



A SUMMARY OF STORMWATER PROCEEDINGS AT THE
2018 P3 WATER SUMMIT

Public-Private Partnerships: A New Solution for Age Old Stormwater Problems?

May 2018



A white paper on public-private
partnerships for stormwater

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Glen Lake in Michigan (Image: Sanjiv K. Sinha, ECT)

Introduction

The American Society of Civil Engineers (ASCE) estimated in 2012 that U.S. water and wastewater infrastructure needs will equal approximately \$126 billion by 2020¹. ASCE anticipates only \$42 billion will be available to meet those needs, meaning public agencies will need to find an additional \$84 billion in funding to keep water infrastructure performing nationwide². That anticipated gap was apparent (and understated with respect to stormwater) at the second annual P3 Water Summit, held in San Diego, CA on April 3-5, 2018, according to Ken Susilo, Senior Principal with Geosyntec. Susilo observed that participants from across the country expressed interest—at overflowing roundtables and well-attended panels—in finding innovative solutions to stormwater issues, including receiving water quality improvements, pollutant control/compliance, flooding, and groundwater recharge. Public agency participants said they anticipate funding for such programs and projects to further dwindle (e.g., states like California are already severely impacted), so they are increasingly interested in opportunities to partner with the private sector. Recent watershed planning efforts (in southern California) have revealed multi-billion dollar needs for addressing stormwater issues³.

Focused on more efficient delivery that can lead to significant cost savings, public-private partnerships (P3s) offer long-term solutions that can provide a variety of benefits. They can create scalability, transfer delivery risk, create efficiencies that can reduce gaps between revenue and needs, and introduce broader policy goals and objectives important to the community through stormwater projects and programs. P3s have been widely used in Europe and Canada. In the United States, P3s have long been used in the transportation sector and over the past 15 years, nearly \$25 billion worth of projects have been completed using P3 models⁴. A new form of P3, one focused on community co-benefits, is gaining in popularity due to its ability to efficiently deliver large-scale, distributed green infrastructure. This includes a community-based P3 (CBP3) that has been successful in the Mid-Atlantic (Chesapeake Bay) region⁵.

¹ Failure to Act; The Economic Impact of Current Investment Trends in Water and Wastewater Treatment Infrastructure (Rep.). (2011). Retrieved April 16, 2018, from American Society of Civil Engineers website: https://www.asce.org/uploadedFiles/Issues_and_Advocacy/Our_Initiatives/Infrastructure/Content_Pieces/failure-to-act-water-wastewater-report.pdf

² *ibid*

³ Recent planning efforts reported by cities in Southern California, including Los Angeles and San Diego, 2018.

⁴ McNichol, D. (2013). The United States: The World's Largest Emerging P3 Market (Rep.). AIG.

⁵ <https://thecleanwaterpartnership.com/>

Understanding the Opportunities and Challenges of Implementing Stormwater P3s

Despite potential promise, stormwater P3s face numerous uncertainties and challenges. To identify which specific obstacles and benefits exist for stormwater P3s, Geosyntec Consultants convened two panels at the 2018 P3 Water Summit. These panels included experts in P3 financing, development, execution, and legal and regulatory issues, along with representatives from public agencies in California who see opportunities for P3s in their jurisdictions. The first panel focused on defining and measuring metrics, transferring risks, developing financing structures, and strategies for monitoring P3s for benefits and issues. The second panel focused on linking specific metrics to various project or program delivery mechanisms, as well as lessons learned from stormwater P3 projects from around the country. A third panel about stormwater P3s addressed specific benefits of pay-for-performance contracting in Chesapeake Bay, Maryland.

This white paper summarizes key takeaways from these three panels and provides additional details based on resources and information the panelists shared during their discussions. The following list summarizes the key takeaways and outlines the sections of this white paper:

- **P3s need to be better defined, understood, and promoted.** A clear definition of P3s is badly needed. Accordingly, national or regional experts who can clearly articulate their benefits and costs can help reduce obstacles to P3 adoption, and where appropriate, increase the likelihood that they are used successfully to solve stormwater problems. It was noted that the term “P3” is often confused with privatization (where a public agency gives up control of an asset) and may have counter-productive connotations in the public discourse.
- **P3s are not one size fits all.** There are many different types of P3s in application, and they vary widely in cost, duration, scope, and political goals. Local jurisdictions looking for stormwater solutions should consider approaching problems and solutions holistically, customizing points of emphasis according to specific needs and opportunities. P3s themselves represent gradations of a subset of project delivery approaches. For example, some of the approaches discussed in this paper are market-based but are not technically P3s. This flexibility presents an opportunity and also a challenge in definition and understanding.
- **Stormwater P3s are ramping up in California (and elsewhere in country).** The State of California and local California jurisdictions are now carefully looking to implement successful P3s in the stormwater sector. California Stormwater Quality Association (CASQA) members, the California State Water Resources Board, and cities and counties in California are encouraging the use of P3s and are prepared to implement them soon.
- **Existing stormwater P3s are working.** The few stormwater P3s that have been implemented in the Mid-Atlantic (Chesapeake Bay) are providing lessons learned and are proving that P3s can be highly effective for large-scale stormwater programs, often providing social equity and economic benefits.
- **Stormwater P3 metrics are varied.** The metrics necessary to track and measure the effectiveness of stormwater P3s differ based on short-term and long-term needs, regulatory uncertainty, stakeholder interests, and costs versus benefits.

