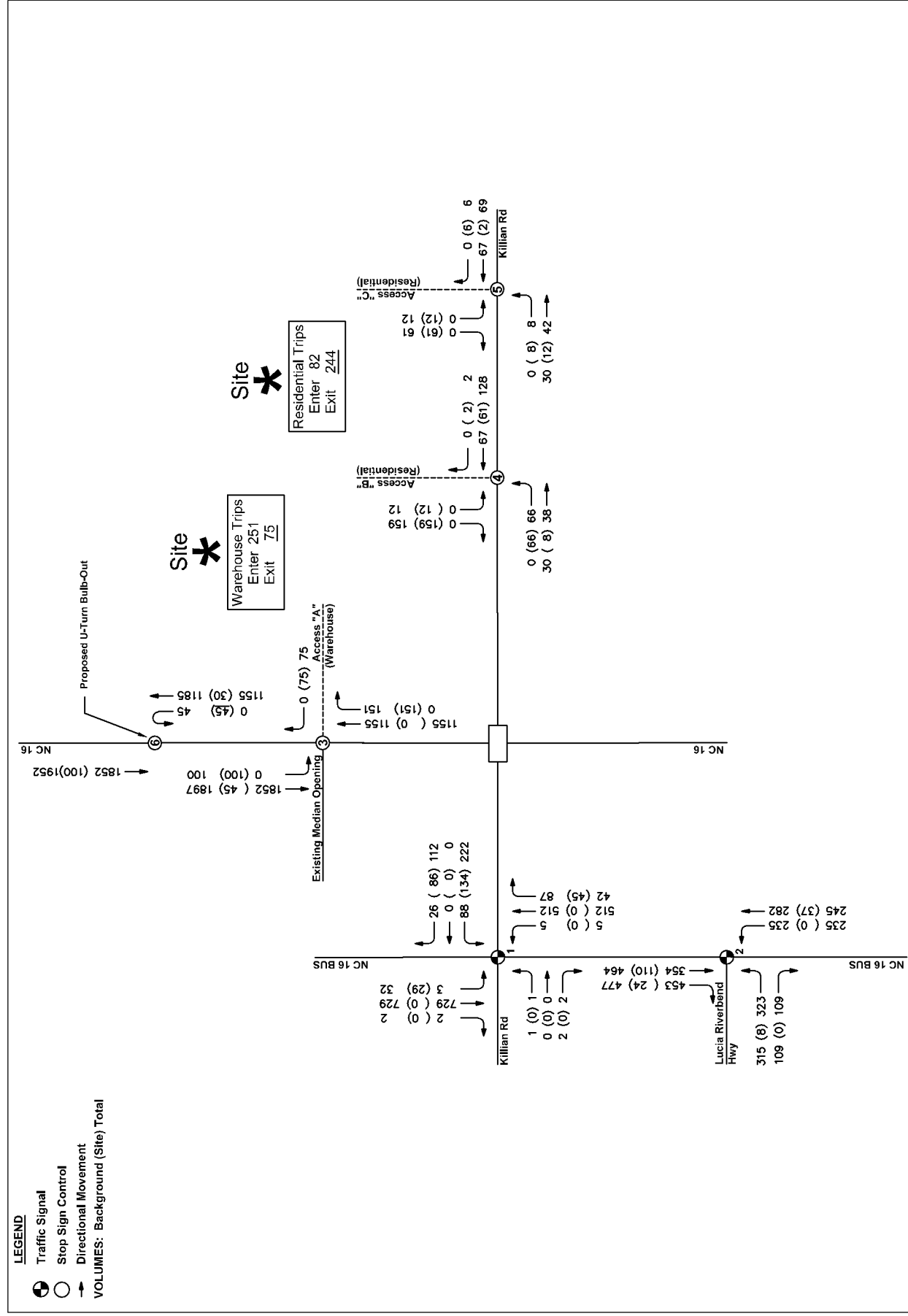
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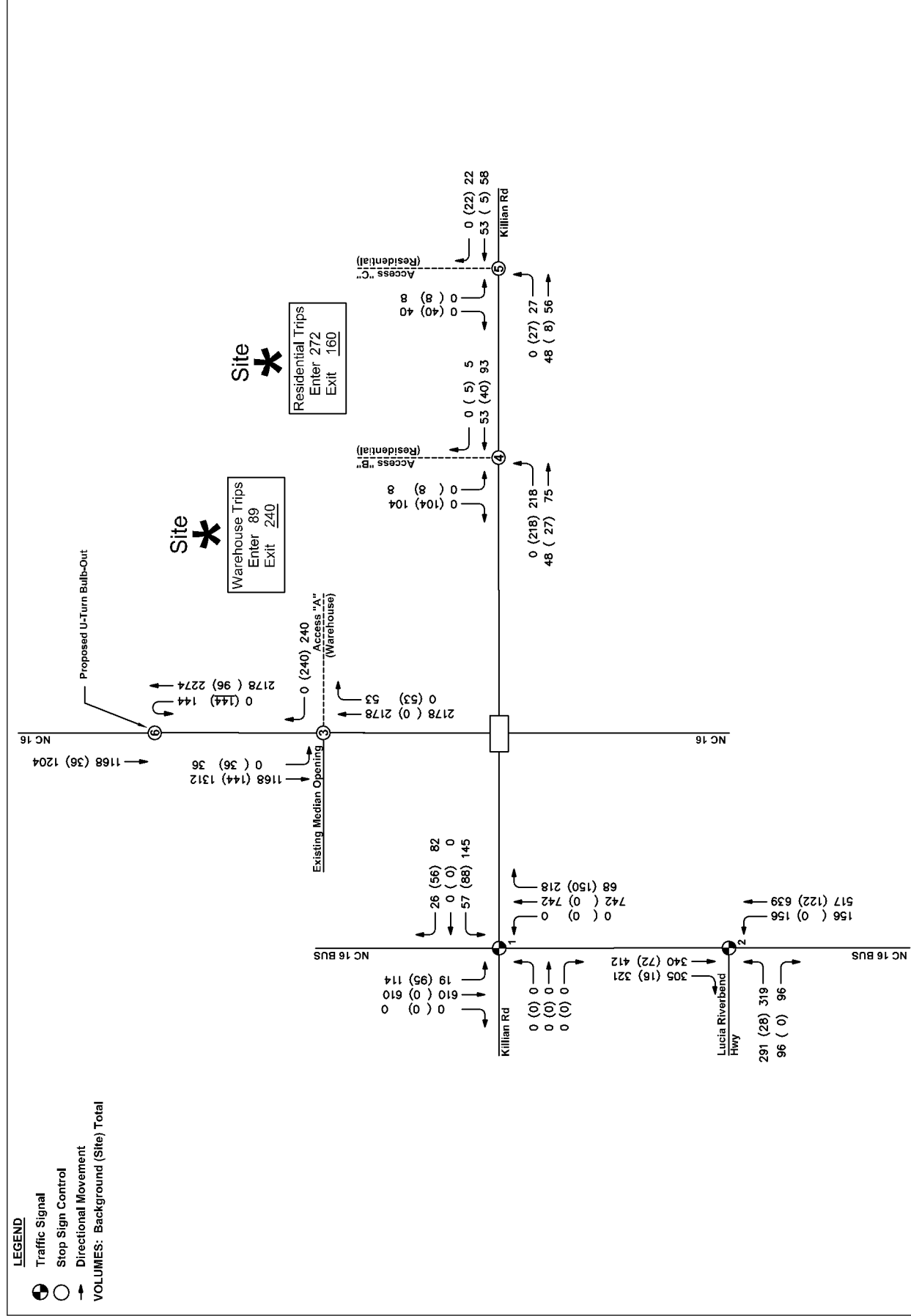


Figure 6



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## **TRAFFIC ANALYSIS**

The study intersections identified within the area of influence were analyzed to detect the traffic impact that the development has under the build-out (2024) and built-out plus 10 years (2034). The traffic analysis evaluates following measures of effectiveness' (MOEs) and their respective criteria at the intersections assuming the future year conditions of 2024 and 2034 (Build-out + 10 years per Lincoln County).

Level of service (LOS) of an intersection or approach is a qualitative MOE of traffic operations. It is a measure of average control delay in time within a peak period. The Transportation Research Board's Highway Capacity Manual<sup>1</sup> (HCM) defines the LOS thresholds established for signalized and unsignalized intersections per the following exhibits:

Intersection LOS	Exhibit 19-8 Signalized Intersection Control Delay per Vehicle (sec/vehicle)	Exhibit 20-2 Unsignalized Intersection Control Delay per Vehicle (sec/vehicle)
A	$\leq 10.0$	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$	$> 10.0$ and $\leq 15.0$
C	$> 20.0$ and $\leq 35.0$	$> 15.0$ and $\leq 25.0$
D	$> 35.0$ and $\leq 55.0$	$> 25.0$ and $\leq 35.0$
E	$> 55.0$ and $\leq 80.0$	$> 35.0$ and $\leq 50.0$
F	$> 80.0$	$> 50.0$

For the analysis of unsignalized intersections, intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. It should be noted that stop sign controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

This report provides analysis of the traffic operations within the area of influence, according to the standards set by the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C", Lincoln County Unified Development Ordinance (UDO) Section 9.8 and Gaston County's UDO Section 5.11. It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2019 Existing Conditions
- 2024 No Build Conditions
- 2024 Build-out Conditions
- 2034 Build-out + 10 years Conditions (Lincoln Co. Requirement)

---

<sup>1</sup> National Research Council. Transportation Research Board. Highway Capacity Manual 6<sup>th</sup> Ed., Washington, DC. 2016.



**NCDOT/LINCOLN COUNTY ANALYSIS REQUIREMENTS** - In order to determine the mitigation responsibility of the developer, this study compares 2024 and 2034 Build results to the 2024 No Build results. In addition, Lincoln County UDO requires analysis of conditions 10 years after the build-out of the site.

Per Chapter 5, Section J of the *August 2003 NCDOT Policy on Street and Driveway Access to North Carolina Highways*, the applicant shall be required to identify mitigation improvements to the roadway network if at least one of the following conditions exists when comparing base network conditions to project conditions:

- *The total average delay at an intersection or an individual approach increases by 25% or greater, while maintaining the same level of service,*
- *The Level of Service (LOS) degrades by at least one level at an intersection or an individual approach,*
- *Or the Level of Service is "F" for an intersection or an individual approach.*

This section of the NCDOT access policy also states that, *mitigation improvements shall be identified when the analysis indicates that the 95<sup>th</sup> percentile queue exceeds the storage capacity of the existing lane.*

Per Lincoln County UDO Section 9.8.F the following requirements must also be met:

*The County shall utilize means by which to maintain a minimum Grade "C" level of service for intersections affected by proposed developments through improvements mandated or suggested by traffic impact analyses; technical memoranda required by rezoning cases; and through adherence to level-of-service criteria described as follows:*

- *Where proposed development lowers any intersection leg impacted by said development below a Grade "C", the developer will be required to provide those transportation improvements necessary to retain a Grade "C".*
- *Where an existing intersection is rated below Grade "C" prior to any proposed development, the developer will be required to maintain existing transportation levels for any/all legs impacted. Final intersection grades shall include the impact of the proposed development.*

SYNCHRO 10.3 was the software tool used in determining the delay, capacity and corresponding LOS at the study intersections. SimTraffic 10.3, a traffic simulation software application for unsignalized and signalized intersections, was used to calculate the maximum queue lengths at the study intersections. The Synchro and SimTraffic results of each scenario is displayed per intersection and are presented in Tables 4 – 15.



