



# New England Transportation Consortium

## NETC Advisory Committee Meeting - Minutes

**DATE:** Tuesday, April 23, 2019, 11:00am – 12:00pm EST

**LOCATION:** Conference Call – 1-800-444-2801 (Access Code: 1930608)

### In Attendance:

Ian Anderson, VTrans	Emily Parkany, VTrans
Matt Mann, UMass University Rep.	Dale Peabody, MaineDOT
Eshan Ghazanfari, UVM University Rep.	Ann Scholz, NHDOT
Brian Hirt, CTC & Associates	Jo Sias, UNH University Rep.
Chris Jolly, FHWA	Kirsten Seeber, CTC & Associates
Dee Nash, NHDOT	Maina Tran, CTC & Associates
Lily Oliver, MassDOT	Nicholas Zavolas, MassDOT

### AGENDA

#### Open Project Review (April 2019)

Project # and Title	PI, University <i>AC Liaison</i>	Update	End Date
18-1: Development of MASH Computer Simulated Steel Bridge Rail & Transition Details	Chuck Plaxico, Malcom Ray, Roadsafe LLC <i>D. Peabody</i>	The next TAC meeting is on 4/25/19. Tasks 1-3 are complete. Task 4 is nearing completion. Task 5 is underway.	6/1/20
18-2: Framework of Asphalt Balanced Mix Design for NE Agencies	Walaa Mogawer, UMass Dartmouth <i>A. Scholz</i>	Kickoff meeting held 4/16/19. UMass Dartmouth to begin Task 1.	6/30/20
18-3: Integration of Unmanned Aircraft Systems into State DOTs	PI John Gustafson, WSP <i>E. Parkany</i>	Contract with WSP finalized. Kickoff TAC meeting to be scheduled.	3/31/21
18-4: Quick Response: ICNet Workshop	Daniel, UNH <i>A. Scholz</i>	CTC has received four invoices from UNH.	10/14/19

### Discussion

- 18-1 – Update on states obtaining approval on MASH compliance for bridge rails from their FHWA Division Offices.
- From the 18-1 project meeting held on 4/25/19:
  - ~ Obtaining regional approval from FHWA is not an option. Each state must get approval from their FHWA Division Office. A state will not receive an FHWA eligibility letter without conducting full-scale crash testing. Individual states can provide evidence that they have a process in place for the state to certify bridge rail.
  - ~ ME – Sent a draft procedure to their Division Office for determining MASH compliance without running MASH testing. It involves considering a broad picture of crash performance, including: FEA results, previous crash test results on the system, and the 20-year history of

performance in the field. They hope to have comments back soon on whether FHWA will accept this process.

- ~ CT – Sent their process to their Division Office. It is their understanding that FHWA did not need to approve the process, but just need to know that the state had a process in place. FHWA provided feedback, but the state ultimately dictates how they are moving forward with determining eligibility.
- ~ MA – Their understanding is also that the state is fully responsible for the making the eligibility decision, and that FHWA only needs to be aware of the eligibility process that is being used.
- ~ VT – Submitted their process to FHWA, but they are not expecting their approval. VT indicated in their process that they would be using FEA results as part of their process for determining crashworthiness.
- ~ NH – Has not submitted a process to FHWA specific to bridge rail.
- ~ RI – Not on the call.
- **Action item:** Chris will follow up with FHWA at the national level and get back to Emily with any additional information. Follow up: See pages 5-11 for the FHWA memo “Evaluating a State DOT’s Process To Determine Roadside Safety Hardware Crashworthiness on the National Highway System (NHS)” dated 4/18/18 for details on FHWA’s guidance.
- 18-2 – Kickoff meeting held 4/16/19. Task 1 work is beginning. The TAC discussed possibly holding a workshop at the end of the project. Ann Scholz and Joe Blair (NH) are acting as the TAC co-chairs for the project. Matt Courser from the NH Materials Lab is sitting in on the calls. After TAC reviews and provides feedback on the survey created by UMass, the PI (Walaa Mogawer) will send the survey to each of the NE states to collect state best practices.
- 18-3 – Maina is coordinating the TAC kickoff meeting. Dale spoke with John Gustafson (PI) and told him communicating with the TAC often is important. Dale suggested that Emily, as the AC liaison, should attend meetings as much as possible. It leads to better communication and better success of the project.
- 18-4 – The workshop was held this month. Eight research problem statements were developed and will be put in the NETC format. Not all problem statements need to go to NETC; they can also be submitted to NCHRP or could be research projects at individual states. Lily would like to see the participant list and notes from the workshop. These should be part of the final report for the workshop.

