



UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

PROJECT TITLE: A Data Driven Safety Assessment of Various Left Turn Phasing Strategies

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INSTITUTION: SINGLE-INSTITUTION PROJECT

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Background

Protected-permissive left turn phases have potential to improve traffic operations by allowing more vehicles to complete their left turns during the permissive phase especially in off-peak hours; however, their safety is perceived to be less than protected-only left turn phases. As such, assessing the safety of protected-permissive left turn phases with FYA is needed before implementing them in the field. Doghouse displays accommodate permissive left turn movements during a circular green signal without an FYA. As a result, doghouse displays may create some confusions among drivers as a circular green signal indicates the allocation of the right-of-way while left turning vehicles must yield to the opposing traffic during the permissive phase with a circular green signal. The safety impacts of doghouse displays need to



be assessed and compared to that of FYAs before making a decision to use them. Finally, signal plans may change from a protected-permissive with FYA to a protected-only phase in different times of the day, based on traffic conditions. There is evidence showing that protected-permissive phases with FYA may contribute to more crashes during off-peak periods due to driver confusion. It is needed to identify if changing the phase plane from of time of the day to another creates confusion among drivers.

Research Project

This research will use a data-driven methodology to assess the safety of the aforementioned signalization strategies. The results of this research will help decision makers to select a more suitable signal phasing plan/display under various operational conditions. Specific objectives are:

1. Compare the safety of protected left turns to protected-permissive left turns with FYA,
2. Compare the safety of doghouse displays to four section vertical displays with Flashing Yellow Arrow (FYA), and
3. Assess the safety of including FYA phases in protected-permissive left turns at different times of the day to identify if it creates driver confusion.

