

# **BTC meeting, Wednesday, June 17, 2015**

Minutes prepared by John Allen

## ***Attendance***

### **BTC members:**

Richard Moeur, Chair  
John Allen, Secretary  
Dongho Chang  
Mike Cynecki  
Josh DeBruyn  
Bill DeSantis  
Bill Fox  
Dwight Kingsbury

Rock Miller  
Nathan Richman  
Bill Schultheiss  
Ryan Snyder  
Lee Stuart  
Ron van Houten  
Craig Williams, arrived 2:00  
Mighk Wilson, arrived 2:30

### **Guests:**

Dewayne Carver, Florida DOT  
Ray Derr, TRB  
Bruce Friedman, FHWA  
Ismael Garza, Nevada DOT  
Leonard Gillaina, OneSmartLight  
Kevin Hall, Evonik Industries

Gene Hawkins, Chair, Edit Committee  
Jim Kalchbrenner, Pexco Davidson  
Randy McCourt, SROPT task force  
Rafat Raie, OneSmartLight  
Jim Shurbutt, FHWA

## ***BTC business***

Members and guests introduced themselves

January 2015 minutes were approved by acclamation.

Membership: There has been one resignation, Mike Coleman, from Portland, Oregon. We still have 13 government and 11 non-government members. Even with Ryan Snyder and Rock Miller now as members, we can have one more non-government member. There are several persons interested in becoming members: Hank Fung (LA County), Joost Van Boekhold (Delaware DOT), Stewart Robertson (Kimley Horn - non govt.), and Dewayne Carver (Florida DOT). Stewart and Dewayne are in attendance at this meeting. Ginny Sullivan from Adventure Cycling is too busy with the US Bike Routes project and is withdrawing as a prospective member, but will stay on the e-mail list.

## ***Updates***

Friedman: MUTCD rulemaking is being held up by the Office of Management and Budget as “non-urgent.” So the draft MUTCD is currently not even in internal review at this time. This may allow a window for adding new content to the next MUTCD. This is new information. With the delay in rulemaking, we might have more interim approvals. The FHWA may not want to grant

interim approval on bike boxes, because there is still controversy. Current Interim Approvals for green bike lanes, US Bike Route signs and bicycle signals have not been as controversial.

Moeur: Interim Approval IA-5 on the Clearview typeface as an alternative to the Federal standard may be rescinded by FHWA. Federal rescission of approval would still allow keeping existing signs up for the rest of their service life. The BTC is willing to assist FHWA with content and information on any new Interim Approvals affecting bicyclists.

Van Houten: Michigan DOT came up with significant crash reductions with the Clearview typeface, but better results while also changing the background color.

Friedman: Two IAs preceding the 2009 manual were Clearview and rectangular rapid flash beacons (RRFBs). FHWA may come up with a modified IA on bike signals (IA-16 to IA-16A). Signs for motorist overtaking of bicyclists were identified as a priority item by both BTC and RWSTC at the January meeting. Designs for overtaking signs were included into the FHWA traffic control device pooled-fund study. Bryan Katz is leading work on this. IA-14 is green paint for bike lanes and extensions. There is trouble keeping the paint in the accepted range of colors as it fades. Moeur: Robert Dingess will address us on this issue on Thursday.

Allen and Carver reported on the morning's Rules of the Road Committee meeting. It addressed only Chapter 1 of the Uniform Vehicle Code, Definitions. The latest version is not yet posted on the NCUTCD Web site but it will be. We need to carry the ball on definitions for E-bikes. At January's TRB meeting, Moeur was approached about E-bikes and RRFBs by two people in the academic community, and he will bring them in if we develop a working group. Our committee of the whole does not work well by e-mail to address UVC issues.

