

# Stormwater Testing and Evaluation of Products and Practices (STEPP) Consortium and Work Team Meeting Summary

July 25-26, 2018

*On July 25 and 26, 2018, the Water Environment Federation (WEF) convened a meeting in Alexandria, Virginia comprised of representatives of stormwater sector organizations who are active in or touch upon stormwater technology testing and evaluation programs. Specifically, the event brought together members of the Stormwater Testing and Evaluation of Products and Practices (STEPP) Work Team and Consortium Group. In addition, subscribers of the WEF Stormwater Institute (SWI) were invited to participate in the event. A list of meeting participants is included as an attachment to this document as is the meeting agenda. The focus for discussion was on stormwater control measures (SCM) verification programs and issues, with a specific focus on the STEPP program initiative. Objectives for the discussion are listed below. This document serves as a summary of the discussions that took place at the meeting.*

- *Provide an overview of the STEPP Consortium Group*
- *Develop a more detailed/enhanced understanding of the roles of Consortium Group members in the STEPP program*
- *Identify and discuss key areas of focus that will enable the STEPP program to progress*
- *Develop a list of near-term activities for Consortium Group members along with a schedule for activities*
- *Discuss the nature of Memoranda of Understanding (MOUs) along with proposed MOU elements articulating the relationship of Consortium Group members with the STEPP program initiative along with contributing products and/or activities each member can provide toward the further development of the STEPP program initiative*
- *Develop a list of areas for further/deeper understanding/research*
- *Develop a list of next steps in the STEPP program initiative for Work Team and Consortium Group members*

## Introduction: Context and Purpose

A meeting was held in July 2018 at the Water Environment Federation (WEF) that focused on the Stormwater Testing and Evaluation for Products and Practices (STEPP) program initiative and how this initiative should progress in the future. STEPP was initiated in 2012 and has continued to evolve<sup>1</sup> from initial efforts focusing on the feasibility and need for a national program on the testing and evaluation of proprietary stormwater products and public domain practices to the basic framework and elements of this type of program. Currently, the STEPP initiative is led by the WEF Stormwater Institute (SWI) STEPP Work Team (“Work Team”). Work Team members are comprised of professionals with experience and knowledge in stormwater management and the testing and evaluation of stormwater control measures

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<sup>1</sup> Details on this initiative can be found at <http://wefstormwaterinstitute.org/programs/stepp/>

(SCMs) with backgrounds that include state regulatory, non-profit, academic, practitioner, and manufacture/product sectors. Some members of the Work Team are affiliated with organizations who are subscribers of the SWI while others are not. The Work Team meets periodically to provide support on the STEPP program initiative.

Another key group is the STEPP Consortium Group (“Consortium Group”), which is a collective of organizations who have an interest in supporting the STEPP initiative as it matures into a sustaining and functioning organization. The Consortium Group organizations include:

- Water Environment Federation (WEF)
- The Water Research Foundation (WRF)
- Interstate Technology and Regulatory Council (ITRC)
- American Society for Testing and Materials International (ASTM)
- Washington State Department of Ecology (Ecology) / University of Washington – Washington Stormwater Center / Technology Assessment Protocol – Ecology (TAPE)
- New Jersey Corporation for Advanced Technology (NJCAT) / New Jersey Department of Environmental Protection (NJDEP)

A majority of these organizations initially met in the summer of 2017 and have worked together since to articulate an initial understanding of respective roles led by each organization as STEPP matures into an independent program, which is documented in the attached document titled, “Stormwater Testing and Evaluation of Products and Practices (STEPP) Consortium Overview” (“Consortium Document”). The Work Team and the Consortium recently met and reviewed this document with no major disagreements articulated during or since this event, which suggests that the Work Team supports the members of the Consortium as well as their roles as outlined in the Consortium Document. This document formed an initial basis of understanding regarding the various roles that the Consortium Group members would play as STEPP matures into a full-fledged program.