P3s Need to be Better Defined, Understood, and Promoted

The term P3 evokes preconceived notions, and according to Seth Brown, Principal of Storm and Stream Solutions, there are various interpretations of what P3s are and how they can be used for a project or program within a community. As a U.S. Environmental Protection Agency (EPA) contractor who provides policy and infrastructure analysis in the stormwater sector, Brown is working with the EPA to provide communities with technical assistance to determine how to apply the CBP3 program approach. Stormwater is a new and nascent sector for P3s, and there is interest in the potential for P3s to drive larger-scale investments in integrated green stormwater infrastructure, but there are also varied perspectives on how they function, and which situations public agencies could, or would want to, use them.



Malibu Legacy Park (Image: Ken Susilo, Geosyntec Consultants)

Partly due to this lack of definition and general knowledge, P3s are often a community's last resort for getting a project off the ground. According to Edward Fanter, a member of Deloitte's Infrastructure Advisory, "P3s aren't on the table at the very beginning." Agencies typically have a defined process for project delivery, and they only consider P3s when they face

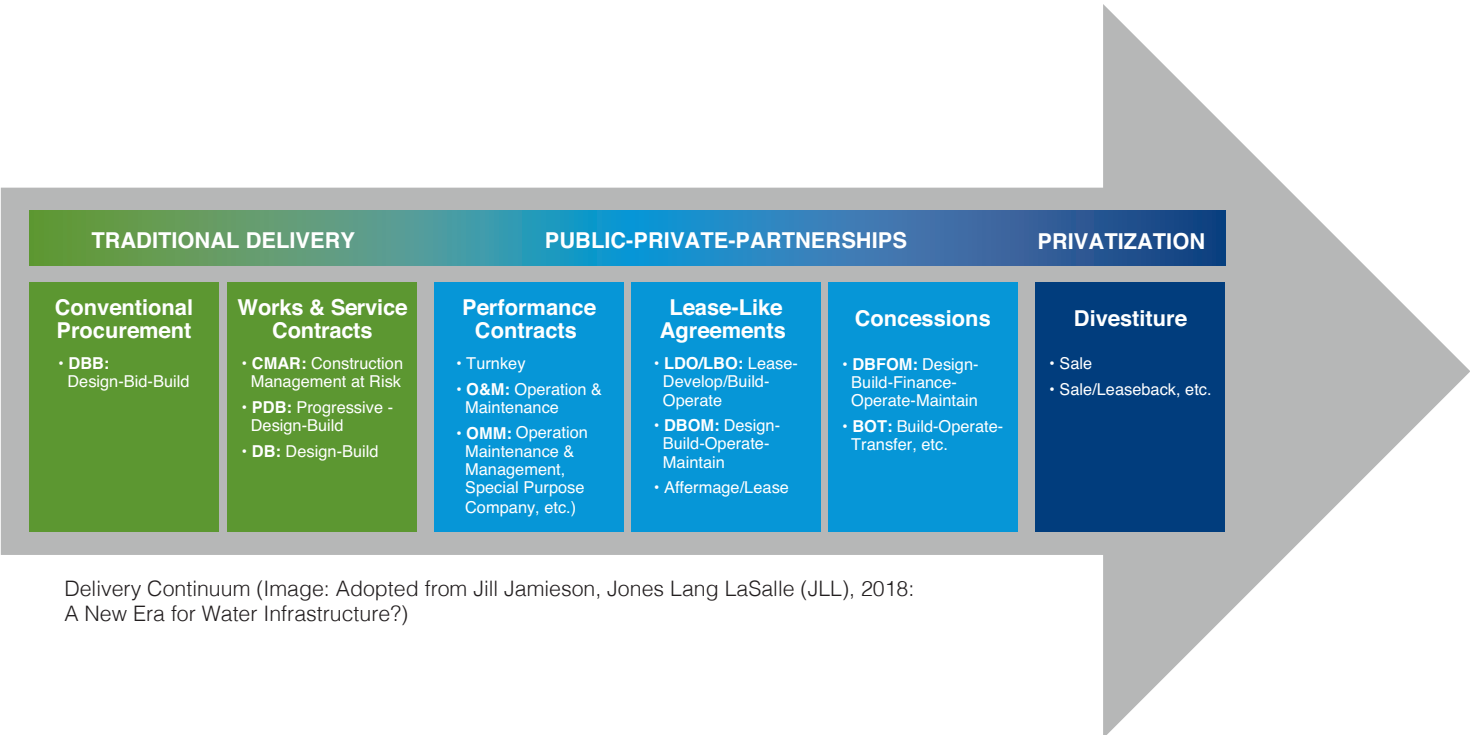
major problems. Until every financing and delivery option has a "seat at the table" during the feasibility stage and P3s are a part of an agency's usual cost-benefit evaluation, or value-for-money analysis, Fanter said, "P3s will be slow to take off."

