SESSION #1 AGENDA

Thursday, September 16, 2021 10:00 AM - 12:30 PM (EST)

- **Introduction, Agenda and General Updates**
  10 mins — John Durkos
  - Agenda and Virtual Meeting Schedule – meeting began at 10am EST and Session #1 was recorded, through GoToMeeting software …
  - Overview of Website modernization.
  - 50th anniversary of TF13 Hardware Guide publication(s)!
  - Introduction of Eric Smith (Treasurer) and Greg Neece (Secretary)
    - Eric provided some housekeeping thoughts …
    - Greg requested anyone desiring PDH/CEC certificates for meeting today to send an email to him … or place the request in the chat box.

Sub-Committee #1 Publications/Website Report
15 mins — Eric Lohrey
- High level overview of guide/drawings enhancements and website modernization.
  - Searchable website, increased security – now online at: www.tf13.org
  - Hardware Guides available, as well as historical access, still using older format currently on the Guides web site. www.tf13guides.org/Guides
  - 7 systems (w- FHWA Eligibility Letter) added since the April 2021 meeting.
  - Easy to access archive of past TF13 drawings from designator page.
  - Future activates will continue to be focused on modernization of programming and functionality, adding new systems and MASH updates

Sub-Committee #7 Meeting / Report (Certifications of Test Facilities & ILC)
75 mins — Karla Lechtenberg
- Inter-Laboratory Comparisons ("ILC")
  - Must have a 5-year plan to maintain A2LA accreditation
  - Labs determine the schedule and all participate and share the lead – current schedule:
  - **Fall 2021 – MwRSF**, MASH Evaluation Criteria
  - **Fall 2022 – STI**, Impact data review … such as speed, angle, exit angle, loss of contact, parallel time, etc.
    - STI is going through a reorganization and is requesting to switch or delay their lead of this project to a later date. ("To-Do")
    - Karla will take the lead on reordering the ILC schedule to accommodate the STI request. Will be done "offline".
    - Current plan is to provide a video(s) of a prior test and labs are to provide data results for comparison and lab alignment.
  - **Fall 2023 – E-Tech**, Documentation of ballasting locations & weights (2270P)
  - **Fall 2024 – Caltrans,** Uncertainty in Measurements
  - **Fall 2025 – TTI,** Review of OIV, ORD, THIV, PHD, ASI, Roll, Pitch, Yaw
  - **Fall 2026 – FOIL,** How impact speed is calculated
  - **Fall 2027 – SwRI,** SUT Box attachment, ballasting, length of truck, etc. Is hydraulic lifting ok?
  - **Fall 2028 – TBD,** CIP selection of given barrier and selection of angle for test with a given impact range (potentially CIP for 3-34/26/27 and angle for 3-32/33).
- ILC Documents have been housed on MwRSF ftp site, *now in process of moving to TF13 website.* Login creditials will be provided to the labs, etc.

