NORTH CAROLINA		IN THE GENERAL COURT OF JUSTICE SUPERIOR COURT DIVISION
WAKE COUNTY		10-CVS-19930
BRIAN CECCARELLI and LORI MILLETTE individually and as class representative, Plaintiff, v. TOWN OF CARY, Defendant.	)	RESPONSE AND OPPOSITION TO THE TOWN OF CARY'S MOTION FOR SUMMARY JUDGMENT

The Plaintiffs oppose the Town of Cary's Motion for Summary Judgment although, pursuant to Rule 56 (c) (last sentence) of the Rules of Civil Procedure, the Plaintiffs state that if the court determines that there is no genuine issue of material fact, Summary Judgment should be granted as a matter of law for the Plaintiffs on the First Claim for Relief.

INTRODUCTION

1. What this case is about. May the Town of Cary penalize those driving on its public streets for lawful actions taken which, for a significant number of drivers, will leave them in jeopardy of penalty despite driving otherwise lawfully, reasonably and safely? NO.

   http://failblog.files.wordpress.com/2010/02/epic-fail-diving-sign-fail.jpg

2. What this case is not about:
   a. The wisdom of the legislation authorizing the ordinance in question. The Plaintiffs do not object to red light cameras. Cameras do not create the problem. They statistically reveal the problem. Plaintiffs do not object to penalizing those who willfully or negligently violate the red light traffic laws, to wit: G.S. §20-158, by entering an intersection on red. Instead these Plaintiffs are concerned with public safety and believe that the statute and ordinance should be construed so as to prevent absurd results, unfair enforcement, and creation of unsafe situations.
   b. The criminal enforcement of red light laws by officers.
   c. The standards for negligence when drivers are faced with an emergency. In such a case the law expects a reasonable driver to decelerate more rapidly or accelerate more rapidly, or take other reasonable actions to avoid injury or damage to others.
   d. A tort claim against the state.

   Instead this case is about reasonable speeds, reasonable deceleration rates and reasonable perception/reaction times in non-emergencies. Should the statutes be

construed to authorize towns to penalize drivers who are compliant with the law, reasonably perceptive, and decelerating normally?

e. This case is not about whether physicists or engineers are better people or better scientists or which are more talented. The statute calls for engineering standards to be met but, as will be shown, engineering standards that are not based on sound principles of physics are incomprehensible as engineering standards. Physics, including the laws of motion enunciated by Isaac Newton several centuries ago and in force everywhere in the known universe (except at speeds approaching the speed of light) are an essential predicate for sound engineering. G.S. §89C-3(6) defines engineering as the "application of special knowledge of the mathematical, physical, and engineering sciences…" and G.S. §89C-2 puts this in the context of safeguarding "life, health and property."

f. This lawsuit is not about whether the Town of Cary intended to act wrongly. This case is about whether the trap which was set, whether intentionally or unintentionally, is authorized by the statute.

3. The Shape of the class – Reserved as an offer of proof

a. The Town of Cary's intent and knowledge is relevant to the shape and numerosity of the class. In December 2004 the N.C. Department of Transportation was telling towns that it would shorten yellow lights by a half second .By July 2005,the N.C. Department of Transportation was telling towns that it would further short yellow lights by another half second. On June 30, 2006, Greg Fuller of the NCDOT responded to Town of Cary Chief Engineer Richard Moore's plea not to decrease yellow light durations. Moore said those shortened yellows would increase red light camera violations and accidents. Moore makes reference that he brought forward all these issues in February 2006. As will be shown, the Town of Cary had actual knowledge of the safety and compliance problem as early as January 13, 2006. The Town of Cary offered as an alternative, to allow a grace period so as to obviate the safety problem but the Town of Cary did not follow through on that. Cary's asserted 0.2 second grace period is de minimis. Lengthening the all red clearance interval does ameliorate T-bone crashes but ameliorating the safety problem does nothing to help drivers who are trapped (but are otherwise acting lawfully and reasonably) from receiving the $50 penalty.

The Plaintiffs contend that each class should, therefore, include those drivers cited on or after January 13, 2006. This issue is preserved for appeal. Please consider this as an offer of proof.

In December 2004 NCDOT reduces minimum yellows from 4.0 to 3.5 seconds (pp. 3-4):
http://redlightrobber.com/red/links_pdf/NCDOT-Typo-20-30-Document-Error.pdf

In July 2005 NCDOT further reduces minimum yellows from 3.5 to 3.0 seconds (pp. 4-5):
http://redlightrobber.com/red/links_pdf/NCDOT-Typo-20-30-Document-Error.pdf

On February 3, 2006, Cary Traffic Engineer Richard Moore responds to NCDOT that decreasing yellow times from 4.5 to 3.0-3.3 seconds for all left turns at all intersections on Harrison Ave. could create a safety problem. Moore makes distinction between stop bar and approach speed measurements (p. 9):
http://redlightrobber.com/red/links_pdf/north-carolina/Cary-Arguing-with-NCDOTs-Decreasing-Yellows-in-Cary.pdf

On January 13, 2006, Cary's Senior Engineer Dale Privette pleads with Don Darity to increase the yellow change intervals to at least 3.5 seconds (p. 11):

http://redlightrobber.com/red/links_pdf/north-carolina/Cary-Arguing-with-NCDOTs-Decreasing-Yellows-in-Cary.pdf

b. In addition and with respect to the first claim for relief, the commencement of the class was set by the Court at the date when Plaintiff Ceccarelli gave his notice of appeal for a hearing, December 2, 2009. His citation was for actions occurring on November 6, 2009. As of November 4, 2009 the North Carolina Department of Transportation had formally approved a request to correct the signal plan at that intersection and it thus became the signal plan of record as of November 4, 2009. And it further appears that the Town of Cary was actually aware of the error with respect to the signal plan (the actual speed limit was 45 mph since 1984) instead of the 35 mph on the 1991 signal plan in error) no later than September 30, 2009 when Town of Cary engineers submitted the signed and sealed proposed new signal plan for that intersection.
c. The purpose for using notice of appeal as a cutoff date is to give the Town of Cary notice. It had notice much earlier. That class should be extended back no later than September 30, 2009 and, Plaintiffs contend, February 1, 2004 when Cary installed this camera (since Town officials – e.g. Tim Bailey, actually knew the speed limit was 45 mph since before that date)--Cary's very first red light camera.

   Plaintiffs will preserve this issue for appeal. Please consider this an offer of proof.

But on the liability question itself, Cary's intent is irrelevant. This is not a malpractice case, it is not a criminal case, and it is not a negligence case. It is a case for money "had and received" which is owed to a class of drivers who were caught in the trap. NCDOT set up the trap but Cary's camera program activated it and harvested the proceeds.

STATEMENT OF THE CASE

Plaintiffs filed this action on November 30, 2010, including a motion for class certification. (See Tab 1, Complaint.) Defendant filed an Answer and, on or around February

24, 2011, an Amended Answer.

On June 3, 2011, Judge Carl Fox ordered: (1) that the Motion to Dismiss Plaintiff Ceccarelli's claim be denied; (2) Plaintiffs Casperson and Metters' claims be dismissed with prejudice; and (3) Plaintiff Millette's claims be dismissed without prejudice, with permission to re-file. (Plaintiff Millette actually had exhausted her administrative remedies but had not alleged it.) Judge Fox recognized that she could cure this issue by repleading. See ¶¶ 8 & 11 of Judge Fox's Order of June 3, 2011.)

