

**ST. PAUL VILLAGE**  
**TRAFFIC IMPACT STUDY**



**Prepared for:**

The Town of Chapel Hill  
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## Executive Summary

The St. Paul AME Church plans to develop St. Paul Village within a parcel of land in the northeast corner of the Rogers Road (SR 1729) and Purefoy Drive (SR 1896) intersection in Chapel Hill, NC (Figure 1). The proposed development will consist of approximately 199 multifamily dwelling units, 151 senior adult housing dwelling units, including 93 affordable housing dwelling units, a 16,400 square feet (sf) Church Sanctuary, a 30,000 sf Community Center, a 47,500 sf of Recreation Center, and 13,800 sf of retail space. The development is expected to be fully constructed and occupied by 2025. This document summarizes the traffic impacts associated with this development and improvements to the recommended roadway network.

## Project Background

Based on the conceptual site plan (Figure 2), access to the development is proposed via two (2) primary vehicular access points. The following are the primary proposed access points:

- › Future Access #1: access via a future full movement driveway on Rogers Road (SR 1729), approximately 375 feet north of Purefoy Drive (SR 1896).
- › Future Access #2: access via a future full movement driveway on Purefoy Drive (SR 1896), approximately 550 feet east of Rogers Road (SR 1729).

The site also includes a connection to Edgar Street; however, this access point is expected to be used sparingly as Future Access #2 provides a more direct route to offsite destinations. Based on a Traffic Impact Study (TIS) scoping meeting on February 24, 2023, with Town of Chapel Hill and the North Carolina Department of Transportation (NCDOT) staff, the following intersections were identified for inclusion within the study area and analyzed for existing and future conditions, as applicable:

- › Rogers Road (SR 1729) at Eubanks Road (SR 1727)
- › Rogers Road (SR 1729) at Purefoy Drive (SR 1896)
- › Rogers Road (SR 1729) at Homestead Road (SR 1777)
- › Rogers Road (SR 1729) at Future Access #1
- › Purefoy Drive (SR 1896) at Future Access #2

The Town of Chapel Hill requires that future year analysis of the traffic conditions be conducted for the projected build year plus one (+1). Therefore, the analysis was performed under the following four (4) scenarios:

- › Existing (2023) Conditions
- › No-Build (2026) Conditions
- › Build (2026) Conditions
- › Build (2026) Conditions – With Improvements

The Existing (2023) scenario includes AM and PM peak hour analysis based on turning movement count data collected in March 2023. The No-Build (2026) scenario includes existing traffic with an annual growth rate of 1.5% applied to the study area roadways between the base year (2023) and the future year (2026). The Build (2026) scenario includes the calculated No-Build (2026) volumes with the addition of site trips generated by the full build-out of the proposed development. The Build (2026) with Improvements scenario includes future Build conditions with any recommended improvements in place.

## Existing (2023) Conditions

Existing analyses were conducted based on current roadway geometrics and intersection turning movement counts. The existing traffic volume was obtained from turning movement counts collected in March 2023.

### Study Area

The site is located in the northeast corner of the Rogers Road (SR 1729) and Purefoy Drive (SR 1896) intersection in Chapel Hill, North Carolina. The site has two primary proposed access points, one along Rogers Road (SR 1729) and one along Purefoy Drive (SR 1896). Rogers Road (SR 1729) is a north-south two-lane local roadway with a posted speed limit of 35 miles per hour (mph).

Currently, there are no bicycle lanes present along Rogers Road (SR 1729) and Purefoy Drive (SR 1896). Sidewalks are present along portions of Rogers Road, but the network is incomplete adjacent to the project site. Ten (10) bus stops are present within the study area and two (2) bus stops are located along the future site's Rogers Road (SR 1729) frontage.

### Crash Analysis

Five-year crash data (2/1/2018 – 1/31/23) obtained from the NCDOT Traffic Engineering Accident Analysis System (TEAAS) indicated that there was only a single reported crash at the intersection of Rogers Road (SR 1729) and Purefoy Drive (SR 1896).

