

2020 TRB 100th Annual Meeting
Committee AKD50
Hydrology, Hydraulics and Stormwater
Meeting Minutes
Virtual Meeting

Wednesday, January 13th, 2021 – 2:00pm to 5:00pm EST

1. Call to Order, Introduction of Guests

- a. Overview of agenda
- b. Housekeeping summary – not recording meeting

2. Committee Merger

- a. Overview of structure
 - i. Current membership is 58 but need to be at 36 by April 2022.
 - ii. If no longer want to continue as a member let Bea or Scott know
 - 1. Will be meeting this year to go over membership – let Bea know if you want to participate
 - iii. No limit on sub-committee members, so reach out if want to get involved with those.
 - iv. John Hunt – What is the functional difference between Member or Friend in sub-committees? How do we add a member to a sub-committee and what is the functional difference?
 - 1. As a member you get more information from the group (on all email lists)
 - 2. Sign up for sub-committee membership on MyTRB
 - 3. Only Members can vote
- b. Timeline for consolidation/approach
 - i. Spring – discuss current membership roll
 - ii. Fall - begin culling roster
 - iii. January, 2021, finalize membership list in AKD50

3. Report from TRB Staff

- a. Nancy Whiting – TRB Staff Liaison Officer - Welcome to 100th TRB meeting
 - i. 18,000 registrants this year; more than last year's 14,000
 - ii. Sponsors are sending twice as many folks to meeting as general
 - iii. Thank all friends and members reviewing papers – 4,500 papers
 - 1. About 60% moved forward for presentation
 - 2. About 18% went on for publication

- 3. Number of papers were down some
- iv. Poster sessions – author uploads up to 4 things (presentation, PDF, links, etc.)
 - 1. Available 1 week from Thursday (1/21) and available 24/7
 - 2. Will be available for 70 days
 - 3. There will be a 90-minute window available for online chat with each author during the designated poster session
- v. Dates for TRB annual meeting 2022 Jan 9-13 – Plans for face to face meeting
- b. Eric Donnell – Design Section Lead
 - i. Thanks to Nancy Whiting – transitioning Committees to a virtual format is a huge effort
 - 1. Been a great meeting so far!
 - ii. Design Section – strategic realignment of section
 - 1. Transportation Infrastructure Group
 - a. Committee designations used to be AFB but now AKD
 - b. H&H merged with stormwater – thanks for the efforts Scott and Bea
 - c. New committee AKD80 – Roundabout and Other Intersection Design and Control Strategies
 - d. Traditional TRB activities were put on pause for 2020 – awards will be back in 2021
 - e. Dialogue with Leaders – put on hold for 2021 be back in 2022
 - f. No triennial strategic plan update. Process likely to restart in 2022
 - iii. Registration greater than 18,000 – expected to increase
 - iv. Approx. 4,500 papers and 58% presented – about 800 recommended for publication
 - v. Undertaking transition of leadership role of committee – thanks to Scott and Bea (co-chairs through April 14th)
 - vi. Incoming chair – Michael Perez will assume role on April 15th, 2021

4. Reports from FHWA and Federal Labs

- a. FHWA – Joseph Krolak
 - i. Reauthorization is a big focus – expecting incoming administration to have new thoughts – there will be things that impact this committee and our colleagues
 - ii. Working on updating national Bridge Inspection standards/approach and how scour is addressed
 - iii. Scour initiative – working on refining approaches on bridge scour
 - 1. Better balancing loads (hydraulics) and resistance (geotechnical)
 - 2. Strike a balance between current design practices and advancing the research/practice
 - 3. Support approaches in HEC documents