Allen and Miller attended the Roundabout Task Force meeting, (Allen will send notes on this meeting to the BTC by e-mail) Bicycles in multi-lane roundabouts are a concern. Proposed Federal accessibility guidelines (PROWAG) require signalization at crosswalks at multi-lane roundabouts. RRFBs might become an acceptable signal in these locations. RRFBs are less expensive than signals and PHBs, but more expensive than signs. Solar power could reduce expense. Studying RRFBs at multi-lane roundabouts should be in the research proposal. Bicycles will not get much attention in the Roundabout Task Force unless we are involved. Raised crosswalks could be used to slow cars entering and exiting roundabouts. Snyder: 7-lane crossings get down to 2 lanes with a roundabout. But this doesn't work with lots of crosswalks. Friedman: It's harder to cross exits than entrances because it's hard to tell whether a vehicle is exiting.

Chang and Carver attended the pedestrian controls task force. Main item of concern: why are we prohibiting pedestrian "half signals"? ("Half Signals" resembling PHBs with a standard signal face are used in Seattle, but are prohibited in the national MUTCD).

### ***(also covered later) Bicycle Route Signage***

This issue was identified by the NCHRP 20-7(350) research project, funded by AASHTO. 20-7 projects are smaller projects with budgets less than \$100,000. This project is complete, and developed recommendations on signing bike routes on roadways in a practicable manner. The system of route signing described in Chapter 2D of the MUTCD works really well, but it's seen

as too expensive for bike routes and so agencies aren't putting up any signs at all. A staged approach would make signs more practical. Moeur sent the final report and recommendations on this project to the BTC on April 6 and June 17, 2015.

Moeur: Theo Petritsch of the BTC was the principal investigator on the project, though he is not at this meeting. We can give changes to Chapter 2D to GMI, or work on them ourselves with GMI's concurrence.

The BTC worked through Petritsch's recommendations. Summarizing:

Issues: Section 2A.16 is about grouping signs. Section 2D.29 specifies order of precedence: Interstate, US, state and county routes in that order, lower-numbered routes at the left or top. How do we get bicycle route signs in here? In Section 2D.30, signs are required where all numbered routes intersect, but this doesn't make sense in many cases, for example when a bicycle route intersects an Interstate. Advance guidance: Where are signs really needed, and how far before turns?

Where is the best place to address this: Chapter 2D or Part 9? The decision at the end of the discussion was to put most of the material in Chapter 9B and refer to it as needed in Chapter 2D. Allen, DeSantis and Carver volunteered to work on this after today's meeting.

## **OneSmartLight**

### **Presentation**

Rafat Raie and Leonard Gillaina gave a demonstration of their proposed innovative traffic signal. (see website <http://www.onesmartlight.com/>). This would take advantage of LEDs to use a single signal head to give red, amber and green indications, with different shapes to make them distinguishable to color-challenged people. Advantages are lighter weight, and that two heads can replace 5 or 6 conventional ones; high energy efficiency, a 22% larger red light, UPS shippable, easy to maintain, plug and play and can run on DC power and solar power. Only a single power supply is needed. Potential applications are for ramp metering, bridge toll plazas, traffic signal control, bicycle signals, or parking structures. The problem of confusion of a bicycle signal with a signal for general traffic is avoided. The signals can be dimmed at night to avoid glare.

### **Discussion**

Van Houten: Canada has used different shapes with conventional signals. Allen: has a photo of one and will send it (see [http://john-s-allen.com/galleries/Quebec/signs/slides/IMG\\_0053squarelightsm.html](http://john-s-allen.com/galleries/Quebec/signs/slides/IMG_0053squarelightsm.html)). Friedman: ITE has bluish tinge to green in the chromaticity diagram to make red and green distinguishable by people with red-green color blindness.

Allen: main problem is introduction, and education of the public. Previous major changes – driving on the left to driving on the right in Canada and Sweden – were carefully planned and orchestrated. Raie: bicycle signals, being new, offer an opportunity.

Moeur: regarding loading of signal poles - going from the 1994 to the 2013 edition of the AASHTO Standard Specifications for Highway Signs, Luminaires, and Traffic Signals has a much bigger effect on weight loading than a change in the signal head size or configuration.

