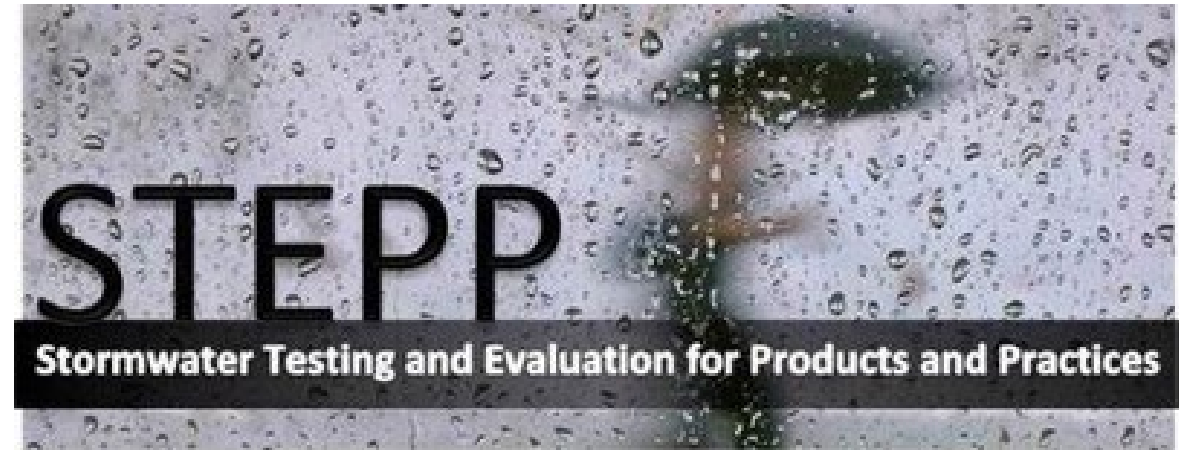


# Regional Stormwater Conference

## Overview of the STEPP Program



Gian Villarreal, PE, CPSWQ, CFM  
Becca Oliver, NGICP, CPESC, CESSWI

# Outline

- Purpose
- Problem
- Background
- Current Data / Information
- STEPP Program
- ASTM



# Purpose

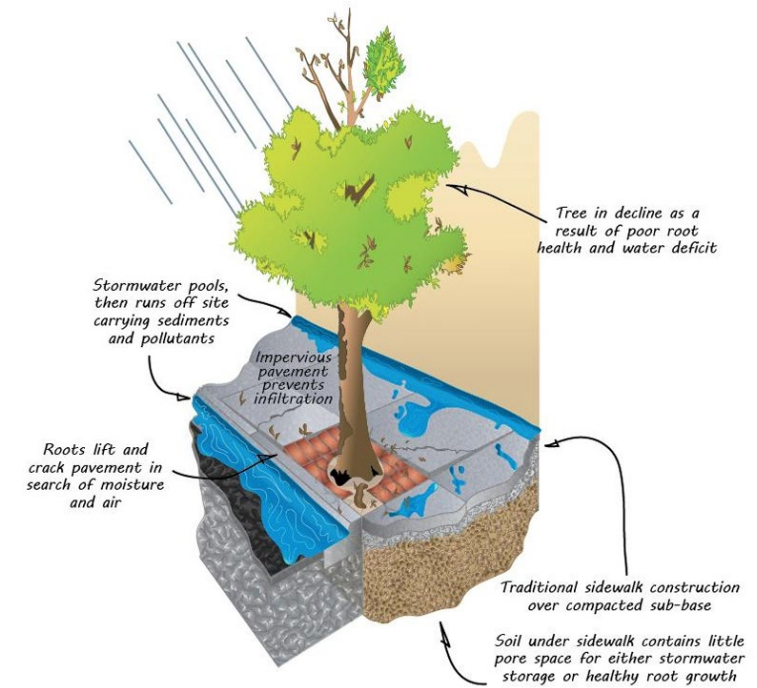
Develop a national testing/evaluation and verification program for stormwater products and practices

- **Verification:** test performance of products/practices in a standard way
- **Certification:** performance of verified products/practices meets regulatory performance standards

## The Problem

### Challenges include:

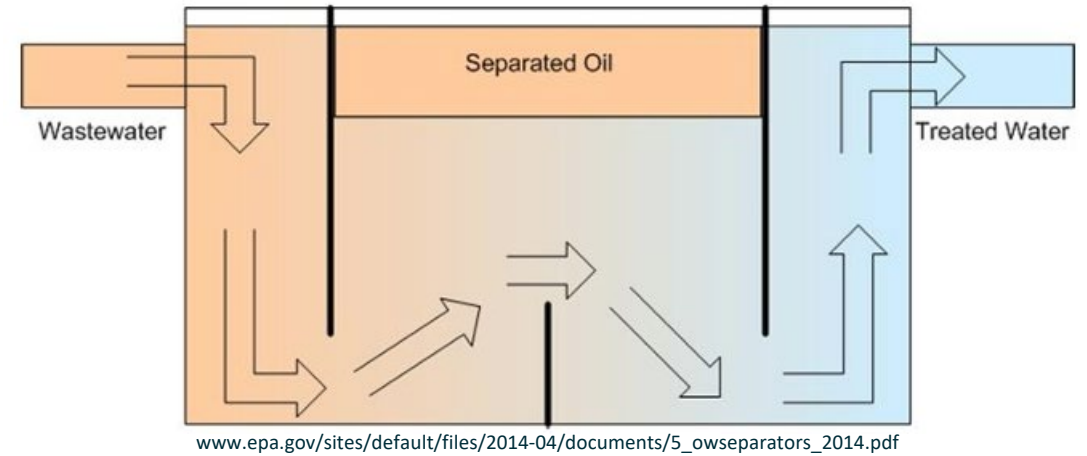
- Variability
  - Design (non-proprietary)
  - Construction
  - Performance (proprietary and non-proprietary)
  - Maintenance
  - Long-term performance
- Standardization
- Specifications



## The Problem

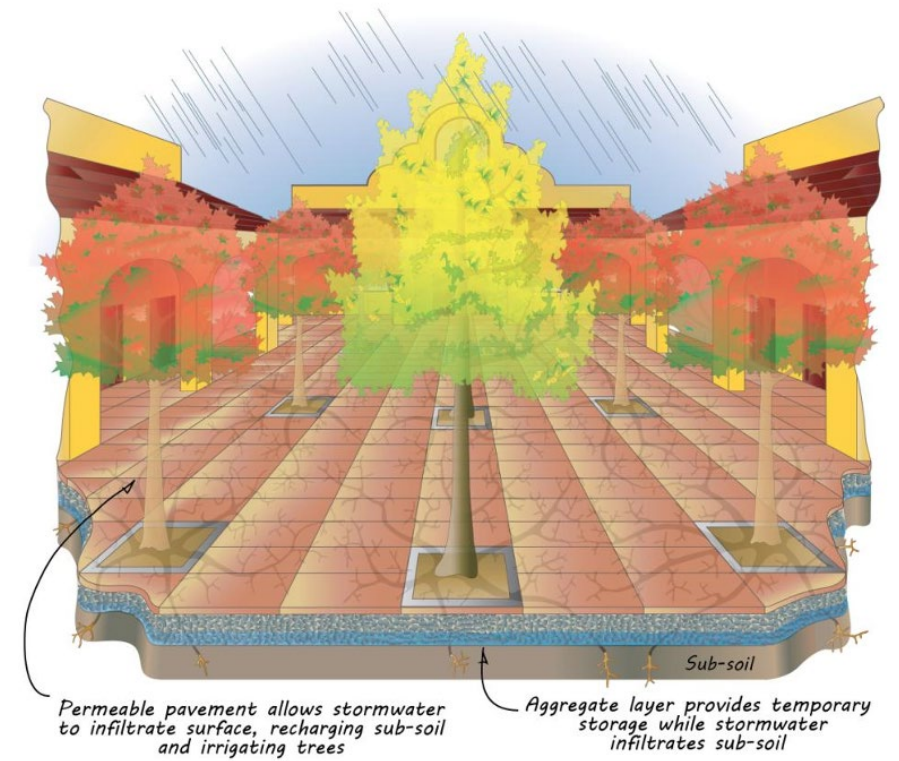
Lack of standardized testing & verification for stormwater BMPs creates problems for everyone