Sanjiv Sinha, Ph.D., a Vice President at ECT and Program Director of the P3GreatLakes Initiative that evaluates and leverages water sector P3s in the Great Lakes Basin, said, "Because P3s are better suited for complex, multi-year or multi-decade programs, they require resources and patience to develop." Accordingly, he considers it important to: a) work directly with local decision makers who can advance these programs; b) clearly communicate the concepts to local leaders; c) ensure that decision makers are aware of relevant P3 successes (because not all P3s are alike); and d) make sure communities (and leaders) know about the potentially significant cost-savings and community co-benefits. This theme carried over from roundtable discussions led by Susilo, earlier during the conference where many participants said they were not familiar with the specifics of P3s and were interested in learning more.

Strong P3 advocates who understand when a P3 can be structured to provide an effective solution to a challenge and who communicate effectively can help to overcome P3 perception issues and their lack of inclusion in project delivery approaches. Dr. Jacqueline Ashmore, Executive Director of Boston University's Institute for Sustainable Energy, says "the hesitation of public-sector leaders to consider whether P3s are a good delivery option that present a high benefit-cost case is both a challenge and an opportunity." More P3 champions will drive their implementation in communities, but they need to understand what P3s are and what they offer.



Malibu Legacy (Image: Ken Susilo, Geosyntec Consultants)



Delivery Continuum (Image: Adopted from Jill Jamieson, Jones Lang LaSalle (JLL), 2018: A New Era for Water Infrastructure?)

In Prince George’s County, Maryland, Adam Ortiz, the Director of the Department of Environment for the County government created a vision with clearly articulated goals and values that the County wanted to obtain and to track through measurable key performance indicators (KPIs). That leadership and clear vision led to a successful P3 where the community understood all the tangible benefits of the P3, and the County has a clear path towards meeting its regulatory requirements, as well as achieving broader policy goals and objectives important to them. This turned community members’ stormwater utility fees into an investment rather than a tax.

Greg Cannito, the Managing Director of Corvias Group, the firm responsible for implementing the Prince George’s County, Clean Water Partnership, said, “The biggest barrier is a lack of balance of concepts, such as delivery, risk transfer, community goals and objectives, regulatory compliance, and accountability. Stormwater impacts communities in many ways.” The ability to talk about stormwater binds a community and improves it. Then the community can move forward with a plan that has broader outcomes and benefits for its members. Prince George’s County has been successful because they articulated their vision and goals in a way that the community understood how stormwater achieves them.

P3s Are Not One Size Fits All

There are many approaches to project delivery, and stormwater P3s are a newer, alternative approach. Agencies often lead projects based on financing, but Brown said we need to think about delivering projects as assets to securitize and finance. The goal, he said, should be to find the most holistic approach to project delivery, where the community is at the center.

- Environmental Impact Bonds (EIBs) are a popular financing tool, but they are not designed to address project delivery. EIBs can be a catalyst for green infrastructure or can be used to test new technologies, but they do not manage risk or create project delivery efficiencies and scale.
- Design-build approaches are sometimes considered “light” versions of P3s, but whether they are true P3s is debated. Tax laws and related funding restrictions can limit what agencies can do to raise funds for and deliver projects that address stormwater needs.
- The CBP3 program approach is holistic because it focuses on the overall needs and goals articulated by communities, such as creating and sustaining job creation, supporting small business development, and other related social and environmental goals that go beyond mandated regulatory compliance.¹

Along the same theme, Fanter emphasized that P3s do not fund projects. While P3s provide private capital, that capital is still repaid from government payments and/or user fees. However, P3s do transfer risk, whether for construction, operations, or technology, and the private sector provides expertise to deliver a project that performs as planned.

