Alternative Financing and Delivery of Waterways Infrastructure

Task Committee on Alternative Financing for Waterways Infrastructure

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PREFACE

This report presents the interim findings of the Task Committee on Alternative Financing of Waterways Infrastructure, which was established in 2015 to evaluate the Public Private Partnership (P3) authorization included in the Water Resources Reform and Development Act of 2014 (WRRDA). This report is focused on the use of Alternative Finance generally in support of water resources related activities within the context of the U. S. Army Corps of Engineers civil works program. Its purpose is to provide information to ASCE and others about the use of Alternative Finance in our country today and what can be done to enhance its use in the future. Our society and its members have a role in leading our country towards better infrastructure through innovation, technical advice, and informing public officials about changes needed to enable Alternative Finance use in our nation.

The task committee sought broad input for its work and recruited committee members from COPRI's Waterways and Ports and Harbors Committees as well as outside groups including the American Association of Port Authorities, Illinois Soybean Association, and the National Waterways Council, Inc. Other sources of information included documentation and materials provided by USACE Institute for Water Resources, the Transportation Research Board, and the Institute for Public-Private Partnerships.

The task committee held workshops in New Orleans, New York City and St. Paul, MN, in September 2015, January 2016 and September 2016, respectively, to educate and share information on the P3 concept and discuss potential P3 opportunities for coastal harbor improvements, channel improvements, inland navigation, flood damage reduction, aquatic ecosystem restoration, and hurricane and storm damage reduction. The task committee has a workshop planned for spring 2017 on the West Coast to gain additional insights. Harvard University and the Corps sponsored two seminars (October 3, and December 6, 2016) that further highlighted the need for Federal inter-agency action to address the impediments identified at the seminars and in this report (Goldsmith, 2017).

The objective of this report is to raise awareness of the usefulness of Alternative Financing, under the right circumstances, to address water resources infrastructure issues in our country, and by extension, to address infrastructure issues in general as highlighted by the ASCE Infrastructure Report Card. These recommendations should result in improved project delivery, lower life cycle costs, and more reliable infrastructure. This report makes recommendations which if accepted will enable policymakers to promulgate the appropriate use of Alternative Financing in addressing water resources and other infrastructure needs.

Comments on this report will be gratefully accepted by the task committee and may be submitted at copri@asce.org.

EXECUTIVE SUMMARY

As the new Administration looks to fulfill campaign pledges to rebuild America's aging infrastructure to improve the Nation's economic competitiveness and to create jobs, Alternative Finance mechanisms, such as Public Private Partnerships (P3s) and Public-Public-Private Partnerships (P4s), could be important ways to meet these needs. The objective of this report is to raise awareness of the usefulness of Alternative Financing, under the right circumstances, to address water resources infrastructure issues in our country, and by extension, to address infrastructure condition and funding issues as highlighted by the ASCE Infrastructure Report Card.

This report presents the interim findings of the Task Committee on Alternative Financing of Waterways Infrastructure. The Committee was established in 2015 to evaluate the Public-Private Partnership (P3) authorization that is included in Section 5014 of the Water Resources Reform and Development Act of 2014 (WRRDA14) and to educate, facilitate, and advocate for the use of Alternate Finance for water resource projects in our country. This report outlines how Alternative Financing can serve as an important resourcing component to supplement traditional Federal financing models while raising awareness of the usefulness of alternative financing methods. It encourages ASCE members to lead reference the use of Alternate Finance in providing technical and public policy advice.

The report highlights the need to develop a full life cycle and comprehensive infrastructure delivery and management model and examines the applicability of Alternative Finance to water resource activities within the U. S. Army Corps of Engineers (USACE) civil works program. The policy changes proposed in this report would enable the Federal government to leverage private capital to fund and finance public infrastructure requirements more quickly, effectively, and efficiently in ways that do not create excessive downstream tax or public debt consequences.

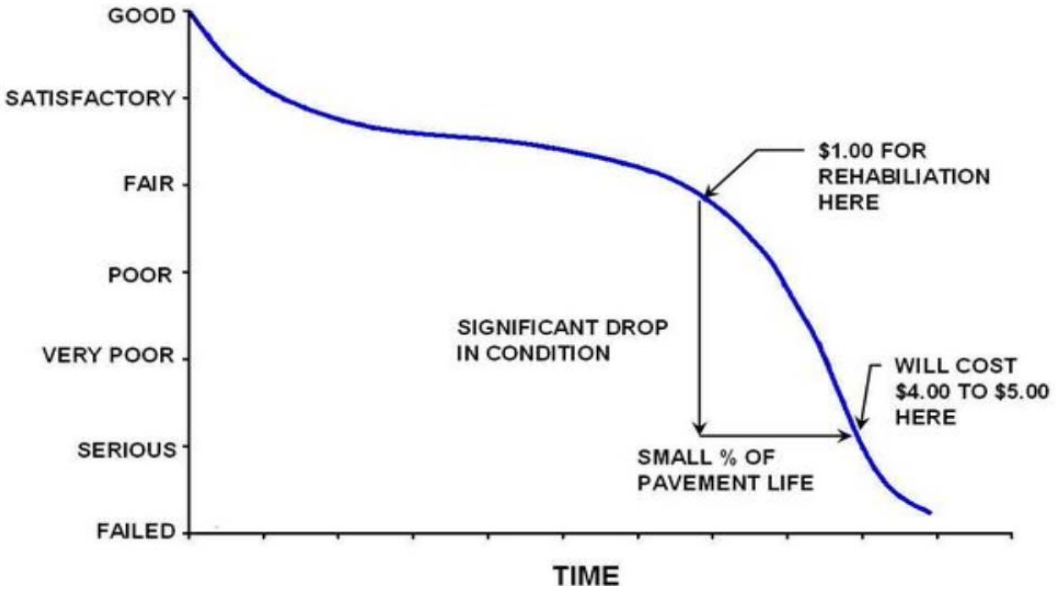
To reach out to a broader audience three successful workshops have been held to educate, facilitate, and advocate for Alternative Finance and to identify prospective projects that could use this capability in the future. A fourth workshop is planned for the spring 2017. Additionally, Harvard University and the USACE sponsored two seminars that also highlighted the need for a Federal inter-agency working group to remove impediments to, and enhance the use of, Alternative Finance for water resources projects. These efforts demonstrate how engineers can impact the technical and public policy aspects of Alternative Finance use in addressing our country's infrastructure needs. These needs are particularly acute in the water resources arena, such as those overseen by USACE.

USACE manages one-third of the nation's water resource assets the majority which were built many decades ago in the last century. This infrastructure addresses navigation channels, flood risks, coast and harbor, and other national needs of a new and expanding nation, while ensuring that we could take best advantage of the largest navigable interior river systems in the world.

The design life of most of these projects has been exceeded while funding to meet asset life cycle costs to sustain our water resources infrastructure have been overlooked. Current federal funding is insufficient to address the backlog of projects or needed improvements to existing infrastructure assets which are not sustainable under these circumstances. As illustrated in the typical life cycle curve below, decades of deferred maintenance will greatly increase the ultimate cost of infrastructure rehabilitation and/or replacement. Different resourcing models should be considered to address these needs. The main driver behind interest in Alternative Finance is to find ways to address this infrastructure funding "gap" so that these assets can be properly rehabilitated, managed, and maintained.

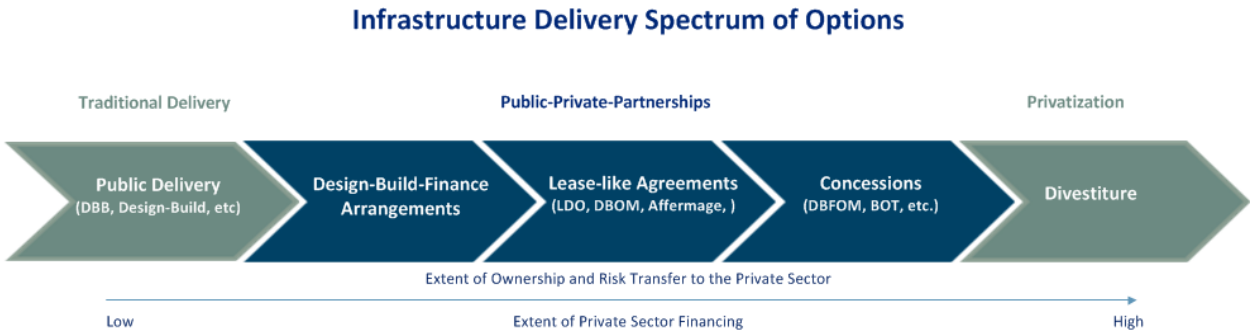
Typical Infrastructure Life Cycle Curve

(http://www.faa.gov/airports/central/airport_compliance/pavement_maintenance**)**



P3s and P4s refer to types of contracting structures wherein the private sector partner secures upfront financing for capital improvements to publicly owned infrastructure. The private partner also commits to delivering the improvements within a specified period and maintaining the project over the life of the contract. Compensation is provided either directly through revenue generated from the improvement, or indirectly through budget payments linked to the performance/availability or enhanced value of the asset.

The figure below illustrates the spectrum of different public infrastructure contract models. These models support Public ownership and delivery of project capability and varying degrees of P3 use in support of public facilities through divestiture. Alternative Financing is not a panacea for rebuilding our nation's infrastructure, but it can unlock the delivery of critically needed projects by partnering with private entities to leverage private capital.



For P3/P4 arrangements to succeed, good risk management is a key factor. It is also critical that there is a clear path for covering the private partner's upfront costs, sharing its risks, and recouping its investment. P3/P4 benefits include accelerated project delivery, greater capital efficiency and increased operational efficiency, lower life cycle costs and risks, private sector innovation, and enhanced project reliability and resiliency.

Alternative Finance has become an increasingly popular method for financing large public infrastructure projects, especially in the British Commonwealth countries, which have used it for years in meeting their public project needs. It has proven especially viable for projects like toll roads and metered water treatment plants that generate user fees, and thereby provide a well-defined revenue stream for the private partner/investor. However, alternative finance methods face significant challenges when applied to federal water resource projects as current Federal authorities reference project evaluation, financing, revenue generation and "ring fencing", and project prioritization methods hinder its application.

Methods of prioritizing projects within the USACE civil works program can make implementing Alternative Finance mechanisms difficult. For example, priorities based on traditional benefit cost ratio (BCR) calculations often fail to reflect the full value that can be derived from P3/P4 financing, such as accelerated delivery of public benefits, shared risk, access to private industry innovation, greater project resilience, and lower life cycle costs. Additionally these benefits are realized without having to turn over control of public infrastructure assets. Alternative Finance delivery assessments are also penalized because the budgetary rules for scoring require evaluation of the entire cost of the project in the year in which the budget authority is made available. The scoring system needs to be amended if P3/P4 is to be effectively used in Federal projects.

Using alternative finance and long term contracting methods provide many advantages in terms of cost savings, schedule relief, and risk mitigation compared to traditional public funding methods. Therefore, efforts should be advanced to promote P3/P4 financing, to include simplifying the compensation method for non-revenue-generating projects and by modernizing established legislation to add alternative finance as one of many tools available to federal water resources planners.

Unlike toll roads, most USACE water resource projects do not generate direct user fees, or otherwise provide a clearly defined revenue stream. This complicates the application of P3 financing in some of these types of projects and can be a significant drawback. The Harbor Maintenance Trust Fund and the Inland Waterway Trust Fund are prohibited from being used as direct revenue generation tools. If the legislation governing these funds was amended they could be used as a capital fund to address revenue generation issues. The above paragraphs are illustrative of the obstacles Alternative Finance methods face under established Federal law and policy.

Impediments aside, USACE and other Federal agencies have embarked on a number of innovative contracting initiatives for water resource projects under existing authorities, such as Energy Savings Performance Contracts (ESPC's). This report also provides several examples of P3/P4 initiatives including pilot programs and projects financed through P3 variations. A variety of initiatives for alternative financing have been undertaken in accordance with WRRDA14 by USACE, including several pilot water resources projects. These pilots have been designed to test supplementing traditional Federal funding and to test the potential benefits of P3 contract delivery. Changes to WRRDA14 will enhance these efforts further.

Recommendations for addressing how some alternative financing and delivery issues might be resolved include:

1. ASCE should encourage public officials at all levels to consider the use of P3/P4 and other alternative finance and delivery mechanisms as a tool, when appropriate, to address USACE water resources and other infrastructure needs in our nation.
2. WRRDA14 should be amended to address constraints identified by USACE to allow full implementation of the pilot program envisioned by Congress.
3. Federal budget scoring and BCR calculation methods should be amended to facilitate greater use of alternative financing and delivery.
4. Congressional authorities should be modified to enable a more effective approach to revenue generation for funding projects within the USACE civil works program.
5. USACE should be provided greater authority to enter into long-term contracts (up to 50 years) to facilitate the use of alternative finance and delivery for civil works projects.
6. Encourage States that do not have alternative finance and delivery legislation to enact laws that will enable the use of this tool to address water resource and other infrastructure needs.

