



Z-17-10-003

City of Greensboro Planning Department Zoning Staff Report and Plan Amendment Evaluation

Zoning Commission Hearing Date: October 16, 2017

GENERAL INFORMATION

APPLICANT	Byron Development, LLC
HEARING TYPE	Original Zoning Request
REQUEST	Rezone from County AG (Agricultural) to City CD-RM-8 (Conditional District Residential Multifamily).
CONDITIONS	1. Use limited to a maximum of 240 residential dwelling units.
LOCATION	4622 McKnight Mill Road
PARCEL ID NUMBER(S)	0126903
PUBLIC NOTIFICATION	The notification area for this public hearing was 600 feet (Chapter 30-4-1.4 of the Land Development Ordinance requires notification of the owner of that parcel of land and the owners of all parcels of land adjoining and contiguous to that parcel of land as shown on the County tax listing). 84 notices were mailed to those property owners in the mailing area.
TRACT SIZE	64.336 Acres
TOPOGRAPHY	Undulating
VEGETATION	Residential

SITE DATA

Existing Use	Undeveloped
Adjacent Zoning	Adjacent Land Uses
N County CU-SC (Conditional Use Shopping Center)	Undeveloped
CD-RM-12 (Conditional District Multifamily)	Townhomes and undeveloped

E	County RS-30 (Residential Single Family) County AG	Single family dwellings
W	County RS-30-MH (Residential Single Family Manufactured Housing) County AG	Manufactured dwellings Single family dwellings
S	County AG (Agricultural) R-3 (Residential Single Family)	Single family dwellings and Undeveloped

Zoning History

Case #	Date	Request Summary
N/A	N/A	The subject property is not currently within the City of Greensboro’s jurisdiction

ZONING DISTRICT STANDARDS

District Summary *

Zoning District Designation:	Existing (County AG)	Requested (City CD-RM-8)	
Max. Density:	N/A	Limited to maximum 240 residential multifamily units	
Typical Uses	Primarily intended to accommodate uses of an agricultural nature, including farm residences	Primarily intended to accommodate low to medium density single-family detached residential development.	Primarily in an

*These regulations may not reflect all requirements for all situations; see the City of Greensboro Land Development Ordinance for all applicable regulations for site requirements for this zoning district.

SPECIAL INFORMATION

Overlay District Ordinance/Historic Preservation

N/A

Environmental/Soils

Water Supply Watershed Site drains to N. Buffalo Creek, Non-watersupply watershed

- Floodplains >2000FT
- Streams Streams onsite require a 50ft Jordan Lake buffer measured from top of bank on each side.
- Other: If >1acre is disturbed *AND* the impervious (BUA) amount is increased, site must meet Phase 2 requirements – Water Quality and Water Quantity Control must be addressed.

Utilities

Potable Water Request a water/sewer feasibility from Kenny Treadway 336-373-2897

Waste Water See above

Airport Overlay District & Noise Cone

N/A

Landscaping & Tree Conservation Requirements

Landscaping:

Street Yard: Street planting yards must be installed abutting public street rights-of-way. The required street planting yard must have a minimum width of 10 feet (as measured from the outside edge of the right-of-way or the back of the sidewalk, whichever is further from the street centerline) and include at least 2 canopy trees and 17 shrubs per 100 linear feet of required street planting yard, not including allowed driveways.

Buffer Yard: Adjacent to single family residential: Type C buffer yard, with an average width of 15', a minimum width of 10', and a planting rate of 2 canopy trees, 3 understory trees, and 17 shrubs per 100 linear feet.

Adjacent to vacant property or multi-family residential: Vehicular Use Area buffer yard (see below) between any parking lot or drive aisle and the adjacent property line.

Parking lot: When a parking lot or other vehicular use area abuts a vacant site or a site with the same land use classification as the subject site, a planting yard with a minimum width of 5 feet must be provided between the parking lot/vehicular use area and the abutting (interior) property line. This required planting area must be landscaped with at least 2 understory trees and 18 evergreen shrubs per 100 linear feet.