Private capital is more expensive, so Fanter said, “The innovation provided by a P3 should generate enough savings for the agency to overcome its cost.” The basic element in deciding whether to use a P3 is if the value of risk transfer and construction and operations savings is worth the higher cost of capital. There have not been many true P3s in the water sector that

could frame what a stormwater P3 should look like. Some have been private development models, and some have been privatizations. It is recognized that privatization for stormwater is generally not viable. It will be difficult to structure a P3 around revenue-based stormwater rates, but the public sector will most likely see an availability payment in stormwater. “The structure,” Fanter said, “will vary by project.”

There is still uncertainty surrounding P3s and stormwater P3s since few have been successfully implemented to date. Also, hydrology, green infrastructure performance, and anticipated pollutant loads are unique stormwater challenges that limit the type and scope of P3s available to their needs.²

As the public and private sectors wait for results, the most important steps they can take are to understand their project goals and communities’ needs. Then they can use that knowledge to determine whether P3s offer the necessary value they require for the cost—where value may be measured by a set of metrics that go beyond pure financial measures. The more a community can define its desired goals and outcomes, the better the private sector can scope the value created through a P3 to allow the public partner to measure the cost-benefit of any revenue commitment.



Mill Creek Wetlands (Image: Lewis Operating Group, Ontario, CA)

¹ Susilo, K. (2017, March 2). Performance Based Infrastructure and Public Private Partnership (P3) Solutions for Water Resources and Stormwater Quality. Lecture presented at City and County Engineers Association Meeting, Monterey Park, CA.

² ibid

Stormwater P3s Are Ramping Up in California (and Elsewhere in the U.S.)

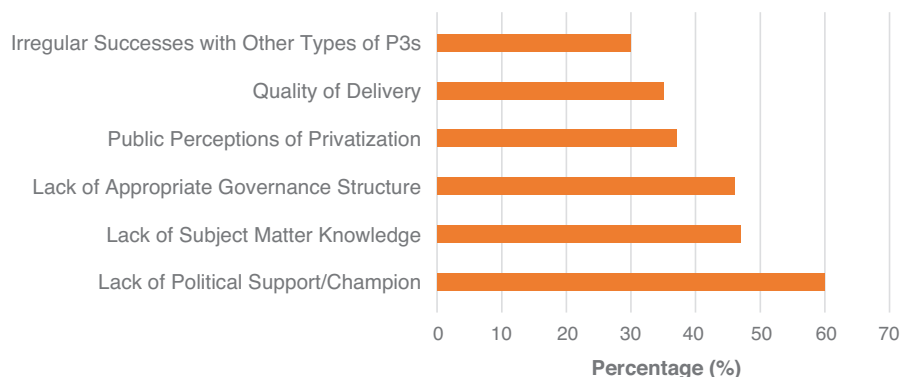
Geoff Brosseau, Executive Director of CASQA, asked CASQA members about their knowledge of and interest in P3s. Eighty-three municipalities responded to a 10-question survey and indicated they are interested in P3s for meeting stormwater project needs. Brosseau said municipalities are looking for assistance with implementing stormwater resource plans and with meeting TMDL and regulatory requirements. Construction schedules, long-term performance, water quality compliance, and cost surety from contractors top their list of needs from potential P3s. Most municipalities that responded said they would measure success by volume of water treated, runoff reduced, pollutant loads reduced, or surrogate measures of retrofitted acres.

Despite their interest and anticipated needs, respondents said there are numerous obstacles that will prevent them from successfully testing and implementing P3s. They see a lack of political support, limited public understanding, and governance structures, as potential impediments to using P3s for stormwater projects. To be successful, P3s should be considered among many project delivery approaches; each jurisdiction should identify a strong project champion; and the community should be informed about the process and invested in the project's outcomes.



California County Map (Image Sources: ESRI, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, ESRI Japan, METI, ESRI China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community)

Concerns About P3 Implementation



CASQA survey respondents say they are most concerned about a lack of political support when considering P3s. (Source: CASQA)

In California, the State Water Resources Board is supportive of P3s and other market-based approaches and sees opportunities for improved water quality compliance through their use. Jon Bishop, the Chief Deputy Director of the State Board, said he sees alternative compliance programs (ACPs) as a particularly promising market-based strategy (though not a true P3). Bishop said, “The State Board issued a precedential order endorsing ACP as a good idea and encouraging every jurisdiction to adopt some version of ACP.” The order also outlined methods and metrics for meeting water quality requirements through a watershed management plan (WMP), enhanced watershed management program (EWMP), or an equivalent master plan (e.g., Water Quality Improvement Plan).