Base assumptions for the analysis scenarios include:

- A 1% per year background growth rate between the existing 2019 and future 2024 and 2034 conditions
- All study intersections and movements assume a 0.90 peak hour factor (PHF)
- Observed heavy vehicle percentages (from TMCs) were used in all analysis for all intersections, a minimum of 2% was applied to proposed intersections.
- 20% heavy vehicle percentages were used for the industrial Access "A" entering and exiting movements
- A minimum of 4 vehicles was assumed for all allowed movements
- Existing signal plans were used in the Existing, No Build and Build conditions, coded based on the NCDOT Congestion Management Capacity Analysis Guidelines (2015) See Appendix 4 for existing signal plans:
  - Right turn on red (RTOR) was disabled
  - Permitted-Protected phasing was adjusted to protected only in future conditions
  - Yellow and red times were adjusted to 5 seconds and 2 seconds, respectively with -2 seconds of lost time adjustment
- Signal timings as given by the signal plan were utilized and the intersections were optimized through all scenarios



## **1. Killian Road & NC 16 Business**

**Table 4: Killian Rd. & NC 16 Bus. Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>Existing Conditions</b>						
Intersection	A	8.6	0.55	A	6.1	0.48
Eastbound - NC 16 Business	B	19.3	-	C	21.0	-
Westbound - Killian Road	C	26.5	-	C	24.6	-
Northbound - NC 16 Business	A	5.9	-	A	5.2	-
Southbound - NC 16 Business	A	7.7	-	A	4.6	-
<b>2024 No Build Conditions</b>						
Intersection	A	9.1	0.58	A	7.4	0.55
Eastbound - NC 16 Business	B	19.9	-	C	21.5	-
Westbound - Killian Road	C	26.7	-	C	26.9	-
Northbound - NC 16 Business	A	6.2	-	A	6.5	-
Southbound - NC 16 Business	A	8.3	-	A	5.6	-
<b>2024 Build Conditions</b>						
Intersection	D	38.3	1.21	B	18.5	1.03
Eastbound - NC 16 Business	B	20.0	-	C	22.1	-
Westbound - Killian Road	F	149.0	-	F	97.6	-
Northbound - NC 16 Business	A	7.5	-	A	7.5	-
Southbound - NC 16 Business	B	11.0	-	A	6.9	-
<b>2024 Build Conditions with Improvements (Westbound Right Turn Lane)</b>						
Intersection	B	16.7	0.84	B	11.4	0.73
Eastbound - NC 16 Business	B	20.0	-	C	22.2	-
Westbound - Killian Road	D	44.6	-	D	41.7	-
Northbound - NC 16 Business	A	7.4	-	A	7.2	-
Southbound - NC 16 Business	B	10.8	-	A	6.7	-
<b>2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)</b>						
Intersection	D	42.8	1.28	C	20.5	1.08
Eastbound - NC 16 Business	B	20.0	-	-	-	-
Westbound - Killian Road	F	175.6	-	F	113.8	-
Northbound - NC 16 Business	A	8.0	-	A	8.2	-
Southbound - NC 16 Business	B	12.4	-	A	7.6	-

### **2019 Existing Conditions**

Currently the intersection operates with a LOS "A" in both peak hours.

### **2024 No Build Conditions**

With the inclusion of the growth in the background, the intersection operates with a LOS "A" in both peak hours.





### 2024 Build Conditions

When comparing the impact of the 2024 Build to the 2024 No Build conditions the intersection LOS becomes a “D” in the AM peak period and a “B” in the PM peak period. The overall intersection delay increases between the No Build and Build scenarios by 320% in the AM peak hour and 150% in the PM peak hour.

### 2024 Build with Improvements Conditions

Based on NCDOT guidelines, the analysis results indicate the need for mitigation at the study intersection as means to improve LOS and delay.

The following improvements were tested and suggested:

- Construct a separate westbound right turn lane with 175' storage on Killian Road
- Remark the existing combined left-thru-right lane to a combined left-thru lane
- Extend southbound left turn lane storage to 125' on NC 16 Business

Assuming these improvements in place the intersection operates at a LOS “B” in both peak hours, allowed under NCDOT guidelines. Although the overall LOS decreases and delay increases, the intersection is still operating well above acceptable analysis parameters.

### 2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)

The 2034 Build conditions indicate that the intersection operates at a LOS a “D” in the AM peak period and a “B” in the PM peak period.

**Table 5: Killian Rd. & NC 16 Bus. Queue Lengths**

Killian Road @ NC 16 Business	Storage (Proposed)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 No Build Conditions					
Eastbound Left-Thru-Right (NC 16 Business)	TERM.	15'	25'	16'	34'
Westbound Left-Thru-Right (Killian Road )	TERM.	83'	102'	67'	83'
Northbound Left-Thru (NC 16 Business)	TERM.	135'	154'	191'	152'
Northbound Right-Turn (NC 16 Business)	175'	13'	36'	16'	40'
Southbound Left-Turn (NC 16 Business)	60'	3'	26'	7'	66'
Southbound Thru-Right (NC 16 Business)	TERM.	229'	194'	139'	227'
2024 Build Conditions with Improvements					
Eastbound Left-Thru-Right (NC 16 Business)	TERM.	15'	29'	16'	25'
Westbound Left-Thru (Killian Road )	TERM.	#209'	191'	#146'	169'
Westbound Right-Turn (Killian Road )	(175')	#88'	151'	#70'	114'
Northbound Left-Thru (NC 16 Business)	TERM.	135'	211'	191'	224'
Northbound Right-Turn (NC 16 Business)	175'	24'	103'	47'	141'
Southbound Left-Turn (NC 16 Business)	(125')	12'	57'	39'	124'
Southbound Thru-Right (NC 16 Business)	TERM.	229'	226'	139'	291'



## **2. Lucia Riverbend Highway & NC 16 Business**

**Table 6: Lucia Riverbend Hwy. & NC 16 Bus. Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>Existing Conditions</b>						
Intersection	C	30.5	0.86	D	35.1	0.84
Eastbound - Lucia Riverbend Highway	D	40.5	-	D	35.9	-
Northbound - NC 16 Business	C	20.8	-	C	27.3	-
Southbound - NC 16 Business	C	31.0	-	D	42.7	-
<b>2024 No Build Conditions</b>						
Intersection	D	36.7	0.98	D	39.3	0.90
Eastbound - Lucia Riverbend Highway	E	63.0	-	D	49.7	-
Northbound - NC 16 Business	B	18.9	-	C	25.1	-
Southbound - NC 16 Business	C	33.5	-	D	47.8	-
<b>2024 Build Conditions</b>						
Intersection	D	43.1	1.02	E	63.8	1.05
Eastbound - Lucia Riverbend Highway	E	70.1	-	E	69.1	-
Northbound - NC 16 Business	C	24.5	-	D	49.4	-
Southbound - NC 16 Business	D	41.0	-	E	76.4	-
<b>2024 Build Conditions with Improvements (Southbound Right Turn Overlap Phasing)</b>						
Intersection	C	29.5	0.88	D	44.2	0.92
Eastbound - Lucia Riverbend Highway	D	43.2	-	E	59.6	-
Northbound - NC 16 Business	C	26.5	-	D	39.3	-
Southbound - NC 16 Business	C	24.9	-	D	41.0	-
<b>2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)</b>						
Intersection	E	57.5	1.13	F	86.5	1.14
Eastbound - Lucia Riverbend Highway	F	95.1	-	F	90.0	-
Northbound - NC 16 Business	C	28.2	-	E	69.4	-
Southbound - NC 16 Business	E	56.3	-	F	103.1	-

### **2019 Existing Conditions**

Currently the intersection operates with a LOS "C" in the AM peak hour and LOS "D" in the PM peak hour.

### **2024 No Build Conditions**

With the inclusion of the growth in the background, the intersection operates with a LOS "D" in the AM peak hour and a LOS "D" in the PM peak hour.

### **2024 Build Conditions**

When comparing the impact of the 2024 Build to the 2024 No Build conditions the intersection LOS remains a "D" in the AM peak hour and becomes a "E" in the PM peak hour. The overall intersection delay increase between the No Build and Build scenario is 17% in the AM peak hour and 62% in the PM peak hour. In addition, the some of the approaches exceed the allowable parameters in both peak hours.



### 2024 Build with Improvements Conditions

Based on NCDOT guidelines, the analysis results indicate the need to identify mitigation at the study intersection. The following improvements were tested and are suggested:

- Implement for southbound right turn overlap phasing on NC 16 Business
- Extend eastbound right turn lane to 150' on Lucia Riverbend Highway

Assuming these improvements are in place, the intersection LOS becomes a "C" in the AM peak hour and remains a "D" in the PM peak hour (both of which are considered acceptable based on NCDOT guidelines).

### 2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)

The 2034 Build conditions indicate that the intersection operates at a LOS becomes a "E" in the AM peak period and a "F" in the PM peak period.

**Table 7: Lucia Riverbend Hwy. & NC 16 Bus. Queue Lengths**

Lucia Riverbend Highway at NC 16 Business	Storage (Proposed)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 No Build Conditions					
Eastbound Left-Turn (Lucia Riverbend Highway)	-	#258'	954'	#233'	512'
Eastbound Right-Turn (Lucia Riverbend Highway)	50'	78'	150'	69'	150'
Northbound Left-Turn (NC 16 Business)	-	53'	170'	36'	95'
Northbound Thru (NC 16 Business)	TERM.	#164'	217'	#314'	315'
Southbound Thru (NC 16 Business)	TERM.	186'	364'	#248'	400'
Southbound Right-Turn (NC 16 Business)	300'	#308'	365'	#238'	312'
2024 Build Conditions with Improvements					
Eastbound Left-Turn (Lucia Riverbend Highway)	-	#259'	539'	#340'	542'
Eastbound Right-Turn (Lucia Riverbend Highway)	(150')	79'	150'	93'	150'
Northbound Left-Turn (NC 16 Business)	-	72'	189'	46'	115'
Northbound Thru (NC 16 Business)	TERM.	#218'	240'	#559'	560'
Southbound Thru (NC 16 Business)	TERM.	#335'	338'	#412'	552'
Southbound Right-Turn (NC 16 Business)	300'	158'	282'	176'	399'



### 3. NC 16 & Proposed Warehouse Access "A"

**Table 8: NC 16 & Proposed Warehouse Access "A" Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>2024 Build Conditions</b>						
Westbound - Warehouse Access "A"	C	15.9	-	F	288.0	-
Northbound - NC 16	A	0.0	-	A	0.0	-
Southbound - NC 16	A	0.8	-	A	0.9	-
<b>2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)</b>						
Westbound - Warehouse Access "A"	C	17.3	-	F	427.2	-
Northbound - NC 16	A	0.0	-	A	0.0	-
Southbound - NC 16	A	0.8	-	A	1.0	-

#### 2024 Build Conditions

We propose the following intersection configuration:

- Convert NC 16 full median opening to a southbound directional X-over with a minimum storage of 150' (or as required to accommodate the appropriate design vehicles)
- Two ingress lanes and one egress lane (a terminating westbound right turn lane on Proposed Access "A")
- Channelized northbound right turn lane with 100' storage on NC 16
- Minimum internal protected stem of 500'

Assuming this configuration, the worst leg of the intersection (westbound) operates at a LOS "C" in the AM peak period and LOS "F" in the PM peak hour. It should be noted that stop sign-controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

#### 2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)

10 years after the build-out of the site, the worst leg of the intersection (westbound) remains at a LOS "C" in the AM peak period and LOS "F" in the PM peak hour.

**Table 9: NC 16 & Proposed Warehouse Access "A" Queue Lengths**

Warehouse Access “A” @ NC 16	Storage (Proposed)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 Build Conditions with Improvements					
Westbound Right-Turn (Warehouse Access “A”)	TERM.	18'	101'	418'	2117'
Northbound Right-Turn (NC 16 )	100'	-	65'	-	4'
Southbound Left-Turn (NC 16 )	150'	20'	95'	20'	116'



#### **4. Killian Road & Proposed Residential Access “B”**

**Table 10: Killian Rd. & Proposed Residential Access “B” Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>2024 Build Conditions</b>						
Eastbound - Killian Road	A	5.0	-	A	6.0	-
Westbound - Killian Road	A	0.0	-	A	0.0	-
Southbound - Access “B”	B	10.0	-	A	9.7	-
<b>2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)</b>						
Eastbound - Killian Road	A	4.8	-	A	5.9	-
Westbound - Killian Road	A	0.0	-	A	0.0	-
Southbound - Access “B”	B	10.0	-	A	9.7	-

#### **2024 Build Conditions**

We propose the following intersection configuration:

- One ingress and two egress lanes (a terminating southbound right turn lane and left turn lane with 100' storage) on Proposed Access “B”
- Construct an eastbound left turn lane with 100' storage on Killian Road
- Minimum internal protected stem of 100'

Assuming this configuration, the worst leg of the intersection (southbound) operates at a LOS “B” in the AM peak period and “A” in the PM peak period. It should be noted that stop sign-controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

#### **2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)**

10 years after the build-out of the site, the worst leg of the intersection (southbound) remains at a LOS “B” in the AM peak period and “A” in the PM peak period.

