



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

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SECRETARY

April 14, 2020

To: NCSITE Traffic Engineering Council

From: Jim Dunlop, for Congestion Management

Re: Congestion Management and MSTA Procedures - Dallas Phasing in Synchro (Flashing Yellow Arrow)

Synchro has included the option of "Dallas Phasing" for many years. Dallas Phasing refers to a specific signal operation first developed in Dallas, TX, which allowed for protected-permitted left-turn phases in lead/lag operation without the issue of creating a "yellow trap". This phasing required special programmable signal heads.

The implementation of the flashing yellow arrow in signal heads now allows this operation without the special equipment. Synchro's User Guide (page 10-3) recommends the use of Dallas Permitted (D.Pm) and Dallas Permitted plus Protected (D.P+P) for a protected plus permitted Flashing Yellow Arrow (FYA). The selection of the Permitted Flashing Yellow checkbox is only used if a simulation within SimTraffic is conducted. The Permitted Flashing Arrow setting does not affect the analysis results in Synchro. These settings are found on the Home/Timing Settings screen.

Our limited review of the Dallas Phasing shows that there appear to be minimal differences in total delay when comparing D.P+P to the traditional Protected/Permitted (pm+pt) phases in Synchro. The primary difference in the timing settings is that the Permitted Phases selects the opposing through phase rather than the concurrent one. This matches the settings in the controller.

Based on our review, Congestion Management will accept the use of Dallas Phasing in Synchro analyses. Dallas phasing should only be used for existing Protected/Permitted conditions where a four-section head with a FYA has been installed. If a five-section "doghouse" signal head is used, then the traditional pm+pt phasing should be used. Almost all new signals with Protected/Permitted phases will include four-section FYA heads.

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This does not change Congestion Management's requirement that protected-only phasing should be used for left-turn phases (in build scenarios) for any new or modified signals. Any Protected/Permitted phasing should only be used for existing signals or those that are not modified in the build scenario. Exceptions should be approved before submitting a traffic impact analysis.