Trees for required parking spaces: 1 canopy tree per 12 spaces, in islands or medians within the parking lot.

Tree Conservation:

For 65 acres, 10% of parcel size in critical root zone to be dedicated for Tree Conservation.

Transportation

Street Classification:	McKnight Mill Road – Minor Thoroughfare. Briar Run Drive – Local Street.
Site Access:	All access(s) must be designed and constructed to the City of Greensboro standards.
Traffic Counts:	McKnight Mill Road ADT = 2,000 (NCDOT, 2016).
Trip Generation:	24 Hour = 2,285, AM Peak Hour = 180, PM Peak Hour = 240.
Sidewalks:	Sidewalks are a requirement of the Development Ordinance. 5' sidewalk with a 5' grass strip is required along both sides of thoroughfares. 5' sidewalk with a 3' grass strip is required along one side (at a minimum, collectors may require sidewalk on both sides) of all other street types. Sidewalk does not exist along the frontage of this property.
Transit in Vicinity:	No.
Traffic Impact Study: (TIS)	Yes, required per TIS Ordinance. Please see the end of this staff report for the Executive Summary of the DRAFT TIS.
Street Connectivity:	N/A.
Other:	N/A.

IMPACT/POLICY ANALYSIS**Land Use Compatibility**

The proposed **CD-RM-8 (Conditional District – Residential Multifamily – 8 du/ac)** zoning, as conditioned, would allow land uses that are compatible with the general character of the area.

Connections 2025 Comprehensive Plan Policies

The Generalized Future Land Use Map designates this location as **Mixed Use Commercial, Moderate Residential (5-12 d.u./acre)**, and **Interim Node of Mixed Use**. The requested **CD-RM-8 (Conditional District – Residential Multifamily – 8 du/ac)** zoning district, as conditioned, is generally inconsistent with the **Moderate Residential (5-12 d.u./acre)** and **Interim Node of Mixed Use** GFLUM designations, however the applicant has concurrently submitted a request (CP 17-09) to amend the GFLUM designation on the subject site to **Low Residential (3-5 d.u./acre)** which, if approved, would resolve this inconsistency. The Growth Strategy Map designates the subject site as being within **Growth Tier 1, Current Growth Area (2013 – 2019)**.

Connections 2025 Written Policies

Land Use Goal 4.3 – Growth at the Fringe: Provide a development framework for the fringe that guides sound, sustainable patterns of land use, limits sprawl, protects rural character, evidences sound stewardship of the environment, and provides for efficient provision of public services and facilities as the City expands. Development will increase density and mix land uses at a pedestrian scale with sidewalks, bikeways, and where possible, public transit.

Policy 4F: Initiate a fringe area growth management framework comprising the following elements.

Policy 4G: Improve the quality and patterns of development through incentives and regulatory guidelines.

Community Character, Goal 5.2 – Man-Made Environment: Preserve and enhance the character and visual quality of Greensboro’s built environment, including historic resources, private developments, and public landscapes.

Policy 5E: Improve the aesthetic quality of publicly owned and maintained landscapes.

Policy 5F: Implement and improve design standards governing the appearance of development from public roadways.

Housing and Neighborhoods, Goal 6: Meet the needs of present and future Greensboro citizens for a choice of decent, affordable housing in stable, livable neighborhoods that offer security, quality of life, and the necessary array of services and facilities.

Policy 6C: Promote the diversification of new housing stock to meet the needs of all citizens for suitable, affordable housing.

Economic Development, Goal 7: Promote a healthy, diversified economy with a strong tax base and opportunities for employment, entrepreneurship and for-profit and non-profit economic development for all segments of the community, including under-served areas such as East Greensboro.

Policy 7A: Target city investment and regulatory policies for economic development.

