

Technical Memorandum

To: Peter Stalland, Tyr Development, LLC
From: Bryant Ficek, PE, PTOE
 Max Moreland, PE
Date: July 11, 2018
Re: Traffic Assessment – Aster Meadows Apartment Development in Vadnais Heights

A 156-unit apartment building is proposed on the west side of Centerville Road north of County Road F East in Vadnais Heights, Minnesota. Vehicle access to the development will be split between two accesses on Centerville Road. An emergency vehicle access will be located on the south side of the site at County Road F East. The site will have 289 total vehicle parking spaces including 156 underground, 118 surface, and 15 garage spaces.

This technical memorandum presents a high-level traffic analysis of the proposed development. The primary purpose is to confirm the County’s opinion that a full traffic impact study is not necessary for this development. A site plan, dated May 18, 2018, is attached for reference.

Study Area

Table 1 shows the primary characteristics of the key roadway corridors around this site.

Table 1 – Study Corridor Characteristics

Name	Designation ¹	Classification ²	Daily Traffic Volume ³	Speed Limit	Lanes	Fixed Route Transit	Bike/Ped Facilities
Centerville Road	Ramsey CSAH 59	A-Minor Expander Arterial	8,400	40 mph	3 undivided	None	Trail on west side
County Road F East	Ramsey CSAH 12	B-Minor Arterial	3,700	45 mph	2 undivided	None	None

¹CSAH = County State Aid Highway

² Source: Vadnais Heights Comprehensive Plan

³ Source: MnDOT’s Traffic Mapping Application

Estimated Traffic Generation

Trip generation for the proposed development was established using the Institute of Transportation Engineers’ (ITE) *Trip Generation Manual, 10th Edition*. Spack Consulting also has local data compiled through various studies across the Twin Cities. Local data is often preferred as it reflects the area’s driving patterns better than national data. Table 2 shows the resulting new trips based on ITE and local data, respectively.

Table 2 – Trip Generation – New Trips on a Weekday

Land Use (size)	Data Source	Daily			AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Multifamily Housing (Mid-Rise) – 156 units	ITE	424	424	848	15	42	57	42	27	69
Apartment – 156 units	Local	343	343	686	7	41	48	46	21	67

As shown in Table 2, the trip generation based on local data is lower than the trip generation forecasts based on the national ITE dataset. Both are relatively close for peak hour volumes on a typical weekday. Since local data is recommended to be used when available, those are the volumes used in the analysis in this memorandum.

Daily Volume Analysis

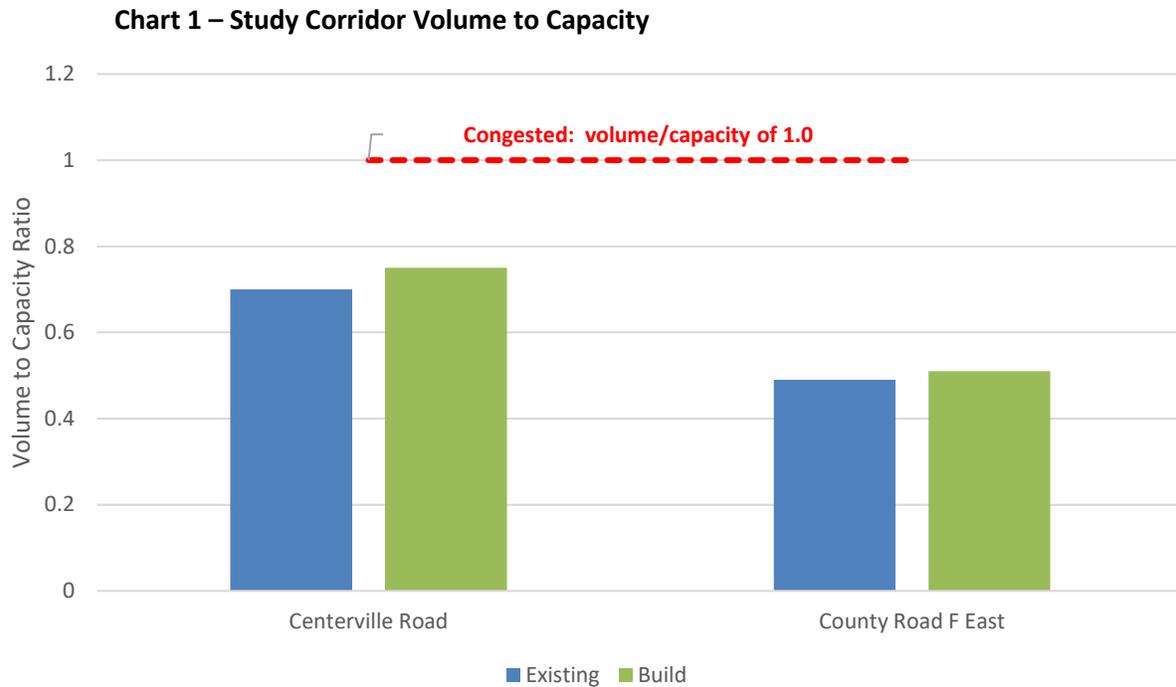
While many factors contribute to a road feeling congested, the two biggest factors are volume, how many vehicles are using the road, and capacity, how many vehicles the road can accommodate a day. Transportation professionals use these pieces of information to create a ratio of volume to capacity. For example, a road with a volume to capacity ratio of 1.0, where the traffic demand is nearly equal to the traffic supply, will feel congested to motorists.