**Table 11: Killian Rd. & Proposed Residential Access “B” Queue Lengths**

Killian Road @ Access “B”	Storage (Proposed)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 Build Conditions with Improvements					
Eastbound Left-Turn (Killian Road)	(100')	5'	52'	15'	70'
Southbound Left-Turn (Access “B”)	(150')	-	23'	-	19'
Southbound Right-Turn (Access “B”)	TERM.	18'	62'	10'	44'



## 5. Killian Road & Proposed Residential Access "C"

**Table 12: Killian Rd. & Proposed Residential Access "C" Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>2024 Build Conditions</b>						
Eastbound - Killian Road	A	1.3	-	A	2.6	-
Westbound - Killian Road	A	0.0	-	A	0.0	-
Southbound - Access "C"	A	9.0	-	A	8.9	-
<b>2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)</b>						
Eastbound - Killian Road	A	1.2	-	A	2.4	-
Westbound - Killian Road	A	0.0	-	A	0.0	-
Southbound - Access "C"	A	9.1	-	A	9.0	-

### 2024 Build Conditions

We propose the following intersection configuration:

- One ingress and two egress lanes (a southbound right turn lane and left turn lane with 100' storage on Proposed Access "C")
- Construct an eastbound left turn lane with 100' storage on Killian Road
- Minimum internal protected stem of 100'

Assuming this configuration, the worst leg of the intersection (southbound) operates at a LOS "A" in both peak hours. It should be noted that stop sign-controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

### 2034 Build Conditions (Build - out + 10 years per Lincoln Co. Requirement)

10 years after the build-out of the site, the worst leg of the intersection (southbound) operates at a LOS "A" in during both peak hours. It should be noted that stop sign-controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

**Table 13: Killian Rd. & Proposed Residential Access "C" Queue Lengths**

Killian Road @ /Access “C”	Storage (Proposed)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 Build Conditions with Improvements					
Eastbound Left-Turn (Killian Road )	(100')	0'	16'	3'	19'
Southbound Left-Turn (Access “C” )	(100')	-	23'	-	23'
Southbound Right-Turn (Access “C” )	TERM.	5'	53'	3'	50'



## **6. NC 16 & Future U-Turn Bulb-Out**

We propose the following intersection configuration:

- Convert NC 16 full median opening to a northbound channelized U-turn lane with a minimum storage of 250' (or as required to accommodate the appropriate design vehicles)

The max queues are maintained within the channelized left-turn lane in both the AM and the PM peak.

**Table 15: NC 16 & Future U-Turn Bulb-Out Queue Lengths**

Killian Road @ /Access "C"	Storage	AM PEAK	PM PEAK
		Max Queue	Max Queue
2024 Build Conditions with Improvements			
Northbound U-Turn (Killian Road )	(250')	218'	235'

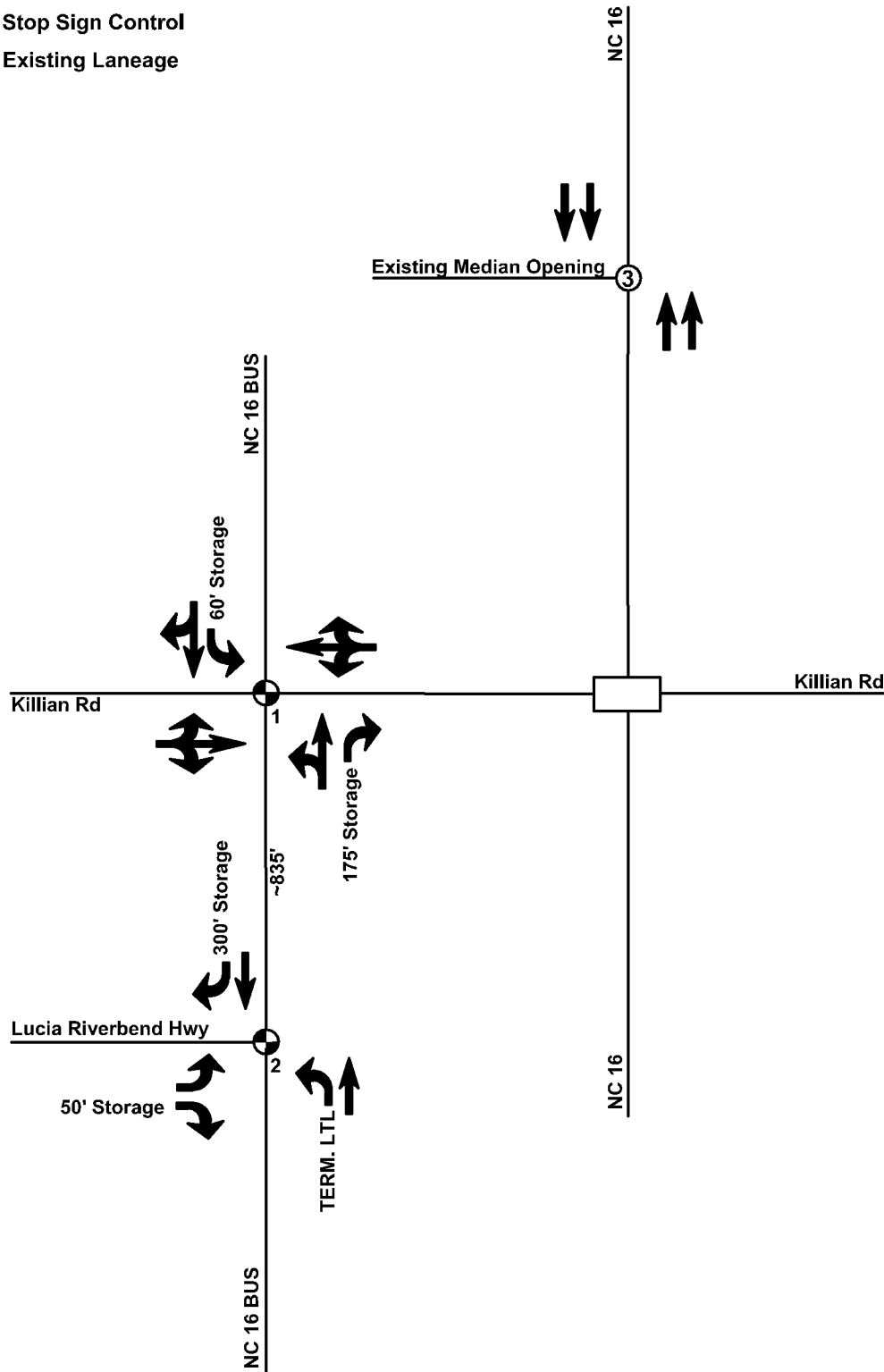
Analysis software result reports per scenario are provided in the Appendix 5.

The existing/suggested laneage is shown on Figures 9 and 10.



# LEGEND

-  Traffic Signal
-  Stop Sign Control
-  Existing Laneage



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RIVERBEND PRESERVE

GASTON/ LINCOLN COUNTY, NC

THE SHAW TATE GROUP  
1030 S. CALDWELL STREET  
CHARLOTTE, NC 28203

EXISTING  
LANEAGE

0 NTS N  
SCALE: NTS

PROJECT #: 811-001  
DRAWN BY: PAH  
CHECKED BY: MWW

AUGUST 2019

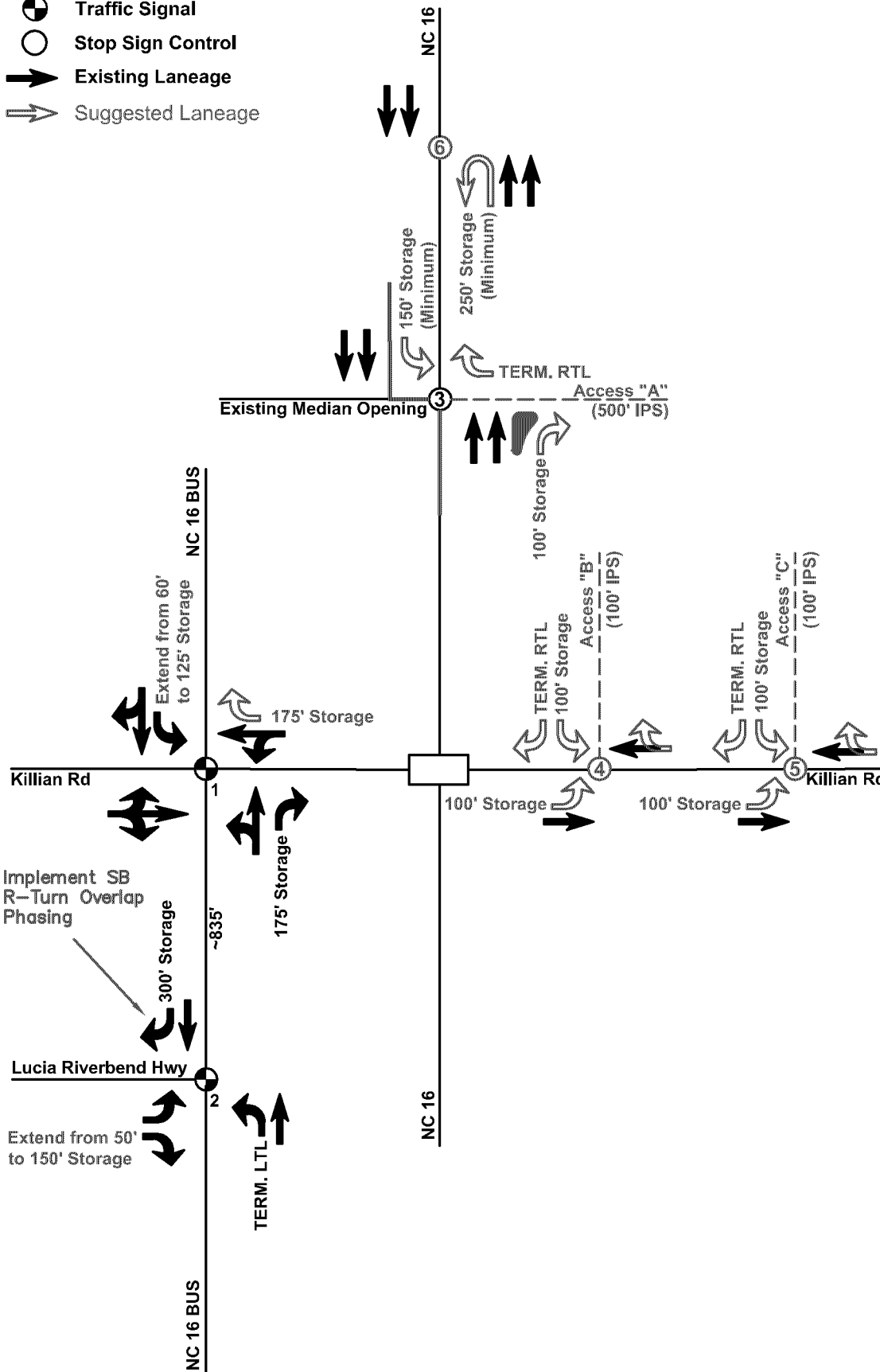
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Figure 9

# LEGEND

-  Traffic Signal
-  Stop Sign Control
-  Existing Laneage
-  Suggested Laneage



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## RIVERBEND PRESERVE

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## SUGGESTED LANEAGE



PROJECT #: 811-001  
DRAWN BY: PAH  
CHECKED BY: MWW

AUGUST 2019

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1.	

Figure 10



## **CONCLUSION**

In conclusion, even though the Riverbend Preserve development will increase the amount of vehicular and truck traffic on the adjacent roadways/corridors, the suggested intersection improvements/enhancements will help mitigate the additional site generated trips on the adjacent roadway network. In addition, the suggested recommendations will improve the conditions for the general traveling public as well as the users of the warehouse and the residents of the residential community.



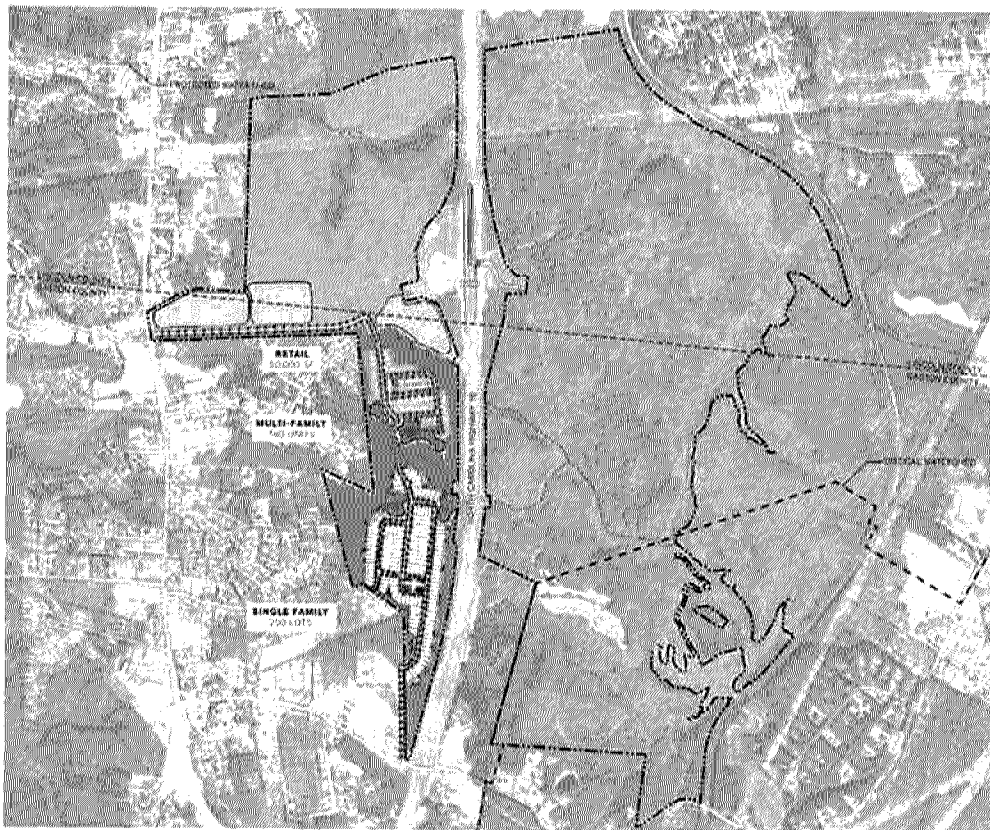
## APPENDIX

# TRAFFIC IMPACT ANALYSIS (FINAL)

## RIVERBEND PRESERVE PHASE 2

North of Killian Road and West of NC 16

Gaston County, North Carolina



for

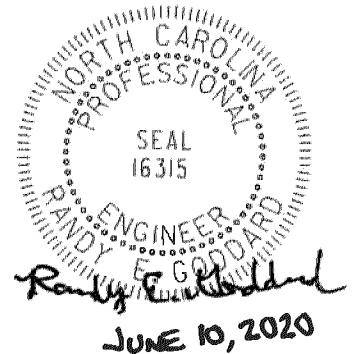
The Shaw Tate Group

June 2020

811-002 (C-2165)

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## **EXECUTIVE SUMMARY**

The Shaw Tate Group proposes to develop a site with the following land uses:

- 250 Single-Family Homes
- 180 Multi-Family (Low-Rise) Units
- 50,000 SF of Retail

The proposed site is located north of Killian Road and west of NC 16 in Gaston County, NC (see Figure 1). The development is expected to be completed in 2024.