Policy 7C: Ensure that city land use policies and regulations allow for an adequate supply of land to accommodate economic development.

Transportation, Goal 8: Develop and maintain a safe, efficient, and environmentally sound transportation system that provides convenient choices for accessing destinations throughout Greensboro and the Triad, including a range of well-integrated transit, pedestrian, and bicycle linkages.

Policy 8A: Maintain a roadway network that safely and efficiently accommodates vehicular traffic while supporting other community objectives defined in the Comprehensive Plan.

Connections 2025 Map Policies

Moderate Residential (5-12 d.u./acre): This category accommodates housing types ranging from small-lot, single-family detached and attached single-family dwellings such as townhomes to moderate density, low-rise apartment dwellings.

Mixed Use Commercial: This designation is intended to promote a mix of uses, of which various commercial uses remain predominant, but where residential, service, and other uses are complementary. Where applied to older highway corridors characterized by “strip” commercial uses, the intent is to encourage infill and redevelopment for a more diverse and attractive mix of uses over time. Examples include residential units over commercial uses or a wider array of economically viable uses to replace obsolete uses. Such areas also may represent opportunities for the introduction of substantial higher density and/or mixed-income housing, with negligible impacts on, or resistance from, nearby single-family neighborhoods. Ensuring that buildings are of the appropriate scale and intensity is critical, as is ensuring that sites are designed in a coordinated, as opposed to a lot-by-lot, manner. New “strip” commercial development is discouraged.

Interim Node of Mixed Use: Areas with a mixture of uses of high and moderate intensity, primarily providing services to the surrounding area (e.g. small to mid-size shopping areas that could include higher density housing, office, and institutional uses). These nodes are typically focused in the vicinity of local access interchanges at major roadway intersections.

Growth Tier 1, Current Growth Area (2013 – 2019): Where infrastructure systems are in place, can be economically provided and/or will be proactively extended and where continued annexation and consolidation of the City’s development pattern shall be encouraged over the next six years.

Low Residential (3-5 d.u./acre): This category includes the City's predominantly single-family neighborhoods as well as other compatible housing types that can be accommodated within this density range. Although there are some existing residential areas in the City developed on lots greater than 1/3 acre, future residential developments and "conventional" subdivisions should generally maintain a gross density of no less than three dwellings per acre, except where environmental constraints (e.g., the Watershed Critical Area) prevent such densities from being achieved. Compact developments that include clustered, small lots with substantial retained open space are encouraged.

Comprehensive Plan Amendment History

Case #	Date	Request Summary
n/a	n/a	n/a

Applicant Stated Reasons for Request

“Developer proposes to develop the property with a maximum of 240 Residential Dwelling Units which yields a density of 3.5 Units an Acre. The property currently has two Land Use designations. Mixed Commercial on the Northern portion of the property and moderate Density Residential (5 to 12 Units an Acre) on the Southern Portion. An original Zoning Designation of RM-8 is being requested for the Property. The property is currently in the County and Zoned AG.”

Explain in detail the conditions that you think may warrant a Plan Amendment – Per Applicant and Application

“The requested Map Amendment would result in less Units than what could have been built on the property. Current Market Conditions would not support Higher Density at this location and since the project fronts on a secondary road a Commercial Development is very unlikely to be successful.”

COMPREHENSIVE PLAN POLICY ANALYSIS

Need for Proposed Change

The requested **CD-RM-8 (Conditional District – Residential Multifamily – 8 du/ac)** zoning, as conditioned, would allow uses that are incompatible with the subject site’s current GFLUM designations as **Mixed Use Commercial, Moderate Residential (5-12 d.u./acre), and Interim Node of Mixed Use**. If approved, the requested GFLUM amendment (**CP 17-09**) to **Low Residential (3-5 d.u./acre)** would resolve this inconsistency.

