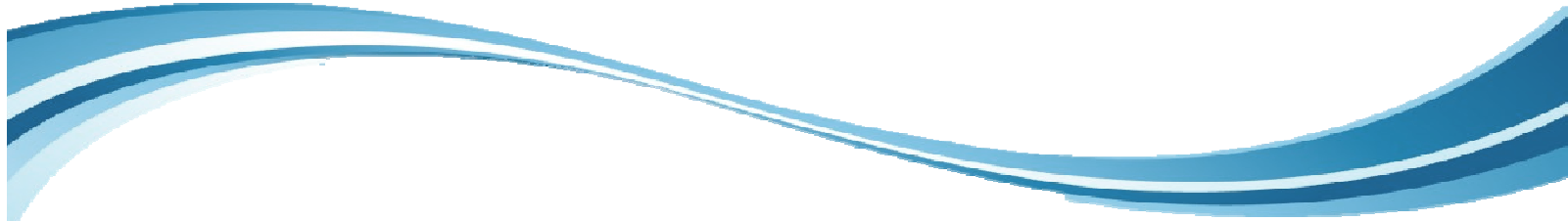




# **Ohio Stormwater Association General Information**

**January 18, 2018**

**Webinar**



## OSWA Organization Overview

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- Dedicated to advancing the management of stormwater and related natural resources through education, leadership, watershed-based coordination and technical assistance in Ohio.
- Not-for-profit, non-political





## **Board of Directors**

---

- President: Harry Stark, City of Wadsworth
- Vice President: Kathy Wade-Dorman, Village of Indian Hill
- Treasurer: Bob Lentz, Butler County SW District
- Secretary: Jennifer Fish, Franklin SWCD
- Board Members
  - Patekka Pope Bannister, City of Toledo
  - Samantha Brown, Contech Engineered Solutions
  - Justin Czekaj, City of Aurora
  - Kelly Kuhbander, Strand Associates
  - Mark McCabe, Gresham, Smith & Partners
  - Michael Liptak, EnviroScience
  - Andrea Salimbene, McMahon DeGulis LLP
  - Joe Gearing, City of Lima



## Join OSWA!

- [www.OhioSWA.com](http://www.OhioSWA.com)
- [www.WMAO.org](http://www.WMAO.org)



### Division Affiliation (check one\*):

\*Members are in all Divisions. Select a primary, if applicable.

- ☐ None  
☐ Ohio Dam Safety Organization (ODSO)  
☐ Ohio Floodplain Management Association (OFMA)  
☐ Ohio Lake Management Society (OLMS)  
☐ Ohio Stormwater Association (OSWA)  
☐ Ohio Watershed Professionals Association (OWPA)

### Areas of Interest (check all that apply\*):

\*For dissemination of WMAO information.

- ☐ Agriculture      ☐ Lake management  
☐ Dam safety      ☐ Mineral resource management  
☐ Drinking water / wastewater      ☐ Navigation and recreation  
☐ Education      ☐ Research and data management  
☐ Floodplain management      ☒ Stormwater  
☐ Ground water      ☐ Watersheds

### Membership Annual Dues:

Individual	\$ 85
Organizational	\$ 250
Added individuals above 3 members	\$ 80
Unlimited	\$ 950
Citizen	\$ 30
Emeritus	\$ 25
Student	\$ 10

**Individual** = anyone interested in Ohio's water resources.

**Organizational** = an incorporated or unincorporated entity interested in Ohio's water resources with up to three (3) individual memberships.

**Unlimited** = an incorporated or unincorporated entity interested in Ohio's water resources with unlimited individual memberships, advertisement space in WMAO's newsletter, and recognition on the WMAO website.

**Citizen** = anyone with an interest in Ohio's water resources but not employed in a water-resource field, as a non-voting member with benefits limited to the WMAO newsletters and notification of activities.

**Emeritus** = any individual who is at least 65 years of age and who has been a member of WMAO for not less than five (5) consecutive years.

**Student** = any student currently enrolled in an accredited high school, technical school, college or university.



## **Sponsorship Opportunities Available!**

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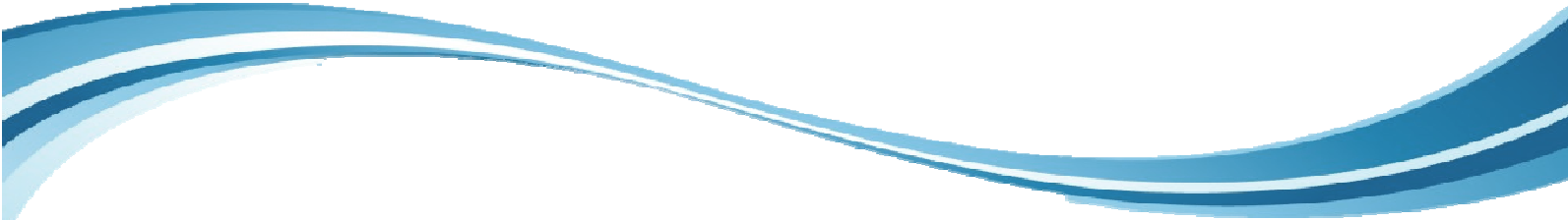
We would greatly appreciate your support.

