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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. The flaw is not the formula 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 input perception-reaction time and deceleration values for the average passenger car driver. By using *average*, the engineer de facto forsakes half of driving population as well as all commercial vehicle drivers.
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 Louisiana Revised Statute § 32:235 (A1) . The yellows do not conform to the Manual of Uniform Traffic Control Devices (MUTCD)[2]. MUTCD 4D.26(3) requires change intervals to be determined by engineering practices. Louisiana R.S. Title 37 § 8-682 (4) and Title 46 Part LXI § 1517 define an engineer as one who applies (not misapplies) the physical and mathematical sciences.

The solution is at http://talussoftware.com/download/yellow-change-intervals.

[1]Engineers may invoke the name of the "federal guidelines" to justify using the ITE formula. The ITE formula, however, is neither a federal standard nor a guideline. The formula is not even an ITE recommended practice. The formula only appears in a book referenced by the MUTCD. [2]Engineers often justify any 3 second yellow using MUTCD 4D.26(13). But MUTCD 4D.26(13) restricts the 3-second yellow to slower approaches--in consonance with the ITE formula--approaches with a speed limit of 25 mph or less. In spite of the restriction, 3-second yellows appear often for turning lanes for any speed limit though ITE's own practice for turning lanes is to plug in v = speed limit – 5 which yields 4 seconds or longer. The 3 to 6 second range for yellows is a MUTCD "guideline". The ITE formula is a MUTCD "option". Engineers use options and guidelines at their own personal risk and liability.

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