- Discussion between labs regarding wheel well intrusion/penetration into passenger compartment, caused by something that was NOT the test article – such as a vehicle component (tie rod, tire, starter, power steering component).
  - **Reference MASH, 2nd Edition (2016) page 105-106.**
  - *Per Ron Faller* - Was discussed with TCRS and FHWA and their opinion is MASH is not clear on topic and continued discussion/exploration is needed for determination. Recommended it is discussed with all labs during SC#7. There is a NCHRP problem statement being drafted as a research topic ("To-Do"). Noted that this is a rare occurrence, but consistency is the key.
  - *Bill Griffith & Allen Beavers* – opinion is that this would NOT be considered a failure, as MASH is currently written, since the test article did not directly cause the tear IF the deformation limits were not exceeded. Clarified by *Faller* ... it was over the 12" deformation limit
  - *Dave Bizuga* – he is concerned with test article intrusion, not vehicle component intrusion.
  - *Bob Meline* – Agrees that since it was over the 12" allowed, it is a failure. Have had a similar test where a SUT leaf spring came through floor board.
  - *Nick Volenburg* – From a DOT perspective, this is unacceptable – unless the vehicle component malfunctioned during the test.
  - *David Whitesel* – Perhaps there should be additional consideration as to WHERE the penetration of the vehicle component occurred.
  - *Joseph Nagy* – Possibly something wrong with the vehicle prior to the testing which wasn't caught during the pre-inspection activities.
  - *Faller* – This is EXTREMELY rare occurrence, but clarification is needed for consistency between the labs.
  - *Tim Moeckel* – would all vehicles in this class perform similarly, given that there are several vehicle models utilized per vehicle class.
  - *Dusty Arrington* – Did this behavior begin to show up AFTER the body style change of test vehicle. *Faller* – yes, it seems to be newer model vehicles – small cars and pick-ups too – could be related to body style changes. Unknown at this time.
  - *Griffith* – Perhaps provide defined limit to hole size, this large hole is an issue.
  - *Bob Bielenberg* - I would agree that MASH does not specifically denote a vehicle component penetration as a failure. However, I think that the hazard to the occupant is similar if the penetration is caused by a component of the test article or the vehicle.
  - *Meline* - To further complicate the discussion, our SUT leaf spring penetration occurred after the SUT left contact with the test barrier. An end of the leaf spring rotated down, caught on the pavement and was pushed up into the cab floor.
  - *Dusty* - Another consideration is sharp edges of the tear is risk to occupants.
  - *Beavers* - My opinion is that any intrusion (deformation and/or penetration) into the occupant compartment should be considered regardless of what caused the intrusion.
  - *Scott Rosenbaugh* - floor pan/wheel well limit is 12", toe pan limit is 9"
  - *Eric Lohry* - Are there similar issues with evaluation of roof crash that may occur in testing of luminaire poles?
  - *Whitesel* - Adding to what Meline said, the penetration was behind the seat.
  - *Eric Smith* - As EV's become a higher percentage of the vehicle fleet, at one point will it be appropriate for "us" to consider looking back at systems that have passed currently testing criteria with pan deformation… Would this be a potential problem statement? ("To-Do"?)

- Karla confirmed the last ILC (completed in spring) project was completed and will be posted to the website, if not already.
- Labs reporting audits are being conducted remotely, except STI and Holmes who had in person audits.
- General discussion on "shopping" of labs for same test article and the ethics of such. General agreement that the hypothetical example provided was unethical and ensuring more consistency between labs helps to resolve this from happening.
- Several people commented on the pros/cons of virtual vs in person meetings. General comments are a desire to get back to "in person", as soon as it is feasible.

Sub-Committee #9 Marketing Report

5 mins Mauer / Perry

- Perry – in process of sending out the current newsletter

Sub-Committee #2 Barrier Hardware Report

5 mins Eric Smith

- Nomination(s) for Sub-Committee **Co**-Chair for SC#2
  - George Eicher – Gregory Highway Products
  - Don Pyde – Trinity Highway Products, LLC.
  - Both seconded by Durkos verbally and in the chat by D. Bizuga & J. Grover
  - Both accepted as co-chairs of SC#2 as no "NO" votes were received.

Roadside Safety Pooled Fund Program – Update

20 mins Jim Kovar

- MGS w- 8" blocks with ¼, ½ and full post spacings were successful
  - ¼ post spacing tests 3-10 and 3-11 conducted
  - ½ post spacing tests with shortened (10" vs standard 14") blockout, only 3-11 conducted
    - Note that previous testing which failed was with standard 14" block
    - There was a question about the soil strengths of the failed and successful tests. ("To-Do")
  - Full to ¼ post spacing transition test (3-21) conducted and successful – test was conducted with all standard blocks – NOT the shortened blocks.
    - Due to previous testing, 3-10 was not conducted
    - *W.Williams* clarified Thrie beam in the transition was 10ga. Kovar to provide drawings and specifications to TF13 for shortened block, post sizes, post spacing, hardware and other details for the transition, so we can include. ("To-Do")
- MASH TL4 testing of critical flare rate for CIP concrete flaring around a fixed object.
  - 40" tall (not a typo) 20:1 flared single sloped concrete barrier.
  - MASH 4-12, 4-11 and 4-10 conducted successfully.
- MASH TL4 Testing and Evaluation of 3ft Single Slope Concrete Median Barrier with 6ft chain link fence mounted on top of barrier.
  - MASH 4-12 and 4-11 conducted. 4-11 passed. 4-10 was considered non-critical, due to previous research.
  - Consideration was taken in consideration that this is a median barrier application.
  - Roadside Safety Pooled Fund Program *may* pursue this project further after their vote next week.
  - Kinball Olsen question: Regarding the barrier top chain link fence, I wonder if MwRSF could briefly describe their efforts at a special barrier top fence design (not standard chain link construction) intended for TL-3 for Iowa. An explanation of why standard chain link fence construction was not pursued, when TTI's TL-3 PU test shows successful result, would be valuable. Also,