## Level of Service Summary

As reported in the summary level of service (LOS) table, all stop-controlled approaches operate at an acceptable level of service (i.e., LOS D or better) during all peak hours.

## No-Build (2026) Conditions

### Background Growth

A future annual growth rate of one and a half percent (1.5%) was determined during a scoping meeting with the Town of Chapel Hill. The annual growth rate was applied to the existing traffic volumes on all the roadways to account for growth between the base year (2023) and the build year (2026). No background developments were identified within the project study area. Therefore, no additional site trips were applied to the network due to background developments. No background roadway network improvements were identified within the study area.

### Level of Service Summary

As reported in the summary LOS table, the stop-controlled approaches continue to operate at LOS D or better during both peak hours.

## Trip Generation

Trip generation was conducted based on the most appropriate corresponding trip generation codes included in the *ITE Trip Generation Manual, 11<sup>th</sup> Edition*, and the suggested method of calculation in the NCDOT's *"Rate vs. Equation" Spreadsheet*. ITE Land Use Codes (LUC) 221 (Multifamily Housing Mid-Rise), LUC 223 (Affordable Housing), LUC 252 (Senior Adult Housing – Attached), LUC 560 (Church Sanctuary), and LUC 882 (Strip Retail Plaza) were used based on the NCDOT guidance. The proposed development is to consist of approximately 199 multifamily dwelling units, 151 senior adult housing dwelling units, including 93 affordable housing dwelling units, 16,400 sf of Church Sanctuary, 30,000 sf of Church Auxiliary Building (community center), 47,500 sf of Church Auxiliary Building (recreation center), and 13,800 sf of retail space. There will be 83 one-bedroom units (31 affordable), 228 two-bedroom units (45 affordable), and 39 three-bedroom units (17 affordable). The affordable housing units were assumed to be proportional across the multifamily and senior housing, resulting in approximately 145 standard multifamily dwelling units and 112 standard senior adult housing dwelling units.

Based on information provided by the development team, the recreation center is restricted to residents of St. Paul Village, except for two basketball courts, which may be used by community leagues. The classrooms will be used by the church with participants that are generally residents of St. Paul Village. The event space is expected to be used approximately 2 times per month for weddings and/or conventions on the weekends. Since the community center and recreation center will largely be used by the residents within St. Paul Village or in conjunction with regular church functions, those two buildings were assumed to have trip characteristics similar to the ITE Land Use Code 560 (church), which includes a sanctuary, but "may also house meeting rooms, classrooms, and occasionally, dining, catering, or event facilities."

A ten percent (10%) reduction was taken for the trip generation to account for the pedestrian, bicycle, and transit trips associated with the proposed development. This reduction also accounts for the internal capture between the residential dwelling units and the community center and recreation center, which are not accounted for in the NCHRP 684 internal capture methodology. Table ES-1 shows the final external non-pass-by and pass-by site trips generated by the proposed development. As shown in the table, the proposed development is projected to generate up to 165 trips (63 entering, 102 exiting) occurring in the AM peak hour and 206 trips (114 entering, 92 exiting) occurring in the PM peak hour. The generated site trips were distributed in accordance with the existing turning movement counts and land uses.

