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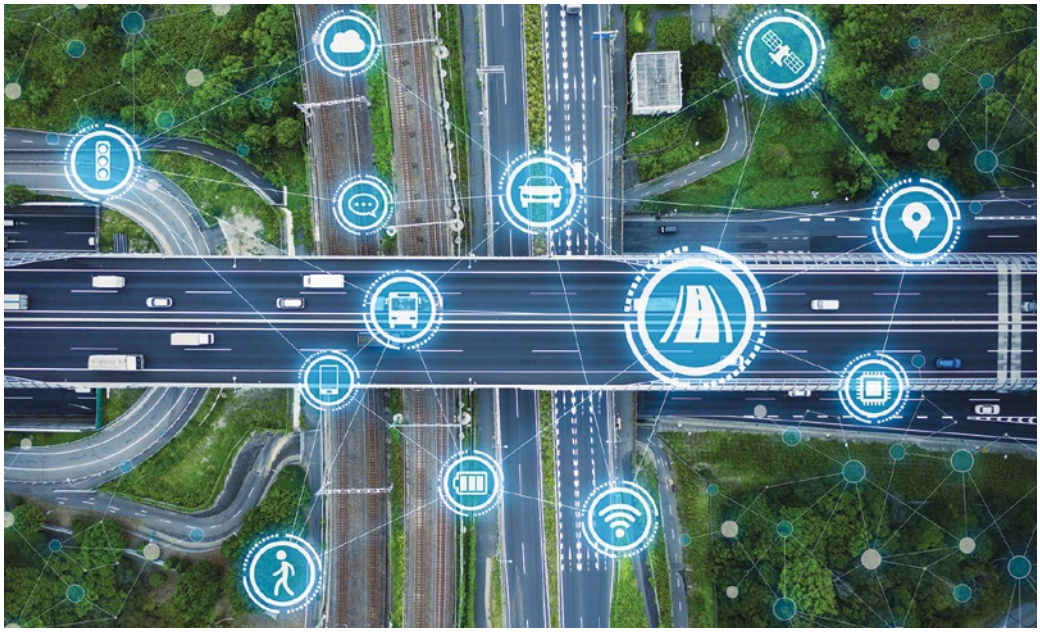
Delivering Infrastructure Better, Faster and Cheaper:

Lessons in Shifting Risk and Reducing Life-Cycle Cost for the Public Owner

by Charles V. McPhillips



I. Overview: Re-Engineering the Procurement Process to Save Taxpayer Dollars

With our "crumbling national infrastructure" constantly in the news, I submit that, in appropriate circumstances, a properly structured public-private partnership (P3 project) can save time and money for a public body that wants to deliver new and much-needed infrastructure to its constituents. The cost savings are particularly significant when, as a wise steward of the taxpayers' money, the public body weighs the total cost — and risk — of *operating and maintaining* that infrastructure over its useful life (or what should be its useful life).

Under pressure in a budget-constrained environment to deliver a new road, a new school or a new municipal building, public owners often feel compelled to disregard the reality that most of a facility's total life-cycle costs will be incurred in the "out years," operating and maintaining the structure over its expected life.

Here lies the Achilles heel in the traditional public procurement process: the taxpayer bears the risk that the significant costs of keeping a facility open for business over its useful life will exceed what is anticipated. Far too often nothing — or nothing realistic — is budgeted!

The result is the staggering cost of deferred maintenance and neglected highways, bridges, schools and other public buildings. **By hastening the early demise of our infrastructure, deferred maintenance necessitates major renovations and capital replacements, piling extra operation and maintenance costs upon the taxpayer that can range anywhere from 6 to 40 times what proper maintenance would have cost.**[1]

In large part due to the insidious cost of deferred maintenance, the American Society

of Civil Engineers (ASCE) gives our national infrastructure a grade of D+ (C- in Virginia).[2]

By focusing attention on a facility's total lifecycle costs, a P3 can promote longer-term thinking for the benefit of the taxpayer. For example, one study in Canada found a 24 percent lifecycle cost saving by using a particular P3 model known as Design/Build/Finance/Operate/Maintain (DBFOM).[3]

McKinsey & Company echoes this finding in a 2017 survey of published studies measuring the cost savings from utilizing the P3 approach throughout Europe in social infrastructure projects, such as schools, clinics, etc. The consensus finding of this study was a 20 percent cost savings.[4]

II. The Goal: Reducing Life-Cycle Costs

It is crucial that the public owner weigh both the initial project costs (design, construction and financing) *and* the potentially far larger life-cycle costs (operations, maintenance and capital replacements) under each alternative procurement method. Failure to do so is short-sighted and costly to the taxpayer.