will TTI's test of the fence be published as a successful TL-3 system, even though the original effort was to develop a successful TL-4 design?("To-Do"?)

- Development of a Thrie-Beam Retrofit for Upgrading Obsolete Bridge Railings
  - 3-10 and 3-11 conducted and successful.
- Barrier Gap Rail for MASH TL3
  - Develop a MASH TL3 compliant barrier gap rail (galvanized tubing) that is removable for a 8ft wide maximum gap (within a single slope concrete barrier). This for possible utility or drainage access or such.
  - 3-10 and 3-11 conducted and successful.
- Roadside Safety Pooled Fund Group will be finalizing their meetings next week and after voting, will provide TF13 a summary of the projects going forward into next year. ("To-Do")

George Mason University CCSA – Research / Activities

20 mins Fadi Tahan

- Vehicle Model Development – Nissan Rogue FE Model, completed
  - Research sponsored by NHTSA.
- Vehicle Model Development – Dodge Ram FE Model, in process next quarter
  - Research sponsored by NHTSA.
  - *Meline* - Caltrans has two additional bridge rail tests using 2018 RAMs. *We'd be glad to share the test information, if helpful.*

150 minutes allotted, 150 minutes scheduled, meeting concluded after 155 minutes
152 participants active

SESSION #2 AGENDA

Thursday, September 16, 2021 2:00 PM - 4:30 PM (EST)

Transportation Research Board - AKD20 Update / Report

10 mins John Donahue

- 35 members, across a broad spectrum of academia, industry, research, DOTs, FHWA, etc.
- Annual meeting at TRB in January each year – held in DC
  - Scheduled for January 9-13, 2022, registration will be open in October
  - Papers / presentation / publication process are underway already. Paper reviews are a good way to get involved.
  - TRB Design Section crosscutting workshop
    - "Urban Streets, designing for context"
    - Will be on Sunday afternoon!
- Summer meeting, locations vary and typically topic focused
  - In 2021, was held virtual in May. Some topics included MASH 101, design research, RDG 5th edition update, emerging issues (technology)
  - Developed research need statements for NCHRP funding proposals.
  - Membership rotation – positions are available soon
  - More to come on the 2nd annual international workshop coming out soon.
  - The new AKD20 website is: https://sites.google.com/site/trbcommitteeakd20
  - All AKD20 presentations are posted on website.

NCHRP Report / Update, current projects

20 mins David Jared

- NCHRP research pertinent to TF13, typically fall into four categories:
  - "15" – General Design "17" – Safety
  - "20" – Special "22" – Vehicle Barrier Systems
  - Reports in all four categories published in last six months.
- Active (David Jared) projects that TF13 might be interested in:
  - 17-11(03): Development of Clear Recovery Area Guidelines
  - 17-82: Proposed Guidance for Fixed Objects in the *RDG*
  - 22-33: Multi-State ISPEs of Roadside Safety Hardware
  - 22-38: TL-3 Deflection Reduction Guid. for 31-in. Guardrail
  - 22-39: Guardrail Performance at Various Offsets from Curb MASH TL-3 Applications
- Active or pending publication (under other program officers) which might be of interest:
  - 22-35: Evaluation of Bridge Rail Systems to confirm MASH Compliance
  - 22-34: Determination or Zone of Intrusion Envelopes under MASH Impact Conditions for Barrier Attachments
  - 22-37: MASH Barrier development to Shield Pedi, Bikes, etc. from Vehicles
  - 22-40: Update to AASHTO M180-18 and Associated Guardrail Specifications
  - 17-71A Highway Safety Manual, 2nd Edition (HSM2)
  - 22-29B Performance of Longitudinal Barriers on Curved, Super-elevated Off-Ramps
- NCHRP FY22 program approved by AASHTO Board of Directors
  - Panels currently being formed
  - Most of panel formation process now systematized
- NCHRP FY23 program problem statements due Nov. 1

