

South Carolina Department of Transportation
Traffic Engineering Guidelines

NUMBER: TG-29

SUBJECT: Late Night Flash (LNF) Operation of Traffic Signals

BACKGROUND: This guideline is intended to establish and maintain consistency in the use of late night flash operation of traffic signals statewide. The Department occasionally receives requests for use of late night flash operation as a method to reduce delay at signalized intersections. This guideline provides alternatives, study requirements, and operation criteria.

GUIDELINE: Based on the research conducted in developing this guidance, the national trend is to utilize fully actuated traffic signal operation to avoid the use of Late Night Flash operation. Prior to considering the use of LNF operation at a particular traffic signal, efforts must first be made to reduce delay while keeping the signal in steady (stop-and-go) operation. The signal timings and/or equipment settings should be adjusted in a manner that would reduce delay during periods of low volume. The following options should be considered in order to reduce delay:

- Implement a late night timing plan with a reasonably low cycle length.
- Install pedestrian push buttons and reduce the minimum green values.
- Install or repair loop detection (for pre-timed or semi-actuated signals) and remove the delay value from the loop detectors at night.

The implementation of one or all of these options will allow the signal to operate on a much shorter cycle length and will reduce delay on the side streets.

If implementing these options is not feasible or is unsuccessful, either due to limitations on funding or controller capabilities, the use of LNF could be considered and an engineering study performed. This study should compare the time saved by using LNF to the time saved when the above options are implemented. At a minimum, this study should include the following information:

- Traffic volumes for each approach recorded at 15-minute intervals for a period of 24- hours. If there are protected left turn movements and/or if right turns are observed to carry most of the volume for the minor street, they may need to be counted separately from the thru volumes. Separate counts are needed for weekday and weekend studies. Weekday studies should be conducted between Monday PM and Thursday AM. Weekend studies should be conducted between Friday PM and Sunday AM.

- Observations of vehicle classifications for each movement including cars, trucks, public transit vehicles, pedestrians, and bicyclists.
- Posted speed limit or 85th percentile speed for each approach.
- Condition diagram showing intersection characteristics such as geometrics, channelization, grades, sight-distance restrictions, transit stops and routes, parking conditions, pavement markings, roadway lighting, driveways, railroad crossings, and adjacent land use (particularly businesses that are open late within a quarter-mile of the intersection and on the opposite side of the major street from a neighborhood).
- Collision diagram showing crash type, location, movement direction, severity, weather, time of day, date, and day of week for at least one year.
- Proposed hours of flashing operation.

LNF operation is not recommended if any of the following apply:

- Posted speed limit is higher than 35mph for any approach.
- More than two approach lanes exist on each leg of the major route.
- More than eight total approach lanes exist for all legs of the intersection (including left turn lanes).
- Large number of trucks exist on the minor street (or in protected left turn movements).
- The two-way traffic volume for the major street exceeds 500vph.
- The highest volume approach for the minor street volume exceeds 150vph.
- Sight distance restrictions exist.

The study should include all of the aforementioned information and should meet all of the recommendations. Any exception to the recommendations included here should be noted in the study with justification for the exception. If warranted, LNF should be used no less than two consecutive hours, preferably four. If bars or other late-night establishments are located nearby the LNF operation should not be used until at least one hour after closing time. LNF is not required to be used every night of the week and can be used on weekdays, weekends, or both.

These guidelines seek to reflect the findings in the report “Guidelines for Operating Traffic Signals during Low-Volume Conditions.” The information contained in that report may be used for reference with less emphasis placed on the Literature Review portion and more emphasis placed on the Guidelines and Recommendations portion. Particularly useful information may be found on page 39, “Figure 1: Flowchart for Implementing Flashing Operation during Low-Volume Conditions,” and on page 47, “Figure 3: Illustrative example of the proposed methodology for selecting between the normal signal operation and the flashing signal operation at a signalized intersection (Factor of Safety = 0.5).”

Approved: _____


 Director of Traffic Engineering

October 16, 2013
 Date