



Z-17-06-003

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

Zoning Commission Hearing Date: July 17, 2017

GENERAL INFORMATION

APPLICANT	Brigham Road, LLC
HEARING TYPE	Rezoning Request
REQUEST	Rezone from BP (Business Park) and R-3 (Residential Single-Family) to PUD (Planned Unit Development).
CONDITIONS	<ol style="list-style-type: none"> 1. Uses in the area generally shown as "Commercial" on the approved PUD Concept Plan dated May 1, 2017 shall be limited to any nonresidential uses allowed in the Commercial, Mixed Use or Business Park zoning districts with a maximum height of 5 stories or 66 feet. 2. Uses in the area generally shown as "Multifamily" on the approved PUD Concept Plan dated May 1, 2017 shall be limited to any residential uses allowed in the RM- zoning districts with a maximum height of 3 stories or 55 feet in height, and a maximum of 360 units. Additionally, the exterior of any residential building shall be constructed of at least 30% stone, brick, glass and/or other materials of a similar quality and appearance.
LOCATION	1208 & 1220 Pleasant Ridge Road and 729, 731, 733, 739, 741 & 745 Brigham Road
PARCEL ID NUMBER(S)	Multiple
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). 33 notices were mailed to those property owners in the mailing area.
TRACT SIZE	35.73 Acres
TOPOGRAPHY	Fairly flat
VEGETATION	Residential and fields

SITE DATA

Existing Use Daycare Center and single family dwelling

	Adjacent Zoning	Adjacent Land Uses
N	County AG (Agricultural) R-3 (Residential)	Agricultural Uses & Open Space
E	BP (Business Park)	Warehousing & Office Uses
W	CD-RM-26 (Multifamily) CD-LI (Light Industrial)	Apartments Light Industrial use on single family lot
S	BP (Business Park)	Undeveloped

Zoning History

Case #	Date	Request Summary
N/A	N/A	The subject properties are currently zoned R-3 (Residential Single-Family) and BP (Business Park) and prior to the adoption of the LDO in July 2010, was zoned RS-40 (Residential Single-Family) and CP (Corporate Park) respectively.

ZONING DISTRICT STANDARDS

District Summary *

Zoning District Designation:	Existing (R-3)	Existing (BP)	Requested (PUD)
Max. Density:	3.0 units per acre or less.	N/A	360 Residential Dwelling Units
Typical Uses	Primarily intended to accommodate low density single-family detached residential development.	Primarily intended to accommodate office complexes, warehouse, research and development, and assembly uses on large sites in a planned, campus-like setting that emphasizes natural characteristics and landscaping. The district may also contain retail and service uses which customarily locate within planned employment centers.	Allows variety of nonresidential uses with maximum height of 5 stories or 66ft. and a maximum 360 residential units with a maximum height of 3 stories or 55 ft.

**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 If site drains to the east, it will drain to Greensboro Watersupply Watershed, WSIII, Brush Creek. If site drains to the west, it will drain to Upper Randleman Lake, East Fork Deep River.

Floodplains >2000FT

Streams N/A

Other: Site must meet current watersupply watershed requirements, water quality and water quantity must be addressed. Max. High Density development for either watershed is 70%. Site is also located within the 5 mile statue radius of the PTI Airport. BMP’s that do not hold a normal pool elevation are encouraged.

Utilities

A feasibility for water/sewer should be obtained from Kenny Treadway 336-373-2897

Airport Overlay District & Noise Cone

N/A

Landscaping & Tree Conservation Requirements

Landscaping:

Landscaping requirements will be as set out in the Unified Development Plan.

Tree Conservation:

10% of total acreage in critical root zone to be dedicated for Tree Conservation.

Transportation

Street Classification: Pleasant Ridge – Major Thoroughfare.
Brigham Road – Collector Street.

Site Access: All access(s) must be designed and constructed to the City of Greensboro standards.

Traffic Counts: None Available.

Trip Generation: 24 Hour = 16,531, AM Peak Hour = 907, PM Peak Hour = 1,378.

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: Yes, required per TIS Ordinance. Please see the end of this staff report (TIS) for the Executive Summary of the TIS.

Street Connectivity: N/A.

Other: Site is within the limits of future widening of Pleasant Ridge Road.

IMPACT/POLICY ANALYSIS

Land Use Compatibility

The proposed **PUD (Planned Unit Development)** zoning would allow land uses that are compatible with the general character of the area.

Connections 2025 Comprehensive Plan Policies

The Future Land Use Map of the Western Area Plan designates this location as **Employment Area**. The requested **PUD (Planned Unit Development)** zoning district is generally consistent with the **Employment Area** future land use designation.

Connections 2025 Written Policies

Land Use Goal 4.1 – Growth Strategy: Promote sound investment in Greensboro's urban areas, including Center City, commercial and industrial areas, and neighborhoods.

Policy 4A: Remove present impediments to infill and investment in urban areas.

Policy 4B: Target capital investments to leverage private investment in urban areas.

Policy 4C: Promote new patterns and intensities of use to increase economic competitiveness and enhance quality of life in urban areas.

Policy 4D: Identify potential opportunities and selectively target, plan and promote development/reuse initiatives.

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

Employment Area: A significant portion of the Western Area is designated as an area for employment uses. The majority of the demand for industrial and office land projected in the Market Analysis will be absorbed in the footprint of the Employment Area.

While the Western Area is a preferred residential destination it is also an employer's location of choice due to the existing and planned highway infrastructure, rail and air access and proximity to a large skilled workforce. Preservation and preparation of lands contiguous to existing industrial is critical to ensuring that the Western Area continues to grow as an employment center. In addition, quality-of-life factors, such as walkability and access to amenities, are increasingly important to employer location decisions. While the Western Area has great access and infrastructure, additional improvements are needed to ensure continued employment growth in the area.