This report provides analysis of the traffic operations within the area of influence, according to the standards set by the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C", and Gaston County's UDO Section 5.11. It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2019 Existing Conditions
- 2024 No Build Conditions
- 2024 Build-out Conditions

The area of influence of the site as defined by North Carolina Department of Transportation (NCDOT) staff includes the following three existing intersections and one proposed intersection: (See Appendix for the approved scoping information)

1. Lucia Riverbend Highway & NC 16 Business (signalized)
2. Lucia Riverbend Highway & Killian Road (signalized)
3. Lucia Riverbend Highway & Old Beatty Road-Access "A" (unsignalized)
4. Killian Road & Access "B"

According to the preliminary site plan (Concept Exhibit), access to the development is expected to occur via one unsignalized access on Lucia Riverbend Highway and one unsignalized access on Killian Road:

- Proposed Access "A" (Full-Movement): unsignalized access allowing for full movement access located on NC 16 across from Old Beatty Road.
- Proposed Access "B" (Full-Movement): unsignalized access allowing for full movement located on Killian Road approximately 150 feet west of the NC 16 overpass.

The trip generation results indicate that the development is expected to generate 446 total AM peak hour trips and 561 total PM peak hour trips.





With the results of our analyses (the specifics are described in the Traffic Analysis section of this report) we suggest the following improvements/modifications at the study intersections/proposed accesses:

**2024 Build Suggested Recommendations:**

**1. NC 16 Business & Lucia Riverbend Highway**

- No suggested improvements.

**2. Lucia Riverbend Highway & Killian Road**

- Extend northbound right turn lane storage from 175 feet to 275 feet on Lucia Riverbend Highway
- Extend southbound left turn lane storage from 125 feet to 200 feet on Lucia Riverbend Highway

**3. Lucia Riverbend Highway & Old Beatty Road-Access "A"**

We propose the following intersection configuration:

- Align east/west approaches to a four-legged intersection (right-of-way to be acquired to ensure alignment)
- Construct a southbound left turn lane with 100 feet of storage on Lucia Riverbend Highway
- Construct northbound left turn lane with 100 feet of storage on Lucia Riverbend Highway to allow for intersection alignment
- Construct northbound right turn lane with 100 feet of storage on Lucia Riverbend Highway
- One ingress and two egress lanes (a westbound thru-right turn lane and left turn lane with 200' storage) on Proposed Access "A"
- Minimum internal protected stem of 200'

**4. Killian Road & Access "C"**

We propose the following intersection configuration:

- Construct an eastbound left turn lane with 100 feet of storage on Killian Road
- One ingress and two egress lanes (a terminating southbound right turn lane and left turn lane with 100' storage) on Proposed Access "B"
- Minimum internal protected stem of 100'

**In summary, it was determined that Riverbend Preserve Phase 2 site development will not significantly affect the operations of vehicular traffic on the adjacent roadways with both these suggested improvements as well as, the suggested intersection improvements/enhancements from the approved Riverbend Preserve Phase 1 Traffic Impact Analysis.**



## **PROPOSED DEVELOPMENT**

The Shaw Tate Group proposes to develop a site with the following land uses:

- 250 Single-Family Homes
- 180 Multi-Family (Low-Rise) Units
- 50,000 SF of Retail

The proposed site is located north of Killian Road and west of NC 16 in Gaston County, NC (see Figure 1). The development is expected to be completed in 2024.



According to the preliminary site plan (Concept Exhibit), access to the development is expected to occur via one unsignalized access on Lucia Riverbend Highway and one unsignalized access on Killian Road:

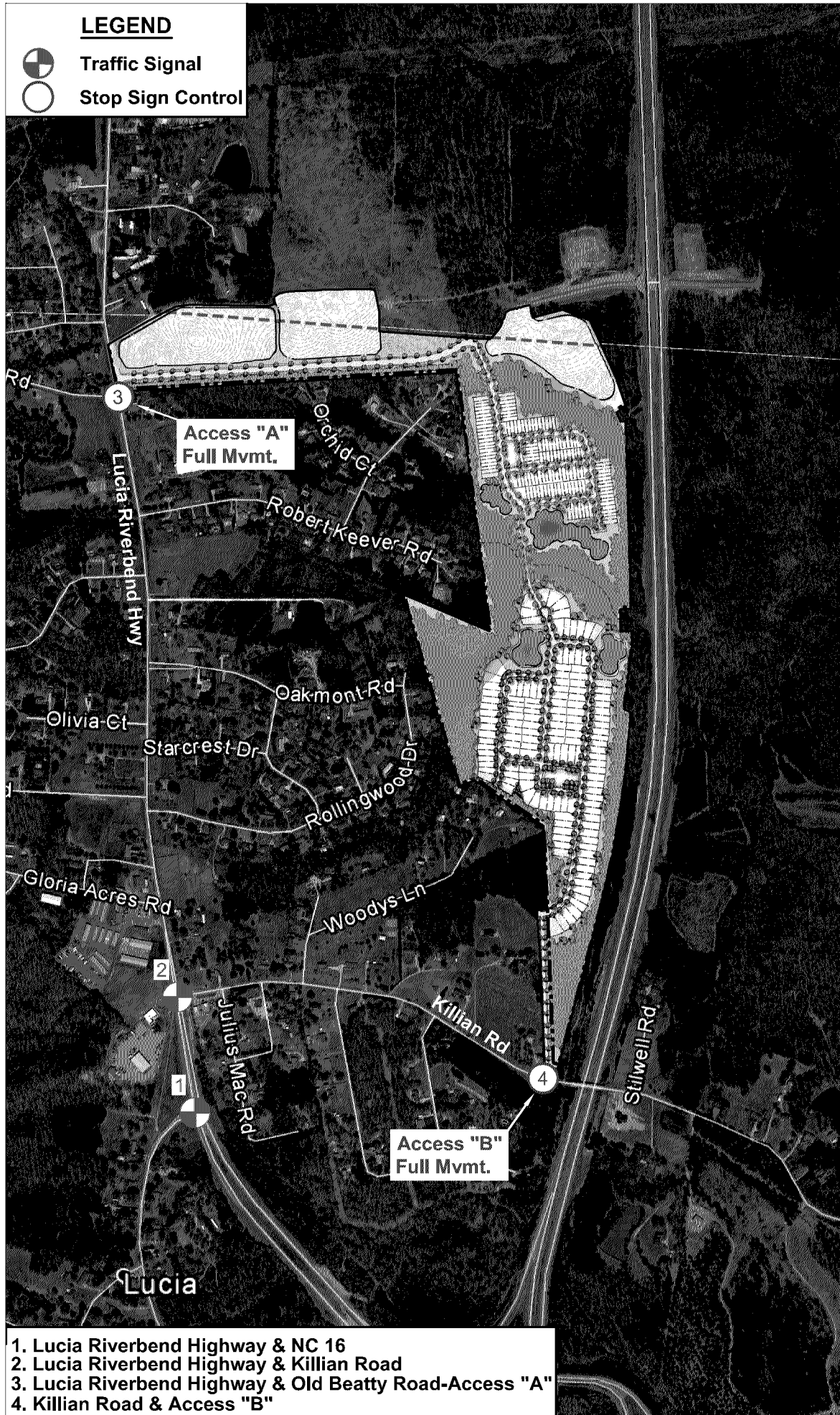
- Proposed Access "A" (Full-Movement): unsignalized access allowing for full movement access located on NC 16 across from Old Beatty Road.
- Proposed Access "B" (Full-Movement): unsignalized access allowing for full movement located on Killian Road approximately 150 feet west of the NC 16 overpass.

## LEGEND



Traffic Signal

Stop Sign Control



1. Lucia Riverbend Highway & NC 16
2. Lucia Riverbend Highway & Killian Road
3. Lucia Riverbend Highway & Old Beatty Road-Access "A"
4. Killian Road & Access "B"

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## RIVERBEND PRESERVE PHASE 2 TIA

GASTON/ LINCOLN COUNTY, NC

THE SHAW TATE GROUP  
1030 S CALDWELL STREET  
CHARLOTTE, NC 28203

## AREA OF INFLUENCE

0 500' 1,000' N  
SCALE: 1" = 1,000'

PROJECT #: 811-001  
DRAWN BY: SA  
CHECKED BY: MW

MARCH 2020

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Figure 1





## **AREA CONDITIONS**

The area of influence of the site as defined by North Carolina Department of Transportation (NCDOT) staff includes the following three existing intersections and one proposed intersection: (See Appendix for the approved scoping information)

1. Lucia Riverbend Highway & NC 16 Business (signalized)
2. Lucia Riverbend Highway & Killian Road (signalized)
3. Lucia Riverbend Highway & Old Beatty Road-Access "A" (unsignalized)
4. Killian Road & Access "B"



**Old Beatty Road facing south towards  
proposed site**



**Old Beatty Road facing north towards  
proposed site**

Morning (7:00-9:00 AM) and afternoon (4:00-6:00 PM) peak period turning movement counts (TMCs) were conducted at intersections 1 and 2 on Tuesday May 14, 2019. The remaining intersection (#3) was counted on Thursday December 12, 2019. See Appendix for raw count data sheets.

According to the latest NCDOT Roadway Functional Classification data, Lucia Riverbend Highway (NC 16 Business) is a Minor Arterial with a posted speed limit of 50 or 55 mph (in the vicinity of the study area). The roadway is a two-lane undivided facility, with no bike lanes, curb/gutter, planting strip, or sidewalk present on either side of the roadway.

Killian Road is a secondary route with a posted speed limit of 55 mph. The roadway is a one-lane undivided facility, with no bike lanes, curb/gutter, planting strip, or sidewalk present on either side of the roadway in the vicinity of the site.



In addition to the intersection TMCs, geospatial information provided by NCDOT's ArcGIS portal (*Go! NC*), such as Annual average daily traffic (AADT) and crash data were collected.

AADT for two-way volumes on roadways within the area of influence are depicted in Table 1 based on latest 2016 data.

**Table 1: Average Annual Daily Traffic Volumes (vehicles per day)**

Roadway	AADT
Lucia Riverbend Highway west of NC 16 Business	7,900
Killian Road east of Lucia Riverbend Highway	1,100
Lucia Riverbend Highway south of Old Beatty Road	11,000

Crash frequency per intersection is reported in Table 2 with data ranging from January 1, 2014 to December 31, 2018.

