Bridging the Gap Between CCT and CCP

Call for Nominations

Public-Private Partnership Projects—What, Why, and How Is Risk Allocated?
SAVE THE DATE!

June 28 - July 1, 2020
Hilton Chicago
Chicago, Illinois, USA
What reading slowly taught me about writing

Reading slowly — with her finger running beneath the words, even when she was taught not to — has led Jacqueline Woodson to a life of writing books to be savored. In a lyrical talk, she invites us to slow down and appreciate stories that take us places we never thought we’d go and introduce us to people we never thought we’d meet. “Isn’t that what this is all about — finding a way, at the end of the day, to not feel alone in this world, and a way to feel like we’ve changed it before we leave?” she asks.

Source: www.ted.com
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SOURCE  OCTOBER 2019
The Top 10 Reasons To Join AACE International

Ready to advance your career and begin enjoying the advantages that our members enjoy? Whether you are an experienced cost engineer or a student, we have a membership ready for you.

1 Time
Gain access to a wealth of resources that will save you time and money! You’ll stay informed about the complexities of the cost and management profession - plus you’ll have access to discounts on educational programs, publications, and more!

2 Information
Locate thousands of technical papers and publications in the Virtual Library. AACE’s database is keyword searchable for quickly locating appropriate reference articles.

3 Career
Members can post resumes at no additional cost in our Career Center and keep your career on track through information sources such as our annual Salary and Demographic Survey of Project and Cost Professionals.

4 Learning
We offer numerous online learning courses on estimating and project management. The Approved Educational Provider program helps maintain high quality development courses and providers. AACE also holds many seminars throughout the year.

5 Resources
Starting with the TCM Framework and Recommended Practices that are available for free only to members to our bi-monthly publication Cost Engineering featuring articles for cost professionals around the world. Through the AACE International website, the Cost Engineering journal is a great current resource for members and as a member, you gain access to an archive of past issues.

6 Technical Development
Increase your knowledge and expertise by joining one of AACE International’s many technical subcommittees, subcommittees, and Special Interest Groups (SIGs) at no additional cost to members. Discuss industry problems with your peers or help experts develop new and improved techniques and practices for the profession.

7 Networking
By attending a local section or our Annual Conference & Expo for interesting speakers, informational tours, social dinners and much more. The online Membership Directory is an excellent source for a list of contact information on thousands of members. Join one of our many technical subcommittees and participate in the AACE Forums - a great way to tap into the collective wisdom and experience of our world-wide membership.

8 Excellence
Our certification programs are independently accredited by the Council of Engineering & Scientific Specialty Boards. AACE certifications are a recognized credible standard in the cost management field. A recent study shows that individuals with an AACE Certification earn 17.4% more than their counterpart without a certificate.

9 Discounts
On products and services ranging from AACE International Conference & Expo registration fees, archived webinars and presentations, certification examination registrations, and more!

10 You!
We are your professional partner bringing you information and support you can trust. Join and become part of a unique network of individuals who are dedicated to improving the cost and management profession.

JOIN TODAY! web.aacei.org
I have had the opportunity over my 25 years as an AACE International member to have volunteered for an array of different positions. I have held every section office, including Section President. I have been the Region 2 Director, as well as Chair of the Estimating Sub-Committee and the Constitution and By-Laws Committee. But, after spending three months as the President of the Association, I am constantly surprised by all the moving pieces that need to seamlessly interact for the Association to be successful.

The efforts of the Technical, Education and Certification Associate Boards drive an amazing volume of work. The results comprise the collective toolbox of technical, education and certification products that make our AACE International membership so valuable. Our new Membership and Marketing Associate Boards are beginning to gain the traction that was envisioned when they were created two years ago. The Headquarters’ Staff balance day to day operations, liaise with the Board of Directors and Associate Boards, help with budget preparations and handle all aspect of the Annual Conference and Expo. I am realizing that our staff is substantially busier than I ever imagined as a member. Please take pride in our staff and numerous volunteer members, who make the Association function and thrive.

In my duties, I will be traveling for face-to-face meetings with the Technical, Education and Certification Boards, as well as attend the fall Board of Director’s meeting at headquarters in Morgantown, WV, over the next six weeks. The monthly Executive Board meetings, which I mentioned in my last message, have been a success. This is a proven way to keep up with activities monthly, that otherwise might only be discussed quarterly as a group.

Two months ago, I gave you a heads up regarding the Board of Directors’ strategic planning session planned for the October Board Meeting at the Association Headquarters in Morgantown. In preparation for this meeting, a Member Value Survey was sent to the membership. It was extremely gratifying to see the level of interest. Thank you all for your participation and all the honest responses. The responses to the survey will serve as a valuable tool, that the Board of Directors and our Associate Board Chairs, will use to make data-driven decisions at the strategic planning session. The intended end result will be an updated strategic plan which will provide a clear road map and baseline for our efforts for the remainder of the year.

Additionally, an effort is underway to update the AACE International Organizational Manual. This exercise is undertaken every few years to keep the mechanics of the Association current and relevant. Once reviewed, updated, and approved by the Board of Directors, the manual will be distributed to the membership through the Associate Boards, the communities and emails, where appropriate.

With our successful New Orleans Conference and Expo completed, efforts are underway already preparing for next year’s Conference and Expo, June 28 to July 1 in Chicago. Please mark your calendars and get support for attendance into corporate budgets for yourself and your teams. Some 200+ abstracts have been received and the technical program is shaping up to be outstanding. Visit https://web.aacei.org/conferences-events/2020ConEx/schedule-at-a-glance for additional information.

In my last message, I said that I would highlight individual volunteer members who are making a difference. Dave Kyle, the Chair of the Estimating Sub-Committee, has been working above and beyond, organizing the estimating track for the Chicago Conference and Expo. Dave has been working with a team of AACE International estimating experts. His plan is to create a track of technical papers walking attendees through presentations that highlight the entire estimating process and an overview of project controls in general. Stay tuned for this exciting effort and big kudos to Dave and his team.

With Fall upon us, our local sections are into their meeting schedules for the year. Please get involved. Write a technical paper. Make a presentation. Volunteer your time. Run for office. Mentor a member. Get mentored. Take a course. Encourage someone to become certified or become certified yourself. Become well versed in our technical library. A professional grounding in Total Cost Management, Recommended Practices, and Professional Practice Guides will greatly assist in you day to day project’s work. Market AACE International to your management, clients and co-workers. And most importantly stay healthy, enjoy your families, learn something new and make some time for yourselves.
Risk Funding in the Private Sector; Contingency and Management Reserve

**BY TODD W. PICKETT, CCP**

Keeping a capital project successfully within budget starts with a cost estimate that adequately reflects the documented scope and also includes funds to effectively address the risks associated with the project. In a previously published article, two components of project risk funding – contingency and escalation – were discussed. In this article, a third risk fund called management reserve is introduced and compared with contingency.

It is important to note, that for earned value management, contingency and management reserve for public sector projects are often applied differently than for private sector projects. This article will focus on the applications of contingency and management reserve for the private sector. For additional information on contingency and management reserve in the public sector, see AACE Recommended Practice 82R-13, Earned Value Management (EVM) Overview and Recommended Practices Consistent with EIA-748-C, which identifies and compares the differences between public and private sector projects.

Contingency and management reserve funds are considered risk funds. They are intended to cover costs associated with the uncertainty that is inherent in the cost estimating process and other project risks. However, there is a distinct difference in the types of risks that are covered by each of these funds and the way they are identified (or not identified) within the cost estimate.

Let’s begin with a review of project contingency from last year’s article. The following narrative is from that article.

AACE defines contingency as, “An amount added to an estimate to allow for items, conditions, or events for which the state, occurrence, or effect is uncertain and that experience shows will likely result, in aggregate, in additional costs.” This definition is in AACE Recommended Practice 10S-90, Cost Engineering Terminology. Contingency typically does not include funding for major scope changes, events that are out of the ordinary (labor strikes, natural disasters, etc.), as well as management reserve and escalation funds. The basic principles of contingency estimating are discussed in Recommended Practice (RP) 40R-08, Contingency Estimating – General Principles.

Every estimate is associated with a range of potential cost values due to the uncertainty associated with the estimating process. Contingency is the amount of money that is included in a cost estimate to align the final cost estimate value with an acceptable probability that the final estimate value will not be exceeded. Therefore, contingency determination is dependent upon an effective evaluation of the various elements of uncertainty within a cost estimate. This evaluation of uncertainty (i.e., risk, including both threats and opportunities) is typically tied to the risk management process for a given project.

The amount of contingency included in an estimate depends on the project team’s capacity to accept a probability of overrunning the final estimated value. The less risk the team is willing to accept that
the final estimate value may be exceeded, the higher the amount of contingency that will need to be included in the estimate.

Some companies have policies for applying standard contingency funds (for example: 10% contingency for all Class 3 estimates); however, many studies indicate that this practice often results in poor project outcomes and is poor practice. Contingency is best determined by using proven analytical methods and risk analysis tools. Without the use of well-founded techniques, methods, and tools for developing realistic contingency, a project has the potential to significantly under or overrun the estimated cost. AACE RP's 41R-08 through 44R-08 describe various methodologies that can be used to determine contingency.

After the appropriate contingency has been determined, a separate control account is typically created in the project budget to hold the contingency funds. Control of contingency occurs through the use of a project's change management process. When a change is approved that includes a significant cost impact, contingency may be distributed as necessary to readjust the appropriate control account(s).

Now, let's discuss management reserve.

While contingency is included in an estimate to cover unforeseen costs that are within the defined scope of a project, management reserve funds are generally included "to allow for discretionary management purposes outside of the defined scope of the project". Occasionally, it may become necessary to include management reserve funds to cover "amounts that are within the defined scope, but for which management does not want to fund as contingency or that cannot be effectively managed using contingency." as defined in AACE Recommended Practice 10S-90, Cost Engineering Terminology.

For example, this may be the case if contingency funds have not been included for an event because it has a low probability of occurring; however, the estimated cost of the risk event is so great that management is not willing to gamble that the event will not take place and will dedicate reserve funds just in case.

As previously noted, management reserve funds are discretionary funds that are allocated at the management level. Typically, analytical methods are not used to determine reserve fund values. Rather, they are most often based on estimates of a particular event or events. Management reserve funds are often not explicitly identified in an estimate (or budget) and, in some cases, project team members may not be aware that the reserve funds even exist. If an event occurs, then the necessary funds are transferred to the project budget from the management reserve fund and are utilized for a particular risk event.

While contingency is typically managed on a project by project basis, management reserve may be handled on a portfolio basis where multiple projects share the same reserve funds. Using this method minimizes the amount of total management reserve funding that is required for all of the projects in the portfolio and allows the funds to be reallocated to specific projects as needed. Management reserve funds are generally controlled by a level of organization management above the individual project manager, and when the portfolio method is utilized, the funds are often controlled at a business unit or corporate level of management (or by a portfolio manager).

In summary, it is important to remember that the most significant differences between contingency and management reserve funds are this: contingency funds are intended to cover events within the defined scope of the project, can be based on both analytical and deterministic methods, and are always included in the project estimate or budget; whereas management reserve funds are allocated for risk events either within the scope or beyond, are typically based on deterministic methods, and generally are not identified in a project estimate or budget.

Editor's Note: This is part of a continuing series of short articles provided by members of the AACE International Technical Board.

Do You Know?

BY MARVIN GELHAUSEN, MANAGING EDITOR

Are you aware that members and non-members have differing levels of access to AACE International products and services?

COST ENGINEERING JOURNAL/SOURCE MAGAZINE

Members only have access to the bi-monthly Cost Engineering journal, while both members and non-members have equal access to the bi-monthly Source magazine. Visit https://web.aacei.org/resources/publications/magazines. Members can access CE journals back to 2005 while everyone can access the Source magazine from the current issue back to 2012.

VIRTUAL LIBRARY

Members and non members can access the AACE Virtual Library. This resource includes pdf downloads of almost every technical paper published by AACE International. Members have the ability to download pdf's of the full technical articles. Non-members can search and see the abstracts but cannot download a pdf of any article.

PURCHASING PRODUCTS

There are several pathways to view what AACE publications and products are available for download and/or purchase. Only a few products are available in print and these include most of the Certification Study Guides, Skills & Knowledge of Cost Engineering, and the TCM Framework. Recommended Practices are only available as pdf downloads.

To review available products, from the website homepage at web.aacei.org, look for the small “Store” tab at the top of the page. The first page that opens will include tabs for Publications, product bundles, continuing education modules, live webinars and online courses. Clicking on Publications will open a page to purchase the TCM Framework, Recommended Practices, Certification Study Guides, Professional Practice Guides, various Cost Engineering journals, Transactions, Skills & Knowledge of Cost Engineering, the CE Notebook, Salary & Demographic Survey and other miscellaneous products.

You can also access products by going from the homepage to Professional and Technical Resources and then clicking on the Publications tab. You can access those products specific to studying and preparing for a certification exam under the main Certification tab at the website. Generally, the first listing that will come up is for the digital pdf download. If a hard copy print version is available, you need to find and click a tab listed as purchase hardcopy. All print product orders will take you to Amazon.com to complete your order.