***CalTRANS* Impact Alert Systems, ongoing project update**

20 mins Camille Abou-Fadel

- CalTRANS Pilot Program with 80+ impact detection devices deployed
- Large portion of the devices are centered around San Francisco / Los Angeles areas
- When impacted, devices send a text and/or email to web-based interface, which provides notification to appropriate CalTRANS personnel.
  - Notification also provides some graphing of the strength of the impact. Have had to adjust the sensitivity of the devices, as at 1st they were recording seismic events, strong winds, bridge cavitation, large trucks, etc.
  - Database is searchable, can be linked to police reports, etc.
  - On site personnel provide photographs, which are uploaded while still onsite.

- TrafFix Devices Inc.(https://www.traffixdevices.com/sentinel). The "Sentinel".
- 3M is in partnership with PI Variables (www.pi-lit.com) The "Pi-Lit".
- Lindsay Transportation (www.lindsaytransportationsolutions.com). "Impact Alert".
- Hill & Smith (https://hillandsmith.com/products/hs2x-wireless-impact-notification-device/). The "HS2X".
- From notification, CalTRANS is allowed seven days for repair/replacement of impacted device. Unclear if this is seven calendar days or seven business days…
- Software / web based interface also provides historical information and it is anticipated that data will be used in the future to "predict" number of impacts per year/month by location; thereby, allowing inventory to be better allocated by CalTRANS.
- Anticipated they will be purchasing 500 impact detection devices in 2021.
  - Will be implemented on crash cushions AND end terminals.
- Questions:
  - *Aiden Rohde* - Roughly what is the cost of one of these impact detection systems? A: CalTRANS is currently receiving these for free, have no idea of price. Do they need to be replaced after impact?
  - *Steve Noel* - Is there a concern among some entities in states because these leave a time line of impact. There are units in our area that have remained unrepaired for what seems like forever. I wonder from a legal standpoint what thoughts are. A: CalTRANS has implemented a seven day repair/replacement policy.
  - *Brian Crossley* - Has a similar application been developed and or piloted for mobile applications such as Truck Mounted Attenuators (TMA's)? A: Unknown
  - *Rohde* - I'm very interested in Steve's question and I had another adjacent question - what drives the 7 day follow up requirement? CalTrans policy or a legal requirement?
  - *David Reese* - Why did you choose 7 days to repair? Wouldn't some locations need to be repaired sooner?

ATSSA Report / Update

10 mins Eric Perry

- Tracking …
  - Raw Materials Shortage
  - AASHTO MASH changes
  - QPL Form
  - MUTCD NPA
  - Flicker Rate associated with VMS
  - Transportation Bill in House / Senate
  - FCC and the Safety (Radio) Band
- March 2021 survey, followed up with June 2021 survey
  - Raw materials shortages seem to be deepening, specifically tied to Covid-19
  - What materials are in Short Supply?
    - Metals, Sheeting, & Plastic were the major concern.
    - Cable barriers were specifically mention, as was high friction surface materials.
  - Will be taking another survey in October.
- February 11-15, 2022 in Tampa, FL for ATSSA 52nd Annual Convention and Expo

