



Service Delivery Not Procurement

A Town+Gown Symposium Event

New York Public Library Branch @ 455 Fifth Avenue

April 18, 2013 (8:30 a.m. to 10:30 a.m.)

Words Matter. Words can sometimes obscure the reality they are meant to signify. In the built environment and, in particular, public capital construction, words like *procurement* and *contracting* can obscure relations to other large system processes and, in particular, to the underlying functions they facilitate. In large organizations, by obscuring the project service delivery function, words with roots in the larger enterprise system can create conceptual impediments that inhibit management innovation. The tendency of referring to project delivery as *procurement* and/or *contracting*, as those at public owners are accustomed to do, can obscure thinking of ways to improve service delivery. It is as if the words themselves inhibit innovative thinking.

The management discipline, within the built environment multi-discipline,¹ covers two related areas. The first is management of an actual project and is often referred to as project management. In large owner organizations, especially public owners, the second is management of the enterprise of which the individual projects are component parts and which projects serve the broader objectives and activities of the larger organization. Terms related to management of the enterprise with a significant

capital program include program management or governance, portfolio management and enterprise risk management. These larger enterprise-wide systems consist of capital planning, finance and budgeting, related management and control systems, such as procurement and audit, and legal analysis and documentation standards.

At this symposium event we will begin to explore the structural dissonance between enterprise-wide management systems and line agency component systems that can create impediments to innovation. We will explore this dissonance through the lens of the potential for innovation at the lowest unit level—the construction project and the project delivery function—and how it can translate into innovation at the higher enterprise-wide system processes.

Sources of the Dissonance. An enterprise's operating systems and controls can, over time, lose the direct connection to the imperatives that animated them. The measures of the larger system, often publicly reported at public owner entities, develop a life of their own, obscuring their underlying animating purposes, sometimes at odds with the imperatives of the actual activities and results.²

¹ Paul Chynoweth, *The Built Environment Interdiscipline: A Theoretical Model for Decision Makers in Research and Teaching (Proceeding of the CIB Working Commission Building Education and Research Conference 2006)*, <http://www.lawlectures.co.uk/bear2006/chynoweth>, pdf, pp.1-5.

² Processes generate documents and measures, which are important to analyze in this context but which analysis is beyond the scope of this précis document.

After the City began to operate under a less strict fiscal monitoring environment, budget analysts identified a structural disconnect between the work of line agencies and the enterprise-wide budget planning and implementation processes.³ This disconnect, expressed in the context of the expense budget, arises from differences in planning functions and budgeting functions.

“The terms ‘financial plan’ and ‘budget’ . . . are often used interchangeably. In fact, they are different products with different purposes even though they are developed at essentially the same time and are often presented together [but are] . . . the result of separate sets of decisions and analytical investigations”⁴

This disconnect, still to be resolved on the expense side of the budget, is exacerbated on the capital budget side by the temporal realities of capital programs as well as the several, but inextricably related, roles the enterprise government plays in the built environment, often simultaneously, as it performs the related functions.⁵ (See Tabs 2, 3 and 4)

The City’s budget process has a four-to-five year horizon, depending on the time of year, consisting of

³ See New York State Financial Control Board, *Financial Planning in the Nineties: Building on New York’s Pioneering Efforts in the Seventies*, June 1992—for the difference between planning and budgeting, see pp. 15-18; for related operational elements, see pp. 24-28.

⁴ *Ibid.*, p. 15.

⁵ Government acts simultaneously as a public owner of facilities and infrastructure to implement its provision of services, a financier of both operations and maintenance and expansion or major renovation, and a regulator of the process (land use and zoning), the participants (licensure of trades and businesses) and the products (building codes). Government also acts as an economic catalyst, whether passively as the result of its ongoing investment in public works or more actively as the result of targeting various types of subsidies to lower the cost of construction of certain types of projects. See Danny Myers, *Construction Economics: A New Approach* (London: Spon Press 2004), pp. 15, 39-40, 60, 70-71, 147-159, 184-86, 191.

the current year (adopted budget) and estimates for up to the following four fiscal years (financial plan period). This horizon, which is considered the gold standard in public budgeting, is not long enough to account for the temporal realities of construction, and a focus on the budget alone—including the capital budget component—will distort analysis. Making matters worse, the time from design to construction completion for an individual project, even excluding the time for related capital planning phase, can span across executive administrations and legislatures, “further attenuating the connection between the decision to invest and the budget consequences of such decision.”⁶ The investment decision methodology, the analytical tool for analyzing capital projects, which accounts for related debt service costs⁷ and post-completion life cycle operation and maintenance expenses, would far outstrip any budget horizon.⁸ This temporal reality establishes an illusion, during the planning and construction phases, especially at the line agency level, that capital projects are without cost or impact on their agency operating budgets, which illusion the budget convention of reporting debt service on an aggregate enterprise-wide basis aids and abets.