If you purchase a pdf, from your Profile page look for the “My Products” tab. Once you click and open the page, scroll down and you should see a pdf of whichever product or products you have just purchased.
Bridging the Gap between CCT and CCP

BY VALERIE VENTERS, CCP FAACE AND CHARLES E. BOLYARD, JR., CFCC PSP FAACE

The Certification Board is frequently asked what additional skills and knowledge are needed to progress from the Certified Cost Technician (CCT) to the Certified Cost Professional (CCP).

AACE International’s Certified Cost Technician (CCT) is the certification available to individuals who have achieved a four-year university-level scholastic degree or who have achieved a minimum of four years of industry experience.

The application of cost estimating, and construction management principles touches many industries, and is a foundation block for developing and following best practices in achieving successful projects. Types of projects vary from architectural/engineering design and construction, systems engineering, software engineering, or systems integration and implementation to communications, manufacturing, or numerous other programs and projects. All projects require reasonable and accurate estimates of cost and time of performance in order to achieve success in the form of completion within budget and on schedule.

The CCT and CCP certification exams are structured on AACE International Recommended Practice (RP) 11R-88, Required Skills and Knowledge of Cost Engineering. To bridge the gap between the CCT and CCP, it is important to understand the skills needed and the kind of experience required that will lead to a successful finish to the CCP exam.

Shown in Figure 1 is the Table of Contents from Recommended Practice 11R-88. The left side represents the minimum knowledge to obtain the CCT certification; the right side represents the required experience and knowledge gained to prepare for the CCP certification.

FIGURE 1 Table of Contents from the AACE International Recommended Practice (RP) 11R-88, Required Skills and Knowledge of Cost Engineering
The CCT is the appropriate certification for exemplifying your commitment to further growth and advancement in your career path and is the logical starting point for furthering your career. Additional training and experience will result in eligibility to become a candidate for AACE's Certified Cost Professional (CCP) professional level certification.

Knowing the CCT certification does not renew, and the CCP requires 8 years of experience or 4 years of experience + 4-year college degree, let’s look at a 4-year program starting after the award of the CCT certification.

**YEAR 1**
In Year 1, after obtaining the CCT, spend time thoroughly understanding the Total Cost Management (TCM) Framework. TCM is important as it is a systematic approach to managing cost throughout the life cycle of any enterprise, program, facility, project, product or services. The TCM Framework is a representation of that “systematic approach.”

**YEAR 2 AND YEAR 3**
In Years 2 and 3, the target focus is developing a plan and implementing that plan. The topics listed in RP 11R-88 outline planning and developing processes related to all the project controls disciplines, including the understanding of procurement planning and contract management, investment decision making, and decision analysis. Once you thoroughly understand the processes involved to develop a good workable plan, moving to successful implementation of those plans is the next focus.

**YEAR 4**
As you move into Year 4, post-CCT certification, RP 11R-88 outlines the remaining topics of performance measurement and performance assessment. Earned value management and physical progress are important topics to understand at an overall level of awareness. The specialty exams of EVP and PSP takes these topics to a very detailed analysis level; the CCP stays at an overall high level.

Starting with the CCT and working through an additional four-year program to gain skills, experience, and increased levels of knowledge can be enhanced by participation in any of the training available through AACE at the Section and Regional levels. It is also very helpful to work with a mentor who has already achieved the CCP to encourage and guide your professional development through the additional four years of experience required to achieve eligibility for the CCP.

**FIGURE 2** Details of a 4-year program starting after the award of the CCT certification
WOMEN IN PROJECT CONTROLS

SPOTLIGHT ON

Emily Federico

Emily Federico was born in Pittsburgh, PA, where much of her family still resides. She grew up in northeastern New Jersey, about 20 miles outside of New York City. She is currently raising her family in southwestern Connecticut.

Emily will never forget her seventh grade algebra teacher pulling her aside to suggest she had a future as an engineer. Many of her extended family members were engineers as well. She fought it because, well, she was a teenager. Lo and behold, through urging and support from her parents, she ended up at Lehigh University in Bethlehem, PA, with a Bachelor of Science in Industrial Engineering.

Emily is currently a Managing Director at Ankura Consulting Group’s Global Construction Practice. As an industrial engineering major, her focus was on scheduling, optimization and efficiency. As she searched for a career path during her senior year at Lehigh, she knew that she did not want to be a design engineer and even thought about applying to law school. She stumbled upon one of Ankura’s legacy companies and found she would be able to apply her engineering degree to construction claims, which seemed like a perfect fit.

Emily has been with Ankura and one of its legacy firms for 17 years, working in construction advisory and dispute resolution. The first few projects she worked on was related to delay claims and she became proficient in Primavera P3 right out of the gate. Over time, she became an expert in developing and accessing delay, productivity and damages claims. She offers expert opinion and testimony and support counsel in construction dispute resolution. In addition, her experience in disputes has given her the knowledge to assist clients proactively, by developing and analyzing project schedule updates and other project controls.

Emily has had many mentors and champions throughout her career. Her boss, who now runs Ankura’s Global Construction Practice, has supported her from day one. From the time he was lifting ceiling tiles in the office to show her the ductwork, to today where he relies on her to help build the business, run the Connecticut office, and mentor/teach the office team throughout the practice. He has always pushed her to make her own opportunities and step out of her comfort zone. There are also many women that have paved the way for her, all with a similar story of how they got started out of college, how they’ve juggled a demanding career with a family, and how they’ve moved up in the firm. Her husband is also in the same line of work and has always been supportive and mindful of the commitment. Between the two of them, they have somehow managed to maintain successful careers while raising two wonderful boys (who are, not so shockingly, great at math). Finally, she works with a great team, on whom she can rely. While their work can be stressful and demanding, they have all been together for a long time and make it “fun.”

About ten years ago, as her career was advancing, Emily wanted to become more involved in the industry and obtain a relevant certification. She obtained her PSP certification in 2009, and started to attend the occasional AACE International Connecticut Section meeting. She was in a “women rainmakers” group at her firm and a very successful female colleague suggested that her business and network grew by not only attending industry events, but more importantly, by joining committees. Following her guidance, she took advantage of a nomination to the Connecticut Section Board of Directors in 2010, stepped into the vice president role in 2014, and has been President since 2016. The presidential role has allowed her to expand her network outside the section and has also allowed her the opportunity to really get to know the industry professionals in the section. She says, “We all have different backgrounds and different jobs, but all speak a similar project controls language.” She has attended the annual AACE International Conference & Expo, the Western Winter Workshop and the Northeast Symposium. She has found these events to be helpful in keeping up with the industry, learning about other professionals’ best practices and maintaining her firm and personal brand through presentation opportunities.

When asked to leave parting inspiration, she leaves this: “Your career is in your hands. Others can support you and offer guidance but you’re the one in charge of making a name for yourself. Decide what it is that you want for yourself and step out of your comfort zone to get there. I’ve found, in my personal life, in the industry and at work, people find me to be approachable, resourceful and reliable. That’s the brand I’ve created for myself and it’s what has led me to the role I am in today.”

“People find me to be approachable, resourceful and reliable. That’s the brand I’ve created for myself and it’s what has led me to the role I am in today.”
SPOTLIGHT ON

Avi Sharma

Avi Sharma is a project scheduler for GH Phipps Construction Company based in Denver, Colorado. He has over seven years of experience in project scheduling and controls, including in academics. Avi was also a recipient of the President’s Volunteer Service Award for his outstanding volunteer work.

Avi was born in New Delhi, India, and moved around to five different cities as a kid. He received his bachelor’s degree in civil engineering from Nagpur University, India. During this time, he also worked on a research project with the Massachusetts Institute of Technology (MIT) on a new method of evaporation retardation from water reservoirs.

Avi’s actual journey in project controls started with his first job out of school with KEC International, India. In 2014, KEC started a new water infrastructure business division and needed project control professionals. Avi was tasked with the implementation of Primavera scheduling software in the department, because of his tech-savviness and his enthusiasm to learn new software. As his first pilot project, he worked on a schedule of over 3,500 activities, which was resource and cost loaded. The goal of this pilot was to integrate construction schedules with financial software to get real-time updates for the top management.

Impressed with the benefits of the pilot, the company incorporated the implementation of Primavera for all new projects in its division. Avi was involved with five Engineering, Procurement, & Construction (EPC) projects which included sewage treatment plants, intake wells, pipeline construction, and a dam project. Despite being very young, Avi was asked by management to work alongside global consulting company McKinsey, which had been assigned to develop a project planning process across the water business division for proper execution and cost control.

With the desire to continuously keep learning, Avi pursued his master’s degree in Construction Management at Colorado State University, Fort Collins. He was assigned as a teaching assistantship for construction scheduling and project control courses. While earning his master’s, he completed internships with Mortenson Construction and GH Phipps Construction Company, developing their historical scheduling database and working within scheduling operations.

After graduation, Avi joined the project scheduling team at GH Phipps Construction Company. His work includes developing schedule baselines, updating schedules, schedule analysis, impact analysis, and maintaining historical schedule databases. Avi works on jobs varying in contract value from several hundred thousand dollars to millions of dollars. Avi has been instrumental in the development and implementation of a historical scheduling database in his company. Since a good number of projects of GH Phipps are essentially related to community development (schools and hospitals), Avi says he is blessed to work on these projects. In his day to day work, he is passionate about the process of developing 2D drawings into a construction schedule. He likes the challenge of developing constructability plans which consider the logistics of the job, respect for the neighborhood, the weather, and many constraints which cannot be seen in a simple drawing.

Avi chose to volunteer, out of his passion for alleviating human suffering, as a crisis mapper which gathered real-time information, and displayed and analyzed data during a crisis. He worked on a number of United Nations and Humanity Road activations as a part of their crisis mapping teams; first during the Libya crisis and then during various other calamities in the world. It needed coordination with over 100s of people, from the USA to Italy to Benghazi, Libya. His team won the UNV Online Volunteering Award for their work in the Libya crisis.

Avi has been looking for a professional association to help him work on improving himself with new tools and processes to stay ahead of the curve. Based on a lot of positive feedback from his peers in the industry, he started to get involved with AACE International. He attended his first AACE conference in 2019 in New Orleans. He found that AACE conferences are unique compared to other conferences he has attended. He found that other attendees and veteran AACE members were very welcoming to new members. The other thing that attracted him towards AACE is the applicability of the research papers in the industry. He was able to take the contents of these research papers and implement them in his day to day work at GH Phipps. Avi joined the Rising Professional Committee in 2019 and feels very passionate that the younger generation of project controls professionals should join AACE from the start of their college education. It is bound to give them benefits such as a practical knowledge base that can’t be provided in a classroom setting.

Avi’s advice to the next generation of young professionals would be to go outside of your network to make connections and collaborations. He would love to see them go to their local AACE Section, collaborate with someone and write a research paper for the next AACE conference, or contact academics who work in their field. Avi has found that these connections create new opportunities which you may not know existed.
AACE International is launching its annual call for members to apply for open positions on the Association Board of Directors and to serve on the Membership Board as a Regional Director. We are looking for leaders interested in furthering our mission and to help lead the Association. There are seven open positions:

**AACE Board Offices Open for Candidates:**
- President-Elect
- Vice President Finance

**Membership Board Director Positions Open for Candidates**
- Director Region 1
- Director Region 2
- Director Region 4
- Director Region 7
- Director Region 9

The President-Elect and Vice President Administration will serve on the Board of Directors and the Executive Committee. The Regional Directors will serve on the Membership Board.

Interested parties should complete the online nomination form. You can self-nominate or nominate another person. All nominations will be submitted to the Nominating Committee for review. The Nominating Committee is charged with developing a slate of candidates to be put forward to the membership. Please go here to self-nominate, nominate another person, read position descriptions, etc.: [https://www.tfaforms.com/418232](https://www.tfaforms.com/418232)

There are substantial benefits to serving as a volunteer leader within AACE which include:

- Demonstrated leadership and involvement with AACE
- Recognized leader in the cost engineering community
- Relevant expertise in the disciplines of organizational management
- Positive leadership attributes, emotional intelligence, ability to collaborate effectively and engage in debate when needed
- Commitment to participate in 2-3 board meetings per year plus several virtual meetings
- Visionary and strategic thinker with an ability to influence

The Nominating Committee will present its slate of candidates to the AACE membership no later than November 15. The membership has the option to add other nominations by presenting, no later than Dec. 15, a petition signed by 20 members in good standing. Voting in the online election will open on February 1, 2020 and close at 4 p.m. eastern US time on March 15, 2020. Elected candidates will take office at the 2020 AACE International Conference & Expo.

Make a Nomination

Click this banner to self-nominate, nominate another person, or read position descriptions.

All nominations will be submitted to the Nominating Committee for review. Voting will take place in early 2020.
Public-Private Partnership Projects—What, Why and How Is Risk Allocated?