Effect of the proposed Change on the Need for City Services and Facilities (e.g. roadway level of service).

n/a

Implications, if any, the Amendment may have for Other Parts of the Plan

n/a

Unforeseen Circumstances or the Emergence of New Information (e.g. significant economic opportunity in Tier 2 or 3)

n/a

PLANNING BOARD COMMENTS

The Planning Board reviewed the GFLUM amendment request CP 17-09 during its meeting on September 20, 2017. The Planning Board commented that the size of the request is positive, with additional low residential to the south and mixed use residential to the north, the proposed change will allow residential development to catch up to demands in the area. The Board added that the requested change is a perfect way to bridge existing land uses, and will benefit the City for years to come. The Board concluded that the request is a great thing for the area.

CONFORMITY WITH OTHER PLANS

City Plans

Sustainability Action Plan

Element 1) Transportation and Land Use:

Policy 1) Encourage increased density, a mix of land uses and more integrated links between transportation and land use through changes to Greensboro's Comprehensive Plan, Development Ordinance and other related plans.

Element 2) Green Jobs and Buildings:

Policy 3) Develop a coordinated City program to provide technical support, energy audits and education and outreach to increase energy efficiency and conservation in commercial and residential buildings.

Policy 4) Use a combination of code changes, incentives, partnerships and education to promote green building in Greensboro.

Policy 6) Promote more efficient use of water through education, partnerships and pilot projects.

Element 3) Waste Reduction and Recycling:

Policy 7) Employ a combination of expanded recycling infrastructure, regulations and incentives to increase Greensboro's solid waste diversion and recycling rates.

Element 6) Education and Outreach:

Policy 11) Provide technical support, awards and recognition to individuals and organizations furthering Greensboro's energy and sustainability efforts.

Other Plans

n/a

STAFF ANALYSIS AND RECOMMENDATION

Community Outreach

Applicant is strongly encouraged to discuss this proposed rezoning and development with owners of surrounding properties.

The subject site is located within the areas eligible for the following economic development incentive or assistance programs:

- New Markets Tax Credits (federal), and
- Economic Development Impact Zone 2 (local).

Staff Analysis

The 65 acre subject site is currently outside the City's jurisdiction and is currently undeveloped. Uses to the north are undeveloped and townhomes (zoned County CU-SC and City CD-RM-12), to the east are single family dwellings (zoned County RS-30 and County AG), to the south are single family dwellings and undeveloped properties (zoned City R-3 and County AG) and to the west are single family dwellings and manufactured dwellings (zoned County RS-30 MH).

The Comprehensive Plan's Future Land Use Map currently designates this area primarily as Mixed Use Commercial and Moderate Residential. The Mixed Use Commercial designation is intended to promote a mix of uses, of which various commercial uses remain predominant, but where residential, service, and other uses are complementary. The Moderate Residential designation accommodates housing types ranging from small-lot, single-family detached and attached single-family dwellings such as townhomes to moderate density, low-rise apartment dwellings.

The proposed scale of residential development provides additional housing choices in relatively close proximity to commercial and service uses and the scale of the proposed development complements adjacent lower density single family residential development. The proposed request does support the Comprehensive Plan's Growth at the Fringe goal Provide a development framework for the fringe that guides sound, sustainable patterns of land use, limits sprawl, protects rural character, evidences sound stewardship of the environment, and provides for efficient provision of public services and facilities as the City expands. It also supports the Housing and Neighborhoods Goal to meet the needs of present and future Greensboro citizens for a choice of decent, affordable housing in stable, livable neighborhoods that offer security, quality of life, and the necessary array of services and facilities.

This request is consistent with the intent and purpose of the zoning code, the Comprehensive Plan (Connections 2025) and is generally compatible with the existing development and trend in the surrounding area.

Staff Recommendation

Staff recommends **approval** of the requested **CD-RM-8** (Conditional District Residential Multifamily) zoning district.