A Value for Money (VfM), or Life Cycle Cost Analysis (LCCA), compares the risk-adjusted cost to the public sector of owning and operating a public facility over its lifespan under each alternative. Such an analysis accounts for all of the following costs:

- Project Financing Costs, including Issuance Costs
- Up-Front Design and Construction Costs
- "Risk-related costs": Cost Overruns or Time Delays
- Project Income from User Fees
- Utility Costs
- Other O&M Costs, including Personnel Costs
- Capital Replacement Costs
- End of Life Costs: Residual Value
- Non-Monetary Costs (Quality Trade-Offs)

The Commonwealth of Virginia recently conducted a successful VfM exercise with respect to the I66 Express Lanes now under construction between the Capital Beltway and US15 in Haymarket. The state calculated that it would cost $600 million to self-perform the project using a traditional procurement approach. It then asked private developers if they could improve on that outcome. In return for a 50-year concession to collect tolls from operating the express lanes (two in each direction), a consortium headed by the Spanish firm Ferrovial (through its subsidiary Cintra) offered a $500 million upfront payment *to the state*, together with a commitment for $800 million in public transit improvements and another $350 million in "hand-back" I-66 corridor improvements over the term of the concession, meaning Virginia should receive an expanded I-66 in well-maintained condition upon hand-back at the 50-year mark.

III. The Challenge: Shifting and Curtailing Project Risks

In order to curtail total project costs, it is axiomatic that risk should be shifted to the party best able to control that risk. To meet this challenge, here are just a few of the project risks (and costs) that may be shifted to the private developer through a properly designed P3 procurement.

Design Risk

In a traditional fixed-price, design-bid-build procurement (DBB), the design team and the construction team are placed in separate camps, resulting in adversarial finger-pointing when things go wrong. **Although the construction team may have grave concerns over the "constructability" or cost of certain design concepts, "value engineering" is usually deferred until after the project is fully designed, bid and awarded. The result is that necessary design changes occur too late in the game, and at the owner's risk and greatly increased cost.** Moreover, the private developer is not incentivized to "design" or construct the facility with the goal of extending its useful life while conserving future operation and maintenance costs.

Inaccurate Cost Estimates

In a traditional procurement, the budget is usually developed based on assumptions and estimates, rather than actual bid costs and differing or unforeseen site conditions — subsurface conditions (e.g., underground utilities), historic resources, endangered species

— all remain on the owner's side of the risk ledger. Likewise, contingencies for "constructability" issues, scope gaps between subcontractors, and subcontractor defaults are usually priced into the bid. The public owner pays for these assumptions, estimates and contingencies while being unable to benefit from any potential cost savings if the contingencies do not materialize.

Construction: Cost and Schedule Overruns

The time it takes to execute the rigidly sequential traditional procurement process inevitably increases the material and labor costs over the course of the project. In addition, the facility remains unavailable for public use during the extended period required to design, bid and then build the project. Labor and materials that were available (or affordable) at the beginning of the planning process may be unavailable (or unaffordable) later when the time for construction finally arrives.

Financing

In contrast to a public owner's need to postpone a project until all funding is in hand (and helplessly watch construction prices rise in the meantime), a private developer is usually willing to proceed with a P3 project even if the public owner's payments are contingent upon ("subject to") appropriations occurring in future years. The P3 market has grown to accept the "subject to appropriations" contingency as relatively low risk, provided that the facility is viewed as a long-term necessity (e.g., a highway or school, as opposed to a public golf course).

Operations and Maintenance

In a traditional DBB procurement, the public owner retains not only the risk of deferred maintenance but also the risk that its design team did not adequately plan for the intended use or "program" of the facility. **Under a P3, the private developer can be held to performance standards that will affect its ultimate compensation for the project, incentivizing the developer to design and construct the facility to last and to execute the program efficiently.** With a "handback guarantee," the public owner is typically assured that the facility will be turned over at the end of the stated project term (e.g., 40 years later), in a condition considered "85 percent new." The result is an extended life for the asset and reduced capital replacement costs to the public owner.

IV. The End Game: Shifting Life Cycle Costs and Risk to the Private Sector: DBOM v. DBFOM

Various P3 models shift risks to the private developer. Each P3 model also offers an opportunity to reap savings during the stage of a project when a majority of its lifetime costs are actually incurred — i.e., during operations and maintenance of the facility.

The DBOM model (i.e., without the "F") reserves the financing and capital requirements to the public owner. After completing the design and construction of the facility, the private developer (or its O&M teammate) is paid to operate and maintain the facility.

Without the investment of equity or debt capital as required under the DBFOM model — i.e., without "skin in the game" — the *DBOM* private developer may not be sufficiently motivated to design and build the facility with a view toward extending its useful life and maximizing its efficiency in serving the intended program.