On December 12, 2011 the Court entered (and thereafter signed on April 25, 2012) an Order denying Cary's Motion for Summary Judgment on the First Claim for Relief. On April 25, 2012 the court allowed amendment to the pleadings for a Second Claim for Relief (Millette). On June 29, 2012 the court certified the Plaintiffs as class representatives. On August 24, 2012 the court approved a notice to the class. The notice has been published, as ordered. On December 10, 2012 the Defendant moved for summary judgment on the second claim for relief and requested a redetermination of its motion on the first claim for relief.

STATEMENT OF THE FACTS

(1) First Claim for Relief:

A traffic control photographic system is used at the intersection of Cary Towne Boulevard and Convention Drive. On November 6, 2009 at 9:27 PM, Plaintiff Ceccarelli drove his vehicle eastbound on Cary Towne Boulevard crossing its intersection with Convention Drive.(Ceccarelli original Aff.¶ 3.) The speed limit on the relevant portion of Cary Towne Boulevard was 45 mph.(Ceccarelli Aff.¶ 4; Spencer Dep. 22:11-21, 6/24/11; Bailey Dep. 4:12-14 & 9:3-8, 6/24/11.) However, the NCDOT traffic signal plan of record was based on the incorrect speed limit of 35 mph.(Ceccarelli Aff.¶¶ 13-14; Spencer Dep. 20:22-23, 22:11-21, 23:20 – 24:23, 6/24/11.) Proof that the actual speed limit was 45 mph is expanded in the Argument Section. The Town of Cary has doubled down on its contention that the speed limit was 35 mph. Its whole case on the First Claims for Relief is based on this contention.

Plaintiff Ceccarelli was issued a Notice of Violation of Cary Town Code 34-303 on

November 10, 2009(Ceccarelli Aff.¶ 6.). The citation alleges on its face that he was going 50 mph in a 45 mph zone. He paid the $50 demanded by the Town of Cary. (Ceccarelli Aff.¶ 7.)Plaintiff Ceccarelli appealed this violation notice on December 2, 2009 and appeared before a panel established by the Town of Cary. (Ceccarelli Aff.¶ 8.) On January 20, 2010, the panel found he violated Cary Town Code 34-303. (*Id.*) Prior Court Rulings have found that Ceccarelli exhausted his administrative appeals.

The inaccurate traffic signal plan of record dated May 31, 1991 was used until March 2010. This error caused the duration of the yellow light to be less than the interval specified in the Design Manual developed by the Signal and Geometrics Sections of the NCDOT.(Ceccarelli Aff.¶ 15; Spencer Dep. 23:20 – 24:23, 6/24/11.)Using the wrong speed in the formula produces the wrong result on the ground – a short yellow light – and lots of wrongly cited drivers.

George Deposition: p. 31 line 24 to p 33 line 4

Hummer Deposition: p. 55 lines 8-17.

Hennings Deposition: p 204 lines 1- 5

Ceccarelli Deposition: p. 84 lines 10-16

(2) <u>Second Claim for Relief:</u>

On May 7, 2010 at 5:18 PM Plaintiff Millette was traveling north on Kildaire Farm Road and turned left at the intersection of Kildaire Farm Road and Cary Parkway. (Millette Aff.¶ 3.) The speed limit at all relevant times and on the relevant portions of Kildaire Farm Road was 45 mph. (Millette Aff.¶ 4.) The left turn yellow light arrow durations are determined using the assumption that vehicles turning left will be approaching the intersection at 20 to 30 mph (actually 22.9 mph) (Ceccarelli Aff.¶ 20.)

After seeing the yellow light, Plaintiff Millette was unable to safely stop her vehicle before reaching the stop bar or was unable to enter the intersection before the red light. (Millette Aff.¶ 5.) Plaintiff Millette received her citation when the yellow light duration had recently been reduced from 4.0 to 3.0 seconds. Shortly thereafter Cary stopped using its cameras and issuing citations at this intersection. (Ceccarelli Aff., Exh. E.)

Plaintiff Millette was issued a Notice of Violation of Cary Town Code 34-303 on May 21, 2010 by the Town of Cary. (Millette Aff.¶ 6.) Plaintiff Millette paid the $50 demanded by the Town of Cary. (Millette Aff.¶ 7.) She appealed this violation notice and appeared before a

panel established by the Town of Cary on August 18, 2010. (Millette Aff.¶ 8.) The panel found that Plaintiff violated Cary Town Code 34-303. By allowing the Amended Complaint Judge Ridgeway implicitly has found that Plaintiff Millette has sufficiently alleged that she has exhausted her administrative remedies.

SUMMARY JUDGMENT

Rule 56(c) of the North Carolina Rules of Civil Procedure states:

> The judgment sought shall be rendered forthwith if the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that any party is entitled to a judgment as a matter of law….Summary judgment, when appropriate, may be rendered against the moving party. (emphasis added)

ARGUMENT

I. Defendant Town Of Cary May Not Use Red Light Cameras To Enforce Violations At Intersections Where The Yellow Light Duration Is Less Than Allowed by Legislative Authority And Its Own Charter.

Judge Fox refused to dismiss, and Judge Ridgeway refused to grant summary judgment for the Town of Cary, based on the Town's convoluted argument that its red light camera citation cannot be challenged since some engineer (P.E.) signed the signal plan, even if it violates NCDOT calculations. This was the position taken by David Spender, Cary Town Engineer in his November 30, 2009 email to Buddy Murr, NCDOT State Signals Engineer. Cary's argument has migrated since then but is essentially unchanged.

a. Authority regarding yellow light duration.

In 2001 the General Assembly enacted a law authorizing municipalities in Wake County to implement traffic control photographic systems. (N.C.S.L. Ch. 2001-286, Section 3.)This was an act to "authorize municipalities to use red light cameras for safety, for schools, but not for profit." (*See id.*)The law specified that the yellow light duration must be a certain length for the municipality to use photo enforcement:

> The duration of the yellow light change interval at intersections where traffic control photographic systems are in use shall be no less than the yellow light change interval duration specified in the Design Manual developed by the Signals and Geometrics Section of the North Carolina Department of Transportation (emphasis added).

(N.C.S.L. Ch. 2001-286, Section 3(e).) In 2004 this law was rewritten:

> The duration of the yellow light change interval at intersections where traffic control photographic systems are in use shall be no less than the yellow light change interval duration on the traffic signal plan of record signed and sealed by a licensed North Carolina Professional Engineer in accordance with Chapter 89C of the General Statues, and shall be in full conformance with the requirements of the Manual an Uniform Traffic Control Devices ["MUTCD"](emphasis added).

(N.C.S.L. Ch. 2004-141, Section 3.) The municipality is under a statutory duty to ensure the yellow light duration is (1) equal to or greater than the signal plan of record and (2) be in full conformance with the MUTCD.

The Town of Cary adopted an ordinance to implement a traffic control photographic system. From 2004 to 2010, the Town Charter held Cary to Cary Code of Ordinances Section 8.15(e).

> The duration of the yellow light change interval at intersections where traffic control photographic systems are in use shall be no less than the yellow light change interval duration specified in the Design Manual developed by the Signals and Geometrics Section of the North Carolina Department of Transportation (emphasis added).