Additional Information
McKnight Mill Road Development – DRAFT Transportation Impact Analysis
Greensboro, NC
Prepared for Byron Development, LLC
October 5, 2017

Executive Summary

The McKnight Mill Road Development is located between Hicone Road and Link Road on McKnight Mill Road in Greensboro, North Carolina. The site plan consist of 240 single family homes. The site plan currently shows three (3) accesses, two (2) on McKnight Mill Road and a connector to an existing access on Briar Run Drive. Figure 1 shows the site plan. The site location and vicinity map are illustrated in Figures 2A and 2B, respectively.

DAVENPORT was retained to determine the potential traffic impacts of this development and to identify transportation improvements that may be required to accommodate the impacts of both background traffic and new development traffic. The following intersections were included in the study:

- US 29 Southbound Ramp at Hicone Road
- US 29 Northbound Ramp at Hicone Road
- McKnight Mill Road at Hicone Road
- McKnight Mill Road at Link Road
- Briar Run Drive at Link Road
- Rankin Mill Road at Link Road
- McKnight Mill Road at Site Access 1
- McKnight Mill Road at Site Access 2

Though the development is planned to construct +/- 50 single family homes a year over the next six (6) years, it was decided to analyze the development at existing plus five (5) years at full build. The intersections were analyzed during the AM (7-9 am) and PM (4-6 pm) peaks for the following conditions:

- 2017 Existing Conditions
- 2022 Future No Build Conditions
- 2022 Future Build Conditions
- 2022 Future Build Condition with Mitigation (if necessary)

Additionally, the proposed site is located in close proximity to US 29, which is currently under construction as part of North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) U-2525BC. This project will improve the interchange at Hicone Road and US 29. In the scoping process, an analysis was requested for the 2040 design year for this interchange and its immediate vicinity.

- 2040 Future Design Year No Build Conditions
- 2040 Future Design Year Build Conditions
- 2040 Future Design Year Build Conditions with Improvements

The Greensboro Department of Transportation (GDOT) and NCDOT were contacted to obtain background information and to ascertain the elements to be covered in this Transportation Impact Analysis (TIA). This project was scoped with GDOT and information can be found in the appendix. Information regarding the property was provided by the Evans Engineering.

Discussion of Results

The following section discusses level of service for each intersection.

US 29 Southbound Ramp at Hicone Road

This signalized intersection currently operates at LOS B during the AM and PM peaks. In 2022 future no build conditions and with addition of proposed site traffic, LOS C is expected to remain in the AM and PM peaks. Therefore, no improvements are recommended.

US 29 Northbound Ramp at Hicone Road

This signalized intersection currently operates at LOS D during the AM and PM peaks. In 2022 future no build conditions and with addition of proposed site traffic, which include the committed improvements, LOS D is expected to remain in the AM and PM peaks. Therefore, no improvements are recommended.

McKnight Mill Road at Hicone Road

This unsignalized intersection currently operates at LOS D during the AM and PM peaks. In 2022 future no build condition, LOS E is expected in the AM and PM peaks. With the addition of site traffic, this intersection is expected to operate at LOS F in the AM and PM peaks. A LOS E/F at an unsignalized intersection is attributed to the lack of gaps for a minor street left turn movement. This is typical at stop-controlled approaches onto major streets such as Hicone Road. To improve the delay at this intersection, it is recommended to provide an eastbound right turn lane with 100 feet of storage and appropriate taper and a northbound right turn lane with 100 feet of storage and appropriate taper.

McKnight Mill Road at Link Road

This unsignalized intersection currently operates at LOS B during the AM and PM peaks. In 2022 future no build conditions and with addition of proposed site traffic, LOS B is expected to remain in the AM and PM peaks. Therefore, no improvements are recommended.

Briar Run Drive at Link Road

This unsignalized intersection currently operates at LOS A during the AM and PM peaks. In 2022 future no build condition and with addition of proposed site traffic, LOS A is expected in the AM peak and LOS B in the PM peak. No improvements are recommended.