To help move the STEPP initiative forward, the meeting focused on two areas. First, the roles outlined in the Consortium Document needed to be developed to a greater detail. It was envisioned that this refinement would initiate at the July 25-26 event with continued/ongoing refining occurring beyond this event. Second, the activities and schedule associated with the STEPP initiative over the next 6-12 months needed to be fleshed out. The identification of these activities and schedule/timeframe for was a focus during the July 25-26 event. These two focus areas underpin the development of memoranda of understanding (MOUs) that need to be developed to more formalize the relationships between the Consortium Group partners and to the program overall.

The structure of the meeting is reflected in the attached agenda. To summarize, the first day covered introductory and background information for those who lacked the context on the STEPP initiative since its inception in 2012, with the remaining balance of the day focusing on in-depth discussions on the roles and activities led by each Consortium Group partner. The second day covered the topics of business plan development as well as envisioned areas of activity for the STEPP program initiative over the next year. It should be noted that the only Consortium Group partner not in attendance at the meeting was the New Jersey Corporation for Advanced Technology / New Jersey Department of Environmental Protection, who had desired to be part of the event; however, previously scheduled

obligations precluded this from happening. WEF staff will reach out to meet with the New Jersey contingent to share details regarding the discussions and outcomes of the meeting and will seek their input on key areas of focus from the meeting as well.



Figure 1 - STEPP Consortium Group Partners

Table 1 - Groups Affiliated with STEPP Program Initiative

GROUP TYPE	GROUP NAME
REGIONAL/NATIONAL GROUPS WITH AN INTEREST IN STORMWATER TESTING AND EVALUTION	Great Lakes Stormwater Collaborative (GLSC)
	City of Indianapolis
	Sustainable Technologies Evaluation Program (STEP) – Canada
	Chesapeake Bay Testing Protocol Development
TESTING AND EVALUATION FACILITIES	Oregon Stormwater Technology Testing Center (STTC)
	University of New Hampshire Stormwater Center
INDUSTRY AND NGO GROUPS	American Society of Civil Engineers – Environment and Water Resources Institute (ASCE-EWRI)
	Stormwater Equipment Manufacturers Association (SWEMA)
	National Association of Home Builders (NAHB)
	American Rivers
REGULATORY SECTOR	U.S. Environmental Protection Agency (EPA)
	Association of Clean Water Administrators (ACWA)

## Refining Consortium Group Roles

WEF staff provided an overview of the Consortium Document to familiarize (or re-familiarize) meeting participants on the information covered in the document. After this introductory effort, each organization present provided input on the activities and functions their organization can play as STEPP matures and develops further, which informs the role each group will play.

### American Society for Testing and Materials International (ASTM)

#### Background on ASTM

ASTM is an organization that has developed testing standards in a variety of industries since 1898. Recently, ASTM has been active in the stormwater sector by leading the development of testing standards through ASTM International Committee C27.70 on Precast Concrete Products for Stormwater Management. Considering this background, ASTM envisions a role to support standards development (SCM performance testing protocols). Specific areas of support that is envisioned by ASTM as outlined in the Consortium Document are preliminary and ongoing standards development.

#### Discussion on Role with STEPP Program

Discussion in the meeting outlined a series of questions regarding the role envisioned by and for ASTM along with uncertainties on the services brought to bear by ASTM in the STEPP program initiative. Some specific areas of concern included:

- How would ASTM standards be generated in the context of existing testing and evaluation programs (New Jersey and Washington, specifically)
- The process and amount of time required to develop standards
- The nature of standards to be developed
- The perceived limitation of standards development in existing precast concrete committee

The discussion at the event addressed all of these concerns. It was clarified that ASTM has focused over the last 10+ years on reducing the amount of time required to develop standards. Further, ASTM can facilitate the establishment of standards quicker in circumstances where existing programs have developed a significant amount of content that would define a standard. For instance, it was estimated that 90 percent of the current NJCAT protocols could be used to define a laboratory testing standard, and it is clear that the TAPE protocols could provide the foundation for a field-testing standard. Considering these facts, it was estimated that ASTM could establish field and laboratory testing standards based upon the TAPE and NJCAT protocols, respectively, within one year. It was suggested that new standards could be developed within 18 months as this is the average amount of time currently required for this type of activity. It should be noted that none of the timeframes presented on standards development are guaranteed and are subject to the amount of engagement and support associated with the effort.