**Table 2: Crash Data from 2014-2018**




Intersection	Severity Type			Total Crashes
	K Injury	B & C Injury Crashes	PDO Crashes	
Lucia Riverbend Hwy. & Stanley Lucia Rd.	0	1	5	6

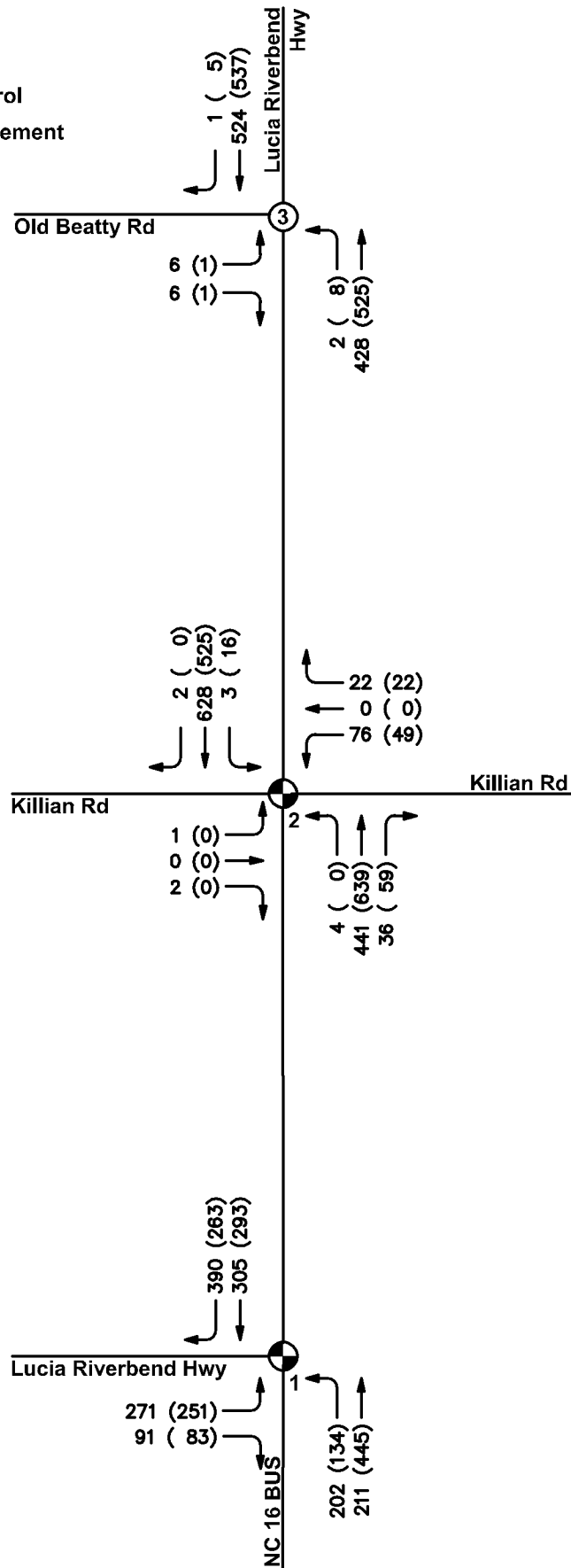
Notes:

**K:** Fatality **B:** B injury type (evident), **C:** injury type (possible), **PDO:** Property Damage Only

Figure 2 portrays the existing TMCs for the AM and PM peak hours. Figures 3A and 3B includes the directional distribution for the townhomes + retail site and the single-family site, respectively. These directional distribution percentages were approved by NCDOT staff on December 6, 2019 per existing traffic patterns.

# LEGEND

-  Traffic Signal
  -  Stop Sign Control
  -  Directional Movement
- VOLUMES: AM (PM)



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CHARLOTTE, NC 28203

## EXISTING PEAK HOUR TRAFFIC VOLUMES



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Raw Turning Movement Counts were collected on Tuesday May 14, 2019 for intersections 1 and 2.  
Raw Turning Movement Counts were collected on Thursday December 12, 2019 for intersection 3.  
Volumes were not balanced between intersections due to local businesses and subdivisions.

Figure 2

Townhomes + Retail



# RIVERBEND PRESERVE PHASE 2 TIA

GASTON/ LINCOLN COUNTY, NC

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 1030 S CALDWELL STREET  
 CHARLOTTE, NC 28203

## TOWNHOMES + RETAIL TRIP SITE DIRECTIONAL DISTRIBUTION

0 NTS  
 SCALE: NTS

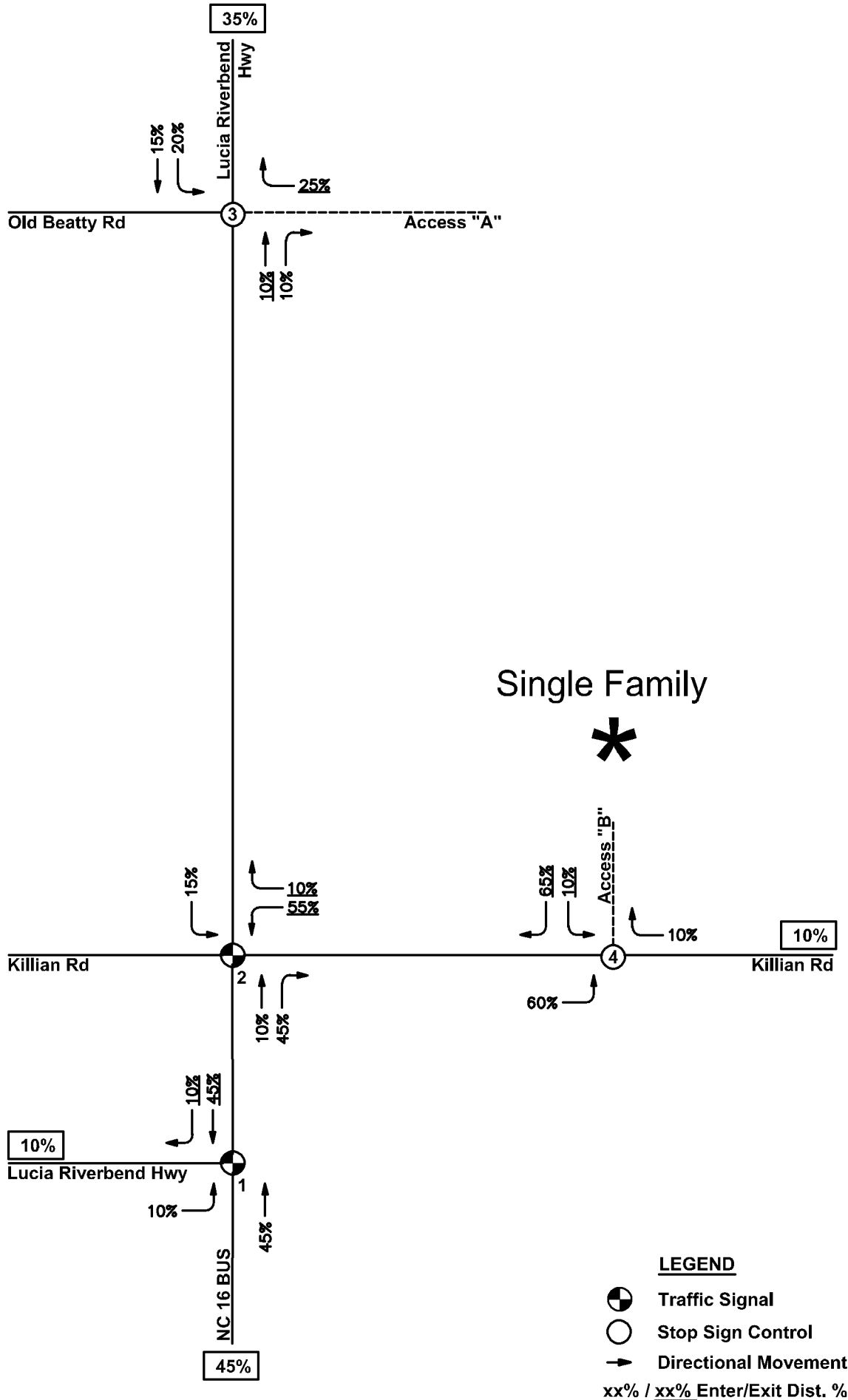
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Figure 3A





# RIVERBEND PRESERVE PHASE 2 TIA

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 CHARLOTTE, NC 28203

## SINGLE FAMILY SITE DIRECTIONAL DISTRIBUTION

0 NTS  
 SCALE: NTS

PROJECT #: 811-001  
 DRAWN BY: SA  
 CHECKED BY: MW

MARCH 2020

REVISIONS:

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Figure 3B



## PROJECTED TRAFFIC

The daily and peak-hour trip generation data for the site is presented in Table 3. Values derived for the anticipated trips generated by the site are obtained from the Institute of Transportation Engineers, Trip Generation Manual, 10<sup>th</sup> Edition, 2017.

**Table 3: Trip Generation**

Land Use [ITE Code]			Daily	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
Single-Family Housing [210]	250	DUs	2,416	46	137	183	155	91	246
<b>Single Family Total</b>			<b>2,416</b>	<b>46</b>	<b>137</b>	<b>183</b>	<b>155</b>	<b>91</b>	<b>246</b>
Multi-Family (Low-Rise) [220]	180	DUs	1,320	20	65	85	63	37	100
Retail [820]	50,000	DUs	3,753	110	68	178	157	170	327
Townhomes + Retail Subtotal			5,073	130	133	263	220	207	427
<i>Pass-By Reductions*</i>			-112	0	0	0	-56	-56	-112
<b>Townhomes + Retail w/ Reductions</b>			<b>4,961</b>	<b>130</b>	<b>133</b>	<b>263</b>	<b>164</b>	<b>151</b>	<b>315</b>
<b>Total Trips</b>			<b>7,377</b>	<b>176</b>	<b>270</b>	<b>446</b>	<b>319</b>	<b>242</b>	<b>561</b>

The trip generation results indicate that the development is expected to generate 446 total AM peak hour trips and 561 total PM peak hour trips.

The projected background traffic volumes used in the analyses were developed from the existing peak hour TMCs. Per NCDOT, a 2% per year growth rate was used for the 2024 background volumes. The No Build volumes for the AM and PM peaks are presented in Figures 4 and 5 respectively. The 2024 AM and PM peak hour Build traffic volumes are presented in Figures 6 and 7. The background traffic is indicated to the far left of the movement arrows, followed by the offsite traffic in square brackets, the Townhomes/Retail site traffic in curly brackets and Single Family site traffic parentheses. The four volumes are added to obtain the projected total traffic for that movement:

$$\text{Background} + [\text{Offsite}] + \{\text{Townhomes/Retail Trips}\} + (\text{Single Family Trips}) = \text{Total}$$

# LEGEND



Traffic Signal

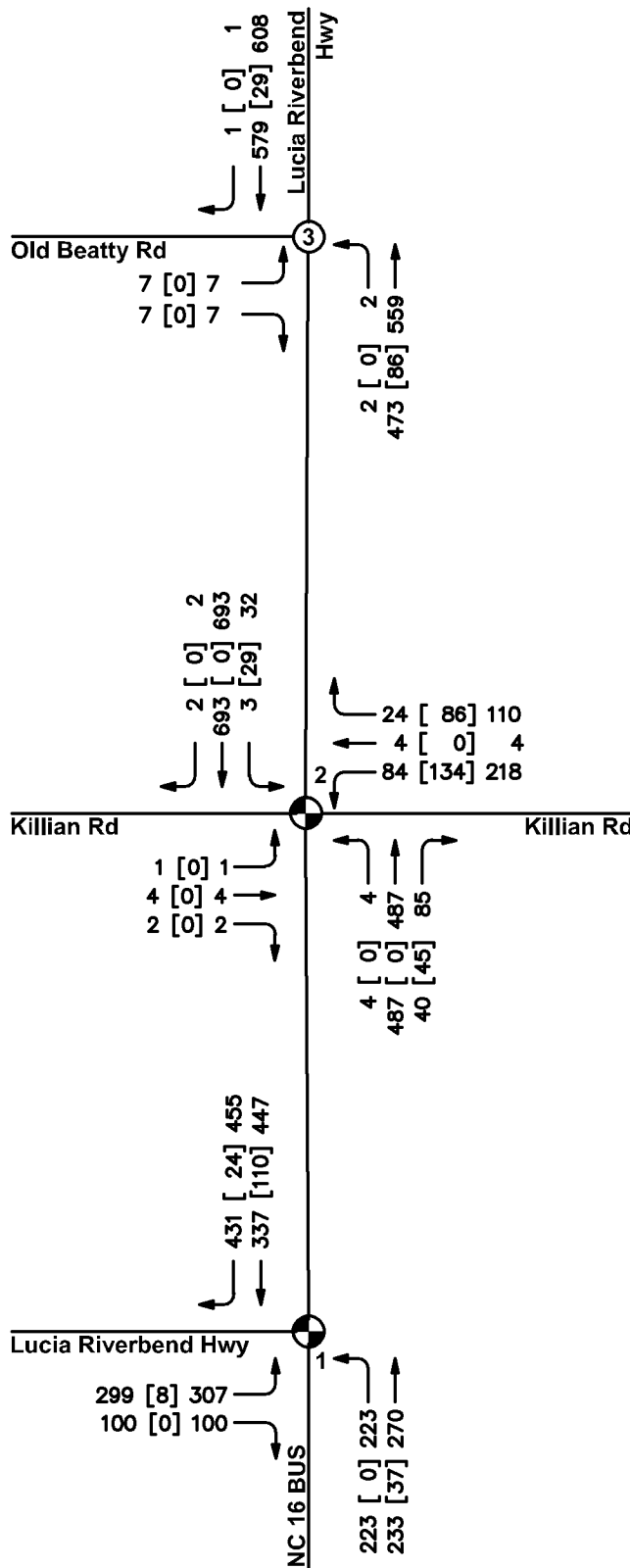


Stop Sign Control



Directional Movement

VOLUMES: Background [Offsite] Total



Existing count data were grown by a 2% compounded annual growth rate for No Build conditions.