Rankin Mill Road at Link Road

This unsignalized intersection currently operates at LOS B during the AM and PM peaks. In 2022 future no build conditions and with addition of proposed site traffic, LOS B is expected to remain in the AM and PM peaks. Therefore, no improvements are recommended.

McKnight Mill Road at Site Access 1

In 2022 future build condition, LOS A is expected in the AM and PM peaks. This site access was assessed for the need of turn lanes. It was determined based on GDOT Driveway Manual, that an auxiliary would not be warranted. Therefore, no improvements are recommended.

McKnight Mill Road at Site Access 2

In 2022 future build condition, LOS A is expected in the AM and PM peaks. This site access was assessed for the need of turn lanes. It was determined based on GDOT Driveway Manual, that an auxiliary would not be warranted. Therefore, no improvements are recommended.

The recommended improvements are illustrated in Figure 9 in the report.

Level of Service Summary

Table A summarizes the level of service analysis at the study intersections:

Table A - Level of Service Summary				
AM Peak	2017 Existing	2022 No Build	2022 Build	2022 Build with Improvements
US 29 SB Ramp at Hicone Road	B (13.9)	C (24.7)	C (24.7)	
US 29 NB Ramp at Hicone Road	D (35.4)	D (38.2)	D (37.7)	
McKnight Mill Road at Hicone Road	D (26.2) NB Approach	E (35.2) NB Approach	F (214.8) NB Approach	F (168.2) NB Approach
McKnight Mill Road at Link Road	B (10.0) WB Approach	B (10.3) WB Approach	B (10.5) WB Approach	
Briar Run Drive at Link Road	A (9.4) NB Approach	A (9.4) NB Approach	A (9.7) NB Approach	
Rankin Mill Road at Link Road	B (10.4) EB Approach	B (10.7) EB Approach	B (10.7) EB Approach	
McKnight Mill Road at Site Access 1			A (9.6) WB Approach	
McKnight Mill Road at Site Access 2			A (9.1) WB Approach	
LOS (delay in seconds) Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay				

Table A - Level of Service Summary cont.				
PM Peak	2017 Existing	2022 No Build	2022 Build	2022 Build with Improvements
US 29 SB Ramp at Hicone Road	B (10.0)	C (21.1)	C (21.5)	
US 29 NB Ramp at Hicone Road	D (43.5)	D (46.9)	D (45.8)	
McKnight Mill Road at Hicone Road	D (31.7) NB Approach	E (46.2) NB Approach	F (253.8) NB Approach	F (102.0) NB Approach
McKnight Mill Road at Link Road	B (10.4) WB Approach	B (10.6) WB Approach	B (11.1) WB Approach	
Briar Run Drive at Link Road	A (9.9) NB Approach	B (10.0) NB Approach	B (10.4) NB Approach	
Rankin Mill Road at Link Road	B (11.6) EB Approach	B (12.1) EB Approach	B (12.4) EB Approach	
McKnight Mill Road at Site Access 1			A (9.8) WB Approach	
McKnight Mill Road at Site Access 2			A (9.5) WB Approach	
LOS (delay in seconds)				
Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay				

Proposed Site Access Throat Distances

The internal throat distances for the site accesses were reviewed using the GDOT Driveway Manual, which states that the distance from the adjacent street right of way to the near side of any internal service drive or parking aisle should be 25 feet, or greater than the expected inbound queue at the location. To determine the inbound queues, internal intersections were modeled for each access and queue reports generated using SimTraffic 9. Based on the number of vehicles entering Site Access 1 during the AM and PM peaks (28 and 92 vehicles, respectively), a minimum throat distance of 60 feet will be required. For Site Access 2, with 11 vehicles entering in the AM peak and 36 vehicles entering in the PM peak, a minimum throat distance of 50 feet will be required. The queuing reports can be found in the Appendix. The access points should be designed according to the GDOT Driveway Manual.