The employment area will grow through a combination of expansion of existing businesses, redevelopment, infill and new development projects. As noted in the Market Analysis, there will be significant demand for land for both office and industrial use over the next twenty years. While some of the 767,000 square feet of office demanded in the area will be met by development within the West Market Village Center and to a lesser extent the Campus Village Center, the majority will occur in the main employment areas noted on the plan. The type of office uses projected for the area include strong growth in the services, retail trade and F.I.R.E. (financial, insurance and real estate) sectors.

Industrial forecasts suggests that there will be demand for nearly two million square feet of industrial space through 2030. Growth in the construction and information technology industries will drive most of this demand.

The Western Area is also a prime location for employers to look for assemblages of land to accommodate a large footprint facility. Similar to the FedEx Ground Facility in the neighboring Triad Business Park, the Western Area has the potential to attract an employer of similar size if contiguous industrial lands are preserved for future employment use. Ensuring a "drop-in" ready site is available in the Western Area will significantly contribute to the economic vitality of the area.

In order to accommodate this growth a strong network of streets are needed to promote connectivity internal and external to the area. Consideration of future connections and

improvements, such as the Pegg-Thatcher connector and extension of Bryan Boulevard will be reviewed to determine their feasibility and benefits to the suggested future land use pattern. Future streets employ a context sensitive design to ensure the roads meet safety, mobility and aesthetic requirements.

Pedestrian infrastructure such as sidewalks and crosswalks create places where employees can exercise on breaks or walk to the West Market Street Village for lunch. Street lighting and wayfinding systems provide additional safety and convenience for both day and night shift employees.

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.

Western Area Plan

Employment Area (EA) Recommendations

Recommendation EA-1) Preserve and market sites for economic development within the Employment Area.

Recommendation EA-2) Market the Western Area as logistics hub.

Recommendation EA-3) Support efforts to attract aviation-related industry.

Recommendation EA-4) Improve the local transportation network within the Employment Area.

Transportation Recommendations

Recommendation T-1) Integrate the Western Area Land Use and Infrastructure Plan into the Long Range Transportation Plan.

Recommendation T-2) Conduct a detailed analysis of any additional proposed major roads and road widenings beyond the current construction program.

Recommendation T-3) Enhance the internal network of streets.

Recommendation T-4) Encourage transportation improvements that will respect and support the rural ambiance and character of the Western Area.

Recommendation T-5) Support plans for transit along West Market Street.

Recommendation T-6) Develop and implement ongoing, coordinated regional congestion management and operations processes (including Intelligent Transportation System elements and Transportation Demand Management strategies) to maximize the efficient use of existing and planned infrastructure.

Recommendation T-7) Maintain close coordination with the planning activities of the Piedmont Triad International Airport Authority for the airport and ancillary development.

Gateways & Corridors Recommendations

Recommendation GC-1) Create a southern gateway into the Western Area.

Recommendation GC-2) Enhance the appearance of West Market Street.

Recommendation GC-3) Preserve and enhance the appearance and operation of NC 68 north of Pleasant Ridge Road.

Utilities Recommendations

Recommendation U-1) Support water extension into Service Area C.

Recommendation U-2) Upgrade water pumps due to challenges in peak periods.

Recommendation U-3) Delay sewer service to basin north of West Market Street and west of Pleasant Ridge Road (Service Area C) to preserve rural and agricultural character.

Recommendation U-4) Encourage coordination among neighboring jurisdictions in the timing and provision of infrastructure.

Recommendation U-5) Work closely with Guilford County, High Point and Kernersville to track infrastructure upgrades, existing and proposed distribution lines and available capacities for water and wastewater facilities.

Governance Recommendations

Recommendation G-1) Work closely and cooperatively with the municipalities in and jurisdictions of Guilford and Forsyth Counties so that development can be guided towards areas planned for urban and suburban development and away from areas with valued environmental or rural qualities.

Recommendation G-3) Establish a Western Area Plan community support committee to shepherd the Western Area Plan through the adoption process at both the City and County level.

Recommendation G-4) Continually engage surrounding jurisdictions discussions of growth and development.

Cultural & Historic Resources Recommendations

Recommendation CHR-1) Raise awareness of existing historic and cultural resources and encourage the preservation of such resources that contribute to the character of the area.

Recommendation CHR-2) Consider creating a Preservation Plan for the Western Area that takes into consideration the important cultural and environmental resources worthy of preservation.

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.

Staff Analysis

The 35.73 acre subject site is a combination of undeveloped property and vacant single family dwellings zoned BP and R-3 respectively. North of the site are agricultural uses zoned County AG and City R-3. East of the site are office, industrial and warehouse uses zoned BP. South of the site is undeveloped property, zoned BP, and west of the site are industrial, multifamily and single family residential uses (zoned CD-LI, CD-RM-26 and R-3).

The Western Area Plan's Future Land Use map designates this area as Employment Area, which is where the majority of the demand projected in the Market Analysis for new industrial and office land will be concentrated. Within the broader description of the Employment Area description are recommendations for the inclusion of service uses and some residential to support the new and expanding industrial, warehouses and office uses.

This PUD zoning request, as conditioned, ensures the development of significant nonresidential uses in conjunction with residential development to serve the broader area. The proposed conditions also ensure a scale of development generally in line with existing residential and nonresidential uses in the immediate vicinity of this request.

The proposed request supports the Comprehensive Plan's Reinvestment/Infill goal to promote sound investment in Greensboro's urban areas and the Economic Development goal to promote a healthy, diversified economy. 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 **PUD** (Planned Use Development) zoning district.

Additional Information

**Pleasant Ridge Road Mixed Use Development – Transportation Impact Analysis
Greensboro, NC
Prepared for Phillips Management Group
Original: April 05, 2017
Revised: June 7, 2017**

Executive Summary

A mixed-use development is proposed to be located on the southwest corner of the intersection of Pleasant Ridge Road and Brigham Road in Greensboro, NC. The development is planned to be constructed in two phases: Phase 1 - 360 dwelling units of apartments and Phase 2 - 54,000 square feet of grocery store, 40,000 square feet of retail and two (2) fast-food restaurants with drive thru of 5,000 square feet each. Phases 1 and 2 have projected build-out dates of 2018 and 2020 respectively. Four site access points are proposed in total. Site Access 1 is on Pleasant Ridge Road and will serve both residential and commercial traffic. Site Access 2 is on Brigham Road and will serve residential traffic. Site Accesses 3 and 4 are also on Brigham Road, but are expected to serve commercial traffic only.