## 1) NETC Fund Balance Update

- TPF-5(222)
  - ~ CT and RI have left over travel funds, \$19,021.02 and \$12,593.53 respectively.
  - ~ NETC “unallocated” balance as of February 22, 2019 - \$115,057.
- TPF-5(373)
  - ~ Funds spent through 3/29/19 - \$122,789.11
  - ~ Total commitments received - \$1,7000,000
  - ~ What FFY19 transfers have been received? – CT, VT, NH
  - ~ Will RI be transferring funds for FFY19? Dale doesn’t know. Emily has contacted RI but hasn’t gotten very far. Ann said that a woman attending the ICNet Workshop mentioned that Brendan’s position (year) and he probably won’t participate in NETC.
  - (a) **Action item:** Chris will call the RI FHWA Division Office to determine what’s happening.

- Funds from TPF-5(222) transferred to TFP-5(373)? – \$37,000 has come from MA. Their \$100,000 for FFY19 has not shown up yet.

## 2) Follow up to March AC Meeting – 2019 Problem Statements Ranking

- Kirsten is working on the minutes and they will be available the week of 4/29/18.
- **N19MA2 - Curved Integral Abutment Bridge Design project - \$150,000**
  - ~ Preliminary SOW completed by CTC.
  - ~ Two TAC members (NH-Kevin Daigle; VT-Jim LaCroix)
  - ~ Need other TAC members.
    - Should RI folks sit on TACs for 19-series projects if they don't transfer funds? We will attempt to get RI TAC members, as well as encourage RI staff to attend the 2019 Symposium. Maybe we could use this as leverage to participate on the AC.
    - **Action item:** Kirsten will reach out to the RI TAC member on 18-1 bridge for a TAC member suggestion for this 19-series bridge project.
    - **Action item:** Lily will ask Alex Bardow if he's interested in chairing.
  - ~ If MA is not interested in leading the TAC for this project, Jim Lacroix (VT) is interested.
- **N19NH2 - Erosion Modeling Project - \$150,000**
  - ~ Preliminary SOW completed by CTC.
  - ~ Two TAC members (CT-Sara Ghatee; ME-Kate Maguire; VT-Callie Ewald)
    - NH will provide the chair. Her champion who sponsored the project doesn't want to be the chair. She is reaching out to someone else.
  - ~ Need other TAC members.
    - **Action item:** Ann will follow up with Mike Sock at RI for a TAC member suggestion.
- Matt – If need university representation on the 19 series TACs, let's discuss. Dale – This would be okay after a contractor is selected. If a project needs TAC members, we will consider adding university reps as friends of the TAC.
- Dale – We are still okay on the timeline of getting projects under contract by the end of the year, if we get the SOWs finished by the end of May.
- Next steps:
  - ~ Find the remaining TAC members.
  - ~ TAC chair and AC liaison review preliminary SOW and provide comments. CTC will incorporate comments and sent to TAC prior to the initial meeting.
  - ~ CTC will schedule the initial TAC meeting to review the SOW.
  - ~ Finalized SOW will go to Maine for eventual posting as an RFP.
- Four projects will be discussed at the NETC Symposium for further feedback from SMEs
  - ~ N19ME1 - Development of a Performance Specification for Bridge Deck Membranes - \$150,000
  - ~ N19ME2 - Performance Engineered Mixes for Structural Concrete - \$150,000
  - ~ N19MA5 - Characterizing Asphalt Binders with Warm Mix Asphalt Technologies for use in New England - \$250,000
  - ~ N19MA6 - Experimental Validation of New Improved Load Rating Procedures for Deteriorated Steel Beam Ends - \$200,00

## Discussion

- Emily – At the Symposium, we should refer to the amount of money that was requested for projects N19MA5 and 19MA6. Ask the group if they can be done for less. **Action item:** Kirsten will add this topic to the May AC meeting agenda.

### 3) Implementation of NETC projects

- No discussion.

### 4) June 2019 NETC Symposium

- Planning meeting was held on 3/27 and 4/17. Discussion topic items were collected, and a draft agenda was fleshed out. Registration form is live. Will continue to work on finalizing agenda and gathering poster session titles. Deadline for this is mid-May. Maina is working on a poster flyer and posting a detailed symposium agenda on NETC website. She sent it out prior to this meeting. Send her comments and she will finalize and send to the group to use.

