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The ITE (Institute of Transportation Engineers) yellow change interval formula calculates the duration of the yellow light. The flaw is not the formula itself. The flaw is how traffic engineers misapply the formula. The misapplications short the yellow light by several seconds. The misapplications adversely affect every intersection. Every driver, good or bad, is susceptible. These misapplications cause crashes, and within a few years the issuance of more red-light tickets than the city's population:

1. Traffic engineers use the ITE formula[1] in the Delaware Traffic Design Manual Section 2c universally. But the formula applies only to unimpeded through movements.   The formula fails for turning and/or impeded movements.

2. Traffic engineers plug the wrong approach speed[2] (i.e., for turning lanes) into the equation.

3. Traffic engineers misapply stochastic methods.   From the Traffic Design Manual, engineers input perception-reaction time 1.2 s and deceleration 11.2 ft/s^2. 11.2 ft/s^2 is the 90th percentile deceleration for emergency stopping. (AASHTO's context of 11.2 ft/s^2 is about emergency stopping, not comfortable stopping. Delaware misquotes AASHTO.)   11.2 ft/s^2 is about the 35th percentile for comfortable stopping.   The Delaware engineer de facto forsakes 65% of the driving population as well as all commercial drivers.

4. Traffic engineers omit the grade deceleration adjustment gG. Vehicles ascending or descending a hill require longer yellows than vehicles on a level road.

5. Traffic engineers omit the calculation of the tolerance of the yellow change interval.   Engineers set the red-light camera grace period to around 0.3 seconds (less time than the blink of an eye), but the tolerance for a properly-applied formula exceeds 2.0 seconds. Currently 70% of camera revenue comes from vehicles entering intersections within 1 second of the light turning red.

6. Because traffic engineers misapply the physical and mathematical sciences to yellow change intervals, the change intervals violate Title 17 § 147 of the Delaware Code. The requires conformance to the Delaware MUTCD.   4D.26(3) requires change intervals to be determined by engineering practices. The formula in the Design Manual 2c is not an engineering practice[1] because it misapplies physics and math as enumerated by 1 thru 5 above.   Delaware Professional Engineers Act § 2803 (14) defines a professional engineer as one who applies, not misapplies, the physical and mathematical sciences.

Solution: http://talussoftware.com/download/yellow-change-intervals Video: https://youtu.be/N1Fle9TB8FE

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[1]Engineers invoke the name of the "federal guidelines" to justify the ITE formula. The ITE formula, however, is not a federal standard, guideline or ITE Recommended Practice. Options and guidelines are used at the engineer's discretion.   [2]Engineers often invoke MUTCD 4D.26(14) to justify a 3-second yellow for any approach speed. However, 4D.26(14) states the 3-second yellow is a minimum to be used only for slower approaches. Slower approaches are 25 mph speed limit or less in consonance with the ITE formula. For turning and impeded motions, the ITE formula always shorts a yellow by several seconds, that according to the laws of physics.