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 the new development traffic. The following intersections were included in the study:

- Pleasant Ridge Road at Cude Road
- Pleasant Ridge Road at Brigham Road
- Pleasant Ridge Road at NC 68
- West Market Street at Camco Manufacturing Driveway/U-Turn location
- West Market Street at Brigham Road
- Pleasant Ridge Road at Site Access 1
- Brigham Road at Site Access 2
- Brigham Road at Site Access 3
- Brigham Road at Site Access 4

These intersections were analyzed during the AM (7:00-9:00am) and PM (4:00-6:00pm) peaks for the following conditions:

- 2016 Existing Conditions
- 2019 Phase 1 Future No Build Conditions
- 2019 Phase 1 Build Conditions
- 2019 Phase 1 Build Conditions with Improvements (if necessary)
- 2021 Phase 2 Future No Build Conditions
- 2021 Phase 2 Build Conditions
- 2021 Phase 2 Build Conditions with Improvements (if necessary)

The Greensboro Department of Transportation (GDOT) and the North Carolina Department of Transportation (NCDOT) were contacted to obtain background information and to ascertain the elements to be covered in this Transportation Impact Analysis (TIA). Information regarding the property was provided by TRINTERRA.

Phase 1 (Residential) Level of Service Analysis

The results of the Phase 1 Level of Service (LOS) analysis are discussed by intersection below and presented in tabular format:

Pleasant Ridge Road @ Cude Road

In the 2019 future no build conditions, with the growth in the background traffic, this intersection is expected to operate at a LOS D during the AM and PM peaks. With the addition of the Phase 1 Site Trips, LOS D is maintained during both the peaks. No improvements are recommended for this intersection.

Pleasant Ridge Road @ Brigham Road

In 2019 future no build conditions, with the growth in the background traffic, this intersection is expected to operate at LOS B in the AM peak and a LOS C in the PM peak. With the addition of the Phase 1 Site Trips, LOS B and LOS C is maintained during the AM and PM peak periods. No improvements are recommended for Phase 1.

Pleasant Ridge Road at NC 68

With TIP I-5110/R-2413 A and B in place, this intersection will be modified and realigned to the north. In 2019 future no build conditions, a LOS D is anticipated during the AM peak and LOS C in the PM peak. In 2019 future build conditions, with the addition of the Phase 1 site traffic, LOS D is expected in the AM peak and LOS C in the PM peak. No improvements are recommended.

West Market Street at Camco Manufacturing Driveway/U-Turn location

In 2019 future no build conditions, this unsignalized left-over intersection is expected to operate at LOS B in both the AM peak and LOS C during PM peak. With the addition of site traffic, the level of service is expected to remain the same in both the AM and PM peaks. No improvements are recommended.

West Market Street at Brigham Road

This unsignalized intersection is expected to operate at LOS B in 2019 future no build conditions. In 2019 future build conditions, this is expected to remain unchanged. No improvements are recommended.

Pleasant Ridge Road @ Site Access 1

In the 2019 future build conditions, with the residential site traffic this intersection is expected to operate at a LOS B in the AM peak and a LOS C in the PM peak. The need for auxiliary turn lanes was reviewed based on page 80 of the 2003 NCDOT "Policy on Street and Driveway Access to North Carolina Highways" and on pages 25 and 29 in the GDOT Driveway Manual. Based on projected traffic volumes, a left turn lane is warranted at this access point. A right turn lane is not warranted in Phase 1. We recommend providing a westbound left turn lane with 150 feet of storage and appropriate taper in order to facilitate left turn entry into the site. With this improvement in place, the intersection is expected to remain at a LOS B in the AM peak and a LOS C in the PM peak. The site access should be designed in accordance with NCDOT and GDOT standards.

Brigham Road @ Site Access 2

In 2019 future build conditions, with the residential site traffic this intersection is expected to operate at a LOS A during the AM peak and LOS B during the PM peak. The need for auxiliary turn lanes was reviewed based on pages 24 and 28 in the GDOT Driveway Manual. Based on projected traffic volumes, neither a left nor a right turn lane is warranted at this proposed site access. The site access should be designed in accordance with GDOT standards. No improvements are recommended.

Table A presents the summary of the level of service analysis for the 2019 Phase 1 Future conditions.

Phase 1 Level of Service Summary

Table A - Level of Service Summary			
AM Peak	2019 Future No Build	2019 Phase 1 Build	2019 Phase 1 Build with Improvements
Pleasant Ridge Road at Cude Road	D (28.2) SB Approach	D (33.2) SB Approach	
Pleasant Ridge Road at Brigham Road	B (12.7) SB Approach	B (14.7) SB Approach	
Pleasant Ridge Road at NC 68	D (37.5)	D (39.9)	
West Market Street at Camco Manufacturing Driveway**	B (13.3) WB Approach	B (13.9) WB Approach	
West Market Street at Brigham Road	B (12) SB Approach	B (12.4) SB Approach	
Pleasant Ridge Road at Site Access 1		B (14) NB Approach	B (14) NB Approach
Brigham Road at Site Access 2		A (9.8) EB Approach	
PM Peak	2019 Future No Build	2019 Phase 1 Build	2019 Phase 1 Build with Improvements
Pleasant Ridge Road at Cude Road	D (27) SB Approach	D (32.5) SB Approach	
Pleasant Ridge Road at Brigham Road	C (15.3) NB Approach	C (18.6) NB Approach	
Pleasant Ridge Road at NC 68	C (32.1)	C (33.1)	
West Market Street at Camco Manufacturing Driveway**	C (15.4) WB Approach	C (15.8) WB Approach	
West Market Street at Brigham Road	B (13.6) SB Approach	B (13.8) SB Approach	
Pleasant Ridge Road at Site Access 1		C (15.9) NB Approach	C (15.9) NB Approach
Brigham Road at Site Access 2		B (10.5) EB Approach	