BY PETER V. BADALA; MISBAH UDDIN; AND JAMES G. ZACK, JR., CFCC FAACE HON. LIFE

ABSTRACT
This article discusses the topic of risk assessment, management and allocation on typical P3 projects. The article identifies what a P3 project is; what are the characteristics of the typical P3 project; and what P3 projects are not. It examines the various ways P3 projects may be structured, recognizing that different project structures may well have different project risks. The authors look at why project owners employ the P3 project delivery method including the perceived benefits and potential risks. In determining the above, the article provides a list of risks typical P3 projects must be prepared to address; and identifies how risks on typical P3 projects are, or should, be allocated in the P3 agreement. Finally, the article discusses some risk allocation clauses that seem inappropriate in P3 projects and may ultimately lead to project failure if left intact in a P3 agreement. This article was first presented as RISK.2813 at the 2018 AACE International Conference & Expo.

INTRODUCTION
The purpose of this article is to explore various aspects of Public Private Partnership (“P3” or “PPP”) projects. P3 projects are gaining in popularity in the U.S. and abroad. While many P3 projects have been delivered successfully, several other P3 projects failed in the long run. One study of P3 projects surveyed some 20 P3 projects in the U.S. Fourteen (70%) of the 20 projects included in this survey were either operational or under construction and nearly complete. However, the report also revealed that the remaining six (30%) of these P3 projects were in default or bankruptcy. [4]

Another report analyzed the failure of the three P3 projects on the London Underground. [39]

The report points out that the failure of the London Underground PPP projects was attributable to the lack of “appropriate risk allocation between the public and private sectors.” Author Young Hoon Kwak and his co-authors in a 2009 article determined through a literature survey that the success or failure of a PPP project is dependent on four groups of factors: the competence of the government, the selection of an appropriate concessionaire, an appropriate risk allocation
between the public and private sectors, and a sound financial package. The problems with the London Underground PPPs centered on the allocation of risk between the government and private sector and the ability of the government agencies to appropriately monitor the private participants. [18, 34]

These studies fly in the face of so many papers, articles, and presentations that tout P3 projects as the way to go. Notwithstanding this tranche of P3 project failures, research indicates that there are many more P3 project successes than failures. P3 projects are often seen as a solution concerning major projects insofar as their ability to defer capital expenditures; lower whole life cost through integrated and bundled contracts; and introduce private sector expertise and innovation into public projects.

The authors decided to look into this apparent disparity in perceptions concerning P3 projects. In performing the initial research, the authors concluded that, to date, the P3 project delivery method seems to be used primarily on larger, more costly infrastructure projects. And, the authors know from their own experience that larger infrastructure projects are more fraught with risk than smaller projects.

The authors located numerous studies and articles suggesting that a lack of appropriate risk management and risk allocation may well be at the very heart of the known P3 project failures.

Author Frank Beckers and his coauthors in a 2013 article wrote: “Many of the problems we observe are due to a lack of professional, forward looking risk management. Direct value losses due to undermanagement of risks for today’s pipeline of large scale projects may exceed $1.5 trillion in the next five years, not to mention the loss in GDP growth, as well as reputational and societal effects. Large infrastructure projects suffer from significant undermanagement of risk in practically all stages of the value chain and throughout the life cycle of a project. In particular, poor risk assessment and risk allocation, for example, through contracts with the builders and financiers, early on in the concept design phase lead to higher materialized risks and private financing shortages later on.” [3]

His paper points out that poor assessment, management and allocation of risk occurs on P3 projects as well as on the traditional Design-Bid-Build (DBB) infrastructure projects as stated in the following:

“Surprisingly, the risks of large infrastructure projects do not get properly allocated to the parties that are the best ‘risk takers’ – those that have a superior capability to absorb these risks. This can result from a misunderstanding or disregard on the part of governments of the risk appetite, for instance, of private investors who are sensitive to the kinds of risks they accept and under what terms. Providers of finance will often be the immediate losers from poorly allocated or undermanaged risks. Even in public private partnership … structures, private risk takers and their management techniques are introduced too late to the process to influence risk management and risk allocation, and therefore they cannot undo the mistakes already embedded in the projects. One crucial consequence is an increase in the cost of financing PPP projects and a greater need for sovereign guarantees or multilateral agency support. In the end, however, society at large bears the costs of failures or overruns, not least in the form of missed or slowed growth.” [3]

Thus, the purpose of this article is to examine what are the typical risks P3 projects face, how these risks are or should be assessed, managed, and allocated on typical P3 projects. The author acknowledges at the outset that the risk management process on P3 projects is more complicated than the same process when employed on DBB projects.

WHAT IS A P3 PROJECT?

P3 projects are not new nor was this project delivery method created in the U.S. It has been reported that the first concession project [37] was granted in 1782 to Perrier in France. This concession involved the distribution of water. [21] The term “concession” is defined as “A P3 project delivery structure involving a lease of an existing or to be constructed public asset to a private concessionaire for a specified period. In general, the concessionaire will receive the right to collect availability payments or direct revenue generated by the asset over the life of the contract … in exchange for agreeing to construct or operate and maintain or improve the facility during the terms of the lease. During the 1800’s many canals and railroads in the U.S. were designed and constructed with private European investments. [4] Moving to more modern times, in the late 1950’s the government of Hong Kong explored the possibility of a privatized vehicle tunnel as a concession. The first mention of the Build Operate Transfer (BOT) project delivery method can be traced to Targut Ozal, the Prime Minister of Turkey in the early 1980’s. [2] In Australia, P3 infrastructure projects date back to 1988 and in the UK, the Private Financing Initiative (PFI) was introduced by the government in 1992. [23]

Having provided some background on P3 projects, the authors examined some definitions. It appears from this research that there is no one single definition that encompasses all aspects of a P3 project and can be put forth as a standard definition. Two of the more general definitions from the U.S. are set forth as follows:

“A contractual arrangement between a public agency (federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the services and/or facility.” [35]

“A contractual agreement formed between public and private sector partners, which includes private sector financing, and allows for more private sector participation than what is traditional. The agreements involve a government agency contracting with a private company to renovate, construct, operate, maintain, or manage a facility or system. The public sector retains ownership of the facility; however, the private party may be given additional decision rights in determining how the project or task will be completed.” [37]

Two other generalized definitions of P3 projects follow:

“…an arrangement of roles and relationships in which two or more public and private entities coordinate in a complementary way to achieve their separate objectives through the joint pursuit of one or more common objectives.” [19]

“…a long-term contract between the public and private sectors where mutual benefits are sought and where ultimately the private sector provides operating services or puts private finance at risk.” [10]

The most thorough definition of a P3 project the authors located is the following:
“Fundamentally, a PPP is a long-term contract between a government (the local or national government) or government owned entity (hereinafter referred to as a public agency) and a private sector party (typically a consortium) in which:

• The public agency leverages the private sector party’s skills and assets to perform all or significant aspects of a project (for example, financing, design, construction and/or O&M).
• The public agency and the private sector party share in some fashion or another the risks and rewards of the project.
• The public agency retains some measure of control over the project (either through ownership of the project or contractual provisions binding the private sector party).

PPPs can be used to:

• Construct or develop a wide range of physical and social infrastructure projects, including highways, power plants, bridges, prisons, pipelines, ports, waste treatment facilities, schools and hospitals. Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services. Examples of social infrastructure assets include community housing, hospitals, prisons, schools and universities.
• Modify, rehabilitate or expand existing infrastructure projects. When used for this purpose, the modification, rehabilitation or expansion is typically significant, requiring substantial new capital investment to justify the costs of structuring the project as a PPP.
• Monetize underperforming infrastructure assets to provide governments with much needed capital. When used for this purpose, the revenues the government earns from selling the right to operate the project (often referred to as a concession) must be sufficient to justify the PPP process and the loss of the project’s ongoing revenues.” [29]

The commonalities among all of these definitions are summarized below:

• Of a project or a facility;
• Where risk and rewards are shared;
• Generally financed by long-term project specific equity and debt (Project Financing); and,
• Where the public owner maintains the ultimate ownership.

CHARACTERISTICS OF A TYPICAL P3 PROJECT
Since there appears to be no uniform definition of a P3 project, the authors reviewed the literature to determine what characteristics are common to most P3 projects globally. This literature review indicates the following are the typical characteristics of P3 projects:

All Project Phases Bundled Into A Single Contract – Typically, P3 projects have all project phases – financing, design, construction, commissioning and, often, the operation and maintenance (O&M) phases – bundled into a single contract. Such bundling offers the contractor the opportunity to be much more involved in the design process than is typical under many other project delivery methods. Further, such bundling also allows the contractor to employ innovative methods to deliver a P3 project. Most P3 projects are a single integrated project versus separate contracts for construction and O&M. This integration of project elements and contracts (construction and operation combined) potentially offers lower whole life cost compared to traditional project procurement where the public owner takes control of the asset.

Incentivized Performance Based/Output Specification Approach – In P3 projects, public owners set forth performance standards and requirements for the completed projects. This approach leaves the contractor free to select their own means and methods on how to meet these contract requirements. The concept underlying the output specification approach used on P3 projects is to provide an incentive for such innovations based on the contractor’s skill, knowledge, and experience to be brought to bear on all phases of the project – particularly the project design phase. And, most P3 contracts provide for service-oriented payments – that is, no service, no payment! When P3 projects are successful, they result in better on time, in budget project delivery.

Large Size – Most P3 projects are large projects (upwards of US$500 million or more in cost). Part of the reason P3 projects are often large in size is because P3 projects often have a much longer lead time for procurement and because of this factor larger projects potentially have a greater Value for Money (VfM) [6] than smaller projects. Value for Money ("VfM") is a term used to assess whether an organization has obtained the maximum benefit from the goods and services it both acquires and provides, within the resources available to it. Some elements may be subjective, difficult to measure, intangible and misunderstood. A utility derived from every purchase or every sum of money spent. Value for money is based not only on the minimum purchase price (economy) but also on the maximum efficiency and effectiveness of the purchase. [6]

On these larger projects, the additional cost involved in P3 procurement can be justified against the overall project value. Additionally, in the public sector, such projects tend to be good candidates to be delivered using the P3 process as public entities often lack the capability to finance or manage such large projects on their own. Not only does the P3 project structure allow the public entity to defer capital funds spend, but it only spends when the project is operational and delivering the project benefits (i.e., payments linked to the "availability of the asset.") From the private sector perspective, large projects are much more likely to provide profit sufficient to warrant their investment in the project.

Complex Projects – Public owners may consider certain projects to be complex, thus justifying use of the P3 project delivery method. This thinking is likely to be prevalent on projects of the kind that the public entity has never constructed. And, from the private sector perspective complex projects tend to offer contractors a greater ability to use innovative ways to deliver the project that, in turn, may increase potential project profitability.

P3 Agreements Tailored to Fit the Situation – Since P3 projects are not cookie cutter projects, generally there is no standard set of contract documents commonly used on such projects in the U.S. In the authors’ experience every P3 project has a different, uniquely crafted, and negotiated contract. In a 2009 survey of P3 transportation projects the authors, Manju Chandrasekhar and

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Charles Nicholas, recommended that each party should:

…”insist on the importance of recognizing the unique circumstances of each individual case when crafting a PPP agreement. Chandrasekhar declares that ‘there is no silver bullet or one size fits all approach’ for PPPs, while Nicholas expresses concern that new PPP practitioners fail to recognize how complex the process can be, where ‘every location, every jurisdiction, has its different political and legal problems.” [28]

The authors note that some countries – such as the UK – have tried to standardize P3 agreements to help stakeholders become familiar with P3 agreements (e.g., Standardization of PFI contracts [“SOPC”]. The latest iteration is SOPC 4.)

Strong Public Support – Perhaps because of the intense public scrutiny of large, complex projects, public sector owners tend to employ the P3 project delivery method only on those projects that have gained widespread public support. From the perspective of the private sector contractors, such public support is typically perceived as easing the project through all of the needed political approvals. A recent article concerning P3 projects in Engineering News-Record commented on this very point by highlighting the manner in which the Texas Department of Transportation (TxDOT) has taken a very proactive approach to P3 procurement, as follows:

“This approach provides the public with earlier access to corridor improvements that may have otherwise been delayed for decades. While some projects have not performed as financially projected, the public has still benefited from the availability of infrastructure. As the program has evolved, both TxDOT and the private sector have moved to better manage the risks, and the public has benefited greatly from the new availability of infrastructure.” [24]

Reliable Revenue Source(s) – P3 projects tend to have reliable revenue sources whether the project itself will produce new revenue or, as in a concession project, the municipality pays the P3 contractor from user fees as in a Lease, Develop and Operate project – or at least, reliable revenue forecasts as these are necessary to show the project’s capacity to generate Return on Investment (ROI) sufficient to entice the private sector to participate in the P3 process. However, as noted earlier in this article, the authors note that one study of some 20 P3 infrastructure projects documented that six of these projects were either in default of their financial obligations or were bankrupt. [4] So, while there is a perception of a reliable revenue source at the outset of the project, that perception may not become a reality when the project is completed and put into operation. The issue of a reliable revenue source depends upon which party to the agreement holds the demand/revenue risk. The end user may not pay, as it may be the government paying for the use of the assets on behalf of the public end user. In such a payment mechanism, potential P3 contractors must, at the very least, look for certainty of payment or government backing.