The timeframes for standards development provide a solution for a perceived major hurdle in the maturation of STEPP as neither the TAPE nor the NJCAT programs utilize Committee C27 Standards although they do use the standards of other ASTM committees. By being able to develop these standards quickly and readily, the sector will benefit by having well-accepted testing and evaluation standards available to existing and future testing and evaluation programs. It was suggested that the

work to develop ASTM standards based upon existing protocols (TAPE and NJCAT) should begin immediately with the understanding that existing programs will continue to function as they currently do until the time when the STEPP program is judged to be technically credible and financially sound and sustainable.

Regarding the committee that would oversee standards development, there was a concern voiced regarding the restricted nature of the existing precast concrete stormwater committee (C27.70) as there are many products and practice that do not employ or include precast concrete elements. It was noted that a new committee could be established quickly and easily, or the existing pre-cast concrete committee could be amended to be more general in nature. It was also mentioned that even though this committee is in the precast concrete committee that this does not preclude any technology regardless of what is constructed from. Finally, it was noted that efforts are underway to establish a new committee called “Stormwater Control Measures”.

A discussion focused on the types of standards that should be considered for stormwater products and practices in the context of the STEPP program initiative. Specifically, how prescriptive should standards be? For instance, should standards focus at the macro or the micro level? It was stated that the current trend in standards development for ASTM is to develop less prescriptive standards, as that allows for increased flexibility. The STEPP program initiative can play a role by working with ASTM and others to understand what level of detail should be targeted for standards to be developed. It was noted that whatever level is utilized, the standards should be developed by following good scientific practice, and therefore, is repeatable in application.

It was suggested that STEPP could develop a programmatic-level guidance document that could be referenced in standards. Similarly, it was suggested that rather than develop a single field testing and evaluation standard, a series of standards based upon aspects of field testing may be a more efficient and appropriate path forward. Additionally, the use of International Organization of Standards (ISO) was suggested as a strategy for a programmatic-level framework. Future effort is required to fully flesh out this topic, but it is clear that there are many viable options forward.

Lastly, it was noted that the annual cost for ASTM membership is \$75.00 with the cost for accessing existing standards incur additional costs. However, a benefit for ASTM members is that there is no cost for standards associated with committees on which they sit. Additionally, an announcement was made that the next meeting of the existing stormwater-focused committee will be on December 4 and 5, 2018 in the Washington, D.C. area. Details will be provided and shared with the Work Team, Consortium Group partners and other interested stakeholder. This meeting, as with all ASTM meetings, is open to the public and people are encouraged to attend. There is likely to be an option to attend the meeting remotely. It was noted that only ASTM members can vote in the context of committee actions and that committee membership restrictions do exist by stakeholder type. Details on policies and procedures can be found at [www.astm.org](http://www.astm.org).

#### Development of Memorandum of Understanding Considerations

ASTM regularly engages in MOU development efforts and is supportive of doing so for the STEPP initiative as well. ASTM could not commit to MOU items at the time of the meeting; however, some specific items were presented for consideration that would be refined in the future. These items included the potential for ASTM to:

- Provide administrative, editorial and project management support for standards development process
- Provide meetings for standards development at no charge
- Engage with STEPP Work Team and Consortium Group actively and regularly
- Create a new committee or make changes to existing committee to support the STEPP program initiative when appropriate to do so
- Collaborate with the TAPE and NJCAT programs to develop standards consistent with the protocols established and used in these programs

## Interstate Technology and Regulatory Council (ITRC)

### Background on ITRC

ITRC has a 23-year history of providing support to the state environmental regulatory agencies across the country via its relationship with the Environmental Council of the States (ECOS). The organization has members from the public and the private sector in all 50 states. Since all but four states have regulatory primacy for stormwater management, it is clear that state regulators play a strong role in stormwater programs, including the topic of stormwater BMP performance. Specific areas of support that is envisioned by ITRC as outlined in the Consortium Document include guidance and training development as well as outreach to state environmental regulatory agencies.

