Infrastructure and Design
Build Contracting

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The non-partisan Hugh L. Carey Institute for Government Reform proposes policies to solve issues Americans face.
There is a compelling need for an enhanced infrastructure commitment by all levels of government in the U.S. Seventy-five per cent of U.S. infrastructure is transportation related. Transportation is the servant of economics and influences every aspect of the U.S. wellbeing including productivity. The American Society of Civil Engineers estimates that the cost of just bringing our existing transportation infrastructure to a state of good repair exceeds $2 trillion. Rosabeth Ross Kanter of the Harvard Business School in 2015 reported that in the previous 25 years, the U.S. had about 600 bridge failures and that Federal officials have deemed a quarter of U.S. bridges structurally deficient or functionally obsolete. Bridges typically are designed to have a useful life of 50 years yet 25% of our bridges are more than 65 years old.

There also is an emerging consensus for massive federal infrastructure spending legislation. It was an issue in the 2016 campaign and is an issue in the 2020 campaign. Bills have been introduced. If the Senate were to become Democrat controlled, there certainly will be legislation next year. President Trump wants a program this year. This political consensus – infrastructure is good politics for all parties – existed with our recent full employment and broad
Prosperity. Now, with tremendous unemployment and historically low interest rates for government borrowing, the political force is intense.

There is also political skepticism. Large transportation infrastructure projects, particularly so-called mega projects, take a long time. They are characterized by huge cost overruns on top of staggering cost estimates. There rarely is unanimous support for large projects; necessarily such projects can bring lengthy disruption to communities, traffic, budgets and patience. “On time and on budget” is a slogan. In our very organized polity, antagonism to projects brings publicity and recognition to would-be elected officials. Our environmental laws are vehicles of political opposition that cause delay and attrition of support. Yet environmental review is a priority value.

**Contracting**

Typically, until recently large government infrastructure projects utilized the Design – Bid - Build (“DBB”) contracting and procurement model. Pursuant to DBB, the government owner would procure design and engineering services via a competitive bidding process. Once a designer were selected and a final design prepared and accepted, government would conduct a second competitive bidding process to select a general contractor. Once that choice were made, usually the lowest qualified bidder, and a contract negotiated, the contractor would build the project in accordance with the government approved design which the government would warrant to be correct. Inevitably, this would lead to multiple change orders as the contractor would identify impracticalities and inconsistencies in the design. Change order negotiations often would lead to litigation between the contractor and the designer with the government
frequently caught in the middle.

Within the last 15-20 years an alternative delivery system, Design/Build ("D/B"), has gained favor. Under the D/B project delivery system the functions of design and engineering are combined with construction in one entity, usually joint ventures of designers and contractors. The owner government conducts only one competitive bidding process seeking design and construction from a single enterprise. The entity selected builds in accordance with its own design as opposed to building to the design provided by the project owner. A DBB contractor does not guarantee a particular outcome. By contrast a D/B contractor guarantees a defined performance, e.g., a fully designed and built functioning bridge that meets contract requirements. Most significantly, the D/B entity delivers a final product for an agreed to, lump sum price. The D/B entity holds single source responsibility and bears contractual risk for every aspect of a project: estimation, assessment, design (architectural), schematics, engineering, subcontracting, constructing, and post constructing.

By combining the functions of designing and building, and having a single bid process, D/B contracting saves considerable time. Time is also saved because the building process, including site preparation, i.e., clearing, grubbing, and materials acquisitions can begin before the design and engineering process is completed. This is referred to as fast tracking. Building, procuring and designing occur simultaneously.

Currently, most states permit some D/B contracting. Architects initially opposed D/B contracting on the ground that they are separately licensed and by
regulation, held to distinct professional standards. Designers argued they could not
work with, or take direction from, builders who are not licensed. Thus, legislation
became necessary. In New York State, e.g., D/B contracting was not legalized
until 2014 and then only for a limited number of authorities. D/B initially was used
in New York for a new, $4 billion Tappan Zee Bridge which connects the upstate
and downstate economies and which became the largest infrastructure project in
the nation. In New York City, D/B contracting was legalized on a limited basis in
FY 2020.

Transportation is the fastest growing sector for D/B contracting, primarily
for large projects where D/B is considered to be more efficient. As greater
transportation infrastructure funding becomes available, one can expect there to be
greater use of D/B beyond its current approximately 40% of projects.

Caution

Because D/B offers the potential of schedule and cost saving it has been
embraced by political leaders. Elected officials make the infrastructure decisions
on large projects that often span multiple political jurisdictions with competing
interests, imperatives and priorities. Some projects can be bi or multi – state and
involve multiple bureaucracies and levels of government. Accordingly, many
aspects of projects are the product of political compromise. Ironically, political
officials that are in office, either elected or appointed, at the beginning of a project
are not in office at the end (or even the middle) of a project. (It took about 50 years
for the now operating, relatively short segment of Manhattan’s Second Avenue
Subway to be accomplished.)