A WMP includes a series of Best Management Practices (BMPs) that can demonstrate through a reasonable assurance analysis (i.e., modeling) that water quality standards will be met. Interim milestones are required to check progress and compliance, and projects must be monitored for effectiveness and reassessed against the goals over time. For an EWMP, in some areas only milestones and monitoring are required. An EWMP does not require a reasonable assurance analysis in the entire watershed because all water from an 85% storm event is captured and reused. A key determination must be made, stating that through a reasonable assurance analysis, we

can establish that MS4 discharges are consistent with attainment of water quality standards.¹

The State Board’s goal is to support alternative approaches to achieving water quality standards and stormwater requirements. Bishop also noted that in addition to ACPs for municipal compliance, an analogous approach is under consideration for industrial stormwater permittees.

Kris McFadden, Director of the Transportation and Storm Water Department for the City of San Diego, is overseeing the completion of watershed master plans for watersheds in the City’s jurisdiction. Kris said, “About 10 years ago the City started to strategize ways to find more funding for capital projects, since the department spends \$70-80 million annually on 900 miles of storm water assets across six watersheds.” Looking more holistically at water quality, drainage, and habitat restoration issues, the department estimated it needs \$3.52 billion through Fiscal “Year 2015” to meet its flood risk management and storm water compliance needs, so questions have been raised about how to generate value for the cost and strategies to reduce the amount of funding required to make these improvements and achieve compliance targets.

McFadden’s department is nearing completion of its first watershed master plan, which compiles detailed information down to the storm drain inlet scale, so the

¹Susilo, K. (2015, October 19). Feeling Reasonably Assured? Potential Spending of \$Billions Based on Model Studies. Lecture presented at CASQA Annual Conference, Monterey, CA.

City can comprehensively understand where flooding and pollutant loading occur and can strategically place BMPs to address those issues. The results identified a variety of opportunities for BMPs, Multi-Use Treatments Areas, and stream restoration mitigation sites. The next step is to partner with other agencies, the private sector, and regulators to find cost-effective strategies for implementing these projects.

Robb Whitaker, General Manager of the Water Replenishment District of Southern California, said there are additional opportunities to use stormwater more effectively in Southern Los Angeles (LA) County that offer several potential benefits. For example, only 10% of stormwater in the LA River is currently recaptured and put to beneficial use. There is 450,000 acre-feet of storage capacity available in the groundwater basins in southern Los Angeles County that could be used to conserve stormwater runoff for the 4 million residents in the region. There is an additional 600,000 acre-feet of storage capacity that will be made available over the next 20 years through the remediation of a brackish water plume in the coastal area. Legal constraints on the use of this storage space were resolved recently, providing a new and significant opportunity to capture stormwater for storage and groundwater replenishment. There are infiltration and flood control challenges that have existed for many years without a clear resolution. P3s could provide innovative solutions to these longstanding problems.

Related to the legal constraints, there are diverse legal requirements that affect stormwater and P3s statewide. Nicole Granquist, a Partner at Downey

Brand, said the various federal, state, and regional (i.e., the National Pollutant Discharge Elimination System (NPDES) permits) regulations are the ultimate drivers for all compliance projects and can create uncertainty for project delivery. Good projects can be cost prohibitive if they are designed to meet every regulatory objective. Granquist said requirements should always be considered based on the site and on political realities for the project's success. There are third party Clean Water Act litigation risks, and in California, for example, there are additional regulatory requirements outlined in the Porter-Cologne Act of 1969. Compliance assurance and shared risk are key potential benefits that P3s could provide to public agencies.

Granquist described the Pure Water Monterey project in Monterey, California where two public agencies—the Monterey Peninsula Water District and Monterey One Water—jointly developed an Advanced Water Treatment Plant to recycle wastewater, stormwater, and food industry water to provide purified potable water for domestic and agricultural uses. The various industrial and agricultural land uses in Salinas, California, were struggling to meet water quality standards individually and could not afford to build their own treatment plants. They turned to the regional public agencies to build the treatment facility, with the promise to purchase the purified water to meet their water and water quality compliance needs, thus demonstrating yet another way to apply P3 concepts to a unique public-private problem.



Freshwater Marsh in Playa Vista, CA. (Image: Ken Susilo, Geosyntec Consultants)

Existing Stormwater P3s are Demonstrating Successes

The Pure Water Monterey project in Monterey, California and the Clean Water Partnership in Prince George's County, Maryland offer many insights into what is necessary for a P3 to be successful. Prince George's County has been (and continues to be) largely successful, according to Cannito, because the County was empowered by clearly understanding the problem it wanted to solve, knowing how it wanted to solve that problem with its goals, and defining its intended outcomes in a measurable manner to ensure the necessary transparency and accountability for a government investment.