This report makes recommendations which if accepted will enable policymakers to promulgate policies that will enable the appropriate use of Alternative Finance in addressing water resources and related needs. Interest in infrastructure investment and in the use of innovative finance by the new Administration may present an opportunity to move Alternative Finance use forward in our country. If the Findings Report recommendations are put into place this tool will help address national requirements and should result in improved project delivery, lower life cycle costs, and more reliable infrastructure.

CHAPTER 1
INTRODUCTION

ASCE and its members will play an important role in helping to make the above recommendations a reality both from a technical and from a policy perspective. As illustrated in the ASCE Infrastructure Report Cards, the future of our nation's security, economy, and our quality of life depend on expanding the tools available to meet growing infrastructure and funding needs. ASCE's technical, public policy, and communications leadership will be key to fostering the use of Alternative Finance in our county to the public's benefit.

ASCE's Infrastructure Report Card gives our nation's waterways infrastructure an overall D- (ASCE, 2013). In many cases, public water resources related infrastructure is fifty or more years old, operating years beyond its design life. This reduces the reliability of individual system components and in some cases the entire system. Funding in the public sector has been flat for many years, while the need to rehabilitate or rebuild water resources related infrastructure, and the need for more reliable funding, continues to grow.

Currently, the U.S. Army Corps of Engineers (USACE/Corps) operates, maintains and manages approximately one-third of the nation's water resource assets. Other Federal agencies are involved in water resources, but USACE's civil works portfolio is the largest. It includes over 3,000 operational projects, with a replacement value of approximately $268 Billion. The civil works business lines include river and coastal navigation, emergency management, environment, flood risk management, hydropower, recreation, regulatory and water supply (USACE 2013).

The Corps built many of these critical infrastructure assets decades ago, and many are reaching or exceeding their original design lives. As assets age, unplanned as well as scheduled outages at the nation's inland waterway locks and dams drive down the reliability of the services provided by these public works (TRB 2015). As the federal custodian of many of these assets, the Corps is faced with more demands for building, maintaining and operating its projects than available federal funding provides, much less keeping up with new priorities across the nation (USACE 2013).

For example, the current cumulative maintenance investment backlog for coastal navigation channels, inland waterways, dams and levees totals $200 Billion., plus USACE retains an authorized but unconstructed portfolio of $60 billion, which adds up to roughly a $260 billion requirement, with annual civil works appropriations hovering around $4.6 billion (Belk 2016). The Federal Government is spending about 0.23% of the annual planned replacement value of this infrastructure vice the National Research Council's recommended 2-4% (Hecker 2016). Additionally, Congress authorized eight coastal navigation improvement projects in WRRDA14 totaling just over $3B (Federal cost about $2B). With current Administration budget requests of $100M for this category of work, it will take over twenty years to complete these projects,

diminishing our nation's status as a global trading partner. Therefore, a new water resources infrastructure investment strategy is needed

The overall funding shortfall, coupled by protracted appropriations that delay project benefits and a growing backlog in deferred maintenance, necessitates an evaluation of non-traditional approaches to infrastructure finance and delivery. Transportation infrastructure, especially roads, has successfully implemented alternative finance and delivery strategies aimed at addressing the full asset life-cycle. Translating this successful approach to the portfolio of Federal agency managed water resources infrastructure (by USACE, Bureau of Reclamation (BOR) and others) is fundamental to restoring the health of this important resource and the functionality of this nationally critical infrastructure, especially during these times of constrained resources and increasing demand.

This ASCE COPRI Subcommittee report examines this problem using the U. S. Army Corps of Engineers Civil Works program as a baseline and makes recommendations on how water resources related needs might be met by the appropriate use of Alternative Finance and Delivery mechanisms, such as Public Private Partnerships (P3s), Public-Public-Private Partnerships (P4s), etc.

P3 is a public-private partnership, and P4 is a public-public-private partnership, essentially a multi-jurisdictional P3 (with more than one public partner) in which one or more of the public parties have a contractual relationship with the private sector. In general, P3s/P4s involve long term contractual agreements between a public sector contracting authority and a private entity for all or some combination of the design, construction, financing, operation and/or maintenance of public infrastructure.

Although P3/P4 transactions refer to a broad spectrum of contracting structures, they typically share the following characteristics: the private partner secures, in whole or in part, the upfront financing needed for owner-specified capital improvements (whether rehabilitation or new construction) and commits to delivering the infrastructure within a specified time period. The Private Partner is also responsible for operating and/or maintaining the asset at prescribed performance levels over the life of the contract, thereby optimizing the life-cycle of the asset (and avoiding deferred maintenance).

P3/P4 contracts "bundle" project delivery phases across the life cycle of an asset, including design and construction with operation and maintenance. In some cases, certain responsibilities may be retained by the public sector (such as operations in the case of the release of flood waters), but generally speaking, the life-cycle bundling approach is what generates value under a P3/P4. The private partner assumes substantial financial, technical, and operational risk for infrastructure and service delivery; however, risks should be allocated to the party best able to manage those risks. The private partner is principally compensated for its costs and risks through revenue generated via the operation of the asset and/or through public sector performance-based budget payments (such as availability payments). The public partner typically retains project ownership and oversight of private partner performance.

The value of a P3/P4 is that, in many cases, the private partner can provide full up front financing with bundled project delivery across phases, which has the potential to maximize efficiency and allow a project to be delivered in a fraction of the time compared to traditional delivery. The private partner is incentivized to provide quality products and assume substantial risk, with compensation based on key performance outcomes. Meanwhile, the public partner retains project ownership and ultimate responsibility for public services. This is especially important as the Corps of Engineers manages the nation's inland waterways, a strategic transportation system for commerce and defense.

The Water Resources Reform and Development Act of 2014 (WRRDA14), Section 5014 authorized the Corps to examine potential projects as pilots for the use of Alternative Finance (P3). Although, certain constraints have prevented the Corps from initiating P3/P4 projects under Section 5014, demonstration projects by the Corps under other existing authorities have shown that the application of these partnership concepts is very project or system specific. Tailored approaches will likely be required rather than one size fits all solutions.

This report examines several alternative finance and delivery approaches and provides recommendations to address some of the following authority and policy issues that could enable the Corps to use Alternative finance and delivery methods in the future, including:

1. Revenue generation and ring fencing. The Corps currently has limited authority to assess project-specific user fees or generate commercial revenues from projects, and to commit revenues for project-specific payments. Successful use of Alternative Finance methods by the Corps will require this kind of authority.
2. Longer Term Contracting Authority. The Corps does not appear to have authorities that allow the agency to enter long-term contracts without obtaining special exemptions. Congressional action would likely be needed to provide the Corps with multi-year contracting authority (up to 50-years) to facilitate future use of Alternative Finance methods.
3. Federal Budget Scoring Policy. Under current scoring guidelines, long-term federal payment obligations for work on federally owned facilities will be scored against the legislation in the year in which the budget authority is first made available in an amount equal to the government's total obligations over the life of the contract (OMB Circular A-11). This means that total federal project cost, or full project appropriation, is scored in the first year, although payment obligations do not occur until well into the future. For all intents and purposes, and despite real risk transfer, this makes it impossible to implement a performance-based P3 at the federal level. Scoring policy needs to be addressed and/or Congress needs to provide legislation that would better enable the use of performance-based budget payments for P3 in the future.

Section 5014 of WRRDA 2014, provides that "any activity undertaken under this section is authorized only to the extent specifically provided for in subsequent appropriations Acts." To date, Congress has not appropriated funds to implement §5014 of WRRDA 2014 which constrains the Corps' ability under that authority to more fully develop P3 pilot projects/programs.

Appropriations and additional authority may also be needed to fully implement a Corps Alternative Finance pilot program. These impediments were identified in a Corps report to Congress in February 2016 required by the 2015 Omnibus Bill.

It is recognized that Alternative Finance and Delivery is not a panacea for all of the nation's infrastructure investment (development, rehabilitation, and modernization) needs. However, this Findings Report recommends how some issues related to the use of Alternative Finance and Delivery methods might be addressed for this tool to become, where appropriate, a more useful one in the future.

CHAPTER 2
PUBLIC-PRIVATE PARTNERSHIPS – HISTORY AND INITIATIVES

2.1 Public-Private Partnerships Defined

In today's global economy, modern and efficient infrastructure and services are a necessary precondition for economic growth. Effective and accessible infrastructure and services impact productivity and competitiveness, boosting jobs and increasing living standards. The World Economic Forum (WEF 2015) publishes a biennial Competitiveness Index of the 100+ countries of the world, based on 12 criteria or "pillars."

One of these pillars is the condition of the country's infrastructure. Strong correlations can be shown between competitiveness rankings and the condition of the infrastructure. For these reasons, countries across the globe are racing to expand and modernize their core infrastructure and service offerings.

Although the positive correlation between economic growth and infrastructure investment is universally recognized, many public authorities - at both federal and local government levels - lack the financial resources required to meet their core infrastructure needs. On the other hand, private capital markets see the value of infrastructure investment and are willing to partner on public infrastructure but are impeded by the lack of a public policy framework for such investments.

To bridge the gap between available public resources and the cost of needed water infrastructure and services, as well as to ensure that infrastructure and services are delivered as efficiently and cost-effectively as possible, public authorities across the world are turning to Public-Private-Partnerships (P3), Public-Public-Private-Partnerships (P4), and other partnering arrangements. Through an infusion of private capital and management, P3 can ease fiscal restraints and boost efficiency in the provision of public infrastructure and services. Despite their potential, however, P3 are highly complex policy instruments.

In other words, P3 have demonstrated their benefit by bringing about improvements in public infrastructure and services through shorter delivery times, better value for the money and increased innovation across a range of sectors, but this does not mean that implementing a P3 program or project is easy. Indeed, significant political, legal, regulatory and institutional hurdles must be overcome to move from a traditional, public sector model of public service delivery towards one in which public and private sectors work together.

While there is no universally accepted definition of "public-private-partnership", P3 generally refer to long-term contractual relationships between a public sector contracting authority and a private entity for the financing, design, construction, renovation, management, operation,

and/or maintenance of public infrastructure and/or the provision of public services. (The private entity may take a variety of legal forms, such as a corporation, Limited Liability Company or, in some instances, even a non-profit. The determination of the legal structure depends on a number of factors, including the requirements set forth in the procurement documents.) P3 do not refer to simple outsourcing or service contracts, but instead involve significant risk-sharing between the public and private sector in the provision of an infrastructure asset or related service.

Public-Private-Partnerships encompass a broad array of contracting modalities. These vary mainly by (i) ownership of capital assets; (ii) extent of responsibilities assigned to the private partner; and (iii) level of risk allocation to the private partner.

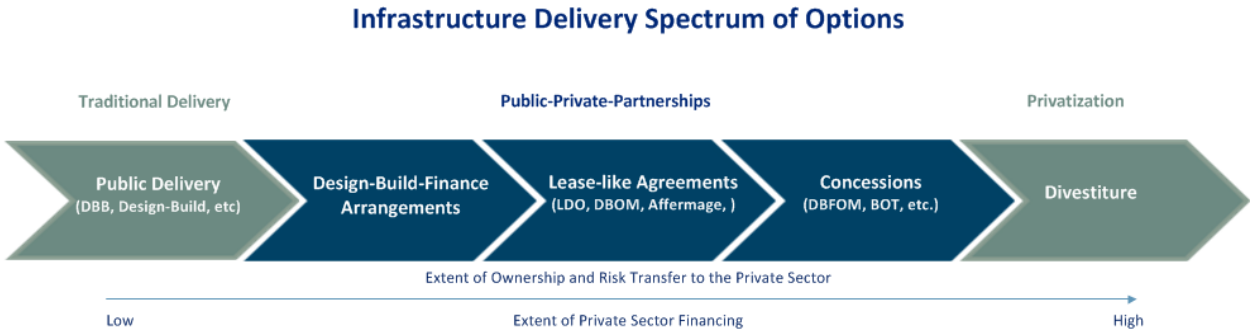


Figure 1 – Infrastructure Delivery Spectrum of Options (source: Jill Jamieson)

As illustrated above (Figure 1), different contract modalities reflect diverse allocations of rights and responsibilities amongst the parties to the P3 agreement. In some cases, such as a Design-Build-Finance (DBF) contract, the private operator assumes responsibility for the short-term financing of works during the design and construction phase of the contract, which is typically repaid by the owner of the asset upon completion and delivery of works. Under a DBF, responsibility for the maintenance and operation of the asset remain with the public owner.

In other instances, such as a Design-Build-Finance-Operate-Maintain (DBFOM), the private party will be responsible for the long-term financing of all required infrastructure, as well as the life-cycle maintenance and operation of the asset (including the provision of working capital).