Organization Partner: \$500

- To become a sponsor, please contact us:
  - [JFish@franklinswcd.org](mailto:JFish@franklinswcd.org)
  - [Kelly.Kuhbander@strand.com](mailto:Kelly.Kuhbander@strand.com)
  - [HStark@oswa.com](mailto:HStark@oswa.com)



# **Ohio Stormwater Association Education Committee**





## Education Committee

---

- Kelly Kuhbander, Strand Associates, Chair
- Bob Lentz, Butler County Stormwater
- Harry Stark, City of Wadsworth
- Mark McCabe, Gresham, Smith & Partners
- Jennifer Fish, Franklin SWCD
- Kathy Wade-Dorman, Village of Indian Hill
- Leigh Ann McCulla, The Clean Water Business
- Kyle Dexter, Hamilton County Public Health Department
- Felicia Graham, City of Dayton
- Brook Frusher, Franklin SWCD
- Jen English, City of Defiance
- Becky Humphreys, ODOT
- Joe Gearing, City of Lima
- Joe Reitz, City of Avon Lake



## **Thank You For Your Support**

---

**The Ohio Stormwater Association Thanks Ohio EPA for its continued support and collaboration, and to our Speakers for their time.**

- **Jon Prier, *ODOT***





# Ohio Storm Water Association

January 2018

## Transportation Sub-Committee Inaugural Bi-Annual Storm Water Information Share

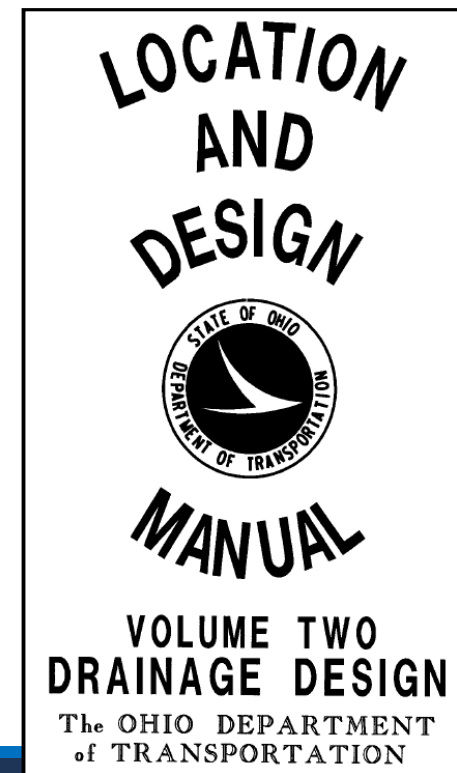


# Agenda

- ODOT Manual Updates
  - Location and Design – Volume 2
  - Standards
  - Specifications/Supplemental Specifications
  - Resources
- Regulatory update
- Research update
  - What's ODOT working on?
  - How can I use completed research?

# ODOT L&D Volume 2 Updates - 2017

- Pedestrian Facilities and Shared Use Paths
- Vegetated Biofilter Credit
- Stream Grade Control
- Sample Plan Notes
- ODOT Design Resources



# ODOT L&D Volume 2 Updates – Bike Paths

- All EDA associated with sidewalk or bike path
- Narrower vegetated filter strips
- VFS must be as wide as contributing impervious area
- No quantity treatment



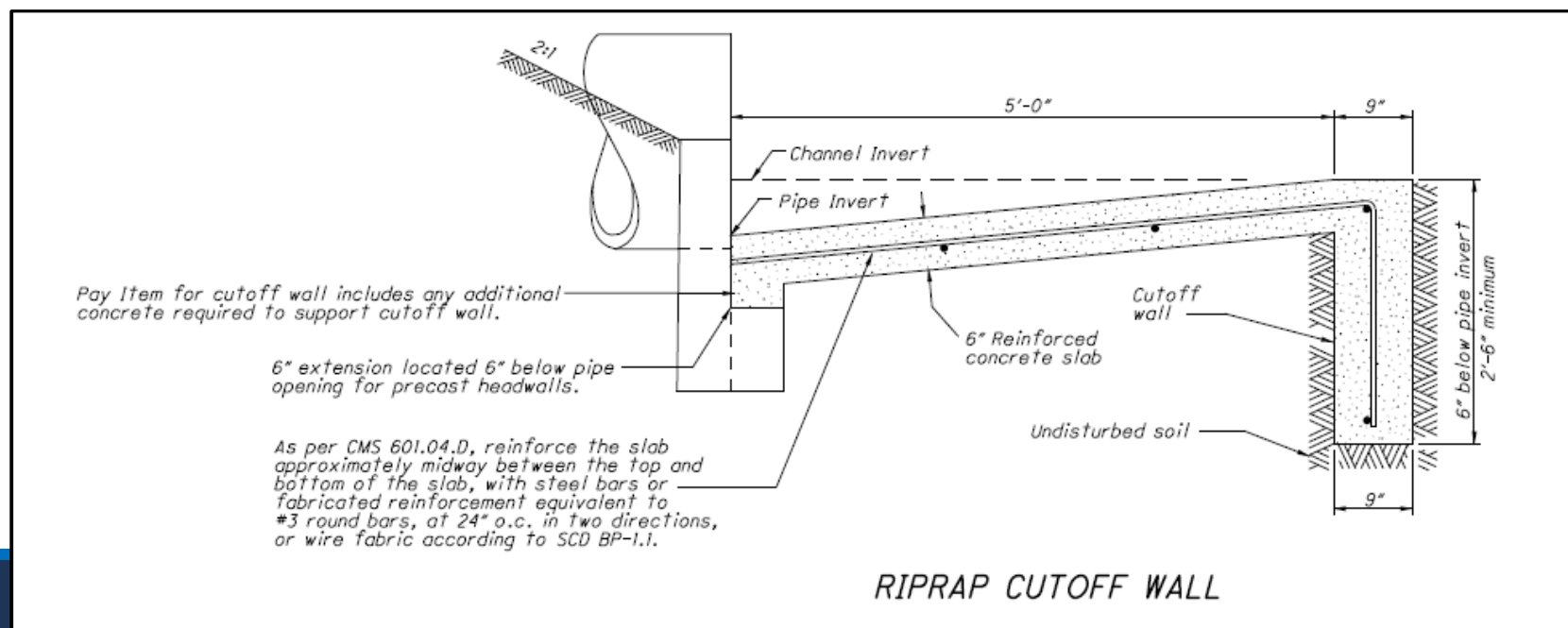
# ODOT L&D Volume 2 Updates – Vegetated Biofilter