- Manufacturer: Product approval process is a barrier
- Consumer: Absence of independent testing reduces confidence in product performance
- Regulator: Potential for the incorporation of BMPs to lead to an under-performing stormwater program



## BMP Maintenance Issues/Challenges

- BMPs installed, accepted by property owner, then found to not be functioning to design specifications
  - Differences in material/media pollutant removal effectiveness or infiltration capacity
  - Variability between lab conditions and field conditions
- Current Testing



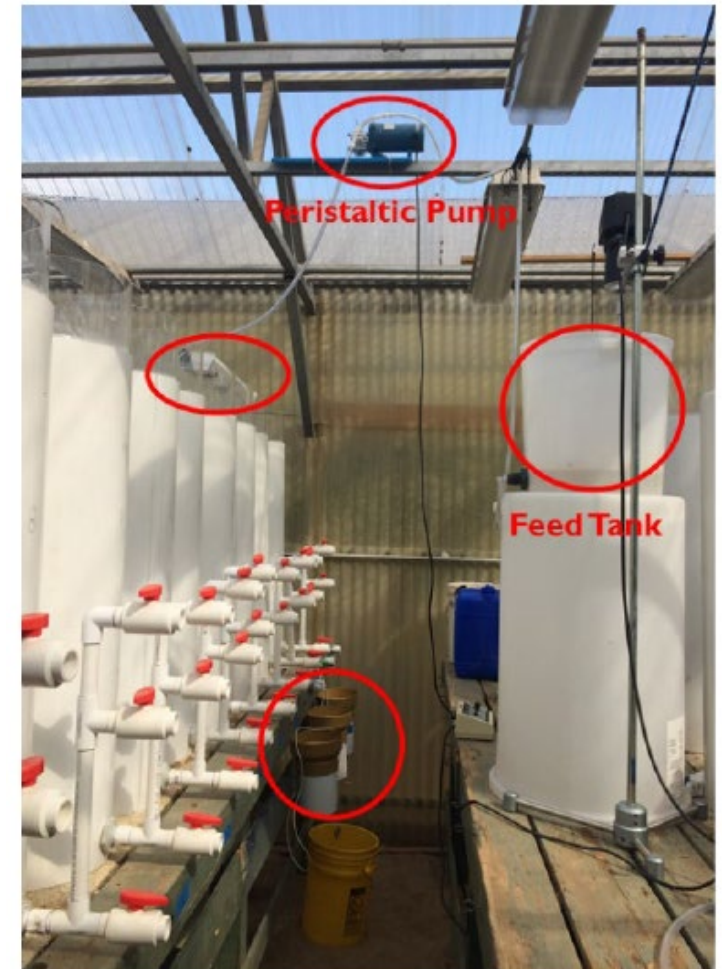
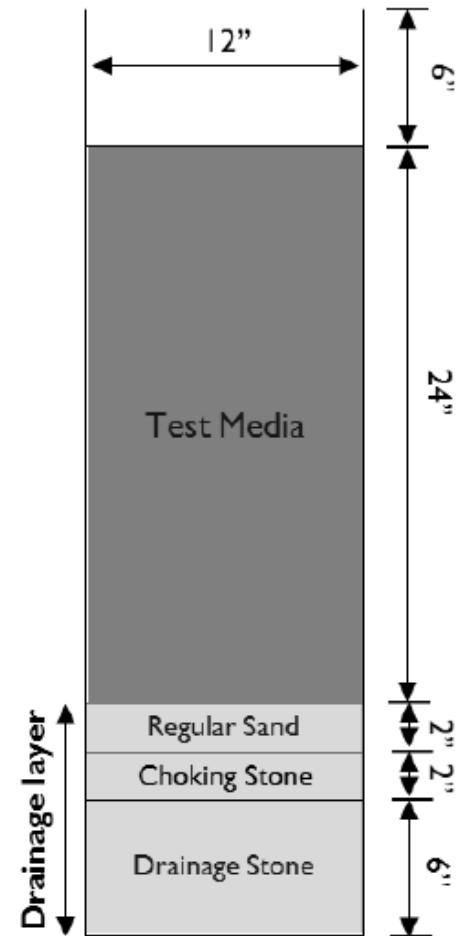
## BMP Maintenance Issues/Challenges

- Owner unaware/unprepared to conduct necessary maintenance to keep BMP functioning
  - Worth the additional upfront cost of implementing low impact development practices if not keeping up with maintenance to ensure continued performance?
- How will the STEPP program help?