Completed or Near Completed Environmental Process – Most P3 projects typically have completed or are nearly complete with the required environmental process as this status gives the private sector some assurance that the project will, in fact, move ahead. Further, if the P3 project has completed the environmental process the private sector has further assurances of no project delays and no changes as a result of the environmental process. Thus, the completion of the environmental process prior to seeking a P3 contractor removes a good deal of the project risk up front.

Trust Based Governance Mechanisms – The public owner’s initial trust and the selection process seem to facilitate trust and increase the focus on project success as opposed to the more typical us versus them mentality on all too many projects. This mutual trust plays into the P3 contract responsibilities in that public owners specify exactly what they want when the project is completed (output specifications) and the P3 contractor focuses on delivering on that specification. Mutual cooperation and continual interactions between the owner and the contractor during the planning and design phase should help increase the level of trust between the project participants.

Reasonable to High Level of Risk Transferred to the Contractor – P3 projects are most often characterized by a higher level of risk transfer from the public owner to the contractor than is typical on other forms of project delivery. The level of risk transfer varies from project to project (as will be discussed further later in this article). Risk is generally allocated to the contractor through incentives (rewards) and disincentives (penalties) embodied in the P3 agreement. [12]

Private Financing – P3 project always involve private financing in the form of project specific debt and, generally, a small amount of equity. This business model is used to ensure that the risks transferred to the contractor are borne and managed by the contractor. This financing method is in juxtaposition to typical DBB contracts where the contractor is paid monthly on the basis of the percentage of work completed. The additional scrutiny or due diligence by lenders helps give the public sector re assurance of the commercial viability of the project and the investor.

Financed by Project Specific Equity and Debt – As the private sector contractor has their own money invested in P3 projects, the contractor has a financial stake in the outcome of the project beyond that which is typical on most projects. Essentially, the contractor’s equity in the P3 project is akin to having skin in the game which tends to increase the likelihood of project success. P3 contractor project financing means that debt and equity are raised at the project level and ring fenced. As such, there is limited recourse to the shareholders if the P3 project defaults. A ring fence is a protection-based transfer of assets from one destination to another, usually through the use of offshore accounting. A ring fence is meant to protect the assets from inclusion in an investor’s calculable net worth or to lower tax consequences.

Long-term Contract Duration – Due primarily to the large costs of most P3 projects and payback schedules, most P3 projects generally have very long-term contracts (often between 15 and 30 years). Concession contracts are frequently linked to the economic life of the asset. Such long-term contracts tend to increase the level of financial involvement of the contractors. At the end of the contract, the public owner regains possession of the project and its assets and may, at their discretion, bid various aspects of the operations and maintenance to other contractors or manage these services with their own staff.
Payment Upon Delivery – P3 projects often employ payment upon delivery somewhat similar to the older turnkey project delivery method. Under this method the contractor is paid only for defined assets or services once construction is completed (although some P3 contracts provide for partial payments at key milestones during the construction phase) and the constructed project is put into operation. Payments may be made on a project availability basis or simply an operations basis. It is worth noting that the payment and performance mechanisms are at the heart of the contractual structure.

 Constructed Asset Returned to Public Owner at End of Contract – Finally, the constructed asset under a P3 project is returned to the owner at the end of the contract term which may include a period of full operation and maintenance. Additionally, there are often clearly defined clawback or handback provisions in P3 agreements that state the expected condition of the asset at the end of the agreement term to ensure the P3 contractor has properly maintained the asset.

Some Common Misconceptions About P3 Projects

Now that the authors have explored the definitions and generally discussed the characteristics of P3 projects a discussion of common misconceptions concerning P3 projects seems appropriate.

Private Financing Saves Money for The Public – One controversial aspect of P3 projects is the perception that the use of private financing is always a cost savings over government financing. For public owners, it is important to undertake a VfM analysis of using the P3 delivery method versus a more traditional project procurement strategy. Public owners need to assess both expected cost and quality of the P3 proposition. One author who studied the financial aspects of P3 projects offers the following observation:

“You’ll often find public quotes saying that the PPP or PFI enables the private sector to step in and provide infrastructure that the taxpayer cannot afford … Whether it’s deliberate or not, I don’t know, but it’s a delusion. What you are doing is delaying paying for something – it’s like public borrowing of other kinds, where the state issues gilt edged securities but repays them out of future taxation.” [11]

In this report, Trefor Williams argues that the cost of private borrowing through the P3 or PFI process far exceeds the going rate for government bond issues. Based on this analysis, P3 projects are not necessarily a way to save money for public owners and their constituents. The authors agree that P3s are not free for public owners. The income to the P3 contractor to fund the construction and operations must come from one or more user payments (e.g., tolls), ancillary revenues or availability payments from the government owner. Perhaps because public sector developed projects are often over budget and delivered late, public owners often look to P3 projects. An Australian study comparing P3 projects with traditional projects found the following:

“In absolute terms, PPP cost advantage was found to be economically and statistically significant. On a contracted $4.9 billion of PPP projects the net cost overrun was only $58 million – not statistically different from zero. For $4.5 billion of traditional procurement projects, the net cost overrun amounted to $673 million.” [25]

Given this study, P3 projects in some cases may be less costly for public owners when lower construction costs or faster project delivery are factored into the analysis.

P3 Projects Are a Form of Privatization –

All too often critics contend that P3 projects are simply a way to privatize public facilities. This is either a misrepresentation or a misunderstanding. Ownership of P3 projects either remain with the public owner or are transferred back to the public owner at the end of the contract. Additionally, the public owner retains authority over the project at all times; including the ability to make project changes and terminate the contract. Finally, the public owner is accountable to their constituents throughout the life of the project. P3 projects do not generally privatize public infrastructure or facilities. One recent article on P3 projects offered the following commentary on this specific issue:

“One of the greatest challenges facing the P3 market is the common misconception that the asset is permanently turned over to a private entity … P3 arrangements usually involve a lease arrangement for a period of time, at the end of which the asset ownership returns to the public entity. Key decision makers (legislators and agency officials) need to understand and support this idea … Agencies should continue to educate the public about the P3 process to increase their trust and assurance that their interests are still at the forefront of project goals.” [24]

P3 Projects Can Work to Meet Any Infrastructure Need – The P3 project delivery method must be carefully analyzed by both the public owner and the private contractor. The following factors must be in place and properly aligned to make a P3 project work successfully:

• An appropriate legal and institutional framework including that for dispute resolution;
• A favorable investment environment for both public owners and private sector contractors;
• A professional, and P3 literate procuring authority;
• A well-structured and economically viable project from both the public and the private sector perspective;
• Reasonable timescales;
• Reliable partners with the capability to successfully deliver a P3 project and meet the performance requirements of the contract; and,
• Appropriate risk allocation and appropriate contractual documents.

If all of these factors are not present on a project, then it is unlikely that the P3 project delivery method will be successful.

P3 Projects Are a Way for Governments to Access Quick Cash to Close Budget Gaps –

Readily available private financing for P3 projects may entice some public owners to pursue a P3 project rather than pursuing the project through more conventional public bonding efforts. Most P3 projects have front end funding requirements required of the public owner and it is not uncommon that such frontend funding often has restrictions in the contract on the use of such funding. Such funding arrangements means that private financing may not be the answer to all public budget shortfalls.

Private Partners Make Excessive Profit on P3 Projects – Earning a reasonable ROI is the objective of all private business. Thus, the profit motive is at the heart of contractor involvement in a P3 project. Many critics
of P3 projects contend that the contractors make excessive profit from such projects. [5] One study stated the following in this regard:

"PPPs are used to conceal public borrowing, while providing long-term state guarantees for profits to private companies. Private sector corporations must maximize profits if they are to survive. This is fundamentally incompatible with protecting the environment and ensuring universal access to quality public services." [13]

As a result of this attitude, many public owners include clauses in their P3 contracts to prevent contractors from making more than a reasonable profit, including revenue sharing provisions, contract rebalancing provisions and the like. While it is probably not the goal of the majority of private contractors to make excessive returns at the public's expense, public owners that include too many restrictive contract clauses are likely to cause a P3 project to fail.

**P3 Projects Are Difficult and Expensive to Negotiate, Negating Their Benefits** – There is a perception that P3 projects involve lengthy and very expensive negotiations. Some critics believe that the time and expense involved in starting up a P3 project more than outweighs any potential benefit that may be gained. While it is true that negotiating a P3 project takes longer and costs more than bidding a DBB project or going through the typical D/B process, one survey of project owners who had completed a P3 project indicate that some 90% of these owners would be willing to pursue further P3 projects. [26] It appears that, based on the experience of public owners who have successfully executed P3 projects, that the difficulty and expense of negotiating a P3 project does not outweigh the benefits of the completed project. That is, on larger projects the higher cost of procuring through the P3 process can be justified. It also appears that with P3 projects the number of advantages increase with the size and complexity of the projects. Nevertheless, it is likely that there is a fine balance or at least some sort of curve beyond which the benefits of undertaking a P3 project may diminish. If a project is too big or too complicated (or both) it may be an un-investable proposition or considered too risky, thereby causing increased bid prices.

**P3 Projects Are Simply a Mechanism to Outsource Public Services** – Some critics contend that P3 projects simply outsource public services since P3 contractors often maintain and/or manage the P3 project for the duration of the contract. When this criticism is raised it is often presented as if public agencies never outsource their services. A cautious analysis of this argument leads the authors to conclude that this comparison overstates the situation. Public agencies frequently outsource many activities with the full knowledge of the public. With respect to construction projects, public agencies rely heavily on the private sector typically outsourcing planning, design, construction and construction management to private entities such as architects, engineers, construction managers and contractors. A literature search also indicates that outsourcing of other government services (as opposed to construction related services) is gaining widespread support in the U.S. and is much more common today than a decade or so ago. [22] Facilities management, and the O&M functions of publicly owned facilities and infrastructure are quite common today. While P3 projects do outsource ongoing operations, the difference between conventional public outsourcing efforts and P3 projects is that P3 projects are performed with private financing under strict contractual provisions.

**HOW ARE P3 PROJECTS STRUCTURED?**

There are a number of different ways of structuring a P3 project. Different project structures are driven by several different factors. These differentiating factors are set forth as follows:

- The service(s) the contractor will perform under the P3 contract – design, construction, financing, operation and/or maintenance.
- Whether the P3 project involves construction of an entirely new project or a rebuild or modernization of an existing facility.
- The degree of control the public agency wants to exercise during the execution of the P3 project.
- If the contractor will own the constructed asset during the term of the P3 contract.
- The terms and requirements of the P3 legislation in the jurisdiction where the project is located.

The most common forms of P3 project structures follow:

**Design/Build (D/B)** – D/B is the most basic type of P3 project. Here the private contractor designs and constructs the project for a fixed, not to exceed or guaranteed maximum price, to meet the performance specifications and requirement of the public owner. The public agency finances the project but avoids the additional costs of separate contracts for design and construction. The public owner owns the project and is solely responsible for O&M and can either perform such services with their own forces or contract out the O&M services to another contractor.

**Design, Build, Operate (DBO)** – Under this P3 structure, the contractor performs all the functions of the D/B process but also operates the constructed facility for the duration of the P3 project. The public owner is responsible for financing the design and construction as well as for the maintenance of the project.

**Design, Build, Maintain (DBM)** – Again, under this form of P3 project the contractor designs and builds the project. However, the owner operates the constructed asset while the contractor performs routine maintenance and/or repairs on the project for the duration of the P3 contract meeting the availability or project usability requirements of the contract.

**Design, Build, Operate, Maintain (DBOM)** – Under this P3 project structure the contractor is responsible for all four elements of the contract. Under this form of contract, the P3 contractor is typically paid from the revenue gained through the operation of the constructed project.

**Design, Build, Finance, Operate (DBFO)** – Like the DBO structure identified above the P3 contractor performs the three basic functions of the project (design, build and operate). However, unlike the simpler form of P3 project under this project delivery method the private contractor finances the project with their own funds. The contractor is paid over the life of the project from the revenue generated by the constructed asset.

**Design, Build, Finance, Operate, Maintain (DBFOM)** – Under this form of P3 contract the contractor designs, builds, finances,
operates and maintains the constructed project. Like the DBOM structure identified above, the P3 contractor performs all four functions plus provides the financing for the project using private funds. While the constructed facility is owned by the public owner, the contractor is paid over the life of the project from the revenue generated from the constructed asset.

**Design, Build, Finance, Operate, Maintain, Transfer (DBFOMT)** – In this project structure the private contractor performs all functions of the project, including financing the project. The contractor is paid through the revenue generated by the operation of the constructed asset. Unlike previous P3 structures identified, the contractor owns the constructed project for the term of the P3 contract. At the end of the contract term the contractor transfers ownership of the project, including all operation and maintenance responsibilities, to the public owner.