LOS (delay in seconds)

*Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay

**LOS and delay values were obtained using HCM 2010 TWSC Report as HCM 2000 Unsignalized Report does not provide the highest delay observed at this unsignalized intersection (which is the WB U-turn movement)

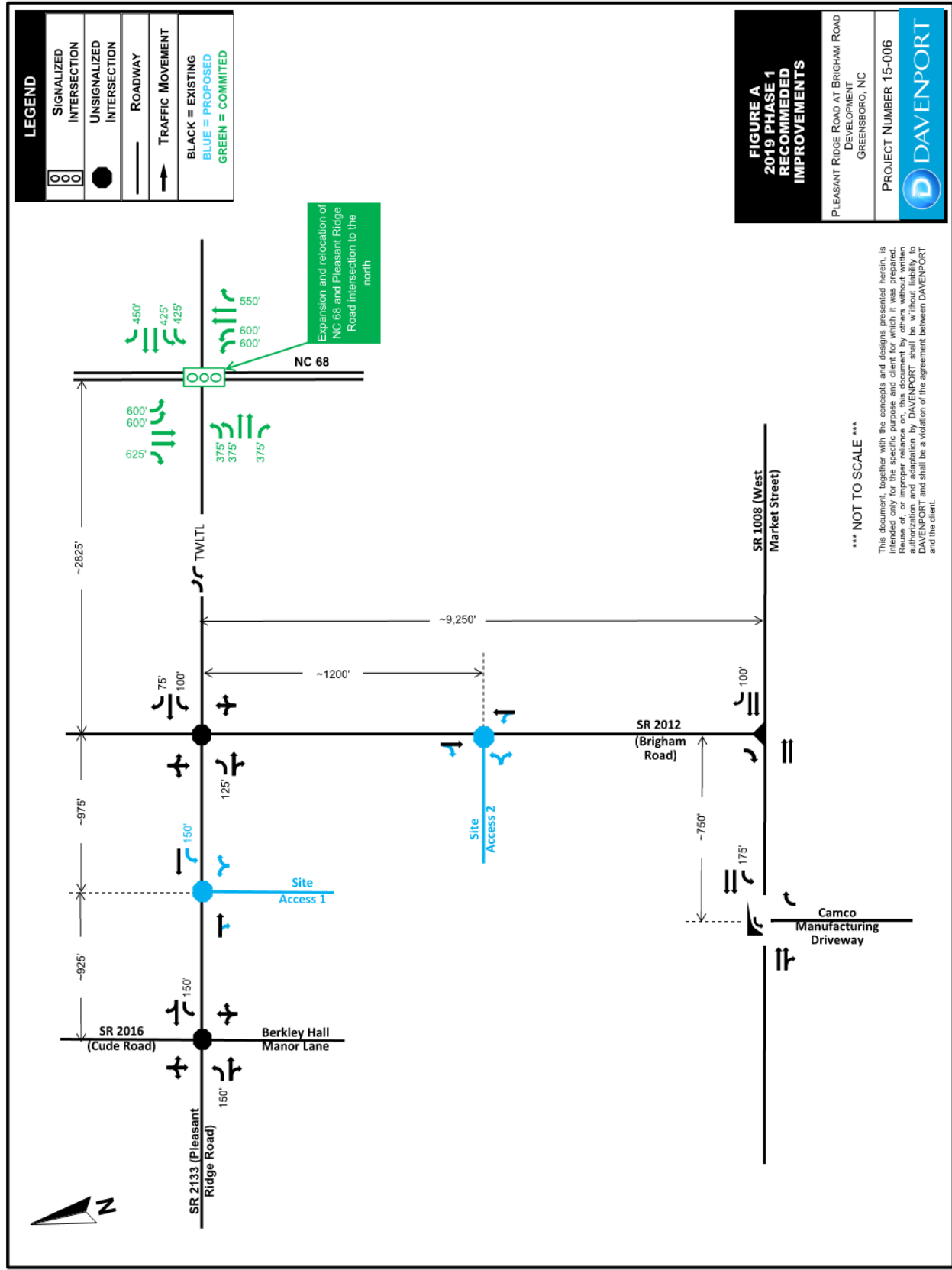
Phase 1 Recommended Improvements Summary

Table B summarizes recommended improvements for Phase 1.

Table B – Recommended Improvements Summary for Phase 1	
Pleasant Ridge Road at Cude Road	No improvements recommended
Pleasant Ridge Road at Brigham Road	No improvements recommended
Pleasant Ridge Road at NC 68	No improvements recommended
West Market Street at Camco Manufacturing Driveway	No improvements recommended
West Market Street at Brigham Road	No improvements recommended
Pleasant Ridge Road at Site Access 1	<ul style="list-style-type: none"> On the westbound approach along Pleasant Ridge Road, construct a left turn lane with a minimum of 150’ of storage and appropriate taper.
Brigham Road at Site Access 2	No improvements recommended

Figure A shows the recommended improvements for Phase 1.

Figure A – Phase 1 Recommended Improvements



2021 Full Build Level of Service Analysis

The results of the Full Build Level of Service (LOS) analysis are discussed by intersection below and presented in tabular format:

Pleasant Ridge Road @ Cude Road

In 2021 future no build conditions, LOS D is expected in the AM and PM peaks. In the 2021 Full Build conditions, with the additional growth in the background traffic and the addition of the Phase 2 site traffic, this intersection is expected to operate at a LOS F in both the AM and PM peaks. However, the delays are expected to be short lived and are typical for stop controlled approaches on a higher volume road. No improvements are recommended at this intersection.

Pleasant Ridge Road @ Brigham Road

In 2021 future no-build conditions, this unsignalized intersection is expected to operate at LOS B during the AM peak and LOS C during the PM peak. In 2021 Full Build conditions, with the additional growth in the background traffic and the addition of the Phase 2 site traffic, this intersection is expected to operate at LOS F during both the peaks.