Still in other cases, the private party may agree to design, build, finance, operate and maintain an infrastructure facility, but the extent of maintenance is limited only to routine repairs and does not include major maintenance or asset rehabilitation. Each contract needs to be designed in the manner that best meets the specific needs and objectives of the project at hand. P3 is definitely not about applying cookie-cutter formulas to individual projects, but instead involves careful structuring of each project to ensure the optimal allocation of rights, responsibilities and risks.

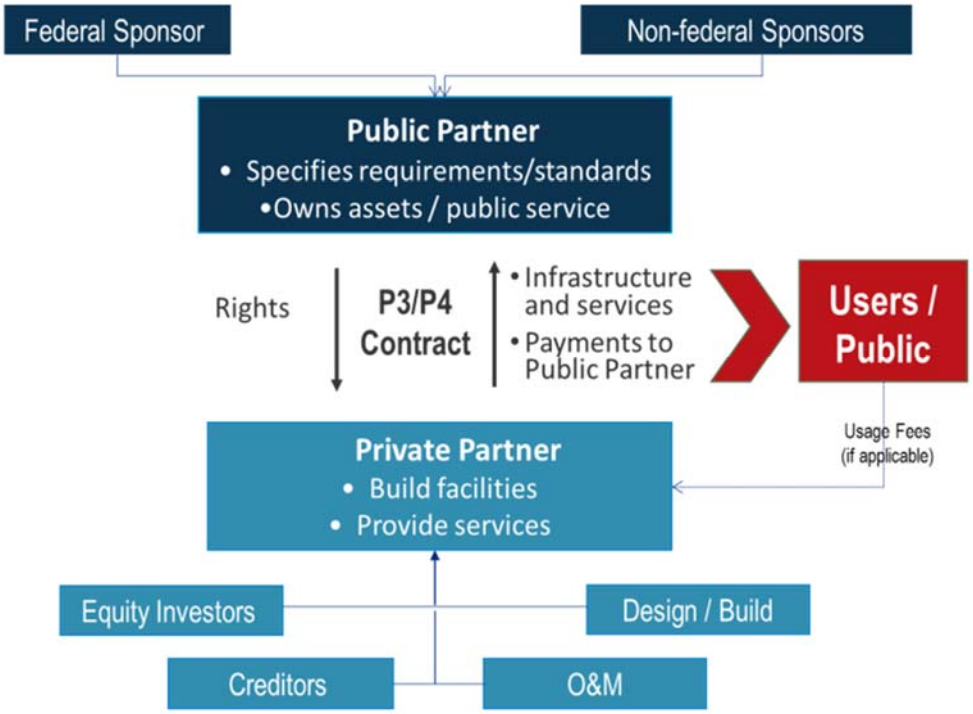


Figure 2: P3/P4 Strawman Structure (source: Jill Jamieson)

It should be noted, however, that there is no universal consensus as to which contractual modalities fall under the banner of "P3" and which do not. This can often create confusion, particularly at the margins of the P3 spectrum of options, where certain contract modalities (such as Design-Build-Finance) may be considered P3 in some circles, but not in others. A basic P3/P4 structure is presented in the adjacent graphic (Figure 2), illustrating the roles of the parties in delivering a public infrastructure and service.

Although public-private-partnerships come in many forms depending on the level of private sector involvement, they generally share the following characteristics:

1. The private partner provides a public service or infrastructure and assumes substantial financial, technical and operational risk in the delivery and operation of the infrastructure asset;
2. The infrastructure or service is financed, in whole or in part, by the private partner who receives no revenues until the successful delivery of the infrastructure asset ("no delivery, no payment');
3. Design, construction, financial, technical and operational risks are shared between the public and private partners, with each type of risk allocated to the partner best able to manage it;
4. P3 involve 'bundled' services (i.e., design, finance, construction, maintenance and operation) to address the infrastructure facility's asset life-cycle and to create the optimal incentive structure;
5. The private partner is compensated for its costs, as well as returns on investment, either through the project's own revenues or through budget-sourced payments;

6. The public partner retains final responsibility to its citizens, and therefore retains the right to take over the facility and services if the contract is not being honored.

Not all contractual relationships between the public and private sectors, however, qualify as P3:

1. P3 is not a simple outsourcing of functions or services. To the contrary, in a public-private-partnership, significant, if not full, responsibility is transferred to the private partner(s) for financing, designing, constructing, and operating infrastructure projects;
2. P3 is not a donation by a private party for public good. In a public-private-partnership, the private partner(s) participate with a focus on making a reasonable profit;
3. P3 is not a simple lease of public land for private purposes. It must involve risk sharing and the delivery of public assets and/or public services; and
4. P3 is not a privatization or the divesture of public assets and/or liabilities.

A final comment should be made regarding the utilization of P3 in water resources infrastructure. Due to the multi-jurisdictional nature of many water resources projects, particularly when taking to account the entire asset life-cycle (i.e., operations and maintenance); some projects will fall under a P4 structure. This means that federal authorities, together with relevant local or state authorities, jointly confer rights and responsibilities relating to the infrastructure asset to a single private entity. This P4 configuration offers both additional opportunities for water resources, as well as some additional challenges (i.e., choice of applicable law, multipartite agreements, assignment of contingent liabilities, etc.).

P3 is an intentionally broad term, as the financing and delivery structure for any particular project must be tailored to meet the public sponsor's specific goals and objectives. Federal, state and local authorities are mainly driven to consider P3 arrangements and other alternative finance and delivery options for the following reasons:

1. Accelerating Infrastructure Delivery / Access to Additional Financing: As public authorities seek to modernize and expand their core infrastructure and service offerings, they are often confronted by debt ceilings, funding constraints and protracted appropriations that result in investment deferrals, which in turn increase ongoing and future O&M and capital costs, as well as defer public benefits.

   For this reason, many public authorities are turning to P3 to pursue alternative finance and delivery strategies that allow them to access upfront financing that allows for accelerated delivery, thus advancing project delivery and associated public benefits. By leveraging third party debt and equity, public authorities can accelerate infrastructure delivery, while likewise incentivizing capital savings and performance improvements.

2. Monetization of Existing Assets: As public authorities continue to feel the fiscal strain of building, operating, and maintaining major infrastructure assets, many are finding creative ways to unlock the value trapped in their current fixed assets in such a way as to advance their core mission. The key principle behind monetization involves leveraging assets to

generate revenue to support the public-sector mission. This can involve long-term concessions or leaseback arrangements for existing assets, commercialization opportunities, and in some instances, the sale/disposition of underutilized assets.

3. Operational Efficiencies and Life-Cycle Savings**:** To improve financial performance and/or capitalize savings, public authorities are also turning to incentivized performance contracts for the operation and maintenance of infrastructure assets. Performance contracts come in many shapes and sizes, ranging from savings performance contracts and peer partnering to long-term O&M concessions. Incentivized performance often means that the private partner is paid in full or in part based on the savings it generates, while still being required to meet key performance output standards. Even in relatively well run public institutions, this revamped incentive structure has proven to generate significant performance improvements, allowing the public authorities to capitalize and use these savings for other purposes.

4. Risk Allocation & Mitigation**:** Likewise, public authorities are turning to P3 for risk management and mitigation purposes. A wide range of risks can be addressed through P3, including financing risk, construction and completion risk (i.e., construction costs, delay, performance, etc.), revenue/funding risks, cost risk (for O&M), operating performance risk, demand risk, technology risk, regulatory risk, etc. By allocating certain risks to a private partner, public authorities can hedge against any associated negative consequences.

Depending on the motivation factors driving a P3, the specific contract modality and transaction structure may vary significantly. Nevertheless, it is highly unlikely that P3 will ever entirely replace the traditional public sector model of public service delivery. P3 are just one tool, amongst many, available to public authorities for the delivery of infrastructure and services.

2.2 Public-Private Partnerships Initiatives

For years, P3 has been a common tool finance and delivery leveraged by municipal and state authorities across the United States for water resource projects, particularly in projects involving water and wastewater treatment. Initiatives to develop and promote P3/P4 in support of federally owned and federally cost-shared water resource projects, however, are much more recent.

2.2.1. Water Resources Reform and Development Act of 2014 (WRRDA)

The Water Resources Reform and Development Act of 2014 (WRRDA) sets forth the general parameters for USACE to implement an alternative finance and delivery program aimed at overcoming resource constraints and promoting efficiencies in infrastructure and service delivery. Key relevant WRRDA provisions include the following:

2.2.1.1 Program Reforms & Streamlining

Under Title I of WRRDA, a variety of initiatives and authorities are set forth that could facilitate and/or enable alternative finance and delivery within the traditional cost-share formulation. Relevant examples include, amongst others, §1008 (Expediting Hydropower at Corps of

Engineers Facilities), §1014 (Study and Construction of Water Resources Development Projects by Non-Federal Interests), §1018 (Credit for In-Kind Contributions), §1022 (Credit in Lieu of Reimbursement), and §1043 (Non-Federal Implementation Pilot Program).

2.2.1.2 Water Infrastructure Public-Private Partnership Pilot Program (§5014)
Section 5014 authorizes the Secretary of the Army to enter agreements with non-federal interests, including private entities, to finance construction of at least 15 authorized water resources development projects. The definition of water resources development projects is intended to cover Corps of Engineers activities related to construction and major rehabilitation projects.

Section 5014 provides USACE with the authority to "*establish a pilot program to evaluate the cost-effectiveness and project delivery efficiency of allowing non-federal pilot applicants to carry out authorized water resources development projects...*" Pilot projects are meant to test the possible benefits of securing project delivery using a public-private partnership (P3) procurement approach.

Section 5014 requires Congressional appropriation prior to taking effect, but to date, no appropriations have been authorized for the P3 program. USACE has identified key legislative and policy constraints facing the P3 program in a Report to Congress in February 2016.

2.2.2. Water Infrastructure Finance & Innovation Act (WIFIA)

Title V, Subtitle C of WRRDA 2014, known as the "Water Infrastructure Finance and Innovation Act" (WIFIA), authorizes a 5-year pilot program that would allow non-federal entities to obtain low-cost federal loans or loan guarantees as a supplemental source of financing for water and wastewater related projects and civil works projects.

The statute authorizes the Administrator of the U.S. Environmental Protection Agency (USEPA) to administer a program for water and wastewater infrastructure, and the Secretary of the Army to administer a program for civil works infrastructure. The presumption is that if a WIFIA program for civil works were pursued it would be implemented and operated by the U.S. Army Corps of Engineers (USACE).

WIFIA is modeled on the existing "Transportation Infrastructure Finance and Innovation Act" (TIFIA), which provides federal credit assistance to non-federal entities for large surface transportation projects. The stated purpose of TIFIA is to fill market gaps and attract substantial private and other non-federal co-investment in critical surface transportation projects by providing supplemental and subordinate investment capital.

The TIFIA program guide explains, "The public policy underlying the TIFIA Program asserts that the federal government can play a constructive role in supplementing, but not supplanting, existing markets for financing large transportation infrastructure project. Because the TIFIA Program offers credit assistance, rather than grant funding, its potential users are infrastructure

projects capable of pledging revenue streams generated through user charges or other dedicated funding sources."

The TIFIA policy target appears to track closely with WIFIA as it relates to drinking water and wastewater projects, but less so for civil works projects. For the former, non-federal interests have responsibility for project delivery and project management following construction, and water projects generate predictable revenue streams from direct user (customer) charges that can be pledged to secure federal credit.

Civil works, on the other hand, is a much different infrastructure context, where USACE has management responsibility for some types of projects and where projects generally do not generate revenues from direct user charges. These differences have raised questions about how and to what benefit WIFIA could be applied to civil works, in recognition that such a program would make USACE a de facto federal bank, a role that it has no prior experience with or current institutional expertise to implement. USACE is maintaining a collaborative relationship with EPA as that agency implements its version of WIFIA for municipal water supply and wastewater projects among other potential applications.

Programs like WIFIA subscribe to a dual-stage Congressional actions – first, the program must be authorized and then, funds must be appropriated. While WRRDA 2014 authorized the WIFIA program, no funds were included in fiscal year 2015 and 2016 appropriations for USACE.

2.2.3. Innovative Contracting

To help address its $60 billion backlog of authorized, but unfunded projects, as well as meet its growing operations and maintenance responsibilities, USACE and other federal agencies have embarked on several innovative contracting initiatives for water resource projects under existing authorities.

2.2.3.1 Energy Savings Performance Contracts (ESPC's)

Energy savings performance contracts allow federal agencies to procure savings and facility improvements with no up-front capital costs or special appropriations from Congress. An ESPC is a partnership between a Federal agency and an energy service company (ESCO). The ESCO identifies improvements to save energy and/or costs. In consultation with the Federal agency, the ESCO designs, builds, finances, operates and maintains a project that meets the agency's needs and arranges the necessary financing. The ESCO guarantees that the improvements will generate energy cost savings sufficient to pay for the project over the term of the contract and is paid exclusively as a percentage of those savings.