- Treatment Credit
- Must sheet flow off of roadway into grass ditch
- No credit for off-site flow or flow that is conveyed through pipe



# ODOT L&D Volume 2 Updates – Stream Grade Control

- New L&D Volume 2, Section 1117.8
- Called out separately to clarify that it is an approved BMP for quantity control



# ODOT L&D Volume 2 Updates – Sample Plan Notes

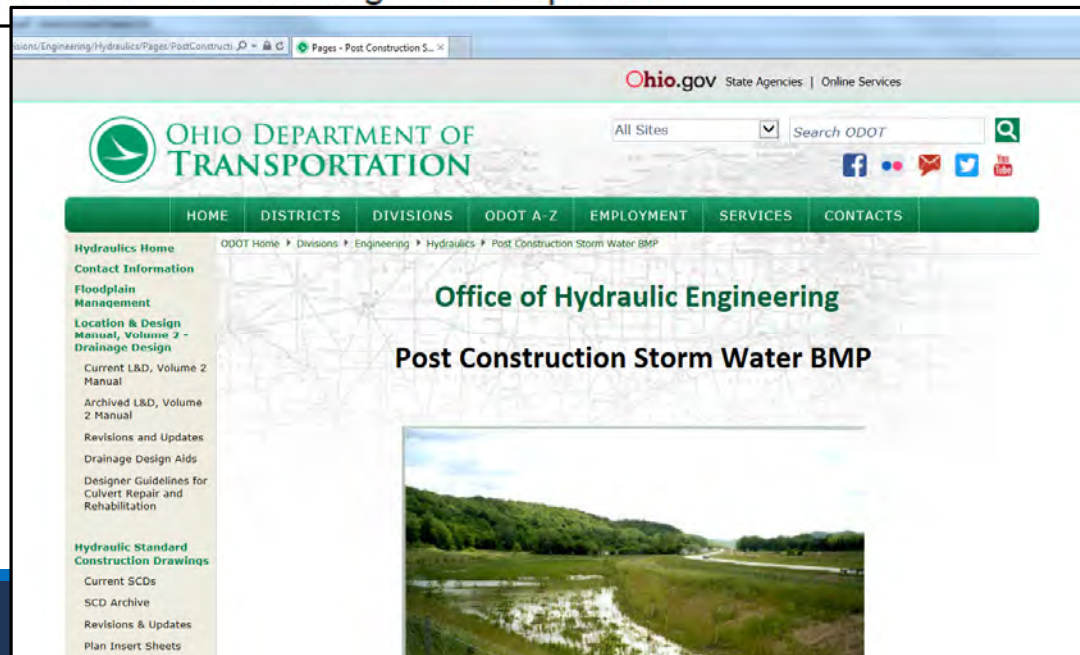
- Existing Sample Plan Notes for:
  - Manufactured Systems
  - Bioretention Cells
  - Infiltration Trench (or Basin)
- New Sample Plan Notes for:
  - Vegetated Filter Strips
  - Vegetated Biofilters
  - Extended Detention Basins



# ODOT L&D Volume 2 Updates – Resources

The following design resources are available on the ODOT, Office of Hydraulic Engineering's website:  
<http://www.dot.state.oh.us/Divisions/Engineering/Hydraulics/Pages/PostConstructionStormWaterBMP.asp>  
[X](#)

- Post-Construction BMP Design Review Checklist
- BMP Calculation Spreadsheet
- Post-Construction BMP Design Examples
- Post-Construction BMP Training Workshop Slides






# ODOT – Resources

The following design are available on ODOTs-ORIL website:  
<http://www.dot.state.oh.us/groups/oril/Pages/BMP-Tool.aspx>


- BMP Screening and Selection Tool

**OHIO DEPARTMENT OF  
TRANSPORTATION**

Ohio.gov State Agencies | Online Services  
f t y

HOME | LOCALS | ORIL PROJECTS | BMP TOOL | DOWNLOADS | SERVICES | CONTACTS

ODOT Home Groups ORIL Hydraulics Stormwater BMP Tool

**ORIL Projects**  
**Storm Water Best Management Practices for Local Roadways**  
**Research Conducted By:** Gresham, Smith and Partners in collaboration with Geosyntec Consultants  
**Research Team:** Mark McCabe (PI), Tom Dietrich, Melanie Knecht, Tim Arendt, Marc Lisenring, Sheila Sahu  
**Project Duration:** September 2014 – September 2015  
**State Job Number:** 134990

**ORIL Links**  
ORIL Home  
ORIL Projects  
Meet the Board  
Meeting Summaries  
Process Overview  
Idea Discussions  
Guidesbook  
Frequently Asked Questions

**Contacts**  
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Michelle Lucas  
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Statewide Planning & Research  
(614) 466-3029  
Mike Fitzh, P.E.  
Local Programs  
Local Technical Assistance Program  
(614) 387-7358