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## RIVERBEND PRESERVE PHASE 2 TIA

GASTON/ LINCOLN COUNTY, NC

THE SHAW TATE GROUP

1030 S CALDWELL STREET  
CHARLOTTE, NC 28203

2024 NO BUILD  
CONDITIONS  
AM PEAK HOUR  
VOLUMES

0 NTS  
SCALE: NTS

PROJECT #: 811-001  
DRAWN BY: SA  
CHECKED BY: MW

MARCH 2020

REVISIONS:

1.	

Figure 4

# LEGEND



Traffic Signal

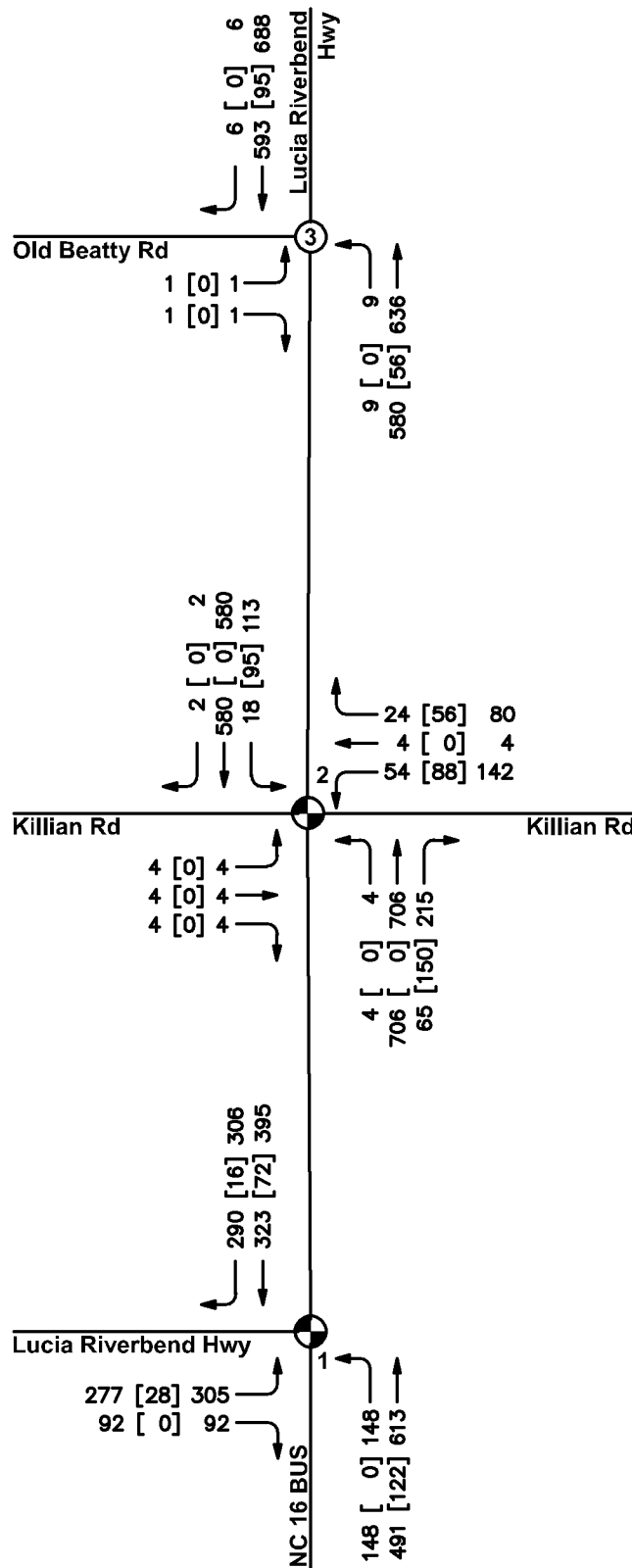


Stop Sign Control



Directional Movement

VOLUMES: Background [Offsite] Total



Existing count data were grown by a 2% compounded annual growth rate for No Build conditions.



LANDSCAPE ARCHITECTURE  
CIVIL ENGINEERING  
TRANSPORTATION PLANNING

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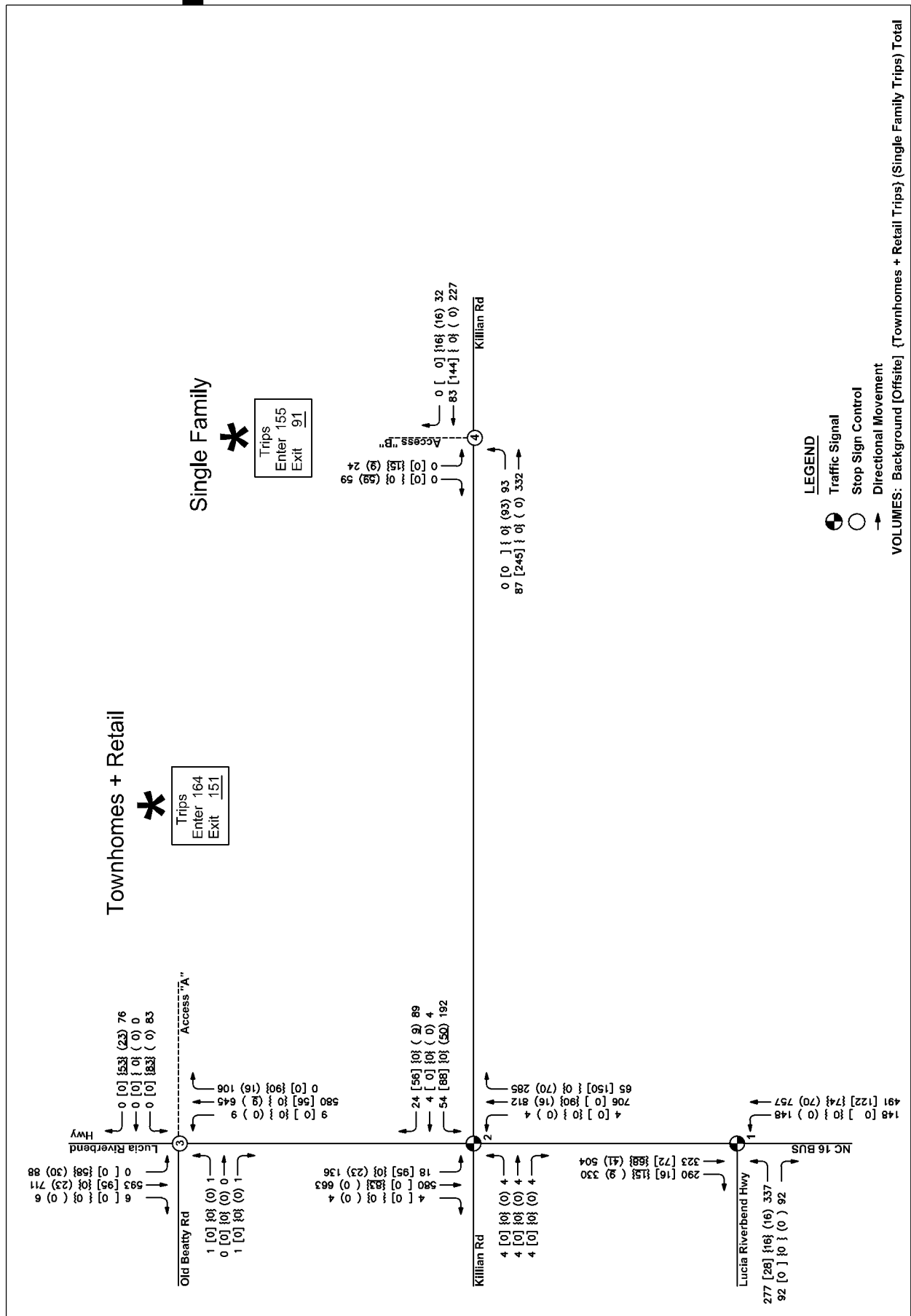
REVISIONS:

1.	

Figure 5



Figure 7



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## **TRAFFIC ANALYSIS**

The study intersections identified within the area of influence were analyzed to detect the traffic impact that the development has under the build-out year (2024). The traffic analysis evaluates following measures of effectiveness' (MOEs) and their respective criteria at the intersections assuming the future year conditions of 2024.

Level of service (LOS) of an intersection or approach is a qualitative MOE of traffic operations. It is a measure of average control delay in time within a peak period. The Transportation Research Board's Highway Capacity Manual<sup>1</sup> (HCM) defines the LOS thresholds established for signalized and unsignalized intersections per the following exhibits:

Intersection LOS	Exhibit 19-8 Signalized Intersection Control Delay per Vehicle (sec/vehicle)	Exhibit 20-2 Unsignalized Intersection Control Delay per Vehicle (sec/vehicle)
A	$\leq 10.0$	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$	$> 10.0$ and $\leq 15.0$
C	$> 20.0$ and $\leq 35.0$	$> 15.0$ and $\leq 25.0$
D	$> 35.0$ and $\leq 55.0$	$> 25.0$ and $\leq 35.0$
E	$> 55.0$ and $\leq 80.0$	$> 35.0$ and $\leq 50.0$
F	$> 80.0$	$> 50.0$

For the analysis of unsignalized intersections, intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. It should be noted that stop sign controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while most of the traffic moving through the intersection on the major street experiences little or no delay.

This report provides analysis of the traffic operations within the area of influence, according to the standards set by the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C", and Gaston County's UDO Section 5.11. It provides intersection improvements needed for mitigating traffic impacts. This study evaluates the following scenarios:

- 2019 Existing Conditions
- 2024 No Build Conditions
- 2024 Build-out Conditions

**NCDOT ANALYSIS REQUIREMENTS** - In order to determine the mitigation responsibility of the developer, this study compares 2024 Build results to the 2024 No Build results.

Per Chapter 5, Section J of the *August 2003 NCDOT Policy on Street and Driveway Access to North Carolina Highways*, the applicant shall be required to identify mitigation improvements to the roadway network if at least one of the following conditions exists when comparing base network conditions to project conditions:

---

<sup>1</sup> National Research Council. Transportation Research Board. Highway Capacity Manual 6<sup>th</sup> Ed., Washington, DC. 2016.



- *The total average delay at an intersection or an individual approach increases by 25% or greater, while maintaining the same level of service,*
- *The Level of Service (LOS) degrades by at least one level at an intersection or an individual approach,*
- *Or the Level of Service is “F” for an intersection or an individual approach.*

This section of the NCDOT access policy also states that, *mitigation improvements shall be identified when the analysis indicates that the 95<sup>th</sup> percentile queue exceeds the storage capacity of the existing lane.*

SYNCHRO 10.3 was the software tool used in determining the delay, capacity and corresponding LOS at the study intersections. SimTraffic 10.3, a traffic simulation software application for unsignalized and signalized intersections, was used to calculate the maximum queue lengths at the study intersections. The Synchro and SimTraffic results of each scenario is displayed per intersection and are presented in Tables 4 – 17.

