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The Institute of Transportation Engineers (ITE) Yellow Change Interval Formula is a math equation which engineers use to calculate the duration of the yellow light. There are problems with how traffic engineers use it. The flaw is not the formula itself but rather that 1) engineers apply the formula to traffic movements the formula does not fit and 2) engineers plug the wrong numbers into the formula. The problem creates yellows too short by several seconds. That creates a systematic defect called dilemma zones. Dilemma zones subject innocent drivers to inadvertently run red lights. The problem is so pervasive that a handful of red light cameras in just a few years will issue more tickets than a city's population. The problem causes crashes as well. Here are some facts:

1. Traffic engineers use the formula[1] universally but the formula works only for one special case.
2. Traffic engineers plug the wrong approach speed into the equation.
3. Traffic engineers misapply stochastic methods. Engineers plug in percentiles for perception-reaction time and deceleration. By using percentiles, engineers always forsake a set of drivers. FDOT plugs in average deceleration for a passenger car which neglects half the driving population and commercial vehicles. FDOT uses a 1.4 perception-reaction time. 1.4 seconds is the 85th percentile for passenger car drivers. FDOT neglects 15% of drivers. The 85th percentile for commercial truckers is 2.2 seconds.
4. Traffic engineers misapply an analytic solution to a physical solution. Engineers misapply grade term Gg to uphill traffic.
5. Traffic engineers omit the calculation of the tolerance of the yellow change interval. Engineers set the red-light camera grace period to 0.3 seconds (less time than the blink of an eye), but the tolerance for a properly-applied formula exceeds 2 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 Florida Statute § 316.0745 with FAC Rule 14-15.010. The yellows do not conform to the Manual of Uniform Traffic Control Devices (MUTCD). MUTCD 4D.26(3) requires change intervals to be determined by engineering practices. Florida Regulation of Profession and Occupations Title XXXII § 471-005 (7) defines engineering practice as the application (not the misapplication) of the physical and mathematical sciences[2].

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

[1]Florida Traffic Engineering Manual (3.6.2) elevates the ITE formula to a standard. But the ITE formula was never a federal standard or a guideline. The ITE formula is only an indirect reference of an option within the MUTCD. ITE itself does not recommend engineers to use it. Engineers exalt the formula at their discretion. [2]The FDOT Traffic Engineer Manual binds the ITE formula with MUTCD 4D.26(3) but the two are incompatible. Using the ITE formula is not engineering practice.

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