**Table ES-1 Trip Generation Rates (Vehicle Trips)**

Land Use Code <sup>1</sup>	Land Use	Unit	ADT	AM Peak Hour			PM Peak Hour		
				Enter	Exit	Total	Enter	Exit	Total
<b>Total Site Trips<sup>2</sup></b>									
221	Multifamily Housing (Mid-Rise) Not Close to Rail	145 du	645	12	40	52	35	22	57
223	Affordable Housing	93 du	447	14	33	47	25	18	43
252	Senior Adult Housing - Attached	112 du	349	7	15	22	16	12	28
560	Church Sanctuary	16,400 sf	125	3	2	5	4	4	8
560	Church Auxiliary Building (Community Center)	30,000 sf	228	6	4	10	7	8	15
560	Church Auxiliary Building (Recreation Center)	47,500 sf	361	9	6	15	11	12	23
822	Strip Retail Plaza (< 40K)	13,800 sf	751	20	13	33	46	45	91
<i>Development Total</i>			<b>2,906</b>	<b>71</b>	<b>113</b>	<b>184</b>	<b>144</b>	<b>121</b>	<b>265</b>
<b>Trip Reduction Due to Internal Capture<sup>3</sup></b>									
221	Multifamily Housing (Mid-Rise) Not Close to Rail	145 du	16	0	0	1	2	0	2
223	Affordable Housing	93 du	11	0	0	1	1	0	2
252	Senior Adult Housing - Attached	112 du	9	0	0	0	1	0	1
560	Church Sanctuary	16,400 sf	0	0	0	0	0	0	0
560	Church Auxiliary Building (Community Center)	30,000 sf	0	0	0	0	0	0	0
560	Church Auxiliary Building (Recreation Center)	47,500 sf	0	0	0	0	0	0	0
822	Strip Retail Plaza (< 40K)	13,800 sf	48	1	1	2	1	5	6
<i>Development Total</i>			<b>84</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>11</b>
<b>Total External Site Trips</b>									
221	Multifamily Housing (Mid-Rise) Not Close to Rail	145 du	629	12	40	52	33	22	55
223	Affordable Housing	93 du	436	14	33	47	24	18	42
252	Senior Adult Housing - Attached	112 du	340	7	15	22	15	12	27
560	Church Sanctuary	16,400 sf	125	3	2	5	4	4	8
560	Church Auxiliary Building (Community Center)	30,000 sf	228	6	4	10	7	8	15
560	Church Auxiliary Building (Recreation Center)	47,500 sf	361	9	6	15	11	12	23
822	Strip Retail Plaza (< 40K)	13,800 sf	703	19	12	31	45	40	85
<i>Development Total</i>			<b>2,822</b>	<b>70</b>	<b>112</b>	<b>182</b>	<b>139</b>	<b>116</b>	<b>255</b>
<b>Total External Site Trips - 10% Transit/TDM Reduction</b>									
221	Multifamily Housing (Mid-Rise) Not Close to Rail	145 du	566	11	36	47	30	20	50
223	Affordable Housing	93 du	392	13	30	43	22	16	38
252	Senior Adult Housing - Attached	112 du	306	6	14	20	14	11	25
560	Church Sanctuary	16,400 sf	113	3	2	5	4	4	8
560	Church Auxiliary Building (Community Center)	30,000 sf	205	5	4	9	6	7	13
560	Church Auxiliary Building (Recreation Center)	47,500 sf	325	8	5	13	10	11	21
822	Strip Retail Plaza (< 40K)	13,800 sf	633	17	11	28	41	36	77
<i>Development Total</i>			<b>2,540</b>	<b>63</b>	<b>102</b>	<b>165</b>	<b>127</b>	<b>105</b>	<b>232</b>
<b>Pass-by Site Trips<sup>4</sup></b>									
822	Strip Retail Plaza (< 40K)	13,800 sf		0	0	0	13	13	26
<i>Development Total</i>				<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>26</b>
<b>Non-Pass-by Site Trips</b>									
221	Multifamily Housing (Mid-Rise) Not Close to Rail	145 du		11	36	47	30	20	50
223	Affordable Housing	93 du		13	30	43	22	16	38
252	Senior Adult Housing - Attached	112 du		6	14	20	14	11	25
560	Church Sanctuary	16,400 sf		3	2	5	4	4	8
560	Church Auxiliary Building (Community Center)	30,000 sf		5	4	9	6	7	13
560	Church Auxiliary Building (Recreation Center)	47,500 sf		8	5	13	10	11	21
822	Strip Retail Plaza (< 40K)	13,800 sf		17	11	28	28	23	51
<i>Development Total</i>				<b>63</b>	<b>102</b>	<b>165</b>	<b>114</b>	<b>92</b>	<b>206</b>

