

TRANSPORTATION TECHNICAL MEMORANDUM

Date: July 7, 2020

To: Jacqueline Mancher
Asset Manager
Turnstone Group

From: Michael Wickline, P.E.
Principal
Design Resource Group, PA (C-2165)

Subject: **Henry Chapel TIA Review Comments (897-001)**



Per the request of Turnstone Group, Design Resource Group (DRG) has conducted a preliminary review of the Draft Henry Chapel Traffic Impact Analysis (TIA) dated February 9, 2018 prepared by Kimley-Horn and Associates, Inc. for the city of Belmont, North Carolina.

The following comments are the results of DRG's preliminary review of the Draft TIA to insure uniformity with the North Carolina Department of Transportation's (NCDOT) "Policy on Street and Driveway Access to North Carolina Highways, Chapter 4 Part C" and the City of Belmont's "Land Development Code – Section 16.14 Traffic Impact Analysis".

General/Analysis

- The trip generation was calculated using ITE rates whereas NCDOT's Rates vs Equation spreadsheet indicates equations to be used, resulting in a slightly higher trip generation calculation for the site.
- The growth rate used for the overall study area appears to be based on the historical growth on Henry Chapel Road only. Growth rates along South Point Road (NC 273) appear to be closer to 2% per year, which could create over estimated background volumes with increased deficiencies in the future No Build and Build analysis scenarios.
- Analysis parameters/assumptions are not consistent with NCDOT's Capacity Analysis Guidelines, although the analysis does remain consistent throughout all analysis scenarios. This includes the following:
 - Right turn on red is not disabled
 - 0 volumes/volumes at allowed movements less than 4 were not increased to 4 vehicles for future no build and build scenarios
 - Permitted protected signal phasing was not adjusted to protected only in future year no build and build conditions
 - Signal timings were not adjusted to assume 5 second yellow time, 2 second red time, and 2 second lost time adjust.



Roadway Improvements/Recommendations

As an overview of the recommended roadway improvements it appears the recommendations **far exceed** the requirements stated in the City of Belmont's "Land Development Code (LDC) - Section 16.14 Traffic Impact Analysis." Based on the most current LDC, *"If the background LOS (intersection or approach) is inadequate (i.e., "D," "E," or "F"), the applicant will be expected to mitigate only the impact caused by the proposed project. For example if the background LOS of an approach is LOS F with 85 seconds of delay, and the project traffic increases the delay to 95 seconds LOS F), **the applicant will be required to mitigate the added 10 seconds of delay on the approach, not required to mitigate the inadequate background delay.***

South Point Road & Armstrong Road

- Agree with recommendations

South Point Road (NC 273) & Henry Chapel Road

- Agree with recommendation for a traffic signal, a southbound left turn lane, and a westbound right turn lane as these improvements would fully mitigate developer impact to overall intersections delay and LOS.
- If delay and queueing on South Point Road is the major concern, consideration should be given to an unsignalized directional crossover with northbound U-turn accommodations at Forest Hill Road as an alternative.

South Point Road (NC 273) & Forrest Hill Road

- If the No Build scenario is analyzed assuming NCDOT capacity analysis guidelines (0 volumes increased to 4 vehicles at allowed movements) the eastbound leg (BB Road) is fully mitigated with the conversion of this intersection to an unsignalized directional crossover.
- Although the westbound approach of the intersection (Forrest Hill Road) delay increases and indicates the need for mitigation based on the LDC, page 46 of the TIA indicates a similar situation for the intersection of South Point Road and Stowe Road/McKee Farm Lane where side street delays were LOS F and were not mitigated. The consultant indicated "It is not uncommon for minor-street, stop-controlled approaches to experience long delays in the peak hours due to major street volumes" and we feel this rationale could also be applicable at this location as well.

South Point Road (NC 273) & Stowe Road/McKee Road

- Based on the TIA, an additional northbound thru lane is recommended at this location to mitigate the delay increase on the northbound approach to LOS F (660.3 seconds per vehicle– delay)
- It appears the northbound approach delay/LOS can be fully mitigated with the addition of a northbound left turn lane which improves the approach to a LOS A
- Although the side-street approaches of the intersection (McKee Farm Lane and Stowe Road) delay increases and indicates the need for mitigation based on the LDC, page 46



of the TIA indicates the following: “It is not uncommon for minor-street, stop-controlled approaches to experience long delays in the peak hours due to major street volumes” (as previously noted).

South Point Road (NC 273) & Red Raider Run/South Point HS

- We agree the suggested improvements to this intersection meet the intent of the current LDC, although the improvements can be considered to improve existing deficiencies along NC 273.

South Point Road (NC 273) & Nixon Road/R L Stowe Road

- We agree the suggested improvements to this intersection meet the intent of the current LDC, although the developer’s responsibilities should be limited to constructing the 2nd southbound receiving lane that would transition or drop at McKee Farm Lane/Stowe Road and not continue along the NC 273 corridor.

South Point Road (NC 273) Road Widening - Two Lanes to Four Lanes

After further review of the TIA and provided historical data, it appears South Point Road (NC 273) currently is a deficient minor arterial based on the latest NCDOT AADT data (16,000 vehicles per day – 2016 data).

Based on NCDOT Transportation Planning Branch’s “Level of Service D Standards for Systems Level Planning” document (dated 10/14/2011) a minor arterial/thoroughfare (under the piedmont area classification) with a speed limit of 35 mph with 12 foot lanes and 45 mph with 12 foot lanes can accommodate an AADT of 10,200 vehicle and 12,200 vehicles respectively per day to operate at a LOS D.

