

Wainwright, Scott

From: Richard E. Mullinax [rmullinax@dot.state.nc.us]
Sent: Monday, October 03, 2005 8:33 AM
To: Wainwright, Scott
Subject: [Fwd: Interpretation of Section 4D.15]



Interpretation of
Section 4D.1...

Scott,

I meant for this to go to you. Apparently NCDOT has its own
Scott Wainwright!
Thanks.

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Wainwright, Scott

From: Richard E. Mullinax [rmullinax@dot.state.nc.us]
Sent: Friday, September 16, 2005 9:16 AM
To: Scott Wainwright
Cc: Bruce Friedman
Subject: Interpretation of Section 4D.15

Scott

An issue regarding the interpretation of Section 4D.15 of the MUTCD has recently been brought to my attention. As you know, this section currently states that "a minimum of two signal faces shall be provided for the major movement, even if the major movement is a turning movement."

We have interpreted this to mean that if the major movement is a turning movement, then two signal faces would need to be provided for the turning movement, but not necessarily the through movement. For instance, if there are dual-left turn lanes (with the lefts being the major movement) and a through lane on an approach, we would provide two three-section RA,YA,GA faces for the lefts and one three section RB,YB,GB face for the through.

Bruce Friedman has recently shared with me a chain of e-mails between Ray, you, and him which discussed the intent of Section 4D.15. From this chain, it appears the intent of the MUTCD is to require two signal faces for the through movement regardless of the significance of the turning movements.

If this is the case, can I get an official memorandum from the FHWA outlining this so that I can pursue getting our design standards revised to reflect this intent? I also understand that revised language will be proposed to clarify this requirement.) (★)

On another note, I thought you might be interested to know that some of our field forces have visited our four-section flashing arrow test location. Initially they were extremely skeptical, but after seeing it in operation they have become enthusiastic supporters!

Take care.

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Richard Mullinax, PE
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Wainwright, Scott

From: BDandRinc@aol.com
Sent: Saturday, August 13, 2005 2:46 PM
To: Bruce.Friedman@kimley-horn.com; Wainwright, Scott
Subject: Re: Interpretation of Section 4D.15?

Hi

Your example is the reason I said my comments were an Executive Summary

I don't remember if it still exists (I'm not at home), but the MUTCD once permitted a minor commercial exit or urban street as an odd leg on a signal to be controlled by a STOP sign. That avoided a lot of wasted time. Paul Box put forth the argument that providing a phase in a pre-timed environment for an occasional vehicle was an unjustified delay and the odd phase screwed up the time-space diagram. A STOP sign was much cheaper than actuation when that meant trying to keep a pressure pad in a street full of pot holes or a "strange controller" in a sea of mechanical units.

It is always the special cases that drive you nuts and make this pursuit fun.

In the example given, sequence sensitivity is an issue.

If the entire approach goes at once, signal faces from left to right might be; Ball Red and Ball Yellow all, with a left arrow, a left arrow & a ball green (inverted "T") and a Ball Green. That gives us a signal for each lane and honors the dual indication for the thru using three signal heads and not four.

Using LED signals and noting the primary reason for dual indication and with the type of approach you describe, I would listen to an argument that three signal faces, left to right; all arrow, all arrow, and all ball would be just fine. This permits an early cutoff of the thru so a conflicting left can be honored with less wasted time and it does not raise the risk of a complete red failure to an unacceptable level.

Clearly, a suggestion that LED can be traded in some circumstances for dual indication will cause heart failure for some, and drive the rule writers up a wall, but it is not a universal bad thing.

My fear is that the MUTCD will become so large that wheels or bearers will necessary. What we need is a set of books rooted in the MUTCD, one for low speed and one for high speed and maybe one for weird intersections which take the inexperienced by the hand. The real problem is that getting a consensus on what to say will not happen.

If we ask the STC to list the ten most important considerations in signal design in the order of importance, how many years do you think it would take to adopt a list?

Ray

Wainwright, Scott

From: Bruce.Friedman@kimley-horn.com
Sent: Friday, August 12, 2005 1:31 PM
To: Wainwright, Scott; BDandRinc@aol.com
Subject: RE: Interpretation of Section 4D.15?

Scott and Ray,

I agree that we should revise the text to make it clearer that the through movement should always have two faces. This revision would prevent others from coming to the same conclusion that I did.

think that Item A in Paragraph 7 of Section 4D.15 should be revised to read as follows:



"A. If a through movement exists on an approach, a minimum of two signal faces shall be provided for the through movement. If a through movement does not exist on an approach, a minimum of two signal faces shall be provided for the turning movement that is considered to be the major movement from the approach."

