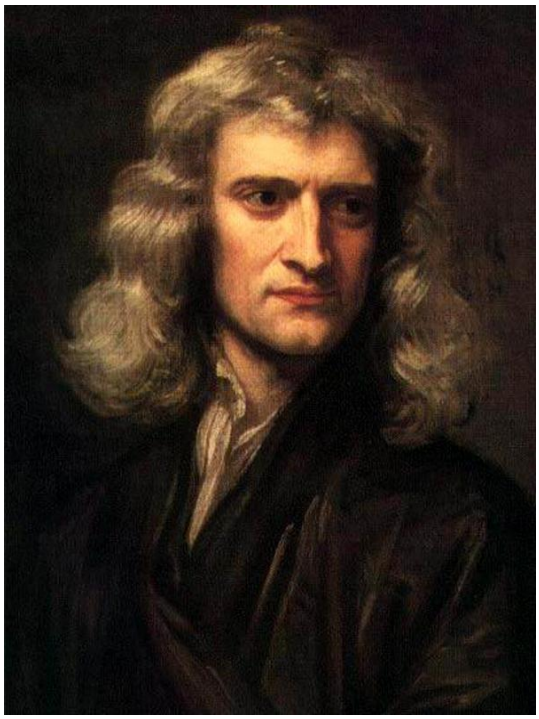
2011

Isaac Newton vs. Red Light Cameras



Breach of Contract
Town of Cary, North Carolina

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Contracts

When we think of contracts, we think of business contracts. We think of mutual obligations between parties within a business arrangement. When one party does not fulfill his obligation as required in the contract, he breaches contract and the other party can sue.

What does red light cameras have to do with business contracts? After all, one does not normally think of stopping at red lights as a business contract. But by all definitions, stopping at red lights is indeed a contract. Stopping at red lights is actually a business contract on steroids. The terms of this contract are not conveyed with the imprecise language of words, but rather with the exact language of mathematics. Mathematical contracts can never be misconstrued.

The red light camera contract is declared by the Town of Cary Charter 8.15 or Session Law 2004-141 to be ITE's Yellow Light Equation. These laws and equation explicitly define the parties and the terms of the contract.

There are two parties:

1. The Town of Cary
2. The Automobile Driver

There are mutual obligations:

Town of Cary's Obligations

1. The Town of Cary must set the yellow light duration to the time computed by the equation.

2. The Town of Cary must reveal the location of the decision line to the automobile driver. The decision line is a line crossing the width of the road located at the safe braking distance from the intersection. If the driver crosses the decision line before the light turns yellow, then the driver must go through the intersection. If the driver crosses the decision line after the light turns yellow, the driver must stop.

The Automobile Driver's Obligations

A. When the Town of Cary's fulfills both its obligations, the Automobile Driver's obligation is to not run a red light.

The Town of Cary's fulfillment of its obligations is a precondition for the Automobile Driver to meet his obligation.

There are penalties when the Automobile Driver breaches contract:

1. The Town of Cary demands $50 from the Automobile Driver.
2. The Automobile Driver may cause an accident, hurt himself or hurt others.

There are penalties when the Town of Cary breaches contract:

1. The Town of Cary may get sued by the Automobile Drivers, individually or by class.

   But unfortunately since Automobile Drivers have so far not realized that the Town of Cary is not meeting its end of the bargain . . .

2. The Town of Cary has been able to get with demanding $50 from the Automobile Driver.
3. The Automobile Driver may cause an accident, hurt himself or hurt others.

From the introduction of red light cameras in 2004 unto the present day, the Town of Cary has never met its obligations as mandated by the mathematical contract within Town of Cary Charter 8.15. Yet the Town of Cary has so far been able to penalize every Automobile Driver for its own breach of contract. This is going the stop. The Town of Cary is now going to get sued by the Automobile Drivers, both individually and by class action.

- Cary does not meet Obligation 1 for 80% of the intersections in the Town of Cary,
- Cary does not meet Obligation 2 for 100% of the intersections in the Town of Cary,

Failure to Meet Obligation 1 – Yellow Light Too Short

The Town of Cary fails to set the length of the yellow lights to at least the minimum values computed by ITE's Yellow Light Equation for straight-thru traffic at these red light camera intersections. These intersections make up Failure Group 1:

- Cary Town Blvd and Convention (Eastbound)
- Cary Parkway at High Meadows (Westbound)
- Kildaire Farm Rd at Maynard Rd (Southbound)
- High House Rd at Prestonwood Drive (Westbound. Dates < Oct 2006)

The Town of Cary fails to set the length of the yellow lights to at least the minimum values computed by ITE's Yellow Light Equation for left turn arrows at these red light camera intersections. These intersections make up Failure Group 2:

- Walnut St. at Meeting Place (Southbound)
- Maynard Rd. at Kildaire Farms Rd. (Westbound)
- Maynard Rd. at Kildaire Farms Rd. (Southbound)
- Cary Pkwy at Kildaire Farms Rd. (Westbound)
- Cary Pkwy at Kildaire Farms Rd. (Northbound)
- Cary Pkwy at High House Rd. (Northbound)
- Harrison Ave. at Maynard Rd (Southbound)
- Harrison Ave. at Weston Pkwy (Southbound)
- NW Maynard Rd at Chapel Hill (Northbound)
- Maynard Rd at Walnut St. (Southbound)
- Tryon Rd at Crescent Green (Eastbound)
- Tryon Rd at Regency Pkwy (Westbound)
- Walnut St at Dillard Dr. (Northbound)
- Ten-Ten Rd. at Kildaire Farms Rd (Eastbound)

Failure to Meet Obligation 2 – Dilemma Zone

The Town of Cary fails to mark the safe braking distance line for *every* intersection in the Town of Cary. This failure creates the Dilemma Zone—a failure which guarantees a steady stream of cars running red lights. Yet the marking of these safe braking distance lines is explicitly mandatory in the mathematical contract of ITE's Yellow Light Equation. *All signalized intersections of Cary, as well as those in rest of the entire world,* make up Failure Group 3.