Through this research, a BMP selection tool, BMP case studies, and an annotated bibliography were developed to assist Locals with identification and BMP selection. The BMP tool is intended to facilitate the understanding of BMP requirements and considerations so Locals and designers can select and plan appropriate post-construction storm water BMPs. These research products will help Locals improve implementation of appropriate BMPs by providing resources to understand BMP characteristics with regard to footprint requirements, on-going maintenance, aesthetics, safety considerations, and other potential impacts to the construction project.  
To download the final report for this project or view the recording of the Results Presentation Webinar, please click on the links below:  
Final Report  
Executive Summary  
Results Presentation Video (from 09/08/2015 webinar)

**Attention BMP Tool Users**  
**We want your feedback!** Please let us know if you are using the tool and what you think about it. Tell us what you like and what you don't like about the tool. Potential future updates to the tool will be based on its use and the demand from locals, so please share your comments by clicking here.  
**Do you have a question about the tool?** Are you experiencing problems with the tool? Do you have a recommendation for additional tool performance/features? If so, please click here to submit your questions, comments or suggestions.

**Download the BMP Tool**  
To download the BMP Tool, please click on the link below:  
**BMP Tool (.xlsx file)**  
Prior to using the BMP tool for the first time, you are encouraged to review the final report or results presentation video in order to learn about its function and features.  
Be advised, the file is password protected to prevent users from inadvertently deleting embedded links and formulas. If you decide that you need to unprotect the tool, please submit a feedback form (located in the box above) requesting the password in the "I need help" section.  
*Please Note: The BMP tool is designed to provide assistance with the screening of BMPs for applicability based on a singular BMP installation site. It is not intended to be used for project design. The research team, ORIL Board, ODOT, and FHWA accept no liability for the use of results from the BMP tool and screening process.*

The Ohio Department of Transportation, 1980 West Broad Street, Columbus Ohio 43223  
John R. Kasich, Governor | Jerry Wray, ODOT Director | Privacy Statement | Advanced Search | Feedback | Ohio.gov

# Ohio EPA Updates – Construction General Permit

- Early Stakeholder Outreach (December 2017)
- Draft for public comment (January 2018)
- 45 Day Public Comment Period (Jan./Feb.)
- Ohio EPA Public Meeting (early March), followed by 7 more Days for Public Comment
- Construction General Permit Renewal (April 21, 2018)

# Ohio EPA Updates - CGP

- Possible Changes:
  - Electronic Submittal of all SWPPPs
  - Clarification for Sediment Basins – Not just for 10 acres sites
  - Clarification for Sediment Barriers – Includes Compost Filter Socks in addition to Silt Fence
  - Incorporate Darby and Olentangy into main permit

## Ohio EPA Updates - CGP

- Not sure yet which draft CGP Changes will be incorporated into post-construction BMP requirements in ODOT's L&D Volume 2.

# Ohio EPA Updates - CGP

## ■ Possible Changes:

- Post-construction for Small Construction Activities (<5 acres) same as Large Construction Activities
- Change the  $WQ_v$  depth from 0.75 inches to 0.90 inches
- Change  $C_q$  to  $R_v$  in  $WQ_v$  calculation
  - $RV = (0 * A_{nat} + 0.25 * A_{graded} + 0.95 * A_{imp}) / A_{total}$

Site Imperviousness	100%	90%	70%	50%
Percent Increase in $WQ_v$ Based on Proposed Changes	28%	45%	80%	112%

# Ohio EPA Updates - CGP

- Possible Changes:
  - Redevelopment: 20% for “green infrastructure practice”
  - Redevelopment: 40% for “standard extended detention practices”
- Example Redevelopment, 10 acre site, 70% impervious, using and extended detention basin
  - April 20, 2018:  $WQ_v = 2,690$  cf
  - April 21, 2018:  $WQ_v = 9,670$  cf (260% Increase)

# Ohio EPA Updates - CGP

## ■ Possible Changes:

- Alternative BMPs 80% TSS Removal of Specific Particle Size Distribution (NJ DEP, and Washington TAPE programs) – Also, standard submittal sheet
- $WQ_F$ : Either using ODOT's 0.65 in/hr or other method
- Add Underground Detention to Standard BMPs
- Adding/clarifying Routine Maintenance
- Runoff Reduction crediting

# ODOT Research Updates

- Particle Size Distribution – Manufactured System Testing
- Catch Basin Insert (CBI) Performance
- Vacuum (Vac) Truck spoil Recycling - Decanting
- Volume Reduction by Soil Amendment