(Code of Ordinances, Town of Cary, Charter Art.VIII, § 8.15(e).)Accordingly, in Cary, a traffic control photographic system was only allowed to operate at intersections where the yellow light duration was: (1) equal to or greater than the signal plan of record; (2) in full conformance with the MUTCD; ***and***(3) equal to or greater than the interval specified in the Design Manual developed by the Signals and Geometrics Section of the NCDOT. 1

b. The yellow light duration at the intersection of Cary Towne Boulevard and Convention Drive was less than yellow light change interval specified in the Design Manual developed by the Signals and Geometrics Section of the NCDOT.

The First Claim for Relief seeks a declaratory judgment (and consequentially, damages)

1Session Law 2010-132, Section 18 was rewritten by the General Assembly again as follows: "The duration of the yellow light change interval at intersections where traffic control photographic systems are in use shall be no less than the yellow light change interval duration specified on the traffic signal plan of record signed and sealed by a professional engineer, licensed in accordance with the provisions of Chapter 89C of the General Statutes, and shall comply with the provisions of the Manual on Uniform Traffic Control Devices (emphasis added)." Same language adopted by Town of Cary Charter, App. 2.8(e).)

that the application of the Cary Code of Ordinances Sections 34-303 & 34-304 to Plaintiff Ceccarelli and the Plaintiff class similarly situated are void and unenforceable in that the penalties imposed thereunder are beyond the scope and violative of Defendant's enabling authority. Defendant collected fines on the basis of a program that did not meet the requirements imposed by its enabling authorities. (*See* Cary Code of Ordinances § 8.15(e) & N.C.G.S § 160A-300.2(e).)

From 2004 until March 2010, the yellow light duration at the intersection of Cary Towne Boulevard and Convention Drive was less than the interval required by the Design Manual developed by the Signals and Geometrics Section of the NCDOT ("Design Manual"). Based on the actual 45 mph speed limit, the yellow light duration should have been 4.5 seconds at this intersection. (Ceccarelli Aff. ¶¶ 15, 18; George Aff. ¶¶ 8-9.) However, the yellow light duration was only 4.0 seconds from 2004 until it was changed in March 2010. (Ceccarelli Aff. ¶¶ 13 – 18.) The Town's Charter precluded the operation of a photo enforcement system in this manner. (See Cary Charter § 8.15(e).) Defendant is liable for the unauthorized collection of these fees.

c. The yellow light duration at the intersection of Cary Towne Boulevard and Convention Drive was not in full conformance with the controlling Manual on Uniform Traffic Control Devices ("MUTCD") from 2004 to 2010.

Defendant is under a duty to ensure cameras are only used at intersections where the yellow light duration was in full conformance with MUTCD specifications. (N.C.S.L. Ch. 2004-141, Section 3.) The MUTCD requires (1) the yellow change interval to be determined using engineering practices and (2) the yellow light duration to be consistent with this determined value.2 (MUTCD, Section 4D.26, ¶¶ 3, 8.) The yellow light duration was not in full conformance with the MUTCD from 2004 until March 2010 because the yellow change interval was based on the incorrect speed limit.

This error resulted in a yellow light duration that was less than the determined value. The Town of Cary's own traffic engineer stated:

> [C]learance times are calculated to provide a safe time to allow

2 "Engineering practices for determining the duration of yellow change . . . intervals can be found in ITE's 'Traffic Control Devices Handbook' and in ITE's 'Manual on Traffic Signal Design…' (MUTCD, Section 4D.26, ¶7.)

> people to make that decision when the light shows up, whether to go or to stop, and we always want to make sure that it meets--it meets those standards. So the clearance time in itself is a safety issue. We want to make sure that it's up to date and accurate, and if it's not, that's a safety issue.

(Spencer Dep. 24:6-12, 6/24/11.) When the yellow light duration is set to a speed that is slower than the speed drivers are traveling, they cannot stop safely or enter the intersection lawfully. (George Aff. ¶¶ 7-9.)

II. Defendant's Motion for Summary Judgment On the First Claim Should Be Denied (and instead granted for the Plaintiff) Because:

All of the evidence is that the signal plan was in error because it was predicated on the wrong speed limit.

Based on the signal plans provided, Greg Fuller, employee of the NCDOT, swore that the speed limit on Cary Towne Boulevard crossing its intersection with Convention Drive was 45 mph from 2004 through 2010. (See Fuller Aff.,Exh. "A.") Cary's Director of Engineering confirmed this in his deposition. (See Bailey Dep., 4:12-14 & 9:3-7, June 24, 2011.)NCDOT adopted an ordinance in 2004 setting the limit at 45 mph. However, Defendant still ***denies*** that the speed limit was 45 mph from 2004 to present. (See Def.'s Resp. to 1st RFA, #22.) Their reasoning is that the 1984 limit was not "posted" until January, 2012. This reasoning just makes the trap set for the Plaintiff class more egregious – a secret speed limit unknown to NCDOT, the Cary Police, drivers and everyone else, except Cary's attorney.

But the defense is not even true. It was posted at 45 mph. See Ceccarelli Supplemental Affidavit and contemporaneous video recording of the route he took and what he saw.

It is the responsibility of the Town of Cary to implement any changes in the NCDOT plans of record. (Spencer Dep. 12:8-21, 6/24/11.) However, the Town of Cary does not actually effectuate those changes until there is funding for it. (Spencer Dep. 12:8-21, 6/24/11.) Furthermore, Cary does not keep a log of changes made to the NCDOT signal plan of record. (Def.'s Resp. 1st Int., ¶¶1(a), 2(a).)

NCDOT provided a plan sealed 11/4/09 which then became the "signal plan of record."

However, the Town's camera was still relying on the previous erroneous plan when Ceccarelli was cited. (Ceccarelli Aff. ¶ 13.)The duration of the yellow change interval was not lengthened at this intersection to match the corrected signal plans until March 2010. (Ceccarelli Aff. ¶ 17.) And it was not until January 12, 2012 that NCDOT decided to post another 45 mph speed limit sign. (Grandy Affidavit) If Cary's argument is correct that the speed limit was not changed until posting then the ironic result is that the signal plan was in error until January 12, 2012 and the Plaintiff's class should be expanded for that reason, until January 12, 2012.

Since there is no genuine issue of material fact on the First Claim for Relief, Summary Judgment should be entered for the Plaintiff and his class.

III. For Left-Turn Intersections, Defendant Town Of Cary Unlawfully Collected Penalties From Drivers Traveling Legal Speed Limit When They Were Unable To (a) Stop Within the Distance Allotted By The Yellow Change Interval or (b) Lawfully Enter The Intersection Before the Red Light.

This Claim for Relief seeks a declaratory judgment (and consequently, damages) that the application of the Cary Code of Ordinances Sections 34-303 & 34-304 to Plaintiff Millette and the Plaintiff class similarly situated is void and unenforceable in that the penalties imposed thereunder are beyond the scope and violative of Defendant's enabling authority. Plaintiffs allege that the methodology and plans used to determine the yellow light duration for left hand turns are arbitrary and capricious with regard to the identified intersections.3

The methodology is unlawful because the yellow light change interval assumed a certain speed at these intersections, which is much lower than the posted legal speed limit.4, much lower

3 Left-turn Intersections at issue: (i) Maynard Road & Kildaire Farm Road (WB lf); (ii) Cary Parkway & Kildaire Farm Road (WB lf); (iii) Kildaire Farm Road & Cary Parkway (NB lf); (iv) Cary Parkway & High House Road (NB lf); and (v) Walnut Street & Meeting Street (SB lf). (See Tab 1, Compl.,Exh. C.)

4See Ceccarelli Aff., ¶ 20: "a) The Town of Cary determines left turn yellow light arrow durations using the assumption that all vehicles approach the intersection at 20 to 30 mph (but almost always approximately 20 mph), even though the legal speed limit is 45 mph. **The assumption comes from a typo error beginning in the March 2002 edition of the North Carolina Department of Transportation Signals Design Manual.** In editions prior to March 2002, the specification applies that assumption only to the computation of the all-red clearance interval, not to the yellow change interval. For further explanation see comments tracing the error chronologically in the NCDOT Change and Clearance Intervals formula of the Signals & Geometrics Section, Traffic Engineering and Safety Systems Branch attached as Exhibit "E" to Ceccarelli's initial affidavit.

than the actual approach speeds of many vehicles and much lower than the actual approach speeds recommended by NCHRP Report D 731-(See Hennings Affidavit).

The Town of Cary was only authorized to operate traffic control photographic systems at intersections where the yellow light change interval was no less than the one specified by the ITE Manual, NCDOT traffic signal plan and MUTCD. (See N.C.S.L. 2001-286, 2004-141, and Cary Ord. § 8.15(e).)However, the duration could be ***equal to or greater*** than these durations. While

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The all-red clearance interval is the amount of time all drivers in all approaches to the intersection see a red light. The all-red comes immediately after a yellow. The all-red interval gives the necessary time for all vehicles to clear the intersection. Engineers set the all-red interval so that the slowest moving vehicle that had entered the intersection just as the light turned red, has time to clear the intersection before opposing traffic gets a green. The slowest vehicles within the intersection are the left turning vehicles. Engineers correctly assume that these left turning vehicles move at about 20 mph within the intersection.

b) But by misapplying 20 to 30 mph as the approach speed for the yellow change interval, the Town of Cary creates a type I dilemma zone in the left lane. The Town of Cary sets the left turn yellow change interval to 3.0 seconds. Any driver approaching at the posted speed limit of 45 mph, who is from 293 feet to 198 feet from the intersection when the light turns yellow, will be induced to run a red light. The driver neither has the distance to stop safely, nor the time to proceed at the speed limit into the intersection while the light is still yellow, unless the driver either decelerates beyond the rate which NCDOT believes is reasonable or accelerates beyond the speed limit.

Since drivers do need to slow down before initiating a turn, the dilemma zone is even larger. In the very least, the Town of Cary expects drivers to enter the intersection from 20 to 30 mph. But when the light turns yellow, Cary's 3.0 second yellow only allows the driver, using NCDOT's assumptions on perception retention and deceleration rates, the time to decelerate to 33.5 mph. No less. Given the expected entry speed of 33.5 mph, the location of the dilemma zone is between 293 feet and 152 feet from the intersection. When the light turns yellow, the Town of Cary will induce vehicles within 293 feet and 152 feet from the intersection (travelling at the posted speed limit, decelerating normally and reasonably perceptive) to run a red light.

c) By working the ITE Yellow Change Interval formula backwards, a 3.0 second yellow interval reduces the posted speed limit of 45 mph to an effective limit of 22.9 mph. The Town of Cary sets the speed limit in the left lane to 22.9 mph without notifying the driver of this reduction in the legal speed limit. That is, a driver who intends to follow all of the traffic laws will have to reduce his or her speed to 22.9 mph even when still distant from the intersection." In contrast the NCHRP Report 731 (2012) (referred to by Lisa Moon and Hennings in their affidavits) says the assumed approach speed at this intersection should be 40 mph.

the NCDOT determines what the yellow time should be at a state-owned intersection, "any municipality may request that Yellow Times at State-owned intersections be altered…the Signal Plan of Record then may be amended to reflect that change" (See Fuller Aff., ¶ 13.). Nothing in state law requires Cary to penalize drivers who are acting lawfully and reasonably.

Here, the law enforcing the ITE Yellow Change Interval is *not* in agreement with the immutable laws of nature.5 A certain proportion of those travelling within the lawful speed limit will be forced to run a red light. (Ceccarelli Aff., ¶ 19; George Aff., ¶ 10 -11.) The statues and ordinances should be construed so that traffic signal plans for left-hand turn intersections comply with the laws of nature.

IV. Plaintiffs Are Entitled To A Refund Of Fees.

When a trial court declares a municipal fee to be unlawful and void, the appropriate remedy is to order a refund of the collected fees.6*Durham Land Owners Ass'n v. County of Durham*, 177 N.C.App. 629, 640 (2006). In an analogous case, the Court awarded plaintiffs a refund of fees paid pursuant to a city ordinance enacted without proper enabling legislation. *Smith Chapel Baptist Church v. City of Durham*, 350 N.C. 805, 819 (1999). There, a judgment that fees were unlawfully collected warranted the refund of fees collected by the municipality:

> [B]ecause we have already held that the City's SWU ordinance and the fees charged thereunder are invalid as a matter of law, we further hold that plaintiffs are entitled to a full refund of the illegally collected fees from the City.

Smith Chapel at 819. The action against the municipality was likened to the common law "money had and received". *Id.* at 818. "[T]he common law action could 'be maintained whenever the defendant has money in his hands which belongs to the plaintiff, and which in equity and good conscience he ought to pay to the plaintiff.'" *Smith Chapel* at 818, quoting

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5 The origin of law is 'right reason' as addressed by Marcus T. Cicero:

(MARCUS TULLIUS CICERO, *De Re Publica*, Book 3, Paragraph 22.*De Re Publica, De Legibus*, trans. Clinton W. Keyes, p. 211.) While this type of "law" does include policy matters over which the legislature has discretion, it certainly applies to the laws of physics, which man is not able to violate even if he chooses. King Canute discovered this principle.

6*Durham Land Owners Ass'n v. County of Durham* required the county to refund all illegally collected fees, totaling $8.7 million.

Wilson v. Lee, 211 N.C. 434, 436 (1937).7

Similarly, here, Plaintiffs: (1) allege Defendant acted beyond its enabling authority and (2) seek a refund of any penalties as in an action for money had and received. (Complaint, ¶ 39 & prayer for judgment, ¶¶ 2-3.)Plaintiffs claim a full refund of the illegally collected fees from Defendant as damages. (Complaint, prayer for judgment, ¶ 3.)

DISCUSSION ON THE FIRST CLAIM FOR RELIEF

Issue 1. Was the actual speed limit at Cary Town Boulevard and Convention Drive 45 mph or 35 mph? Throughout this litigation the Town of Cary has continuously contended that the limit was 35 mph as per the 1991 signal plan. That contention is not a genuine issue of material fact because it is contradicted by the Town of Cary's own witnesses repeatedly.

1. Deposition of Daren Marceau, P.E., Expert Witness, (Marceau Deposition, 59:6-60:5, 10/31/12) http://redlightrobber.com/red/links_pdf/north-carolina/Daren-Marceau-Deposition-with-Exhibits-2012-10-31.pdf

2. Deposition of Tim Bailey, Director of Engineering, (Bailey Deposition, 4:12-14, 9:3-8, 6/24/11) Town of Cary - page 9, line 8. It has been 45 mph since Bailey "has been with the town." Bailey has been with the town for 22 years - page 4, line 14.http://redlightrobber.com/red/links_pdf/north-carolina/Tim-Bailey-Interrogatory-2011-06-24.pdf

3. Deposition of David Spencer, (Spencer Deposition, 22:11-23, 1, 6/24/11) Town of Cary Engineer, p. 23, line 4 http://redlightrobber.com/red/links_pdf/north-carolina/David-Spencer-Interrogatory-2011-06-24.pdf

4. Email from David Spencer, P.E., Traffic Engineer, Town of Cary to Buddy Murr., Jr., P.E., State Signals Engineer, NCDOT. Sent 11/30/2009 8:51 AM: "…the signal plan used a speed limit of 35 mph on Cary Town Blvd when the speed limit was 45 mph at that time (and still is) … We based our yellow times for the red light camera on this info but since it wasn't done correctly to begin with, it leaves us in a bind." http://redlightrobber.com/red/links_pdf/Spencer-Speed-Limit-Mistake-at-Cary-Towne-Blvd.pdf (Defendant's Response 1st Request for Production of Documents, Def. 001896).

7 Both *Durham Land Owners* and *Smith Chapel* were represented by Plaintiff's attorneys.

5. Email from Mike Bajorek, Assistant Town Manager, Town of Cary to Ceccarelli sent on November 29, 2009.http://redlightrobber.com/red/links_pdf/north-carolina/Mike-Bajorek-Letter.pdf

6. Document obtained from the North Carolina Department of Transportation. NCDOT Highway Traffic Ordinance Package 84-72 dated August 1, 1984 sets the speed limit of Cary Town Blvd at 45 mph from August 1, 1984 to the present day. The Court may take judicial notice of an ordinance adopted by the state agencies. http://redlightrobber.com/red/links_pdf/Cary-Town-Blvd-I40-to-Maynard-Rd-Speed-Limit-is-45-since-1984.pdf

7. By the action of the Town of Cary in correcting the signal plan before Mr. Ceccarelli was even cited, on the basis, as shown on the plan, of the 45 mph limit. http://redlightrobber.com/red/links_pdf/north-carolina/Cary-Town-Blvd-at-Convention-Signal-Plan-Sep-2009.tif

8. Mr. Ceccarelli has testified that it was 45 mph. Immediately after receiving the citation, he took a video which clearly shows two traffic control signs before arriving at the intersection. The first sign says, "School - Reduced Speed Ahead" immediately followed by the second sign, "School – Speed Limit 35 When Flashing". And then immediately after the intersection a speed limit sign of 45 mph. Why would there be a demand that drivers reduce speed down to 35 mph when lights are flashing if the speed limit is already 35 mph when lights are not flashing?http://redlightrobber.com/red/links_pdf/Cary-Towne-Blvd-Eastbound-Starting-at-Maynard-2010-01-28.mp4, http://redlightrobber.com/red/links_pdf/Cary-Towne-Blvd-Eastbound-After-Convention-2010-01-28.mp4

9. The immediate reduction in citations at that intersection when the signal plan was changed to reflect the actual speed limit demonstrates beyond peradventure that it was the incorrect signal plan that caused the bulk of the violations at that intersection before the signal plan was changed. It was not negligent or willfully criminal drivers who were being cited. The graph illustrating this is discussed in most of the expert depositions.http://redlightrobber.com/red/links_pdf/How-Yellow-Intervals-Affect-Red-Light-Running.pdf
   Greg Fuller, P.E., was alarmed upon seeing the graph.

10. The citation itself records that the speed limit is 45 mph.

By themselves these are reasons enough to grant summary judgment for the plaintiff class on the 'First Claim for Relief. But the following additional reasons are noted.

Issue 2: Plugging in "v" of 35 mph for a road with a speed limit of 45 mph into the yellow change interval formula would not "allow" all drivers traveling greater than 35 mph to stop safely using NCDOT assumption about perception reaction time and deceleration. (Hummer Dep., 55:8-56:5)

General Problems with Apply to All Movements

(a) The yellow change interval does not provide drivers enough distance to stop before entering the intersection. Vehicles egressing or entering business entrances can cause a driver to slow down and involuntarily run a red light.Vehicles entering or emerging from side-streets can cause a driver to slow down and involuntarily run a red light. Vehicles waiting at the next nearby intersection or the next nearby signal itself can cause a driver to slow down and involuntarily run a red light. Railroad tracks, bumps in the road can cause a driver to slow down and involuntarily run a red light.

Deposition of Dr. Joseph Hummer, Ph.D., Town of Cary's Expert Witness (Hummer Dep., 25:17-26:1)

Deposition of Dr. Elizabeth George, Chair of the Physics Department, Wittenberg University, (George Dep., 37:13-38:14, 52:3-12, 9/13/12)

Deposition of Dr. Joseph Shovlin, Physicist, Cree Labs, p. 63 lines 4-7: "My testimony is that if a driver is required to slow down the formula does not fit the physical situation and violates the laws of physics." (Shovlin Dep., 41:21-25, 56-9-16, 56:23-57:15, 63:1-7, 10/15/12)

Deposition of Johnnie Hennings, P.E., p. 167 lines 22-25 to p. 168 lines 1-2; p.187 lines 1-9; p. 191 lines 17-22. http://redlightrobber.com/red/links_pdf/north-carolina/Johnnie-Hennings-Deposition-2012-10-30.pdf

Deposition of Brian Ceccarelli, p. 70 lines 18-25 to p. 71 lines 1-7.http://redlightrobber.com/red/links_pdf/north-carolina/Brian-Ceccarelli-Deposition-with-Errata-2012-09-04.pdf

Brian Ceccarelli, Joseph Shovlin, *Misapplied Physics in the International Standards That Set Yellow Light Durations Forces Drivers to Run Red Lights*, p.4 http://redlightrobber.com/red/links_pdf/Misapplied-Physics-Red-Light-Cameras.pdf

George Affidavit, ¶10

(b) The yellow change interval formula creates indecision zones. Even when the formula is applied correctly, for every signalized intersection the formula creates a region on the road where the reasonably perceptive driver does not know whether he can go or he must stop. That indecision is the result of putting a "2" in the denominator of the formula. The "2" is responsible for creating a mutually exclusive decision between stop and go. The "2" forces the driver to make a judgment. When the driver has not yet crossed the line when the light turns yellow, the driver must stop. When the driver has crossed the line and then the light turns yellow, the driver must proceed to and thru the intersection at the maximum allowable speed. But with the shortened yellow lights the driver must guess at the location of the critical distance and guess at how long the yellow change interval is going to be. The guess causes drivers to intermittently and involuntarily run red lights.

MUTCD, 2012.P 449 Section 4D.01—02.http://redlightrobber.com/red/links_pdf/MUTCD-2009-Rev-2-2012.pdf

Tom Urbanik, Peter Koonce, *The Dilemma with Dilemma Zones*, This paper refers to a long history of traffic engineers' knowledge of type II dilemma zones. http://redlightrobber.com/red/links_pdf/The-Dilemma-with-Dilemma-Zones.pdf

Daren Marceau, *Accident Reconstruction at Traffic Intersections*. Marceau' book has a table containing the range of distance from the intersection of a driver's dilemma of stop and go decisions.

Brian Ceccarelli, Joseph Shovlin, *Misapplied Physics in the International Standards Forces Drivers to Run Red Light*,.p.5 .http://redlightrobber.com/red/links_pdf/Misapplied-Physics-Red-Light-Cameras.pdf

Deposition of Johnnie Hennings, p. 193 lines 14-19. http://redlightrobber.com/red/links_pdf/north-carolina/Johnnie-Hennings-Deposition-2012-10-30.pdf

Deposition of Lori Millette, p. 17 lines 11-14. An example of the indecision zone in action.http://redlightrobber.com/red/links_pdf/MUTCD-2009-Rev-2-2012.pdf

(c) The yellow change interval is set using the speed limit instead of the design speed of the road. The speed limit may be 45 mph but the design speed, which is based on the 85th percentile speed, may be 52 mph. Using 52 mph instead of 45 mph computes a yellow change interval which is 0.5 seconds longer. As proven at Cary Town Blvd, even a 0.5 second increase in the yellow change interval decreases red light incursions by 75%.

Plaintiffs agree that drivers who willfully go over the speed limit are not entitled to sympathy. But the point is that Defendant's own documents state that the appropriate "v" in the kinematic equation is the "approach speed". And that the speed limit is used only because there is no speed survey. But uniformly (at this type of intersection) where speed surveys are done the approach speed is about 7 mph faster than the speed limit for through traffic and about 5 mph less than the speed limit for turning traffic. By using the wrong "v" in their equations the government has substantially shortened the yellow change interval. This affects all drivers – not just those in the class - who may or may not be speeding but are, nevertheless, affected by the behavior of those in front and to the rear.

NCDOT ITSS Unit Design Manual.Spec 5.2.2 4 of 4. 2nd column
http://redlightrobber.com/red/links_pdf/NCDOT-Yellow-Change-Interval-Spec-Sheet.jpg

Deposition of David Spencer: p 78 lines 12-16 (design speed typically 5 mph over speed limit). http://redlightrobber.com/red/links_pdf/north-carolina/David-Spencer-Interrogatory-2011-06-24.pdf

Hennings says 7 mph over speed limit is the design speed. . http://redlightrobber.com/red/links_pdf/north-carolina/Johnnie-Hennings-Deposition-2012-10-30.pdf (Hennings Dep., 205:12-15, 10/30/12)

National Cooperative Highway Research Program Report 731 p. 2. "Use 7 mph over speed limit for approach speed for straight-through movements" use 5 mph under the speed limit as the approach speed ("v") for left turning vehicles pp. 41 and 46. http://redlightrobber.com/red/links_pdf/north-carolina/NCHRP-Guidelines-for-Timing-nchrp_rpt_731.pdf

Moon admits no speed studies are done. (Moon Dep., 30:3-16) She is one who actually designs the intersections.

According to Greg Fuller"…[W]e use the posted speed limit for straight-through movements unless there is a speed study that has been performed."
(See Fuller Dep., 41:3-9, 10/15/12)

Town of Cary Signal Plans: All the signals plan's straight-through yellow durations are set using the speed limit for "v". The duration is the absolute minimum. No exceptions.
http://redlightrobber.com/red/links_pdf/RLCSignalPlans.pdf
Deposition of Joseph Hummer.P. 149 lines 17-25. Hummer speaks in regards to setting speed limits. Cary rounds down to nearest 10 mph." Design speed is

more than real speed limit."http://redlightrobber.com/red/links_pdf/north-carolina/Joseph-Hummer-Deposition-with-Errata-2012-10-17.pdf

North Carolina does not normally conduct speed studies (Marceau Dep., 84:7-11, 10/31/12)

(d) A perception/reaction time of 1.5 seconds is used regardless of the complexity of the intersection. 1.5 seconds is the 85th percentile reaction times for the simplest of intersections and assumes that no unexpected events occur at the intersection. The other 15% of drivers are out of luck.

A pedestrian suddenly entering the crosswalk is not allowed. AASHTO recommends 2.5 seconds as the 85th percentile to cover realistic situations. But even using 2.5 seconds the other 15% are out of luck even if acting otherwise reasonably and lawfully. American Association of State Highway Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets (2004)*, p 111. http://redlightrobber.com/red/links_pdf/AASHTO_Perception-Times-Studies.pdf

> **"**A brake reaction time of 2.5s is considered adequate for conditions that are more complex than the simple conditions used in laboratory and road tests, but it is not adequate for the most complex conditions encountered in actual driving. The need for greater reaction time in the most complex conditions encountered on the roadway, such as those found at multiphase at-grade intersections and at ramp terminals on through roadways, can be found later in this chapter in the section on "Decision Sight Distance."

North Carolina Division of Motor Vehicles, *North Carolina Commercial Driver's Manual*, North Carolina Department of Transportation. p. 2-14, p. 5-9: section 5.4.4 (2009). This manual breaks up perception/reaction time into its individual components. The NCDOT itself establishes a 2.5 second perception reaction time.http://redlightrobber.com/red/links_pdf/north-carolina/NC-Commerical-Drivers-License-Manual.pdf
Oregon State University Study (1997): page 8,
http://redlightrobber.com/red/links_pdf/Perception-Reaction-Oregon.pdf

Discussed at Hennings Deposition p. 34 lines 2-6, p. 157 line 2, 20-22, p. 158 lines 2 -12

(e) The signal plans do not accommodate unique vehicle streams such as school buses. Cary shorts the yellow change interval an additional 1/2 second or more for any commercial vehicle that uses air-brakes.

Deposition of Joseph Hummer: p. 121 lines 9-13. http://redlightrobber.com/red/links_pdf/north-carolina/Joseph-Hummer-Deposition-with-Errata-2012-10-17.pdf

Fawzi P. Bayan, et al.,*Brake Timing Measurements for a Tractor-Semitrailer Under Emergency Braking*, p. 4 graphs. A full pressurization of the air brakes takes about 1 second, and that is even under emergency situations. http://redlightrobber.com/red/links_pdf/Truck-Brake-Lag-Times-2009.pdf

See NC Manual for Commercial Drivers, Exhibit to Hennings Affidavit.

SECOND CLAIM FOR RELIEF

Lori Millette was clocked at 23 mph at the stop bar when she entered the intersection northbound on Kildaire Farm Road turning left (west) on Cary Parkway. There are many reasons why she was entrapped.

1. The yellow change interval does not provide fair warning to drivers approaching the intersection travelling over 22.9 mph. On the onset of yellow, drivers approaching the intersection at a speed faster than 22.9 mph do not have either the distance to stop safely or the time to enter the intersection lawfully. The formula used in the trap assumes that the approach speed is 22.9 mph even though.

   (a) The speed limit is 45 mph.

   (b) The National Cooperative Highway Research Program (NCHRP) demonstrates that the actual 85th percentile approach speed is 39.91 mph for left turning vehicles, http://redlightrobber.com/red/links_pdf/north-carolina/NCHRP-Guidelines-for-Timing-nchrp_rpt_731.pdf (pp. 41, 58).

   (c) Plaintiff, Ceccarelli, has measured the actual approach speeds of unimpeded left turning vehicles at the intersections of Kildaire and Cary Parkway and Walnut Street and Meeting place. The recorded videos are athttp://redlightrobber.com/red/exhibits-north-carolina.html#leftmovies. The speed for these unimpeded left-turning vehicles at the critical distance (294 feet) ranges from 25 mph to 39 mph with the 85% percentile speed of 37 mph.

   (d) Cary Traffic Engineer Moore says that vehicles approaching to turn left travel much faster than 20-25 mph, February 3, 2006 email to Pamela Alexander.

2. When the driver is no longer able to stop safely, the yellow change interval does not provide the time for a driver to proceed legally. A driver who decelerates from 45 mph at the safe stopping distance to 23 mph at the intersection, needs up to 5.2 seconds to reach the intersection. Cary gives the driver 3 seconds.

Deposition of Hummer p. 36 lines 6-8; p. 40 lines 9-13. Hummer says that NC traffic engineers do not plan for cars approaching at the speed limit.

The critical distance for a driver proceeding at 22.9 mph is 100.7 feet upstream.

The critical distance for a driver proceeding at 45 mph is 294 feet upstream.

http://redlightrobber.com/red/links_pdf/north-carolina/Joseph-Hummer-Deposition-with-Errata-2012-10-17.pdf

3. The yellow change interval does not provide drivers enough distance to slow down before entering the intersection. The yellow change interval formula is a formula only applicable to vehicles that can approach the intersection at a speed which never falls under the maximum *allowable* speed. The maximum allowable speed is the speed limit. Turning motion requires a driver to slow down before entering the intersection. One cannot execute a turn at the full speed limit. All the experts agree that it takes a left turning driver more time to reach the intersection than a straight through driver. Yet Cary allows these driver less time (3.0 seconds instead of 4.5 seconds) rather than more time.

   Deposition of Hummer p. 25 lines 18-24: "the ITE yellow time formula is designed [sic] get a driver across the stop bar during the yellow who was at the stopping distance when the yellow first came on, and drivers at that constant speed of the speed limit and anybody who drivers—was at the speed limit and then slows down and still tries to make it through the yellow will not do so." ; p. 65 lines 8-13; p. 67 lines 17-25

   Deposition of Fuller: p. 56 lines 7-8. "…the one [car] turning left is going to need more time to clear the intersection." When shown the graph of red light camera violations at Millette's approach increase from 70/month to 400/month when Cary decreased the left turn yellow duration from 4.0 to 3.0 seconds, it alarmed him as an engineer (p. 54 line 10). Being seriously concerned, Fuller asked (p. 52 line 5), "Did any crashes happen there?"

   Deposition of George p. 38 lines 1-3; p. 40 lines 14-21

   Deposition of Shovlin: p. 30 lines 2-11

   Deposition of Hennings; p. 142 line 21 to p. 143 line 3.P 144 lines 4-7 P. 169 line 20 to p. 170 line 8.P. 176 lines 5-12

   Deposition of Marceau: P. 114 line 22 to p. 115 line 1. " … it would take a longer time for the turning driver to go from the point of origin to the intersection."

   Denos Gazis, The Inventor of the Yellow Change Interval Formula, *The Problem with the*

Amber Light in Traffic Flow, On page 113, "We consider the traffic situation depicted in Fig. 1, in which a car travelling at a *constant* speed v_0 toward an intersection is at a distance x from the intersection when the amber phase commences." Gazis states that his formula only applies to straight-through movement drivers at a single traffic light. Gazis says his formula neither applies to two closely spaced traffic lights nor turning motions. (p 129) Gazis article is an exhibit to deposition of George and Shovlin.

4. The trap assumes that vehicles approaching to make a left turn are always in a queue; that is, that all vehicles approaching are slowly moving because their progress to the intersection is impeded by cars in front of them. The formula as applied assumes that all vehicles are travelling 22.9 mph or less from 100 feet upstream into the intersection. Cary only designs for cars in a queue and thus does not allow any cars to go 22.9 mph or more, including cars going the legal speed limit. This assumption, embedded in the equation and in the signal plan, is counterfactual.

   Testimony of Elizabeth Martineau during Daren Marceau's Deposition: p. 45 lines 2-3 "Well, then there's going to be a queue."

   Deposition of Daren Marceau: p 45 line 7-9. In response to "Is there always going to be a queue when there is a dedicated left turn lane?", Marceau answers, "No, not at all." Then Marceau was asked where the approach speed for a left turning vehicle should be measured. Marceau answers, "I have no idea." (p. 46 line 3).
   This is interesting since his affidavit purports to specify exactly where Millett was and how fast she was going.

   Deposition of Joseph Hummer: p 41 line 3. Whether Cary accommodates cars approaching at the speed limit and slowing down to 15 or 20 mph to turn, Hummer replies, "that's not what we design for." When asked, "Is it legal for a driver to travel 45 mph if the posted speed limit is 45 mph no matter what lane the driver is in?", Hummer replied, "I don't know. I'd want to consult the lawyer on that. I'm not sure." (p. 63 lines 7-12).

5. The trap denies the possibility that approaching turning vehicles don't have to start from a stopped queue. It assumes that vehicles do not encounter the condition of a clear path to the intersection and a green or flashing yellow arrow in front of them.

   Marceau: p. 118 line 5 – 9. Car B approaches the intersection with intent to turn left. Car B is 300 feet (about the critical distance for a 45 mph car) upstream from the intersection. It is 2 AM at night. Car B sees a green arrow because there was car ahead of car B that just turned left into Crossroads Mall. Car A had tripped the arrow to green. Marceau says that car B will never see a green light because of the "gap out". The light will turn yellow almost immediately after car A turns. Without realizing it Marceau just disproved his own argument. The signal turns yellow but car B has just crossed over the critical distance point (about 300 feet at 45 mph) and must proceed into the intersection. The shorter yellow (set for a 22.9 mph car) will mean that many car Bs will run a red light even if they are reasonably perceptive and reasonably decelerate.

Hummer believes that drivers approach from 100 feet back at 22.9 mph. (p. 57 line 25 to p. 58 line 3.) when actually we know that figure is measured at the stop bar.

6. The trap assumes that cars always enter the left turn bay at 22.9 mph or less but there is no 22.9 mph speed limit sign for left turning vehicles that their driver can see. (22.9 mph is "v" which yields a 3.0 second yellow).

   Fuller Deposition at p. 23 line 24 to p.24 line 1, 10.

   Hummer Deposition at p. 57 line 25 to p. 58 line 6

   Marceau Deposition at p 32.Line 1. "Current practice is to use one speed limit in the formula". And the speed limit used in the formula is 22.9 mph for turning vehicles, even when the posted speed limit is 45 mph.

7. The trap measures the approach speed for turning traffic at the stop bar. This is a direct violation of the physics in the yellow change interval formula. The physics in the formula mandates that the approach speed be measured at the safe stopping distance (aka. critical distance) from the intersection. For a 45 mph road at zero grade, the safe stopping distance is 294 feet from the intersection. Not only does the trap misapply the yellow change interval formula to turning traffic but it consistently uses the wrong approach speed in the formula.

   These assumptions are directly contrary to the recent National Cooperative Highway Research Program (NCHRP) Report 731. P. 41 and 46 which says that for turning traffic the approach speed to use in the formula is 40 mph for a 45 mph posted speed limit.