To mitigate the LOS F, a signal warrant analysis was conducted to determine if signalization at this intersection would be warranted in full build conditions based on the Federal Highway Administration criteria presented in The Manual on Uniform Traffic Control Devices (MUTCD).

DAVENPORT performed a thirteen (13) hour turning movement traffic count at the intersection of Pleasant Ridge Road at Brigham Road on May 23, 2017. The full report for this traffic count can be found in the Appendix.

The analysis was conducted using PC-Warrants software. The Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD 2009 Edition) has established nine criteria that can be used to justify the installation of a Traffic signal, which are the following:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

Warrants 1-3 are related to traffic volumes were considered for full build conditions. For the northbound minor street approach, right turn volumes were reduced by 60% based on Pagone's Theorem for an exclusive left and shared through / right lane approach. The right turning volumes on southbound minor street approach were excluded from the analysis. More information can be found in the Supporting Documents.

Based on the projected full build conditions, Warrants 1-3 are anticipated to be satisfied. The results of the signal warrant analysis are summarized in Table C, below. Additional information and reports from PC-Warrants can be found in the Appendix.

Table C – Signal Warrant Analysis			
Warrant	Future Conditions		
	Status		
	N/A	Not Met	Met
Warrant 1: Eight-Hour Vehicular Volume			X
Warrant 1A – Minimum Vehicular Volume			X
Warrant 1B – Interruption of Continuous Traffic			X
Warrant 1C – Combination of Warrants			X
Warrant 2: Four-Hour Vehicular Volume			X
Warrant 3: Peak Hour			X

The Manual on Uniform Traffic Control Devices (MUTCD) indicates that a traffic signal can be considered when one of the eight warrants is met. Our analysis indicates that **in future build conditions, three (3) signal warrants were met**, including the eight-hour vehicular volume warrant. Therefore, the following is recommended:

- Install a traffic signal.
- Construct a northbound left turn lane with 250 feet of storage and appropriate taper.
- Restripe the existing westbound TWLTL to provide a westbound left turn lane with 325 feet of storage and appropriate taper.

With these improvements in place, the intersection is expected to operate at a LOS C in the AM peak and a LOS D in the PM peak.

Pleasant Ridge Road at NC 68

In 2021 no build conditions, with the construction of the improvements related to TIP I-5110/R-2413 A and B, LOS D is expected during the AM peak and LOS C during the PM peak. In the 2021 Full Build conditions, with the additional growth in the background traffic and the addition of the Phase 2 site traffic, LOS D is expected during both the peaks. No improvements are recommended.
West Market Street at Camco Manufacturing Driveway/U-Turn location

In 2021 future no build conditions, this intersection is expected to operate at LOS B during the AM peak and LOS C during the PM peak. In 2021 future build conditions, LOS C is expected during both the peaks. No improvements are recommended.

West Market Street at Brigham Road

In 2021 no-build conditions LOS B is expected during the AM peak and LOS C during the PM peak. With the addition of site traffic, the level of service is maintained during AM and PM peak periods. No additional improvements are recommended.

Pleasant Ridge Road @ Site Access 1

In the 2021 Full Build conditions, with the additional growth in the background traffic and the addition of the Phase 2 site traffic, this intersection is expected to operate at a LOS D in the AM peak and a LOS F in the

PM peak. The need for auxiliary turn lanes was reviewed with the additional projected Full Build traffic based on page 80 of the 2003 NCDOT "Policy on Street and Driveway Access to North Carolina Highways" and on pages 25 and 29 in the GDOT Driveway Manual. Based on projected traffic volumes, this access will warrant a left turn lane with 150 feet of storage and a right turn lane with 150 feet of storage. Therefore, the following improvements are recommended:

- Construct an eastbound right turn lane with 150 feet of storage and appropriate deceleration length and taper.
- The site access should have separate left and right turn lanes exiting the site.

With these improvements in place, the intersection is expected to operate at a LOS C in the AM peak and a LOS F in the PM peak. The delay in the PM peak is expected to be significantly reduced (from 213.5 seconds to 64.4 seconds). Long delays are expected to be short lived and are typical for stop controlled approaches on a higher volume road.

Brigham Road @ Site Access 2

In the 2021 Full Build conditions, with the additional growth in the background traffic and the addition of the Phase 2 site traffic, this intersection is expected to operate at LOS B during the AM and PM peaks. The need for auxiliary turn lanes was reviewed with the additional projected traffic based on pages 24 and 28 in the GDOT Driveway Manual. Based on projected Full Build traffic volumes, neither a left nor a right turn lane is warranted at this proposed site access. No improvements are recommended.

Brigham Road @ Site Access 3

In the 2021 Full Build conditions, with growth in the background traffic and the addition of the Full Build site traffic, this intersection is expected to operate at LOS B during both the peaks. The need for auxiliary turn lanes was reviewed based on pages 24 and 28 in the GDOT Driveway Manual. Based on projected Full Build traffic volumes, neither a left nor a right turn lane is warranted at this proposed site access. For this access serving the commercial portion of the site, separate left and right exit lanes are recommended to enhance traffic flow. No other improvements are recommended.

Brigham Road @ Site Access 4

In the 2021 Full Build conditions, with growth in the background traffic and the addition of the Full Build site traffic, this intersection is expected to operate at a LOS B in the AM peak and a LOS C in the PM peak. The need for auxiliary turn lanes was reviewed based on pages 24 and 28 in the GDOT Driveway Manual. Based on projected Full Build traffic volumes, neither a left nor a right turn lane is warranted at this proposed site access. For this access serving the commercial portion of the site, separate left and right exit lanes are recommended to enhance traffic flow. No other improvements are recommended.