# Lab Testing

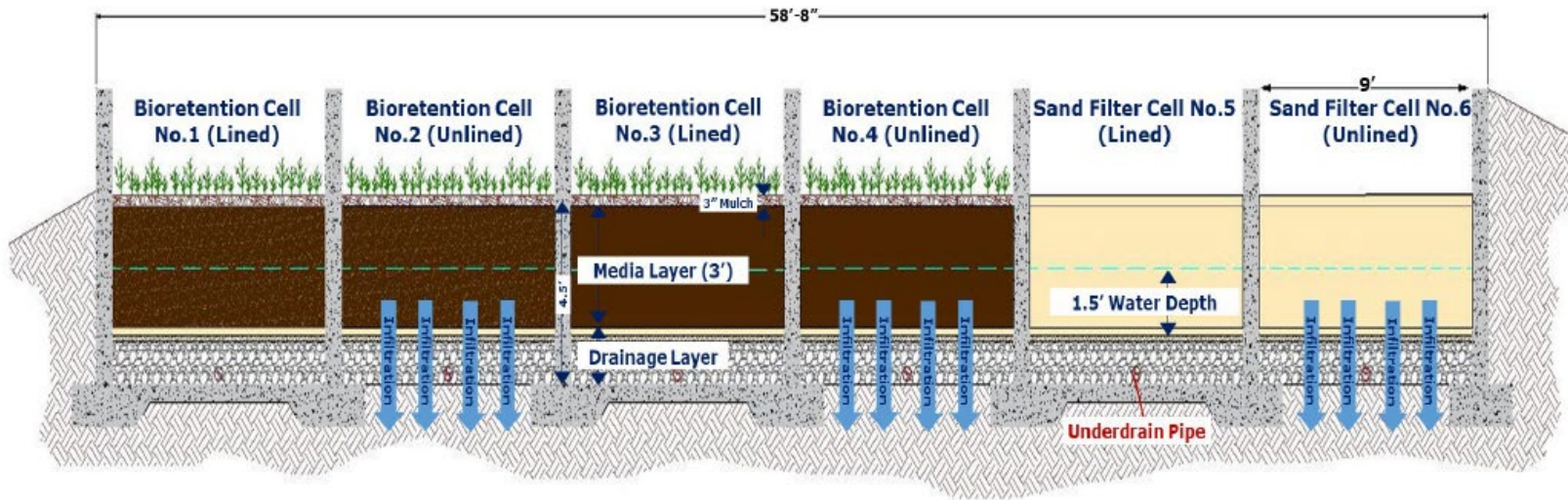
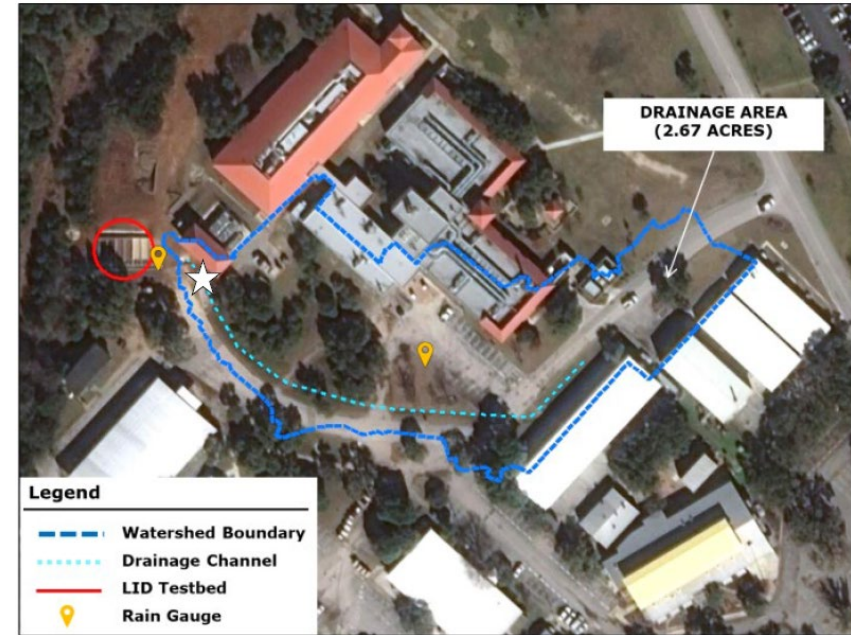
- UTSA Study
  - Dr. Marcio Giacomoni
  - Dr. Heather Shipley
- Column tests
  - Sand
  - Lime-mix
  - Blend (2)
  - Biofilter (3)





# Field Testing

- 6 test beds
  - Limestone Mix
  - Bioretention Mix
  - Limestone Sand
  - Lined and Unlined
- 16 pollutants



## Existing Standards

- Limited Existing ASTM Standard Test Methods
  - Surface Infiltration Rate of Permeable Unity Pavement Systems – C1781/C1781M-21
  - Infiltration Rate of In Place Pervious Concrete – C1701/C1701M-17a(2023)
  - Determining Trash and/or Debris Capture Performance of SCMs – E3332-22
- ASTM Committee E64 on Stormwater Control Measures

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.



Designation: C1781/C1781M – 21

### Standard Test Method for Surface Infiltration Rate of Permeable Unit Pavement Systems<sup>1</sup>

This standard is issued under the fixed designation C1781/C1781M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

#### 1. Scope\*

1.1 This test method covers the determination of the field surface infiltration rate of in place permeable unit pavement systems surfaced with solid interlocking concrete paving units, concrete grid paving units, or clay paving brick.

Note 1—For in-place pervious concrete, Test Method C1701/C1701M should be used. Test Method C1701/C1701M is functionally identical to this standard, but does not include the added provisions for positioning and securing the test ring to a discontinuous surface, which are detailed in this standard. Both tests methods give comparable results

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining items may result in non-conformance

Test method references notes that provide these notes shall not be considered as method.

#### 2. Referenced Documents

- 2.1 *ASTM Standards*:<sup>2</sup>
- C902 Specification for Pedestrian and Light Traffic Paving Brick
  - C920 Specification for Elastomeric Joint Sealants
  - C936/C936M Specification for Solid Concrete Interlocking Paving Units
  - C1232 Terminology for Masonry
  - C1272 Specification for Heavy Vehicular Paving Brick
  - C1319 Specification for Concrete Grid Paving Units
  - C1701/C1701M Test Method for Infiltration Rate of In Place Pervious Concrete
- 2.2 *Other Standards*:<sup>3</sup>
- Federal Specification A-A-3110 (TT-P-1536A) Plumbing Fixture Setting Compound

#### 3. Terminology

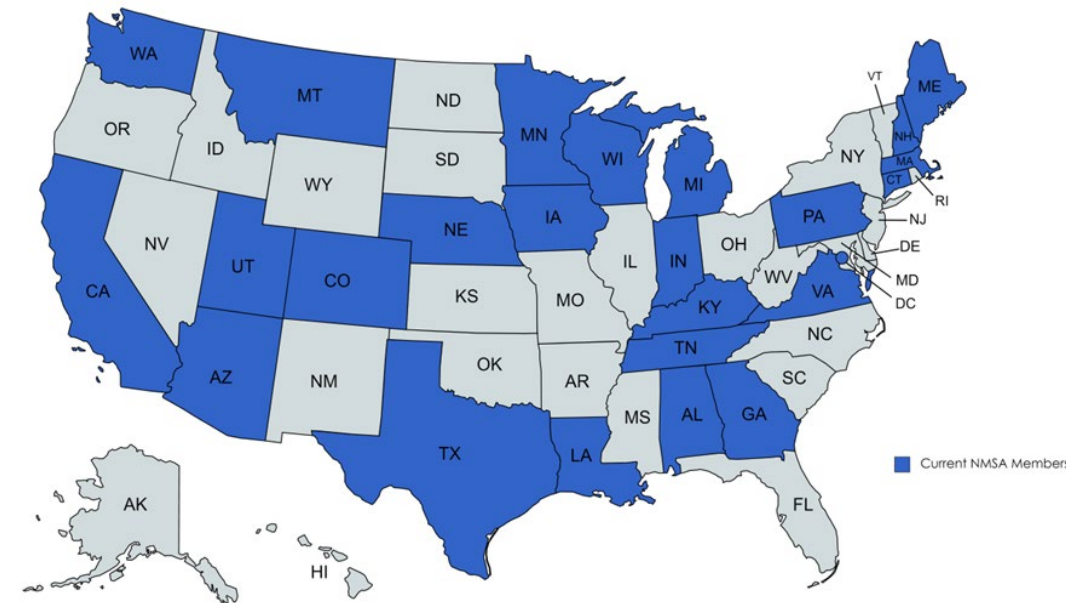
- 3.1 The terms used in this test method are defined in Terminology C1232.