Ray, just so you don't think that I was going off the deep end, I did not think that single-lane through movements on high-speed approaches adjacent to double left-turn lanes should be provided only one face. My interpretation was that a low-speed commercial driveway comprised of two left-turn lanes (considered for a variety of reasons to be the major movement) and a through/right lane where hardly any traffic wants to go straight across to another commercial driveway or a minor side street could be handled by a single through face according to the way Section 4D.15 is now worded. Since both of you disagree with my interpretation, I am sure that I am wrong and I think that my suggested revision to the text will make it clearer. (By the way, I do not consider my ox to have been gored. I'm actually glad that your opinion agrees with Scott's so that we can consider adding this clarity to the text.)

Bruce

From: Wainwright, Scott [mailto:Scott.Wainwright@fhwa.dot.gov]
Sent: Friday, August 12, 2005 1:10 PM
To: BDandRinc@aol.com; Friedman, Bruce
Subject: RE: Interpretation of Section 4D.15?

amen, brother...Thanks for weighing in, Ray!

Bruce, as you know, I agree with Ray. I'd like to see language in 4D.15 to make it totally clear that the thru movement always gets a min of 2 faces, and turning mvmts with separate signal faces may also get 2, regardless of major or minor.

I also think we should be more specific in how to treat the stem of a T intersection in terms of "acceptable options" for displays for various conditions (peds vs no peds, opposing one-way street or ramp vs. actual physical "T", different lane use arrangements, etc.) Practitioners definitely need more guidance on this---you can see a lot of variations and a lot of bad signal display designs on stems of Ts.

Scott

-----Original Message-----

From: BDandRinc@aol.com [mailto:BDandRinc@aol.com]

10/3/2005

Sent: Friday, August 12, 2005 11:55 AM
To: Bruce.Friedman@kimley-horn.com
Cc: Wainwright, Scott
Subject: Re: Interpretation of Section 4D.15?

Hi:

I don't know whose Ox I may have gored, but my thoughts are below

The Executive Summary answer is that the thru movement gets a minimum of two signal heads regardless of traffic volumes. Remember as one drives thru any intersection, one can only speculate, and most likely care less, as to the total 24 hr. traffic volume. The driver sees what the driver sees in a few seconds. Such 24 hour nuances are lost on the average driver. But even if detected, what is the driver to do about it?

I do not believe that a driver on a single lane roadway approaching an intersection with 2 left turn lanes, an on-ramp perhaps, understands that the double indication should go to the left turn lane and not the thru lane. Since we talk of limiting the visibility of turn signals from the thru lanes, but not the opposite, which is more dangerous, a complete display failure on a high speed thru lane or on a low speed turn lane where a driver expects to be stopping or yielding?

If there is no thru movement, the Committee did not want to prepare a laundry list of selection criteria to determine which turn, left or right, deserved the two signal faces, so it was left up to the signal designer to use engineering judgement. Major and minor are not a volume issue as much as they are an appearance issue. Besides which, once a decision is made as to who gets the double indication, there had to be some way to distinguish between the two turns. "The one with the two heads" is a little awkward, even for us.

On the stem of a "TEE", there is a serious conflict in that a protected movement is to be displayed as a green arrow which many ignore by using a Circular Green so the ped. timing does not get out of hand.

My problem with this is that prior to L.E.D. displays, a single lamp failure in an inverted "TEE" signal face left the driver to wonder what to do on the minor approach. The Reds go out and two Green arrows (the major approach) come on, but the single turn Green arrow has failed. Can a driver legally turn? Watch the ped. delay problem. Some jurisdictions hold the green but turn off the red.

hope this light look at the issue is helpful. If not, I can do a multi-page version.

Wainwright, Scott

From: Bruce.Friedman@kimley-horn.com
Sent: Wednesday, August 10, 2005 5:34 PM
To: BDANDRINC@aol.com
Cc: Wainwright, Scott
Subject: Interpretation of Section 4D.15?

Ray,

Scott and I were discussing how to interpret Item A of Paragraph 8 of Section 4D.15 and did not have the same interpretation. We wanted to have the benefit of your interpretation of this issue.

Item A states that "a minimum of two signal faces shall be provided for the major movement on the approach, even if the major movement is a turning movement."

Does this mean that on an approach where the volume for the left-turn movement is substantially higher than the volume for the straight-through movement, that *the straight-through movement can be controlled by a single signal face* while the major movement (the left-turn movement) is controlled by two signal faces to satisfy the Standard? Or is Item A only providing the option of calling the major movement a turning movement when there is no straight-through movement, such as on the stem of a T-intersection?

Your thoughts on this issue would be appreciated.

Bruce

Bruce E. Friedman, P.E., PTOE

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