# Research: Particle Size Distribution

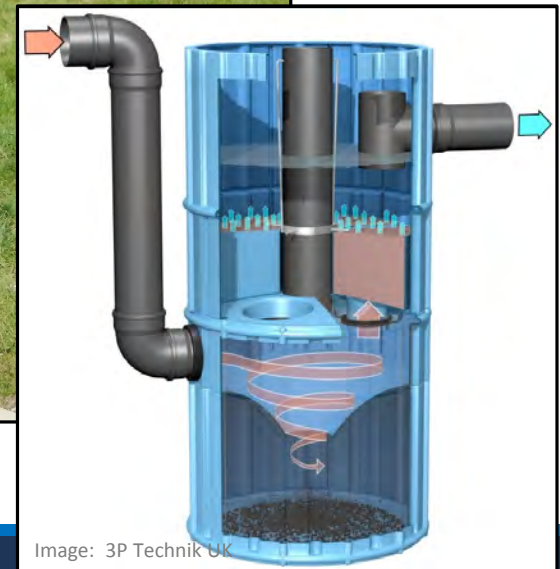
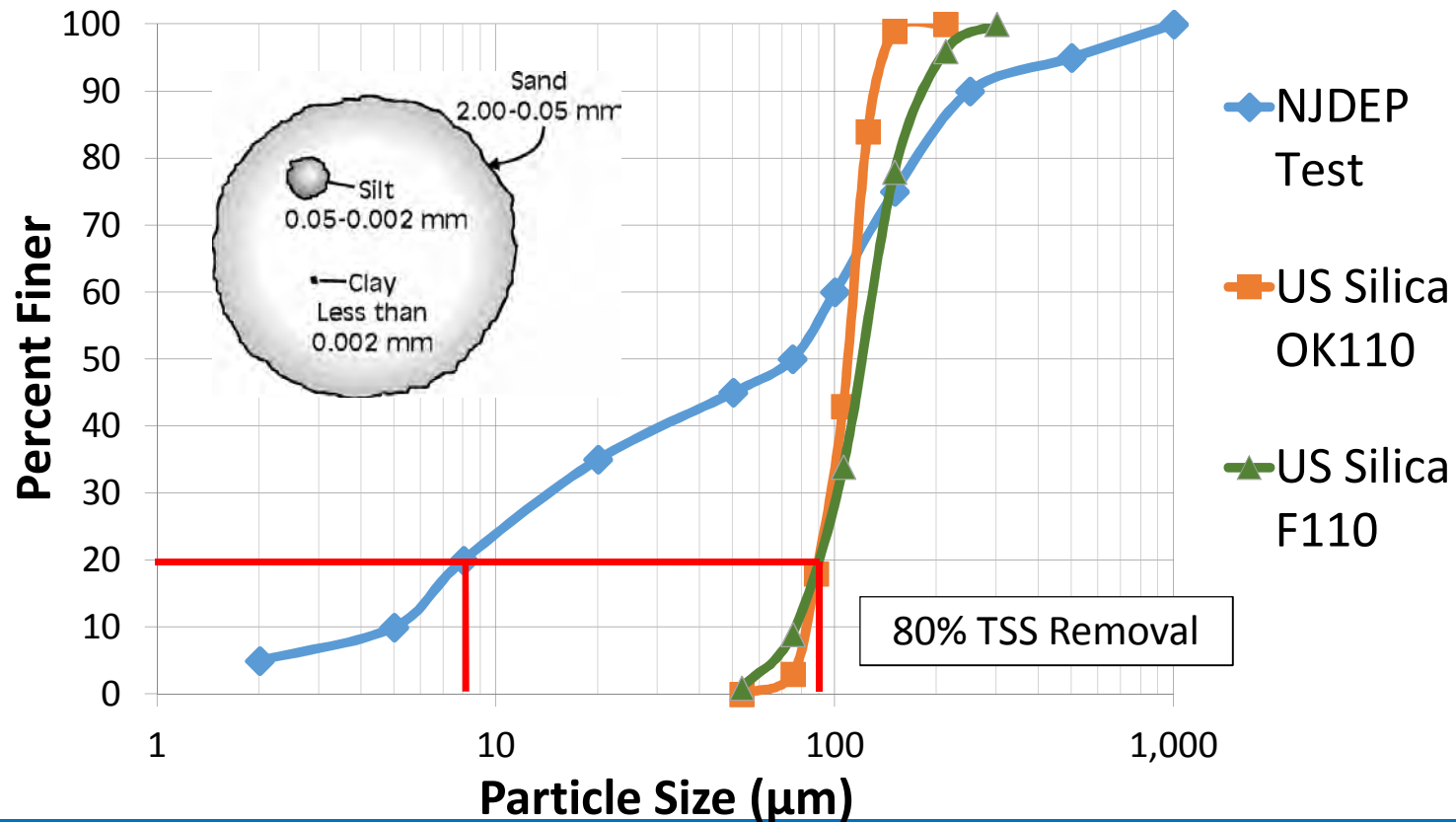


Image: 3P Technik UK

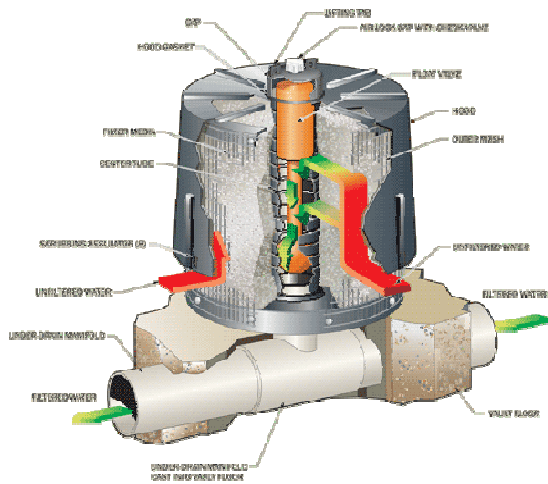
# Research: Particle Size Distribution

## Sediment Particle Distributions

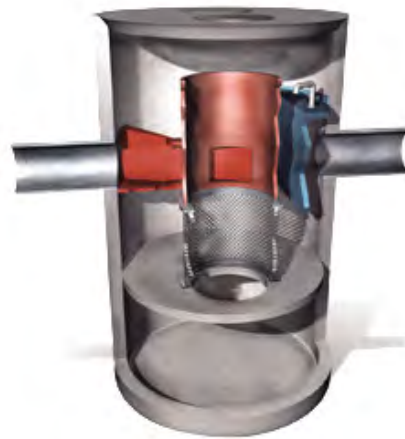


# Research: Particle Size Distribution

- Some Cartridge Filters: 80% TARP TSS Distribution
- Hydrodynamic Separators: 80% ODOT Sand, 50% TARP
- Catch Basin Inserts: May Capture > 200 microns