Elected officials feel cost and schedule pressure acutely. They are held accountable
Infrastructure and Design Build Contracting

for their promises and representations. D/B fast tracking, then, can be seen as a siren song, but it also can be filled with peril and unforeseen consequences. In some states the embrace of D/B has been mythological. Non-construction professionals have made the mistaken assumption that D/B shifts all risk to the design builder thereby relieving government owners of the administrative burden of careful contract management and insulating them from cost overruns. No contractual mechanism in the world can accomplish that. D/B contracting is not a magic elixir that automatically reduces savings.

While substantial risk naturally shifts to a design/builder, there are always many unknowns in large projects. Generally, firm fixed price bids are required to be made with only 30% of design drawings completed. Owners are in the best position to know the pre-existing condition of the building sites and the relation of these conditions to conceptual designs. When proceeding to final design, necessary changes usually are identified which makes a case that allocation of all design risk to the builder may have to be adjusted. D/B provides the builder with opportunities to be innovative which can save costs and benefit the owner. But if innovation becomes necessary due to changed or unforeseen conditions, it can be costly and the occasion of delay. This particularly can be the case with linear construction, viz: tunnels and bridges, where there is little margin of error.

There should be caution with the growing reliance on D/B contracting, especially when there is an inequitable distribution of risk. In fact, it can be statistically demonstrated that inequitable distribution of risk in major projects actually can produce cost and schedule increases. In the longer term, a policy of inequitable risk allocation can result in reduced competition, higher contingencies and
higher bids. It is also statistically determinative that deferring problem solving
during projects, which is a byproduct of assuming there is cost increase insulation,
can produce higher costs and unnecessary litigation. There already is ample
evidence of these phenomena.

In late 2019 major construction firms such as Fluor, Skanska, Granite, Lend
Lease and others announced they no longer will bid on government lump sum
contracts. Construction is a low margin industry and if government owners fail to
understand the real source of savings with D/B contracting which is time and
efficiency and not necessarily price guarantees, then the advantages of D/B will
diminish. D/B can have unintended consequences. These may include: possibility
of compromised quality of both design and construction including the use of shabby
materials due to lump sum insistence; economic bullying between partners;
substantive disagreements between the designers and contractors; and, impactful
disputes over changed conditions clauses.

There is no one size fits all D/B contract. Very careful contract drafting is
required particularly with respect to risk allocation, dispute resolution and claim
preservation.

Owners are wise to emphasize project controls during construction to
develop accurate data in real time thereby identifying key decision points and solving
problems as they arise and before they become disputes. The tendency of many D/B
government owners to defer problem solving due to reliance on the lump sum nature
of the pricing is demonstrably counterproductive. Inattentive contract management
inevitably will lead to understand results and a barrier to lessons learned.

D/B also requires rapid decision making and streamlined change order
Processes. It is essential for government owners to recognize that once a D/B contract is executed, the owner cannot meddle. When political officials make construction decisions, the temptation to interfere can be difficult to resist and always will be costly.

D/B is not an assurance of success. It only works for the most sophisticated and best advised owners. It is imperative that elected officials understand the contractual mechanisms. A substantial problem is government inexperience with D/B contracting. The before mentioned Tappan Zee Bridge project, New York’s first and the country’s largest, is burdened with unresolved claims that are about 33% of the contract price.

D/P and PPP’s

D/B contracting is an essential component of Public Private Partnerships (“P3’s”) whereby a private entity, generally an Infrastructure Fund, provides the financing for a major infrastructure project and also designs, builds, operates and maintains it. P3’s are widely employed throughout the world. There is an enormous amount of private capital – about $15 trillion – seeking infrastructure deals in which to invest. Thirty-one states in the U.S. have P3 authority and about 18 of them have sponsored P3 projects. The largest Infrastructure Funds view the United States as 50 separate countries, each with its own laws, rules and politics and all with inexhaustible infrastructure needs. Nevertheless, P3’s do not enjoy great favor in the US and basically have flat lined. The primary reason is the cost of money. Unlike most countries, U.S. Government debt (“Municipal Finance”) is tax deductible and, therefore, the interest rates are lower than conventional debt. Currently, U.S. municipal finance rates are extraordinarily low – about 1%. By contrast, Infrastructure Funds seek returns of about 10% or more. As long as

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municipal finance is tax deductible and banks can earn volume fees for underwriting municipal debt, private money will be less attractive to government.