Below is a rough guide of the daily traffic volumes different types of roads can accommodate based on Exhibits 16-16 and 12-39 of the *Highway Capacity Manual, 6th Edition*. If the Average Daily Traffic (ADT) volume on a roadway is below the threshold, then it is considered un-congested. If the daily volume falls inside the range, the road is almost congested. If the daily volume is over the threshold, the road is congested.

- 2-Lane (one in each direction with left turn lanes at busy intersections and coordinated signals), undivided street, are considered congested with a volume between 8,900 to 18,300 vehicles per day.
- 4-Lane, undivided street (two in each direction with left turn lanes at busy intersections and coordinated signals), – 18,600 to 36,800 vehicles per day.

The City of Vadnais Heights uses a daily capacity of 7,500 – 12,000 vehicles per day for an undivided two-lane road and 12,000 – 18,000 vehicles per day for a three-lane road.

To provide an initial planning level screening, Chart 1 provides volume to capacity ratios of the study corridors with and without the development traffic (existing and build scenarios) to determine if either of the roadway corridors is nearing the planning-level capacity as based on the lower level of the City's daily capacity range.



As shown in Chart 1, both Centerville Road and County Road F East are forecast to be able to accommodate the increase in roadway traffic from the Aster Meadows development while remaining well below the planning-level capacity thresholds.

Traffic Study Assessment

The Institute of Transportation Engineers’ *Transportation Impact Analyses for Site Development* report recommends completing a detailed traffic impact study when a proposed development’s expected trip generation is 100 or more new trips in a peak hour. MnDOT uses a slightly different threshold of 2,500 daily trips or 250 peak hour trips. These thresholds represent the level where new traffic on the surrounding roadways may impact operations. Under those thresholds, the traffic generation is not significant and not expected to significantly alter or change the current operations.

Even if the higher ITE trip generation results from Table 1 are used, the expected traffic is below these identified thresholds (848 daily and 69 maximum peak hour). Based on this and the daily volume capacity analysis in Chart 1, a full traffic impact study is not necessary for this proposed development.