# STEPP Program

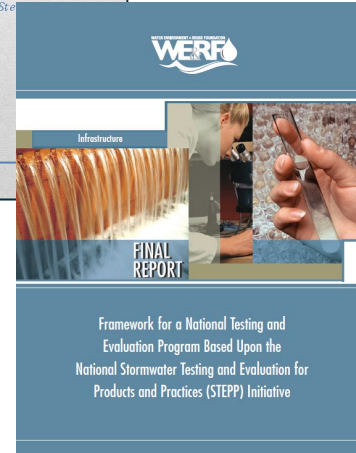
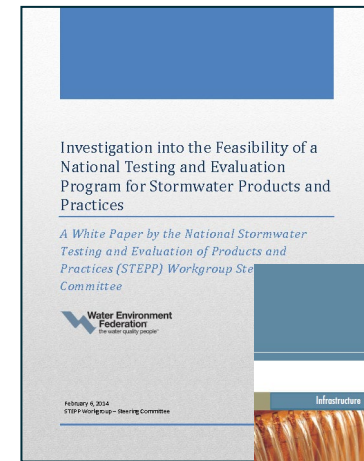
## STEPP - National Stormwater Testing and Evaluation for Products and Practices

- Currently led by National Municipal Stormwater Alliance (NMSA)
  - Collaborate with WEF
  - MS4 permittees in 25 states, including WEAT
- Engagement with EPA
  - Headquarters, regional offices
- Engagement with other key states
- Engagement with key municipalities
- Ongoing work with ACWA
- Stormwater Roundtable; Survey



# Background

- 2012 - Initial investigation
- 2013-2014 - Feasibility White Paper
- 2016 - WERF STEPP framework report published (EPA SUPPORT HERE)
- 2017-2018 - Establishment of consortium of interested groups
  - ASTM, ITRC, NJ, WA, WRF
- 2019 - ASTM Standards
  - ASTM initiating development of lab testing standards based upon NJCAT/NJDEP lab protocols
- Initiated engagement with State of Minnesota

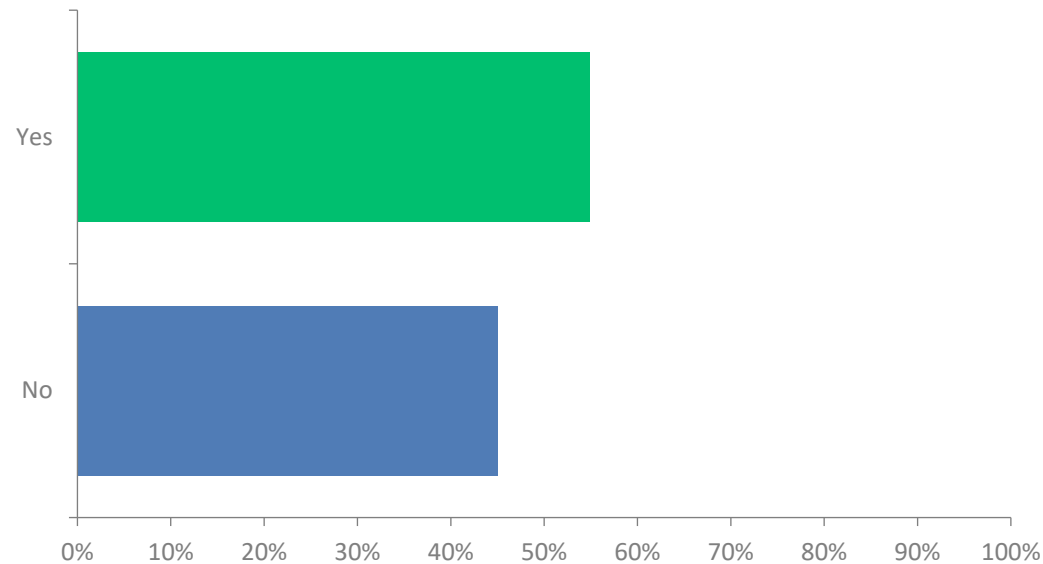


# National STEPP Survey

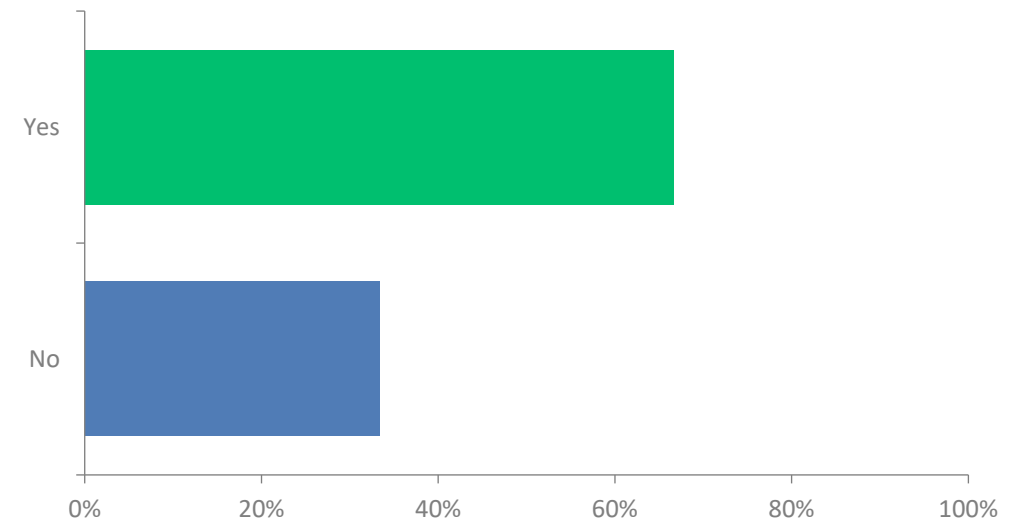


Does your program currently rely on a performance-based testing and evaluation program when making decisions on approval for the use of stormwater products and practices and/or treatment crediting?\*

### *MS4 Results*



### *State Results*



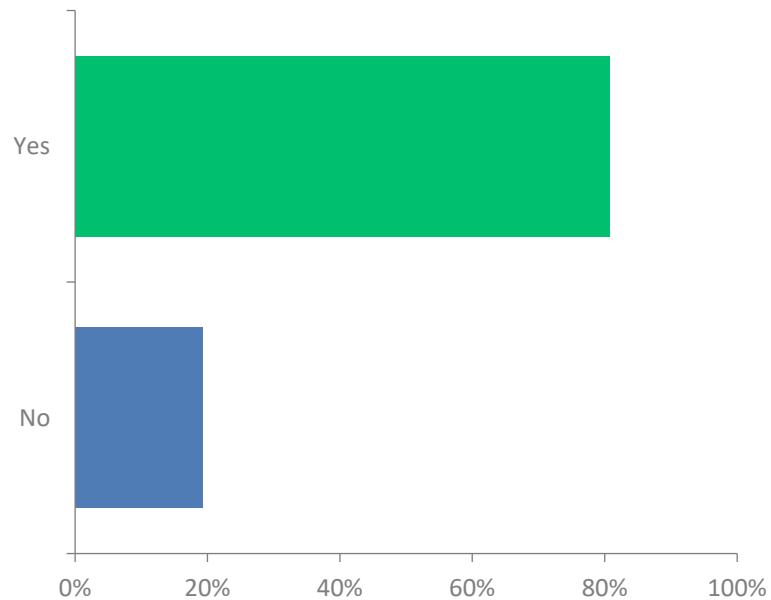
\*Examples include TAPE, NJCAT/NJDEP, TARP, International Stormwater BMP Database etc.