Clean Water Partnership between Prince George's County and Corvias (Image: Corvias)

Stormwater is not a “typical” asset and is different from transportation projects or pay-for-service wastewater structures. It's not a revenue generating asset, and it is becoming burdened by increasing regulations and lower municipal revenues. However, there is value and a tangible return on investment that you can architect through economic development and efficiencies, according to Cannito. That's the key behind Prince George's County's success. The partnership determined what was important to the community and its value, and they took ownership of their vision. This gave them full confidence in utilizing a P3 with the private sector to achieve their vision.

Cannito said, “The County wanted to transfer long-term risk and build local capacity, while getting residents involved and having them drive the business development behind the P3.” The County's ability to produce a tangible benefit for the community—in the form of parks, upgrades to schools and faith-based properties, and economic development—has

increased support from residents and will secure their interest in investing in the County's revenue proposition for the project.

Alternative compliance and credit trading programs are also sparking interest in implementing more market-based, and P3, approaches within the stormwater sector. Washington D.C. manages the first successful Stormwater Retention Credit Trading program, and other cities are interested in following suit. Sinha, whose P3GreatLakes team works with water sector clients to identify opportunities for P3 projects, noted that his team has proposed a stormwater credit trading program for the Greater Cleveland-based Northeast Ohio Regional Sewer District (NEORS).

Overall, these projects have all been successful or are expected to succeed because residents and community members understand the value they provide for their cost. The potential pitfalls of P3s discussed throughout this white paper—lack of knowledge, confusion with unrelated P3 models, limited political support, and reliance on P3 as a last resort—are appropriately managed in these case studies. Each jurisdiction identified a unique problem that could not be solved through traditional public investments, found a champion within the public sector to research the problem and communicate the vision, and set out to find the best possible (i.e., cost-effective and value-driven) solution to the problem from the start.

A third stormwater panel examined an example of performance-based contracting in Anne Arundel County, Maryland, which was designed to catalyze environmental markets to accelerate meeting the Chesapeake Bay clean water goals. The panel included Erik Michelsen, Administrator of the Anne Arundel County Watershed Protection and Restoration Program and George Kelly, Chief Markets Officer of RES. Anne Arundel County piloted this contracting mechanism by issuing a Request for Proposals (RFP) that emphasized “pay for performance” and “turnkey” solutions for MS4 and TMDL compliance that include perpetual easements and easy transference to the County. The RFP allowed flexible practices to achieve the overall impervious acre requirements with some limitations on implementation (e.g., had to be on private property).

Resultant costs were as low as 40% (about \$20,000 per acre) of original estimates for implementing some BMPs. The pilot drew attention to lessons learned, which included the need for detailed technical review of proposals, consideration of long-term maintenance obligations, and awareness of potential approaches to manipulate RFP terms. The project also identified some of the benefits (e.g., scalability, cost-risk transfer, market disruption, new technology, and deferred payment schedule with early implementation) and drawbacks (e.g., loss of control and potential for lowest common denominator solutions) of full delivery approaches. Based on the results on the first set of RFP responses, the County decided to pursue a second round of RFPs and is committed to at least one more round in the near term.



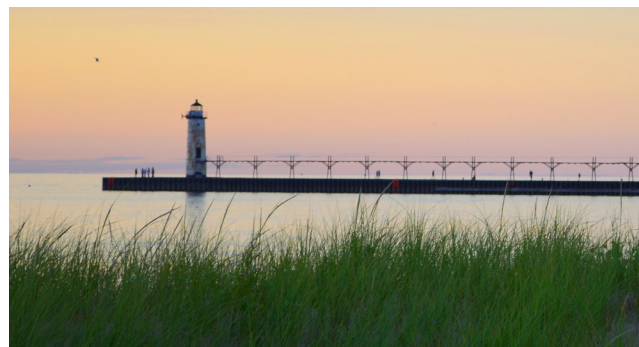
Chesapeake Bay (istockphoto.com)

Stormwater P3 Metrics are Varied

The focus of the first stormwater panel and a recurrent theme throughout the 2018 P3 Water Summit was metrics. Metrics are first and foremost driven by regulatory requirements. From CASQA members, to regulators and attorneys, to P3 developers, everyone agreed that each project must assess which regulatory metrics are driving the project purpose and devise plans to appropriately address those.

According to Granquist, the combination of federal, state, and regional requirements can create uncertainty, which requires a sophisticated and well-founded understanding of the conditions necessary to succeed. “Knowing that these requirements change at least every decade,” said Granquist, “means it is important for municipalities to remain flexible with project delivery and adjust metrics to address changing requirements.”

