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Memorandum

To: North Stafford Associates, LC
Andy Freeman

Date: July 16, 2021

From: Chris Daily, PE, VHB
Chuck Conran, PE, VHB

Project #: 34488.00

Re: Embrey Mill Town Center South Phase CUP

North Stafford Associates, L.C., the developer of the Embrey Mill Town Center South Phase in Stafford County, Virginia, tasked VHB with preparing a Conditional Use Permit (CUP) for the use of Site Plan Building 1 ("subject building") as a day care facility. The current approved use of the property is for retail use and a CUP is required to allow day care use.

Previous traffic impact studies have identified the impacts of the Embrey Mill Commercial development. The original Traffic Impact Analysis that zoned the surrounding parcels as PD-2 was completed in November 1998 by Patton Harris Rust & Associates, PC (PHRA) and revised and approved in March 1999. A more recent traffic impact study for the parcel to the west of the Embrey Mill Town Center commercial site was prepared for the rezoning of the proposed Embrey Mill Retail site and was completed in October 2014, by Pennoni Associates Inc. These previous traffic impact studies assumed commercial retail use for the Embrey Mill Town Center South Phase site and showed acceptable vehicle operations with the included site proffers. Furthermore, VHB has been engaged in both site and transportation engineering for this development, including Signal Justification Reports (SJRs) and functional traffic design. The functional traffic design analysis included a day care building use for the CUP subject building.

To evaluate the potential impacts of the CUP per Stafford County requirements, VHB compared the anticipated vehicle trip generation for the subject building as its proposed day care use and its currently zoned PD-2 (retail) use. VHB utilized the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 10th Edition*, the industry standard for determining trip generation associated with building developments.

As seen on the next page in the last row of **Table 1**, the day care building use is anticipated to generate fewer vehicle trips than the retail use across the entire weekday in addition to Saturday and during the Saturday peak hour. The day care use is expected to generate more vehicle trips than a retail building use during the weekday AM and PM peak hours, which was accounted for in VHB's April 2021 functional design traffic study. This traffic pattern makes sense as a day care facility's traffic is highly concentrated during the morning and evenings of weekdays when parents drop off and pick up their children before and after work, while the traffic associated with retail is more temporally distributed throughout the day. Retail activity also does not wane on the weekend, unlike activity at a day care facility that may only be open during the work week.



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Table 1 ITE Trip Generation Comparison of Day Care and Retail

Land Use Type	Variable ¹	ITE Code	AM Peak Hour		PM Peak Hour		Weekday Total		Saturday Total		Saturday Peak Hour			
			Trips	Exit	Trips	Exit	Trips	Enter	Trips	Enter	Trips	Enter	Exit	
Day Care	13,000	565 (Day Care Center)	143	76	145	68	77	620	310	82	41	22	14	8
	44,049	820	174	108	296	142	154	3,444	1,722	5,362	2,681	324	168	156
Retail ²	57,049	(Shopping Center)	180	112	359	172	187	4,106	2,053	6,294	3,147	397	206	191
	13,000		6	4	63	30	33	662	331	932	466	73	38	35
Trip Comparison (Day Care – Retail)			+137	+72	+65	+82	+38	+44	-21	-850	-425	-51	-24	-27

¹ Reported variable quantities are in thousands of gross floor area square footage.

² In addition to subject building 1, there is 44,049 SF of retail space in Embrey Mill Town Center South Phase. If the subject building was analyzed as retail space, an additional 13,000 SF of retail space would be added to the retail square footage, for a total of 57,049 SF of retail space. Due to the way the ITE Trip Generation Manual reports data for ITE Code 820, the vehicle trips for this additional 13,000 SF of retail space need to be obtained from the delta between the vehicle trips associated with the 44,049 SF size and the 57,049 SF size. The third row of "retail" represents the vehicle trips associated with this additional 13,000 SF of building space.

Stafford County's CUP regulations state that the minimum threshold to submit a Traffic Impact Analysis (TIA) is "Any proposal that generates 150 or more vehicle trips per day above the existing use..." Per Table 1, the existing zoned use of retail for the subject building actually generates 42 more daily vehicle trips (662 trips) than the proposed CUP day care building use (620 daily vehicle trips). The proposed day care therefore generates fewer weekday trips than the retail use analyzed in the previous approved TIAs. While the day care use is expected to generate more vehicle trips during the weekday peak hours, the aforementioned functional design traffic study analyzed this condition and determined acceptable vehicle operations with the site's design and access. Given this combination of factors, VHB's engineering opinion is that the CUP does not represent any negative traffic impacts in comparison to the approved land use.