# National STEPP Survey

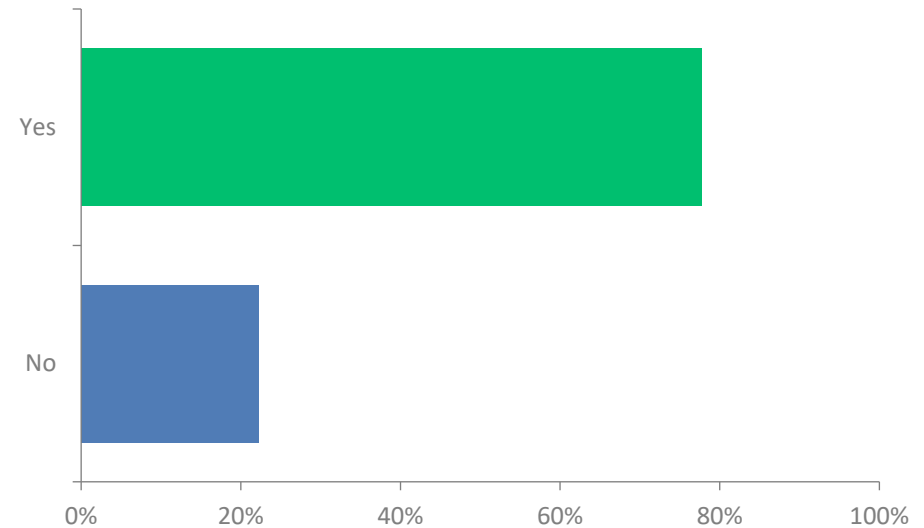


If a national performance testing and evaluation program for stormwater products and practices were available, would your program defer to it?\*

***MS4 Results***



***State Results***



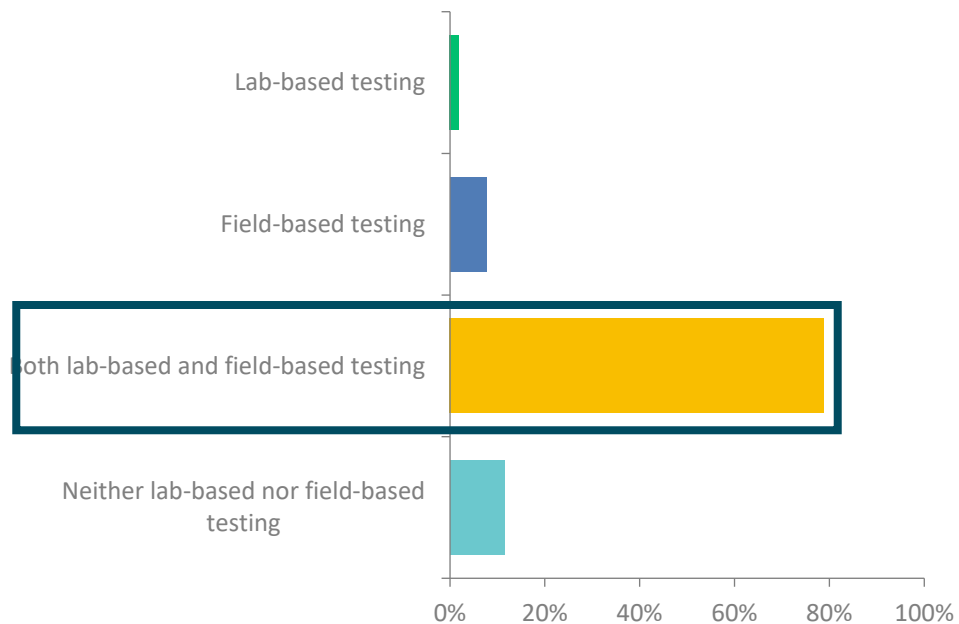
\*Assuming this program utilizes similar or identical protocols used in existing state or regional programs (TAPE, NJDEP)

# National STEPP Survey

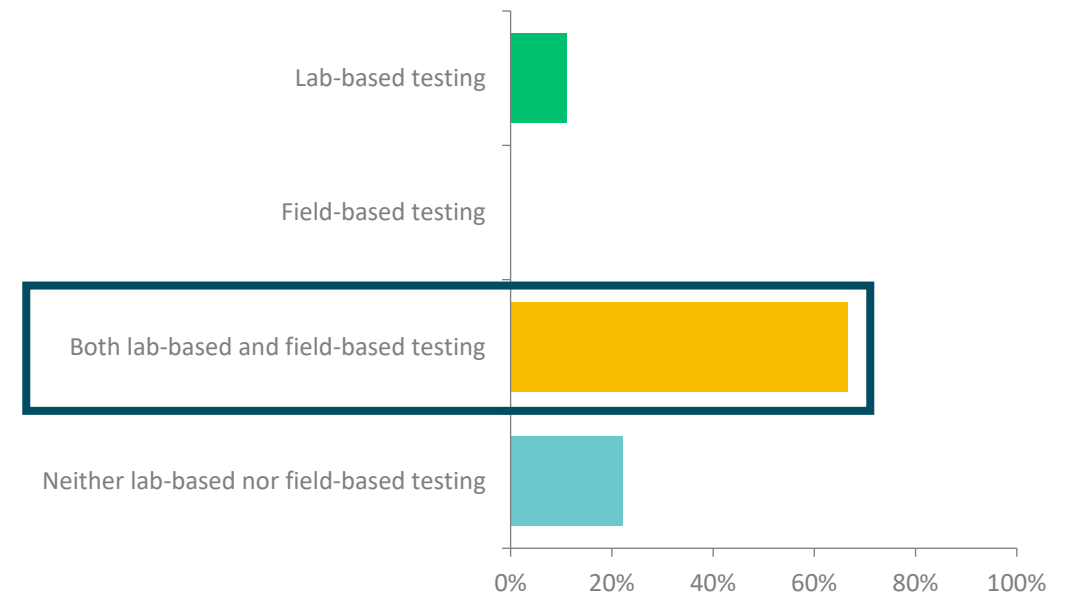


Do you anticipate your program making decisions on stormwater products/practices based upon lab-based testing, field-based testing, both, or neither?