Cartridge (Contech)



Hydro. Sep. (Contech)



Basin Insert (Contech)

# Research: Catch Basin Inserts

- Could catch basin inserts be used as post-construction BMPs?
- How well do they remove pollutants?
- How often would they require maintenance?
- What would the costs be associated with catch basin inserts
- Testing 8 different inserts



Basin Insert (Contech)



# Research: Catch Basin Inserts – Field Testing





# Research: Catch Basin Inserts – Lab Testing



# Research: Vacuum Truck Recycling

- ODOT District 6
- A lot of time is spent taking collected water with very little solids to POTW connections
- Is there equipment that can re-use collected water for jetting?



# Research: Volume Reduction by Soil Amendment

- How much water is running off of compacted R/W?
- What are soil amendment opportunities?
- What impacts do soil amendments have on volume reduction from compacted R/W?
- Could soil amendments be used as a post-construction BMP instead of other BMPs?



# Research: Volume Reduction by Soil Amendment

- 10 different sites in Ohio
- 3 different ODOT rainfall zones
- 3-4 different types of soil amendments
- Monitoring for 1 year of existing conditions
- Monitoring for 1 year after soil amendments



# Federal Research

The National Academies of  
Sciences, Engineering and  
Medicine

Transportation Research Board  
(TRB)

<http://www.trb.org/Main/Home.aspx>

## NCHRP

The National Cooperative Highway Research Program (NCHRP) is an applied research program designed to respond to the practical needs of state departments of transportation (DOTs). TRB administers the program, for which the state DOTs fund, select, and oversee the research.





# Moving America Forward

As part of the National Academies of Sciences, Engineering, and Medicine, the Transportation Research Board shapes the way America and the world travel, ship goods, and connect to one another. For example, committees, researchers, and staff are currently focused on advancing resilient infrastructure, exploring transformational technology, and caring for the public's health and safety. TRB's mission is divided into three primary roles:

## RESEARCH

200+ publications annually

300+ research projects currently managed

\$58 million dollars invested annually in the Cooperative Research Programs

1 million+ transportation research records in the online database, TRID

165,000+ full text documents on TRID

900+ peer-reviewed papers published in the *Transportation Research Record: Journal of the Transportation Research Board (TRR)* annually

6 editions of the *TRNews* annually

## CONVENE

200+ standing committees

7,000+ active committee and panel members

12,000+ attendees at the TRB Annual Meeting

750+ sessions and workshops at the TRB Annual Meeting

90+ webinars annually

70+ TRB meetings and conferences annually

## ADVISE

100+ national policy studies conducted

15 active policy study committees

38 policy studies that have contributed to changes in legislation



“

At UDOT, we actively track the implementation of key ideas that our staff brings back from the TRB Annual Meeting. Our records show that since 2003, we have implemented 199 innovative ideas related to contracting methods, safety improvements, accelerated bridge construction, traffic management, and other areas discussed at TRB meetings. As a result, we have realized more than \$198 million in savings. No wonder we take our participation in TRB meetings very seriously.”

**Carlos Braceras**

Executive Director  
Utah Department of  
Transportation

Monument Valley  
U.S. Route 163, Utah



# Federal Research

This guidance describes scientifically supported methods for defining the design hydrology for stream restoration and channel stability at stream crossings with a set of decision support tools that are both science-based and practical in guiding users to an appropriate combination of design tools and depth of analysis for design hydrology in a given hydrologic and geomorphic setting. Specifically, the guidance and tools provide support in: (1) assessing the current conditions adjacent to a stream crossing and in the upstream watershed to determine design effort, (2) performing the appropriate hydrological and geomorphic analysis using a set of analytical and analog tools, and (3) designing the channel through the stream crossing for stability and sediment balance. The hydrologic metrics and tools developed in this project provide a general framework and stronger physical basis for design hydrology at stream crossings, including locations where watershed land use is changing. This report will be of immediate interest to hydraulic engineers.

Link to document:

<https://www.nap.edu/download/24879#>

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

## NCHRP RESEARCH REPORT 853

### Guidance for Design Hydrology for Stream Restoration and Channel Stability

Brian Bledsoe  
COLLEGE OF ENGINEERING  
UNIVERSITY OF GEORGIA  
Athens, GA

Dan Baker  
Peter Nelson  
Tyler Rosburg  
Joel Sholtes  
Travis Stroth  
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING  
COLORADO STATE UNIVERSITY  
Fort Collins, CO

*Subscriber Categories:*  
Hydraulics and Hydrology

Research sponsored by the American Association of State Highway and Transportation Officials  
in cooperation with the Federal Highway Administration

*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE

TRANSPORTATION RESEARCH BOARD  
2017

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# Federal Research

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

## NCHRP RESEARCH REPORT 840

### A Watershed Approach to Mitigating Stormwater Impacts

*NCHRP Research Report 840: A Watershed Approach to Mitigating Stormwater Impacts* provides a practical watershed-based decision-making framework and spreadsheet-based Watershed-Based Stormwater Mitigation Toolbox that will enable state departments of transportation (DOTs) to identify and implement offsite cost-effective and environmentally beneficial water quality solutions for stormwater impacts when onsite treatment and/or mitigation is not possible within the right-of-way. The report and toolbox—which identifies other useful resources—should be of immediate use to stormwater managers and roadway drainage engineers who have to mitigate water quality impacts from roadway stormwater runoff in order to comply with state and federal water quality requirements.