While ESPC are very common at the federal level, the first ESPC executed for a water civil works project was launched in 2014 for improvements along the Tennessee-Tombigbee (Tenn-Tom) Waterway in Alabama and Mississippi (Figure 3). The 21-year public-private-partnership is expected to save the Army Corps of Engineers a projected $5.05 million in energy costs. The contract was awarded to Siemens Government Technologies Inc., who will install, replace or retrofit elements of the Tenn-Tom's infrastructure — primarily lighting at its 10 locks and dams.

This map shows the Tennessee-Tombigbee (Tenn-Tom) Waterway, managed by the Mobile District. Mobile District is teaming up with Huntsville Center to improve the infrastructure along the waterway through the first-ever Energy Savings Performance Contract executed for a civil works project.

Figure 3: Tenn-Tom Waterway (USACE 2014)

Whether considering energy savings performance contracts or other forms of savings performance contracts, such as operating savings performance contracts, peer partnering, O&M concessions, etc., these P3 structures have the advantage of placing full performance risk on the private partner. Compensation is calculated based on objective, measurable and verifiable performance indicators against which savings can be determined, requiring no additional outlays by the agency. These contracting structures are quite common in a variety of sectors and should be further exploited for water resource projects.

2.2.3.2 USACE P3 Demonstration Program

Even pre-dating WRRDA 2014, the development of alternative finance and delivery approaches was contemplated as a key component of the USACE Infrastructure Strategy. As part of this initiative, USACE is advancing a few P3/P4 and alternative finance and delivery demonstration projects to identify opportunities and constraints associated with diverse delivery models. Key projects considered to date include, amongst others, the following:

Project Name	Description	Status
Illinois Inland Waterway	Design, Rehabilitation, Finance, and Maintenance of a system of eight locks and dams comprising the IIW.	Project structuring and stakeholder discussions have advanced, but legislative and other constraints need to be addressed before P3 can be finalized and taken to market.
Fargo Moorhead Diversion Channel (FRM)	Split Delivery structure, with the federal government applying traditional funding and delivery for its part of the project (Southern Embankment dam) and the non-federal sponsor using an on-balance sheet design-build-operate-maintain structure for the diversion channel. This project is considered a P4, or multi-jurisdictional P3.	New start authorization. Non-federal sponsors have launched a RFQ for delivery of their responsibilities under a P3 structure.
Ala Wai Canal (FRM)	Design, Construction/Rehabilitation, Finance, Maintenance of the FRM project, as well as other locally selected environmental improvements.	Feasibility study finalized and Chief's report expected in early 2017. Funding source analysis and structuring underway with non-federal sponsors.
Grand Prairie Demonstration Project	Design, Build, Finance, Operate and Maintain for a number of stranded federally authorized irrigation projects (Grand Prairie, Bayou Meto, etc.).	Request for Information process finalized. RFQ for first project (Grand Prairie) expected to be launched soon.
Great Lakes Dredging	Work-in-kind P3 structure. Monetization of dredged materials to offset costs associated with dredging.	Industry Day held. Structuring options being assessed.
Whittier Narrows Dam	Monetization structure whereby Corps received additional non-federal funding to advance rehabilitation project in exchange for selling storage capacity at the dam to the Water Replenishment District of Southern California for ground water recharge.	Advanced project structuring has begun, however, issues associated with dam safety and repurposing of asset limit the ability to advance this project quickly.

Table 1: Demonstration Project Pipeline (source: USACE)

Other demonstration projects currently under consideration or being studied address dredging, hydropower, beach re-nourishment and ecosystem restoration. While projects are being added regularly to the program, it is not the expectation that all will proceed as P3/P4. In other instances, the process of evaluating P3 potential will help further identify constraints and obstacle impeding the use of alternative finance and delivery for water resource projects.

2.3. P3 Payment Mechanisms and Water Resource Revenue Generation

In P3 arrangements, the private partner is reimbursed for its services by means of monetary compensation which may be fixed, performance based, or determined through a profit-sharing formula. Typically, the private partner is compensated through one or a combination of the following structures:

1. Usage-based payments made in exchange for infrastructure facilities and/or services (i.e. tolls, user fees, etc.). Key risks associated with usage payments include demand risk, affordability issues, and collection risks.
2. Performance-based compensation structures whereby the public authority compensates the private partner through budget payments over the term of the contract. Payment structures can vary, including mechanisms such as off-take agreements (i.e., power purchase agreements), availability payments, performance based structures (i.e., ESPC), etc. Payment authority is generally tied to appropriations and thus there is significant focus on the credit rating of the contracting authority (payment authority), performance levels, and related guarantees.
3. Other Beneficiary Revenues, generated from their commercial activities that have not been previous contributors, are also used to help off-set costs and/or meet project revenue and return requirements.

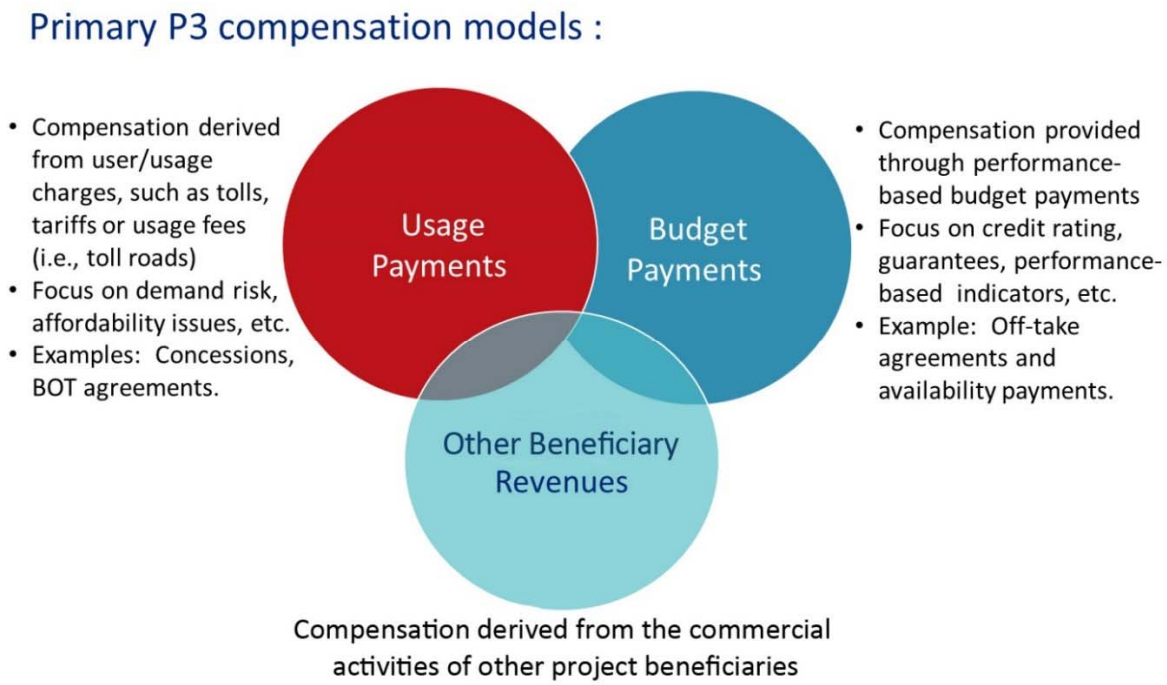


Figure 4: Revenue Sources in P3 (source: Jill Jamieson)

As indicated above, compensation deriving from public sector sources (availability payments, off-take agreements, etc.) is likewise very common in P3. Indeed, availability payments made by the public sector are at the heart of one form of P3, the Private Finance Initiative (PFI) model. This

model has been used for many infrastructure projects and provides the private sector with strong incentives to deliver infrastructure and services on time and within budget, while simultaneously allowing public authorities to spread the cost of this public infrastructure projects over a long term. This creates greater budget certainty, while also liberating scarce public resources for other priorities.

Whereas P3 can leverage a variety of financing tools, alternative finance and delivery remains highly dependent on traditional funding mechanisms. Fees paid by users of the asset may be used to repay investments and costs. Alternatively, budget based payments may be provided, which can be funded by a variety of taxes and assessments, fees and other revenues.

Financing tools, for their part, are available in a variety of forms, ranging from equity and standard credit facilities to concessionary finance (such as WIFIA). While the form of financing will impact its cost (with equity being more expensive than debt), likewise the risks associated with funding sources impact financing costs.

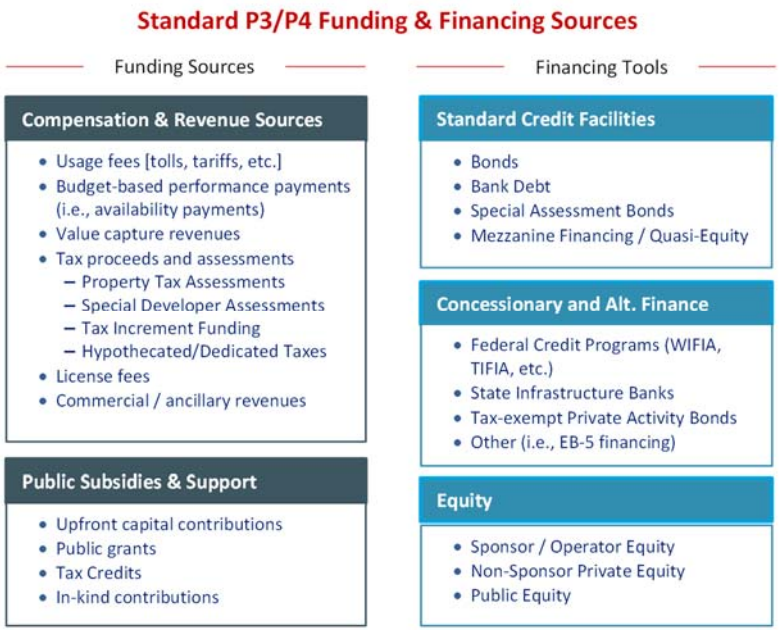


Figure 5: Snapshot of Funding and Financing Sources for Water Resource Projects (Source: Jill Jamieson)

Unlike drinking water and wastewater, where fees associated with usage and services are well established, in the realm of federal and federal cost-shared water resources, one of the key challenges to P3 is the identification of project funding mechanisms. Below key funding elements relating to water resources are discussed:

2.3.1 Usage Payments

With the exception of water storage and recreation, currently few USACE water resource projects derive revenues from direct user payments. In some instances, such as inland waterways, the

imposition of fees are prohibited, while in others, such as flood risk management, there is simply no practical way to assess direct usage fees for a dam or levee. The ability to levy fees would be aligned with OMB Circular A-25 (Revised) that specifically calls for both the self-sustainability of public institutions and the need for enabling private sector participation in the provision of these services.

2.3.2 Dedicated Taxes / Trust Funds

Federal water resource projects have used hypothecated taxes or dedicated taxes as a source of funding for both inland waterways, as well as harbor maintenance. While both provide funding for their respective purposes, the Trust Funds are annually appropriated by Congress and are subject to the Anti-Deficiency Act. As such, they are ill-suited for P3/P4, particularly considering budget scoring guidelines. In other words, monies deposited in these trust funds do not otherwise lose their identity as "appropriated funds."

As a consequence, they are subject to the restrictions of the Anti-Deficiency Act just like any other appropriated funds. The Anti-Deficiency Act prohibits USACE from entering into a contract that would obligate more money than the agency has available in the revolving fund for its use. As such, even with a revolving fund, USACE is required to pre-fund the works. For all practical purposes, this runs counter to the principles of project finance. Despite this limitation, each fund is discussed below:

2.3.2.1 Inland Waterway Trust Fund

The Inland Waterways Trust Fund (IWTF) was created as part of the Inland Waterways Revenue Act of 1978. The IWTF was established to help finance construction and major rehabilitation on the nation's inland waterways. Under the IWTF, commercial users of waterways contribute to the trust fund through a modest tax on fuel they use on the waterway system. The fund is then used to cover 50 percent of the costs for construction of new dams and navigation locks and major rehabilitation of existing facilities. The other 50 percent of project costs is covered by general appropriations. Once these projects are completed, USACE picks up 100 percent of the operations and maintenance costs for the system.

The Inland Waterways Trust Fund (IWTF) was intended to pay for 50% of construction and major rehabilitation costs on the nation's inland waterways. In recent years, however, the IWTF has collected less than is necessary for projects across the country. In 2014, a 9-cent increase on barge diesel fuel user fees was signed into law, which is estimated to add close to $80 million annually to the IWTF. Nevertheless, benefits of this additional funding will depend on both adequate matching-funds deriving from general appropriations, as well as substantial increases in USACE budget for the operation and maintenance of inland waterway assets.