## MS4 Results



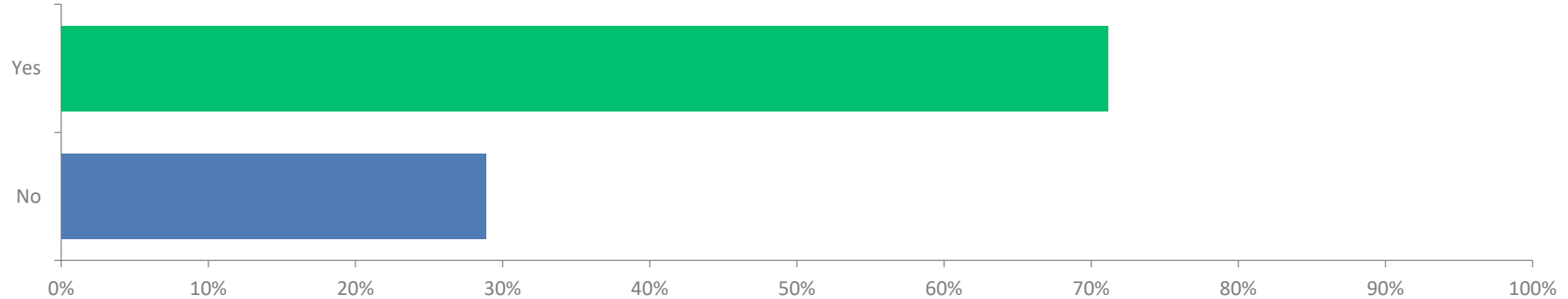
## State Results



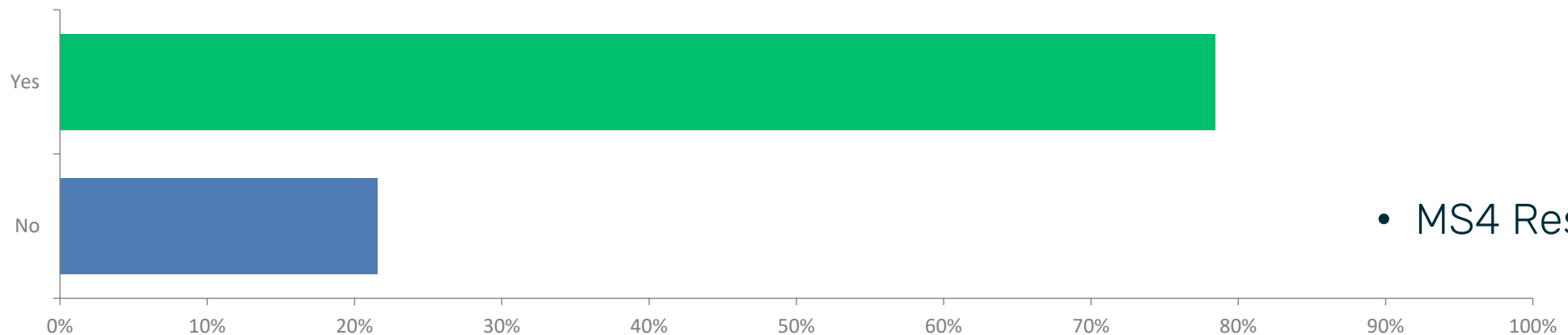
# National STEPP Survey



Q5: If highly-qualified testing professionals with no conflicts of interest observe performance testing, would you accept in-house testing results for lab-based performance testing?



**Q6: If highly-qualified testing professionals with no conflicts of interest led the performance testing, would you accept in-house testing results for lab-based performance testing?**



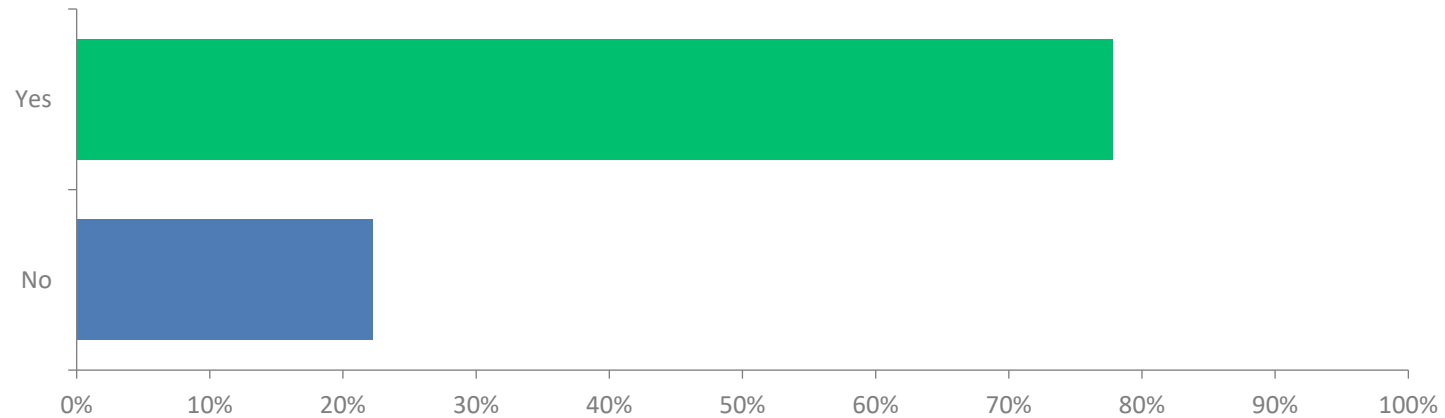
• MS4 Results



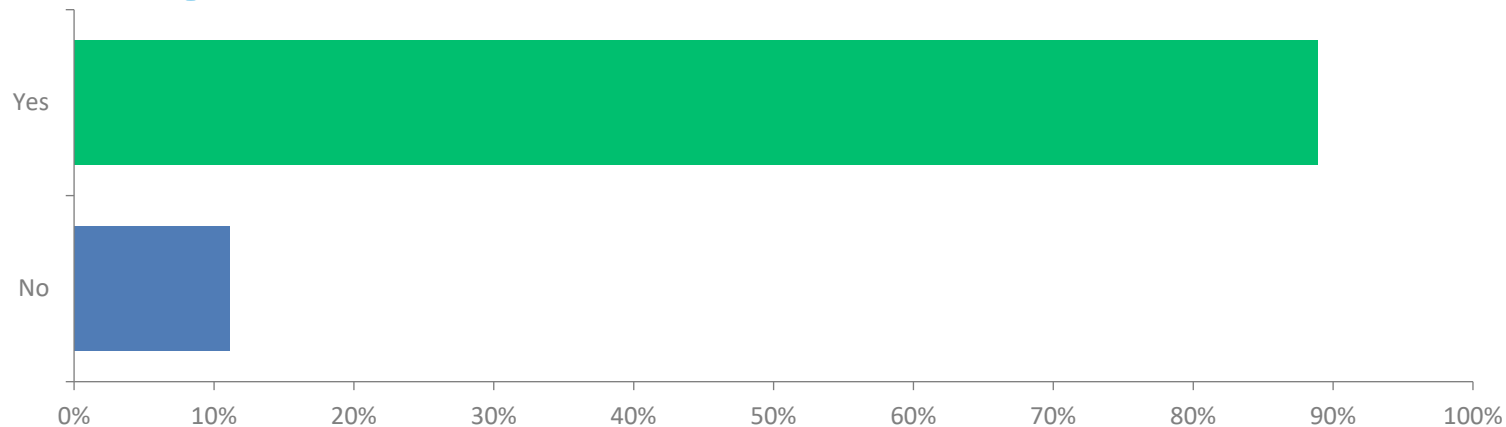
# National STEPP Survey



Q5: If highly-qualified testing professionals with no conflicts of interest observe performance testing, would you accept in-house testing results for lab-based performance testing?



**Q6: If highly-qualified testing professionals with no conflicts of interest led the performance testing, would you accept in-house testing results for lab-based performance testing?**