**Build, Operate, Transfer (BOT)** – Under the BOT structure a public owner grants a private contractor the right to construct and operate a facility for a specified amount of time. The public owner owns the constructed facility and pays the contractor either from public funds or from revenues generated by the asset. Under this P3 structure, the P3 contractor may or may not contribute some of the project financing. At the end of the contract term the contractor transfers operations to the public owner. A difference between this P3 structure and the others identified above, as the public owner was involved in the design or even provided the design to the contractor, the owner remains liable for any design errors or omissions.

**Build, Transfer, Operate (BTO)** – The BTO project delivery model is very similar to the BOT model discussed above but the O&M of the project is performed by the owner at the end of construction. Following construction, the public owner and the private contractor enter into a separate agreement whereby the contractor operates the constructed project for a specified period of time.

**Build, Own, Operate, Transfer (BOOT)** – The BOOT P3 structure is similar to the BOT discussed above. However, the P3 contractor owns the project for the term of the contract. And, like the BOT model, the private contractor may or may not provide some or all the financing for the project.

**Build, Own Operate (BOO)** – In this P3 delivery model the private contractor constructs, operates, and maintains the project for the term of the project. The public owner pays for the use of the project. At the end of the contract term the public owner may or may not purchase the project from the contractor. The owner is under no obligation to purchase the project.

**Lease, Develop and Operate (LDO)** – Unlike the P3 models discussed above, under this model the private contractor leases the facility from the public owner and then, using its funds, modernizes or expands the facility and then operates and maintains the facility under a contract with the owner. The contractor is paid by the owner for the owner’s use of the facility.

**Concession** – In this P3 project delivery model, the public owner sells the right to operate and maintain an existing asset to a private contractor. Typically, under concession model, the duration of the concession is for a very long duration. For example, the Chicago Skyway project was leased to a private P3 contractor for a term of 99 years while the Indiana Toll Road concession was inked for a 75 year term. The P3 contractor is typically paid from the revenue earned on the project from tolls or user fees.

Based on the literature review, there are thirteen P3 models, as outlined above. However, the literature indicates that there are only three basic ways to structure payments to the P3 contractor.

- **Availability Based Payments** – Under this fee arrangement, the P3 contractor starts receiving payments when the project is constructed and made available for use by the public. When this system is used the public owner bears the demand and collection risks in that the payments to the P3 contractor do not change even if the project is not used as anticipated. P3 projects therefore offer budgetary certainty. The public sector often pays a fixed sum to the P3 contractor without having to worry about the increasing costs of operation or the cost of renewals and disruption.

- **Shadow Toll Based Payments** – This payment model is typically employed on transportation projects. The shadow tolls are the vehicle amounts paid to the P3 contractor by the owner not the users of the project. This payment method is typically used when it is not feasible for the public owner to employ toll facilities. Under this system the more the road is used, the more payments the owner owes the P3 contractor. In this system, the owner and the contractor share the demand risk in the sense that if demand goes up, the owner owes more to the contractor and on the flip side, when the demand goes down, the contractor receives less from the owner.

- **User Fee Payments** – In this payment system the users of the facilities pay the P3 contractor for the use of the facility (i.e., tolls on a privatized toll road). Under this payment system, the P3 contractor bears the risk of demand and collection. [29, 32]

One report employed a graphic (see Table 1) to help understand the structure of P3 projects and identify the risks and activities assumed by P3 contractors. [27]

**WHY DO PUBLIC OWNERS EMPLOY P3 PROJECTS?**

In the public arena, there are a number of perceived benefits to delivering projects using the P3 process. One article enumerated the five benefits of delivering projects in the following manner. [27]

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Design</th>
<th>Build</th>
<th>Finance</th>
<th>Operate</th>
<th>Maintain</th>
<th>Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design-Bid-Build</td>
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<td>X</td>
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<tr>
<td>Design-Build</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Design-Build-Finance</td>
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<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Design-Build-Finance-Operate (Availability Payment)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Design-Build-Finance-Operate (Toll Concession)</td>
<td>X</td>
<td>X</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**TABLE 1** Risks And Activities Assumed by Private Partners
1. Cost savings – Cost savings of between 6% and 40% of the cost of construction are reported in this study and the quality of service must be maintained for the life of the P3 agreement, regardless of the cost to the contractor.

2. Project acceleration – This benefit is “...arguably the main benefit to the P3 model...” as the private contractor, left pretty much to their own devices can deliver projects faster than the typical public owner.

3. Better risk allocation – The authors state that “P3s allow risks to be allocated to the party best suited to manage the risk at the least cost and with the best available structure and skills.”

4. Innovation – Another perceived benefit is that the involvement of the private sector in the design and construction process results in a higher quality project.

5. Adequate facility pricing – Finally, it is noted that “GAO has listed efficient pricing as a key benefit to the P3 model as the private sector would be more likely to use efficient pricing concepts such as congestion pricing.” [14]

Another report concerning the P3 project delivery methodology summarized some twelve perceived benefits to the public owner through the employment of P3 projects, as follows: [29]

1. Risk Transfer – P3s allow public owners to transfer some or all of the project risk to the P3 contractor while still retaining a degree of control over the project. This results in transferring more risk to the P3 contractor than is typical in a conventional D-B-B project.

2. The Only Way the Project is Constructed at All – In some cases, due to budget constraints, unwillingness to raise taxes and/or the inability to sell bonds, the P3 process using private financing is the only way the project can be built.

3. Reduces or Avoids Increasing Government Debt – Private financing of the project allows the public owner to receive a completed project at the end of the P3 contract without having to increase public debt (as occurs when public owner sells General Obligation and/or Revenue Bonds). And, because such transactions are “off balance sheet” projects they do not impair the public owner’s bond ratings.

4. Budget Relief – As P3 projects use private financing such projects do not impact the public owner’s budget. Thus, budget funds that would have been expended had the public owner used the conventional DBB project delivery method are freed up for use on other budget priorities. In turn, this reduces or defers capital spending for the public owner as payments are often deferred until the project is completed and goes into operation. As P3 projects are privately financed, they provide budget certainty.

5. Cost Savings – By bundling design, construction, operation and/or maintenance into a single contract the public owner can eliminate the costs associated with procuring and managing a series of separate contractors for all of these project phases. It is also posited that the P3 contractor, knowing they will be responsible for O&M for the duration of the P3 agreement, will focus during design on ways to reduce O&M costs. Thus, the whole life cost for the project (construction and operation combined) is reduced because detailed design, construction and operation is integrated.

6. Better Performing Assets – P3 contractors are generally paid through revenue generated by the completed projects. It is perceived that a P3 contractor is incentivized to ensure the asset is constructed and operates successfully enough that it will generate sufficient revenue to repay the debt owed them. It is also perceived that the quality of service of the completed asset will be maintained for the life of the P3 project as failure to do so will leave the P3 contractor out of pocket due to lack of availability payments or project revenue sharing. It also risks the claim by the public owner that it failed to maintain the asset in the condition outlined in the P3 agreement when the asset is scheduled to be turned over to the owner at the end of the contract term.

7. Avoids Underbidding – In the conventional DBB process there is a belief that some contractors will bid low to win the project and then pursue numerous changes and claims. This report assumes that the P3 process eliminates this potential issue.

8. Shorter Construction Periods – Since P3 projects use private financing, project delays at the outset due to budget allocation or government grant processes, P3 projects avoid delays due to project financing delays. Further, bundling the design and construction process into a single contract will help shorten the duration of the project versus the classic DBB project delivery method. This, in turn, is likely to lead to better on time, on budget construction performance post contract award due to the diligence performed by those that are funding the project.

9. Technical Expertise – The P3 process gives public owners access to the technical experience and innovation of the private sector throughout the entire project. More innovation is possible on P3 projects because they are based on output specifications which maximises the use of private sector skills. This benefit is especially true in those situations where the public owner lacks in house expertise.

10. Minimizes Waste – The report comments that often government contracts are, at times, awarded to political cronies. It is believed that the P3 contracting process is considerably more transparent; that public agencies perform more due diligence and analysis concerning the structure of the P3 project; and, because public agencies must convince their political masters and the public to buy into the P3 process, that the potential for wasting public funds is substantially reduced.

11. Better O&M of the Project – When projects are publicly funded, while the public agency will have sufficient funding to construct the project, they may or may not have sufficient funding or expertise to operate and maintain the project. One of the benefits of the P3 process is that the P3 contractor will make certain there is sufficient funding to pay for O&M and that they will arrange for appropriate staffing to accomplish this mission. Experience shows that operational planning will be better considered from the outset when the P3 contractor knows they will be responsible for all O&M for the life of the P3 contract. P3 contractors are very likely to make it easier to maintain. P3 projects tend to minimize or eliminate the interface risk between the construction phase of the asset and its operations.
12. Revenue Generation – The report refers to this benefit in the context of P3 concessions. As noted earlier, P3 concessions involve public owners selling the right to operate and maintain an existing asset to a private contractor for a very long duration. The sale of the concession can generate a huge amount of revenue for the public owner. “In the Chicago Skyway project, the City of Chicago used US$490 million of the US$1.8 billion concession fee to redeem outstanding municipal debt and fund various city programs.”

WHAT DO BIDDERS LOOK FOR IN P3 PROJECTS?

Now that the authors have examined why public owners may employ the P3 project delivery model, let’s consider what contractors, as bidders on P3 projects, look for when considering they will propose on a P3 project.

Return on Investment – Contractors, like all other businessmen, are in the business of generating profit. Thus, the initial consideration for a contractor considering whether they will propose on a P3 project is the potential ROI on the project. The ROI of a potential P3 project must be sufficiently large to attract the investment needed to fund the project. Profitability is of paramount concern to a potential P3 participant from the private sector. If the proposed P3 project is a revenue generating project (e.g., a toll road, a parking garage in an urban area, etc.) then the project is likely to draw more interest from the private sector. And, as potential proposers on P3 projects must line up investors in order to provide sufficient equity and borrow enough money to construct the project, ROI will be a concern for such outside investors. [38] With P3 projects there is also greater transparency in pricing through the submission of detailed financial models which deal with the internal rate of return of the project and equity pay outs to the shareholders.

Sensible Risk Transfer – Potential P3 contractors understand full well that they will be required to accept more risk than is usual in typical DBB projects. All potential project risks should be identified and an appropriate allocation of risk should be contained in the P3 agreement. Thus, a P3 contractor considering their participation in a project will examine the proposed contractual arrangements carefully to ascertain whether the risk transfer in the agreement goes beyond their threshold for risk. For example, if demand risk is assigned to the P3 contractor; if all project design risk is laid on the P3 contractor even when the public owner and outside agencies have control over all or portions of the design; or if all force majeure risk is placed on the contractor the project may likely be considered too risky for many P3 contractors. In such an event, some of potential P3 contractors may simply walk away from the opportunity while others will propose higher costs to monetize and cover the additional risk.

Clear Legal and Institutional Framework – As noted earlier, P3 contractors want clearly stated and enforceable rules of the road related to the project. The terms and conditions of the P3 contract must be clear and sensible. The P3 agreement must set forth the process by which decisions will be made and implemented as well as in what timeframe they will be made. The agreement must define the relationships between the parties to the agreement and various parties’ roles on the project. Project roles and responsibilities should also be assigned to specific entity representatives. If the proposed P3 contract fails to meet these standards, many P3 contractors will be reluctant to propose their involvement in the project.

High Level Commitment from Key Stakeholders – The stakeholders in the context of a P3 contractor’s consideration include primarily the public owner(s). However, the experienced P3 contractor will likely also consider the owner’s constituents – the taxpayers – as they are the intended users of the completed project. These stakeholders will impact, positively or negatively, the demand or usage of the completed project. Thus, the owner’s constituents may well be the ultimate determinant of whether the project succeeds, and the P3 contractor accomplishes their planned ROI, or the project fails, and the contractor does not recover their construction and/or O&M cost. P3 contractors also look for appropriate compensation on termination should the public owner cancel a P3 project.

Reasonable Timeframes – There are two timeframes a potential P3 contractor is concerned with when considering participation in a P3 project. The first schedule is the duration of the planned design and construction of the project – that is, when is the project to be operational. The concern here is simply whether there is adequate time to design, build and commission the facility. Too short a time will decrease the time needed to design a successful project and will, in turn, likely increase the cost of construction due to the need for overtime work and/or additional labor and equipment. The other schedule concerns the operation and/or maintenance of the constructed facility. The longer this period the greater the potential for a profitable P3 project for the contractor.

Repeatable Projects – Beyond the immediate P3 project, prospective proposers are highly likely to consider what other P3 projects may follow this one. P3 contractors will be more interested in participating in a P3 project if it appears likely that other public owners in the area (such as the State) are also considering the use of the P3 project delivery method.

PRINCIPLES OF RISK TRANSFER ON P3 PROJECTS

All construction projects carry and must plan for significant risks. These risks are often varied and P3 projects are no different in this regard. At their heart, they are still construction projects, albeit procured differently.