Most municipal debt offerings are revenue backed, e.g., toll backed bonds issued to finance the construction of a new tunnel. Also, state constitutions place restrictions and limits on a state’s ability to issue debt backed by the full faith and credit of the state (“General Obligation Debt”) as opposed to debt backed by a specific revenue stream. To illustrate, New York has about $58 billion of outstanding long term debt and only about $3 billion is general obligation debt. Due to the current pandemic, big states’ revenues such as sales tax, income tax and user fees have collapsed. More than 90% of air travel has disappeared so airport revenue is severely constrained. That could impact the borrowing capacity of some governments, particularly if the impact of the pandemic persists.

**Policy Proposals to Attract Reasonably Priced Private Investment in Public Assets**

It is estimated that all government funds available for government investment only would be sufficient to fund/finance, as the case may be, about 75% of the total US infrastructure need. Thus, there needs to be means to attract private money for investment in public assets. This is particularly the case if government revenues such as tolls and fares lag. Government incentives to attract private money should focus on reducing risks, creating new revenue streams generated by newly developed assets, maintaining efficiencies while generating opportunities for additional cost reductions, and expanding the use of

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P3 variants.

a) Risk

In respect of D/B contracting, greater effectiveness and cost/time efficiencies can be achieved by government owners recognizing and demonstrating that there will be equitable allocation of risk. That could attract major contractors to return to competition and participation. Often, major contractors that recently have abandoned lump sum D/B P3’s will be equity investors. But, assuring that there is equitable risk allocation only can be accomplished by government owners. Infrastructure financiers make large fees putting P3 deals together. Then they walk away and do not particularly care if the investors or contractors lose money.

Risk also can be alleviated by greater reliance on availability payments. Availability payments are payments for performance irrespective of demand. Many transportation P3’s involve construction by a private consortium of a toll facility, e.g., a bridge. The investors bear the costs of construction and bear the volume risk that the toll revenue will be sufficient to cover their costs and expected returns. Using the availability payment model, however, assures the investor consortium that it will be paid a negotiated amount, such as $50 million for 40 years by annual appropriations of the owner government. The government bears the volume risk but conditions the availability payments on performance by the P3 consortium of such things as functionality, proper maintenance, good repair, prompt ice and snow removal, etc. With the assurance of annual payments, investors will not have to factor as much risk in their bids.

b) Additional Revenues
Often, transportation assets generate new revenues for the sponsoring governments in the form of additional sales, income and property taxes as well as asset appreciation due to enhanced economic activity. For example, vastly refurbished central rail terminals [or new airports] create adjacent private real estate development opportunities and stimulate economic activity. Government captures this new value and, on a pre-determined basis, can share some of the new value with P3 consortia. Tax credits and abatements can be aspects of value capture that incentivize private investments in public infrastructure assets and related developments for revenue generation. Note, however, that value capture may require adroit political skill by government leaders. For example, a state sponsored development on city owned land may require make whole agreements and compromise with the city. A state cannot abate a city tax.

(c) Additional Cost Reduction

Contract provisions that offer premium payments for accelerated delivery, labor peace, lesser material costs and provisions that require binding dispute resolution boards (most such boards are non-binding and frequently are ignored by owners) are other types of incentives to reduce costs that allow P3 consortia to achieve enhanced returns on investments in return for quality performance.

d) Long Money

Some of the private money that is available for investment in public assets is known as “long money”. Pension, insurance and sovereign wealth funds are examples. These funds seek steady annual returns, typically 4% for 40-50 years. They are not motivated by tax deductibility. If municipal finance rates
were to rise, long money would be more attractive to government. Government could approach long money sources directly rather than through the intermediaries of Infrastructure Funds.

e) P3 Variants

Utilizing tools such as availability payments, value capture, tax credits, zoning variances etc. could enable local governments to incentivize school or other civic facilities construction (“Social Infrastructure”) within new commercial buildings developed by private owners.

**Conclusion**

Sophisticated understanding of how to maximize the expanded use of D/B contracting offers infrastructure progress. Of course, there is a possibility that the devastating effects of the Covid 19 pandemic on government revenues and employment will continue. That could adversely impact municipal finance capacities and could increase reliance on private capital. What surely will continue and accelerate is the government imperative to develop new infrastructure assets and bring crucial, existing assets to a state of good repair. In that circumstance the option of using private capital will become a necessity. The cost/benefit analyses governments would need to make would be to balance the benefits of the jobs created by infrastructure development with the higher cost of money. Jobs put money into local economies and the velocity of that money and the tax revenues generated may outweigh the cost of investment returns to private infrastructure investors that often would not be US entities. Such analyses require exquisite political judgement and leadership.
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The Hugh L. Carey Institute for Government Reform at Wagner College conducts non-partisan studies proposing policy to solve issues Americans face.

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