Dr. Ashmore said, “There has been increasing discussion of a broad array of metrics encompassing sustainability, resilience, environmental impact, community impact, cost, and risk.” Understanding which metrics are most important in a given situation and deciding how they will be measured is important in



Manistee Lighthouse (Image: Sanjiv K Sinha, www.P3GreatLakes.Org & Environmental Consulting & Technology, Inc (ECT))

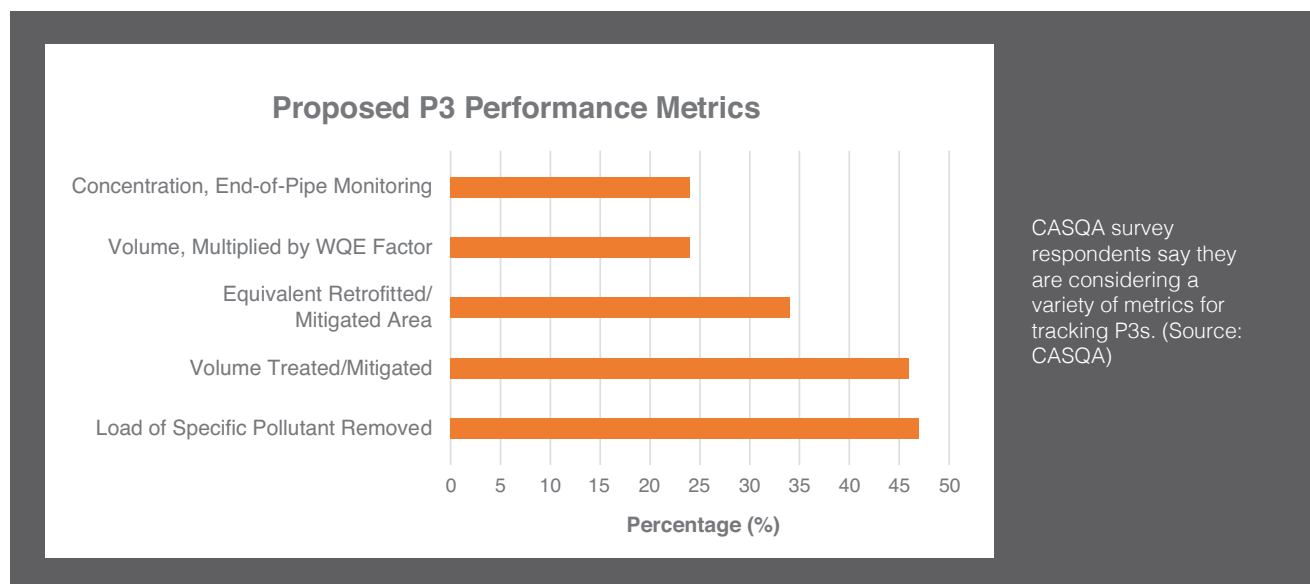
determining whether project delivery is best supported by a P3 and, if so, how the P3 should be structured, whether it's an EIB, pay-for-success, or an integrated watershed management model.

Successful P3 projects have incorporated metrics beyond compliance and project delivery. They have also included workforce development, which Brown says is significant. “Social legitimacy and being able

to hit those metrics,” he said, “is hugely important.” Brown asked why green infrastructure is considered so risky and wondered why it needs to be “de-risked.” Nature works well, and the perception that green infrastructure is risky is overplayed and overstated. He said “we need to look at scale, make progress, and complete projects.” Susilo said “there is evidence to support that green infrastructure does come with certain expected risks than can be challenging, and costly, to mitigate.”

Cannito emphasized the importance of clearly defining what performance is for your project, which makes it more predictable and thus more investable. “Performance,” he said, “is based on being

accountable for your actions and your predictions.” This clarity disincentivizes bad actors by keeping projects from fragmenting and becoming difficult to track. The detailed, inlet-scale work that McFadden’s department has done in the development of WMPs for the City of San Diego can help establish clear metrics for project delivery, including P3s. Fanter agreed with Cannito that risk is tied to the metrics. To make a project investable, it must be predictable in a way that demonstrates the risks for all parties don’t outweigh the costs. Sinha further complimented Prince George’s County’s project partners for maintaining an up-to-date, transparent website that showcases real-time performance data.



Stormwater P3s are Promising, but Uncertainties Remain

There is still uncertainty surrounding how P3s in stormwater will perform, the best ways to structure them, and how to monitor them with appropriate and meaningful metrics. There are a wide variety of project delivery approaches within and beyond P3s that communities should consider to ensure their needs are met. Geosyntec Consultants convened these panels of leading regulatory, development, financing, and legal experts and their counterparts in public agencies, to start an in-depth conversation on what stormwater P3s can do and how they can work. This white paper documented those initial discussions and viewpoints and is intended to provide a starting point for future discussions on stormwater P3s.