Notes:

1. Land Use Code and trip generation rates are determined based on *ITE Trip Generation, 11th Edition*
2. Total site trips are determined based on the suggested method in the NCDOT Rate vs Equation Spreadsheet
3. Internal capture was based on NCHRP 684 method and NCDOT IC calculation spreadsheet
4. Unconstrained pass-by trips are calculated based on *ITE Trip Generation Handbook, 3rd Edition*. The final projections are not expected to exceed 10% of adjacent street volumes.

## Build (2026) Conditions

The volumes associated with the No-Build (2026) scenario were utilized and the generated site trips were distributed through the network based on existing turning movement counts and current land uses to calculate the volumes for the Build (2026) scenario.

### Level of Service Summary

As shown in the summary LOS table, stop-controlled Rogers Road at Homestead Road is projected to operate at LOS E during the AM peak hour and LOS F during the PM peak hour. The other unsignalized approaches are expected to continue to operate at LOS D or better during both peak hours with the site generated traffic in place.

## Roadway Improvement Recommendations

The proposed development is not expected to significantly impact operations at multiple study intersections under Build (2026) conditions. To improve queueing and safety at these locations, the following offsite and driveway improvements should be considered and were analyzed within the Build (2026) with Improvements scenario. The proposed intersection configurations are shown in Figure ES-1.

### *Rogers Road (SR 1729) at Purefoy Drive (SR 1896)*

The stop-controlled Purefoy Drive (SR 1896) approach is projected to operate at LOS B during the AM peak hour and LOS B during the PM peak hour under Build (2026) conditions. Based on a review of turn lane warrants, an exclusive northbound right-turn lane along Rogers Road (SR 1729) is warranted, however based on discussions with Town of Chapel Hill and NCDOT staff, this improvement is not required due to the lack of available right-of-way for this lane. Purefoy Drive is planned to eventually extend westward, which would create a fourth leg and additional travel demand through this intersection. The following mitigation is recommended to help accommodate potential future widening at this intersection:

- › Dedicate sufficient right-of-way along the site's Roger Road and Purefoy Drive frontages to allow for the construction of a future left-turn lane along each facility.

There is an existing bus stop shelter on the west side of Rogers Road (SR 1729) just northwest of Purefoy Drive (SR 1896). To enhance the safety of pedestrians accessing this bus stop, the following improvements are recommended:

- › Install a high-visibility crosswalk across Rogers Road (SR 1729) and appropriate sidewalk sections to connect the proposed sidewalk along the site's frontage to the existing sidewalk along the west side of Rogers Road (SR 1729). Provide advance pedestrian ahead warning signs and pedestrian crossing warning signs with RRFBs on both approaches of Rogers Road (SR 1729) to the crosswalk.
- › Upgrade the existing streetlight near the bus stop shelter and install another streetlight on the southeast corner of the intersection.
- › Relocate the existing bus stop sign and remove the attached radar speed sign, so that it does not impede visibility of pedestrians at the proposed crosswalk.

Note that any locally stipulated multi-modal enhancements on State maintained routes are subject to NCDOT requirements and approval through the encroachment process.

***Rogers Road (SR 1729) at Homestead Road (SR 1777)***

The stop-controlled Rogers Road (SR 1729) approach is projected to operate at LOS E during the AM peak hour and LOS F during the PM peak hour under Build (2026) conditions with increased delay as a result of the development. Based on this delay and coordination with Town of Chapel Hill and NCDOT staff, the following is recommended for this location:

- › Monitor intersection for future conversion to all-way stop control

If an all-way stop is added, then stop signs would be added to the Homestead Road (SR 1777) approach with stop ahead signage, pavement markings, and other appropriate necessary design elements. Under all-way stop control, the intersection is projected to operate at LOS C in the AM and PM peaks, with minor queueing. There is a curve just east of this location that may contribute to some crashes and NCDOT research has documented that converting intersections to all-way stop control has resulted in an average crash reduction of 68%.