While the contractual allocation of responsibilities and commercial structures de-risk the project to some extent, those risks still exist. However, what a P3 project structure seeks to do is allocate those risks to the party that can best manage those risks. It is also worth noting that these risks will continue to exist across the whole lifecycle of a P3 project, but if they are not identified, mitigated and, more importantly, allocated appropriately from the outset they can have far reaching implications on the future viability of the project at any stage of its lifecycle. If these risks materialize, they have the potential to jeopardize the P3 premise of lower whole life costs for the public owner and on time and on budget project delivery.

The nature of the risks can also have implications on the commercial structure of the P3 project or even on the decision around whether to procure a project utilizing a P3 approach. Each risk should therefore be objectively reviewed by the public owner, individually, for whether it is a risk that should be transferred to the P3 contractor or concessionaire, one to be retained by the public owner, or one to be shared equally between the parties.
Naturally, from the owner’s perspective they want to avoid assuming or accepting more risks than they would otherwise would do. However, most public owners are cognizant that the wholesale transfer of risks to the P3 contractor can potentially reduce the VfM the owner might otherwise derive from the P3 project. Figure 1 illustrates how risk transfer in a P3 agreement impacts the VfM of the P3 project.

If the bidding community perceives an unfair transfer of risks, they will either view the project as too risky a proposition to bid on or increase the cost of their involvement given the breadth of risks they are being asked to take on. Each risk can have a material cost and therefore impact the project’s viability. For example, where there is more risk transfer to the private sector, those that are funding the project may become very cautious and raise the cost of project financing. On the other hand, where the public sector owner retains both risks and provides guarantees around payments to the private sector, the cost of financing comes down but this, of course, would also reduce the VfM of procuring under via P3 compared to traditional procurement where the public sector retains most risks anyway. In fact, in such a scenario it is even possible that the P3 procurement mechanism (or payment mechanism) between the parties in a P3 contract is often a reflection of the allocation of risks between public and private sector and the risk and reward. Those P3 projects that transfer risks to the P3 contractor and their investor(s) without the financial incentives are more likely to fail.

**WHAT TYPICAL RISKS MUST P3 AGREEMENTS DEAL WITH?**

Realistic risk transfer is at the epicenter of a P3 contract. However, to consider what risks should be transferred, mitigated, accepted or shared, it is necessary to first identify and understand those risks. Risks exist across the entire project lifecycle. There are some risks that exist during the preconstruction phase, others during the construction period, and even others during the O&M phase post construction. Additionally, certain potential market risks exist across the whole life of the project. Such risks include the following:

- Pre-construction risks (e.g., land acquisition, permits, etc.);
- Construction period risks (rise in cost of materials, delays, changes, etc.);
- O&M period risks (asset failures, unavailability of maintenance materials, etc.); and,
- Commercial and market risks (demand risk, change in law, etc.).

A P3 project, like any other construction project, has critical periods in the project lifecycle when the impact of risk events may be at their highest and could affect the commercial and technical viability of a project. Figure 3 illustrates this point.
FIGURE 3 Model of When in Project Lifecycle Risk Events Highest

Arguably, the probability of things going wrong on a project are higher in the earlier stages of the project life but the impact upon cost and therefore the VfM from a P3 project is likely to be lower than if a risk event materialized later in the project when both significant amounts of money, time and resources will have already been injected into a project and any one risk event is likely to have a knock on or compounding effect. One risk event may even cause another to materialize.

The UK National Audit Office’s reports on previous privatizations have an evident trend. They have often found that the private sector prices in a sizeable risk premium for retaining financial risk, even if in the event of project failure responsibility for paying out or making remedies contractually falls upon the public sector. Reporting on the failed London Underground P3 contracts, the Public Accounts Committee of the British Houses of Parliament published a report in March 2005 on what went wrong. It reported that the perception by financiers of political risk (such as the amount of central government support to local government), rather than project risk, appears to have accounted for most of the extra cost of private finance. [17]

The authors also located a study that summarized risks that should be considered when negotiating a P3 agreement. This paper also surveyed and cited thirteen previous studies and mapped the risks identified in each of these studies to determine the ranking of project risks. [1] A summary of ten risk categories, how many of these risks were cited is set forth in Tables 2-11.

The authors believe this list of project risks is fairly comprehensive. However, the authors are cognizant that some specialized P3 projects may have additional risks not contained in the above list. The authors caution readers not to rely exclusively on this article when identifying and analyzing risk concerning future P3 projects.

TYPICAL RISK ALLOCATION ON P3 PROJECTS

As noted above, P3 projects tend to allocate many more risks than typical DBB or D/B projects. However, the basic risk management and allocation process remains fundamentally the same. This process generally follows the steps outlined below:

1. Identify – All risks the project may encounter should be identified.
2. Analyze – Each identified risk should be analyzed to determine the probability of the risk occurring on the project.
3. Assess – Each risk should be assessed to determine the potential impact on the project, both cost and time, should the risk arise on the project.

### Risk Attributes of a Public Project

<table>
<thead>
<tr>
<th>POLITICAL RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in law</td>
<td>9</td>
<td>69%</td>
</tr>
<tr>
<td>Delay in project approvals &amp; permits</td>
<td>9</td>
<td>69%</td>
</tr>
<tr>
<td>Expropriation / nationalization of assets</td>
<td>7</td>
<td>54%</td>
</tr>
<tr>
<td>Poor public decision making process</td>
<td>6</td>
<td>46%</td>
</tr>
<tr>
<td>Inconsistencies in government policies</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Strong political opposition / hostility</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Unstable government</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Government intervention</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Government reliability</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Inability of concessionaire</td>
<td>1</td>
<td>8%</td>
</tr>
</tbody>
</table>

### TABLE 2 Political Risks

<table>
<thead>
<tr>
<th>CONSTRUCTION RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land acquisition</td>
<td>9</td>
<td>69%</td>
</tr>
<tr>
<td>Availability of appropriate labor / materials</td>
<td>8</td>
<td>62%</td>
</tr>
<tr>
<td>Availability of finance</td>
<td>8</td>
<td>62%</td>
</tr>
<tr>
<td>Construction cost overruns</td>
<td>8</td>
<td>62%</td>
</tr>
<tr>
<td>Design deficiency</td>
<td>8</td>
<td>62%</td>
</tr>
<tr>
<td>Construction time delay</td>
<td>8</td>
<td>62%</td>
</tr>
<tr>
<td>Excessive contract variations / contractual risk</td>
<td>8</td>
<td>62%</td>
</tr>
<tr>
<td>Geotechnical conditions / ground conditions</td>
<td>6</td>
<td>46%</td>
</tr>
<tr>
<td>Late design changes</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Contractor failure / Capability of SPV</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Project delay</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Completion risk</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Consortium inability</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Unproven engineering technique</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Resettlement &amp; rehabilitation</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Quality risk</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Insolvency / Default of subcontractors &amp; suppliers</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Poor quality workmanship</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Change of scope</td>
<td>1</td>
<td>8%</td>
</tr>
</tbody>
</table>

### TABLE 3 Construction Risks

<table>
<thead>
<tr>
<th>LEGAL RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in law regulation</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Corruption &amp; lack of respect for law</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Legislation changes / inconsistencies</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Industrial regulatory change</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Import / export restrictions</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Rate of return restrictions</td>
<td>1</td>
<td>8%</td>
</tr>
</tbody>
</table>

### TABLE 4 Legal Risks

<table>
<thead>
<tr>
<th>ECONOMIC RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate volatility</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Inflation rate volatility</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Foreign exchange &amp; convertibility</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Poor financial market</td>
<td>3</td>
<td>23%</td>
</tr>
</tbody>
</table>

### TABLE 5 Economic Risks

<table>
<thead>
<tr>
<th>OPERATIONS RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operations cost overrun</td>
<td>7</td>
<td>54%</td>
</tr>
<tr>
<td>Residual value (after concession period)</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Maintenance cost higher than expected</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Operation financial risk</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Low operating productivity</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Risk regarding pricing of product / service</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Operator default</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Quality of operation</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Project / operation change</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Supporting facilities risk / necessary infrastructure risk</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Technology risk</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>Waste of material</td>
<td>1</td>
<td>8%</td>
</tr>
</tbody>
</table>

### TABLE 6 Operations Risk

<table>
<thead>
<tr>
<th>MARKET RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff change</td>
<td>6</td>
<td>46%</td>
</tr>
<tr>
<td>Market demand</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Fluctuation of material cost (by government)</td>
<td>5</td>
<td>38%</td>
</tr>
<tr>
<td>Fluctuation of material cost (by private)</td>
<td>5</td>
<td>38%</td>
</tr>
</tbody>
</table>

### TABLE 7 Market Risks

<table>
<thead>
<tr>
<th>PROJECT SELECTION RISK</th>
<th>Frequency Cited by Studies</th>
<th>% of Times Cited</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public opposition to project</td>
<td>5</td>
<td>31%</td>
</tr>
<tr>
<td>Uncompetitive tender</td>
<td>4</td>
<td>31%</td>
</tr>
<tr>
<td>Level of demand for the project</td>
<td>3</td>
<td>23%</td>
</tr>
<tr>
<td>Competition risk</td>
<td>2</td>
<td>15%</td>
</tr>
</tbody>
</table>

### TABLE 8 Project Selection Risks
4. Determine – For each risk, determine whether to:
   a. Accept – Some risks may be accepted via the terms of the contract. For example, the risk of differing or latent site conditions are frequently accepted by owners through inclusion of a Differing Site Conditions clause in the contract.
   b. Avoid – Contractors can avoid some risks by hiring specialty subcontractors. As an example, a P3 contractor may hire a hazardous waste subcontractor to deal with any asbestos encountered on the project.
   c. Reduce – Owners and D/B contractors can reduce risk by changing the project design, means and methods, etc.
   d. Transfer – Owners and contractors can transfer some risks by purchasing insurance or bonds to cover certain risk events.

5. Manage and Mitigate – Owners and contractors should prepare a risk register for each project that includes all identified risks on the project. Owners and contractors should prepare specific risk management plans for each specific risk that has a high potential risk for occurrence and/or a potentially large impact (time and/or cost) on the project.

6. Monitor – Finally, the project risk register should be routinely reviewed and reassessed as the P3 project moves from one phase to another – design, construction, commissioning, and operation and/or management.

One article that examined how risk is reflected in infrastructure contracts classified project risk into three categories – production, commercial and context – and then ranked the importance of major risks in each category. [20] The results of this article are summarized in the Table 12. As another study pointed out:

“Effective risk transfer is one of the keys to achieving high VfM under PPP contracts. Although the base cost of financing is often higher when using private funds, risk allocation is one of the primary areas where those costs are recovered and, often, real cost savings is realized … decision makers should seek to allocate risk to the party best able to manage it. Under PPP arrangements, many project risks traditionally shouldered by the public sector are transferred to the private sector…” [35]
This study received 45 detailed responses from professionals with interest in and/or experience with P3 projects. The author of this study pointed out that 27 of the 46 risk factors (59%) in this survey were allocated to the P3 contractor including the following:

1. Poor financial market
2. Lack of tradition of private provision of public services
3. Geotechnical conditions
4. Weather
5. Level of demand for project
6. Availability of finance
7. Financial attraction of project to investors
8. High finance costs
9. Residual risks
10. Design deficiency
11. Unproven engineering techniques
12. Construction cost overrun
13. Construction time delay
14. Material/labor availability
15. Late design changes
16. Poor quality workmanship
17. Excessive contract variations
18. Insolvency/default of subcontractors or suppliers
19. Operation cost overrun
20. Operational revenues below expectation
21. Low operating productivity
22. Maintenance costs higher than expected
23. Maintenance more frequent than expected
24. Organization and coordination risk
25. Differences in working methods and know how between partners
26. Third party tort liability, and
27. Staff crises.

The author of this study pointed out that 27 of the 46 risk factors (59%) in this survey were allocated to the public owner, including:

1. Unstable government
2. Expropriation/nationalization of the asset
3. Poor public decision-making process
4. Strong political opposition/hostility
5. Legislation changes
6. Change in tax regulation
7. Level of public opposition to the project, and
8. Delay in project approvals and permits.