Friedman: we are a long ways from having a motor vehicle traffic experiment with this. With new types of signals for bicycles, ramp metering, toll plazas it might be possible. If people get used to it, then it might get extended. Best place to start would be s closed course or simulators.

Moeur: Test human factors, then do experimentation.

Allen: Are these being tested in other countries? Raie: no, but we have put out requests.

Raie: Our most likely experiment will be in Palo Alto around the Google campus, with a strong component of education.

Members of the BTC thanked the presenters. Response to the presentation was favorable, but difficulties of transition would prevent widespread implementation anytime soon, as discussed.

### ***Site Roadways Open to Public Travel (SROPT)***

Gene Hawkins presented. Randy McCourt is in charge of this: The SROPT task force approved changes to Part 1, and they will be presented to Council on Thursday morning. If the Council approves only the changes in Part 1 for site roadways, he will be happy. He would recommend not planning on anything till after tomorrow (Thursday) morning, after the General Session. We have plenty of time to deal with this.

McCourt: BTC is in really good shape on this topic.

### ***Bicycle Route Signage Redux***

What is our philosophical approach: modify 2D or Part 9?

There was an inconclusive informal vote. Williams: Use changes in 2D with reference. Allen: Changes are needed in both parts. Moeur: this could get resistance because it would enlarge the MUTCD. Kingsbury: put only special examples in Part 9.

Moeur: For reference, Part 9 was added 22 years before the creation of the BTC, in 1978. That is, it is there for a reason - to address bicycle-specific traffic control differently from other modes where appropriate.

DeSantis: Put the bulk of material in Part 9, reference as needed in Part 2. Cynecki: not a little bit here and there. Miller: Exceptions need to be in Chapter 2D.

Committee consensus was to put most material in Chapter 9B, and make changes as needed in Chapter 2D to refer to Part 9 for bicycle route guidance.

Next there was a discussion of sign placement and which signs could be omitted from the typical configurations given in Chapter 2D. But this was only preliminary. The working group volunteered to finalize the proposal so as to get a package together for GMI concurrence and out to sponsors.

Moeur: alternate methods such as mapping may also be used to provide bicycle route guidance. AASHTO does not require signing for USBRs. An acknowledgement of this needs to be in the section.

DeSantis, Allen, Moeur, and Carver prepared a proposal after today's meeting. (See Thursday minutes.)

## **Announcements**

### **Future meetings**

Moeur: Announcements on locations of the 2016 and 2017 meetings have been made. The June 2016 meeting will be in Savannah, Georgia, June 8-10 or one day longer if we are in rulemaking. The 2017 meeting will be in in Pittsburgh, PA. The 2018 meeting would typically be in the Midwest given the standard SCOTE meeting rotation among the four AASHTO regions, except that there is a proposal that the Midwest and West switch places for a joint NCUTCD/ITE/AASHTO meeting in Colorado in 2017. There may be concerns about finding enough meeting rooms and with the length of the meeting.

### **NCHRP Report**

A new NCHRP report deals with pedestrian and bicycle data focusing on the most serious crashes. Contributing factors were suburban environments and unconventional bicyclist behaviors. Every state is required to have a strategic highway safety plan, and most comments on this issue dealt with pedestrian and bicycle issues. How do you address performance measures for this requirement if you do not have a denominator for your fraction, such as bicyclist volumes? (Allen suggested islands with cyclists arriving by ferry as one location where exposure data would be easier to obtain. Also see tomorrow's discussion of research for more ideas.)

The meeting adjourned at 4:55 PM to make way for the Pedestrian Task Force.