The most current AADT along NC 273 of 16,000 vehicles per day indicates the corridor is currently in need of an additional lane in each direction without the addition of new developments in the area. Therefore, in adherence to the latest LDC, the developer should not be expected to mitigate inadequate background conditions.

Finally, consideration should be given to allow the developer to contribute their fair proportionate share of the improvements/road widening as proposed based on the level of impact to the roadway from the anticipated trip generation and assignment. Please see table below for examples of the Henry Chapel development’s anticipated impact at each study intersection along the NC 273 corridor.

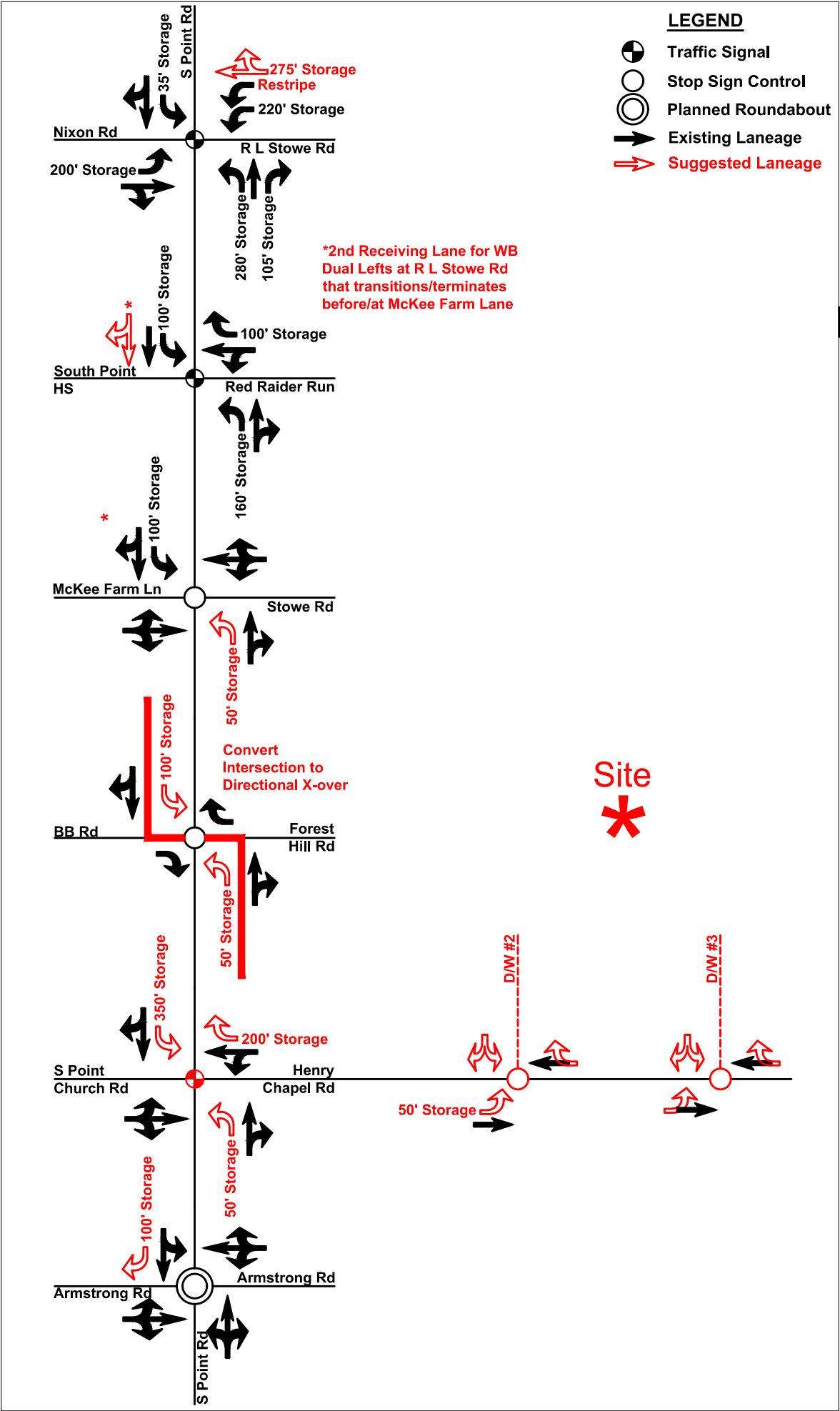
Intersection	AM		PM	
	Northbound	Southbound	Northbound	Southbound
S Point Rd & Henry Chapel Rd	0.0%	0.0%	0.0%	0.0%
S Point Rd & Forest Hill Rd	11.3%	11.0%	11.3%	14.2%
S Point Rd & Stowe Rd/McKee Farm Ln	15.2%	13.2%	15.9%	18.3%
S Point Rd & Red Raider Run/South Point HS	14.6%	12.1%	14.2%	17.5%
S Point Rd & Nixon Rd/R L Stowe Rd	14.4%	7.7%	12.8%	16.5%



Please contact us should you need any additional information.

Attachments: Exhibit 1 – Alternative Suggested Laneage

cc: Bridget Grant Moore & Van Allen
File



LEGEND

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



LANDSCAPE ARCHITECTURE
 CIVIL ENGINEERING
 TRANSPORTATION PLANNING

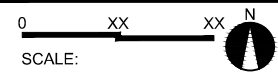
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Site *

**ALTERNATIVE
 SUGGESTED
 LANEAGE**



PROJECT #: 897-001
 DRAWN BY: PAH
 CHECKED BY: MWW

JULY 2020

REVISIONS: