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IN THE GENERAL COURT OF JUSTICE
SUPERIOR COURT DIVISION
WAKE COUNTY, NORTH CAROLINA

BRIAN CECCARELLI and
LORI MILLETTE, individually
and as class representatives,

Plaintiffs,

v. Case No. 10-CVS-019930

TOWN OF CARY,

Defendant.

DEPOSITION OF
JOSEPH D. SHOVLIN, Ph.D.
9:00 a.m. - 11:00 a.m.
October 15, 2012
Apex, North Carolina

Job No. AMB201466

REPORTED BY: Joseph C. Spontarelli, CCR

1 Deposition of JOSEPH D. SHOVLIN, Ph.D.,
2 taken by and before Joseph C. Spontarelli, Notary
3 Public in and for the State of North Carolina at
4 large, pursuant to North Carolina Rules of Civil
5 Procedure and by notice or agreement to take
6 depositions; commencing at 9:00 a.m. on Monday,
7 October 15, 2012 at the law offices of Stam &
8 Danchi, PLLC, 510 West Williams Street, Apex,
9 North Carolina.

10
11 APPEARANCES:

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18 On behalf of the Plaintiffs

19 MARTINEAU KING

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 On behalf of the Defendant

 Also present:

 Brian Ceccarelli
 William Peaslee

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P R O C E E D I N G S

9:10 a.m.

JOSEPH D. SHOVLIN, Ph.D.,
was sworn or affirmed and testified as follows:

BY MS. MARTINEAU:

Q Dr. Shovlin, my name is Elizabeth Martineau. I'm an attorney. I represent the Town of Cary in a lawsuit filed by Mr. Ceccarelli and Ms. Millette.

You've been designated as an expert witness in this case. Are you aware of that?

A Yes.

Q Have you ever given a deposition before?

A No.

Q Have you ever testified in court as an expert witness?

A No.

MS. MARTINEAU: I'm going to attach as Exhibit 1 to your deposition a copy of your most current CV that was given to me by Mr. Stam this morning.

1 (Exhibit No. 1 Marked for
2 Identification.)

3

4 BY MS. MARTINEAU:

5 Q Do you have in front of you a copy of
6 your CV?

7 A Yes.

8 Q Can you give me a little thumbnail
9 sketch of your educational background?

10 A I have a Bachelor of Science in physics
11 and a Bachelor of Arts in English from Case
12 Western Reserve University in Cleveland, Ohio. I
13 graduated in 1990.

14 I went on to graduate work at Ohio
15 University where I received an M.S. and a Ph.D. in
16 physics. I received the Ph.D. in 1996. My
17 research was on surface service physics primarily
18 having to do with electron emission from wide-band
19 gap semiconductors.

20 Q Can you explain what that is?

21 A A semiconductor is in between an
22 insulator and a conductor. Metal conducts
23 electricity and an insulator does not.

24 Semiconductors have a band gap that's a
25 narrow between the conduction and the valance

1 bands so that the electrons will not flow unless
2 you put dopants into them -- impurities -- that
3 then allow the electricity to flow. By
4 controlling the dopants you can control the
5 electrical characteristics of the material.

6 Some of these materials if you apply an
7 electric field you can extract electrons from them
8 at low energies.

9 In an old fashioned CRT you have a
10 metal wire that you run electricity through and
11 get it very hot and you boil the electrons out.
12 With an electron field emitter you don't have to
13 do that so I was looking at the behavior of these
14 electron field emitters.

15 Q Has your research other than the paper
16 that you wrote with Mr. Ceccarelli ever involved
17 traffic engineering?

18 A No, it has not.

19 Q Are you licensed as an engineer in any
20 state?

21 A No.

22 Q Do you believe you're qualified to give
23 testimony on engineering standards of care?

24 A Can you be more specific as to what
25 that means?

1 Q Are you qualified to give an opinion as
2 to whether or not an engineer in North Carolina
3 has met engineering standards of care?

4 A Generally speaking I would say no.

5 Q Do you know whether or not the North
6 Carolina Board of Engineering believes testifying
7 in North Carolina without an engineering license
8 constitutes practicing engineering without a
9 license in the state?

10 A I do not know the answer to that.

11 Q Where are you currently employed?

12 A I'm currently employed at Cree,
13 Incorporated in Durham.

14 Q What do you do there?

15 A I'm a scientist in the Opto R&D group.
16 I work with process development and process
17 transfer. This is for the fabrication of light
18 emitting diodes.

19 Q Has your work at Cree, Inc. involved
20 either preparing or critiquing traffic signal
21 plans?

22 A No.

23 Q Have you ever designed a traffic signal
24 plan?

25 A No.

1 Q Have you ever calculated for a client
2 yellow times?

3 A Not for a client, no.

4 Q Before that you worked for Fairfield
5 (sic) Semiconductor?

6 A Fairchild?

7 Q Fairchild.

8 A Yes.

9 Q Did any of your work at Fairchild
10 involve either designing traffic signal plans or
11 critiquing traffic signal plans?

12 A It did not.

13 Q Did your work at Fairchild
14 Semiconductor involve calculating yellow times?

15 A No.

16 Q How about your work at Extreme Devices,
17 Inc. -- what did you do there?

18 A I worked in wide-band gap semiconductor
19 research. In this case we were developing power
20 semiconductors using silicon carbide as the
21 semiconductor. My work there did not involve
22 traffic plans.

23 Q So your work at Extreme Devices did not
24 involve either designing traffic signal plans or
25 critiquing traffic signal plans?

1 A It did not.

2 Q Do you know whether or not you're
3 qualified to design traffic signal plans in North
4 Carolina?

5 A I do not know.

6 Q When you worked for TeraStore, Inc.
7 from 1997 to 1998 in Chantilly, Virginia what did
8 you do there?

9 A I was on a team that was developing
10 laboratory demonstration of a novel way to store
11 magnetically stored data for computing systems.

12 Q Did that job involve either designing
13 traffic signal plans or critiquing traffic signal
14 plans?

15 A No.

16 Q Did that job involve calculating yellow
17 times for traffic signal plans?

18 A No.

19 Q How about your job at SI Diamond
20 Technology from 1995 to '97?

21 A What about that?

22 Q Tell me a little bit about what you did
23 there.

24 A At SI Diamond I was working on the
25 electron field emission devices that I described

1 when I was talking about my graduate research
2 work. We were developing field emission devices
3 for flat screen displays.

4 Q Did that position at SI Diamond
5 Technology involve either designing traffic signal
6 plans or critiquing traffic signal plans?

7 A No.

8 Q How about calculating yellow times?

9 A No.

10 Q Before that it says from 1990 to '95
11 you were with Ohio University, Department of
12 Physics, Graduate Research Associate; is that
13 right?

14 A Yes.

15 Q Did any of your work as a graduate
16 research associate involve either teaching about
17 how to design traffic signal plans, designing
18 traffic signal plans or critiquing traffic signal
19 plans?

20 A No.

21 Q Did it involve research into traffic
22 engineering?

23 A No.

24 Q From 1988 to 1990 when you were with
25 Case Western Reserve University as a research

1 associate what did you do there?

2 A I basically did general laboratory
3 system maintenance. I converted a system from an
4 older ion pump system into a UHV ion beam sputter
5 deposition system. We were growing
6 non-hydrogenated diamond layered carbon with it.

7 Q Did any of that work while you were a
8 research associate at Case Western Reserve
9 University involve either teaching or researching
10 traffic engineering?

11 A No.

12 Q Did it involve either designing or
13 critiquing traffic signal plans?

14 A No.

15 Q Did it involve calculating yellow
16 times?

17 A No.

18 Q How do you know Mr. Ceccarelli?

19 A We go to the same church.

20 Q What church is that?

21 A North Cary Baptist Church.

22 Q How long have you known him?

23 A For three years.

24 Q Take a look if you would, Dr. Shovlin,
25 at page four of your CV which is your

1 publications. You have listed as number one
2 Misapplied Physics in the International Standards
3 that Set Yellow Light Duration Profits Red Light
4 Camera Companies. Do you see that?

5 A Yes.

6 MS. MARTINEAU: I'm going to hand you
7 what I'm going to mark as Exhibit 2.

8
9 (Exhibit No. 2 Marked for
10 Identification.)

11

12 BY MS. MARTINEAU:

13 Q Take a look at that and let me know if
14 what I have marked as Exhibit 2 is your
15 publication listed as number one?

16 A Yes.

17 Q If you look at the back of Exhibit 2
18 the very last page says Revised September 28,
19 2012-Draft 26. Do you see that?

20 A Yes.

21 Q What does that mean?

22 A As we go through and check things like
23 typos and that we correct them and then we make it
24 as a new revision.

25 Q Do you give it to anyone?

1 A Yes. It's been submitted to the
2 American Civil Engineering -- the full name of the
3 group escapes me right now.

4 Q When you create a new draft -- for
5 example Exhibit 2 which is dated September 28,
6 2012 -- do you submit the new draft?

7 A We have been. I'm not sure if this one
8 has been resubmitted as of yet.

9 Q It's okay because you're just
10 testifying as to your memory, but do you know the
11 name of the organization that you submitted this
12 manuscript to?

13 A I can't recall its acronym.

14 Q Do you know whether or not whatever
15 organization you submitted your manuscript to
16 whether or not they've agreed to publish it?

17 A They have not yet agreed to publish it.

18 Q Take a look at publications listed 2
19 through 12. Do any of these publications involve
20 traffic engineering?

21 A No.

22 Q Do any of these publications involve a
23 critique on what engineering standard of care
24 should be?

25 A No.

1 Q The manuscript listed under publication
2 number one, how did you become to be involved in
3 drafting that manuscript?

4 A Brian and I talked about his situation
5 as far as the red light camera was concerned. I
6 looked into the physics and engineering behind it
7 and I agreed with Brian that there were problems
8 with the formula that the North Carolina DOT was
9 using to base their yellow light durations on and
10 we went together and we created this paper.

11 Q When was that?

12 A Probably the first we worked on this
13 was around a year ago.

14 Q If I'm correct in what you're telling
15 me, you came to be involved in this manuscript
16 after you were approached by Mr. Ceccarelli and he
17 let you know what his issues were with the red
18 light cameras in Cary, correct?

19 A We discussed the issues before we began
20 writing the paper.

21 Q Prior to being approached by
22 Mr. Ceccarelli had you ever done any research into
23 what you just talked about was the physics behind
24 the engineering DOT uses?

25 A No.

1 Q So that research was never part of any
2 scholarly interest that you had?

3 A No.

4 Q When I say that research you know what
5 I'm talking about; the investigation and the
6 research you did after being contacted by
7 Mr. Ceccarelli into NC DOT signal plans.

8 A I had not done that type of
9 investigation prior to that.

10 Q How did you educate yourself about what
11 NC DOT standards were?

12 A I read over a number of the
13 publications that showed what the yellow light
14 time was based on. I have the Determination of
15 Yellow Change and Red Clearance Intervals and it
16 references the ITE so I went and I looked at the
17 ITE Traffic Engineering Handbook to see where they
18 referenced it, and going back to the Third Edition
19 they reference a paper from 1959 which is The
20 Problem of the Amber Signal Light in Traffic Flow
21 and I read that paper and the physics behind the
22 engineering in the paper is very simple. It's
23 simple mechanics.

24 I looked at the application within the
25 original paper by Denos Gazis and it appeared that

1 it was being misapplied by the ITE and then by
2 extension it was being applied by the NC DOT in
3 the Town of Cary.

4 Q That's all investigation that you did
5 and opinions that you formed after being contacted
6 by Mr. Ceccarelli, is that right?

7 MR. STAM: Objection to form.

8 BY MS. MARTINEAU:

9 Q You can answer.

10 MR. STAM: You can answer if you
11 understand the question.

12 THE WITNESS: I didn't look into this
13 before I knew that there was an indication of a
14 problem.

15 MS. MARTINEAU: I'm going to give you
16 what I'm marking as Exhibit 3. I don't have a
17 copy. It's just the notice of this deposition.

18
19 (Exhibit No. 3 Marked for
20 Identification.)

21

22 BY MS. MARTINEAU:

23 Q Dr. Shovlin, take a look at Exhibit 3.
24 Have you seen that before? It's okay if you
25 haven't. I'm just asking you if you have.

1 A Yes.

2 Q You brought some materials with you
3 today. What did you bring with you? You just
4 sort of identified them, but go ahead and identify
5 them again.

6 A I brought the Determination of Yellow
7 Change and Red Clearance Intervals from the North
8 Carolina DOT.

9 I brought several copies of different
10 editions of the ITEs from the Traffic Engineering
11 Handbook -- the Third, Fifth and Sixth Editions.
12 The pages where they describe how they calculate
13 the yellow change intervals.

14 The Problem of the Amber Signal Light
15 in Traffic Flow which was the paper that was
16 referenced by those items as being the origination
17 of the formula that's used by those groups to do
18 the calculation of the yellow light interval.

19 A history of the Yellow Change in Red
20 Clearance Intervals which describes how the yellow
21 light interval has changed for left-hand turns.

22 Q Where did you get that from?

23 A I got that from Brian Ceccarelli.

24 Q How many pages is that?

25 A There's four pages total.

1 Q It looks like more than four.

2 A I'm sorry. Five pages.

3 Q What else did you bring with you today?

4 A I brought a copy of the Application of
5 the ITE Change and Clearance Interval Formulas in
6 North Carolina.

7 I brought a copy of a draft that Brian
8 and I are working on -- Short Yellows and Turns,
9 and then the Misapplied Physics in the
10 International Standards which you already made as
11 an exhibit and my Curriculum Vitae.

12 MS. MARTINEAU: What I would like to do
13 is mark your file materials as Exhibit 4.

14
15 (Exhibit No. 4 Marked for
16 Identification.)

17
18 MR. STAM: We're stipulating that
19 Exhibit 4 will be the collection of paper copies
20 that he brought with him.

21 MS. MARTINEAU: Right, the file
22 materials that he brought with him to the
23 deposition today.

24 BY MS. MARTINEAU:

25 Q Where did you get Exhibit 4 from? You

1 talked a little bit about where you got the
2 various versions of the signal design section
3 documents change and clearance intervals from.
4 You said you got these from Brian Ceccarelli.

5 A Yes.

6 Q Where did you get a copy of the
7 Application of the ITE Change and Clearance
8 Interval Formulas in North Carolina from?

9 A I also got that from Brian.

10 Q Where did you get a copy of The Problem
11 of the Amber Signal Light in Traffic Flow?

12 A I got that from Brian.

13 Q Where did you get a copy of the various
14 excerpts from various ITE publications that you
15 brought with you today?

16 A I got those from Brian.

17 Q How about the 7-'09 Change and
18 Clearance Intervals from the Signal Design Section
19 of the Transportation Mobility and Safety Division
20 of NC DOT?

21 A I also got that from Brian.

22 Q Other than receiving documentation from
23 Brian Ceccarelli what investigation did you take
24 on your own to see what other research was out
25 there regarding the design of traffic signal plans

1 and/or the calculations of yellow times for those
2 plans?

3 A I worked through the calculation of the
4 yellow times myself. I didn't do anything outside
5 of my own research.

6 Q I appreciate that answer. Listen to my
7 question.

8 Other than the documents that you got
9 from Mr. Ceccarelli did you do any other research
10 to determine -- I understand you did calculations
11 -- did you go out and do any other research to
12 determine what yellow time design standards of
13 care was?

14 A No.

15 Q Did you do any research to see what
16 other engineering publications might be out there
17 that talk about the calculation of yellow times?

18 A No.

19 Q Did you look at the Manual of Uniform
20 Traffic Control Devices at all?

21 A No.

22 Q Do you know what the Manual of Uniform
23 Traffic Control Devices says the standard is for
24 determining the length of yellow times for traffic
25 signals?

1 A No.

2 Q Do you know what the engineering
3 purpose of a yellow time is?

4 A Yes. There's two purposes to it. The
5 first purpose is to warn cars that are approaching
6 the intersection that the right-of-way is going to
7 change and give them time to stop.

8 The second purpose is to give cars
9 which are unable to safely stop time to clear the
10 intersection before the light turns red.

11 Q What do you base that on?

12 A The ITE definition.

13 Q Show me the ITE definition. Why don't
14 you circle where you're looking at.

15 A Would you like me to read it?

16 Q I'll take a look at it.

17 MR. STAM: Can you tell us what page
18 you're on?

19 MS. MARTINEAU: This is page 407 of the
20 1965 Traffic Engineering Handbook.

21 It says the purpose of the yellow
22 interval is twofold. One, to advise drivers that
23 the green interval is about to end and to permit
24 them to come to a safe stop and two, to allow
25 vehicles having entered the intersection legally

1 to clear the point of conflict prior to the
2 release of opposing pedestrians or vehicles.

3 THE WITNESS: In the Sixth Edition
4 which is the latest one that I have it has a
5 slightly different definition and it leaves out
6 the second half of that. If you want I can circle
7 that as well.

8 BY MS. MARTINEAU:

9 Q Just so I'm clear, you were given
10 excerpts of the 1965 Traffic Engineering Handbook
11 from Mr. Ceccarelli, is that right?

12 A Yes.

13 Q On page 407 of that handbook there is a
14 definition of yellow interval.

15 A Yes.

16 Q And then you just said that newer
17 versions of Traffic Engineering Handbooks have a
18 different definition, is that correct?

19 A Yes.

20 Q Would you agree that it's a more recent
21 or up-to-date definition?

22 A It's more recent, yes.

23 Q What are you looking at? Go ahead and
24 circle what you're looking at.

25 A The Sixth Edition of the Traffic

1 Engineering Handbook.

2 Q What is the date of that Dr. Shovlin?

3 A The date is 2010.

4 Q Go ahead and circle that definition.

5 If you would read for me what that says.

6 A The purpose of the yellow change
7 interval which is required to be the first
8 interval following every circular green or green
9 arrow indication is to warn approaching traffic of
10 the termination of the related green interval or
11 that a red signal indication will follow.

12 Q Do you know whether or not back in 1965
13 if it was common for traffic engineers to use an
14 all red phase?

15 A My understanding is that it wasn't. It
16 wasn't physically possible to do that at the time.

17 Q Do you know in 2010 whether North
18 Carolina engineers used an all red phase traffic
19 signal plan?

20 A They do.

21 Q Do you know whether or not ITE -- the
22 International Transportation Engineers --
23 organization recommend using all red phases?

24 A I don't know what their recommendation
25 is.

1 My understanding is that some places do
2 not have the ability to do that as yet so they
3 leave that as something that's up to the states.

4 Q Where did you get that understanding?

5 A I would have to go back and look at the
6 additional stuff that I gathered.

7 Q Anything that you're testifying here
8 about today -- traffic engineering and development
9 of signal plans -- is any of this anything that
10 you use in your career as a physicist?

11 A No.

12 Q Do you know what the definition of
13 yellow clearance interval is in the Manual of
14 Uniform Traffic Control Devices in the 2009
15 edition?

16 A I know that it's stated what it is in
17 the Traffic Engineering Handbook here. It says
18 the MUTCD states the yellow change interval should
19 have a duration of three to six seconds.

20 Q My question is a little bit different.

21 Do you know what the definition of
22 yellow change interval is in the Manual of Uniform
23 Traffic Control Devices?

24 A Not specifically.

25 Q Your answer would be the same whether

1 it would be the 2003 edition or the 2009 edition?

2 A I'm sorry. I don't understand.

3 Q I'll purport to you that there's a 2003
4 edition of the Manual of Uniform Traffic Control
5 Devices and it has a definition of yellow change
6 interval, and then there is a 2009 Manual of
7 Uniform Traffic Control Devices that has the
8 definition of yellow change interval.

9 My question is: Do you know what
10 either of those editions' definition for yellow
11 change interval is?

12 A No.

13 Q Do you use ITE publications in your
14 work as a physicist?

15 A No.

16 Q Do you use the Manual of Uniform
17 Traffic Control Devices in your job as a
18 physicist?

19 A No.

20 Q Have you ever taught traffic signal
21 engineering?

22 A No.

23 Q Have you ever taken a course on traffic
24 signal engineering?

25 A No.

1 Q Do you have an understanding, Dr.
2 Shovlin, of the North Carolina section of the
3 Institute of Traffic Engineers study that they did
4 in 2004/2005?

5 A Is that this document that you're
6 talking about?

7 Q You're looking at a document called the
8 Application of ITE.

9 A Right.

10 Q Application of ITE Change in Clearance
11 Interval Formulas in North Carolina.

12 A Yes.

13 Q I'll represent to you that document
14 does talk about the task force study done by the
15 North Carolina section of ITE.

16 A Right.

17 Q Other than the words on this page or
18 the words in this document do you have any other
19 understanding about the task force?

20 A Other than having read this paper, no.

21 Q Have you reviewed the signal plans that
22 are at issue in this case?

23 A No.

24 Q Do you have an opinion as to whether or
25 not the signal plans that are at issue in this

1 case -- I can tell you they are signal plans for
2 Cary Towne Boulevard and Convention Drive in Cary.
3 Have you looked at that one?

4 A No.

5 Q Have you looked at the one where
6 Mr. Ceccarelli got his citation?

7 A No.

8 Q How about the signal plan for Maynard
9 Road and Kildaire Farm Road?

10 A No.

11 Q Have you looked at the signal plan for
12 Cary Parkway and Kildaire Farm Road?

13 A No.

14 Q Have you looked at the signal plan for
15 Cary Parkway and High House Road?

16 A No.

17 Q Or Walnut Street and Meeting Street;
18 have you looked at that signal plan?

19 A No.

20 Q Do you have an opinion then as to
21 whether or not those signal plans that I just
22 mentioned whether they were done at the time in
23 accordance with the Manual of Uniform Traffic
24 Control Devices?

25 A I would assume that they were.

1 Q As you know you've been designated as
2 an expert in this case.

3 A Yes.

4 Q What opinions do you have that you
5 intend to testify to at the trial of this matter?
6 What are your expert opinions?

7 A My expert opinion is that the yellow
8 change interval calculation is based on a single
9 condition that was described in the 1959 paper
10 where it described how to calculate the change
11 interval for cars that were going in a straight
12 line, not turning, driving at the speed limit and
13 able to go through the intersection without
14 slowing down.

15 The ITE took that equation and applied
16 it to situations that it was not originally
17 intended to be applied to and in doing so they
18 induce dilemma zones where drivers are forced to
19 enter the intersection on red.

20 Q Any other opinion that you're prepared
21 to give in this case?

22 A That's it. It doesn't matter what
23 speed limits they choose for applying the formula;
24 the formula is wrong.

25 Q You base the formula being wrong on

1 what?

2 A I base the formula being wrong on its
3 design for a single case; the case of the straight
4 ahead traffic driving through the intersection at
5 the speed limit and it doesn't allow for the case
6 of a driver slowing down to turn and it doesn't
7 allow for the case of impeded traffic where there
8 is something ahead of the intersection that causes
9 the driver to slow down before turning. It
10 doesn't allow for the case of drivers that have
11 drivers in front of them that slow down to turn.

12 In all of these cases where the driver
13 is not able to drive from the critical distance
14 which is the safe stopping distance through the
15 intersection at the speed limit that's the only
16 occasion for which this formula -- the ITE and the
17 North Carolina Department of Transportation are
18 using -- that's the only situation for which that
19 should be applied and is correct.

20 Q You base that on your investigation
21 that you've done after being contacted by
22 Mr. Ceccarelli, correct?

23 A I base that on the math that I did,
24 yes.

25 Q Other than your investigation after

1 being contacted by Mr. Ceccarelli have you ever in
2 any of your papers or in any of your jobs ever
3 used the yellow change interval outlined by NC DOT
4 on its --

5 A The yellow change --

6 Q Let me finish my question.

7 Have you ever used the formula as
8 outlined on the change and clearance intervals
9 from the North Carolina Department of
10 Transportation?

11 A Not specifically, no.

12 Q What kind of background do you have in
13 human factors?

14 A Could you be more specific?

15 Q When an engineer uses the term human
16 factor do you know what that means?

17 A I would assume it means perception
18 times, reaction times being different for
19 different people. The fact that you can't have
20 every situation defined by a specific constant
21 value.

22 Q Do you know what role human factors
23 plays into traffic engineering?

24 A I know for traffic signals you have to
25 take in perception times; you have to take in the

1 different deceleration and acceleration abilities
2 of cars and drivers. If you could be more
3 specific in your question.

4 Q Do you have an opinion of whether or
5 not the yellow time is supposed to be the time it
6 takes the driver to stop?

7 A No.

8 Q Have you researched or do you know what
9 types of intersections the Town of Cary was
10 authorized or permitted back in 2009/2010 to use
11 red light camera enforcement at?

12 A I know that they use them at left turns
13 and straight throughs.

14 Q Other than that?

15 A Other than that I don't know if they
16 use them for other conditions.

17 Q You may not have heard my whole
18 question.

19 I said do you know what the statutory
20 requirements are that allowed Cary back in
21 2009/2010 to operate red light camera systems?

22 A No.

23 Q So you have no opinion of whether or
24 not the Town of Cary was authorized to operate red
25 light camera systems back in 2009/2010 at the time

1 Mr. Ceccarelli or Ms. Millette received their
2 civil violation.

3 A No.

4 Q Have you received or have you looked at
5 the ITE response to Mr. Ceccarelli's submission?
6 Have you seen ITE's response to Mr. Ceccarelli's
7 submission?

8 A What submission?

9 Q You're aware of the paper that you both
10 wrote, correct?

11 A Yes.

12 Q Have you ever seen his paper that talks
13 about Isaac Newton?

14 A I might have looked at it early on. I
15 don't remember it specifically.

16 Q Have you seen a response by ITE to the
17 opinions that have been promulgated by
18 Mr. Ceccarelli regarding his disagreement with how
19 NC DOT calculates yellow times?

20 A No.

21 Q What is your understanding of what this
22 lawsuit is all about?

23 A My understanding is that the lawsuit is
24 about the fact that some people are forced to run
25 red lights based on the way the yellow light

1 interval is calculated, and they are being
2 ticketed by the red light camera program for
3 running the red light when they were forced into
4 it by the way the yellow light interval was
5 calculated.

6 Q Where did you get that understanding
7 from?

8 A Just from my interactions with Brian
9 and the reading and research I've done on the
10 interval.

11 Q Have you ever looked at the lawsuit?

12 A No.

13 Q The Complaint?

14 A No.

15 Q Have you read any of the depositions
16 taken in this case?

17 A I read Brian's deposition.

18 Q Any other depositions?

19 A No.

20 Q Have you looked at the civil citation
21 that Mr. Ceccarelli received?

22 A No.

23 Q Do you know how long the light was red
24 in Mr. Ceccarelli's direction of travel when he
25 first entered the intersection?

1 A No.

2 Q Have you done any calculations to
3 determine whether or not Mr. Ceccarelli could have
4 stopped at a comfortable deceleration rate prior
5 to entering the intersection in question?

6 A No.

7 Q How about Ms. Millette; have you taken
8 a look at Ms. Millette's civil citation?

9 A No.

10 Q So you have no opinion of whether or
11 not Ms. Millette could have stopped prior to
12 entering the intersection where she got her civil
13 citation.

14 A Not specifically.

15 Q You don't know how long the light was
16 red in her direction of travel, do you?

17 A No.

18 Q Do you know how fast she was going?

19 A No.

20 Q Do you know how many feet in front of
21 the intersection she was when she first saw a
22 steady yellow turn signal?

23 A No.

24 Q Do you have any opinion of your own
25 whether or not Ms. Millette could have safely

1 stopped prior to entering the intersection?

2 A Not her case specifically.

3 Q Have you ever received a red light
4 camera civil violation?

5 A No.

6 Q Have you ever driven through
7 intersections where red light cameras are?

8 A Yes.

9 Q Where?

10 A I assume at one time or another in
11 Cary.

12 Q How long have you been driving?

13 A Since 1984 maybe.

14 Q Do you know how human factors and just
15 time in a vehicle affects someone's ability to
16 determine whether or not they should stop or go
17 when a light in their direction of travel first
18 turns yellow?

19 A What do you mean by time in the
20 vehicle?

21 Q Practice, experience driving.

22 A Not how many hours you're in the car?
23 You're talking about experience.

24 Q Sure.

25 A Yes, I would assume that experience

1 helps.

2 Q Do you play baseball?

3 A I don't think you could call it
4 baseball.

5 Q Have you played baseball or softball?

6 A I've played softball in the past.

7 Q Do you have an understanding of how
8 experience playing softball helps an outfielder,
9 for example, determine the trajectory of a ball or
10 how far they need to move in order to catch a
11 high-fly for example?

12 A I think I could practice as long as you
13 might want and I would still not be very good at
14 it.

15 Q I'm not asking if you're good at it or
16 not; I'm asking you about human factors and how
17 just people's experience help them deal with
18 things such as what to do when a light turns
19 yellow or what to do when a softball is hit in
20 their direction.

21 A Yes.

22 Q Do you know how those concepts play
23 into the field of traffic engineering?

24 A Yes.

25 Q How do you know that?

1 A Again from reading the papers where
2 they talk about the formula, they talk about the
3 perception time and they talk about average
4 perception -- that all goes into the first portion
5 of the yellow light interval.

6 Q You're talking about the actual formula
7 that is being used, is that right?

8 A Yes.

9 Q These are all things that you do not do
10 in your every day work as a physicist but you've
11 undertaken to do when requested by Mr. Ceccarelli,
12 correct?

13 A I don't know that Brian actually
14 requested me to do it. We came to the decision to
15 do that together.

16 Q When you were approached by
17 Mr. Ceccarelli and you agreed to look at how
18 engineers calculate yellow time.

19 A Yes.

20 Q Do you know how traffic engineers who
21 design traffic plans in the State of North
22 Carolina design yellow times?

23 A I'm aware of the spec that shows how
24 they determine it.

25 Q Are you familiar with the term

1 standards of practice and how that might be used
2 in ordinary English?

3 A Yes.

4 Q What does that mean to you?

5 A It means that if you're going to create
6 an engineering process you base it on good physics
7 and good engineering. You don't randomly pick
8 something out and say I'm going to make the yellow
9 light two seconds because it feels good to me; you
10 base it on physical reasons.

11 Q Where did you get that definition from?

12 A You asked me to give you my
13 understanding.

14 Q So that's your understanding?

15 A That's my opinion, yes.

16 Q How about just the general term
17 standards of practice; what does that mean to you?

18 A Standards of practice means that you
19 base your decisions on good science and good
20 engineering. You don't use the wrong formula in
21 the wrong place; you check your calculation and
22 make sure they're right.

23 Q You indicated earlier today that you're
24 not familiar with engineering standard of care.

25 A I'm not familiar with that expression,

1 no.

2 Q Are you able to answer questions about
3 whether or not a certain practice is in accordance
4 with engineering standard of care or not in
5 accordance with engineering standard of care?

6 A Generally speaking, no.

7 Q Do you know whether or not using
8 20 miles an hour as an approach speed for
9 determining yellow times for a left-hand turn is a
10 common practice of North Carolina traffic signal
11 engineers?

12 A My understandings is that it is 20 to
13 30.

14 Q How about for other municipalities
15 across the country; do you know whether or not
16 using a calculated speed of 20 to 30 miles an hour
17 for designing left-hand turn yellow times is
18 commonly used by engineers throughout the country
19 in determining yellow times?

20 A I believe that's correct.

21 Q Do you have an opinion of whether or
22 not any of the engineers who designed the traffic
23 signal plans that are in question in this lawsuit
24 deviated from that standard practice of using 20
25 to 30 miles an hour when determining left turn

1 yellow times?

2 A I'm sorry, could you say that one more
3 time?

4 Q Sure. I just want to make sure I'm not
5 surprised at trial.

6 You've not looked at any signal plans,
7 correct?

8 MR. STAM: Objection.

9 THE WITNESS: No.

10 BY MS. MARTINEAU:

11 Q Do you have an opinion of whether or
12 not any of the engineers who signal plans are at
13 play in this lawsuit whether they complied with
14 the standard practice that you discovered in North
15 Carolina of using 20 to 30 miles an hour in
16 calculating yellow times for left turns?

17 A I would assume that they all did. As
18 far as the calculation of the interval goes I
19 think that that's immaterial to whether they used
20 the right formula to create the interval time.

21 Q You feel how engineers have been
22 calculating yellow times in the State of North
23 Carolina and across the country particularly for
24 left-hand turns is wrong, correct?

25 A Yes.

1 Q You think that you and Mr. Ceccarelli
2 have a better way, correct?

3 A Yes.

4 Q My question is different than that.
5 I'm asking you do you know what the standard
6 practice is for determining the yellow times for
7 left-hand turns in North Carolina, for example?

8 A Yes.

9 The standard practice is the 20 to
10 30 miles that you mentioned, and that they call
11 out in the Determination of Yellow Change and Red
12 Clearance Intervals.

13 Q What's the date of that one right
14 there?

15 A July 2009.

16 Q Do you know what has to happen to
17 change the legal speed limit on a state road in a
18 municipality in Wake County?

19 A No.

20 Q Do you know whether in 1991 when the
21 signal plan was prepared for the intersection that
22 Mr. Ceccarelli got his civil violation at do you
23 know what the speed limit was at the time
24 Mr. Ceccarelli received his citation?

25 A My understanding was that the speed

1 limit was 45 miles an hour and that the signal
2 plan was for 35 miles an hour.

3 Q Listen to my question because I think
4 you maybe misunderstood me.

5 A I'm sorry.

6 Q Back in 1991 when the signal plan at
7 issue was prepared for Mr. Ceccarelli's
8 intersection do you know what the speed limit of
9 the road was back in 1991?

10 A '91?

11 Q Correct.

12 A No.

13 Q Do you know when the legal speed limit
14 on the road where Mr. Ceccarelli received his
15 civil citation -- when the speed limit changed to
16 45?

17 A No.

18 Q Have you ever assisted in writing any
19 guidelines or standards for developing or
20 calculating yellow times for traffic signal
21 engineers?

22 A No.

23 Q Have you ever been on any committee
24 that looked at best practices for standard of care
25 for traffic signal engineers?

1 A No.

2 Q Do you know what the MUTCD definition
3 of engineering judgment is?

4 A No.

5 Q You indicated that you read somewhere
6 that the MUTCD promulgated that yellow times
7 should be between three and six seconds, is that
8 right?

9 A Yes. It was in one of the ITE
10 handbooks.

11 Q Do you know whether or not any of the
12 signal plans at question in this lawsuit had
13 yellow times that were less than three seconds or
14 more than six seconds?

15 A No.

16 Q You don't know or --

17 A My assumption is that they fall in that
18 range.

19 Q The intersections at play in this case,
20 do you know whether they are state owned
21 intersections or Town of Cary owned intersections?

22 A No.

23 MS. MARTINEAU: Thank you Dr. Shovlin.
24 Those are all the questions I have.

25

1 BY MR. STAM:

2 Q Dr. Shovlin, look at Defendant's
3 Exhibit 2.

4 A Yes.

5 Q Are the opinions stated in this article
6 that you have submitted for publication still your
7 opinions as of this date?