### Discussion on Role with STEPP Program

ITRC staff and volunteers opened the discussion by clearly voicing strong support for the STEPP program initiative from both ITRC as well as the Environmental Council of the States (ECOS), which is the parent organization for ITRC. Additionally, it was made clear that ITRC does not provide services related to the testing, verification or certification of technologies. The clearest role for ITRC would be to take technical and detailed information generated for the STEPP program and boil it down to more readily consumed guidance material/documents tailored for state regulators and other interested stakeholders. An example provided was to take an ASTM standard developed through the STEPP initiative and develop a “desktop-ready” guidance document for state regulators. In addition, ITRC regularly develops and delivers both online and in-person training for their members. Providing this service could augment the information dissemination purpose of developing guidance documents.

ITRC works through teams based upon proposals submitted to the Council and approved by the nine-member Board of Advisors. In a typical year, between eight and ten proposals on technical topics are approved. Once a proposal is approved, a team is formed that can be small or large in scale. The team then works to meet the goals and deliverables outlined in the approved proposal, and once the effort is completed, the team is disbanded. Figure 2 illustrates the life cycle for a typical project.

Stormwater-related issues are of high interest to ITRC members, as evident by the ongoing stormwater-related project as well as the fact that three of eight proposals submitted for next year have a focus on stormwater issues. While none of these proposals were selected, ITRC staff suggested that additional opportunities to address stormwater management issues are likely to surface within the year. The current stormwater-focused project is focusing on identifying best methods for the evaluation of

pollution-reducing capabilities and verifying the performance of SCMs for regulatory compliance<sup>2</sup>. This project is directly related to issues covered by STEPP and the team includes members from the STEPP Work Team and Consortium Group.

#### Development of Memorandum of Understanding Considerations

Rather than developing a robust MOU between ITRC and the STEPP program, it was suggested by ITRC staff that a more general and “lean” MOU be developed that allows for the flexibility of adding specific items by targeting specific products and work elements that could be proposed to ITRC to meet the growing demands of the STEPP program as it matures. ITRC could not commit to MOU items at the time of the meeting; however, some specific items were presented for consideration that would be refined in the future. These items included the potential for ITRC to:

- Provide staff-level engagement with volunteer engagement depending upon current projects approved by the ITRC Board of Advisors
- Collaborate with STEPP stakeholders to develop and submit proposals related to the STEPP program, such as guidance documents and trainings related to topics of interest for STEPP stakeholders
- Identify and support training opportunities related to STEPP program
- Engage with state regulators to promote the STEPP program as it evolves and matures
- Provide outreach to other stakeholders with an interest in stormwater-related issues, such as the Department of Defense and private sector industry groups who are members of ITRC

It should be noted that there was a discussion regarding concerns on the topic of intellectual property associated with products developed and made freely available. No resolution was found on this topic; however, it is a topic that likely will need to be addressed within the context of the STEPP program initiative in the future.

#### Washington State Department of Ecology – Technology Assessment Protocol – Ecology (TAPE)

##### Background on TAPE

The TAPE program is the one Manufactured Treatment Device (MTD) field evaluation and verification program in the United States, and has been in operation since the 1990’s. There are 13 separate MTDs holding Basic Treatment (TSS removal) General Use Level Designations (GULD) that allow unlimited installations to meet new and redevelopment criteria. Many of these also hold GULDs for Dissolved Copper, Dissolved Zinc, or total Phosphorus removal. In addition, there are 17 more MTDs at some stage in their monitoring and submittal process. TAPE has a proven set of monitoring and reporting protocols that are familiar to stormwater treatment manufactures. The Washington State Department of Ecology provided funding to the Washington Stormwater Center to provide technical support for the TAPE program through June 30, 2021.