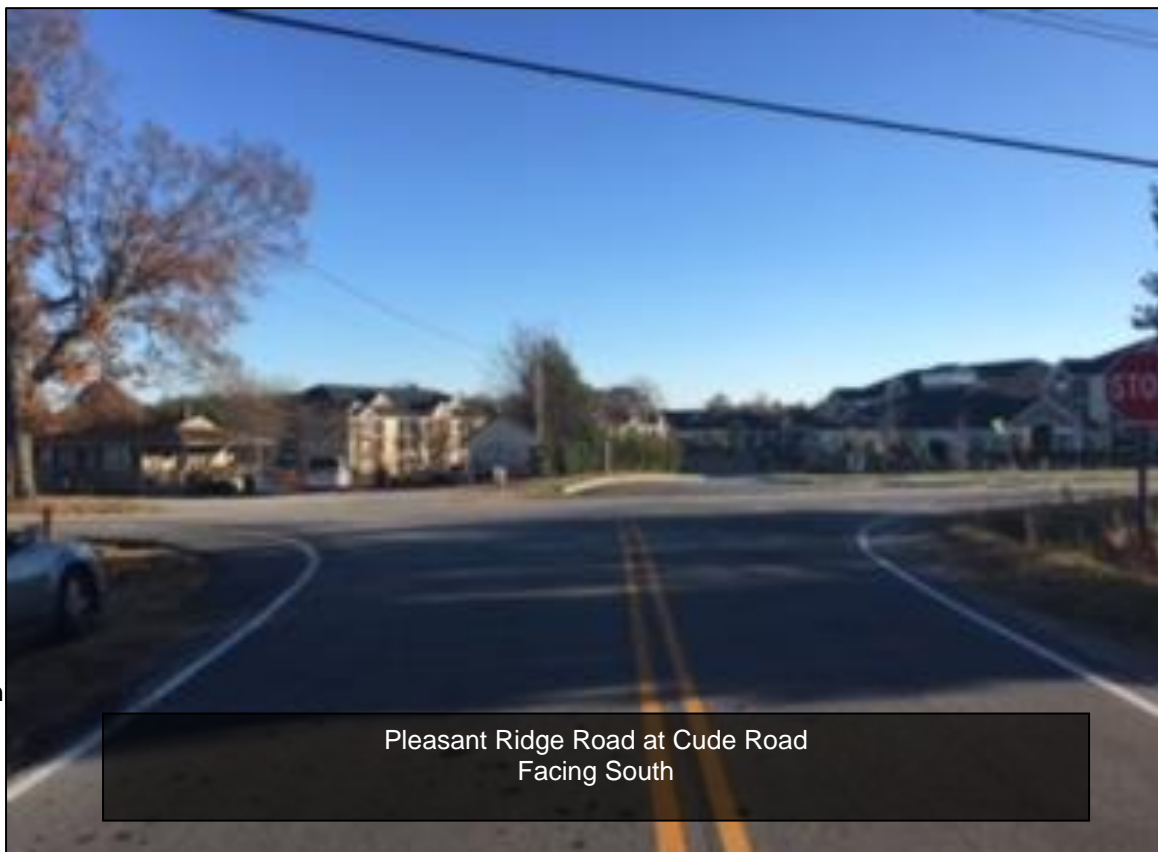
Proposed Site Access Throat Distances

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 a queue report generated using SimTraffic 9. Based on the number of vehicles entering Site Access 1 during the AM and PM peaks (201 and 325 vehicles, respectively), a minimum throat distance of 75 feet is recommended. For Site Access 2, with 21 vehicles entering in the AM peak and 84 vehicles entering in the PM peak, a minimum throat distance of 75 feet is needed. For Site Access 3, with 65 vehicles entering in the AM peak and 91 vehicles entering in the PM peak, a minimum throat distance of 50 feet will be required. For Site Access 4, with 108 vehicles entering in the AM peak and 154 vehicles entering in the PM peak, a minimum throat distance of 75 feet will be required. Table D lists the maximum queues for the AM and PM peaks. The

queueing reports can be found in the Appendix. The access points should be designed according to NCDOT and/or GDOT Standards.

Table D – Site Access Throat Queuing			
Intersection Movement	SimTraffic Maximum Queue (feet)		Minimum Recommended Throat Distance (Feet)
	AM Peak	PM Peak	
Site Access 1 SB Left-Thru-Right	51	74	75
Site Access 2 WB Thru-Right	32	68	75
Site Access 3 WB Left-Thru-Right	50	45	50
Site Access 4 WB Left-Thru	56	55	75

Table E presents the summary of the level of service analysis for the 2021 Future conditions.



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Pleasant Ridge Road at Cude Road
Facing South

2021 Full Build Level of Service Summary

Table E - Level of Service Summary			
AM Peak	2021 Future No Build	2021 Full Build	2021 Full Build with Improvements
Pleasant Ridge Road at Cude Road	D (33.3) SB Approach	F (125) SB Approach	
Pleasant Ridge Road at Brigham Road	B (13.3) SB Approach	F (53.7) SB Approach	C (29.1)
Pleasant Ridge Road at NC 68	D (41.3)	D (44.2)	
West Market Street at Camco Manufacturing Driveway**	B (14.1) WB Approach	C (15.9) WB Approach	
West Market Street at Brigham Road	B (12.5) SB Approach	B (13.5) SB Approach	
Pleasant Ridge Road at Site Access 1		D (33.4) NB Approach	C (20.3) NB Approach
Brigham Road at Site Access 2		B (10.6) EB Approach	
Brigham Road at Site Access 3		B (11.1) EB Approach	
Brigham Road at Site Access 4		B (12.6) EB Approach	
PM Peak	2021 Future No Build	2021 Full Build	2021 Full Build with Improvements
Pleasant Ridge Road at Cude Road	D (31) SB Approach	F (151.5) SB Approach	
Pleasant Ridge Road at Brigham Road	C (19.3) NB Approach	F (551.2) NB Approach	D (41.2)
Pleasant Ridge Road at NC 68	C (33.1)	D (35.1)	
West Market Street at Camco Manufacturing Driveway**	C (18.7) WB Approach	C (23.4) WB Approach	
West Market Street at Brigham Road	C (16) SB Approach	C (18.8) SB Approach	
Pleasant Ridge Road at Site Access 1		F (213.5) NB Approach	F (64.4) NB Approach
Brigham Road at Site Access 2		B (12.6) EB Approach	
Brigham Road at Site Access 3		B (14.6) EB Approach	
Brigham Road at Site Access 4		C (22.3) EB Approach	