Acknowledgments

This white paper was made possible by the organizers of the 2018 P3 Water Summit and our esteemed colleagues who participated in the panels. We appreciate the time and effort they spent to share their experiences, ideas, and comments on stormwater P3s. The primary authors of this white paper were Leslie Stahl (Geosyntec, San Diego, CA) and Ken Susilo (Geosyntec, Los Angeles, CA).

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Jonathan Bishop has served as Chief Deputy Director at the State Water Board (<https://www.waterboards.ca.gov/>) since 2007, where he oversees Water Quality, Financial Assistance, Monitoring and Assessment, and Data Management, among other responsibilities.

Geoff Brosseau is the Executive Director of CASQA (<https://www.casqa.org/>), a statewide professional member association, dedicated to the advancement of stormwater quality management, science, and regulation. CASQA's 1,600 members include cities, counties, special districts, industries, suppliers, and consulting firms.

Seth Brown is the Principal and Founder of Storm and Stream Solutions (Washington DC, <http://stormandstream.com/>), a consulting firm providing policy and infrastructure finance analysis in the stormwater sector. Seth was a major contributor for the EPA Region III document, Community Based Public-Private Partnerships (CBP3s) and Alternative Market-Based Tools for Integrated Green Stormwater Infrastructure.

Greg Cannito is the Partnership Innovator for Corvias Group (<https://www.corvias.com/>) and solves challenges faced by public sector institutions nationwide. Greg has nearly two decades of P3 and business development experience with Federal and local government infrastructure. He was instrumental in the development of The Clean Water Partnership, addressing federal environmental regulatory requirements for stormwater management in Prince George's County, Maryland.

Edward Fanter is a member of Deloitte's Infrastructure Advisory (<https://www2.deloitte.com/>), which advises public and private sector clients on large infrastructure projects and assets. Prior to Deloitte, Edward worked in investment banking and infrastructure and has experience working on several U.S. water P3s and privatizations.

Nicole E. Granquist is a partner with the law firm of Downey Brand (<https://www.downeybrand.com/>) and manages practitioners in areas of water rights, water quality, water reuse, and endangered species. Her practice specializes in water quality, and regulatory permits and agreements for recycled water, storm water, and disposal projects.

George Kelly is the Chief Markets Officer at RES (<https://res.us/>) and is responsible for enhancing services in existing markets and expanding and developing new market sectors. Mr. Kelly has extensive experience with wetland and stream mitigation banking, conservation banking for endangered species, water quality trading and carbon offsets (i.e., agriculture and forestry), and environmental credit finance.

Kris McFadden is the Director of the Transportation & Storm Water Department for the City of San Diego (<https://www.sandiego.gov/>). As the Director, Kris oversees four Divisions: Administration and Right of Way Coordination, Traffic Engineering Operations, Streets, and Storm Water.

Erik Michelsen is the Administrator of the Watershed Protection and Restoration Program Division of Anne Arundel, County, MD (<http://www.aacounty.org/>). He is responsible for the environmental assessment, restoration implementation, and ecological evaluation work associated with the County's clean water obligations under its MS4 permit and the Chesapeake Bay TMDL. He also serves on the Maryland Water Quality Trading Advisory Committee and Chesapeake Stormwater Network Board of Directors.

Sanjiv Sinha, Ph.D., P.E., is the Project Director of www.P3GreatLakes.Org and a Vice President at Environmental Consulting & Technology, Inc (ECT) (Ann Arbor, MI, www.ectinc.com), a consulting firm that maintains 20 offices across the country. A frequent presenter on topics related to economic instruments in the water infrastructure market, Sanjiv aspires to make these ideas mainstream.

Ken Susilo is the managing Senior Principal of Geosyntec Consultants' (<https://www.geosyntec.com/>) Los Angeles operations. He has expertise in stormwater compliance, reasonable assurance analyses, integrated water resources, and alternative project delivery of green infrastructure projects.

Robb Whitaker is the General Manager of the Water Replenishment District of Southern California (WRD) (<https://www.wrd.org/>), a regional groundwater agency that provides half of the total demand for water to nearly four million residents in 43 cities within southern Los Angeles County.

Resources

Clean Water Partnership

<https://www.corvias.com/about/insights/partnership-library/municipal/the-clean-water-partnership>

EPA's Community-Based Public-Private Partnership (CB3) Resources

<https://www.epa.gov/G3/financing-green-infrastructure-community-based-public-private-partnerships-cbp3-right-you>

Pure Water Monterey

<http://purewatermonterey.org/>

P3 Great Lakes Initiative

<http://www.p3greatlakes.org/resources-for-municipalities-agencies/>

Stormwater P3s and Performance Based Infrastructure (video)

<https://www.youtube.com/watch?v=QxhwF6LL91I>

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