

Why Red-Light Cameras are Unlawful in North Carolina

Engineering Malpractice

1. The NCDOT uses the Institute of Transportation's "ITE yellow change interval formula" to calculate yellow light durations. The formula is wrong. Because the NCDOT uses this formula and the fact that this formula has severe math and physics errors which makes every one run red lights, red-light camera programs are unlawful. Here are the stepping stones from the federal regulation to North Carolina statutes:

2. Stepping Stones

- a. [23 CFR 655.601\(a\) Subpart F](#) → [MUTCD](#). The Manual of Uniform Traffic Control Devices (MUTCD) is published by the Federal Highway Administration (FHWA). The MUTCD defines the engineering design and operational standards required by traffic signals and traffic signs in the United States. For example, all stop signs in the United States are octagons and painted red because the stop sign design is in the MUTCD. The MUTCD also has mandates for yellow light durations.

The MUTCD is for engineers, written in the vocabulary of engineers.

Engineers call the MUTCD a “Systems Requirements Specification”

(SRS). The SRS contains four different kinds of statements. One of the four is a “standard”. Only standards must be implemented.

- b. [MUTCD](#) → [North Carolina General Statute 136-30\(d\)](#). North Carolina adopts the [MUTCD](#) as law.
- c. [MUTCD 4F.17\(03\)](#) is a standard mandating that “yellow change intervals shall be determined by *engineering practices*.” (Saying “yellow change interval” is the same thing as saying “yellow light duration”.)
- d. “Engineering practices” is special terminology specific to law.
- e. [MUTCD 4F.17\(03\)](#) → [North Carolina General Statute 89-C\(6a\)](#). → “engineering practice.” NCGS 89-C(6a) defines “engineering practice” as the “application of the mathematical and physical sciences”. This definition sifts what is engineering from what is not engineering. For example, an engineer implementing $2 + 2 = 4$ is an engineering practice but implementing $2 + 2 = 5$ is not an engineering practice.
- f. [ITE formula](#) → engineering malpractice. The [ITE formula](#) is misapplications of the mathematical and physical sciences. It is the equivalent of $2 + 2 = 5$. Therefore, **the ITE formula is not an engineering practice**. These National Society of Professional Engineers

[videos](#) describe the history of the yellow light, the math behind the yellow light, and the NCDOT's misapplications of math to yellow lights. The videos show that such misapplications cause over 90% of all red-light running and crashes. (The NCDOT's implementation of the ITE formula shares the same major defects as all DOTs'.)

g. North Carolina's red-light camera statute [NCGS 160A-300.1\(c1\)](#) requires the "yellow light change interval duration to comply with the [MUTCD 4F.17\(03\)](#)". The yellow light change interval does not comply with the MUTCD because the NCDOT's formula is not an engineering practice. Therefore . . .

h. Red-light camera programs in North Carolina are unlawful.

- i. The FHWA and ITE confirm that the ITE formula is not an engineering practice:
- i. ITE never claimed its formula to be an engineering practice. For decades, ITE only called its formula a "practice". Since 2020, its new formula a "guideline". But ITE never called any of its practices "engineering practices" or "standards".
 - ii. In 2020, [ITE formally acknowledged](#) that its old formula is wrong. ITE introduced a new formula. Though the new formula is better than the old one the NCDOT uses, the math is still wrong, still

making everyone run red lights. In 2020, ITE begins warning governments that photo-enforcement is incompatible with the ITE formulas.

- iii. In 2023, the FHWA formally rejected all ITE formulas. The MUTCD (11th Edition, 2023, [4F.17](#)) no longer declares the ITE formula an engineering practice. Prior editions indirectly referred to the ITE formula as an engineering practice in ([4D.26\(07\)](#)).
- iv. The FHWA removed the ITE formula from its web pages. One can no longer claim that the ITE formula is a federal guideline (as if guidelines had authority in the first place).
- v. [MUTCD 4F.17\(13\)](#). “The yellow change interval *should* be between 3 and 6 seconds.”
 - A. Not *shall* be. This statement is a *guideline* and has no authority. It is not a *standard*.
 - B. Not every value within the range is valid. You cannot set the yellow to a minimum 3 seconds just as you cannot broil meat at 200°F--the minimum temperature of your oven.
 - C. The 3 to 6 second range is a holdover from the old ITE formula. It is wrong. I mention this because the NCDOT uses 3 second yellows for left turn arrows whereas the correct

yellows should be over 6 seconds. The NCDOT makes 15 times more people run red lights when turning left than going straight.

- j. [H189 Session 2025-26](#). The NCDOT wrote this bill. Embedded in this bill is NCDOT's confession that its formula makes *everyone* eventually run red lights. The bill differentiates safe red-light runners (called non-violators) from unsafe red-light runners (called violators). The NCDOT admits that its ITE formula causes safe red-light running. (70% of red-light running are imperceptible to the human eye.) The formula also causes unsafe ones which the NCDOT will not admit. The bill limits red-light cameras to punish only unsafe red-light runners. Erin Paré introduced this bill. Raleigh immediately terminated its red-light camera program. Raleigh's City Manager said if we just ticket the unsafe drivers, there is no money left to cover operating expenses. Wilmington followed a year later.
- k. There is an engineering and lawful solution. A yellow light formula that would be an engineering practice is one that removes the 2 from the denominator of the ITE formula.
- l. The ITE formula is a standard of *practice*, not a standard of *care*. This is a decisive legal distinction. The ITE practice does not rise to the

threshold required of a standard of care. Though all traffic engineers use the ITE formula, popularity does not qualify the formula as a standard of care. Only a formula that is applications of mathematical and physical sciences can be an engineering practice, and once an engineering practice, only then can it be elevated to a standard of care.