#### Discussion

- New topics may be added to the agenda up until the Symposium.
- Maina creating a web page with details for the topics so folks can get more information.
- Poster flyer
  - ~ **Action item:** Maina will finalize the flyer with suggestions she receives by 4/26/19.
  - ~ We will specify that posters can be on topic-related research projects or state innovations.
  - ~ The registration form indicates that submissions are not automatically selected.
  - ~ Deadline for poster submissions is May 10th. AC members can provide feedback on the poster submission form and flyer by April 26. Maina will send out final drafts next week. Topic leaders can also suggest posters.

### 5) NETC Poster at AASHTO RAC Summer Meeting – July 22-25, 2019 – Santa Fe, NM

- July 24<sup>th</sup> - Poster session featuring pooled fund studies will take place during breaks and lunch.
- CTC will create a poster featuring NETC.

#### Discussion

- Ned Parrish is coordinating a poster session featuring pooled funds. CTC can help on this and are doing it for the other three pooled funds they administer.
- Brian - For NETC, the call to action to join isn't the same as the other pooled funds. Need to ID what to feature on the poster. Hard to feature more than a couple of things on a poster. Focus on high value projects that appeal beyond New England.
- Ann – Include some NETC history on the poster. Demonstrate how the pooled fund has progressed, including Quick Response Projects and the 2019 Symposium. There are many projects that could be featured. **Action item: Kirsten will send Brian a PowerPoint on NETC.**
- Emily – Agrees with Ann's suggestions. Project 18-1 may be interesting to other states and NETC is proud of it. Possibly feature the three projects submitted as high value research projects (NETC 17-1, 17-2 and 13-3, phases I and II).
- Brian – Between the NETC website, PowerPoint, HVR submissions and Symposium results, he can draft a poster.
  - ~ Brian – We may have time to include results from the June Symposium. We will need a quick approval from the AC and time to print the poster.

### 6) Other Business

- Website revamp – Send suggestions to Kirsten. This will be on the May AC meeting agenda.

### 7) Adjourn

**Next meeting: Tuesday, May 28, 2019, from 11am – Noon EST**




U.S. Department  
of Transportation  
Federal Highway  
Administration

# Memorandum

Subject: **ACTION:** Evaluating a State DOT's  
Process to Determine Roadside Safety  
Hardware Crashworthiness on the  
National Highway System (NHS)

Date: April 9, 2018

From: Michael S. Griffith   
Director, Office of Safety Technologies

In Reply Refer To:  
HSA

To: Division Administrators  
Federal Lands Division Engineers  
Directors of Field Services

## PURPOSE

The purpose of this memorandum is to provide guidance to the FHWA Division Offices to assist in their evaluation that a State DOT has an acceptable process for determining the crashworthiness of roadside safety hardware used on the National Highway System (NHS).

## BACKGROUND

The FHWA's longstanding policy is that all roadside safety hardware installed on the NHS be crashworthy. To support this policy, the [joint implementation agreement](#) for the American Association of State Highway Transportation Officials (AASHTO) Manual for Assessing Safety Hardware (MASH) was adopted by AASHTO and FHWA. This agreement established dates for implementing AASHTO MASH as the criteria for determining crashworthiness of roadside safety hardware.

The FHWA continues to provide a voluntary service of reviewing crash test results and issues eligibility letters for *new* roadside safety hardware only. The FHWA no longer provides Federal-aid eligibility letters for modifications made to an AASHTO MASH-crash tested device. An eligibility letter is not a requirement for roadside safety hardware to be determined eligible for Federal funding. Roadside safety hardware is eligible for Federal funding if it has been determined to be crashworthy by the user agency (i.e., State DOT).

An FHWA eligibility letter should not be the sole basis for a State's determination of crashworthiness. It is each State's responsibility to determine crashworthiness and to approve new or modified roadside safety hardware meeting the State's specific needs. Each State should consider its own operational issues such as installation and

maintenance requirements, climate considerations (e.g., use of wood vs. steel posts), and in-service performance data in determining what roadside safety hardware to use on highway projects. The determination of crashworthiness of roadside safety hardware, acceptance for use on highway projects, and installation and maintenance are responsibilities handled at the State and local level.

## **GUIDANCE**

Each FHWA Division Office should work with its respective State DOT to ensure that the State has an acceptable process for determining the crashworthiness of roadside safety hardware. Please note that there is no single recognized procedure or standard for how State DOTs determine crashworthiness, and existing processes may vary from State to State. However, an acceptable process for a State's determination of crashworthiness should be fully documented and may include:

- For new roadside safety hardware:
  - A physical crash test report documenting successful crash testing (relative to the AASHTO MASH test criteria) conducted by an ISO 17025 accredited laboratory.
- For modifications to existing successfully tested roadside safety hardware:
  - Proprietary devices: an engineering analysis conducted by an ISO 17025 accredited crash testing laboratory that determines the modification does not affect the crashworthiness of the roadside safety hardware based on previous crash testing (relative to the AASHTO MASH test criteria). If necessary, crash testing may be warranted based on the results of an engineering analysis.
  - Generic devices: an engineering analysis as described above can be conducted by the State DOT or an ISO 17025 laboratory. If necessary, crash testing may be warranted based on the results of an engineering analysis.