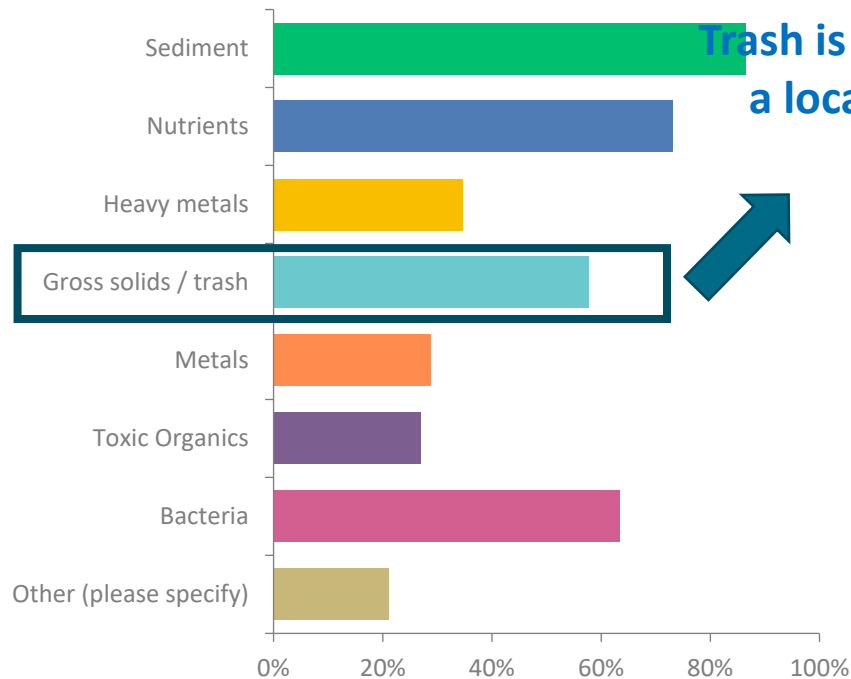
- State Results

# National STEPP Survey



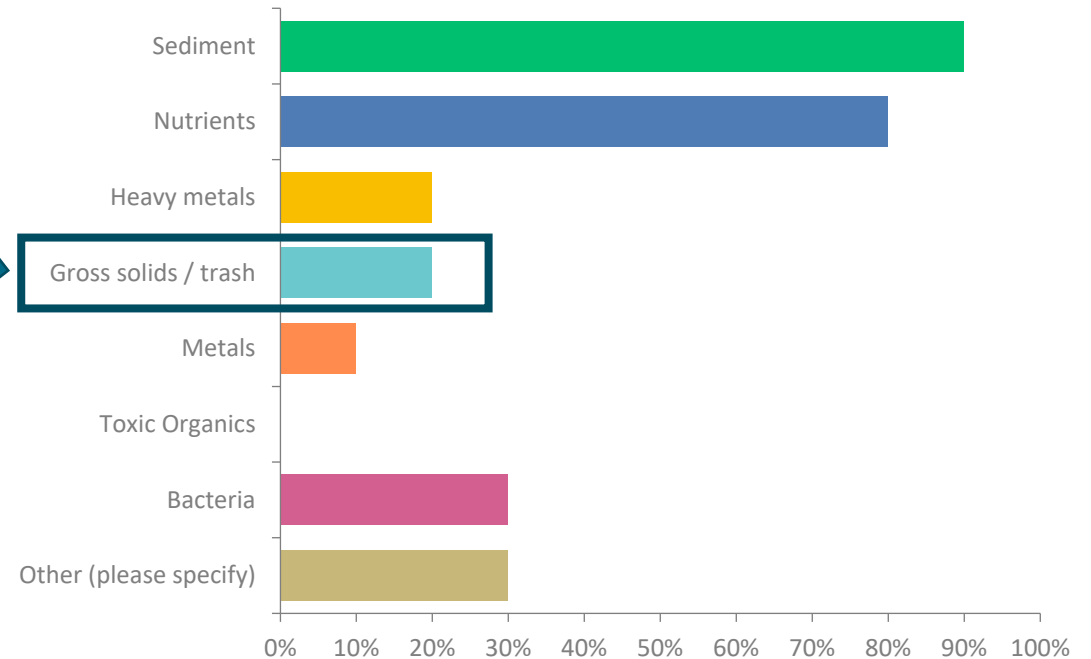
What are the current stormwater related pollutants of most interest or priority in your MS4 program?

## MS4 Results



Trash is primarily a local issue

## State Results

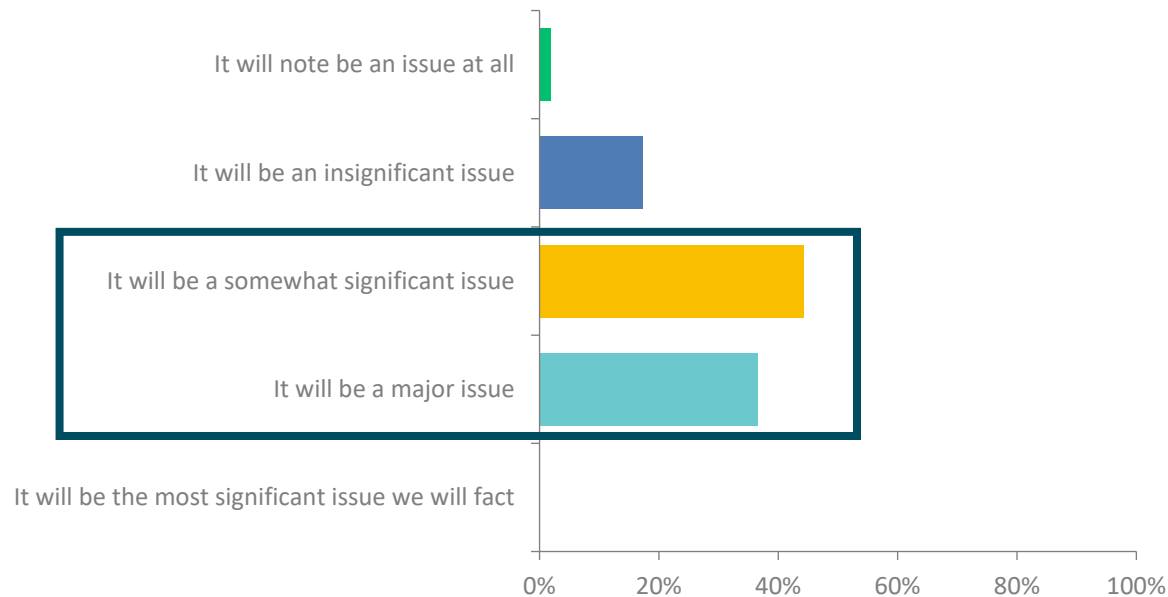


# National STEPP Survey

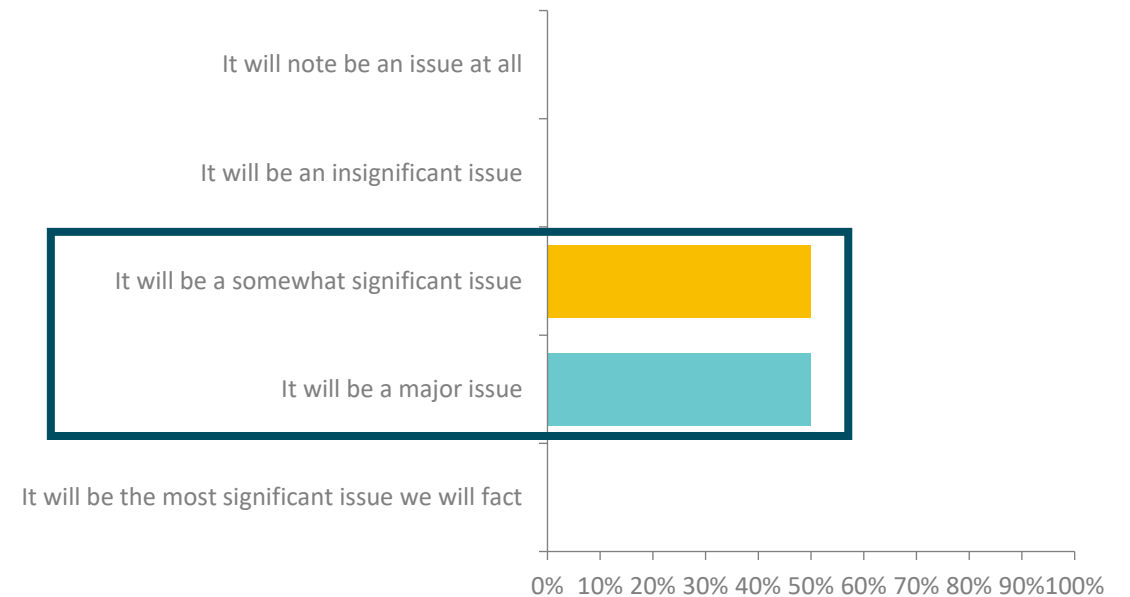


What role do you think emerging contaminants (PFAS, microplastics, 6PPD, etc.) will play in your MS4 stormwater program in the future?