8 A Yes.

9 Q In your group of documents marked as
10 Exhibit 4 you also have an article about short
11 yellow turns.

12 A Yes.

13 Q What's the date and draft number?

14 A Reversion 13, September 29th.

15 Q Does that bear your name as a
16 co-author?

17 A Yes.

18 Q Are the opinions stated in that article
19 still your opinions?

20 A The article is a draft and it's still
21 being worked on, but yes.

22 Q If you would look at Defendant's
23 Exhibit 1 -- your Curriculum Vitae.

24 Have you ever worked as an engineer but
25 not a licensed engineer? Have you ever worked as

1 an engineer?

2 A Yes.

3 Q For whom and when?

4 A When I was at Fairchild Semiconductor
5 from 2002 to 2009.

6 Q In your present employment do you work
7 with engineers?

8 A Yes.

9 Q Where is that?

10 A I work at Cree, Incorporated in Durham.

11 Q How frequently do you work with
12 engineers?

13 A Every day and many times a day.

14 Q This is in connection with
15 semiconductors and other high-tech product
16 development; is that what it's about?

17 A Yes.

18 Q Describe the relationship between
19 physics and engineering as best you understand it.

20 A There's a large overlap between the
21 two. To the far right physics is the study of the
22 world and how it works. As you move towards the
23 center you begin to apply that and you need to
24 develop new ways to work with the science in order
25 to develop it further. At that point it overlaps

1 with engineering where in engineering you take the
2 scientific principles that have already been
3 developed and you apply them in order to get
4 useful things out of them.

5 Q Do you have an opinion whether the laws
6 of motion apply to vehicles driving on roads?

7 A Yes, they do.

8 Q Are those the same laws of motion that
9 you apply in discussing electrons and other
10 objects?

11 A The study of moving things is in the
12 study of classical mechanics which is the problem
13 of the yellow light interval. Electrons moving is
14 electrodynamics and that's a little different.

15 Q As a doctoral student did you have an
16 opportunity to teach?

17 A Yes.

18 I taught physics labs, classical
19 mechanics labs and I also was a teaching assistant
20 in at least two sections of introductory physics
21 classes where I graded the homework and went over
22 and reviewed the homework with the students after
23 it was given back to them.

24 Q Would these be undergraduates?

25 A Yes.

1 Q Do you know whether engineers take
2 introductory physics as part of their
3 prerequisite?

4 A At the university I went to all of the
5 engineers took introductory physics as part of
6 their prerequisites.

7 Q In all of your work as an engineer,
8 work with engineers or work teaching perspective
9 engineers have you ever heard the proposition that
10 engineers can disregard the known laws of physics
11 and come up with a proper engineering solution?

12 A No.

13 Q Do you have an opinion if there is a
14 practice that violates the laws of physics whether
15 that can properly be described as an engineering
16 practice?

17 A It cannot.

18 Q Do you have an opinion satisfactory to
19 yourself whether a practice that violates the laws
20 of physics can be described as a proper
21 engineering practice?

22 A A practice that violates the laws of
23 physics cannot be known as a proper engineering
24 practice.

25 Q You work at Cree, is that correct?

1 A Yes.

2 Q If you were to take to your
3 supervisors -- I assume you have supervisors --
4 you're not in charge of Cree, is that right?

5 A That's correct.

6 Q If you were to take a new invention and
7 say this is what the engineers think but I've
8 worked out the equation and it doesn't fit with
9 the laws of physics would Cree say let's develop
10 this; let's try to make a good product out of
11 this?

12 A I think my supervisors would take a
13 look at my work and take a look at my coworkers'
14 work and try to determine who was correct before
15 we would go forward.

16 Q You had the 1965 version of the Traffic
17 Engineering Handbook --

18 MS. MARTINEAU: Excerpts from it.

19 BY MR. STAM:

20 Q You also had them from 2010 -- these
21 will be part of Defendant's Exhibit 4 -- my
22 recollection of your testimony is you found a
23 difference in the definition or purpose of the
24 yellow change interval between those two versions.

25 A Right.

1 Q Can you tell us looking at them what
2 was left out of 2010 that was in the 1965 version?

3 A In the 1965 version they had a twofold
4 purpose. The second part of the purpose was to
5 allow vehicles that have entered the intersection
6 legally to clear the point of conflict. In the
7 Sixth Edition, which is the most recent, it leaves
8 that out.

9 Q Truly the purpose has changed so that
10 no longer the yellow light tells a person who
11 can't stop --

12 MS. MARTINEAU: That's not the
13 definition of yellow light from 1965.

14 MR. STAM: I'm going to finish the
15 question and then you can object. I'll start
16 again.

17 MS. MARTINEAU: Thank you.

18 BY MR. STAM:

19 Q Read please the second purpose from the
20 1965 handbook for yellow change intervals.

21 A Just the second purpose?

22 Q The one that's left out in 2010.

23 A To allow vehicles having entered the
24 intersection legally to clear the point of
25 conflict prior to release of opposing pedestrians

1 or vehicles.

2 Q You recall Ms. Martineau's suggestion
3 by questions as I took it that that's no longer
4 necessary since there's all red interval in there.

5 MS. MARTINEAU: Objection to the form
6 of the question.

7 BY MR. STAM:

8 Q Do you recall that?

9 A Yes.

10 Q What is the consequence of leaving out
11 that second purpose even if there is an all red
12 interval not including that as a purpose of the
13 yellow change interval?

14 MS. MARTINEAU: Objection to the form
15 of the question.

16 THE WITNESS: In some cases vehicles
17 that enter the intersection on red may not have
18 time to get through the intersection on red
19 because the time is shorter.

20 BY MR. STAM:

21 Q Another one of your documents that's
22 part of Exhibit 4 -- if you would just tell us
23 which one it is.

24 A Determination of Yellow Change and Red
25 Clearance Intervals.

1 Q I'm sorry. That's not the right one.

2 A Which one are you looking for?

3 Q The ITE document.

4 A Here.

5 Q What's the document you're looking at
6 right now?

7 A The Application of the ITE Change and
8 Clearance Interval Formulas in North Carolina.

9 Q Going to page 22 -- I'm sorry. I'm
10 going to withdraw that question. Let's use
11 this -- the determination of yellow change and red
12 clearance.

13 MS. MARTINEAU: What's the date of
14 that?

15 THE WITNESS: July 2009.

16 BY MR. STAM:

17 Q I know the reason I wanted to look at
18 this one first. This is the Application of the
19 ITE Change and Clearance Interval Formula, page
20 20.

21 Comparing the equation on page 20 with
22 the breakdown of that equation on page 24 which
23 blown up is then this document which if you could
24 tell the court reporter what that is.

25 A The blown up document is the

1 Determination of Yellow Change and Red Clearance
2 Intervals from July 2009.

3 Q Is that a portion of page 24?

4 A Page 24 -- the Application of the ITE
5 Change and Clearance Interval Formulas in North
6 Carolina.

7 Q It appears to me -- tell me if I'm
8 wrong -- that the formula at the bottom of page 20
9 puts these formulas in the same equation, is that
10 correct?