Texas A&M University Transportation Institute – Research / Activities

20 mins William Williams

- MDTA MASH TL-5 Bridge Rail for William P. Lane Bridge – Annapolis, Md
  - Bridge originally built in 1952
  - Railing is made from galvanized steel, featuring a “skin” on the impact side and large structural members behind the skin and tubing on top.
  - MASH testing including 4-10, 4-11, 4-12, 5-12 – met all testing requirements.
- MASH Evaluation of PCB with Modified X-Bolt Connection
  - Several years ago conducted testing under 350 for 30ft long F-Shape Barrier
  - Changes made to optimize fabrication and erection and bring product into compliance with MASH specifications.
  - MASH testing conducted included 3-11 (27” deflection).
  - X-bolt design is a freestanding (non-anchored) system.
- T2P Bridge Rail Retrofit onto 6in Thick Deck (T2P is used by TxDOT)
  - In 2016 C2P (similar to T2P) was tested to MASH TL4
  - Engineering judgement (through AASHTO LRFD) was that only MASH 4-12 was required for retrofit design. Successfully passed.
- MASH TL5 Crash Testing to Barrier with Sound Wall (TxDOT T80SS w/ Soundwall)
  - Critical test determined to be MASH 5-12, passed
  - Concrete bridge railing
- Project LTRC-16-1 Retrofit Thrie Beam (LaDOTD)
  - > than 200 miles of vintage “safety walk” bridges in Louisiana
    - Similar to the Lake Pontchartrain design from the 50s, the SB lanes were recently retrofitted.
    - MASH 3-10 failure on this project, resulted in a new design
    - Completed MASH 3-10, 3-11 testing
    - This in process of being implemented in Louisiana in near future.

Sub-Committee #3 Bridge Railing / Transitions

5 mins Kurt Brauner

- Due to significant weather related issues in Louisiana, Kurt was unable to attend and/or report.

Sub-Committee #5 Sign, Luminaire & Traffic Hardware

5 mins Lohrey / Jollo

- New sign support in TF13 Guide, FHWA SS-185, Telespar 12"w x 18"h panel at 7' mounting height.
- New NCHRP Project 22-55 – Surrogate Bogey Vehicles to Evaluate MASH Breakaway Performance of Luminaire Poles, Signs and Work Zone Devices. MASH does not currently allow use of surrogate vehicles; however, results from this project may potentially be incorporated into future revisions.
- Crash test on Luminaire Pole at FHWA Impact Lab (FOIL), scheduled for September 20th 12:45 EST, Live Streaming. Report of results are pending.

AASHTO MOU & MASH Conversion Scoping Update / Report

15 mins Jim McDonald

- Just left a meeting discussing the Senate passed dedicated federal funding mechanism for roadway and safety improvements, as well as other infrastructure.
- Scoping Study *Objective: Determine the steps needed to convert MASH into a set of performance specifications:*
  - Simplify instructions and increase the level of certainty in crash testing
  - Helps manufacturers know what tests to run
  - Provide increased consistency in the results
  - Allows users of roadside hardware to make decisions based on more clearly-defined crash-testing criteria. Pro's (highlighted in green) and Con's (in blue)
    - Reduced subjectivity in testing, leading to increased certainty in comparison of results
    - New format would be easier to follow – commentary in separate section
    - Revised organization (by device) makes updates simpler
    - Users growing weary of change
    - Industry concerns about the potential need for re-testing
    - Potential confusion if conversion is staged
  - Initial conversion of the "Simple" and "Expert Opinion" material:
    - ~$420,000 & 2 years (not incl start-up time and AASHTO balloting)
  - Additional research: $2.4m
    - Approx. $1m has already been programmed
    - 4 research projects, 30-36 months each
  - In review by AASHTO committees
    - TCRS, Design, Bridges, Traffic Engineering
    - Obtained input from States and Industry - Two webinars in June
  - Deciding how to move forward
    - Fall AASHTO Meeting
  - Funding and follow-on research
- AASHTO / Task Force 13 MOU discussion:
  - Original **M**emorandum **O**f **U**nderstanding ("MOU") was signed in January 2019 and was valid for three years. Includes:
    - Invite representatives of the partner organization … to participate in the meetings of the other organization.
    - Communicate among members and staff … on technical and policy issues of interest to both organizations.

- Promote the use of appropriate informational resources of the partner organization by the other, including the Task Force 13 Guide to Standardized Highway Barrier Hardware and the AASHTO Roadside Design Guide…
- Seek and consider input from the partner organization in the scoping and development of new and updated technical publications and software

  - Anticipate renewal of MOU, in coming months, possibly for five-year period.

Sub-Committee #6 Work Zone Hardware

5 mins Shewmaker / Perry

- Perry provided update, Shewmaker traveling
- Significant still confusion as to MASH testing, since little has been resolved yet.