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<sup>2</sup> More information on this project can be found at: <https://www.itrcweb.org/Team/Public?teamID=72>

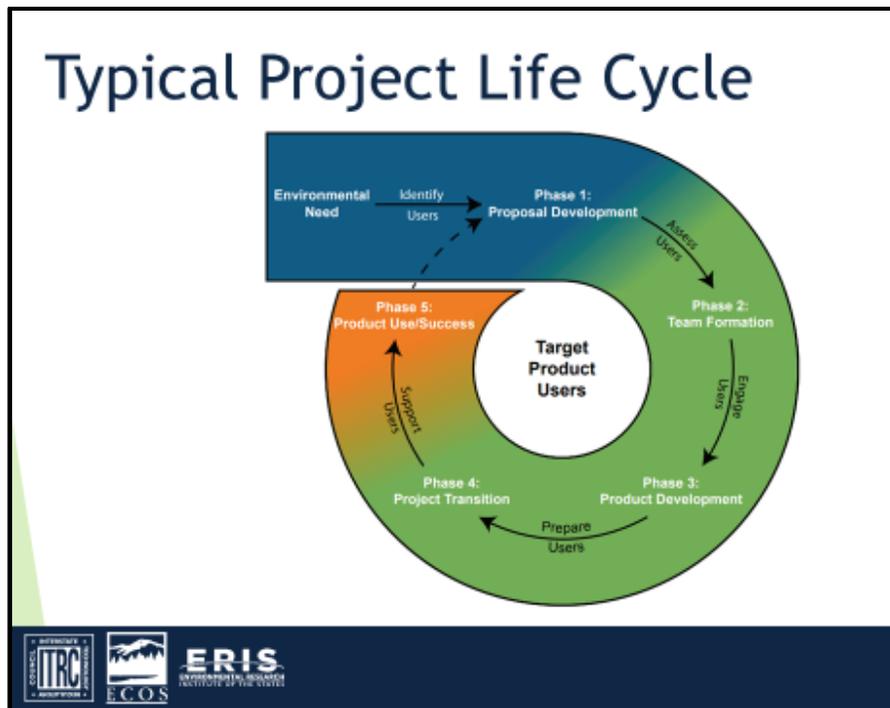


Figure 2 - Interstate Technology Regulatory Council Typical Project Life Cycle (Source: ITRC)

### Discussion on Role with STEPP Program

The role of the TAPE program with respect to the STEPP program initiative has been clearly outlined in the Consortium Group document. Specifically, these activities include leveraging of the existing field testing and verification protocols developed for the program, sharing of technical resources, such as TAPE Board of External Reviewers (BERs), and the “borrowing” of credibility provided by the association of STEPP to the TAPE program that will facilitate the potential for a broad network of states and municipal governments who currently look to the TAPE program for product performance verification.

Ecology staff also clarified that Ecology certifies stormwater products and practices based upon the verification review administered by the Washington Stormwater Center, which is affiliated with the University of Washington. The relevance of this is that these additional institutions will need to be included in the STEPP program in future engagements. Additionally, this distinction between the verifying body and the certifying body was made to underscore that the STEPP program will work in the verification space, but that certification should be left to state and local governments. It was highlighted that the New Jersey program has a similar distinction with verification provided by NJCAT and certification provided by NJDEP.

A recognition was made that the protocols already established and utilized in the TAPE program should accelerate the development of ASTM standards. In addition, the potential to develop a standard for the establishment of a field testing facility/site may be helpful in increasing the population of testing facilities around the country. Input and guidance from the TAPE program may be crucial for this standard development, and the STEPP program can help to promote the establishment of additional testing facilities by leveraging the network the STEPP program will create across the country. It was

noted that some protocol elements may be updated and/or refined or otherwise altered as the protocols go through the standards development process.

Policy issues were highlighted for consideration. One example is the need for a review and a “grievance process” for product representatives who may protest the verification results produced through testing and evaluation in the STEPP program. It was noted that the NJCAT process provides a good model for this that should be considered for adoption into the STEPP program. Specifically, this process has two components. The first component is a competitive peer review process, which allows for peer review of verification reports prior to certification in the NJCAT/NJDEP program. The second component is a grievance process, which allows a representative of a tested product to protest or challenge outcomes or information associated with their own products. This second component occurs at the board level. Some expressed concern that the “peer review” component may allow for parties to “game” the process to unnecessarily delay the verification of products leading to extended time frames to complete the verification process.