Finally, a total of 11 of the 46 risk factors (24%) were identified in this survey as being equally shared between the public owner and the P3 contractor, including:

- Inadequate experience in PPP/PFI
- Inadequate distribution of responsibilities & risks
- Inadequate distribution of authority in partnership
- Differences in working method & know how between partners
- Lack of commitment from either partner
- Third party tort liability
- Staff crises

The study also reported that only 8 of the 46 risk factors (17%) were allocated to the P3 contractor including:

- Unstable Government
- Expropriation/Nationalization of Asset
- Poor Public Decision Making Process
- Strong Political Opposition/Hostility
- Poor Financial Market
- Inflation Rate Volatility
- Interest Rate Volatility
- Influential Economic Events
- Legislation Change
- Change in Tax Regulation
- Industrial Regulatory Change
- Lack of Tradition of Private Provision of Public Services
- Level of Public Opposition to Project
- Force Majeure
- Geotechnical Conditions
- Weather
- Environment
- Land Acquisition (Site Availability)
- Level of Demand for Project
- Availability of Finance
- Financial Attraction of Project to Investors
- High Finance Costs
- Residual Risks
- Delay in Project Approvals & Permits
- Design Deficiency
- Unproven Engineering Techniques
- Construction Cost Overrun
- Construction Time Delay
- Material/Labor Availability
- Late Design Changes
- Poor Quality Workmanship
- Excessive Contract Variations
- Insolvency/Default of Subcontractors or Suppliers
- Operation Cost Overrun
- Operational Revenues Below Expectation
- Low Operating Productivity
- Maintenance Costs Higher Than Expected
- Maintenance More Frequent Than Anticipated
- Organization & Coordination Risk
- Inadequate Experience in PPP/PFI
- Inadequate Distribution of Responsibilities & Risks
- Inadequate Distribution of Authority in Partnership
- Differences in Working Method & Know How Between Partners
- Lack of Commitment from Either Partner
- Third Party Tort Liability
- Staff Crises

The study concluded with a summary of the results of this survey, which are presented in Table 20:

<table>
<thead>
<tr>
<th>RISK FACTORS</th>
<th>ALL PREFERRED ALLOCATION</th>
<th>PUBLIC PREFERRED ALLOCATION</th>
<th>PRIVATE PREFERRED ALLOCATION</th>
<th>BANKING PREFERRED ALLOCATION</th>
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</thead>
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<tr>
<td>Unstable Government</td>
<td>Public</td>
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<tr>
<td>Expropriation/Nationalization of Asset</td>
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<tr>
<td>Poor Public Decision Making Process</td>
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<tr>
<td>Strong Political Opposition/Hostility</td>
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<tr>
<td>Poor Financial Market</td>
<td>Private</td>
<td>Shared</td>
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<tr>
<td>Inflation Rate Volatility</td>
<td>Shared</td>
<td>Shared</td>
<td>Public</td>
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<tr>
<td>Interest Rate Volatility</td>
<td>Shared</td>
<td>Private</td>
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<tr>
<td>Influential Economic Events</td>
<td>Shared</td>
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<tr>
<td>Legislation Change</td>
<td>Public</td>
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<tr>
<td>Change in Tax Regulation</td>
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<tr>
<td>Industrial Regulatory Change</td>
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<td>Lack of Tradition of Private Provision of</td>
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<td>Public Services</td>
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<tr>
<td>Level of Public Opposition to Project</td>
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<td>Public</td>
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<tr>
<td>Force Majeure</td>
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<tr>
<td>Geotechnical Conditions</td>
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<tr>
<td>Weather</td>
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<tr>
<td>Environment</td>
<td>Shared</td>
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<tr>
<td>Land Acquisition (Site Availability)</td>
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<tr>
<td>Level of Demand for Project</td>
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<tr>
<td>Availability of Finance</td>
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<tr>
<td>Financial Attraction of Project to Investors</td>
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<td>High Finance Costs</td>
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<td>Residual Risks</td>
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<tr>
<td>Delay in Project Approvals &amp; Permits</td>
<td>Public</td>
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<tr>
<td>Design Deficiency</td>
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<td>Unproven Engineering Techniques</td>
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<td>Construction Cost Overrun</td>
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<td>Construction Time Delay</td>
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<td>Material/Labor Availability</td>
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<td>Late Design Changes</td>
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<td>Poor Quality Workmanship</td>
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<td>Excessive Contract Variations</td>
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<td>Insolvency/Default of Subcontractors or Suppliers</td>
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<td>Operation Cost Overrun</td>
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<td>Operational Revenues Below Expectation</td>
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<td>Low Operating Productivity</td>
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<td>Organization &amp; Coordination Risk</td>
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<td>Inadequate Experience in PPP/PFI</td>
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<td>Inadequate Distribution of Authority in Partnership</td>
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<td>Differences in Working Method &amp; Know How Between Partners</td>
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<tr>
<td>Lack of Commitment from Either Partner</td>
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<td>Third Party Tort Liability</td>
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<tr>
<td>Staff Crises</td>
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</tr>
</tbody>
</table>

TABLE 20 Results of Risk Allocation Preferences [36]
1. Inflation rate volatility
2. Interest rate volatility
3. Influential economic events
4. Industrial regulatory changes
5. Force Majeure
6. Environment
7. Site availability
8. Inadequate experience in PPP/PFI
9. Inadequate distribution of responsibilities and risks
10. Inadequate distribution of authority, and
11. Lack of commitment from either partner.

The authors acknowledge that not all P3 projects will allocate risk in the same fashion. However, this survey may give readers some idea on how risk was allocated on previous P3 projects.

**SOME INAPPROPRIATE RISK ALLOCATION CLAUSES IN P3 PROJECTS**

As discussed, risk transfer on a project should be based on transferring specific risks to the party best positioned to manage each risk should it arise on the project. Inappropriate risk transfer, particularly risks that the private sector is not any more in control of or experienced with, will increase the funding costs of the P3 project which in turn will reduce the VfM of the P3 delivery method.

The risks the project is exposed to and the appropriateness of risk transfer varies from project to project regardless of the project delivery method employed. However, there are arguably certain risks that are often best left in the hands of either the private sector or the public sector. Land acquisition is one such risk. Public owners typically have greater powers than private entities in acquiring land as they can utilize powers such as Eminent Domain (U.S.) or Compulsory Purchase Orders (UK) to procure and secure a site for a project. If the P3 contractor were made responsible for land acquisition this transfer of responsibility would likely cause delays in acquiring the land as it would not have the leverage of a government entity and its statutory powers. The P3 contractor would have to rely almost entirely upon the financial offers it is able to make to those whose land it seeks to acquire. It is not a zero sum game for the public sector as the risk of the P3 contractor paying out significant sums will have been priced into their bid. It is therefore better from the outset that land acquisition much like permit and licensing risks be retained by the public owner.

Similarly, change of law is a risk best retained by the public sector. The public owner is responsible for the laws and any changes made to them. Transferring a risk such as change in law subjects the P3 contractor to a great degree of uncertainty which it would then be forced to price into its bid or refuse to participate in the project as it would be too risky. Even if the public sector body procuring the P3 project is not directly in control of the laws that govern the project, it will have more influence than the P3 contractor in protecting the project from changes in law which detrimentally impact the project costs and/or revenues or its ability to operate. An example may be a coal powered fire plant originally constructed as a P3 project, but a few years later new laws demand the closure of all coal fired power plants, require them to adopt newer technologies, or only source and use cleaner coal any of which would jeopardize the viability of the P3 project.

Some risks cannot simply be priced into a project and insistence that they be transferred to the private sector may cause project abandonment. Force Majeure risks are such an example. When they occur, how they occur, and what will be their impact cannot be estimated or predicted. All sorts of natural (Acts of God) and unforeseen political triggers can cause them to materialize and potentially disrupt or destroy an asset causing downtime and loss of revenue. For this reason, it is often more appropriate for Force Majeure risk events and their impacts to be shared. This sharing may be determined by the type of event or simply relief events that allow the investor to get back up and running without penalties being applied to them. Another approach is to simply take out All Risk / Builder’s Risk insurance policies with third parties that protect the investor(s) from damages and loss of revenue for such event.

Likewise, the transfer of demand risk or the risk of usership to the P3 contractor will likely cause a sharp increase in the cost of the project or may cause potential P3 contractors to decline to bid. With respect to demand risk, one study stated the following:

“Engel et al. (2010) for instance shows that with financing considerations, it is optimal to transfer demand risk to the government. They argue that since PPPs involve large upfront investments, exogenous demand risk is an important concern of lenders when use fees are the main revenue source, so by assigning it to the government, the risk and therefore the interest rates charged to the project fall.”[9]

Likewise, specifically crafted risk transfer clauses are also likely to cause an increase in the cost of the project at the outset including those that:

- Define concurrent delay as contractor caused delay leaving the P3 contactor liable for overlapping owner caused delay;
- Include a Submittal Metering clause that limits how many drawing submittals the P3 contractor can submit in any month on the project;
- Provide for direct costs only, no delay costs, in the event that the P3 contractor encounters a materially different, latent site condition during construction; or
- Incorporate a No Damages for Delay clause.

The authors acknowledge that these examples are only a few of the many clauses employed in some P3 projects that the authors have encountered. Nevertheless, clauses such as these run contrary to the accepted rule that risk should be assigned to the party best able to deal with the risk should it arise during the performance of the project.

**TYPICAL CAUSES OF P3 PROJECT FAILURES**

While there are numerous successfully completed P3 projects, there are also several P3 project failures. As one study stated:

“… public infrastructure sponsors seldom apply state of the art risk and project management tool and techniques, despite the knock on consequences of being seen to ‘lose’ public money during a time of increasingly constrained public budgets. … As a result, the seeds of many project failures are sown in the early stages of development, when a poorly designed project delivery approach or ill-considered procurement decision can lead to delays, higher costs, and ultimately diminished returns.”[3]

Some typical cause of P3 project failures are set forth below:

**Poor Legal Framework and Enforcement** – The lack of a solid legal framework that clearly
KEYS TO SUCCESSFULLY MANAGING P3 PROJECTS

Two published papers summarized what their authors believed are the keys to P3 project success as noted below. A summary of the factors The National Council for Public Private Partnerships believes will lead to a successful P3 project include the following: [35]

1. **Public Sector Champions** – Strong political commitment is imperative. Recognized public figures should be the advocate for the P3 project. A recently published article on P3 projects put forth exactly this point in the following manner: “Government relations becomes critical for P3 projects. Consultants may be required to help local regulators and legislators continue to understand the value of the P3 and to maintain the political will for the project over time – particularly when administrations change.” [24]

2. **Statutory Environment** – There needs be a clear legal structure in place that includes transparency and a competitive proposal process to create an effective enabling environment.

3. **Public Sector’s Organized Structure** – The public owner should have a team dedicated to the P3 project and this team must be involved from the initial project planning phase through the completion of the project and beginning of operations.

4. **Detailed Contract and Business Plan** – The contract should include the responsibilities, risks and benefits for both the public owner and the P3 contractor.

5. **Clearly Defined Revenue Stream** – Even though the P3 contractor will provide funding for the project, an identifiable “…revenue stream sufficient to retire this investment and provide an acceptable rate of return over the term of the partnership…” must be included.

6. **Stakeholder Support** – Stakeholders include more than just the public owner and the P3 contractor and their financial backers. Other groups may include the owner’s employees, the public users, other interest groups and the press. It is important that the public owner reach out to all such groups and gain their support for the project.

7. **Pick Your Partner Carefully** – The report points out that “The ‘best value’ (not always the lowest price) in a partnership is critical in maintaining the long-term relationship that is central to a successful partnership.” The P3 contractor’s experience in delivering P3 projects and their financial capacity are also critical factors in picking the right partner.

Likewise, the Urban Land Institute published a study that identified ten principles necessary to successfully deliver a P3 project. [8] These principles are summarized below:

1. **Prepare Properly for Public/Private Partnerships** – Both public owners and P3 contractors must prepare in advance of entering into a P3 agreement. Both parties need to assess their own internal capabilities and, if found lacking, fill necessary gaps. Public owners must create and transmit a public vision for a P3 project and create or make certain there is an appropriate legal structure. (It may be appropriate for public owners to identify pathfinder projects that are small and easily understood that align with contractor appetite and pave the path for further and increasingly complex projects.) Public owners need to identify and capitalize on all public and nonprofit funds to support the project and have all necessary land acquisitions and rights of way in place. P3 contractors must establish the project feasibility and arrange their financial backing accordingly. P3 contractors must arrange the right team for the project. A recent article included the following concerning this point: “There needs to be a comfort in asking questions and not a presumption of understanding. Everyone needs to operate from a greater level of understanding.” [24]

2. **Create a Shared Vision** – The owner/P3 contractor team must create and maintain a shared vision of the project. The shared vision is the framework for the project and forms the benchmark for measuring and accomplishing project goals. P3 projects are long-term and relatively inflexible structures so it is important to get it right from the outset. This report notes that the public owner
and the P3 contractor must become partners to be successful in delivering a P3 project.

3. Understanding Your Partners and Key Players – The report notes the following. “The beginning point of any successful partnership is for all prospective partners to invest the time and effort necessary to gain a full appreciation of, and respect for, their counterparts in a deal – their background, reputation, experience, needs, financial strength, motivations, expectations, and goals. Choose wisely, because you want partners who will work with you, not against you. Everyone is not in the deal for the same reasons, and without such understanding, trust will never be built, and distrust may cause the deal to unravel.” While this report does not specifically mention project partnering as this term is used in the construction industry, the implications are clear to the authors. [40]

4. Be Clear on the Risks and Rewards – The report contains Table 21 setting forth the risks and rewards in a P3 project that must be balanced in order to provide for project success for both the P3 contractor and the public owner.

5. Establish a Clear and Rational Decision Making Process – As the report notes – “All parties need to articulate and agree upon the process to be followed and the rules of engagement to be used to structure a deal with public and private dimensions as early as possible. Agreement on process helps ensure that partnerships establish effective policies and implement them efficiently and collaboratively. Furthermore, a documented decision-making process increases transparency and facilitates the sharing of information about the project.”