Link to document:

<http://www.trb.org/HydraulicsHydrology/Blurbs/175861.aspx>

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Emily Clifton  
LOW IMPACT DEVELOPMENT CENTER, INC.  
Beltsville, MD

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VENNER CONSULTING, INC.  
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Polebridge, MT

Dan Nees  
SANDY POINT ENVIRONMENTAL  
Arnold, MD

*Subscriber Categories*  
Highways • Environment • Hydraulics and Hydrology

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 TRANSPORTATION RESEARCH BOARD  
*The National Academies of*  
SCIENCES • ENGINEERING • MEDICINE  
2017

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# Federal Research

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

## NCHRP REPORT 802

### Volume Reduction of Highway Runoff in Urban Areas

#### *Guidance Manual*

Eric Strecker  
Aaron Poresky  
Robert Roseen  
Ronald Johnson  
Jane Soule  
Venkat Gummadi  
Raina Dwivedi  
Adam Questad  
GEOSYNTEC CONSULTANTS  
Portland, OR

Neil Weinstein  
Emily Ayers  
LOW IMPACT DEVELOPMENT CENTER  
Beltsville, MD

Marie Venner  
VENNER CONSULTING  
Littleton, CO

#### *Subscriber Categories*

Design • Environment • Hydraulics and Hydrology

Research sponsored by the American Association of State Highway and Transportation Officials  
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#### TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.  
2015  
www.TRB.org

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This guidance manual provides practical, research-based evaluation and implementation practices for the reduction of stormwater volumes in urban highway environments. The manual outlines a five-step process for the identification, evaluation, and design of feasible solutions for runoff volume reduction based on site-specific conditions. It is accompanied by a CD-ROM containing a Volume Performance Tool to assist the user in efficiently estimating the performance of volume reduction approaches and understanding the effects and sensitivity of local climate patterns, design attributes, and site conditions. The manual also includes a set of volume reduction approach fact sheets and a user guide for the Volume Performance Tool. This guidance manual will be useful to DOT managers, project staff and design engineers, permit writers, consultants, and planners.

Link to document:

<http://www.trb.org/HydraulicsHydrology/Blurbs/172415.aspx>

# Federal Research

Snapshot of Hydraulics, hydrology, stormwater management, Stormwater runoff and water quality information available via NCHRP Research:

- Search conducted using – Highway Stormwater Runoff Management – 520 Research reports published.
- Search conducted using – Highway Hydraulics and Hydrology – 730 Research reports published.
- Search conducted using – Highway water quality management – 370 Research reports published.

Note: Number of reports could include duplicative reports in the number located.

Where can I search and find published TRB research reports?

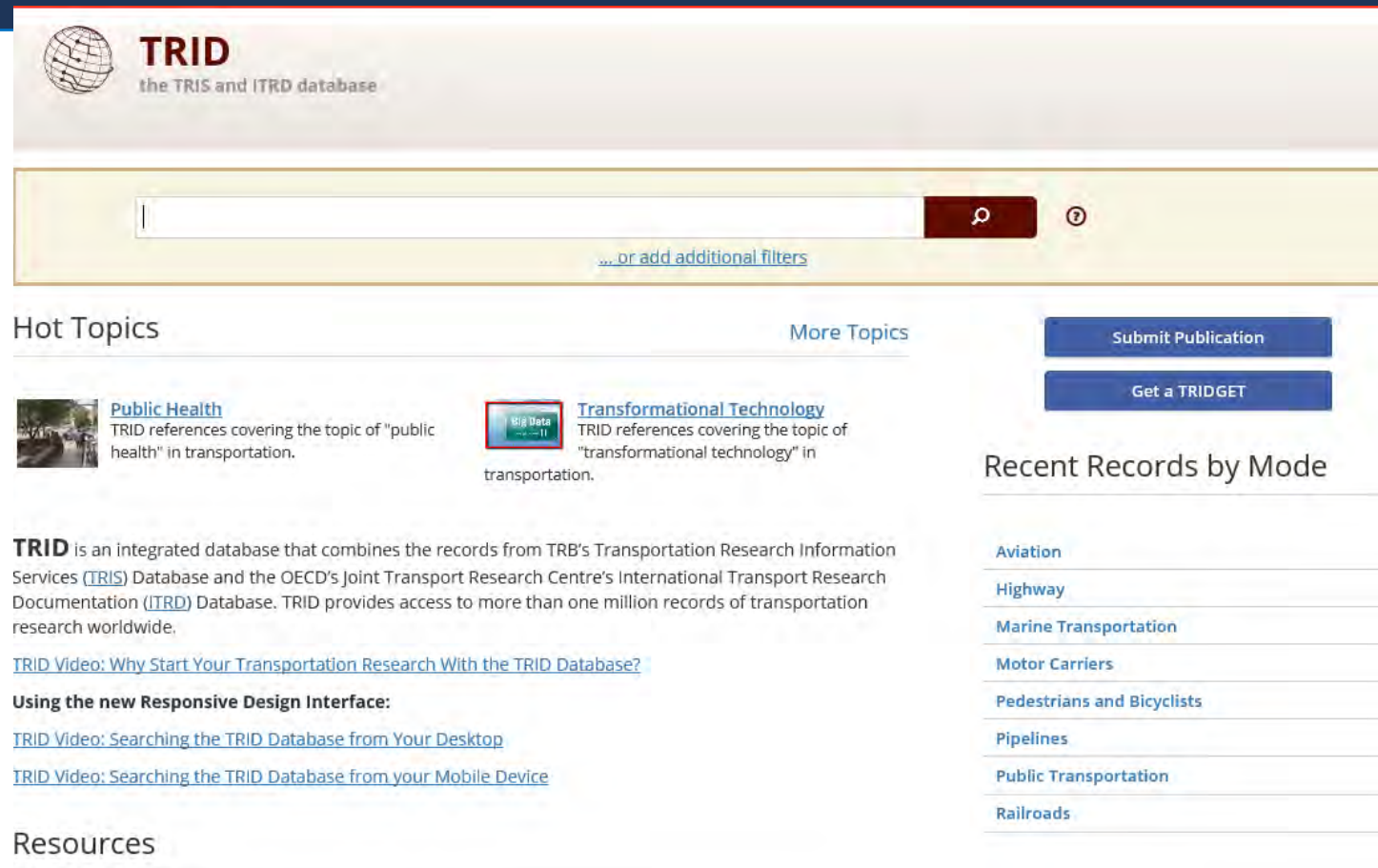
TRID is an integrated database that combines the records from TRB's Transportation Research Information Services ([TRIS](#)) Database and the OECD's Joint Transport Research Centre's International Transport Research Documentation ([ITRD](#)) Database. TRID provides access to more than one million records of transportation research worldwide.