***Eubanks Road (SR 1727) at Rogers Road (SR 1729)***

The stop-controlled Rogers Road (SR 1729) approach is projected to operate at LOS C during the AM and PM peak hour, and as a result, no improvements are recommended at this time. This intersection should be monitored for a conversion to an all-way stop in the long-term.

In addition to offsite improvements, the following driveway configurations should be considered.

***Rogers Road (SR 1729) at Future Access #1***

The stop-controlled driveway is projected to operate at LOS A during the AM peak hour and LOS B during the PM peak hour under Build (2026) conditions. The following driveway configuration is recommended:

- › Construct a 100-foot northbound right-turn taper to help reduce conflicts between northbound through and right-turn vehicles.
- › Provide one ingress lane and one egress lanes along the driveway.
- › Construct a sidewalk along the site's Rogers Road frontage.
- › Provide a marked crosswalk across the driveway.
- › Provide a 100-foot internal protected driveway stem.

Based on the results of this analysis, the stop-controlled approach is expected to operate at LOS A during both peaks, with minor queueing on the stop-controlled approach (less than three vehicles). Additional turn lanes or a two-lane egress may be included as shown in the site plan to improve movement into or out of the site.

***Purefoy Drive (SR 1896) at Future Access #2***

The stop-controlled driveway is projected to operate at LOS A during both peak hours under Build (2026) conditions. The following driveway configuration is recommended:

- › Provide one ingress lane and one egress lane along the driveway.



- › Construct a sidewalk along the site’s Purefoy Drive frontage. This should result in a sidewalk connection to the existing facilities east of the site along Rogers Road and the Chapel Hill Transit bus stops.
- › Provide a marked crosswalk across the driveway.
- › Provide a 100-foot internal protected driveway stem.

**Table ES Summary LOS Table**

ID	Intersection and Approach	Traffic Control	Existing (2023)		No-Build (2026)		Build (2026)		Build (2026) with Improvements	
			AM	PM	AM	PM	AM	PM	AM	PM
1	<b>Rogers Rd (SR 1729) and Eubanks Rd (SR 1727)</b>	Unsignalized	-	-	-	-	-	-	-	-
	Northbound		C-15.0	B-12.9	C-15.7	B-13.4	C-18.2	C-15.4	C-18.2	C-15.4
2	<b>Rogers Rd (SR 1729) and Purefoy Dr (SR 1896)</b>	Unsignalized	-	-	-	-	-	-	-	-
	Westbound		B-10.0	A-9.7	B-10.1	A-9.7	B-11.3	B-11.0	B-11.3	B-11.0
3	<b>Homestead Rd (SR 1777) and Rogers Rd (SR 1729)</b>	Unsignalized	-	-	-	-	-	-	<b>C (16.5)</b>	<b>C (23.5)</b>
	Eastbound		-	-	-	-	-	-	C-18.4	B-14.6
	Westbound		-	-	-	-	-	-	B-14.9	D-34.4
	Southbound		C-20.8	C-22.9	C-23.0	D-25.5	E-39.1	F-56.9	B-15.0	B-14.0
4	<b>Rogers Rd (SR 1729) and Future Access #1</b>	Unsignalized	-	-	-	-	-	-	-	-
	Westbound		-	-	-	-	A-9.6	A-9.7	A-9.6	A-9.6
5	<b>Purefoy Dr (SR 1896) and Future Access #2</b>	Unsignalized	-	-	-	-	-	-	-	-
	Southbound		-	-	-	-	A-8.8	A-8.8	A-8.8	A-8.8

X (XX) = Overall intersection LOS and average delay, X-XX = Approach LOS and average delay