Base assumptions for the analysis scenarios include:

- A 2% per year background growth rate between the existing 2019 and future 2024 conditions
- All study intersections and movements assume a 0.90 peak hour factor (PHF)
- Observed heavy vehicle percentages (from TMCs) were used in all analysis for all intersections, a minimum of 2% was applied to proposed intersections.
- A minimum of 4 vehicles was assumed for all allowed movements.
- Existing signal plans were used in the Existing, No Build and Build conditions, coded based on the NCDOT Congestion Management Capacity Analysis Guidelines (2015) See Appendix for existing signal plans:
  - Right turn on red (RTOR) was disabled
  - Permitted-Protected phasing was adjusted to protected only in future conditions
  - Minimum green time was adjusted per speed limit
  - Yellow and red times were adjusted to 5 seconds and 2 seconds, respectively with -2 seconds of lost time adjustment
  - Signals were coordinated in all future scenarios
  - Cycle lengths were adjusted to future minimums per phase
- Signal timings as given by the signal plan were utilized and the intersections were optimized through all future scenarios
- All future scenarios assume the improvements per approved Riverbend Preserve Phase 1 TIA at the intersection of Lucia Riverbend Highway & NC 16 Business and the intersection of Killian Road & NC 16 Business.
  - ❖ Lucia Riverbend Highway & NC 16 Business
    - Implement southbound right turn overlap phasing on NC 16 Business
    - Extend eastbound right turn lane to 150' on Lucia Riverbend Highway
  - ❖ Killian Road & NC 16 Business
    - Construct a separate westbound right turn lane with 175' storage on Killian Road
    - Remark the existing combined left-thru-right lane to a combined left-thru lane
    - Extend southbound left turn lane storage to 125' on NC 16 Business





## **1. NC 16 Business & Lucia Riverbend Highway**

**Table 4: NC 16 Bus. & Lucia Riverbend Hwy Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>Existing Conditions</b>						
Intersection	D	41.5	0.88	D	35.9	0.79
Eastbound - Lucia Riverbend Highway	D	48.5	-	D	40.1	-
Northbound - NC 16	D	38.7	-	C	31.5	-
Southbound - Lucia Riverbend Highway	D	39.6	-	D	38.1	-
<b>2024 No Build Conditions with Riverbend Preserve Phase 1 TIA Improvements</b>						
Intersection	C	27.7	0.80	C	22.5	0.74
Eastbound - Lucia Riverbend Highway	D	43.1	-	D	36.9	-
Northbound - NC 16	C	27.3	-	C	19.5	-
Southbound - Lucia Riverbend Highway	C	21.1	-	B	17.7	-
<b>2024 Build Conditions with Riverbend Preserve Phase 1 TIA Improvements</b>						
Intersection	C	31.2	0.89	C	24.0	0.82
Eastbound - Lucia Riverbend Highway	D	53.4	-	D	42.8	-
Northbound - NC 16	C	28.6	-	C	20.3	-
Southbound - Lucia Riverbend Highway	C	23.5	-	B	18.4	-

### **2019 Existing Conditions**

Currently the intersection operates with a LOS “D” in both peak hours.

### **2024 No Build Conditions**

With the inclusion of the growth in the background and future adjustments to the signal, the intersection operates with a LOS “C” in both peak hours.

### **2024 Build Conditions**

When comparing the impact of the 2024 Build to the 2024 No Build conditions the intersection LOS remains a “C” in both peak periods. The overall intersection delay increases between the No Build and Build scenarios by 13% in the AM peak hour and 7% in the PM peak hour.

It should be noted that improvements from Riverbend Preserve Phase 1 TIA will alleviate the traffic at this intersection with minimal queuing while the majority of the traffic moving through the intersection on the major street experiences little or no delay per Table 5.

**This intersection does not require further mitigation under NCDOT guidelines. Therefore, no developer required improvements at this intersection should be deemed necessary.**



**Table 5: NC 16 Bus. & Lucia Riverbend Hwy Queue Lengths**

Lucia Riverbend Highway/ @ NC 16 /Lucia Riverbend Highway	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 No Build Conditions with Riverbend Preserve Phase 1 TIA Improvements					
Eastbound Left-Turn (Lucia Riverbend Highway)	TERM.	#309'	302'	260'	403'
Eastbound Right-Turn (Lucia Riverbend Highway)	150'	98'	227'	84'	216'
Northbound Left-Turn (NC 16 )	TERM.	#244'	257'	#192'	202'
Northbound Thru (NC 16 )	-	110'	174'	344'	291'
Southbound Thru (Lucia Riverbend Highway)	TERM.	#416'	420'	307'	304'
Southbound Right-Turn (Lucia Riverbend Highway)	300'	281'	396'	m117'	181'
2024 Build Conditions with Phase 2 Improvements					
Eastbound Left-Turn (Lucia Riverbend Highway)	TERM.	#359'	391'	#328'	324'
Eastbound Right-Turn (Lucia Riverbend Highway)	150'	101'	248'	87'	250'
Northbound Left-Turn (NC 16 )	TERM.	#266'	325'	149'	218'
Northbound Thru (NC 16 )	-	138'	194'	463'	368'
Southbound Thru (Lucia Riverbend Highway)	TERM.	#530'	614'	#446'	493'
Southbound Right-Turn (Lucia Riverbend Highway)	300'	176'	400'	104'	344'



## **2. Lucia Riverbend Highway & Killian Road**

**Table 6: Lucia Riverbend Hwy & Killian Rd Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>Existing Conditions</b>						
Intersection	A	8.6	0.55	A	6.1	0.48
Eastbound - Killian Road	B	19.3	-	C	21.0	-
Westbound - Killian Road	C	26.5	-	C	24.7	-
Northbound - Lucia Riverbend Highway	A	5.9	-	A	5.2	-
Southbound - Lucia Riverbend Highway	A	7.7	-	A	4.5	-
<b>2024 No Build Conditions with Riverbend Preserve Phase 1 TIA Improvements</b>						
Intersection	C	20.5	0.78	C	20.2	0.78
Eastbound - Killian Road	C	24.8	-	C	32.2	-
Westbound - Killian Road	D	43.6	-	D	53.0	-
Northbound - Lucia Riverbend Highway	B	14.1	-	B	17.4	-
Southbound - Lucia Riverbend Highway	B	14.9	-	B	13.2	-
<b>2024 Build Conditions with Riverbend Preserve Phase 1 TIA Improvements</b>						
Intersection	C	25.9	0.89	C	28.9	0.92
Eastbound - Killian Road	C	23.3	-	C	31.3	-
Westbound - Killian Road	D	49.1	-	E	65.7	-
Northbound - Lucia Riverbend Highway	B	17.5	-	C	26.6	-
Southbound - Lucia Riverbend Highway	C	20.9	-	B	19.1	-
<b>2024 Build Conditions with Test Improvements (Westbound LTL)</b>						
Intersection	C	31.5	0.83	C	27.8	0.90
Eastbound - Killian Road	D	53.5	-	C	32.1	-
Westbound - Killian Road	E	56.8	-	E	64.5	-
Northbound - Lucia Riverbend Highway	C	25.3	-	C	24.1	-
Southbound - Lucia Riverbend Highway	C	23.3	-	B	19.9	-

### **2019 Existing Conditions**

Currently the intersection operates with a LOS "A" in both peak hours.

### **2024 No Build Conditions**

With the inclusion of the growth in the background and future adjustments to the signal, the intersection operates with a LOS "C" in both peak hours.

### **2024 Build Conditions**

When comparing the impact of the 2024 Build to the 2024 No Build conditions the intersection LOS remains a "C" in both peak hours. The overall intersection delay increases between the No Build and Build scenario is 26% in the AM peak hour and 43% in the PM peak hour. In addition, the some of the approaches exceed the allowable parameters in both peak hours.



### 2024 Build with Test Improvements Conditions

Based on NCDOT guidelines, the analysis results indicate the need to identify mitigation at the study intersection as means to improve LOS and delay.

The following improvements are suggested:

- Extend northbound right turn lane storage from 175 feet to 275 feet on Lucia Riverbend Highway
- Extend southbound left turn lane storage from 125 feet to 200 feet on Lucia Riverbend Highway

The following improvement was tested within the analysis:

- Westbound left turn lane on Killian Road

Assuming these improvements are in place, the intersection LOS remains a “C” in both peak hours. The overall intersection delay increases between the No Build and Build scenario is 54% in the AM peak hour and 38% in the PM peak hour.

This tested improvement showed minimal to no improvement to this intersection and therefore, is not suggested as a developer responsibility.

It should be noted that improvements from Riverbend Preserve Phase 1 TIA will alleviate the traffic at this intersection with minimal queuing while the majority of the traffic moving through the intersection on the major street experiences little or no delay per Table 7.

**Table 7: Lucia Riverbend Hwy & Killian Rd Queue Lengths**

Killian Road @ Lucia Riverbend Highway	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 No Build Conditions with Riverbend Preserve Phase 1 TIA Improvements					
Eastbound Left-Thru-Right (Killian Road)	-	18'	51'	21'	46'
Westbound Left-Thru (Killian Road)	TERM.	#226'	247'	#185'	165'
Westbound Right-Turn (Killian Road)	175'	104'	180'	90'	123'
Northbound Left-Thru (Lucia Riverbend Highway)	-	413'	206'	375'	415'
Northbound Right-Turn (Lucia Riverbend Highway)	175'	m46'	95'	95'	275'
Southbound Left-Turn (Lucia Riverbend Highway)	125	48'	137'	125'	185'
Southbound Thru-Right Turn (Lucia Riverbend Highway)	TERM.	400'	299'	194'	237'
2024 Build Conditions with Phase 2 Improvements					
Eastbound Left-Thru-Right (Killian Road)	-	18'	40'	21'	40'
Westbound Left-Thru (Killian Road)	TERM.	#328'	275'	#261'	209'
Westbound Right-Turn (Killian Road)	175'	113'	241'	99'	127'
Northbound Left-Thru (Lucia Riverbend Highway)	-	#510'	619'	#695'	616'
Northbound Right-Turn (Lucia Riverbend Highway)	175'	74'	275'	150'	275'
Southbound Left-Turn (Lucia Riverbend Highway)	125	56'	88'	#196'	170'
Southbound Thru-Right Turn (Lucia Riverbend Highway)	TERM.	534'	421'	254'	211'



### **3. Lucia Riverbend Highway & Old Beatty Road-Access “A”**

**Table 12: Lucia Riverbend Hwy & Old Beatty Rd-Access “A” Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>Existing Conditions</b>						
Eastbound - Old Beatty Road	C	16.4	-	C	17.9	-
Northbound - Lucia Riverbend Highway	A	0.0	-	A	0.1	-
Southbound - Lucia Riverbend Highway	A	0.0	-	A	0.0	-
<b>2024 No Build Conditions with Riverbend Preserve Phase 1 TIA Improvements</b>						
Eastbound - Old Beatty Road	C	20.2	-	C	23.9	-
Northbound - Lucia Riverbend Highway	A	0.1	-	A	0.1	-
Southbound - Lucia Riverbend Highway	A	0.0	-	A	0.0	-
<b>2024 Build Conditions with Riverbend Preserve Phase 1 TIA Improvements</b>						
Eastbound - Old Beatty Road	C	21.4	-	D	28.6	-
Westbound - Access "A"	C	16.0	-	E	42.5	-
Northbound - Lucia Riverbend Highway	A	0.0	-	A	0.1	-
Southbound - Lucia Riverbend Highway	A	0.8	-	A	1.1	-
<b>2024 Build Conditions with Phase 2 Improvements</b>						
Eastbound - Old Beatty Road	C	21.3	-	D	27.5	-
Westbound - Access "A"	C	23.2	-	E	36.9	-
Northbound - Lucia Riverbend Highway	A	0.1	-	A	0.1	-
Southbound - Lucia Riverbend Highway	A	0.8	-	A	1.1	-

#### **2019 Existing Conditions**

Currently the worst approach of the intersection (Eastbound-Old Beatty Road) operates with a LOS “C” both peak hours.

#### **2024 No Build Conditions**

With the inclusion of the growth in the background, the worst approach of the intersection (Eastbound-Old Beatty Road) remains at a LOS “C” in both peak hours.

#### **2024 Build Conditions**

When comparing the impact of the 2024 Build to the 2024 No Build conditions, the worst approach of the intersection (Eastbound-Old Beatty Road) operates at a “C” in the AM peak hour and becomes a “D” in the PM peak hour. The eastbound delay increases between the No Build and Build scenario is 6% in the AM peak hour and 20% in the PM peak hour.

It should be noted that stop sign controlled streets/driveways intersecting major streets typically experience long delays during peak hours, while the majority of the traffic moving through the intersection on the major street experiences little or no delay.



### 2024 Build with Improvements Conditions

We propose the following intersection configuration:

- Align east/west approaches to a four-legged intersection (right-of-way to be acquired to ensure alignment)
- Construct a southbound left turn lane with 100 feet of storage on Lucia Riverbend Highway
- Construct northbound left turn lane with 100 feet of storage on Lucia Riverbend Highway to allow for intersection alignment
- Construct northbound right turn lane with 100 feet of storage on Lucia Riverbend Highway
- One ingress and two egress lanes (a westbound thru-right turn lane and left turn lane with 200' storage) on Proposed Access "A"
- Minimum internal protected stem of 200'

Assuming these improvements are in place, the worst approach of the intersection (Eastbound-Old Beatty Road) operates at a "C" in the AM peak hour and becomes a "D" in the PM peak hour (both of which are considered acceptable based on NCDOT guidelines). Sight distance should be verified by site-civil engineer during permitting process.