2.3.2.2 Harbor Maintenance Trust Fund

The Harbor Maintenance Tax (HMT) and Trust Fund (HMTF) were established by Title XIV of the Water Resources Development Act (WRDA) of 1986 (P.L. 99-662) and subsequent legislation. Currently, the HMT is applied as a 0.125 percent *ad valorem* tax on the value of commercial cargo loaded or unloaded on vessels using federally maintained harbor projects, with some exceptions.

The tax is generally imposed against most imports, domestic shipments, foreign trade zone cargo, and passengers not aboard ferries (such as cruise ships).

HMT revenues collected by the U.S. Customs and Border Protection are transferred to the HMTF and subsequently transferred to the General Treasury in accordance with Congressional appropriations. Congress appropriates funds annually. The HMTF is authorized to be used to recover 100 percent of USACE eligible Operation and Maintenance (O&M) expenditures for commercial navigation, along with 100 percent of the O&M cost of the St. Lawrence Seaway by the St. Lawrence Seaway Development Corporation (SLSDC), certain costs of the National Oceanic and Atmospheric Administration, and the costs to the Customs and Border Protection (CBP) to collect the HMT. The federal share for construction of Dredged Material Placement Facilities (DMPFs) is also eligible for recovery from the HMTF in accordance with Section 201 of WRDA 1996 (P.L. 104 – 303).

HMT revenues and interest earnings exceed HMTF transfers for authorized activities by an increasing margin, amassing a surplus exceeding $9 billion. However, due to budget constraints, many harbors and channels throughout the nation have not been maintained to their congressionally authorized depths and widths. Inadequate channel maintenance results in commercial cargo vessels having to light load, entering and/or departing with less than a full shipment. This adds to shipping costs and reduces economic benefits associated with the initially optimized improvement project.

Current stakeholder efforts focus on getting to full use of HMTF revenues for their intended purposes. Congress addressed this issue in the Water Resources Reform and Development Act (WRRDA) of 2014, establishing targets of HMTF funding with annual incremental increases leading to full use of HMTF revenues in Fiscal Year 2025. Stakeholders have not identified plans for use of the $9 billion HMTF surplus currently amassed; however, given that the HMTF is subject to annual appropriations, some reforms would likely be necessary for these funds to be leveraged for P3 or other alternative finance and delivery approaches.

2.3.3 Monetization of Benefits

The monetization of benefits deriving from water resource projects has also been used to generate revenues from water resource projects. Examples range from mitigation credits on ecosystem restoration projects to special assessments and value capture for flood risk management projects. The monetization of benefits is also paramount in Energy Savings Performance Contracts, where relative savings are used to compensate the private partner for its risks and services. The ability to leverage monetized benefits varies greatly depending on asset type and ownership structure, but is particularly useful for P4 projects where a non-federal sponsor can ring-fence and commit those benefits for project-specific purposes.

2.4. Private Sector Perspectives and Considerations

From a private sector perspective, three fundamental elements must be given proper consideration: trust, clarity, and how risk is shared between the public and private partners.

These elements are key to any successful Alternative Finance and Delivery arrangement. Without them, the project or proposal may be doomed from the start.

Trust is important from several perspectives. Investors often favor infrastructure assets because of stable, long term return on investment (such as inflation-linked cash returns). This requires a long term relationship based on mutual trust. The parties must be confident that the arrangement is mutually beneficial, is fair, and is supported by a legal, transparent, and competitive procurement process. There must be trust that the project will truly meet the need (in this case the public need) based on a mutually agreed to project vision and a favorable macroeconomic environment. This will ensure that customer benefits and that participating party reputations will remain intact through the contract's term. Also, confidence is essential in all the arrangements leading up to and through the project's life cycle, to include the payback scheme, stability of interest rates, risk allocation, etc. There must also be certainty about the public partner's authority and ability to manage the public asset and to successfully partner with a private sector entity for the entire contract term.

Transparency of the tasks to be performed and the purpose of the work is a must. Partner interests and capability to contribute to a successful project, and the partnership terms and agreements must be clear. There must be an unambiguous justification for the project, one that compares favorably between the Alternate Finance and Delivery proposal (which includes a private sector component) and a fully funded/managed government effort. Well spelled out financial arrangements, to include sources of funds, interest rates, and payback mechanisms are essential to success. Incentives, often performance based, and the circumstances in which they will apply, should be clear. There must be transparency with respect to life cycle costs, accident and force majeur issues, financial, and a host of other risk management/sharing needs and mechanisms if a project using Alternate Finance and Delivery is to be successful.

Risk identification, risk allocation and sharing, and a risk management methodology that is perceived, and in reality is, fair to all parties is essential in an Alternative Finance and Delivery partnership. Risk takes many forms. Some include: economic, political, financial, performance, requisite quality, safety and accidental, force majeur, long term viability of the parties and/or the asset being managed, demand for the desired public service, reliability of payback schemes, asset control (before, during, and after the partnership performance period), issues resolution/arbitration, etc. Identification of these and all risks associated with the project and the partnership is a must. This will then facilitate how best to allocate and share these risks, often using the rule of thumb that risks are accepted by the partner best able to manage them, leading to a fair, mutually acceptable risk management plan.

From the private sector perspective, the elements of trust, clarity, and fairness with respect to risk allocation and management are all keys to a successful Alternative Finance and Delivery arrangement. This will lead to an early and true partnership between public and private entities. Then it is up to the parties to ensure the project meets the public need while properly managing/maintaining the infrastructure and the public-private alliance throughout the agreed to period.

CHAPTER 3
IMPEDIMENTS AND SOLUTIONS TO P3/P4 FOR WATER RESOURCES

In endeavoring to implement alternative finance and delivery for water resources, USACE has identified several constraints and obstacles that effectively restrict its ability to develop a sustainable alternative finance program aligned with best practice. While there may be opportunities to work around some of these issues through P4 when addressing individual projects or asset classes, these constraints generally impede the ability to maximize public benefits, restricting the ability to design transaction structures that optimize risk allocation and generate value-for-money for the tax payer. Key constraints identified to date include the following:

3.1 Compensation Mechanisms

Recognizing the P3 does not equate to free money, a viable Public-Private-Partnership framework founded on the principles of non-recourse/project finance will require that the vast majority of private partner investments and risks be repaid and compensated. This requires public authorities to be able to clearly define funding sources and compensation mechanisms that will be dedicated to project repayment.

As discussed in Chapter 2, in non-recourse finance, there are essentially three payment categories used to repay third party infrastructure and service delivery: user payments, budget-based performance payments, and commercial/ancillary revenue. The ability to generate revenues and pledge revenue streams to compensate the private partner for its costs and risks is a necessary pre-condition for any alternative finance and delivery project, whether P3 or P4.

At present, the challenge facing federal authorities is that they have no authority to assess and commit user fees for project repayment, as user fees – where legally allowable- are typically sent back to the Treasury General Fund or dedicated Trust Funds and subject to future appropriations. Without the ability to dedicate specific revenues for project repayment, most federal P3 projects are thus entirely dependent on budget-based payments (i.e., availability payments), which – regardless of risk allocation - are generally treated by budget authorities as a capital lease and scored upfront. In other words, lacking the authority to assess and commit user-fees for specific project purposes, federal authorities are effectively limited to availability or performance based payments; but apart from some energy savings performance contracts, these projects are untenable for all intents and purposes as budget scorekeeping rules mandate that the entire federal obligation relating to the project be scored upfront in a single year. For all intents and purposes, this situation inhibits federally funded P3 projects, instead forcing federal authorities to recur to non-federal sponsors, even when this structure does not reflect optimal risk allocation.

Specific constraints relating to compensation mechanisms are discussed below.

3.2 User Payments / Revenue Generation and Ring-Fencing

With regard to user payments, at present, there is a threefold challenge facing water resource projects, including the following:

1. Limited ability to assess new fees and generate revenues;
2. Inability to commit revenues for project-specific purposes (ring-fencing); and
3. Lack of contract authority to enter into agreements that encumber future revenues.

Currently, most existing fees and excise taxes assessed over the use of water resource assets are deposited into the Treasury's General Fund with some trust fund payments, such as the Inland Waterway Trust Fund and the Harbor Maintenance Trust Fund, tracked for accounting reports Treasury's General Fund. These revenues are not available for dedicated project-specific purposes. This situation, exacerbated by the limited ability to assess new user fees and the constraints of the Anti-Deficiency Act, legally and practically impede federal authorities from transferring demand risk to the private sector or engaging in user-fee based P3, thereby restricting federal authorities to budget-based performance payments or less comprehensive work-in-kind arrangements.

3.2.1 Revenue Generation

Federal authorities would benefit from the flexibility to create and assess new user fees, particularly when required for cost-recovery on P3/P4 projects. This policy would be aligned to OMB Circular A-25 (Revised) that specifically calls for both the self-sustainability of public institutions and the need for enabling private sector participation in the provision of these services. While there are some practical limitations, the authorization of new fees would help to facilitate P3s by allowing for cost-recovery associated with infrastructure and service delivery. In some cases, particularly in the case of transaction being undertaken as a locally-led (non-federal) P4, the authority to assess fees might need to be further delegated to non-federal sponsors and/or private partners.

Currently, the ability to assess fees varies enormously depending on the specific water resource asset class. In some cases, such as inland waterways, the ability to assess user charges is legislatively prohibited; while in others, such as recreation, there are no legislative barriers. Constraints related to revenue generation need to be addressed on an asset-class or project-purpose basis.

3.2.2 Ring-Fencing

At present, most existing fees and excise taxes assessed over water resource assets are either deposited in designated Trust funds or sent to the General Fund of the Treasury. In some cases, such as IWTF and HMTF, this treatment of revenues is mandated by law; in others, such as recreational concession fees, by internal federal directives. Nevertheless, the inability to commit project-related revenues to specific project purposes represents a significant constraint to P3 and alternative finance program development.

To facilitate dedicating user charges for project-specific purposes, steps should be taken to allow the revenues to be collected and retained for project-specific purposes. Again, the specific solution to address this problem will depend in great part on the primary project purpose, but in general, there are two approaches. The first would be to deposit the funds into some sort of legally established revolving trust fund, while the second would be to deposit the funds into an escrow account held by either the non-federal sponsor or the private partner.

A revolving fund is a special account into which money is deposited for expenditure without regard to fiscal-year limitations. An agency has no authority to establish a fund of this type unless specifically authorized by Congress. The establishment of a revolving fund is a special exception to the general rule that Congress appropriates funds for an agency's use on a fiscal-year basis. Accordingly, their administration and use are limited strictly to the terms of the act that establishes them.

As a consequence, there are many differences among revolving funds; however generally speaking, money left in a revolving fund at the end of the year remains available for use the following year. The money does not revert to the general treasury as would ordinary, unused fiscal-year appropriations. Furthermore, 31 U.S.C. & Sect; 1516 grants agency heads the authority to exempt revolving funds from the normal rules by which appropriations are apportioned by time periods of less than a year or by activities, functions, projects or objects.

In short, the creation of a revolving fund for individual projects or project types could allow for revenue to be dedicated to specific purposes. Nevertheless, money in a revolving fund does not otherwise lose its identity as "appropriated funds" and is thus still subject to the to the restrictions of the Anti-Deficiency Act. The second option, allowing revenues generated over federal water resource assets to be deposited in a non-federal or privately held escrow account, would be optimal for locally-led P4 projects. In most instances, the ability to transfer these funds to a non-federal escrow account would require legislative authorization.

3.2.3 Contract Authority / Anti-Deficiency Act

As indicated above, money in a revolving fund does not otherwise lose its identity as "appropriated funds." Consequently, revolving funds are subject to the restrictions of the Anti-Deficiency Act just like any other appropriated funds. In essence, the Anti-Deficiency Act prohibits an agency from entering into a contract that would obligate more money than the agency has available in the revolving fund for its use. In other words, even with a revolving fund, federal authorities would be required to pre-fund the works, as an Anti-Deficiency Act violation would occur if federal authorities were to enter into a contract valued above the amount of the money available in the revolving fund at the time of executing the contract. For all practical purposes, this runs counter to the principles of project finance.

Nevertheless, occasionally Congress may grant an agency a limited exemption from the Anti-Deficiency Act by giving the agency "contract authority." Contract authority in this context is different from authority to contract. By implication of its creation, every agency has the authority to contract for goods and services in support of its statutory purpose to the extent that funds are

available. Additionally, Congress has given some agencies a separate contract authority allowing them to enter binding contracts even though they do not have sufficient funds available for obligation. All such grants of contract authority are strictly and narrowly construed. If federal authorities hope to utilize revenues for project-specific purposes, they would likely need to consider seeking contract authority on a pilot basis that would allow it to enter contractual arrangements based on future revenues.