6. Make Sure All Parties Do Their Homework – Both the public owner and the P3 contractor must analyze thoroughly and fully understand what they will have to invest in time, energy, and resources during all phases of the project. Each party must continue to perform due diligence reviews throughout the project; share information with the other party; and continually monitor and act upon the project risk register as the project progresses through the phases of the project life cycle.

7. Secure Consistent and Coordinated Leadership – A well-functioning P3 project team requires a small group of individuals – from both the public owner and the P3 contractor – to be the champions of the P3 process. This group will define project goals, coordinate the decision-making process, facilitate communications with all project stakeholders, etc.

8. Communicate Early and Often – As the report states: “The more open the communication channels and the more they are used by each partner, the greater the prospects for a successful project outcome and lasting public/private partnership.” The authors also remind readers of the adage “Bad news delivered early is useful information. Bad news delivered late is a disaster!”

9. Negotiate a Fair Deal Structure – The P3 contract is the deal! Public owners and P3 contractors understand and acknowledge this. However, circumstances may change. In such circumstances fairness may be difficult to accomplish. Some general rules for achieving a “fair deal structure” as outlined in this report include the following.

- Spend sufficient time preparing and reviewing a detailed term sheet.
- Do not let legal counsel or the documentation process drive the outcome. Only the principals from the public owner and the P3 contractor have a shared vision for the project.
- Build in objective measures of the expected outcomes that can be used to determine the ultimate fairness of the transaction.
- Both sides need to hire competent legal and technical counsel.
- Allow sufficient time to conclude negotiations.
- Understand the long-term nature of the partnership.
- Understand that compromise is a necessary requirement for achieving a fair transaction.

10. Build Trust as a Core Value – The report notes that “Trust is one of the overarching values to be realized from the beginning and throughout the public/private partnership process. To endure, partnerships require a foundation of trust in each partner’s commitment to the project and its objectives. Given the complex public/
P3s have become a legitimate project delivery method. After performing the necessary research to prepare this paper the authors have concluded that P3 projects, if properly structured, can and will be successful. However, a number of P3 projects have failed and others appear to be on the verge of failure. The authors believe that inadequate risk identification, allocation and management are at the heart of the currently known P3 failures.

Identification, allocation and management of P3 project risks will greatly affect project success and their bankability from both a contractor and lender’s perspective. Careful and thorough risk identification, risk planning, risk allocation and risk management will make a difference in the VFM necessary to justify the use of the P3 project delivery method as opposed to traditional procurement methods such as D-B-B or D/B. The authors believe that P3 projects will perform well when the risks are appropriately transferred and a thorough risk management plan is implemented.

Public owners need to recognize that P3 agreements will not allow for total risk transfer and that while P3 agreements are one tool in the project delivery method toolkit, P3 projects are not the answer every time.

Public owners also need to recognize that appropriate risk transfer is not the only thing that helps to deliver a successful P3 project. P3 agreements are complex contractual arrangements and public owners must start by choosing the right project(s). The public owner must draft and negotiate realistic and thorough output specifications that encourage innovation with financial performance linked directly to achievement of these outputs. Public owners and P3 contractors must negotiate and settle on well drafted contracts with clear incentives – for both parties. Finally, public owners and P3 contractors must look beyond contract execution to the design, construction, operation and/or maintenance plans and even beyond to what happens when the term of the P3 agreement is reached.

Provided that all of this is done correctly by both the public owner and the P3 contractor the authors believe that P3 projects can be successfully delivered for the benefit of the public owner, the P3 contractor and all other project stakeholders. The authors trust that this paper will aid those considering their involvement in P3 projects and those already participating in this project delivery method.

REFERENCES


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On August 31, the Greater Cairo Section held a technical meeting in which Alaa Khater presented the topic of “Specialties of Construction as a Business - Economic Perspective.” The presentation covered the following topics: specialties of one-off projects, economies of scale and tendering considerations, management of political and legal risk and the role of cost consultants and cost engineering associations.
INDIA SECTION

Sankar Subrahmaniyam, Director Region 8, recently visited Vellore Institute of Technology, a premier private university in India. He addressed the Construction Technology and Management program’s graduate students. He talked about 21st century skills, a necessity for deep learning and life-long learning, how an individual can make a difference in their life, to those around them, and to the society at large. He introduced AACE International to the students. Subrahmaniyam believes current students are the potential torch bearers of AACE in future and getting them to become members while they are young will be good for them and for the organization. The strategy for expanding the visibility and reach of AACE in India is to introduce AACE to the students and budding professionals. With this intent, Subrahmaniyam initiated the outreach program. Subsequently, he held detailed discussions with the Dean of Civil Engineering, Dr. Santhakumar, and the Head of the Department of Civil Engineering and Associate Professor Dr. Shanmuga Priya. Dr. Santhakumar expressed willingness to create a student section of AACE International and orient the students in AACE knowledge areas. Sankar says the India section will also be offering CCT and CST certification training to the students. Section members also plan to address the students through webinars and offer guidance to students undertaking research in AACE knowledge areas. Subrahmaniyam hopes one day there will be the possibility of adding a Masters in Cost Engineering to the curriculum.

PAKISTAN SECTION

On August 28, the Pakistan Section and NED University of Engineering and Technology at Karachi, Pakistan, agreed to a Memorandum of Understanding to promote activities and events to increase awareness of cost engineering and total cost management.

QATAR SECTION

Avinash Gaikwad is the Section President of the Qatar Section (www.aacei-qatar.org). He is a Managing Director with AG Consultancy WLL (www.agc.qa). In updating activities of the Qatar Section, he says: “First, I want to thank the Qatar Section for providing an opportunity to serve as Section President and to be a part of an organization that not only gives knowledge back but allows friendships to be created within the industries. I am following the footsteps of some great leaders in the industry.” Gaikwad notes that the Qatar Section was formed in 2015 “by individuals who were motivated and persistent in pursuing a goal of success for the Section.” He says, “I was fortunate to be part of the Section’s founding management team as Section Vice President – Membership. With hard work and clear vision of the whole section management team, the section grew from 67 members to more than 170 members and became a major section within Region 7. The Qatar Section received Gold awards in 2016, 2017, 2019 and also received a Platinum award in 2018.”

“This year comes as a challenge as we continue to develop and improve AACE Qatar Section in midst of blockade which reflects our industry. We have scheduled a variety of technical seminars and trainings over the coming months that will benefit members and industry practitioners. Both myself and our board are excited about the opportunity to give something back to our membership,” notes Gaikwad. He continued, “The second challenge we will have is increasing our membership. Like with other sections, many of our members are entering the twilight of their careers and are looking forward to a much-deserved retirement. With that said we need to bring some youth into the association and that starts at the section level. The sections that continually recruit new members and are always growing, are the ones that thrive and have the most activities. If any section or member needs any help or ideas, my door, as well as any member of the board is always open (so to speak) to answer any questions.”

Gaikwad explains that several opportunities will be available throughout the year as well as networking with individuals within our industry. “Networking is an important part of our industry. I have been a member of AACE International and the Qatar Section for many years and networking personally has allowed several opportunities to come my way that otherwise would not have. This association has a wealth of knowledge, and when combined with the networking opportunities, has helped create long term relationships which have been priceless.”

He concludes, “For our current members and prospective members, I want to assure you that my intention is to grow without limits. We will stay focused on remaining as a benefit to our members while also staying current with Industry standards and requirements. I look forward to a productive successful presidency and invite each of you to participate, and most importantly become involved.”
The Toronto Section held its end of summer technical and networking event on August 22nd. The guest speaker Ettorino Di Giovanni from Ares Prism discussed the difficulties present when introducing a robust project controls system in an immature project management environment and the benefits of using software to drive project management maturity. The speaker also explored how to successfully implement a software solution in a manner that will overcome the challenges and presented examples from Ares Prism's flagship software - Prism G2.

The Toronto Section held a summer social event on July 24th at Scallywags rooftop patio in midtown Toronto. Members and guests enjoyed meeting and exchanging conversation in a relaxed and laid-back environment. The event was sponsored by Ares Prism project management, one of the leading enterprise project controls software developers.

Guest speaker Ettorino Di Giovanni from Ares Prism is shown above presenting at an August 22 technical event at the Toronto Section.

Shown at left and below members and guests attending the Toronto Section August meeting enjoyed a technical presentation by guest speaker, Ettorino Di Giovanni, from Ares Prism.
SUBMITTING SECTION NEWS  We invite all sections to submit news and updates to be included in the International Bulletin section of each Source issue. Please submit any and all text as a part of the e-mail or as a Microsoft Word file attachment. Please submit any photos as individual attachments in JPG formats. Do not embed photos in Microsoft Word files. For photos to be used, we require either large original files or print size photos at 300 dpi (dots per inch). For photos to be published, they must be in focus, of print quality, and of sufficient resolution.

Please include the names and titles of each person shown in any photos. Please list names from left to right or refer to those shown as being above left or right. For group photos please list names from left to right, beginning with the front row and working to the back. All submissions should be e-mailed to editor@aacei.org. Please use the official name of the Section as approved by the AACE Board when the Section’s charter was approved. Within 2 to 3 business days of submitting a “Section News” items, you should receive a return confirmation e-mail that your submission was received at AACE headquarters.

MISSING SUBMISSIONS  Generally, all submissions received in the above scheduled times will be published in the listed issue. Items are not held because of space restrictions. There is no waiting list and no preference is given to one Section over another. Questions about incomplete submissions or failure to follow these submission guidelines could delay publication. Text will be published without submitted photos if the photo does not meet the listed quality requirements. AACE reserves the right to edit all submissions and/or to refuse to publish any submissions determined by the Managing Editor or the Art Director to not meet the standards of the journal. Any appeals of these decisions will have a final decision determined by the Executive Director.

If a submission is not included in the designated issue, please e-mail or call the Managing Editor to ensure that it has not been lost or misplaced. Call or e-mail if you do not receive a confirmation e-mail within 3 business days of submission.

Source has a submission deadline of two months in advance of the issue date.

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Any Section representative with questions is advised to e-mail editor@aacei.org or call the Managing Editor during regular business hours, 9 a.m. to 5 p.m. Eastern Standard Time, Monday-Friday, except holidays and special closings.
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2 CONSTRUCTION NETWORK, TECHNOLOGY TRENDS IN TRANSPORTATION
8 a.m. – 9:30 a.m.
City Club, 555 S. Flower St., 51st floor, Los Angeles, CA
register.ironfly.com/construction-network/

8 CMAA KEYS OF NEGOTIATION SEMINAR
8 a.m. – 9:30 a.m. The LA Hotel Downtown
333 South Figueroa Street, Los Angeles, CA
sccmaa@cmaasc.org

8 CMAA THE PORTS OF LONG BEACH AND LA CAPITAL PROGRAMS UPDATES
Long Beach Marriott
Long Beach, CA
sccmaa@cmaasc.org

10 CMAA BREAKFAST OF CHAMPIONS
hosts Riverside, College of the Desert and San Bernardino Community College Districts
8 a.m. to 9:30 a.m. Marriott Riverside
sccmaa@cmaasc.org

9-10 MODULAR, PREFAB AND CONSTRUCTION TECH SENATE
San Francisco
johnk@trueventus.com

15-17 MOTION + POWER TECHNOLOGY EXPO
American Gear Manufacturing Association (AGMA),
National Fluid Power Association (NFPA) and ASM
Heat Treating Society Conference and Exposition
COBO Center, Detroit, Mich
www.motionpowerexpo.com

17 CONSTRUCTION NETWORK VIP BREAKFAST
Project Updates Transportation Corridor Agency
Dave Speirs presenter
8 a.m. Long Beach Marriott
4700 Airport Plaza Drive, Long Beach, CA
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19 PERU SECTION - 7TH INTERNATIONAL CONGRESS OF COST ENGINEERING
James Arrow speaking on How Artificial Intelligence can help manage digital disruption, as well as skills and knowledge needed to use total cost management analytics to the fullest
National Society of Industries, San Isidro, Lima, Peru

24 CMAA KEYS OF NEGOTIATION SEMINAR
8 a.m. – 9:30 a.m. The LA Hotel Downtown
333 South Figueroa Street, Los Angeles, CA
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24 SEAOI 9TH ANNUAL STRUCTURES SYMPOSIUM
8 a.m. – 5 p.m., 150 N. Riverside, Chicago, IL
https://www.seaoi.org/event/9th-annual-structures-symposium

30 CMAA PREFABRICATION CONSTRUCTION
How Prefabrication Will Change
8 a.m. – 9:30 a.m. Long Beach Marriott
sccmaa@cmaasc.org

NOVEMBER

5 CONSTRUCTION NETWORK
Los Angeles Streetcar Project Update
8 a.m. – 9:30 a.m. The Westin Bonaventure
404 South Flower, Los Angeles, CA
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7 CMAA PREVAILING WAGE LAW AND LABOR UPDATES
8 a.m. to 10 a.m., Long Beach Marriott
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3-5 AEC NEXT AND SPAR 3D CONFERENCE
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