Physicists or engineers

Defendant's case is that engineers approved these signal plans and did a lot of them. Therefore they must be right. Of course all traffic signal engineers in North Carolina either work for a government or are contracting to do work on behalf of the government but at private expense.

It is amusing to read the Town's examination of Brian Ceccarelli, Dr. Elizabeth George and Dr. Joe Shovlin to discover that most of the questions asked of them is whether or not they were licensed professional engineers. Of course they are not.

But all of the Defendant's experts agree that sound physics is a predicate to sound engineering.

> Hummer at page 7 lines 13-19; page 82 line 9 to page 83 line 4: http://redlightrobber.com/red/links_pdf/north-carolina/Joseph-Hummer-

Deposition-with-Errata-2012-10-17.pdf

Marceau at page 9 lines 13-15; page 13 line 14-20;page 132 lines 7-11: http://redlightrobber.com/red/links_pdf/north-carolina/Daren-Marceau-Deposition-with-Exhibits-2012-10-31.pdf

Fuller at page 7 lines 14-19: http://redlightrobber.com/red/links_pdf/north-carolina/Greg-Fuller-Deposition-2012-10-15.pdf

Moon at page 21 lines 7-9; page 22 lines 20-22: http://redlightrobber.com/red/links_pdf/north-carolina/Lisa-Moon-Deposition-with-Exhibits-2012-10-09.pdf

And Plaintiff's experts agree

George at page 11 line 2 to page 12 line 11: http://redlightrobber.com/red/links_pdf/north-carolina/Elizabeth-George-Deposition-with-Exhibits-2012-09-13.pdf

Shovlin at page 48 lines 7-24: http://redlightrobber.com/red/links_pdf/north-carolina/Joseph-Shovlin-Deposition-with-Errata-2012-10-15.pdf

Hennings at page 69 lines 19-24: http://redlightrobber.com/red/links_pdf/north-carolina/Johnnie-Hennings-Deposition-2012-10-30.pdf

Ceccarelli at page 30 lines 3-10; page 44 line 21 to page 45 line 2: http://redlightrobber.com/red/links_pdf/north-carolina/Brian-Ceccarelli-Deposition-with-Errata-2012-09-04.pdf

Yet all of Cary's Expert Witnesses demonstrate that they do not know what the formula means. They do not know the physical meaning of the mathematics of the formula. And so Cary's Expert Witnesses systematically misapply the formula.

Deposition of Hummer

Within the physics context expressed in mathematical expression "v" in the Formula is exact—it is the initial speed of the vehicle as measured at the critical distance upstream from the intersection. For a 45 mph road, that distance is 294 feet. But Hummer says on page 16:

14 A. Sure. Yeah. And you're correct in that above the
15 formula it does say provides yellow time for a vehicle
16 to travel at its initial speed over the distance it
17 would take to stop at a comfortable average

18 deceleration. Again, I'm not clear from this what
19 that term initial speed means, initial speed of what,
20 initial speed where is not clear here.

It is extremely clear. Dr. Hummer just does not know the physics which leads him to believe one can measure the initial speed at the stop bar or at some other distance pertinent only to vehicles traveling at 22.9 mph.

Deposition of Fuller

Fuller does not know the basic equation of motion: distance = $(v_f^2 - v_i^2)/2a$ which is embedded in the Formula. Regarding the 45 mph road at Walnut Street and Meeting Place, we asked Fuller this question. From page 30:

18 Q. If you knew the length of the left turn bay, if you
19 knew it was 0 grade, if you knew that it was a 90 degree, if
20 you made your five (sic) second assumption and your 11.2 feet per
21 second per second deceleration, is it possible to calculate
22 at what point a driver who intends to turn left would need to
23 begin to decelerate from the posted speed limit?

Fuller answers:

24 A.I don't know. I've never made that calculation, and
25 I'm not aware if any of my engineers have ever made that
1 calculation. It's irrelevant to thecalculation of the
2 yellow change interval.

The calculation is relevant. The yellow change interval is based on this calculation. The Formula calculates this distance before computing the time. *The computation is embedded in the formula.*

Deposition of Daren Marceau

Marceau, like Hummer, does not know where the physics of the Formula requires them to measure the initial speed. From page 46:

4 Q. Okay. Where does the physics in the yellow change
5 interval mandate that the engineer measure the approach
6 speed?
7 Ms. Martineau: Objection to the form of the
8 question.
9 A. I have never been asked that or never considered that.
10 I don't know.

Deposition of Lisa Moon

Lisa Moon believes that Newton's Laws of Motion, only partially apply to a "vacuumed earth". We asked Moon about the Laws of Motion. From page 22:

Q. Yeah. These are so common I bet you've heard of them. Have you heard of this law of motion? An object in uniform motion remains in uniform motion unless a force acts on it.
A. Yes.
Q. Otherwise known as the law of inertia.
A.I couldn't tell you the name, but I've heard of it.
Q.And does that apply to the physics of traffic engineering?
A. Abstractly, yes.
Q. How about this one? Force equals mass times acceleration. The acceleration of a body is directly proportional to the net force acting on the body and is to the body's mass.
A. Yes. I've heard of that equation, and that's pure physics, yes.
Q.And is that something that would apply to traffic engineering because you're talking about force, mass, and acceleration?
A. As a very limited, vacuumed world, yes.

Newton's Laws of Motion apply fully to all locations in the known universe. The only time when Newton's Laws of Motion do not apply are cases in relativistic physics—the study of motion near the speed of light. Newton's Laws also do not apply to accelerating reference frames. The general theory which encompasses both relativistic motion and accelerating reference frames is Einstein's General Theory of Relativity. For all day to day activities, including traffic engineers, Newton's Laws are fully in effect.

Finally we conclude with this astounding reference regarding the NCSITE methodology of determining appropriate left turn yellow change intervals. From page 26 of the Moon Deposition:

Q. Do you recall at the meetings of the task force or any subcommittee that you were on any discussion about whether the physics of the formula actually fit the engineering and fit the---
A. (interposing) Hard core physics, like what you're

talking about?
Q. Yes.
A. No. There was not discussion about that that I am aware of.

CONCLUSION

This is a genuine issue material of fact as to the Second Claim for Relief and Cary's Motion for Summary Judgment should be denied. If the Court determines that there is no genuine issue of material fact as to the First Claim for Relief then Partial Summary Judgment should be granted in favor of the Plaintiff on that claim.

This the 17th day of December, 2012.

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STATE OF NORTH CAROLINA	**IN THE GENERAL COURT OF JUSTICE SUPERIOR COURT DIVISION**
COUNTY OF WAKE	**10-CVS-019930**
BRIAN CECCARELLI and LORI MILLETTE,	
individually and as class representative,	**CERTIFICATE OF SERVICE**
Plaintiffs,	
v.	
TOWN OF CARY	
Defendant.	

The undersigned hereby certifies that a copy of the foregoing Response and Opposition to the Town of Cary's Motion for Summary Judgment was served on the defendant's counsel in this action by depositing a copy of the same in the United States Mail, first-class postage prepaid, and addressed as follows:

__X__ Depositing a copy hereof, postage prepaid, in the United States Mail, addressed to the attorney for each said party as follows:

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This the 17th day of December, 2012

_____
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