3.3 Budget-Based Payments

Given the inability to assess fees and ring-fence revenues for project-specific purposes, federal authorities are effectively restricted to budget-based payments for P3. Nevertheless, while budget-based P3 are a very common transaction structure, there are likewise several constraints that limit their use for federal or cost-shared water resource projects.

3.3.1 Budget Scoring

As indicated above, given the inability to assess fees and dedicate them to project-specific purposes, federal authorities are essentially limited to compensating P3 investments through budget-based payments. In accordance with OMB Circular A-11, however, these long-term payments are generally treated for budget scoring purposes as a capital lease or lease-purchase, thereby requiring the entire project cost (an amount equal to the Government's total obligations over the life of the P3 contract) to be scored against the legislation in the year in which the budget authority is first made available. This budgetary impact in a single year is thus the total value of the project, thereby effectively precluding federal authorities from utilizing P3 to deliver water resource projects.

3.3.2 Continuing Contract Authority / Anti-Deficiency Act

P3 projects involve multi-year obligations and payment streams; therefore, the associated contract must cover the needs or requirements of more than one fiscal year. In other words, performance and obligations extend into multiple fiscal years. Unless federal authorities either have specific multiyear contracting authority (*e.g.,* 62 Comp. Gen. 569 (1983)), are contracting in compliance with the multiyear contracting provisions of the Federal Acquisition Streamlining Act of 1994, or are operating under a no-year appropriation (*e.g.,* 43 Comp. Gen. 657 (1964)), the Anti-Deficiency Act, together with the *bona fide* needs rule, prohibits contracts purporting to bind federal agencies beyond the obligational duration of the appropriation. This is because the current appropriation is not available for future needs, and appropriations for those future needs have not yet been made.

In other words, a fixed-term appropriation (fiscal year or multiple year) may be obligated only during its period of availability and only for the *bona fide* needs of that fixed term. The Anti-Deficiency Act prohibits the making of contracts which exceed currently available appropriations or which purport to obligate appropriations not yet made. If an agency does not have specific multiyear contracting authority but enters into a multiyear contract solely under authority of a multiple year or no-year appropriation, then the full contract amount must be obligated at the time of contract award.

To facilitate federal P3 projects and mitigate contracting and appropriation risk, federal authorities would benefit from multiyear contracting authority.

3.3.3 Budgetability

Given the accelerated delivery and costs savings associated with P3 projects, as well as the ability of USACE to execute more projects within its existing budget than would otherwise be possible, traditional benefit-cost-ratios (BCR) used to prioritize projects are no longer reflective of the underlying value of some proposed P3 projects. In this regard, the budget prioritization process does not account for or recognize benefits accrued as a result of an alternative finance and delivery approach (i.e., accelerated delivery of public benefits, cost-avoidance, incentivized efficiency savings, higher return on federal investment, etc.). This constraint likewise impacts projects requiring new start appropriations.

3.3.4 Other Constraints

P3 Pilot Program (as per Section 5014 of WRRDA 2014) –

1. Scope of Application of §5014 / Exclusion of O&M Projects. §5014 of WRRDA 2014 establishes a P3 pilot program for water resource projects; however, limits its application to "authorized" projects. This effectively restricts USACE from harnessing P3/P4 for many ongoing O&M projects. Moreover, the lack of specificity of §5014 regarding the inclusion of operations and maintenance leads to conflicting interpretations as to whether O&M responsibilities can be bundled into P3 contracts, as per standard P3 practice. Indeed, the entire value proposition of P3 is heavily dependent on the allocation of responsibilities for O&M to a private entity, so any lack of clarity over the scope of application of §5014 needs to be addressed.
2. Funding for §5014. To date, there have been no appropriations assigned to §5014 of WRRDA 2014, thereby limiting USACE's ability to fully develop the P3 Pilot Program envisioned therein. For this reason, the majority of the effort to date has focused on exploring other alternative finance and delivery approaches contemplated in other provisions of WRRDA 2014.
3. Contract Term. A. There is some concern that federal authorities may not have the necessary authorization to enter long-term contracts of a sufficient duration to accommodate a P3. This same issue has arisen with other federal agencies pursuing P3, such as the Department of Defense's alternative energy program, who have had to secure legislative relief to enter long-term P3 contracts.

3.4 Summary

Given the criticality of the nation's water resources infrastructure, as well as the need to leverage a wide variety of tools to most effectively and efficiently deliver these assets, it is necessary to identify key constraints and obstacles currently impeding the use of alternative finance and delivery, as well as solutions for overcoming these hurdles. As such, the following table lays out

the key constraints to P3 for federal or cost-shared water resource projects, as well as examples where these same constraints have been address by other federal agencies:

Constraint	Solution	Precedents
Revenue Generation & Ring-Fencing	Legislation to permit: • Revenue generation to allow for project finance. • Need to keep revenues out of Treasury, otherwise P3/P4 will not work and scoring will be prejudicial. • Need to be able to obligate revenues in anticipation of their deposit in the revolving fund and/or escrow account.	Title 23 of the United States Code (Highways) includes a general prohibition on the imposition of tolls on Federal-aid highways. However, Title 23 and other statutes have also carved out certain exceptions to this policy. Two mainstream federal tolling programs and several pilot programs offer states opportunities to use tolling to generate revenue to support highway construction activities and implement priced managed lanes on federal-aid highways. The most relevant of these to the Corps needs is the **Section 129 General Tolling Program, which allows** tolling on new highways and new lanes added to existing highways, and on the reconstruction or replacement of bridges, tunnels and existing toll facilities. On a pilot basis and subject to appropriate user consultations, a similar approach could be applied to inland waterways. 31 U.S.C. 1516 grants agency heads the authority to exempt revolving funds from the normal rules by which appropriations are apportioned by time periods of less than a year or by activities, functions, projects or objects. Trust fund monies could be expressly excluded from Anti-Deficiency, thereby allowing for project finance of water resource projects.
Budget Scoring	Work with OMB and CBO to update OMB Circular A-11 to reflect changes in accounting standards over the past 25 years. Specifically, as recommended by the Government Accounting Standards Board (GASB) Statement 60, allow for a distinction between lease arrangements and other sorts of P3 (such as service concessions), applying different scorekeeping methodologies to each. Additionally, as set forth in ESA 95, apply the risk-reward methodology for P3 projects in which the government agency is not the primary off-taker or beneficiary of the asset.	n/a

Constraint	Solution	Precedents
Budgetability	As part of the P3 pilot program, take additional criteria into consideration when evaluating BCR, such as Return on Federal Investment (ROFI), risk transfer valuation, accelerated public benefits and forgone costs.	n/a
Expand scope of application of §5014 of WRRDA 2014 to include operations and maintenance, as well as rehabilitation.	Need to expressly include O&M.	P3 is designed to address infrastructure life-cycle needs. Exclusion of O&M makes P3 almost untenable. Moreover, deferred maintenance of existing water resource projects are being excluded from P3.
Applicability of Federal Law (specifically FAR)	Exception from FAR in case of a locally-led P4.	Shared services language is in Section 331 of the National Defense Authorization Act of 2013 exempted the non-federal interest in shared service agreements (P4) from the obligation to contract services using FAR.
Contract Term	Need authorization to enter into long-term contracts to allow for repayment opportunity and to minimize contract risk.	**§2922a "Contracts for energy or fuel for military installations" or** 10 U.S.C. 2922a (DOD Authority) allows for contracting for up to 30 years for certain activities (energy production facilities on DoD real property or on private property).
5014 of WRRDA 2014 P3 Program Funding	P3 pilot program needs appropriation to become effective. Also needs funding to function.	DOT OIPD, RCI, Army Shared Services, et al

In a few instances, the use of public-public-private-partnerships (P4) may enable alternative finance and delivery for federal or cost-shared water resource projects that are otherwise impeded by the aforementioned constraints. The ability of a non-federal sponsor to lead a P4 initiative is dependent on several factors, such as the following:

1. Existence of state or local enabling P3/P4 legislation: P4 are only viable where the non-federal interest has the ability to leverage appropriate P3 enabling legislation. Although there is no database of state or local governments with P3 enabling legislation for water resource projects, it is important to note that many state and local governments have broad-based P3 enabling legislation which might be leveraged for water resources. At the local government level, home rule if often leveraged to allow for P3. Likewise, many quasi-governmental authorities, such as port authorities, are endowed with the legal authority to enter P3/P4 agreements. A good example of this is the Port Authority of New York and New Jersey, which has a strong track record of innovative P3 even though the state of New York lacks P3 enabling legislation.

2. Viable non-federal cost-share partner: A P4 places additional obligations on the non-federal cost share partner responsible for executing the P3 agreement with a private partner. The

non-federal cost share partner will be a signatory to the P3 and will thus need to have the institutional credibility, governance experience, contract authority, and credit-worthiness to assume the contingent liabilities associated with a P3 (such as compensation in the case of early termination). Moreover, the non-federal cost-share partner will need to be endowed appropriate legal authorities.

Obviously, not all projects are suited for P4 and certainly not all non-federal interests will meet market requirements to enable P4. For this reason, priority should be given to trying to address the key P3 constraints identified earlier in this section.

CHAPTER 4
CONCLUSIONS AND RECOMMENDATIONS

Through its workshops in New Orleans, New York City, and St. Paul, the subcommittee explored the serious state of decline of our nation's water resources infrastructure and the need for new tools to address those needs given the paucity of public funding in today's environment. Alternative Finance and Delivery methods (P3s, P4s, etc.) were examined primarily within the context of the Corps' Civil Works Program and its national level infrastructure needs. This tool was found to be a viable way, where appropriate, to address the current issues of flat budgets and a fix when it fails methodology to infrastructure management.

However, regardless of the cost-share structure, federal funding of water resource projects takes place in a bifurcated process. Capital projects must first receive Congressional authorization as a federal project, and then are subject to subsequent annual budget appropriations. There is simply not enough money available to address all the capital needs associated with federally authorized water resource projects, so projects with higher BCR's take budget priority. Flat budgets often mean that projects, when finally funded, are subject to protracted appropriations over an extended time period, deferring project completion and public benefits, while extending completion dates and exponentially increasing project costs. Additionally, increasing costs to operate, maintain, and rehabilitate the aging water resources infrastructure creates additional downward pressure on the public institutions to invest in new infrastructure.

Complicating issues further is that when considering Alternative Financing and Delivery, traditional BCR calculations often fail to reflect the benefits and costs derived from an alternative finance and delivery approach, including the lifecycle cost savings that can be realized. For instance, given the accelerated delivery and costs savings associated with P3 projects, BCRs used to prioritize projects do not reflect the underlying value of Alternative Financing and Delivery to the project. The budget prioritization process does not account for or recognize benefits accrued because of an Alternative Finance and Delivery approach (i.e., accelerated delivery of public benefits, lifecycle cost-avoidance, incentivized efficiency savings, access to industry innovation, higher return on federal investment, etc.). BCR assessment methods need to change in this regard.

Moreover, there is significant value in allocating risks to third parties (i.e., a private partner) without abrogating control of the infrastructure which addresses schedule delays, cost overruns, deferred maintenance, etc. In other words, the value of off-loading risks from the public sector, which is one of the key drivers for P3/P4, is not accounted for at all by current BCR calculation methods. In short, projects viable for delivery under a P3 structure may never see the light of day because the additional benefits and cost savings associated with the alternative finance and delivery approach are not recognized in the BCR calculation that serves as the basis for budget appropriations.

Therefore, projects viable for delivery under a P3 structure may not be seriously considered because the additional benefits and cost savings associated with the alternative finance and delivery approach are not recognized in the BCR calculation that serves as the basis for budget appropriations. This virtually eliminates the possibility that Alternative Finance methodologies will be used on Federal water resources projects.

As stated previously, Federal project scoring policy remains a concern because under current rules P3/P4 projects do no compete well with traditional projects. Scoring policy must be changed and/or Congress needs to provide legislation that would better enable the use of alternative finance and delivery for Federal water resources projects in the future.

Some recommendations to address how Alternative Finance and Delivery issues might be resolved follow.

First, ASCE has a vital role to encourage public officials at all levels (Federal, state, and local) to consider the use of Alternative Finance and Delivery as a tool, when appropriate, to address the infrastructure needs of our nation. This is also true of public water resources infrastructure such as that managed by the U. S. Army Corps of Engineers.

Second, WRRDA14 needs to be amended, or a new WRDA enacted to address the constraints identified by USACE that must be resolved to allow full implementation of the pilot program envisioned by Congress. Stakeholders to include ASCE have a role in this regard. Additionally, Congress should provide the appropriations needed to enable those Alternate Finance and Delivery pilot projects approved by them to proceed to construction for the public's benefit.