## **BTC meeting Thursday June 18 2015**

Minutes prepared by John Allen

### ***Attendance***

#### **BTC members:**

Richard Moeur, Chair  
 John Allen, Secretary (left, 4:00)  
 Dongho Chang  
 Mike Cynecki  
 Josh DeBruyn  
 Bill DeSantis  
 Bill Fox  
 Dwight Kingsbury

Rock Miller  
 Nathan Richman  
 Bill Schultheiss  
 Ryan Snyder  
 Lee Stuart  
 Ron van Houten  
 Craig Williams  
 Mighk Wilson

#### **Guests:**

Paul Carlson, Vice-Chair of Research  
 Dewayne Carver, Florida DOT  
 Rob Dingess, President, GTMA  
 Jim Kalchbrenner, Pexco Davidson  
 Bruce Friedman, FHWA

Ismael Garza, Nevada DOT  
 Kevin Hall, Evonik Industries  
 Elizabeth Hilton, FHWA  
 Stephen Ratke, FHWA  
 Stewart Robinson, Kimley Horn and Associates

### ***Task Force Meetings***

#### **Pedestrian Task Force**

Van Houten presented on research looking into eliminating the flashing hand indication on the pedestrian signal face and had found that fewer people entered the crosswalk later in the signal phase when the hand was not flashing. People are apparently hurrying up more to finish the walk without the hand flashing. He has no explanation for this. Also, Kay Fitzpatrick presented on the RRFB, which showed better effects with placement of the flashers above the sign in a campus study but with no significant difference between above or below in a new study on streets. RRFBs are effective when vehicles are slowing down or at constant speed, not so much when accelerating. Fitzpatrick will also look at speed and lane width. RRFBs and hybrid beacons are more effective the longer they are up and the more of them there are: you put one up and you don't get Tucson-level compliance results. With no education and no enforcement, compliance is poor. Very high yielding rates occur with a gateway treatment, using an in-street pedestrian crossing sign on the curb: Placing an in-street sign in the gutter pan has many problems.

#### **Research Committee**

Paul Carlson reminded the BTC that there is a research committee meeting tonight: Kingsbury and van Houten are to attend.

**General session:**

At the General Session, Kevin Sylvester of FHWA gave an update like Friedman's from the previous day, except that there may possibly be a rulemaking in 2018, and so only minor changes and edits may be possible. There were no promises about adding anything.

**Green Marking Material Standard**

Rob Dingess, president, GTMA, chair of High-Friction Surface Council for ATSSA (<http://www.atssa.com/Resources/HighFrictionSurfacing.aspx>) presented. There is no standard for green bike lane materials, so a task force took on the job of establishing one. Testing had to do with the "color box" (chromaticity diagram, a graph of the acceptable range of hue and saturation). Some materials were fading quickly and some were slippery. Manufacturers wanted to know about color retention. There is no test method applicable to all US locations, but comparison of materials is like-to-like. In testing, colors can fade within 72 hours of high-intensity UV – like a year in sunlight. Initial proposal is to tighten up the color box to remove yellowish hues, while allowing somewhat lower saturation. The color box goes into the CFR, not the MUTCD. Dingess can't say this has been endorsed by ATSSA or the HFSC, but the task force will be voting on it.

Van Houten: what actually matters is efficacy.

Snyder: big issue is materials: paint, thermo, slurry, colored asphalt.

Friedman: Frank Julian has more information under Pavement Marking Materials on the page <http://mutcd.fhwa.dot.gov/res-relatedprograms.htm>. He is the go-to guy.

Dingess: If you look for information at the High Friction Surface Council Web pages, at least you're dealing with companies that have been around for a while. We have some good materials. City managers hear: "we want it, now and there's no money."

David Entekin's Future Labs (<http://futurelabsllc.com/>) is a private-sector lab. State materials labs are also a resource.

Friedman: The Interim Approval home page has a list of authorized requests on IA-14.

Debruyne: Glass-bead-impregnated paint has darkened due to contamination.

Snyder: UV isn't the only problem. Asphalt bleeds and can obscure the surface color.

Dingess: Metamerism (colors which look the same under some light sources despite different spectral power distributions, see [https://en.wikipedia.org/wiki/Metamerism\\_%28color%29](https://en.wikipedia.org/wiki/Metamerism_%28color%29)) is a problem.