Another issue raised was the need for an understanding of the relationship between the number of storm events sampled and the confidence in product or practice performance. It was suggested that some initial work in this area had been performed by a Work Team member, but that additional research would be needed to formalize a process or protocol that could be used to associate these two elements (number of storm events sampled, product performance confidence). This process could be captured in a guidance document developed through the STEPP program with the hope that this type of guidance document could aid state and local governments as they develop policies related to certification of stormwater products and practices.

Lastly, it was stated that the TAPE program will continue to function while the STEPP program matures and has been shown to be a program with long-term sustainability. During this maturation, engagement between STEPP and TAPE will be needed to flesh out details regarding programmatic details such as revenue, expenses and program structure/framework.

#### Development of Memorandum of Understanding Considerations

As with other organizations at the meeting, Ecology could not commit to a list of items to be included in an MOU document; however, it was made clear that Ecology supports the development of an MOU to formalize the relationship between the TAPE and STEPP programs. Future engagement on the details related to such an MOU will include the University of Washington. Some specific items were presented for consideration that would need to be refined in the future. These items included the potential for TAPE to:

- Engage with STEPP Work Team and Consortium Group actively and regularly
- Work with STEPP program to aid in the development ASTM standards for field testing and evaluation activities as well as the establishment of a field testing facility/site
- Consider leveraging Board of External Reviewers (BERs) for involvement in the STEPP program
- Share technical expertise and documents, such as Quality Assurance Project Plan (QAPP) template and technical review reports that can be used as models as the STEPP program matures

- Share programmatic and budgetary information with the STEPP program for the purpose of furthering the business and programmatic planning for the STEPP program

## The Water Research Foundation (WRF)

### Background on WRF

WRF is a leader in research in the water sector, and this organization has provided leadership in the stormwater sector well before the STEPP initiative began. Specifically, WRF coordinated a coalition of agencies, including the U.S. EPA, the American Society of Civil Engineers (ASCE), the Federal Highway Administration (FHWA) and the American Public Works Association (APWA), to manage and enhance the International Stormwater BMP Database. Additionally, WRF has, along with WEF, developed the Leaders Innovation Forum for Technology (LIFT) program, which seeks to drive the development and adoption of innovative technologies in the water space as well as provide forums for policy and information transfer within the sector on the role of innovation development.

### Discussion on Role with STEPP Program

The role of WRF in the context of the STEPP program centers around two areas; the International Stormwater BMP Database (“BMP Database”), and the LIFT program. Specific discussions regarding these two areas focused on the consideration of expanding programs to meet the needs of the stormwater sector as well as facilitate the ability of the STEPP program to develop and progress. It was suggested that a module could be added to the BMP Database specifically to meet the needs of the STEPP program to store critical data and metadata on testing and evaluation results among other data elements. It was noted that the current status of this database addresses proprietary stormwater products (referred to as “Manufactured Treatment Devices” (MTD) in the database) as a single category with limited information regarding testing protocols utilized. Considering these conditions, the effort to address updates will likely be significant and require additional funding.

Similarly, it was suggested that the LIFT Test Bed network could be modified to include stormwater facilities in the context of establishing additional new STEPP testing facilities. In addition, WRF could work with STEPP program stakeholder to identify and collaborate on important research questions and topics. For example, WRF could work with members of the STTC to explore research-oriented areas of investigation on topics related to O&M and long-term performance.

### Development of Memorandum of Understanding Considerations

WRF has envisioned a number of specific MOU items, but as with other organizations, they were not ready to commit to these items at the time of the meeting; however, some specific items were presented for consideration that would be refined in the future. These items included the potential for WRF to:

- Engage with STEPP Work Team and Consortium Group actively and regularly
- Investigate the ability to leverage the BMP Database by adding a module specifically to meet the needs of the STEPP program
- Explore the ability of the LIFT Test Bed network to support the formation of additional STEPP testing site/locations

- Collaborate with members of the STTC to evaluate research needs associated with O&M and long-term performance of stormwater products and practices

## Water Environment Federation (WEF)

### Background on WEF

WEF is a recognized leader in the Clean Water sector, and the stormwater field, specifically. By hosting an annual conference on stormwater, the Stormwater Congress at WEFTEC, publishing a periodical focusing on stormwater, *World Water: Stormwater Management*, and launching an entity focused entirely on the stormwater sector, the Stormwater Institute, WEF has provided, and continues to provide, leadership in the stormwater and wet weather sector. Regarding STEPP, WEF began the STEPP initiative in 2012 and has shepherded the development of documents and sector support since that time.