- iv. New training courses and reference manuals for interaction of structures and rivers – 2 NHI trainings, stream dynamics workshops, virtual site visits
- v. Webinar on coupled models for future precipitation estimates
- vi. HEC-HDS, HEC Circulars, NHI courses
 - 1. HEC-22, HEC-23, HDS2, HDS7, HEC-18, HEC-20, HEC-16 (balance engineering and ecological), Highways in Coastal Environment 3rd Edition, HEC-17, HEC-19 (new concepts highway hydrology)
 - 2. NHI Urban Drainage, Countermeasure, Hydraulic Design Safe Bridges, Practical Highway, 046 and 047 Scour, and Highway in Coastal Environment, Intermediate in 2D courses, many new courses (web-based trainings – See FHWA notes)
 - 3. Converting some structured courses to virtual delivery – 2D course has been completed, hydraulic modeling with WMS, NHI Urban Drainage course, and culvert course. Looking at scour courses
- b. FHWA – Kornel Kerenyi – Turner-Fairbank Highway Research Center
 - i. Hydrology
 - 1. Two agreements with USGS – Flood frequency estimation of hydrologic design of changing conditions (wrapping up), hydrologic forcing function (just started)
 - 2. Agreement with NWS for updating stationary and non-stationary hydrology
 - 3. Highway drainage
 - a. New HEC-22 curb equation
 - b. Looking at transition flow in sump conditions (weir to orifice)
 - 4. Pooled studies
 - a. Many DOTs looking at catch basins
 - b. Hydroplaning and super elevation
 - c. Culvert bed forms, 2D modeling
 - 5. Scour
 - a. Working on hydraulic loads on scour conditions
 - b. Working on in-situ testing methods
 - c. CFD scour tool – plot entire scour envelope
 - d. Probabilistic scour methods and design
 - e. Scour fragility curves
 - i. Pooled funds – many states involved
 - f. Coastal and riverine flood using CFD
- c. FHWA - Susan Jones – Highway Engineer
 - i. Looking at stormwater courses due to low attendance – FHWA evaluating which course to keep and continue to provide in a virtual format, in-person or cancel/discontinue
 - ii. Continuing SELDM model with USGS
 - iii. Federal eligibility for stormwater banking both quantity and quality

1. Looking into in-lieu fee with Michigan Division Office and DOT
- d. USGS – Greg Granato - Hydrologist
 - i. A Partial Summary of 2020 USGS Activities of Interest to the FHWA and State Highway Agencies
 1. Available at: <https://www.usgs.gov/transportation>
 - ii. Description of National programs with references and contact information
More than 80 publications of interest to committee members and friends
 - iii. Stormwater Runoff YouTube Channel with about 24 hours of training videos
https://www.youtube.com/channel/UChgAb_28TbrqXUu8ZpombXw
 1. Available at: <https://www.usgs.gov/SELDm>
- e. USACE - no representative

5. Subcommittee Reports

a. Hydrology

- i. Thomas Knight, Subcommittee Chair
 1. Reviewed RNS from previous year
 - a. Assessment on Current Hydrology Practices
 - b. Construction Hydrology
 - c. Drones and Sensors
 - d. Cloud computing and precipitation conditions
 2. New RNS
 - a. Rational applicability
 - b. Where states are with changing hydrology
 - c. Upper and lower bounds and data availability for state hydrology.
 3. Idea for workshops/webinars
 - a. USGS with Streamstats
 - b. Training for Bulletin 17C methods
 - c. SC Unit Hydrograph methods
 - d. Rain on grid analysis using 2D models – HEC-RAS and SRH-2D

b. Hydraulics

- i. John Hunt, Subcommittee Chair
 1. Lectern Session for Monday 25th – 1091 1 – 2:30 EST
 - a. Monitoring Aquatic Organism Passage (AOP) Structures at Water Crossings
 - b. Bank full Width and Streambed Evolution for Aquatic Organism Passage Structures
 2. Several successful NCHRP Reports
 - a. NCHRP 24-49 – Guidelines for Selection and Application of Manning's Roughness Values in 2D Hydraulic Models; Phase 1 complete with final report expected in 2023

- b. NCHRP 20-05/Topic 51-10 – Practices for Integrated Flood Prediction and Response System; final publication underway
- 3. New RNS
 - a. Aquatic Organism Passage in Rehabilitation Culverts
 - b. Artificial Intelligence Meshing for 2D models
 - c. Culvert end treatments to mitigate capacity loss from slip lining
- 4. Living coast design guide – weblinks in Hydraulics subcommittee meeting minutes
- 5. Hear more about green streambank stabilization design next year
- 6. Ideas for workshops/webinars
 - a. HEC-25
 - b. NCHRP presentation on 24-49
 - c. Green streambank stabilization and living coasts

c. Stormwater

- i. Michael Perez, Subcommittee Chair
 - 1. Excited to lead committee and try to keep as productive as Bea and Scott
 - 2. Provided updates on activities
 - a. Stormwater theme to July/August issue of TRB News
 - 3. Research
 - a. Synthesis
 - i. Stormwater BMP operation and maintenance – post construction
 - ii. Use of roadside fire retardants
 - iii. UAVs in stormwater
 - iv. Reduction of plastics in erosion and sediment control products – looking for volunteers to help out
 - b. New RNS
 - i. Tire toxicity related to new findings
 - c. Ideas for workshops/webinars
 - i. Summary of NCHRP 14-39 – Using Vegetated Compost Blankets to Achieve Highway Runoff Volume and Pollutant Reduction
 - ii. Summary of NCHRP 25-60 – Watershed Approach to Mitigating Hydrologic Impacts of Transportation Projects
 - iii. UAVs in stormwater