As described below, there are two versions of the DB*F*OM model — a "privately financed" version and a "tax-exempt" version — that address this shortcoming.

Under the "privately financed" DBFOM model, the private developer accepts the risk and responsibility for a facility's total life-cycle costs in return for the opportunity to earn "availability payments" from the public owner or a "concession" by which the private developer is paid back by revenues directly derived from the operation of the project (e.g., tolls). Under the former scenario, the public owner retains "user demand" or "tollbooth" risk, while in the latter, the private developer accepts that risk.

In either DBFOM scenario, the private developer is incentivized to design and construct the project to extend the projected lifespan of the facility and to reduce the cost of operating and maintaining the facility over the term of its O&M agreement with the public owner (e.g., 40 years). It "pays" the developer to select more durable building materials and HVAC systems than would have been specified when upfront construction costs are the overriding concern. Further, the performance metrics used in determining the developer's availability payments, plus the handback guarantee, provide powerful incentives to resist the short-term seductions of deferred maintenance.

For an "availability payment" version to succeed from the taxpayer's perspective, the public owner and private developer must agree on detailed performance standards that will govern whether the developer earns all or a reduced share of the potential contractual payments for keeping the facility open and operating. Done correctly, an availability-payment deal should enable the public owner to budget predictable costs into the future that are vulnerable neither to general economic conditions (inflation, interest rates, etc.) nor to unforeseen costs of operating and maintaining the facility — most, if not all, of these risks are transferred to the private developer.

In the debate over the DBFOM model, adherents of the traditional procurement structure object that the public sector can borrow money more cheaply than the private developer can raise its equity and debt capital.

Entering this debate, as if on cue, is a hybrid model known as the "New American Approach," a publicly-financed version of a DBFOM structure. In this approach, a 501(c)(3) non-prof-

it owner issues "63-20" tax-exempt lease revenue bonds to finance the design, development and construction of the project by a private developer. After the facility is delivered, the governmental entity pays rent equal to the non-profit owner's debt service and administrative costs *plus* budgeted operating and maintenance costs. Once the bonds are paid off, ownership of the facility is transferred to the government.

Proponents of this New American DBFOM option argue that it achieves lower financing costs (essentially the equivalent tax-exempt municipal revenue bonds) and a shorter, less expensive commitment to any single O&M contractor, while avoiding any windfall to a private developer intent on a cash-out refinancing after the project is stabilized. In response, proponents of the privately funded DBFOM option tout its greater degree of risk-shifting to the private developer, who is more powerfully incentivized to make *value-added* decisions during design and construction, and to avoid deferred maintenance thereafter when it will be saddled with operations and maintenance costs for the 30–40 year term of the project, after which it must hand over the facility to the public owner in a "like-new" condition.

In any DBFOM scenario, however, the public owner does not suffer the relentless inflation of construction prices while it sits impatiently through multiple municipal or state budget cycles waiting to fund its capital improvement plan. Moreover, under each DBFOM approach, the public owner's payment obligations commence only after a completed facility is delivered, in contrast to a traditional procurement in which the public owner often must borrow its project costs up front, including the added cost of carrying "capitalized interest" on the project.

For these reasons, the various DBFOM models are truly the state of the art in systematically aligning the interests of the public owner and the private developer, incentivizing the design, construction, operation and maintenance of durable, cost-effective infrastructure that efficiently serves the objectives of public owners who are answerable to current and future taxpayers. ⚖

Endnotes

1 William D. Eggers & Tiffany Dovey, *Closing American's Infrastructure Gap: The Role of Public-Private Partnerships*, at 5 (Deloitte 2007); *see also* David Tod Gersch, *The Disastrous Effects of Deferred Maintenance* (available at www.linkedin.com) (2017) (His "inverse-square rule for deferred maintenance" states that, if maintenance of a failing part is deferred until the next level of failure, the resulting expenses will be the square of the cost of the failed part.); and The National Council for Public-Private Partnerships, *Testing Traditions: Assessing the Added Value of Public-Private Partnerships*, at 5, 12 (2012).

2 ASCE, *2017 Infrastructure Report Card: A Comprehensive Assessment of America's Infrastructure*; *see also* ASCE, *Failure to Act: Closing the Infrastructure Gap for America's Economic Future* (2016).

3 The National Council for Public-Private Partnerships, *Testing Tradition: Assessing the Added Value of Public-Private Partnerships*, at 10 (2012).

4 Michael Della Rocca, *The Rising Advantage of Public-Private Partnerships*, at 4 (McKinsey & Co.) (Apr. 2017).

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