Third, Federal Budget scoring and BCR calculation methods need to be amended or Congress needs to provide enabling legislation that would allow greater use of Alternate Financing and Delivery to facilitate greater use of Alternate Financing and Delivery, focusing on optimizing the return of Federal investment that can be realized from these methods where their use is appropriate. Again, ASCE with other stakeholders can encourage efforts to draft policies and/or legislation, or acquire the resources to do so, to address this issue which impede the use of Alternative Finance and Delivery on Federal water resources projects.

Fourth, Congressional authorities must be modified to enable a more effective approach to revenue generation and ring fencing for funding and financing projects within the Corps' Civil Works program. The key to this strategy is to allow for reinvestment of at least part of the revenues generated by water resources projects, complemented by other funding sources, by using P3/P4 contracts for investment in new or existing water resources infrastructure. This would enhance greater use of P3s/P4s and Delivery as a tool that would also be more attractive to potential private sector investment and partners. ASCE should influence this effort as well.

Fifth, the Corps needs greater authority from Congress to enter long-term contracts (up to 50 years). This would facilitate the use of Alternate Finance and Delivery for Civil Works projects.

Finally, states that do not have Alternate Finance and Delivery legislation currently in place should be encouraged to enact laws that will enable the use of this tool to address water resource infrastructure needs. Non-Federal water resources infrastructure sponsors and stakeholders should consider Special Purpose Entity (SPE) partnerships that have the authorities to address greater non-Federal contributions, to include necessary lifecycle investments in a more consistent way. This will help achieve the full benefits of P3/P4 enabled infrastructure across its entire life cycle.

ASCE, its members, and partners can play an important role in making the above recommendations a reality. The future of our nation's security, economy, and our quality of life depends on expanding the tools available to meet growing infrastructure and funding needs. It will take a concerted effort by ASCE working with Congress, the Administration, CBO/OMB, Federal agencies, the private sector/stakeholders, academia, states, and other institutions to move the use of Alternative Finance and Delivery forward in our country.

APPENDIX A
GLOSSARY

Affermage. A P3 structure (originally created under French law), under which the private operator is responsible for operating and maintaining the utility/ business but not for financing investment. The project company does not receive a fixed fee for his services but retains part of the receipts collected from consumers, with a portion of the receipts going to the contracting agency as owner of the assets. The payment to the contracting agency will be a percentage of the receipts or a percentage of the total units of service provided.

Alternative Delivery. Alternative delivery and finance means the use of innovative infrastructure finance, delivery, and operational arrangements that have not traditionally been used by the US Army Corps of Engineers. This includes design-build engagements, as well as P3 and P4 arrangements.

Availability. The period when the facility (or the relevant part thereof) is able to provide the service as required under the P3 Contract

Availability Payment. Availability payments are payments for performance made irrespective of demand for the use of an infrastructure asset. They can be an attractive financing and project delivery alternative for projects which, for reasons related to policy, profitability, or affordability are not feasible under a usage-fee arrangement. An availability payment-based P3 structure transfers the risks of designing, building, financing and operating/maintaining a project to a private partner.

Benefit-Cost-Ratio (BCR). BCR is an indicator, used in the formal discipline of cost-benefit analysis, which attempts to summarize the overall value for money of a project or proposal. A BCR is the ratio of the benefits of a project or proposal, expressed in monetary terms, relative to its costs, also expressed in monetary terms. All benefits and costs should be expressed in discounted present values.

BBO. Buy-Build-Operate (similar to BOO).

Bond. A debt instrument that is tradable.

BOO. Build-Own-Operate. The private entity will build, own and operate the project just as in a BOT project, but there is no transfer back to the Government. This method is often used where there will be no residual value in the project after the concession period or accounting standards

do not permit the assets to revert to the contracting agency if the contracting agency wishes to benefit from off-balance sheet treatment.

BOOS. Build-Own-Operate-Sell. Same as a BOT except that the contracting agency pays the project company for the residual value of the project at transfer.

BOOT. Build, Own, Operate & Transfer: A P3 Mode under which the Concessionaire builds the assets, owns them, operates and maintains them and at the end of the Concession, transfers the assets back to the Sponsoring Authority. (e.g. – Real Estate projects)

BOR. Build-Operate-Renewal of concession (similar to BOO).

BOT. Build, Operate & Transfer: A P3 Mode under which the Concessionaire builds the assets, operates and maintains them and at the end of the Concession, transfers the assets back to the Sponsoring Authority. (e.g. – Road projects)

BTO. Build-Transfer-Operate (similar to BOT). This often involves the contracting agency paying for construction of the facility, separate from operations, at or before transfer.

Bundling. Bundling refers to the grouping or packaging of a variety of responsibilities relating to multiple programs, projects, and/or activities across several phases of an Asset Life-Cycle to deliver better value for money by taking advantage of synergies, savings, commercialization opportunities, and enhanced incentive structures.

Concession. Concession refers to a wide variety of contractual modalities in with the public authority grants exclusive rights to a private partner for the provision, operation and maintenance of an infrastructure asset for a specified period of time. The private partner assumes significant investment and operational risk, while the public sector retains ownership of the original asset.

Consortium. A group of private sector parties who work together to bid and, if successful, deliver the project. The bundled services included in the scope of the project will require consortium members with specialization in design, construction, asset management, facilities maintenance, operational expertise (if applicable), and debt and equity financing.

Cooperative Agreements. As set forth in 31 USC 6305, a cooperative agreement is the legal instrument an executive agency uses to reflect a relationship between the U.S. government and a state, a local government, or other recipient when (1) the principal purpose of the relationship is to transfer a thing of value to the state, local government, or other recipient to carry out a public purpose of support or stimulation authorized by U.S. law, and (2) substantial involvement is expected between the executive agency and the state, local government, or the recipient in carrying out the activity contemplated in the agreement.

COPRI. Coasts, Oceans, Ports & Rivers Institute

Cost Benefit Analysis. The ratio of the NPV of the benefits of a project to the NPV of its costs (from the public-sector point of view).

Credit Rating Agency. A private agency that assesses credit risk of sovereign entities, companies or investments, such as Standard & Poors, Moody's and Fitch. The agency applies a letter grade to indicate credit risk. Lenders and investors use the rating as an indication of the relative riskiness of a loan or investment.

Credit Risk. The risk that a counterparty to a financial transaction will fail to perform according to the terms and conditions of the contract (default), either because of bankruptcy or any other reason, thus causing the asset holder to suffer a financial loss. Sometimes known as default risk.

DBO. Design-Build-Operate, a form of long-term contract for construction and operation of a Facility, in which funding is provided by the Public Authority.

DBF. Design-Build-Finance Contract.

DBFM. A form of P3 procurement that bundles the Design, Build, Finance and Maintenance components of the project (including associated risks) for delivery by the contractor. Responsibility for provision of operational services (and risk) is retained by the procuring entity.

DBFMO. Design-Build-Finance-Operate-Maintain Contract.

DBFMO. A form of P3 procurement that bundles the Design, Build, Finance, Maintenance and Operational components of the project (including associated risks) for delivery by the contractor.

DBFO. Design-Build-Finance-Operate. The grantor retains title to the site and leases the project back to the project company for the period of the concession. Similar to BOO.

DBFOT. Design-Build-Finance-Operate-Transfer

Divestiture or Asset Sale. A public entity sells or otherwise transfers ownership of an asset, either in part or in full, to a private sector entity. Generally the public entity will include certain conditions with the sale or transfer of the asset to ensure that improvements are made and services continued to be delivered.

Engineering, Procurement and Construction Contract (EPC Contract). A fixed-price, date-certain, turnkey contract. Usually, it involves design and engineering, equipment procurement or manufacture, and construction and erection of process or other plant. Until the time P3s appeared on the scene, this was the most common mode of procurement in Governments.

Funding. Funding refers the primary stream of revenue used to offset program, project or activity costs or to support revenue leveraging options. For the USACE, traditional funding sources have included annual budget allocations, user fees, trust funds, matching grants, etc.

Financing. Financing is the means by which the primary revenue streams are manipulated to make funds available when needed or to reduce the costs of borrowing.

Force Majeure. Acts of God and other specified risks (e.g. terrorism) which are beyond the control of the parties to the contract and as a result of which a party is prevented from or delayed in performing any of its non-financial obligations under the contract.

Funding Gap. The funding gap refers to any shortfalls between available funding and project costs.

Handback. At the conclusion of the operating period, the asset must be handed back to the procuring agency in a pre-defined condition, at no additional cost.

HMTF. Harbor Maintenance Trust Fund.

IWTF. Inland Waterways Trust Fund.

Lease Agreements. A lease is an agreement whereby the lessor conveys to the lessee in return for a payment or series of payments the right to use an asset for an agreed period of time. All standard setting boards classify leases for the lessee as either a capital lease or an operating lease. Capital leases are considered equivalent to a purchase, while operating leases cover the use of an asset for a period of time and are treated by the lessee as periodic expenses. OMB makes a further distinction and identifies a lease in which ownership is transferred to the Government at or shortly after the end of the lease term as a lease-purchase.

Lifecycle Costs. The cost of replacing or refurbishing asset components during the contract period.

Loan guarantee. A loan guarantee refers to any guarantee, insurance, or other pledge with respect to the payment of all or a part of the principal or interest on any debt obligation of a non-Federal borrower to a non-Federal lender.

Monetization. Monetization of assets refers to the process of generating a revenue stream from the operation of existing or future infrastructure assets.

Mezzanine Debt. Subordinate debt provided by third parties other than the investors.

Off-budget. Off-budget refers to transactions that are not treated as part of the Budget of the United States Government.

Off-take Agreement. An off-take agreement involves the purchase all or a substantial part of the product produced by a project, which typically provides the revenue stream for project financing.

O&M. Operations and Maintenance.

Payment Mechanism. The methodology for applying the performance regime to calculate the unitary payment for a period (and set out in a schedule to the project agreement). The payment mechanism and performance regime work together to determine the unitary payment for a period and therefore incentivize performance of the contractor's obligations under the project agreement and delivery of the project outcomes.

Performance Regime. The performance standards expected of the contractor, including key performance indicators, and abatements to the unitary charge for performance below the standard required by the project agreement (and set out in a schedule to the project agreement). The payment mechanism and performance regime work together to determine the unitary payment for a period and therefore incentivize performance of the contractor's obligations under the project agreement and delivery of the project outcomes.

P3 Framework. The combination of legal, regulatory, institutional and financial framework that together facilitates the implementation of P3, generally on a programmatic rather than ad hoc basis.

P3 Institutional Framework. The series of institutions that together deliver the different functions and inputs from the Government needed to implement a P3 program.

PPPI. Private Provision of Public Infrastructure.

Public Private Partnerships (also P3 or PPP). P3 generally refer to long term contractual relationships between a public sector contracting authority and a private entity for the financing, design, construction, renovation, management, operation, and/or maintenance of public infrastructure and/or the provision of public services. P3 do not refer to simple outsourcing or service contracts, but instead must involve significant risk-sharing between the public and private sector in the provision of an infrastructure asset or related service.

Public-Public-Private-Partnership (also P4). P4 refer to Public-Private-Partnership arrangements involving more than one public authority, such as projects involving shared jurisdictional responsibilities for infrastructure delivery and operations.

Public Sector Comparator (PSC). The Public Sector Comparator means the hypothetical risk adjusted cost of a project across its entire life-cycle, if it were to be financed, owned, and implemented by government. PSC represents the most efficient public procurement cost (including all capital and operating costs and share of overheads) after adjustments for

Competitive Neutrality, Retained Risk and Transferable Risk (for definitions of these terms please refer to the Public Sector Comparator technical note) to achieve the required service delivery outcomes. This is used as the benchmark for assessing the potential value for money of private party bids in PPPI projects.

Privatization. Complete transfer of public infrastructure to the private sector, as compared to P3s, where it remains in the public sector.

Revenue Bonds. Revenue bonds are bonds (instruments and indebtedness) issued by the public sector to finance a facility or equipment purchase, which, unlike general obligation bonds, are not backed by the full faith and credit of the government. Instead, their revenues are generated from the facility or equipment that they finance. Because they are state or local government bonds, their interest earnings are tax exempt under the Internal Revenue Code.

Risk. In the context of alternative delivery and public-private partnerships, Risk refers to any of a series of project related risks that must be addressed in the P3/P4 contract. Amongst other risks, projects are subject to design defects, delays and cost overruns (constructions risks), environmental liabilities, force majeure, revenue collection shortfalls (demand risk), operating and maintenance cost overruns (operating risk), fluctuations in interest rates (financial risks), changes in legislation, policy, or tax treatment (political risk), etc. The optimal allocation of risks between the public and private partners is the key objective in P3/P4 project structuring.

Risk Allocation. Risks are allocated (through the project agreement) to the party that is best able to manage and mitigate those risks, in order to drive delivery of the required service outcomes and value for money. All project risks are identified early in the procurement process, and the cost of those risk to the procuring entity determined. Risks will only be allocated to the private sector partner where they can manage those risks more effectively or efficiently than the procuring entity, and therefore provide a value for money solution.