11 A Yes.

12 Q There's a term in that combined
13 equation on page 20 of V and it appears two
14 places.

15 A Correct.

16 Q What is V?

17 MS. MARTINEAU: According to the
18 document?

19 MR. STAM: According to the document,
20 yes. What is V?

21 THE WITNESS: According to the document
22 V is the design velocity in feet per second.

23 BY MR. STAM:

24 Q What is the design velocity according
25 to the paper?

1 A The design velocity is the 85th
2 percentile of speed or the speed limit.

3 Q The second time the term V is used in
4 the document in the formulas that appear on page
5 20 what does that refer to?

6 A As far as the paper is concerned?

7 Q Yes.

8 A It's also the design velocity.

9 Q Is that, however, on the blown up part
10 on page 24 part of the red clearance interval?

11 A They've modified the term, but it's
12 part of the red clearance interval.

13 Q At that point is that where they are
14 talking about 20 to 30 miles an hour?

15 A Not specifically. The 20 to 30 miles
16 per hour is what they assume the velocity is going
17 to be for cars that are turning left.

18 Q Velocity measured when?

19 A They don't specifically say when
20 they're measuring it. They're assuming it the
21 entire time they're doing the calculations.

22 Q Since the first V in the equation
23 refers to the speed limit or the 85th
24 percentile --

25 A The design speed.

1 Q -- since the same term is used in the
2 same equation should that be the same value when
3 it's used twice in the same equation?

4 MS. MARTINEAU: Objection to the form.

5 THE WITNESS: The design speed in the
6 yellow interval is the speed limit and it's used
7 to calculate the safe stopping distance and the
8 yellow interchange interval. The V and the red
9 clearance interval they're using as the design
10 speed it should be the speed you're traveling
11 through the intersection.

12 BY MR. STAM:

13 Q Is that a different value?

14 A For a car turning left before it gets
15 to the intersection it will be driving at the
16 speed limit, so in the yellow change interval
17 formula it should be the design speed as the speed
18 limit. As it slows down to make the turn it
19 therefore should use the V which is the turn speed
20 which is the 20 to 30 miles per hour.

21 Q Denos Gazis in his paper uses this
22 formula only for what case?

23 A He uses the formula only for the case
24 of straight-through traffic.

25 Q That is not slowing down for any

1 reason.

2 A That is not slowing down for any
3 reason.

4 Q But this paper -- tell me if I'm
5 wrong -- uses it --

6 MS. MARTINEAU: What paper? Please
7 identify what you're talking about.

8 BY MR. STAM:

9 Q The Application of the ITE Change and
10 Clearance Interval Formulas in North Carolina
11 attempts to use it also for vehicles that are
12 decelerating to stop.

13 A They also use it for vehicles that are
14 attempting to stop or slowing down.

15 Q Is that proper?

16 A No.

17 MR. STAM: If I could just have five
18 minutes to consult.

19

20 (Recess.)

21

22 BY MR. STAM:

23 Q In a yellow change interval formula is
24 the V the initial design speed at the critical
25 distance?

1 A Yes.

2 MS. MARTINEAU: I'm going to object to
3 the form of that question.

4 BY MR. STAM:

5 Q Must the vehicle proceed at that speed
6 or greater in order to enter the intersection
7 legally under that formula?

8 A If the driver passes the critical point
9 when the light turns yellow then in order to make
10 it into the intersection before the light turns
11 red he has to drive at the initial speed or
12 faster.

13 Q When you say initial speed do you mean
14 initial design speed?

15 A Yes, the design speed.

16 MR. STAM: No further questions.

17 BY MS. MARTINEAU:

18 Q Dr. Shovlin, we took about a
19 five-minute break. During that break did you talk
20 to Mr. Stam or Mr. Ceccarelli about any of the
21 issues in this case?

22 A No.

23 Q I want to clarify a couple of things.
24 You talked about or you recall answering questions
25 from Mr. Stam about the difference in the

1 definitions in ITE publications from 1965 and 2010
2 regarding yellow times, correct?

3 A Yes.

4 Q Take a look at the 1965 definition.
5 Nowhere in that definition does it talk about
6 vehicles entering the intersection illegally, does
7 it?

8 A That's correct.

9 Q The second part of that definition that
10 was later omitted as you testified from 2010 talks
11 about vehicles who enter the intersection legally,
12 correct?

13 A The second definition?

14 Q The second part of the 1965 definition
15 that you later said was omitted from the 2010
16 version talks about vehicles entering into the
17 intersection legally, correct?

18 A Yes.

19 Q Does that to you mean that they enter
20 the intersection while the light is still yellow?

21 A Yes.

22 Q And that second part of the 1965
23 definition is to give vehicles who enter the
24 intersection on yellow the time to clear the
25 intersection before the light turns red, correct?

1 A No. I believe it's to clear the
2 intersection before the light turns green for
3 opposing traffic.

4 Q Based on what you just said the second
5 purpose that appears on the 1965 one is to allow
6 vehicles who enter the intersection legally on
7 yellow to clear the intersection before the
8 opposing traffic gets a green light.

9 A Yes.

10 Q You understand from either talking to
11 Mr. Ceccarelli or from reviewing documents that
12 we've identified in this case that in 2009/2010
13 there is now an all red, correct?

14 A Correct.

15 Q You know the purpose of the all red is
16 to help clear the intersection before the opposing
17 traffic has the green light, right?

18 A Yes.

19 Q You testified that you practiced
20 engineering. When did you practice engineering?

21 A When I was at Fairchild Semiconductor
22 my title was an engineering title and I worked in
23 research and development where we were developing
24 existing technology and bringing a product to
25 market.

1 Q When was that?

2 A From 2002 to 2009.

3 Q What state was that in?

4 A That was in the State of Maine.

5 Q Were you licensed to practice
6 engineering in Maine at that time?

7 A No.

8 Q Were you illegally practicing
9 engineering at that time?

10 A I was not required to have a license to
11 practice engineering for that position.

12 Q Your position did not require you to
13 have an engineering license, is that right?

14 A That's correct.

15 Q Did you sign or seal any plans as an
16 engineer while you worked in Maine for that
17 company?

18 A No.

19 Q You just used engineering principles,
20 is that right?

21 A Yes.

22 Q Are you able to lawfully practice
23 engineering in North Carolina?

24 A I do not have a license in North
25 Carolina; however -- could you be more specific in

1 what you mean?

2 Q Are you familiar with the North
3 Carolina Board of Surveying and Engineering?

4 A Not specifically, no.

5 Q Do you know whether or not they
6 promulgate rules regarding the practice of
7 engineering in this state?

8 A What kind of engineering?

9 Q Engineering in this state --
10 professional engineers in this state.

11 A I assume they do.

12 Q Do you know what the requirements are
13 for being able to practice professional
14 engineering in this state?

15 A No.

16 Q Do you know whether you're qualified to
17 practice professional engineering in this state?

18 A I'm not.

19 Q You indicated that according to the
20 calculation that is on the 7-2009 change in
21 clearance intervals worksheet that using
22 calculation for those drivers who are in the
23 critical distance when the light turns yellow that
24 if they continue at the assumed speed that they
25 will be able to enter the intersection before the

1 light turns red.