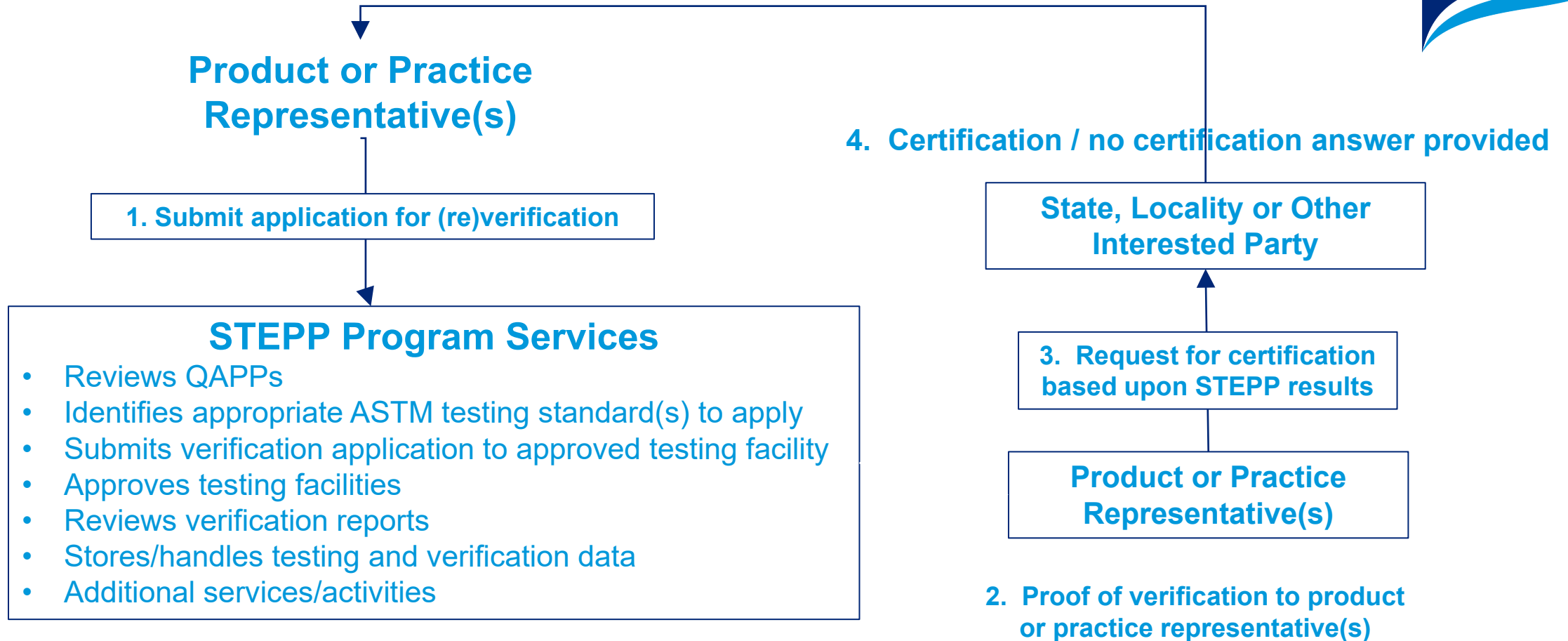
## MS4 Results



## State Results



# STEPP Process



# ASTM Committee E64 & STEPP

- E64.01 Lab Evaluation
  - 8 Active Standards
- E64.02 Field Evaluation
  - Development ongoing
- E64.03 Component Evaluation
- E64.04 Nonpoint Control Measures
- E64.09 Terminology
- E64.90 Executive



Committee supports the STEPP program and provides a platform for assessing SCM connections with existing standards & the development of new standards beyond STEPP

## Subcommittee E64.01 on Lab Evaluation

### Matching Standards Under the Jurisdiction of E64.01 by Status

**Active** 8 matching standards

- C1745/C1745M-18 Standard Test Method for Measurement of Hydraulic Characteristics of Hydrodynamic Stormwater Separators and Underground Settling Devices
- C1746/C1746M-19 Standard Test Method for Measurement of Suspended Sediment Removal Efficiency of Hydrodynamic Stormwater Separators and Underground Settling Devices
- C1814/C1814M-20 Standard Test Method for Measurement of Hydraulic Characteristics of Stormwater Filtration Elements
- C1893-23 Standard Practice for Laboratory Performance Verification of Hydrodynamic Separators for the Treatment of Stormwater Runoff
- E3317-22 Standard Specification for Silica-Based Sediments for the Evaluation of Stormwater Treatment Devices
- E3318-23 Standard Terminology for Standards Relating to Stormwater Control Measures
- E3332-23 Standard Test Method for Determining Trash and/or Debris Capture Performance of Stormwater Control Measures
- E3373-23 Standard Test Method for Scour of Hydrodynamic Separators and Settling Devices

**Withdrawn, Replaced** 0 matching standards

# ASTM E64 Committee on Stormwater Control Measures

- ASTM E64 Committee on Stormwater Control Measures
  - <https://www.astm.org/get-involved/technical-committees/committee-e64>
- Lab Testing
  - NJCAT lab-based protocols being standardized
    - Focus on hydrodynamic separators and filter systems
    - Completion expected in next 3-6 months
  - Trash capture standard finalized
- Field Testing
  - WA TAPE protocol field-based test methods standards initiated
    - Completion could be in next 12-18 months



# STEPP Updates of Note



## UPDATES

- *STEPP to focus on trash capture technologies for soft launch by late 2023*
  - Establishing governance bodies
  - Finalizing and establishing verification processes and documentation
- Survey illustrates high support and need for STEPP
- Continued engagement w/state, MS4s and EPA
- Congress to provide \$3M/year for Centers of Excellence for Stormwater Infrastructure Technologies (CESITs)

# STEPP Updates of Note



## UPDATES

- Sediment via lab testing will be included soon after soft launch
- Continuing to develop field testing aspect of program
- Developed state and MS4 membership fee schedule
- Currently going through fundraising for Phase 2
- Significant interest from a number of states and jurisdictions



# How Interested Parties can Participate

- Get involved with NMSA
- Support STEPP Program
- Data

# Thank you & Contact Info

National Municipal Stormwater Alliance (NMSA)

Seth Brown

Executive Director

[seth.brown@stormandstream.com](mailto:seth.brown@stormandstream.com)

Gian Villarreal

Board of Directors

[gvillarreal@seagullpme.com](mailto:gvillarreal@seagullpme.com)

Becca Oliver

[boliver@seagullpme.com](mailto:boliver@seagullpme.com)