**Table 13: Lucia Riverbend Hwy & Old Beatty Road-Access "A" Queue Lengths**

Old Beatty Road/ @ Lucia Riverbend Highway	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 No Build Conditions with Riverbend Preserve Phase 1 TIA Improvements					
Eastbound Left-Right Turn (Old Beatty Road)	-	5'	32'	3'	22'
Northbound Left-Thru (Lucia Riverbend Highway)	-	0'	50'	0'	84'
2024 Build Conditions with Phase 2 Improvements					
Eastbound Left-Thru-Right (Old Beatty Road)	-	8'	29'	5'	50'
Westbound Left-Turn (Access "A")	150'	43'	93'	78'	193'
Westbound Thru-Right (Access "A")	-	20'	85'	23'	80'
Northbound Left-Turn (Lucia Riverbend Highway)	100'	0'	24'	0'	27'
Northbound Thru-Right (Lucia Riverbend Highway)	-	0'	10'	0'	37'
Southbound Left-Turn (Lucia Riverbend Highway)	100'	5'	44'	10'	68'



#### 4. Killian Road & Access "C"

**Table 16: Killian Rd & Access "C" Analysis Results**

Approach	AM Peak Hour			PM Peak Hour		
	LOS	Delay (sec/veh)	Capacity (v/c)	LOS	Delay (sec/veh)	Capacity (v/c)
<b>2024 Build Conditions with Phase 2 Improvements</b>						
Eastbound - Killian Road	A	1.5	-	A	1.8	-
Westbound - Killian Road	A	0.0	-	A	0.0	-
Southbound - Access "B"	B	11.7	-	B	12.4	-

#### 2024 Build with Improvements Conditions

We propose the following intersection configuration:

- Construct an eastbound left turn lane with 100 feet of storage on Killian Road
- One ingress and two egress lanes (a terminating southbound right turn lane and left turn lane with 100' storage) on Proposed Access "B"
- Minimum internal protected stem of 100'

Assuming these improvements are in place, the worst approach of the intersection (Southbound-Access "B") operates at a "B" in the AM peak hour and becomes a "B" in the PM peak hour. (both of which are considered acceptable based on NCDOT guidelines). Sight distance should be verified by site-civil engineer during permitting process.

**Table 17: Killian Rd & Access "C" Queue Lengths**

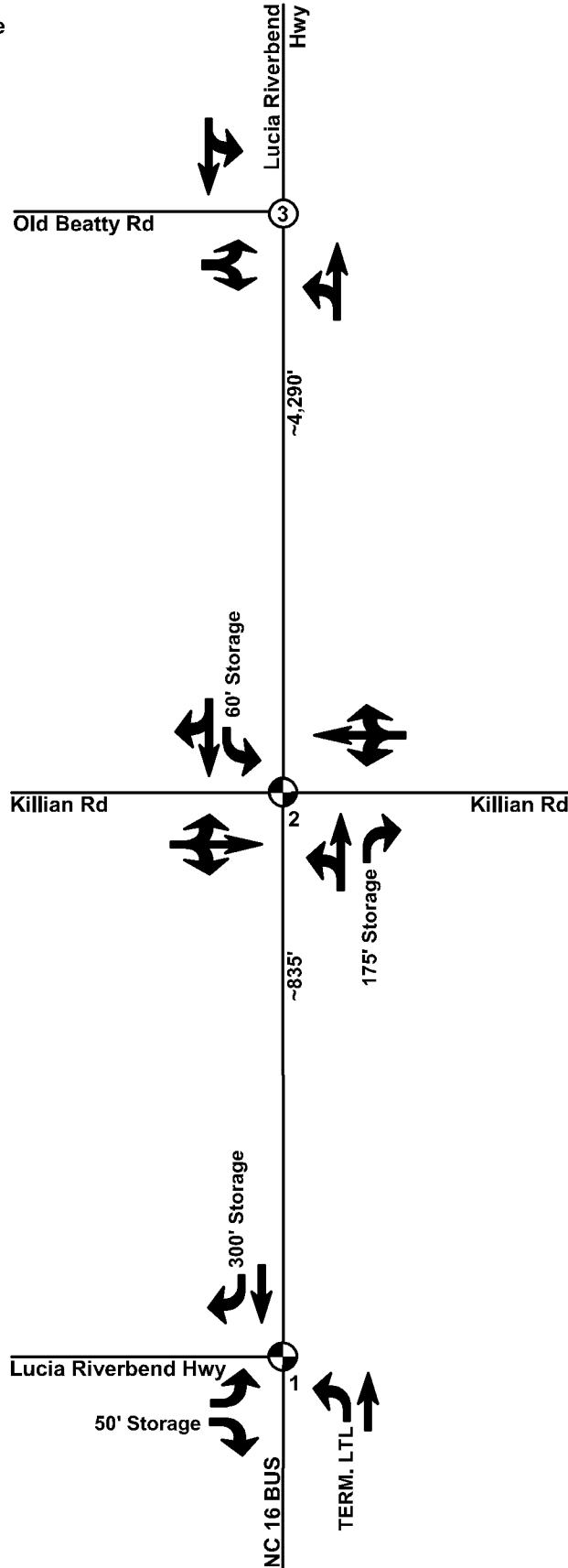
Killian Road @ /Access "B"	Storage (ft)	AM PEAK		PM PEAK	
		95th % Queue	Max Queue	95th % Queue	Max Queue
2024 Build Conditions with Phase 2 Improvements					
Eastbound Left-Turn (Killian Road)	100	3'	33'	8'	69'
Southbound Left Turn (Access "B")	-	5'	35'	8'	35'
Southbound Right Turn (Access "B")	-	13'	80'	8'	63'

Analysis software result reports per scenario are provided in the Appendix.

The existing/suggested laneage is shown on Figures 8 and 9.

# LEGEND

-  Traffic Signal
-  Stop Sign Control
-  Existing Laneage



LANDSCAPE ARCHITECTURE  
CIVIL ENGINEERING  
TRANSPORTATION PLANNING

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## RIVERBEND PRESERVE PHASE 2 TIA

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1030 S. CALDWELL STREET  
CHARLOTTE, NC 28203

### EXISTING LANEAGE



PROJECT #: 811-001  
DRAWN BY: SA  
CHECKED BY: MW

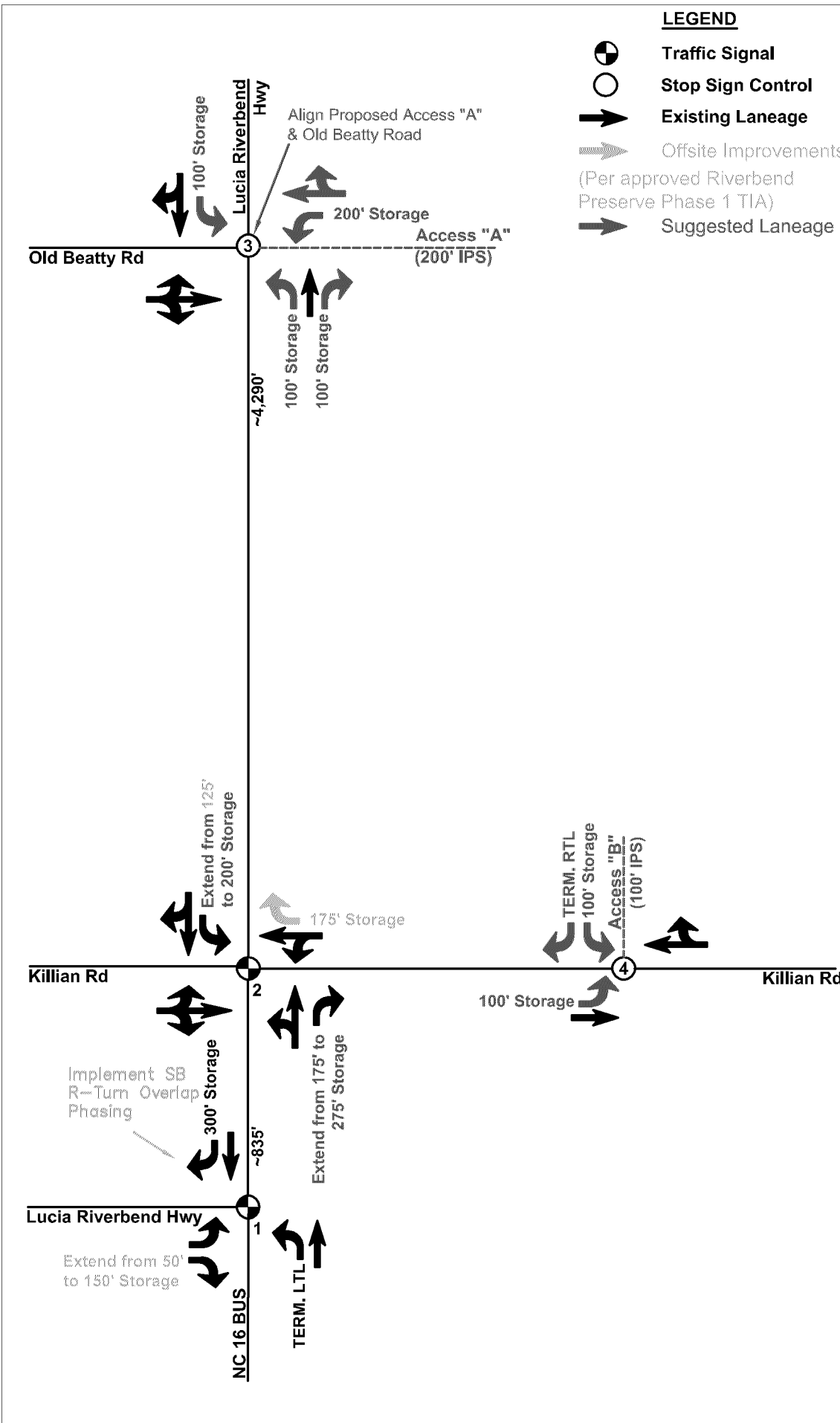
MARCH 2020

REVISIONS:

1.	

Figure 8





LANDSCAPE ARCHITECTURE  
CIVIL ENGINEERING  
TRANSPORTATION PLANNING

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## RIVERBEND PRESERVE PHASE 2 TIA

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THE SHAW TATE GROUP  
1030 S. CALDWELL STREET  
CHARLOTTE, NC 28203

## SUGGESTED LANEAGE



PROJECT #: 811-001  
DRAWN BY: SA  
CHECKED BY: MW

MARCH 2020

REVISIONS:  
1. Revised per Com.Mgmt, comments 5/18/2020

Figure 9



## **CONCLUSION**

In conclusion, it was determined that Riverbend Preserve Phase 2 site development will not significantly affect the operations of vehicular traffic on the adjacent roadways with both these suggested improvements as well as, the suggested intersection improvements/enhancements from the approved Riverbend Preserve Phase 1 Traffic Impact Analysis.



## APPENDIX



# Gaston County

Gaston County  
Board of Commissioners  
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## Building and Development Services Board Action

File #: 23-113

Commissioner Brown - Building & Development Services - Zoning Map Change: Conditional District REZ-23-01-06-00138, Riverbend Preserve LLC (Applicant); Property Parcels: Portion of 202649, 226548, and 304413 (Residential and Commercial Development Area), located at NC 16 and Killian Rd., Stanley, NC, Rezone from (R-1) Single Family Limited with (SH) Special Highway and (US) Urban Standards Overlays to the (CD/C-1) Conditional Light Commercial and (CD/RS-8) Conditional Single Family 8,000 sqft. Zoning Districts with Special Highway (SH) and Urban Standards (US) Overlays

### STAFF CONTACT

Jamie Kanburoglu - Director of Planning and Zoning - 704-862-5510

### BACKGROUND

Chapter 5 of the Unified Development Ordinance requires a public hearing by the Commission, with recommendation by the Planning Board prior to consideration for final action by the Commission. Riverbend Preserve LLC (Applicant); Property Parcel: Portion of 202649, 226548, and 304413 (Residential and Commercial Development Area), located at NC 16 and Killian Rd., Stanley, NC, Rezone from (R-1) Single Family Limited with (SH) Special Highway and (US) Urban Standards Overlays to the (CD/C-1) Conditional Light Commercial and (CD/RS-8) Conditionals Single Family 8,000 sqft. Zoning Districts with Special Highway (SH) and Urban Standards (US) Overlays. A public hearing was advertised and held on March 28, 2023 with Public Hearing comments being on file in the Board of Commission Clerk's Office. Planning Board recommendation was provided on March 6, 2023, and the Commission is requested to consider the public hearing comment, Planning Board recommendation and other pertinent information, then (approve), (disapprove) or (modify) the map change.

### ATTACHMENTS

Resolution, Staff Report, Application Packet, Maps, Site Plan, MPO Comments, & TIA Documents

DO NOT TYPE BELOW THIS LINE

I, Donna S. Buff, Clerk to the County Commission, do hereby certify that the above is a true and correct copy of action taken by the Board of Commissioners as follows:

NO.	DATE	M1	M2	CBrown	CCloninger	AFraley	BHovis	KJohnson	TKelgher	RWorley	Vote
2023-085	03/28/2023	CB	AF	A	A	A	A	A	N	A	6 - 1

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