### Discussion on Role with STEPP Program

Considering the effort by WEF to champion the STEPP program initiative, it is reasonable that WEF envisions a leadership role in the context of the STEPP program and its governance structure. The discussion led by WEF staff laid out a vision for WEF to continue in the role as administrative lead along with sector promotion as well as regulatory engagement. WEF has led the development of two documents, a webcast, and numerous presentations dedicated to the STEPP program initiative and associated issues and topics. In addition, WEF has developed a website dedicated to STEPP, which is a repository of meeting agendas and other publications and items of interest.

### Development of Memorandum of Understanding Considerations

As with other organizations at the meeting, WEF has considered a number of specific MOU items. However, as with other organizations, WEF could not commit to specific items, but items were presented for consideration that would be refined in the future. These items included the potential for WEF to:

- Continue to lead the STEPP program initiative via administrative support
- Engage directly with Washington and New Jersey testing and evaluation programs to gain detailed insights on the STEPP program development as well as coordinate with leadership within these programs on the activities and budget associated with the STEPP program and related elements
- Provide leadership in engagement and outreach to state regulators and local officials who have an interest in the STEPP program initiative goals
- Lead efforts to raise funds through a variety of avenues including grants and philanthropy organizations
- Continue to identify regional programs and initiatives focusing on stormwater testing and evaluation, such as the State of California and Regional Water Boards, to grow the reach of regional partners supporting the STEPP program initiative
- Continue to promote the STEPP program through the WEF SWI network and publication vehicles
- Leverage experience gained from establishing the National Green Infrastructure Certification Program (NGICP) to aid in the development of STEPP as a national or international organization

## Other Areas of Discussion

A number of additional topics were discussed with business plan development being a leading topic of interest. A key topic associated with the business planning is the source or sources of revenue. Options discussed at the meeting included:

- MS4s paying fees for access to STEPP-approved information
- Heavy focus on the sector who will receive most of the benefit – the product manufacturers – by requiring initial fees for verification from STEPP (and certification from state or local jurisdiction) with ongoing/regular fees (perhaps annual) for re-verification/re-certification
- Recognize that products listed on a website as “STEPP verified” is conspicuous, so payments should be considered for approved/verified products in the form of paying for “advertising” their products
- There needs to be a firewall in place between vendors who pay and verification/certification budget, which is a feature both of the WEF National Green Infrastructure Certification Program (NGICP) and the TAPE program. This separation ensures that conflicts of interest, either real or perceived, do not occur
- There is a need for initial funding to seed the STEPP program in the near term

It was recognized that input from both the TAPE and NJCAT programs regarding revenue, expenses, and business planning overall will be crucial to the development of a business plan for STEPP. It was also recognized that the initial business plan framework included in the 2014 WERF report showing that the STEPP program could be profitable by the third year of operation is probably unrealistic, and that it is common for a program like STEPP to not show profit for 5-6 years. One reason for this is due to the large upfront investment in staffing resources required to get a program like STEPP up and running – this lesson was learned by WEF as they have developed and grown the NGICP program. Related to business planning is the need for a market analysis regarding demand for product and practice verification and/or certification. An action identified as having high priority was the quantification of market size now and in the future as it relates to revenue for the STEPP program. It was agreed that more work was required on the business planning effort and that a follow-on meeting should be set up to develop a pathway to developing this plan.