LOS (delay in seconds)

*Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay
 **LOS and delay values were obtained using HCM 2010 TWSC Report, as HCM 2000 Unsignalized Report does not provide the highest delay observed at this unsignalized intersection (which is the WB U-turn movement)

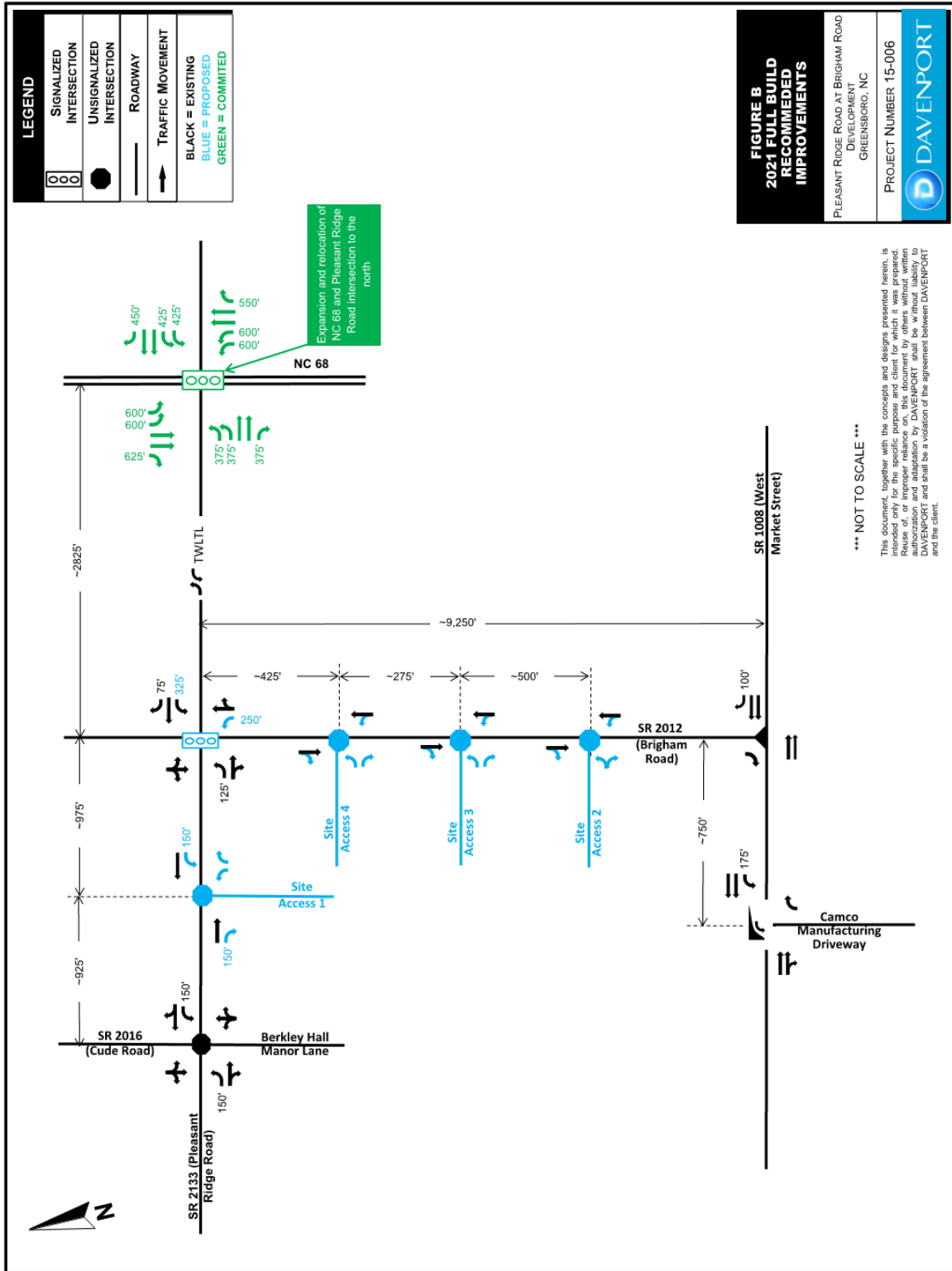
Full Build Recommended Improvements Summary

Table F summarizes recommended improvements for the Full Build condition.

Table F – Full Build Recommended Improvements Summary	
Pleasant Ridge Road at Cude Road	No improvements recommended.
Pleasant Ridge Road at Brigham Road	<ul style="list-style-type: none"> • Construct a northbound left turn lane with 250 feet of storage and appropriate taper. • Restripe the existing westbound TWLTL to provide a westbound left turn lane with 325 feet of storage and appropriate taper. • Install a traffic signal.
Pleasant Ridge Road at NC 68	No improvements recommended
West Market Street at Camco Manufacturing Driveway	No improvements recommended
West Market Street at Brigham Road	No improvements recommended
Pleasant Ridge Road at Site Access 1	<ul style="list-style-type: none"> • Construct an eastbound right turn lane with 150 feet of storage and appropriate taper. • The site access should have separate left and right turn lanes exiting the site.
Brigham Road at Site Access 2	No improvements recommended.
Brigham Road at Site Access 3	<ul style="list-style-type: none"> • Provide separate left and right lanes exiting from site access
Brigham Road at Site Access 4	<ul style="list-style-type: none"> • Provide separate left and right lanes exiting from site access

Figure B shows the recommended improvements for the Full Build.

Figure B – Full Build Recommended Improvements



Summary and Conclusion

A mixed-use development is proposed to be located on the southwest corner of the intersection of Pleasant Ridge Road and Brigham Road in Greensboro, NC. The development is planned to be constructed in two phases: Phase 1 - 360 dwelling units of apartments and Phase 2 - 54,000 square feet of grocery store, 40,000 square feet of retail and two (2) fast-food restaurants with drive thru of 5,000 square feet each. Phases 1 and 2 have projected build-out dates of 2018 and 2020 respectively. Four site access points are proposed in total. Site Access 1 is on Pleasant Ridge Road and will serve both residential and commercial traffic. Site access 2 is on Brigham Road and will serve residential traffic. Site accesses 3 and 4 are also on Brigham Road, but are expected to serve commercial traffic only.