Site Accesses

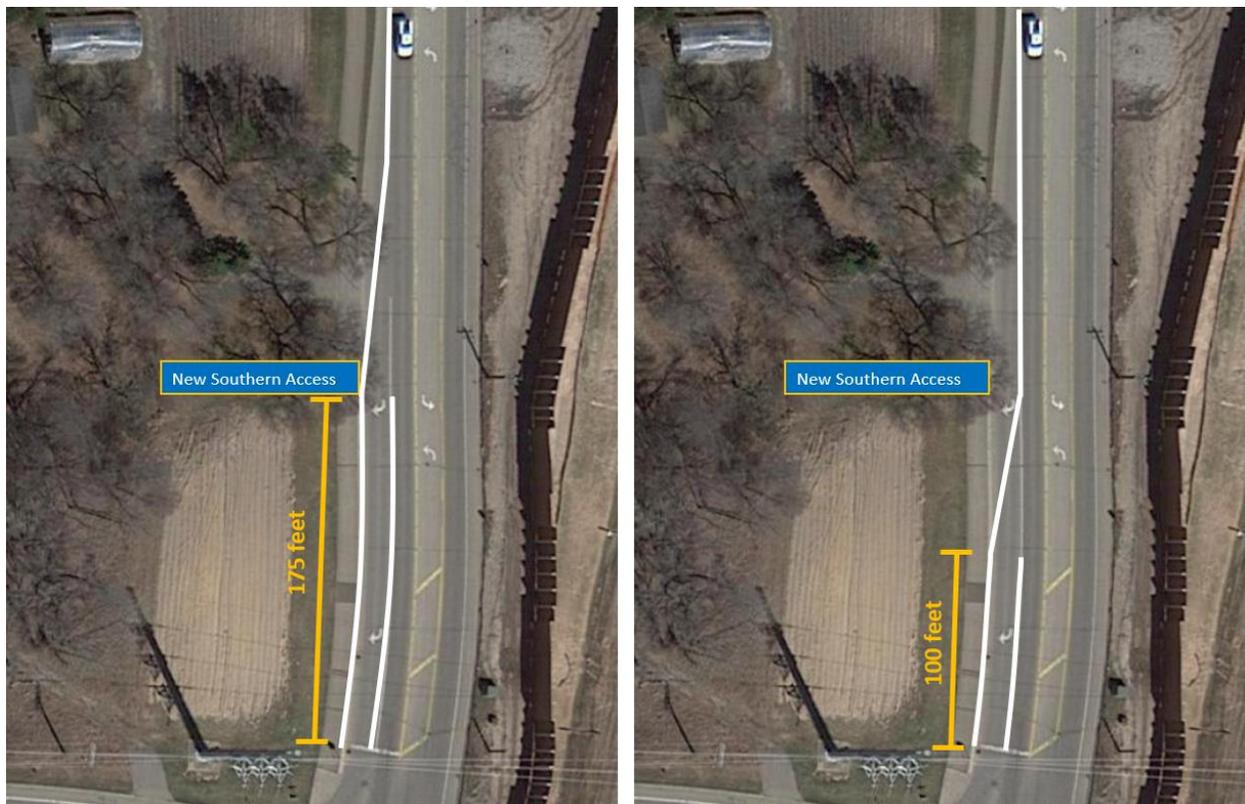
MnDOT’s access spacing guidelines have been adopted by Ramsey County. Based on these guidelines, for a minor arterial in an urbanizing area, full movement intersections have a recommended minimum spacing of 1/4 mile (1,320 feet) and secondary intersections have a recommended minimum spacing of 1/8 of a mile (660 feet). With the current site plan, the southern access on Centerville Road is 275 feet north of County Road F East, and the northern access on Centerville Road is 710 feet north of County Road F East (435 feet north of the southern access). These distances do not meet the spacing guidelines for full access at the two site accesses. In the absence of specific information about a site or corridor, these guidelines provide for safe and efficient traffic flow.

For this case, the proposed development is expected to have relatively low volumes as demonstrated by the trip generation and lack of need for a full traffic study. Centerville Road has moderate volumes

compared to the capacity of a three-lane road. The all-way stop control at intersection of Centerville Road/County Road F East moderates the vehicle speeds by the site as well, with drivers either slowing on approach to the stop signs or accelerating from the intersection. The volumes and traffic control also suggest the vehicle queues are not excessive and would generally not stretch back to the site access driveways where site driveway operations would be impacted. These existing conditions suggest the site access locations, although not desirable based on the generic access management guidelines, would provide acceptable operations.