Table B – Site Access Throat Queuing			
Intersection Movement	SimTraffic 95th Percentile Queue (feet)		Minimum Recommended Throat Distance (Feet)
	AM Peak	PM Peak	
Site Access 1 EB Through-Right	42	57	60*
Site Access 2 EB Right-Left	28	41	50

*Note: Based on the maximum queues observed in SimTraffic simulation.

2040 Design Year Analysis

Due to the proximity of the proposed site to the NCDOT TIP U-2525BC project which will widen and improve interchanges along US 29, a 2040 Design Year Analysis was carried out to assess the long term traffic capacity of the interchange of US 29 and Hicone Road and their immediate vicinity. This analysis was conducted for 2040 conditions based on available traffic forecasts and with the addition of proposed development traffic. This analysis was carried out for the following intersections within the TIP U-2525BC project area:

- US 29 Southbound Ramp at Hicone Road
- US 29 Northbound Ramp at Hicone Road
- McKnight Mill Road at Hicone Road
- McKnight Mill Road at Site Access 1
- McKnight Mill Road at Site Access 2

The 2040 analysis uses the same trip generation and trip distribution as presented in 2022 future build conditions.

2040 Forecast No Build – Future volumes without TIP in place
 2040 Forecast Build – Future volumes with TIP in place
 2040 Design Build – Future volumes with TIP and development in place

2040 Design Year Discussion of Results

The results of the study are discussed by intersection below:

US 29 Southbound Ramp at Hicone Road

In 2040 Forecast No Build conditions, LOS C is expected in AM and PM peaks. In 2040 Forecast Build conditions, LOS F is expected in the AM and PM peaks. During the 2040 Forecast Build Year the following improvements should be made:

- Modify and optimize signal timing
- Provide westbound right turn lane as a free flow

With these improvements this signal is expected to operate at LOS C in the AM and PM peaks. In 2040 Design Year Build, LOS C is expected to remain.

US 29 Northbound Ramp at Hicone Road

In 2040 Forecast No Build conditions, LOS D is expected in AM and PM peaks. In 2040 Forecast Build conditions, LOS E is expected in the AM and PM peaks. In 2040 Design Year Build, LOS E is expected to remain.

McKnight Mill Road at Hicone Road

In 2040 Forecast No Build conditions, LOS F is expected in AM and PM peaks. In 2040 Forecast Build conditions, LOS F is expected in the AM and PM peaks. During the 2040 Forecast Build Year the following improvements should be made:

- Signalize when warranted
- Provide a westbound left turn lane 100 feet of storage and appropriate taper

With these improvements this signal is expected to operate at LOS E in the AM and PM peaks. In 2040 Design Year Build, LOS E is expected to remain.

McKnight Mill Road at Site Access 1

In 2040 Design Year Build conditions with the addition of proposed site traffic and site-related improvements, LOS B is expected in the AM and PM peaks. No additional improvements are recommended.

McKnight Mill Road at Site Access 2

In 2040 Design Year Build conditions with the addition of proposed site traffic and site-related improvements, LOS B is expected in the AM and PM peaks. No additional improvements are recommended.

The recommended improvements are illustrated in Figure 13 in the report.

2040 Level of Service Summary

As mentioned earlier in this section:

2040 Forecast No Build – Future volumes without TIP in place

2040 Forecast Build – Future volumes with TIP in place

2040 Design Build – Future volumes with TIP and development in place

Table C summarizes the level of service analysis for the 2040 Design Year analysis.