DAVENPORT was retained to determine the potential traffic impacts of this development and to identify any transportation improvements that may be required to accommodate the impacts of both background traffic and new development traffic.

Based on trip generation equations published in Trip Generation (Institute of Transportation Engineers, 9th Edition), Phase 1 of this development has a trip generation potential of 2,305 daily trips with 180 trips in the AM peak and 216 trips in the PM peak. At full build, the development has a trip generation potential of 16,531 total daily trips with 907 trips in the AM peak and 1,378 trips in the PM peak. With the effects of internal capture and pass-by trip reduction included, the trip generation potential is 690 net trips in the AM peak and 894 net trips in the PM peak.

In conclusion, this study has determined the potential traffic impacts of this development and has identified transportation improvements that will be required to accommodate the impacts of the proposed development traffic. The aforementioned improvements should all be constructed in accordance with NCDOT's Policy on Street and Driveway Access to North Carolina Highways. Table G presents a summary of the level of service results for all analyzed conditions. Table H illustrates the recommendations related to this development.

Table G - Level of Service Summary							
AM Peak	2016 Existing	2019 Future No Build	2019 Phase 1 Build	2019 Phase 1 Build with Improvements	2021 Future No Build	2021 Full Build	2021 Full Build with Improvements
Pleasant Ridge Road at Cude Road	C (23.1) SB Approach	D (28.2) SB Approach	D (33.2) SB Approach		D (33.3) SB Approach	F (125) SB Approach	
Pleasant Ridge Road at Brigham Road	B (11.4) SB Approach	B (12.7) SB Approach	B (14.7) SB Approach		B (13.3) SB Approach	F (53.7) SB Approach	C (29.1)
Pleasant Ridge Road at NC 68	D (54.2)	D (37.5)	D (39.9)		D (41.3)	D (44.2)	
West Market Street at Camco Manufacturing Driveway**	B (11.2) WB Approach	B (13.3) WB Approach	B (13.9) WB Approach		B (14.1) WB Approach	C (15.9) WB Approach	
West Market Street at Brigham Road	B (11.1) SB Approach	B (12) SB Approach	B (12.4) SB Approach		B (12.5) SB Approach	B (13.5) SB Approach	
Pleasant Ridge Road at Site Access 1			B (14) NB Approach	B (14) NB Approach		D (33.4) NB Approach	C (20.3) NB Approach
Brigham Road at Site Access 2			A (9.8) EB Approach			B (10.6) EB Approach	
Brigham Road at Site Access 3						B (11.1) EB Approach	
Brigham Road at Site Access 4						B (12.6) EB Approach	

Table G - Level of Service Summary (Cont.)							
PM Peak	2016 Existing	2019 Future No Build	2019 Phase 1 Build	2019 Phase 1 Build with Improvements	2021 Future No Build	2021 Full Build	2021 Full Build with Improvements
Pleasant Ridge Road at Cude Road	C (23.2) SB Approach	D (27) SB Approach	D (32.5) SB Approach		D (31) SB Approach	F (151.5) SB Approach	
Pleasant Ridge Road at Brigham Road	B (13.5) NB Approach	C (15.3) NB Approach	C (18.6) NB Approach		C (19.3) NB Approach	F (551.2) NB Approach	D (41.2)
Pleasant Ridge Road at NC 68	D (43.5)	C (32.1)	C (33.1)		C (33.1)	D (35.1)	
West Market Street at Camco Manufacturing Driveway**	B (13.7) WB Approach	C (15.4) WB Approach	C (15.8) WB Approach		C (18.7) WB Approach	C (23.4) WB Approach	
West Market Street at Brigham Road	B (12.5) SB Approach	B (13.6) SB Approach	B (13.8) SB Approach		C (16) SB Approach	C (18.8) SB Approach	
Pleasant Ridge Road at Site Access 1			C (15.9) NB Approach	C (15.9) NB Approach		F (213.5) NB Approach	F (64.4) NB Approach
Brigham Road at Site Access 2			B (10.5) EB Approach			B (12.6) EB Approach	
Brigham Road at Site Access 3						B (14.6) EB Approach	
Brigham Road at Site Access 4						C (22.3) EB Approach	

LOS (delay in seconds)

*Note for unsignalized conditions, LOS and delay indicates only minor street approach with longest delay

**LOS and delay values were obtained using HCM 2010 TWSC Report, as HCM 2000 Unsignalized Report does not provide the highest delay observed at this unsignalized intersection (which is the WB U-turn movement)

Table H – Recommended Improvements Summary

Pleasant Ridge Road at Cude Road	No improvements recommended
Pleasant Ridge Road at Brigham Road	<p><u>Phase 2:</u></p> <ul style="list-style-type: none"> • Construct a northbound left turn lane with 250 feet of storage and appropriate taper. • Restripe the existing westbound TWLTL to provide a westbound left turn lane with 325 feet of storage and appropriate taper. • Install a traffic signal.
Pleasant Ridge Road at NC 68	No improvements recommended
West Market Street at Camco Manufacturing Driveway	No improvements recommended
West Market Street at Brigham Road	No improvements recommended
Pleasant Ridge Road at Site Access 1	<p><u>Phase 1:</u></p> <ul style="list-style-type: none"> • Construct a westbound left turn lane with 150 feet of storage and appropriate taper. <p><u>Phase 2:</u></p> <ul style="list-style-type: none"> • Construct an eastbound right turn lane with 150 feet of storage and appropriate taper. • The site access should have separate left and right turn lanes exiting the site.
Brigham Road at Site Access 2	No improvements recommended
Brigham Road at Site Access 3	<ul style="list-style-type: none"> • Provide separate left and right lanes exiting from site access
Brigham Road at Site Access 4	<ul style="list-style-type: none"> • Provide separate left and right lanes exiting from site access