The initial determination of the crashworthiness of roadside safety hardware begins with laboratory testing and engineering analysis as defined by the AASHTO MASH. Once roadside safety hardware is identified as crashworthy and properly installed, States are encouraged to collect and assess in-service performance data on how the device performs in the vast array of real-world collisions. As selectors of hardware, the States are in the best position with complete access to crash data, maintenance information, and other critical elements to perform in-service performance evaluations and to use that data to make improvements to crash testing criteria and to installation and maintenance procedures. States should use all information available to determine the continued crashworthiness of roadside safety hardware.

Chapter 6 in the AASHTO MASH provides guidance on crash testing documentation and Chapter 7 provides guidance on in-service performance evaluations. A list of Q&As and a guidance document are attached for further clarification.



**ACTION**

Each FHWA Division Office should ensure that the State DOT has an acceptable process in place for determining the crashworthiness of all roadside safety hardware installed on the NHS.

Please report to Will Longstreet, Office of Safety, by June 30, 2018, on the existence of an acceptable State DOT process and, if necessary, a timeline for addressing any needed improvements. If you have questions or comments, please contact Will at [will.longstreet@dot.gov](mailto:will.longstreet@dot.gov) or 202-366-0087.

Enclosures

CC: Safety field

Division Office Guidelines for Reviewing State Processes for Determining Crashworthiness  
of Roadside Safety Hardware

This guidance is provided to assist the FHWA Division Offices in reviewing a State DOT process for determining the crashworthiness of roadside safety hardware used on the National Highway System (NHS).

A State DOT's initial determination of crashworthiness of roadside safety hardware should begin with how the device meets current national testing criteria (i.e. AASHTO Manual on Assessing Safety Hardware (MASH)). This initial step often may include full-scale crash testing for new devices and/or an engineering analysis (for modifications of crashworthy devices). Below are some examples of how devices may be determined and documented as crashworthy that State DOTs may implement in their processes.

1. Research (NCHRP or pooled fund studies) conducted through ISO 17025 accredited crash test laboratories (accredited laboratories) showing a device meets AASHTO MASH.
2. Crash test results, videos, and test summary sheets that are completed and reported by accredited laboratories and in accordance with AASHTO MASH.
3. Evaluation of modifications to devices in accordance with AASHTO MASH to determine if additional testing is necessary for a device. At the State's discretion, this may be done through a State DOT's analysis for generic products or requiring manufacturers to have modifications of proprietary products reviewed by an accredited crash testing lab.
4. State requirements for manufacturers to have products tested to AASHTO MASH at accredited laboratories and to provide a manufacturer's certification that the device meets AASHTO MASH criteria supported by concurrence from the accredited crash testing lab.
5. Consultant review of a device's crashworthiness for States that may not have the expertise to review roadside safety hardware.

Once roadside safety hardware is identified as crashworthy and properly installed, States are encouraged to collect and assess in-service performance data on how the device performs in the vast array of real-world collisions. As selectors of hardware, the States are in the best position with complete access to crash data, maintenance information, and other critical elements to perform in-service performance evaluations and to use that data to make improvements to crash testing criteria and to installation and maintenance procedures. States should use all information available to determine the continued crashworthiness of roadside safety hardware.

Full analysis and review of each device submitted for a determination of crashworthiness should also include an operational analysis. This operational analysis may include review and input from other State DOT offices including Design, Construction, and Maintenance.

A State may consider the following when conducting its operational reviews:

- Is the device appropriate for use in your State? For example, is it appropriate for the State's climate; is it compatible with legacy hardware?
- Will the device be difficult for contractors to install correctly?
- Will the device be practical to maintain?
- Will the device require new maintenance protocols and/or inventory stock?
- Does in-service performance data from other users exist that identify potential issues with the device?



## **FHWA Division Office Q&As re: a State DOT Determination of Crashworthiness of Roadside Safety Hardware**

1. Does roadside safety hardware installed on the NHS need to be crashworthy?

It is FHWA's longstanding policy that all roadside safety hardware installed on the NHS be crashworthy. This policy is reinforced through design standards incorporated by reference in 23 CFR part 625, including *A Policy on Geometric Design of Highways and Streets*, 2011 (the AASHTO Greenbook).