With the location of the southern access being within the existing southbound right turn lane on Centerville Road, a change in striping is recommended to change to avoid driver confusion. Two striping options are shown in Figure 1. The first option shifts the striping so that the taper begins north of the access, but the full turn lane does not start until after it passes the access. This way, if a driver is turning into the access, they will need to essentially merge onto the shoulder before the turn lane begins which should indicate to other drivers where they are turning and that they are not turning down at County Road F East. The second striping option shifts the taper to start after the access, providing a shorter taper and shorter turn lane. With the all-way stop at the Centerville Road/County Road F East intersection and the existing volumes, estimated vehicle queues should also be served by this shorter turn and weaving is acceptable.

Figure 1 – Southbound Right Turn Lane Alternate Striping Options



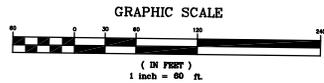
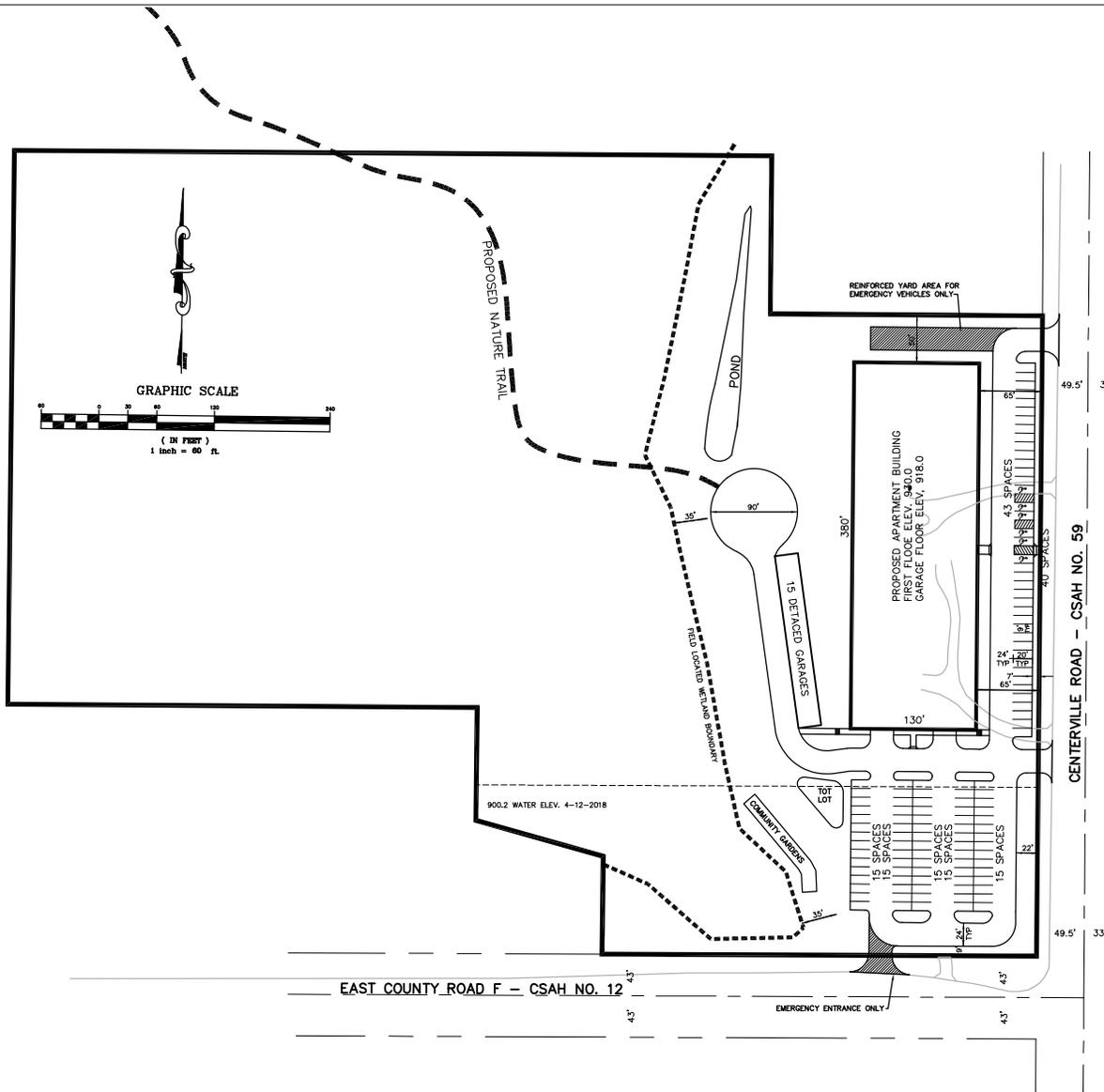
Due to the expected low volumes at the two site accesses themselves and the moderate speed limit on Centerville Road, right turn lanes into the accesses are not recommended.