Stenko: We need a durable bike lane specification. The majority of the cost is labor.

Carver: Are you looking into the long-term friction issues?

Dingess: this is why we are the HFSC. Stenko: It depends on the kind of traffic. Most manufacturers can give you the required initial friction value.

Allen: Is friction testing in the wet? Dingess: yes. Allen: How about color at night, with varied light sources? Dingess: if the treatment has retroreflectivity, it doesn't matter (for drivers of vehicles with headlights). Van Houten: LED lighting can provide a more uniform white illumination source which will show colors.

### ***Numbered bicycle route signing***

Moeur: the working group yesterday evening came up with a proposal. AASHTO does not require signing at all, as alternate means (maps, etc.) are possible. The proposal moves bicycle route signing fully into Chapter 9B, and recommends a minimum level of signing if signing is provided.

Moeur went on to describe the proposal and the BTC discussed it. Minor changes were made. The BTC approved sending the proposal to GMITC.

### ***Bicycle service signs***

This proposal now might be able to get into the manual, so the BTC reviewed it quickly and approved it to go to GMITC. A bicycle repair symbol sign is not part of this proposal, as much more research is needed on that symbol. Moeur left for GMITC to present this and the numbered bicycle-route signing proposal. DeSantis took over the chair in Moeur's absence.

### ***Bike Lane Termination Signs***

BTC's Proposal for a Bike Merge warning sign came back from the Regulatory and Warning Sign Technical Committee with the comment that this is a lane drop. DeSantis revised the proposal to reflect what is in the manual now for lane drops, two signs: a bike lane ends and merge left or right sign. The black on white regulatory sign will be retained for regulatory purposes (to legally define the preferential lane for enforcement and other purposes.).

Friedman: That sign goes right where the bike lane ends. Maybe we need to change the wording in the Manual for that sign as well.

Fox: do we want to use a merge sign for bicyclists who want to go onto the sidewalk? We never before told them to merge left. Allen: roundabout entry? Friedman: this is a regulatory sign. An option in the proposal serves to avoid oversigning.

There was a discussion and several changes were made to the proposal. A plaque would indicate merging right or left.

### ***Discussion of Research Needs***

This was in response to the Research Committee's request for research problem statements pertaining to traffic control devices. There was considerable discussion by the BTC on potential research projects, focusing on the following issues:

- Crash numbers and rates by bikeway type
- Determining bicyclist volumes (and variations thereof) to determine effective crash rates

- Warning signs for sidepaths
- Additional sign needs (symbol signs for bicycle services, rail track warning, etc.)

### ***Report from GMITC***

Moeur (who had just returned to the room after his presentation to GMITC): GMITC concurred with the BTC's new proposal on numbered bicycle route guide signing, on condition that the figure be modified to show distance dimensions for sign assemblies. Consistent with Petritsch's NCHRP study, these could be about half the dimensions of the corresponding signs for general traffic listed in Figure 2D-6.

Also, the GMITC approved BTC's proposal on D9 service signs.

Both proposals will now go to sponsors.

### ***Voting on Research Needs***

Returning to discussion of research needs to propose to the Research Committee, the committee ranked, by means of a series of votes, the following as the four greatest needs.

#### **Less than \$100,000 (consider for an NCHRP 20-7 project):**

- A traffic-control device for use at intersections of sidepaths at roadways and/or driveways that is effective in reducing crashes and conflicts: Michigan DOT is undertaking study for design guidance regarding the use of sidepaths for bicycle use in lieu of or in addition to on-road bicycle lanes and how sidepath installations can be made safer at driveway and roadway crossings.
- In-roadway RR/light-rail track bicycle hazard warning sign:
- Identify and test warning signs for bicycle surface hazard/fall warning signs at railroad/light rail track crossings. The existing W10-12 skewed-crossing warning sign only warns of a skewed track crossing but does not identify the fall hazard inherent on roadways with in-road parallel tracks. Also include community education campaign elements.
- Symbol bicycle repair sign: develop panel for use on bicycle repair service sign.