2. What should be considered in determining the crashworthiness of roadside safety hardware?

The initial determination of the crashworthiness of roadside safety hardware begins with laboratory testing and engineering analysis as defined by the AASHTO MASH. This is just the first step—proper installation and maintenance of roadside safety hardware also plays a crucial role in how hardware will perform. For this reason, States are encouraged to collect and assess in-service performance data of roadside safety hardware and take appropriate action as needed. As selectors of hardware, the States are in the best position with complete access to crash data, maintenance information, and other critical elements to perform in-service performance evaluations and to use that data to make improvements to crash testing criteria and to installation and maintenance procedures. States should use all information available to determine the continued crashworthiness of roadside safety hardware.

3. What is the State DOT's role in determining the crashworthiness of roadside safety hardware?

Each State DOT should have a process in place for determining the crashworthiness of new and modified roadside safety hardware. This process should include documentation supporting the State DOT's determination.

4. Can a State DOT use an FHWA eligibility letter as the sole basis for determining the crashworthiness of a new roadside safety hardware?

While a State DOT may use an FHWA eligibility letter as *one of the resources* for determining crashworthiness, it should not be the sole basis for a State's determination of crashworthiness. Each State DOT should document its basis for a determination of crashworthiness through review of crash test results and engineering analyses provided by accredited crash test labs and manufacturers. It is the State's responsibility to determine the appropriateness of new and modified roadside safety hardware for approval and use for its needs. Each State should consider its own operational issues such as installation and maintenance requirements, climate considerations (e.g., use of wood vs. steel posts), and in-service performance data in determining what roadside safety hardware to place on their highway projects.

5. What is the role of the FHWA Division Office in the process for ensuring crashworthy roadside safety hardware is incorporated on the NHS?

Each FHWA Division Office should ensure that the State DOT has a process in place for determining the crashworthiness of all roadside safety hardware installed on the NHS.

6. Does FHWA require the State DOT to have an FHWA Federal-aid eligibility letter?

No. Each FHWA Division Office should rely on the State DOT process to establish the State's determination of crashworthiness of roadside safety hardware installed on the NHS. If a State DOT does not have a process for determining crashworthiness, the Division Office should work with the State DOT in developing one.

7. What is the role of the State DOTs in working with manufacturers regarding modifications?

An acceptable State process should include a procedure for manufacturers to notify State DOTs of modifications to their devices. State DOT processes should address the review of modifications.

8. Must roadside safety hardware be tested to the full matrix of tests recommended in the AASHTO MASH to be determined crashworthy?

No. Running the full matrix of tests recommended in the AASHTO MASH is only required if a State DOT or manufacturer requests an FHWA Federal-aid eligibility letter for a specific roadside safety hardware device. The AASHTO MASH allows for user agencies (i.e., State DOTs) to determine a critical test matrix for generic devices or to consider a critical test matrix developed by a manufacturer. For proprietary devices, State DOTs and manufacturers should consider consultation with an accredited crash testing lab in determining critical test matrices.

9. Can modifications be made to roadside safety hardware that has received an FHWA eligibility letter?

Yes. Modifications can be made to roadside safety hardware that has previously received an FHWA eligibility letter; however, FHWA no longer considers submissions for Federal-aid eligibility letters for modifications made to an AASHTO MASH-crash tested device. The State DOT should determine the effect of the modification of roadside safety hardware based on the crashworthy criteria established in AASHTO MASH. It is the State DOT's responsibility to determine the appropriateness of modified roadside safety hardware for approval and use for its needs.

10. What is considered a significant modification to roadside safety hardware?

A modification that adversely affects the crashworthy performance of roadside safety hardware based on the crash testing criteria in AASHTO MASH is deemed to be significant. The determination of significance should be based on engineering analyses. A State DOT

may choose to have an accredited crash testing lab make this determination. If a State DOT determines that there has been a significant modification to a previously tested roadside safety hardware device, then the relevant manufacturer should retest the device in accordance with AASHTO MASH criteria.

11. Can new and existing research be used to determine crashworthiness of roadside safety hardware?

Yes. A State DOT may consider new and existing research (e.g., NCHRP reports and synthesis; individual crash test reports) conducted by an accredited laboratory or qualified researchers as part of its process to determine the crashworthiness of roadside safety hardware.

12. Does a State have to make new crashworthiness determinations for existing roadside safety hardware currently in place on the NHS?

No. Existing in-service roadside safety hardware may remain in place until it reaches the end of its service life or it becomes damaged beyond repair. If there is interest in continuing with the same device for future installations, the owner should determine if the device is crashworthy using the latest version of AASHTO MASH criteria.