



September 23, 2019

Mr. John B. Nagel,
Township Manager
East Whiteland Township
209 Conestoga Road
Frazer, PA 19355

Mr. Rick Smith,
Township Manager
East Goshen Township
1580 Paoli Pike
West Chester, PA 19380



Dear Mr. Nagel and Mr. Smith:

This letter is in response to your correspondence of June 26, 2019 with regard to the intersection of Sproul Road (S.R. 0352) and King Road (S.R. 2022). First off, the Department appreciates the time and attention by both Townships to evaluate potential solutions to improve traffic conditions at the intersection of these two state roads. Like other intersections in Pennsylvania, this is an old intersection of two roads that have evolved over time in terms of their function and traffic volume. The intersection layout creates less than desirable traffic movements, which have been exacerbated by an increase in traffic volumes.

Under the current configuration, the intersection layout results in the need for split signal phasing on the King Road approaches, whereby these approaches operate with separate green phases. Split signal phasing is generally inefficient, as it results in less total available green signal time to move traffic, and for that reason, the Department prefers concurrent signal phasing, with opposing legs of an intersection operating on the same green signal phase. As such, it has been the Department's preference to avoid the use of split signal phasing, except in select situations, such as when the intersection layout requires split phasing to address a safety issue that would otherwise be created by concurrent signal phasing.

The Department agrees that solutions are necessary to improve traffic conditions at the intersection, and specifically to address issues of safety and traffic delays/queuing, with safety being the primary goal. Your letter specifically requests the Department's input on any feasible traffic signal solutions. As such, any traffic signal solutions must first address the safety aspects of the intersection, which relate to the interlocking left-turn movements from Route 352, and the skewed, offset alignment of the King Road approaches. Therefore, with regard to any traffic signal solutions, these conditions must be addressed first. At this time, the Department does not support an all split signal phase solution (four separate signal phases for each leg of the intersection) due to the unacceptable impact of added delay and congestion this creates. However, the Department can support the following traffic signal solution.

1. Implement the split signal phasing to the Route 352 approaches to address the interlocking left-turn condition.
2. Operate the King Road approaches with concurrent signal phasing, but due to the skewed, offset alignment of King Road and the poor sight lines that exist, additional improvements are necessary, as follows, which require minor road construction within the existing King Road paved cartway.

- a. Shift the westbound through lane slightly to the south to improve the westbound line of sight to view oncoming eastbound King Road traffic.
- b. Remove the median on the east leg of King Road and shift the westbound left-turn lane slightly to the south to accommodate the adjusted location of the westbound through lane (as described above).
- c. Clear vegetation through the intersection to improve the eastbound/westbound line of sight along King Road.
- d. Implement protected/prohibited left-turn signal phasing on the westbound King Road approach, and otherwise implement concurrent signal phasing on the King Road approaches.
- e. Upgrade the traffic signal with vehicle detection on all four approaches to the intersection.
- f. Provide lane striping to guide eastbound and westbound King Road traffic through the intersection, as well as additional advance signing.

The above-described solution specifically addresses the interlocking left-turn issue for northbound and southbound Route 352 traffic, and the physical lane shift on westbound King Road along with the associated improvements will create a clear line of sight to maintain safety on the King Road approaches. This improvement changes the split signal phasing to the higher volume Route 352 approaches. While beneficial to remove the interlocking left turns on the Route 352 approaches, this solution does not address the traffic delays and queues. These improvements will result in overall worse delay for the intersection and for most traffic movements, which will continue to create long queues. As a result, these improvements should only be considered a temporary solution.

Ultimately, the solutions that are necessary to more fully correct the problems at this intersection should involve changes to the intersection layout and added capacity. This is best achieved by either creating a more conventional 90-degree signalized intersection with left-turn lanes or a roundabout, both of which PennDOT would support. However, we understand the Townships have dismissed the idea of the roundabout at this location. Therefore, with that in mind, we strongly encourage both Townships to advance the conventional signalized intersection improvements to improve the intersection layout/alignment and add left-turn lanes, and the Department will support the Townships' efforts to advance a more comprehensive solution. To that end, the Department is willing to support the signal only solution on a temporary basis, with the understanding that the comprehensive intersection improvement project is preferred and it must be advanced for eventual implementation within a reasonable time frame.

Again, PennDOT applauds the efforts of both Townships to pursue improvements at this intersection, which we understand is not easy, and is further complicated by the various impacts of any physical solution at this intersection. The Department welcomes the opportunity to meet

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with both Townships to discuss this further if there is any interest to advance both the temporary traffic signal solution and the permanent comprehensive solution.

Very truly yours,



Ashwin B. Patel, P.E.
Senior Manager Traffic Engineering
and Safety Division

cc: Honorable Kristine Howard
Honorable Andrew Dinniman
Honorable Carolyn Comitta
Honorable Thomas Killion