Another topic discussed at length during the meeting focused on the number of storm events needed for statistical significance and/or confidence in product or practice performance. A related issue discussed was the concept of developing a single standard for data collection associated with field testing and evaluation rather than a series of standards based upon geographic, physiographic or eco-regions. Related to this would be the concept of a base level of data collection required in a verification effort, with no prescriptive information related to certification at all. An area of agreement on this topic was the need for research funding to develop a deeper understanding of the relationship between data sample size for storm events and the statistically-defined level of confidence associated with product or practice performance. An idea was suggested that the STEPP program could develop guidance based upon this type of research, which could be referenced in ASTM standard on the issue of data collection for field testing and evaluation. The significance of this issue is related to the cost and time required for stormwater product or practice testing and evaluation. A central tenant of the STEPP initiative is the need to reduce testing/evaluation time and costs in order to drive further innovation in the sector as

well as providing greater opportunities to responsibly drive new and emerging technologies to the market and into implementation.

A last area of discussion was on the need to identify other organizations and/or sector to be engaged in the future as STEPP matures. Potential partners not yet engaged with STEPP that were identified in the meeting include DOD, transportation departments, AASHTO, FHWA, APWA, U.S. Conference of Mayors, NACO, the Mayors Innovation Project, NLC, and those representing commercial developers. Associated with partner engagement is the need to engage with states. It was recognized that some states may be more interested than others to actively engage in and support the STEPP program initiative. Those groups most closely aligned with state regulators suggested that an outreach strategy should be developed to target those states that would be most supportive in order to gain support of a critical mass in a more efficient manner. The bottom line is that states who do not support STEPP and will not certify products or practices associated with the STEPP program will undermine the potential success of the program – therefore, it was recognized that gaining support from at least 30 state regulatory programs is likely needed to reach critical mass in terms of market size for product manufacturers.

## Conclusion and Next Steps

The meeting covered a lot of topics and found areas of agreement and common interest upon which to progress in the future. Initial MOU items were identified for all Consortium Group partners with the understanding that these lists will need to be refined, vetted internally, and approved by each partner before the MOUs are finalized. Clarity on the roles for Consortium Group partners was gained and enhanced understanding on key difficult issues was found, such as the time required to develop an ASTM standard and a strategy to address the number of storm events needed within a field testing and evaluation effort. A listing of a summary of areas covered by each Consortium Group partner is shown in Figure 3.

A list of future efforts and activities were identified during the meeting, including:

- Business plan development
- Finalization of MOUs
- Research funds to address number of storm events question
- Development of a market analysis to determine quantified understanding of demand for STEPP-related services
- Development and deployment of an outreach/engagement strategy targeted state regulatory programs
- Engagement with philanthropy entities to identify potential funding sources to aid in the launch of STEPP program
- Begin ASTM standards development for TAPE and NJCAT protocols

Future engagement discussed include WEFTEC 2018, where an open/public meeting will be held to share updates on the effort as well as a closed meeting for Work Team and Consortium Group members only to maintain momentum on the progress gained from this meeting. A second in-person meeting opportunity is the WEF Stormwater and Green Infrastructure Symposium being held in Ft. Lauderdale,

Florida on May 5-6, 2019. In addition, regular engagement in the form of calls/web-based meetings will be needed to address the list of identified areas of focus.

STEPP Program Consortium Partners					
WEF	WRF	ASTM	ITRC	WA-TAPE	NJ-CAT/DEP
<ul style="list-style-type: none"> <li>• Governance</li> <li>• Administrative Support</li> <li>• Leadership</li> <li>• Regulatory and Sector Engagement</li> <li>• Promotional Support</li> </ul>	<ul style="list-style-type: none"> <li>• Database Support / Management</li> <li>• Innovation Support</li> <li>• Project Management</li> </ul>	<ul style="list-style-type: none"> <li>• Preliminary and Ongoing Technical Standards Development</li> </ul>	<ul style="list-style-type: none"> <li>• Guidance Development</li> <li>• Training Support</li> <li>• State Regulatory Outreach and Engagement</li> </ul>	<ul style="list-style-type: none"> <li>• Provides Basis for Field Testing Protocol</li> <li>• Technical Assistance</li> <li>• Country-wide Recognition and Acceptance</li> </ul>	<ul style="list-style-type: none"> <li>• Provides Basis for Lab Testing Protocol</li> <li>• Technical Assistance</li> <li>• Country-wide Recognition and Acceptance</li> </ul>

Figure 3 - STEPP Program Consortium Partners Coverage Areas/Tasks