Conclusions

The proposed development is expected to generate approximately 700 to 850 new daily trips and about 70 peak hour trips on a typical weekday. This level of traffic is below the thresholds generally cited for when a more detailed traffic impact study is necessary. In addition, a daily volume capacity analysis shows the surrounding roads are able to accommodate the expected increase in traffic and remain well below the planning-level capacities of each study road.

Based on this information, the County's opinion is confirmed, and the proposed development does not need a full traffic impact study. The striping for the southbound right turn lane on Centerville Road at County Road F East is recommended to be modified.

Attachment



LAND USE SUMMARY

PROPOSED 156 APARTMENT HOMES
 700,580 SQ. FT.=16.08 ACRES TOTAL AREA

49,400 SQ. FT.= 1.13 ACRES APARTMENT BUILDING
 70,830 SQ. FT.= 1.63 ACRES DRIVEWAYS AND PARKING
 1,200 SQ. FT.= 0.03 ACRES SIDEWALK
 4,320 SQ. FT.= 0.10 ACRES DETACHED GARAGES
 125,750 SQ. FT.= 2.89 ACRES TOTAL IMPERVIOUS
 574,830 SQ. FT.= 13.19 ACRES TOTAL GREEN SPACE
 82.05 PERCENT PERVIOUS - GREEN SPACE

EXISTING ZONING R3
 PROPOSED ZONING PUD

LAND USE DENSITY DATA

PROPOSED 156 APARTMENT HOMES

700,580 SQ. FT.=16.08 ACRES TOTAL AREA
 236,517 SQ. FT.= 5.43 ACRES UPLAND
 464,063 SQ. FT.=10.65 ACRES WETLAND
 31,413 SQ. FT.= 0.72 ACRES SLOPES AREA OVER 20%
 5.43-0.72= 4.71 ACRES NET AREA (UPLAND-SLOPES)

156/16.08 = 9.7 UNITS PER ACRE TOTAL GROSS DENSITY
 156/4.71 = 33.1 UNITS PER ACRE TOTAL NET DENSITY

5 STORY 156 UNIT APARTMENT BUILDING

156 SPACES	UNDERGROUND GARAGE
15 SPACES	DETACHED GARAGE
118 SPACES	SURFACE PARKING
289 SPACES	TOTAL PARKING
1.85	SPACES PER UNIT

PARKING LOT LANDSCAPING

1,578 S.F.	LANDSCAPING WITHIN PARKING LOT
37,520 S.F.	PARKING LOT HARD SURFACE AREA
4.2 PERCENT	RATIO OF LANDSCAPING

OWNER/DEVELOPER

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G-Cubed Inc. Engineering Surveying Planning 285 Westview Drive West Saint Paul, MN 55118 ph. 651.288.9474 fax 651.455.4948	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. Mark, R. Welch REG. NO. 42736	DESIGNED	DJT	REVISED	BY	DATE	LATEST REVISION: 5-18-2018	CITY OF VADNAIS HEIGHTS 2018 CONSTRUCTION	ASTER MEADOW APARTMENTS	SITE PLAN
		DRAWN					Prepared For: ASTER MEADOW APARTMENTS LLC 19356 Meadowridge Trail North Marine on St. Croix, Mn 55047			