

TECHNICAL MEMORANDUM

TO: RK Land Development LLC
FROM: Daniel Stumpf
Max Scheideman
Todd E. Mobley, PE, PTOE
DATE: August 18, 2015
SUBJECT: Sunrise Terrace, Transportation Impact Study Addendum
Queuing Analysis



**LANCASTER
ENGINEERING**

321 SW 4th Ave., Suite 400
Portland, OR 97204
phone: 503.248.0313
fax: 503.248.9251
lancasterengineering.com

This memorandum is written as an addendum to the previously prepared Transportation Impact Study (TIS) for the proposed Sunrise Terrace subdivision, authored by Lancaster Engineering and dated July 31, 2015. This memo provides additional technical analysis in response to comments received from the City of La Center concerning queues from left-turning vehicles along NE Lockwood Creek Road between E 18th Place and the proposed site access at the planned Avenue A. Applicable La Center Municipal Code criteria for a road modification to access spacing are also addressed.

Queuing Analysis

A queuing analysis of the proposed intersection of NE Lockwood Creek Road at Avenue A was conducted to investigate the operation of left turns between the offset north and south approaches of Avenue A and E 18th Place, respectively. The existing intersection of E 18th Place and proposed intersection of Avenue A would be spaced 280 feet apart. Simultaneous left-turns from opposing directions at offset approaches, such as the proposed intersection, can result in a queue behind the turning vehicle blocking the opposing left-turning movement, potentially leading to a safety and traffic circulation concern.

The offset intersections were analyzed using Synchro, a traffic analysis software application, and SimTraffic, a companion micro-simulation traffic model. Queueing analysis was performed for the year 2017 background plus project trips scenario. In order to forecast volumes at the study intersections, site observations of turning movements at the E 18th Place intersection were conducted August 6, 2015, and coupled with traffic count data of nearby intersections collected in June of 2015.

Avenue A is one of four site access locations to the planned Sunrise Terrace subdivision, and the only direct site access onto NE Lockwood Creek Road. Based on previous trip generation and assignment analysis, it is expected Avenue A will carry approximately 30 percent of entering and exiting vehicle traffic to Sunrise Terrace at full build out. This will result in 7 left-turning vehicles from Lockwood Creek Road into the development during the morning peak hour and 24 left-turning vehicles during the evening peak hour.

The results of the analysis show the eastbound left turn from NE Lockwood Creek Road to Avenue A has a 95th-percentile queue length of 25 feet during the evening peak hour. Likewise, the

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westbound left turn from NE Lockwood Creek Road to E 18th Place has a 95th-percentile queue of 25 feet during the evening peak hour.

As detailed in the original TIS, left-turn lane warrants on Lockwood Creek Road at Avenue A will not be satisfied and as such, a left-turn lane was not recommended. This is due to the low turning movement volume and the low volume of opposing traffic on Lockwood Creek Road. Without a left-turn lane, it would take a queue length of over 280 feet on Lockwood Creek Road at either E 18th Place or Avenue A to interfere with the other intersection.

With the queue lengths on each approach totaling only 25 feet and an intersection spacing of 280 feet, it is clear that left-turn queuing at one intersection will not impact the operation of the other. Additionally, the reported queue length values are based on the 95th-percentile queue lengths, which are only exceeded five percent of the time. During the majority of even the peak hours, queues will be shorter than what is reported here. The results of the queuing analysis are shown in the following table:

Left Turn Queuing Summary

	Westbound Left Turn at NE 18 th Place	Eastbound Left Turn at Avenue A	Total Storage Between Intersections
PM Peak Hour	25'	25'	280'

Applicable Code Sections

Section 1.16.D.1 of the City of La Center Public Works Engineering Standards for Construction states that the City Engineer may grant a modification to the adopted specifications of standards when "Topography, right-of-way, existing construction or physical conditions, or other geographic conditions impose an unusual hardship on the applicant and an equivalent alternative which can accomplish the same design is available." A modification of the site access to meet access spacing requirements would significantly alter the site plan of Sunrise Terrace, specifically changing proposed alignment Avenue A. Since the anticipated queuing lengths associated with the proposed development are adequate for maneuvering between the two intersections, the planned access spacing of 280 feet is expected to have minimal impact on traffic circulation between the two access locations.

Summary & Conclusions

The proposed intersection of Avenue A at Lockwood Creek Road is not expected to impact the operation of the existing intersection of Lockwood Creek Road and E 18th Place. Results of the queuing analysis show that 95th-percentile queues from left turns at both locations would only be 25 feet during the evening peak hour with a total intersection separation of 280 feet. No transportation-related mitigation is necessary or recommended.

If you have any questions regarding this information, please don't hesitate to contact me directly.