For the last several decades, the Town of Cary forces everyone to guess where the decision line is for every intersection. When you approach an intersection and the light turns yellow, you have to ask yourself, "Am I close enough to the light to safely go through the intersection?" There is an actual physical line on the road where if you knew its position, you could always answer that question correctly. But since the Town of Cary makes you guess its position, you risk guessing incorrectly. There is no amount of careful driving that you can do to ensure you will always guess correctly. The closer you are to the decision line, the greater the probability that you guess incorrectly.

The Town of Cary's setting the yellow light duration but omitting the location of the decision line is like a bad recipe for bread. The recipe tells you how long to bake the bread but doesn't tell you the temperature to set the oven. Raw dough and burnt crust is like rear-end and t-bone crashes.

Rampant Red Light Running

As long as police didn't give tickets to people who accidently entered into the intersection 1/10th of a second after the light turned red, no one cared. No one cared as long as the means of enforcement complied to the imprecise nature of the guess of the safe braking distance line.

But red light cameras enforce the contract with the same mathematical rigidity of ITE's equation. Unbending. If you guess incorrectly by 1/10th of a second, you get penalized. It looks like the whole world is now suddenly and rampantly running red lights. Now people care.

If the Town of Cary is going to hold drivers accountable to the mathematical precision of traffic computers, then the Town of Cary must mark the safe braking distance decision line so that drivers can comply. **Cary can only enforce ITE's equation as rigidly as engineers comply with its demands.** A rigid enforcement requires that the Town of Cary meets the rigid obligation of ITE's equation. Police never expect a driver to compute the safe braking distances to the accuracy of a few feet. Police would always give a driver a grace time of at about ½ second.

Solution

How does one fix this problem? There are many possible solutions:

1. The best solution is to establish a contract which does require the decision line. The equation that meets that contract is the equation which sets the yellow interval equal to the stopping time. (Right now ITE's equation sets the yellow light duration to half the stopping time.) The information carried by the traffic light turning yellow solely and sufficiently provides the driver always with the option of safely stopping. Using such a contract, the driver *always* has the option of braking.

   The driver can brake, not necessarily *stop*. If the driver starts braking but later realizes that he cannot stop, or that stopping will cause him to get rear-ended, the worst that can happen is that the driver glides through the intersection on a yellow light. (Right now a mistake causes the driver to enter the intersection on a red wherein lays great peril.)

2. Keep ITE's equation but paint a safe braking distance decision line on the approach to every intersection. The downsides are that 1) paint wears off, 2) one cannot see paint when the road is covered with snow, and 3) a line on the road diverts the driver's attention away from the intersection.

3. A third solution, the worse one, is to get rid of the red light cameras. Let police officers judge the infractions using the same loosy-goosy judgments as ITE's equation-without-marking-the-decision-line requires. This is what we have been doing for decades. This solution does not eliminate the safety problem inherent in misapplying ITE's equation—the real cause of the majority of accidents. ITE's equation without the decision line remains a guess and that guess causes accidents. The presence of red light cameras does nothing for reducing accidents. The presence of red light cameras only trades T-bone crashes for rear-end collisions. Red light cameras do not make intersections safe. Correctly timed yellows do. The red light cameras are not bad in themselves for they provide the statistics which expose the engineering defects from which we have all suffered.

4. A fourth solution is as bad the third solution. Let the cameras flash but don't issue a ticket unless the driver enters the intersection over a second after the light turns red. The attempt is to mimic the enforcement policy of police.

One can only enforce ITE's equation as rigidly as an engineer can comply with its demands. Even with all the solutions above, there remain challenges which an engineer hasn't been able to solve. The equation takes only into account the grade of the road and the speed limit. There are other factors which the equation omits; for example, the slipperiness of the road. The equation applies only to dry roads. If you are travelling on an icy road and have to stop, you need more time to stop than on a dry road. The coefficients of friction are different between a dry and icy road. The yellow light has to be several seconds longer. The engineer ignores this particular requirement of Nature because he does not have the technology to implement a real-time weather monitor. The engineer assumes the road is dry. His solution is not complete, but there is nothing he can do it improve upon his solution. The average driver did not care so long the police enforced the law. The police bend to incompleteness of the traffic engineer's solution. Red light cameras do not. In the end, one can only enforce ITE's equation as rigidly as an engineer can comply with its demands.

Yellow Light--Not a Clear and Simple Meaning

The Federal Highway Administrations has one major requirement of a traffic signal. A traffic signal is supposed to "present a clear and simple meaning." The meaning of ITE's yellow light:

> "If you are farther from the light than the unmarked decision point ,which varies upon intersection, speed limit, grade and other geometrics, which you have to guess at and unwittingly do not know about, when the light turns from green to yellow, then you must stop. If you are closer to the light than the unmarked decision point ,which varies upon intersection, speed limit, grade and other geometrics, which you have to guess at and unwittingly do not

know about, when the light turns from green to yellow, then you must go. If you do not correctly guess the location of the unmarked decision point, you may die.