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The Flaw in the Formula. 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. 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 old ITE formula (formula prior to March 2020) universally but the formula works only for one special case.
2. Traffic engineers plug the wrong approach speed for turning traffic 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. 70% of camera revenue comes from vehicles entering intersections within 1 second of the light turning red.

Iowa Specific

6. Because traffic engineers misapply the physical and mathematical sciences to yellow change intervals, the change intervals violate [§761-130.1 of the Iowa Administrative Code](#). The [MUTCD 4D.26](#) mandates change intervals to be determined by engineering practices. Iowa Engineering Practice Statute [542B.2-9a](#) defines engineering practice as the application (not misapplication) of the physical and mathematical sciences.

*Engineers may invoke the name of the "federal guidelines" to justify using the old ITE formula. The old formula appears on the FHWA website, in NCHRP reports and as an indirect reference of an *option* in the MUTCD. These publications cite ITE; however, ITE declares this old formula incorrect. ITE replaced the formula with one which also accommodates left-turning traffic. Even the new ITE practice violates other laws of physics, still forcing drivers in predictable scenarios to run red lights. The engineer uses ITE's practices at his own discretion. Though the ITE practice is the standard of care in traffic engineering, this standard of care departs from the standard of care required under law.