SRF Consulting Group, Inc. | Engineers Planners Designers

Memorandum

SRF No. 10517.00

To: Brandon Anderson, PE, City Engineer
City of Apple Valley

From: Matthew Pacyna, PE, Principal
Tom Sachi, PE, Senior Engineer

Date: October 26, 2017

Subject: Cobblestone Outlot Development Traffic Review; Apple Valley, MN

Introduction

As requested, SRF has completed a review of the *Vehicle Forecasts for Cobblestone Outlot A Retail* document dated October 2, 2017, completed by Spack Consulting. In addition to the review, SRF conducted a supplemental trip generation and intersection capacity analysis to better understand existing and future operations adjacent to the Cobblestone Outlot development. The proposed development is located in the southeast quadrant of the 157th Street/Emperor Avenue intersection in the City of Apple Valley. The following information summarizes the review of the vehicle forecast document and the supplemental analysis.

Review Summary

Based on our review of the *Vehicle Forecasts for Cobblestone Outlot A Retail*, the following items were identified:

1) **Trip Generation** – The trip generation estimate approach using data from the *ITE Trip Generation Manual, 10th Edition*, is reasonable. Review of the ITE code utilized for the retail land use was representative of a "variety store." Although ITE code 820, which represents a "general shopping center" may provide a more realistic description of the future land use, the overall trip generation is relatively similar and not expected to be an issue. However, the trip generation estimate did not include an additional 5,000 square foot retail outlot as requested. Therefore, the supplemental analysis later in this document addresses impacts associated with the additional outlot retail.

2) **Trip Distribution/Assignment** – The directional distribution and resulting trip assignment are reasonable.

Supplemental Analysis

To better understand existing and future operations adjacent to the Cobblestone Outlot development, a supplemental analysis was conducted that reviewed existing area traffic volumes, additional outlot trip generation, intersection capacity, and potential improvements for consideration. The following information summarizes the supplemental analysis.

1) **Data Collection** – SRF collected short-duration (i.e. 15-minute) traffic counts at the following intersections during the a.m. (7 to 8) and p.m. (4:45 to 5:45) peak hours to understand general area travel patterns and magnitude. These counts were modified to reflect peak hour conditions.
   a) 157th Street and Emperor Avenue
   b) 157th Street and Cobblestone Lake Parkway
   c) 158th Street and Emperor Avenue
   d) 158th Street and Cobblestone Lake Parkway

2) **Dakota County Count Data** – A historical traffic count at the Pilot Knob Road/157th Street intersection was provided by Dakota County and modified to reflect existing conditions. The existing peak hour traffic volumes are shown in the Appendix.

3) **Additional Outlot A Development** – Based on discussions with City staff, there is the potential an additional 5,000 square foot retail development could be constructed on the southern portion of the site. An additional 5,000 square foot development would generate an additional 5 trips during the a.m. peak hour, 10 trips during the p.m. peak hour, and 170 daily trips, assuming a general retail land use (ITE Code 820), in addition to the trip generation noted in the *Vehicle Forecasts for Cobblestone Outlot A Retail* document. Future traffic volumes are shown in the Appendix.

4) **Intersection Capacity Analysis** – An existing and future year 2020 (i.e. one-year after construction) intersection capacity analysis was conducted to understand potential impacts associated with the proposed development. The year 2020 capacity analysis include trips generated by the proposed development, as well as a one percent annual background growth rate (consistent with area comprehensive plan growth) applied to the existing intersection volumes.

   Results of the capacity analysis (shown in Table 1) indicate that each study intersection operates or is expected to operate at acceptable levels of services under existing and year 2020 build conditions. The northbound approach of Emperor Avenue at 157th Street operates at LOS D during the existing p.m. peak hour and is expected to operate at LOS E during the year 2020 p.m. peak hour. Side-street delays of this magnitude are generally considered acceptable and do not necessitate mitigation. However, if queues from Pilot Knob Road regularly impact operations at Emperor Avenue, safety issues develop, or side-street delays increase further, potential modification to a three-quarter or right-in/right-out access should be considered.

Table 1 Intersection Capacity Analysis Summary

Intersection	Level of Service (Delay)			
	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
	Existing	2020 Build	Existing	2020 Build
157th Street and Emperor Avenue (1)	A/B (10 sec.)	A/B (10 sec.)	A/D (27 sec.)	B/E (37 sec.)
157th Street and Cobblestone Lake Parkway (2)	A (4 sec.)	A (4 sec.)	A (4 sec.)	A (5 sec.)
158th Street and Emperor Avenue (1)	A/A (8 sec.)	A/A (8 sec.)	A/A (9 sec.)	A/A (9 sec.)
158th Street and Cobblestone Lake Parkway (1)	A/A (9 sec.)	A/A (9 sec.)	A/A (9 sec.)	A/A (9 sec.)
157th Street and Pilot Knob Road (3)	A (9 sec.)	B (10 sec.)	B (18 sec.)	C (22 sec.)

1) Indicates an unsignalized intersection with side-street stop control, where the overall LOS is shown followed by the worst approach LOS. The delay shown represents the worst side-street approach delay.
2) Indicates roundabout control.
3) Indicates a signalized intersection.

5) **Site Plan Review** – A review of the proposed site plan does not indicate any significant issues under the first phase of development. However, under the second phase, a new access appears to be proposed along 158th Street, immediately east of the Emperor Avenue/158th Street intersection. This access is too close to the intersection and would result in unnecessary conflicts. This access should be eliminated and/or moved to the east to align with the internal driveway aisle. If not possible, potential reconfiguration of the Phase 1 building orientation and/or the Emperor Avenue access, may need to be considered to improve overall site circulation.

6) **Emperor Avenue Lane Configuration** – The northbound Emperor Avenue approach currently has a left-turn and a shared through/right-turn lane. Given the current traffic control, the lane configuration could be modified to a shared left/through and a right-turn lane to reduce conflicts.

Appendix

SRF 11118 AV Cobblestone TS
Existing AM Peak Hour **10/25/2017**



SRF 11118 AV Cobblestone TS
Existing PM Peak Hour **10/25/2017**



SRF 11118 AV Cobblestone TS
Year 2020 Build AM Peak Hour **10/25/2017**



SRF 11118 AV Cobblestone TS
Year 2020 Build PM Peak Hour **10/25/2017**