Research on the first two proposals would require both comprehension and field studies (the latter to assess behavioral change).

#### **Greater than \$100,000:**

Bicycle volume exposure, crash data and behaviors data collection: Review various sources of data currently being collected (cell phone, sport-oriented mobile apps) to obtain before- and after- volume exposure, crash data and behaviors for all planned bikeway types as per the checklists and project evaluation worksheets in Appendices E and D of the FHWA Separated Bike Lane Planning and Design Guide.

These items were brought to the Research Committee for consideration. (Note: the proposals that did not deal directly with traffic control devices did not receive support at Research Committee. The Research Committee agreed to consider the sidepath warning sign in their list of potential proposals. The bike- rail symbol warning sign may be added to the FHWA TCD Pooled Fund Study. The symbol sign for bicycle repair services may be studied by Ron van Houten at Western Michigan University.)

### ***Interim Approvals***

As the new MUTCD is delayed, can IAs be issued for some new BTC proposals?

Friedman: FHWA will review proposals for ones that are not controversial and won't generate many comments for IAs. The bike box is too controversial and won't get an IA. The 2STQB needs research reports to come in and probably won't get an IA, but it will be in the NPA.

Friedman: the work zone treatment is not an IA, as it can already be used.

The BTC ranked proposed MUTCD changes (already sent to FHWA for the next MUTCD) for their priority in including in future Interim Approvals:

1. Except Bicycles plaque: FHWA doesn't officially allow symbols on agency-specific signs and plaques, so an IA would be needed to standardize on a plaque with a bicycle symbol.
2. (tie):
  - a. Two-Stage Turn Queue Box: seen as a priority, but needs research.
  - b. Wayfinding Signs for Shared-Use Paths
  - c. Colored Highlighting Under Bicycle Markings
3. New M1-8 numbered bicycle route sign to match new M1-9

The R10-15a turning vehicles yield to bike sign was also noted as a potential IA candidate.:

Friedman: it is shown in the Separated Bike Lane Guide, would not need IA, but could be subject to Official Interpretation.

A table noting suggested shared lane marking locations in travel lanes by width (currently Table 14-4 in the ITE Traffic Control Devices Handbook, Second Edition) was suggested for an IA. The BTC agreed to send the SLM table to FHWA. Friedman noted that new Standards can't be proposed as an IA that have not gone through rulemaking. Note that the table currently only has suggested placement locations, so no Standards are involved.

A list of these proposed Interim Approval topics will be provided to FHWA after the meeting.

### ***Other BTC Priorities for Future Action***

Revised Bicycle Symbol marking. There have been complaints from agencies and industry on the design of the "bicycle without rider" pavement marking regarding installation and durability. This transitioned into a discussion on the inconsistency between bicycle sign and marking

symbols, and the inability by NCUTCD to reach consensus on a single symbol. This may be addressed with RWSTC and MTC in the future.

Bikes use Caution Plaque. Consensus is not to take action on such a plaque at this time.

Signing for bicycle jughandles. Few are in use. The BTC was not in favor. Moeur: we were told that it would be in the new MUTCD. It was in the December 2013 FHWA Draft. Friedman will consider taking it out.

Bike lanes at back-in angle parking: not enough data on placement. On hold. Not ready for prime time but ready for experiments.

The updated list of BTC tasks and their status and priority will be updated and posted to the BTC website. The current list can be seen at <http://www.ncutcdbtc.org/future/btcpriority.pdf>.

### ***Next meetings***

January 6-8, 2016 Hilton Crystal City, Arlington, Virginia.

June 8-10, 2016, Savannah, GA. This meeting may run an extra day if there is rulemaking.

January 2017: dates TBD (Presidential inauguration year).

June 2017: Pittsburgh, Pennsylvania, dates TBD.

June 2018: there is a tentative plan for a joint NCUTCD/ITE/SCOTE meeting in Colorado, switching years with the Midwest meeting.