2 A You're speaking of the yellow change
3 interval?

4 Q Correct.

5 A Could you say that again.

6 Q You just testified a moment ago that
7 using the yellow change interval calculation
8 that's on that sheet 7-'09 that for those drivers
9 who are in the critical distance when the light
10 turns yellow that they will be able to enter the
11 intersection if they continue to travel at the
12 designed speed.

13 A Yes.

14 MR. STAM: Objection.

15 THE WITNESS: Yes. That's for the case
16 of the drivers that are driving straight through
17 the intersection.

18 BY MS. MARTINEAU:

19 Q For those drivers how does, in your
20 opinion, that calculation violate the laws of
21 physics?

22 A For the straight-through driver it does
23 not violate the laws of physics. When the
24 straight-through driver doesn't have to slow down
25 the formula is a proper formula.

1 Q You feel it violates the laws of
2 physics for left turn drivers; is that your
3 testimony?

4 A My testimony is that if a driver is
5 required to slow down the formula does not fit the
6 physical situation and violates the laws of
7 physics.

8 Q For what types of drivers?

9 A Any drivers who are not driving through
10 the intersection unimpeded at the speed limit.

11 Q Let's talk about left turn drivers.
12 Have you done any calculations to determine for a
13 typical left turn what speed a driver must slow
14 down to in order to safely maneuver the turn?

15 A Have I done any calculations?

16 Q Yes.

17 A Calculations on that as to what the
18 safe turning speed is I haven't. There is one of
19 the ITE papers here that has a list of what those
20 turns are done at.

21 Q You have or have not done calculations
22 to determine what speed a left turn driver must
23 slow down to in a typical intersection to safely
24 maneuver the turn, yes or no?

25 A I've done calculations assuming

1 different turning speeds but I haven't determined
2 personally what the safe turning speed is. It's a
3 complicated process because the center of gravity
4 of the car is going to determine what the safe
5 speed for that particular car is. I did it for a
6 range of turning speeds.

7 Q What was the calculation that you
8 determined for your range of turning speeds?

9 A We used --

10 Q When you say we who is we?

11 A Brian and I wrote the paper together
12 and we did the calculations together.

13 Q What was the range of calculations you
14 both determined for your left turn speed?

15 A We used a range from zero to 25 miles
16 per hour.

17 Q Have you ever done any field work where
18 you were out observing folks in North Carolina
19 making left turn speeds to determine what the
20 typical range of speeds were for typical drivers
21 turning left?

22 A No.

23 Q Do you have any information that would
24 refute the range of speeds reported in the paper
25 for left turn drivers Application of the ITE

1 Change and Clearance Interval Formulas in North
2 Carolina?

3 A Are you specifically speaking of the
4 table in figure one?

5 Q Yes.

6 A I don't have anything to refute that.

7 Q For left turn speeds for a driver who
8 was going 20 miles an hour or slower at the time
9 they were in the critical distance when the light
10 first turned yellow in their direction or steady
11 yellow in their direction if they continue to go
12 at a speed of 20 miles an hour over should that
13 driver be able to enter the intersection before
14 the light -- before the yellow light changes to
15 red?

16 MR. STAM: Objection to form.

17 THE WITNESS: If the yellow light
18 critical distance is determined at the same speed
19 that they're making the turn and if the same speed
20 that they're making the turn is the speed that
21 they passed the critical distance then what you
22 said is correct.

23 BY MS. MARTINEAU:

24 Q Dr. Shovlin, you understand -- and I
25 think you testified earlier -- that the yellow

1 time formula the purpose of that is not to provide
2 enough time for those drivers who want to stop, is
3 that right -- you understand that now, correct?

4 A Would it be all right if I just restate
5 what my understanding of it is?

6 Q Sure.

7 A My understanding of the formula that's
8 used to calculate the times that the formula does
9 two things; it calculates the safe stopping
10 distance for a given speed and then it sets the
11 length such that if a driver is at that critical
12 distance he's able to enter the intersection on
13 yellow if he continues at the speed limit the
14 entire time. Does that make sense?

15 Q Sure.

16 Also, you're not saying that if a
17 driver who enters the critical distance and
18 determines to stop that the yellow time is
19 supposed to be long enough for him to stop while
20 the light is yellow?

21 A If you're asking my personal opinion I
22 think that would be the best way to do it. If
23 you're asking me how the equation was designed the
24 equation was not designed for that.

25 Q Have you watched yourself or have you

1 been paying attention when you're driving when you
2 first see a yellow light and you decide to stop
3 what happens?

4 A Are you asking me what happens when I
5 come upon a yellow light?

6 Q Since you've been involved in this case
7 have you been paying attention to yellow lights
8 more? Are you able to say when you see a yellow
9 light and you make the decision to stop what color
10 the light is when you come to a full stop or have
11 you not looked at it?

12 A I haven't specifically looked at it,
13 no.

14 Q If a driver makes a decision to stop
15 when he first sees the yellow time why does it
16 matter whether or not when he fully comes to a
17 stop whether the light is red or yellow? Why does
18 it matter?

19 A It doesn't matter.

20 MS. MARTINEAU: Thank you. Those are
21 the questions I have for you.

22 MR. STAM: No further questions. We'll
23 read and sign.

24 (Signature reserved.)

25 (Deposition adjourned at 11:00 a.m.)

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C E R T I F I C A T E

I, JOSEPH D. SHOVLIN, Ph.D., do hereby certify that I have read the foregoing deposition given by me on Monday, October 15, 2012, and I certify it to be a true and correct transcript of my said deposition. In the event that I desire to make changes in the form or substance of my deposition, said changes will be listed below along with my reasons for making them.

PAGE	LINE	CHANGE AND REASON FOR MAKING CHANGE
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17 _____

18 Joseph D. Shovlin

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20 Sworn and subscribed

21 to before me this

22 _____ day of _____, 2012

23 Notary Public: _____

24 My Commission Expires: _____

25 Notary No. _____

1 STATE OF NORTH CAROLINA AT LARGE, to wit:

2
3 I, Joseph C. Spontarelli, CCR, Notary Public
4 in and for the State of North Carolina at Large,
5 and whose commission expires March 29, 2015, do
6 certify that the aforementioned appeared before
7 me, was sworn or affirmed by me, and was
8 thereupon examined by counsel; and that the
9 foregoing is a true and correct transcript taken
10 to the best of my ability.

11 I further certify that I am neither related
12 to nor associated with any counsel or party to
13 this proceeding, nor otherwise interested in the
14 event thereof.

15 Given under my hand and notarial seal at
16 Raleigh, North Carolina, this 22nd day of
17 October 2012.

18
19
20 -----

21 Joseph C. Spontarelli,
22 Court Reporter
23 Notary Public #201008800108
24
25

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C E R T I F I C A T E

I, JOSEPH D. SHOVLIN, Ph.D., do hereby
 certify that I have read the foregoing deposition
 given by me on Monday, October 15, 2012, and I
 certify it to be a true and correct transcript of
 my said deposition. In the event that I desire to
 make changes in the form or substance of my
 deposition, said changes will be listed below
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 Joseph D. Shovlin

20 Sworn and subscribed
 to before me this
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