6. Reports from University Research Centers

None provided

7. DOTs

- a. SCDOT – Thomas Knight
 - i. Updating rural regression equations
 - ii. Development user's manual unit hydrograph method (modified NRCS)
 - iii. Additional research
 - 1. Modeling Type 16 and 17 catch basins
 - 2. Effects on water in ditch on pavement on freeboard
 - 3. Catch basins on inlets in sumps
 - 4. SCDOT Inundation Mapping – ability to download floodplain models
 - 5. Phase 2 of StreamStats
 - 6. Effects on impoundments on streamflow
 - 7. Hydrology/Hydraulic software enhancement
 - 8. Rapid deployment gage analysis
 - 9. Real time scour monitoring website
 - 10. Releasing SCDOT historic flood database
 - 11. Verifying Manning's n values
 - 12. SELDM for SC and tying into StreamStats
 - 13. Scour at culverts – need upstream end scour
 - 14. Interaction between pier and abutment scour in same zone
- b. MNDOT – Hafiz Munir
 - i. Can get updates from MNDOT website can sign up for updates as well
 - ii. Is warming MNDOT winters increasing freeze thaw cycles and causing issues
 - iii. Stormwater pond monitoring and maintenance research underway since 2018
 - iv. Climate change adaptation for stormwater infrastructure with University of Minnesota
- c. NCDOT - Matt Lauffer and Andy McDaniel
 - i. Evaluation of 2D models for scour design
 - ii. Looking at SCDOT work on bridge scour and envelope curves and 3D modeling
 - iii. LiDAR and Sonar data for AI on structures
 - iv. NCDOT future for precipitation
 - v. Flood abatement assessment along hurricane impacted areas
 - vi. Pooled fund 13-99
 - 1. Spray culvert liners
 - vii. USGS SELDM custom model
 - 1. Developing 75,000 model runs to identify stormwater treatment goals
 - viii. Swale and bioswale optimization regarding slope and length impacts on performance
 - ix. Contaminated soil and groundwater on subsurface utilities
 - x. New BMP combining stormwater infiltration and pollinator habitat
 - xi. Dry detention basin optimization– alternative ways to maintain for better WQ treatment
 - xii. Using remote sensing and drones for construction site erosion control to include maps with flow pathways

- xiii. Ways to manage herbicide application along roadways
- xiv. Predictive model development to understand if accelerated erosion could occur at outfalls.
- xv. Optimization of compost to supplement infiltration and treatment
- xvi. Evaluating performance of various bioretention mixes
- d. CDOT – Steve Griffin
 - i. Wildfire looking at debris flows, design and construction of debris facilities
 - 1. RNS for probabilities for debris flows
 - ii. Developing early out SRH analysis methods as part of scoping
 - iii. Several bridge projects with cone penetration testing in cohesive soils
- e. VDOT – Chris Swanson
 - i. Allowed sheet flow from post design project, but can't create downstream flood risk or erosion
 - 1. Developing design criteria for sheet flow causing downstream flooding.
- f. Ohio DOT – Jeff Syar
 - i. ARGON – catch basin design HEC-22 with CFD results
 - ii. Volume reduction benefits of vegetated slopes
 - iii. Updating design manual with 2 column format – policy and commentary
 - iv. Length of riprap apron at culvert outfall
- g. PennDOT – Winnie Okello
 - i. Working on MS4 permit, current permit is administratively extended
 - ii. Pub 888 – maintenance manual
 - iii. Researching stream restoration and best available technologies
- h. Oregon DOT – Kira Glover
 - i. Sodium chloride research
 - ii. SELDM modeling for guidance on road crossings
 - iii. Using LiDAR for evaluating streambed movement
 - iv. Debris flows
 - v. Concrete curing pH impacts to aquatic species
 - vi. Interested in tire toxicity RNS
- i. New England DOTs – Annie Bastoni
 - i. Regional forum with NE states and EPA
 - ii. NE states all have different regulatory criteria – but looking for treatment crediting options such as vegetated filter strips, enhanced street sweeping, trash removal, etc.
 - iii. Developing a web-based watershed tool for defining treatment goals
 - iv. Illicit Discharge Detection and Elimination (IDDE) tracking

