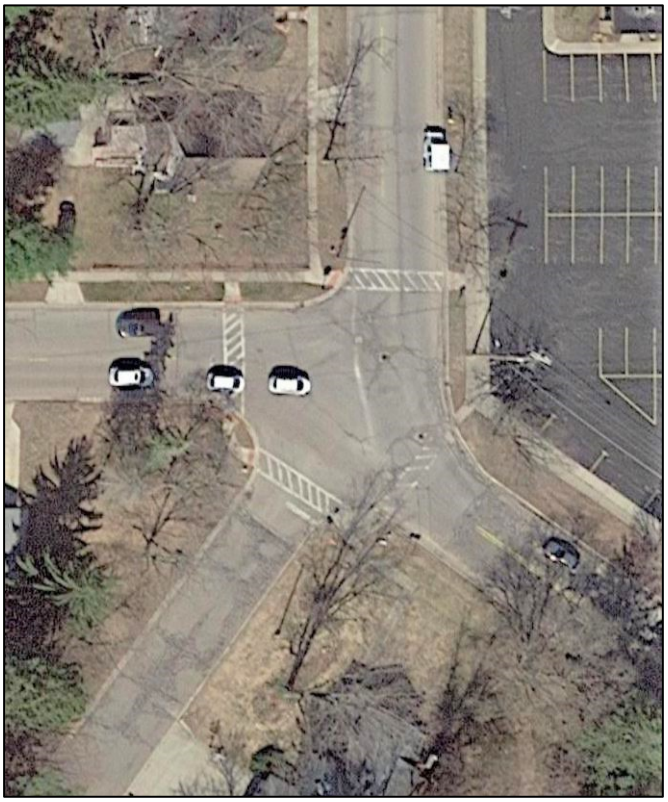
November 11, 2022

Christine Burns, Village Manager
Village of Spring Lake
102 W Savidge Street
Spring Lake, MI 49456

Re: Lake-Leonard-Grandview Intersection Review

Dear Chris,

Progressive AE has completed the traffic and safety review of the existing Lake Avenue/Leonard Road/Grandview Avenue intersection located in the southeastern portion of the Village of Spring Lake (Village). Our comments and recommendations stemming from our analyses are summarized in the following sections.



INTRODUCTION
Concerns have been expressed regarding the operations of this intersection due largely to its odd geometry and resulting traffic control characteristics. Therefore, the village requested a traffic and safety review be completed to determine the extent of any operational issues and identify potential improvements, if applicable.

ANALYSES
For reviews of this type, two sets of analyses were completed – a crash analysis and a capacity analysis.

Crash Analysis
Crash report data was collected for the time from 2017-2021, plus available data for year-to-date 2022. Those crash reports show that eight crashes have occurred at the intersection over that 5+ year period, for an average of just over one (1) crash per year. The crash reports also show that:

- Six (6) of the eight (8) crashes occurred in icy/wintery conditions, mostly involving vehicles going to/from the north leg of Lake Avenue to/from Leonard Road.
- Three (3) of those six (6) crashes occurred in a 2-day period in January 2019.
- There were no pedestrian-related crashes.
- There were no significant injury crashes or fatal crashes.

Eight (8) crashes over a 5+ period is considered low, even for an intersection that experiences relatively low traffic volumes. The crash history also indicates the Lake Avenue-to-Leonard Road curve is the primary geometric issue as opposed to the overall odd shape of the intersection, although even then it is mainly just during icy conditions.

Data Collection and Capacity Analysis
Morning and afternoon peak hour turning-movement counts at the Lake Avenue/Leonard Road/Grandview Avenue intersection were collected in late September. These counts indicate the typical weekday morning peak hour occurs between 7:00 to 8:00 a.m. and the typical afternoon peak hour occurs between 5:00 to 6:00 p.m., with a secondary afternoon peak hour occurring between 3:00 to 4:00 p.m.

Intersection "level of service" (LoS) calculations were completed to evaluate the current operational efficiency of the intersection. These calculations were completed using techniques outlined in the Highway Capacity Manual, published by the Transportation Research Board. Per Michigan Department of Transportation (MDOT) standards*, Synchro*® Traffic Analysis Software, Version 11, based on the Highway Capacity Manual methodologies, was used in the analysis.

Levels of service at unsignalized intersections relates to the delay, traffic volumes, and intersection geometry. Levels of service are expressed in a range from "A" to "F", with "A" denoting the highest or best, operating conditions. Generally, a LoS “D” rating is considered the minimum acceptable service level for signalized and unsignalized intersections in most areas, although a LoS “E” can be deemed as acceptable during the peak hours.

The results of the capacity analyses indicate that the worst level of service experienced by any constrained approach or movement was a LoS C for eastbound Grandview Avenue traffic during both the morning and afternoon peak hours. From an empirical standpoint these results indicate that there are currently no substantial capacity/congestion issues, although it is recognized that eastbound Grandview Avenue traffic experiences significant short-term delays during the peak hours.

ALTERNATIVES REVIEW
Per our discussions there may be several alternatives that would allow this intersection to convert to a more standard geometric design and perhaps resolve any driver confusion. However, truly viable alternatives would require that the Village acquire additional right-of-way from one or more current property owners. Also, based upon the results of the crash and capacity analyses, it just does not appear that there currently is a sound basis for funding right-of-way acquisition and the construction costs that would be incurred (likely in the $100,000-$300,000 (one hundred thousand dollars to three hundred thousand dollars) range for the latter).

There are, however, several less costly improvements as follows that the Village should consider to help improve the intersection operations.

1. Replace the faded “When Turning Left” sign on the Leonard Road approach to the intersection.
2. Place lane lines to/from Leonard Road to/from Lake Avenue that flatten out that curve slightly; this will reduce crash potent and provide a better sightline for northwest-bound Leonard Road drivers to see pedestrians crossing Lake Avenue.
3. Consider eliminating the crosswalk across Grandview Avenue (and the south leg of Lake Avenue). The current location creates a situation where pedestrians cross between queued vehicles, an inherently unsafe condition. Or because the completed counts indicated no pedestrians used that crosswalk during any of the six (6) hours that were recorded.
4. Continue to update/freshen the crosswalk markings on the north (Lake Avenue) side of the intersection.
5. Since northbound Lake Avenue has a 25 mile per hour (mph) speed limit anyway, consider changing the northwest-bound Leonard Road speed from 30 mph to 25 mph with a sign located approximately 250-feet from the intersection.

SUMMARY

The analyses completed as part of this intersection review indicate that substantial improvements are not warranted as there are currently no significant safety or capacity issues despite the irregular intersection geometry. There are, however, smaller improvements as noted that can benefit the drivers and pedestrians using this intersection.

Please let us know if you have any questions regarding the above review comments.

Sincerely,

Peter C. LaMourie PE, PTOE
Senior Transportation Engineer

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