Table C - Level of Service Summary				
AM Peak	2040 Forecast No Build	2040 Forecast Build	2040 Forecast Build with Improvements	2040 Design Year Build
US 29 SB Ramp at Hicone Road	C (26.9)	F (242.6)	C (29.6)	C (31.1)
US 29 NB Ramp at Hicone Road	D (40.6)	E (75.5)		E (76.7)
McKnight Mill Road at Hicone Road	F (Err) NB Approach	F (Err) NB Approach	E (66.4) Signalized	E (67.7) Signalized
McKnight Mill Road at Site Access 1				B (10.5) WB Approach
McKnight Mill Road at Site Access 2				B (10.1) WB Approach
PM Peak	2040 Forecast No Build	2040 Forecast Build	2040 Forecast Build with Improvements	2040 Design Year Build
US 29 SB Ramp at Hicone Road	C (31.7)	F (245.7)	C (29.6)	C (28.8)
US 29 NB Ramp at Hicone Road	D (45.4)	E (77.6)		E (78.3)
McKnight Mill Road at Hicone Road	F (Err) NB Approach	F (Err) NB Approach	E (68.8) Signalized	E (68.3) Signalized
McKnight Mill Road at Site Access 1				B (11.0) WB Approach
McKnight Mill Road at Site Access 2				B (10.6) WB Approach
LOS (delay in seconds) Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay				

Summary and Conclusion

The McKnight Mill Road Development is located between Hicone Road and Link Road on McKnight Mill Road in Greensboro, North Carolina. The site plan consist of 240 single family homes. The site plan currently shows three (3) accesses, two (2) on McKnight Mill Road and a connector to an existing access on Briar Run Drive.

Based on trip generation rates and equations published in Trip Generation (Institute of Transportation Engineers, 9th Edition), this development has a trip generation potential of 180 trips in the AM peak and 240 trips in the PM peak.

Based on the 2022 analysis, it is expected that each study intersection is to operate at LOS D or better in the AM and PM peaks with the exception of Hicone Road at McKnight Mill Road. This intersection is expected to operate at LOS F, which is attributed to the lack of gaps for a minor street left turn movement. This is typical at stop-controlled approaches onto major streets such as Hicone Road. It is recommended to provide a northbound right turn lane of 100 feet storage and appropriate taper and an eastbound right turn lane of 100 feet storage and appropriate taper to the intersection of Hicone Road and McKnight Mill Road. The site accesses do not warrant for turn lanes.

Since the proposed development is in close proximity to NCDOT TIP U-2525BC, a 2040 Design Year analysis was conducted. The recommended improvements for the intersections along Hicone Road should be implemented to accommodate the 2040 forecast volumes.

The recommended improvements are summarized in Table D on the following page. As mentioned in the introduction, this development is planned to build +/- 50 single family homes a year over a six (6) year period. The analysis and recommendations are based on full build of the development; therefore, a discussion with NCDOT and GDOT should be established to determine when the recommendations should be constructed.

In conclusion, this study has reviewed the impacts of both background traffic and this development traffic, and has determined that with the recommended improvements in place, there will be adequate capacity to accommodate future traffic. The final design of these improvements will need to be coordinated during the site plan approval process. Please note that all accesses to the site are required to be constructed to GDOT standards.

Table D – Recommended Improvement Summary		
	2022 Recommendations	2040 Recommendations
US 29 SB Ramp at Hicone Road	No improvements recommended	<ul style="list-style-type: none"> • Modify and optimize the signal • Provide westbound right turn lane free flow
US 29 NB Ramp at Hicone Road	No improvements recommended	No improvements recommended
McKnight Mill Road at Hicone Road	<ul style="list-style-type: none"> • Provide a northbound right turn lane with 100 feet of storage and appropriate taper • Provide an eastbound right turn lane with 100 feet of storage and appropriate taper 	<ul style="list-style-type: none"> • Signalize when warranted • Provide a westbound left turn lane with 100 feet of storage and appropriate taper
McKnight Mill Road at Link Road	No improvements recommended	Not analyzed
Briar Run Drive at Link Road	No improvements recommended	Not analyzed
Rankin Mill Road at Link Road	No improvements recommended	Not analyzed
McKnight Mill Road at Site Access 1	No improvements recommended	No improvements recommended
McKnight Mill Road at Site Access 2	No improvements recommended	No improvements recommended