8. Workshops/Webinars for 2021

- a. Webinar submittals by March 15th will be held May 1st through August 31st and submittals by July 15th will be held September 1st through December 31st
 - i. Anyone can submit for a webinar

1. Can get a committee to sponsor to increase chance of acceptance
- b. Workshop topics are due June 30th each year and workshops are typically held during the TRB annual meeting – only 1 per committee
 - i. Workshop topics need to be implementation ready and typically include multiple speakers

9. 2021 Synthesis topics (Feb 17th) and RNS (November 1st)

- a. Synthesis – Submitted in 2020:
 - i. Summary of Existing Stormwater Bioretention Specifications & Approval Processes Synthesis
 - ii. Anyone can submit synthesis topics, but more likely selected with TRB Committee or especially multiple Committee support
 - iii. Let research chairs know if something has been submitted so it can be tracked and supported
- b. RNS
 - i. TCHH reviews RNS and are an important group to have support a Statement, get to Jeff by Sept 1st for TCHH review by the November 1 submittal deadline.
 - ii. RNS's must be submitted by FHWA or a DOT. TRB Committees cannot submit a RNS.

10. Current NCHRP Projects (in process)

- a. 25-54 Field Testing of BMPs Using Granulated Ferric Oxide
- b. 14-39 – Effectiveness of Compost Amended Vegetated Filter Strips Using a Compost Blanket Application Method
 - i. Extended a year to 2022
- c. 25-60 – Watershed Approach to Hydrologic Impacts of Highway Projects
- d. 25-61 – Effective on-bridge Treatment of Stormwater

11. Anticipated NCHRP Projects

- a. Rewrite of AASHTO Drainage Manual: NCHRP 24-50
- b. RNS funded for FY2022 will be announced May 17th

12. Lectern Sessions Overview

Session 1091 Monitoring and Evaluation of Aquatic Organism Passage Structures: 1/25/21
1:00pm – 2:30pm

Session 1272 Highway Stormwater Management: 1/27/21 10:00am – 11:30am

- a. Have 8 papers in the paper session
- b. Look through papers on the program filtered to H&H
- c. Alex Mann has Poster on January 27th, “Development and Implementation of Culvert Outlet Diffuser to Improve Stream Flow”

13. Mid-Year Meeting and Practitioners Meeting

- a. AKD50 midyear meeting
 - i. Zoom meeting? - TBD
- b. Practitioners Meeting- October 2021 – Raleigh NC
 - i. 3 Day training and discussion of national stormwater issues
 - ii. 1 person from each DOT sponsored to attend
 - iii. Potential mid-year meeting location
- c. NHEC – Georgia Summer 2022
 - i. 2020 Virtual conference recorded -
https://www.youtube.com/watch?v=7ORmPkfNbOQ&list=PLUUYDCHurzg71rQIl3KVA_yjB2_coKxDy
 - ii. http://www.fhwa.dot.gov/engineering/hydraulics/conference_listing.cfm
- d. 10th International Conference on Scour and Erosion (ICSE-10) – Arlington VA Oct 17-20

14. 2020 TR News Issue

- a. July/August 2020 Stormwater Theme Issue:
<http://www.trb.org/publications/blurbs/181248.aspx>

15. TCHH Planning

- a. Research Needs
- b. AASHTO Drainage Manual
- c. Jeff Syar – Slide Show – on AKD50 website
 - i. TCHH 5 regions – 21 members
 - ii. Looking to have membership as a friend – to participate
 - iii. Looking for articles to put in Hydrolink Newsletter
 - iv. AASHTO drainage manual will be biggest effort near term
 - 1. Merge existing drainage manuals (ADM and HDG) into 1 standalone document
 - v. Always looking to collaborate with on TRB on RNS
 - 1. RNS format is different from TRB
 - vi. Trying to get scour in terms of LRFD

16. New Committee Website

- a. landing page for AKD50: : <https://map08g.wixsite.com/akd50>
- b. Looking for help on merging websites and keeping the site updated and content current.

17. Announcements

- a. EPA's Transportation Stormwater Permit (MS4) Compendium – Feb 3rd, 2-3 PM EST, See: [Click here to register](#)
- b.

18. Adjourn

- a. Meeting was adjourned at 5:00 pm EST.