Link to TRID webpage:

<https://trid.trb.org/>



# Federal Research

Link to TRID webpage:  
<https://trid.trb.org/>



The screenshot displays the TRID website, which is described as "the TRIS and ITRD database". The header features the TRID logo and a search bar with a magnifying glass icon and a help icon. Below the search bar, there is a link to "or add additional filters". The main content area is divided into sections: "Hot Topics" with a "More Topics" link, "Public Health" (TRID references covering the topic of "public health" in transportation), "Transformational Technology" (TRID references covering the topic of "transformational technology" in transportation), and "Recent Records by Mode" (listing Aviation, Highway, Marine Transportation, Motor Carriers, Pedestrians and Bicyclists, Pipelines, Public Transportation, and Railroads). There are also buttons for "Submit Publication" and "Get a TRIDGET". A section titled "Resources" is partially visible at the bottom.

**TRID**  
the TRIS and ITRD database

Search bar:   

[or add additional filters](#)

**Hot Topics** [More Topics](#)

**Public Health**  
TRID references covering the topic of "public health" in transportation.

**Transformational Technology**  
TRID references covering the topic of "transformational technology" in transportation.

**Recent Records by Mode**

- [Aviation](#)
- [Highway](#)
- [Marine Transportation](#)
- [Motor Carriers](#)
- [Pedestrians and Bicyclists](#)
- [Pipelines](#)
- [Public Transportation](#)
- [Railroads](#)

**Resources**

**TRID** is an integrated database that combines the records from TRB's Transportation Research Information Services (TRIS) Database and the OECD's Joint Transport Research Centre's International Transport Research Documentation (ITRD) Database. TRID provides access to more than one million records of transportation research worldwide.

[TRID Video: Why Start Your Transportation Research With the TRID Database?](#)

**Using the new Responsive Design Interface:**

[TRID Video: Searching the TRID Database from Your Desktop](#)

[TRID Video: Searching the TRID Database from your Mobile Device](#)

[Submit Publication](#)

[Get a TRIDGET](#)



## MS4 Resources – ODOT

- BMP Calculation Spreadsheet – Excel
  - Project treatment requirement calculations
  - Sizing calculations for each BMP type
  - Checklists for design requirements
  - Checklists for key plan components
- BMP Review Checklist – PDF and Word
  - Project-wide checklist
  - Design checklist for each BMP type

# MS4 Resources – ODOT

- BMP Design Examples
  - Vegetated Biofilter
  - Detention Basin
  - Retention Basin
- Post-Construction BMP Presentation Slides – PDF
  - Project Information, Regulatory Requirements, BMP Calculations, Design Aids, Individual BMP Design, Design and Review Process

# MS4 Resources – ODOT

- Standard Construction Drawings
  - Detention Basin Outlet
  - Retention Basin Outlet
  - Infiltration Trench Details
- Plan Insert Sheets
  - Bioretention Cell plan, cross section, and details
  - Linear Bioretention in a ditch

## MS4 Resources – ODOT

- ODOT MS4 Annual Reports – Same as the SWMP location.
- ODOTs updated MS4 SWMP -  
<http://www.dot.state.oh.us/stormwater/Pages/AnnualReport.aspx>
- ODOT E&SC Training Slides -  
<http://www.dot.state.oh.us/stormwater/Pages/MS4-Public-Education.aspx>

## Upcoming Events

- Public Comment on Ohio EPA Draft Construction General Permit: January – February 2018
- 2018 CEAO Ohio Storm Water Management and Drainage Conference – Columbus, OH: March 13-14
- Ohio Stormwater Conference – Sandusky, OH – May 9-11, 2018
- OTEC 2018 – Columbus, OH: Oct. 2-3
- WMAO Conference 2018 – Columbus, OH: November

# Upcoming Events

- Next Transportation Sub-Committee Bi-Annual Storm Water Webinar: July/August 2018
  - ODOT Manual Updates
  - Regulatory Updates
  - Research Updates
  - Discussion of any newly available resources
  - Upcoming Events

# Open Discussion

- Anything else anyone else wants to talk about?