Sub-Committee #11 Delineation Hardware

5 mins Nathan Schulz

- Working with AASHTO NTPEP for standardization
  - Eight products currently selected for testing
  - Testing work plan was recently revised
  - Some clarifications provided, primarily to failure criteria
- Looking to include delineator product information into TF13 guide.

Midwest Roadside Safety Facility – Research / Activities

20 mins Scott Rosenbaugh

- Modified Delaware Bridge Rail (HiDOT sponsored)
  - 10ga Thrie Beam, W6x25# posts, 6'3" Post Spacing with 4 anchors (different on front than the back), installed on 6" to 9" curbs.
  - Three critical tests identified were MASH 3-10 with 6" curb, MASH 3-11 with 6" curb, MASH 3-11 with 9" curb (7.4" deformation in toe pan, allowed 9")
  - All three MASH tests passed. Summary to be issued
  - Will need testing on the transition to be completed – schedule for next few months.
- 42" Concrete Bridge Rail on 6" (sloped to 7.5" at rear, for drainage) Elevated Sidewalk (HiDOT Sponsored)
  - 3-11 and 3-10 conducted and passed. Summary to be issued.
  - Product is similar to Caltrans Type 732SW (ILC 2017 TF13: SC#7 review)
  - Will need testing on the transition to be completed – schedule for next few months.
- Development of Tanker-Truck Model
  - Conducted a field survey of 10 vehicles
  - LBT Inc. provided MwRSF with BKZ 5949 Trailer Model, which was very helpful. MwRSF added fluid models – Lagrangian & ALE.
  - Conducted Model Validation and completed a Barrier Height Study (95in, 70in, 60in, and 55in) – model indicated that tanker likely to roll over at heights less than 55in.
  - TL-6 Concrete Barrier concept developed, in process of building
    - Single Slope, 5.5 degrees – 62in height, 22in width
    - To date only one barrier was ever tested to TL-6
    - Objective is to develop shorter, less expensive TL-6 barrier

NCHRP 15-53 Project - Short Radius Guardrail System ("SRGS") Update
20 mins Powers / Lohrey

- Comments have been received by the NCHRP Panel and are being incorporated for publication.
- The MASH SRGS is made up of three segments:
  - 10ga 31in height W-beam (6'3" PS) 6ft guardrail post with 8" blocks at ½ spacing within the SRGS,
  - System is connected to MASH Thrie Beam transition to rigid barrier at the main road section. Any MASH transition may be used,
  - Connected to a MASH MGS terminal or standard MGS barrier at the side road section.
- No post to rail connection in radiused section.
- Cable below the W-beam rail.
- Cable in the valley of the W-beam, using ½ length cable anchor brackets.
- MASH 3-31, 3-32, 3-33 and 3-35 (no 3-30, 3-34, 3-36, & 3-37b) conducted on flat ground
- Modified MASH Test Condition 33 on a 2:1 slope *at 55mph* was conducted.
- May be used with 12" blocks, per computer simulation.
- Can be used with 16ft and 24ft radiuses, per computer simulation. Tested with 8ft radius.
- Task Force 13 drawings have been created and will also be used for publishing of the 15-53 project report, when finalized.
- Typical application would be on Farm-to-Market / Low Volume roads.
- FHWA Eligibility will not be pursued, due to a finalized MASH test matrix not established to date.
- MANY of the parts in the system are standard guardrail parts – exceptions are cables, eye bolts. The special panels have "additional" holes for the eye bolts.
- Note that the Thrie Beam section used 8" depth W-beam blocks (14" heights).
- ½ length cable anchor bracket is essentially just a standard part that is ½ the length.

Treasurer Report … $27,032.27.

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150 minutes allotted, 155 minutes scheduled, meeting concluded after 166 minutes
155 participants active

Requests received for Professional Developmental Hours ("PDH") or Continuing Education ("CE") certificates ("To-Do"):

Adam Hixon	Jason Hall	Hung Tang
Bret Eckert	Jennifer Rasmussen	Ron Faller
Nathan Poppe	Mary McRae	Scott Jollo
George Eicher	Tamara Good	Eric Lohrey