Revolving Fund. Revolving fund means a fund that conducts continuing cycles of business-like activity, in which the fund charges for the sale of products or services and uses the proceeds to finance its spending, usually without requirement for annual appropriations. There are three types of revolving funds: Public enterprise funds, which conduct business-like operations mainly with the public, intragovernmental revolving funds, which conduct business-like operations mainly within and between Government agencies, and trust revolving funds, which conduct business-like operations mainly with the public and are designated by law as a trust fund.

Scoring or Scorekeeping. Scoring means measuring the budget effects of legislation, generally in terms of budget authority, receipts, and outlays, for purposes of measuring adherence to the Budget or to budget targets established by Congress, as through agreement to a Budget Resolution.

SPV. Special Purpose Vehicle. In establishing a project consortium, the sponsor or sponsors typically establish the private party in the form of an SPV which contracts with government. The SPV is simply an entity created to act as the legal manifestation of a project consortium, with no historical financial or operating record which government can assess. An SPV is a legal entity with no activity other than those connected with its borrowing.

Term Loan. A fixed-period loan, usually for one to 10 years, that is paid back by the borrower in regular (often monthly) installments with interest. This is the most common form of business loan; it may be secured or unsecured.

Term Sheet. A document, not generally intended to be legally binding, setting out the main agreed terms and conditions to a transaction between the borrower and arranger.

Termination. The act of bringing the contract to an end by one of the parties in accordance with a right to do so granted by the applicable law or the contract.

TIFIA. Transportation Infrastructure Finance and Innovation Act.

Trust Fund. A trust fund refers to a type of account, designated by law as a trust fund, for receipts or offsetting receipts dedicated to specific purposes and the expenditure of these receipts.

USACE. U.S. Army Corps of Engineers.

User Charges. User charges are charges assessed for the provision of Government services and for the sale or use of Government goods or resources. The payers of the user charge is typically limited in the authorizing legislation to those receiving special benefits from, or subject to regulation by, the program or activity. User charges are defined and policy regarding user charges is established in OMB Circular A-25. User charges are often a key element in the funding of P3 and P4 projects.

Value-for-Money (Vfm). The marginal economic and social benefit derived from utilizing alternative finance and delivery, instead of the purely public provision of specified infrastructure and services. Value for money is calculated on the basis of a project's expected net present value relative to the public sector comparator. It is the combination of private sector efficiency and innovation, risk transfer, whole life cost and service provided by the facility as a basis for deciding what offers the best value to the Public Authority. The calculation of value for money does not only refer to the price or cost of goods or services, but also reflects the quality, effectiveness, timeliness of implementation, and other factors which influence the determination of the best economic value amongst options.

Venture Capital. Equity and risk capital for new entrepreneurial ventures, invested in a stage earlier than other capital would normally be available. The capital bridge before accessing capital

markets. Venture capitalists look for significant growth prospects, and will expect to improve the business, and take it to the public capital markets, in the short term.

VGF. Viability Gap Funding. A scheme, wherein projects with low financial viability are given grants, making them financially viable under P3. This is an important bidding parameter, if applicable.

WIFIA. Water Infrastructure Finance and Innovation Act.

WRRDA. The Water Resources Reform and Development Act of 2014.

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APPENDIX B
EXAMPLE P3 WATER RESOURCES PROJECTS

Dredging:

- **India: Mormugao Port, Goa India (2015)**
  The Centre-owned port at Goa is launching a port expansion project to be implemented through P3s with approval from the Indian Government. A major element of the project is the deepening of the approach channel through dredging. The draft of the channel will be deepened from 14 meters to 18 meters to facilitate larger cargo vessels. The major advantage of deepening the channel is that shipping costs will be lowered as larger cargo ships handled at the port berths with expedited turn around times.

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- **Sealock Ijmond (Kingdom of the Netherlands)**

  See further down in the document.

Waterway networks:

- **Colombia: Rio Magdalena Navigation Project (2014)**
  The Río Magdalena is the principal river of Colombia, flowing northward about 1,528 km through the western half of the country. It has historically been used a commercial waterway so much so that estimates say that 86 per cent of the country's GDP is somehow produced there or its production is related to the river's waterway functions. The Magdalena River P3 consists of redirecting water flow, dredging and other works in the stretch between Puerto Salgar/La Dorada and the mouth of the river in Bocas de Ceniza, Barranquilla (256 Km), for up to ten years. The model of the contract would be a public-

private partnership for the design, construction, operation, maintenance and finance of the project, according to documents published. The project budget is expected to be in the vicinity of US$ 1.3bn. The P3 concession project will dredge the river 2m deep and 52m wide with a 900m bend radius, ensuring the navigation of six barges of 1,200t per convoy and allowing non-stop river mobility. It is hopes that the activity will revitalized river traffic and increase goods transported from 2 million tons to 6 million tons in 5 years. When completed the Rio Magdalena will be navigable for 908 km.

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Flood risk management:

- **Pevensey Bay Flood Defense (United Kingdom)**

  The Pevensy Bay Flood Defense project is a £27.4 million ($50 million), 25-year project that will rebuild and maintain flood defenses. Funded by shareholder equity to protect against 400-year storm surge. Goal is to incentivize innovation and investment. The Pevensey Bay Sea Defense scheme is unique. It was the first sea defense project anywhere in the world to be funded as a Public Private Partnership (PPP/PFI). In committing to a 25 year contract, Pevensey's residents and environment are guaranteed a consistent standard of defense until at least 2025. This approach to beach maintenance has allowed the Environment Agency and Pevensey Coastal Defense Ltd to develop and advance 'best practice' in provision of sea defense services.

  Pevensey Coastal Defense Ltd (PCDL) is a SPC formed solely for the purpose of performing the contract. Following a tendering process, PCDL received an Invitation to Negotiate (ITN) that ultimately led to a 25 year contract being signed on 1st June 2000. PCDL actually undertakes none of the work, having subcontracted all obligations to the four shareholders which include:

  - Westminster Dredging Co. Ltd
  - Dean & Dyball
  - Mackley Construction
  - Mouchel Group

Each shareholder has a contract with PCDL backed up by a similar direct agreement with the Agency, which would allow the Agency to continue to maintain the defenses should PCDL fail to perform.

Key issues that had to be resolved fall broadly into the following categories:

- Service definition and measurement
- Defining the key physical features
- Paying for something not to happen
- Risk identification and allocation

Sources:
http://www.pevensey-bay.co.uk/ppp.html
http://www.pevensey-bay.co.uk/resources/pdf/Pevensey%20supplement.pdf

Inland Waterways Locks:

- **Limmel lock (The Kingdom of the Netherlands):**
  The €35 million Limmel Lock public-private partnership (P3) barrage lock project near Maastricht in the Netherlands will replace the existing lock which is nearly 100 years old and offer access to the Juliana canal, an important navigational route between Limmel and Maasbracht. The purpose of the project is to broaden and deepen the canal so that larger canal barges can use this canal. The Project Company informed the lenders on the risk profile of the DBFM project. It is expected that the new Limmel Lock will be completed in 2018. Upon completion of the construction phase a 30-year maintenance period will follow.

  Sources:
  https://www.mottmac.com/releases/limmel-lock-ppp-reaches-financial-close-the-netherlands
  https://www.mottmac.com/article/8722/new-limmel-lock-the-netherlands
  file:///C:/Users/david.baxter/Downloads/ppp-dealflow-in-the-netherlands-oct-2013.pdf

- **Sealock IJmond (The Kingdom of the Netherlands):**
  Maritime transport of goods is growing in the Netherlands. This is partly driven by the increase in size, both in length and width, of ocean-going vessels. Because of this the lock too small to handle the increased size demand. Renewal of the lock is also necessary as it was manufactured in 1929. The IJmond sea lock is the gateway to the North Sea canal and the Amsterdam harbor for sea-going vessels. With a new large sea lock near Ijmuiden, the Amsterdam harbor will maintain its international importance. The improvements to the

lock will accommodate the growing river transportation of goods. This project will be tendered on the basis of a DBFM contract.

Construction activities which will commence in 2016 will be carried out by a joint venture. The new lock will be available for shipping at the end of 2019. The dredging activities will be carried out by a subcontractor and new lock will then be maintained by the operator for 26 years.

The financing structure included bank loan facilities, an EIB (European Investment Bank) facility and equity financing. The financing parties involved were DZ Bank, KfW IPEX-Bank, SMBC, BTMU, Unicredit Bank and the EIB. The equity investors were BAM PPP PGGM Infrastructure Coöperatie U.A., VolkerWessels and DIF Infrastructure III, with Rabobank providing an equity bridge facility.

Sources:
https://www.government.nl/topics/public-private-partnership-ppp-in-central-government/documents/leaflets/2014/04/18/ppp-in-the-netherlands-dealflow-october-2013
http://www.bamppp.com/news/rijkswaterstaat-and-openij-consortium-reach-financial-close-on-the-new-sea-lock-at-ijmuiden

Major Rehab and Expansion:

- **New 3rd Beatrix Lock (Kingdom of the Netherlands):**
  This project is being undertaken because there is a concern that the Lek Canal together with the Princess Beatrix lock will become a transportation bottleneck due to the increasing demand for transportation of goods by water. The purpose of the construction of a 3rd lock and widening of the Lek Canal is meant to improve the flow of commercial canal traffic through of the inland navigation system. P3s are being considered. The contract will be modeled on the Limmel Lock P3 project. The project will be executed as a Public Private Partnership (PPP) with a DBFM contract and will include a 27-year maintenance period. The design, new construction, financing and maintenance will be in the hands of a consortium. Following the contract closing of the public-private partnership, the private sector party will be given a one third share in the combination responsible for the construction (EPC) and will participate in the special purpose company (SPC) to be created for this purpose. The private company will be involved in the long-term maintenance. Work is expected to commence in September 2016. The third chamber of the Beatrix Lock and the widened Lek Canal are to be completed in 2019, after which the 27-year maintenance period will go into effect.

  Sources:

https://www.government.nl/topics/public-private-partnership-ppp-in-central-government/documents/leaflets/2014/04/18/ppp-in-the-netherlands-dealflow-october-2013
http://www.heijmans.nl/en/news/heijmans-involved-3rd-chamber-beatrix-lock-and-widening-lek-canal-ppp-project/

Resiliency and Restoration (Disaster Prevention):

- **Afsluitdijk (Kingdom of the Netherlands)**
  As a result of the water safety assessment of the Afsluitdijk (cut off dike across the Zuiderzee / Ijsselmeer) in 2006 it was assessed that improvements were necessary to ensure the long-term safety of the Dutch hinterland. The project's purpose is to strengthen the top layer of the dyke for its entire length of 32 km. Flood prevention measures will include the renovation of existing outlet-locks and lift-locks. In addition, larger water pumps will be installed in the sluices of the Den Oever. The Dutch Government (Rijkswaterstaat) is preparing an integral DBFM PPP contract for both the dyke and its engineering rehabilitation and improvements.

  Sources:
  https://www.government.nl/topics/public-private-partnership-ppp-in-central-government/documents/leaflets/2014/04/18/ppp-in-the-netherlands-dealflow-october-2013
  http://www.rijkswaterstaat.nl/water/projectenoverzicht/afsluitdijk

- **Fargo-Moorhead Diversion**
  The Fargo-Moorhead Diversion authorized by Congress in 2014 project is consistent with the objectives of the President's *"Expanding Public-Private Collaboration on Infrastructure Development and Financing Directive"* and the "*Build America Investment Initiative"*. The project consists of a 20,000 cubic feet per second, 36-mile long diversion channel with a channel width of 1,500-1,600 feet, two aqueduct structures, drop structures, diversion outlet, levees, and adjacent lateral drains. It has a projected cost of $2.1 billion dollars. Alternative financing of the Fargo-Moorhead Diversion is intended to improve collaboration between the public and private sectors, to leverage alternative financing of infrastructure while safeguarding communities, and to protect the environment while efficiently and effectively delivering water resource solutions. The approach chosen by the proponents of the project reallocates risk to the appropriate partners, while optimizing innovative and technical expertise of the private sector to significantly reduce the cost and time of project delivery. It is hoped that the approach used on this project will help the Corps to deliver more projects in the future. The diversion canal is expected to safeguard 230,000 people and provide $1.9 billion in public benefits. It is expected that the PPP project will save the Federal Government $400 million

in project costs and cut down project delivery by 50%. The USACE St. Paul District will oversee the project.

Sources:
http://www.fmdiversion.com/
http://www.usace.army.mil/Portals/2/docs/civilworks/CWRB/fargo/fargo_repsum.pdf
http://www.fmdiversion.com/wp-content/uploads/2016/05/160522_Snyder-Industry_Day.pdf

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