⁶ Terri Matthews, *Blueprint for Modernizing Built Environment Law: A View from the Budget*, 6 Albany Government Law Review (forthcoming April 2013). “The weak connection between capital program decisions at the agency level and their impact on the operating budget is made more tenuous by the length of time from the planning of a project, scoping a project, awarding the contracts, constructing and commissioning the project and, finally, debt service payments.”

⁷ *Idem* Debt service costs and operation and maintenance costs accruing from capital planning/budgeting decisions appear much later in the expense budget. Debt service becomes a non-discretionary cost that can crowd out other expense budget needs when revenues are tight. Expense budget-funded operations and maintenance cost, in practice, are often deferred until they become larger and thus eligible for debt finance (e.g., “capital” eligible). See *When Does Design Begin and End?*, précis document for March 14, 2014 Town+Gown symposium event, pp. 2-3.

⁸ *Idem* The investment decision methodology can also include other costs and benefits, such as negative and positive externalities exposed by the sustainability agenda, which would exceed the budget horizon as well.

These divides and dissonances impede the ability of both enterprise-wide oversight entities and line agencies to understand and plan for the impact of capital decisions on annual operating budgets.

A Few Words on Town+Gown Projects. From the beginning of Town+Gown, the research questions raised by and developed with the agencies touched upon various aspects of the dissonance. Completed Town+Gown projects, all of them excellent, explored some of these questions came up to the systemic breach, and were unable to reach the other side. Projects looking at life cycle costing models for planning purposes ran into limitations with lifecycle cost data limitations, including their absence. Projects looking at the ability of capital planning and/or budgeting processes to inform and manage individual project and *vice versa* ran straight into the complex system and dissonance between planning and budgeting, complicated by the impact of schedule and budget overruns, which appear as change orders, during the construction/contract administration phase that cycles through the annual capital budget process. A project that was Town+Gown's first experience with a Ph.D. dissertation using completed project data (the "BIM Ph.D. Project"), was able to extrapolate from estimates of avoided costs on discrete projects and suggest enterprise-wide potential from a the use of BIM city-wide, across construction agencies, but the potential for system-wide transformation remains just that at the moment.

Operative State Law. Complicating matters, the City enterprise is subject to various laws from higher levels of government. While the City has its own Charter chapter for procurement and an extensive set of rules,⁹ State law effectively pre-empts local law to such an extent that New York State law defines

⁹ See Charter Chapter 13 and Rules of the Procurement Policy Board.

and constrains the public construction process for the City as one of the State's many subordinate municipal governments. The essential elements of New York's public construction procurement statutory ensemble were established by the end of the first half of the last century, and despite "tinkering on the margins, [this ensemble] remains essentially the same reflection of theory and practice, today as when it was enacted."¹⁰ While the statute itself does not explicitly use the functional service delivery term "design-bid-build", various provisions under the rubric of contracting for public works (see Tab 5), result in the design-bid-build methodology as the single authorized service delivery for the vast majority of the State's public owner entities, several decades after alternative delivery service methodologies developed to meet changing project needs.¹¹

Two defining elements of the design-bid-build methodology, which remains appropriate for some projects, consist of a temporal and legal separation of the designer and the constructor entities¹² and the requirement that the lowest initial cost determines who the constructor entities can be. The temporal separation of designer from constructor reduces the opportunities to avoid changes and related costs during the construction phase (see Tab 6, pp. 4-5). The mandated use of a single delivery methodology, with such separation, further reduces opportunities to avoid costs arising from the mismatch from the service delivery methodology and projects needs and

¹⁰ Matthews, *op. cit.*

¹¹ *Idem*

¹² The constructor is a term that contains, and obscures, a highly complex set of contractual arrangements that creates a corresponding highly complex set of management issues within the constructor actor and among the three archetypal participants. See Patrick Bajari & Steven Tadelis, "Incentive versus Transaction Costs: A Theory of Procurement Contracts," 32 *Rand Journal of Economics* 387 (2001), pp. 389-90; see also Iris D. Tommelein, David R. Riley & Greg A. Howell, "Parade Game: Impact of Work Flow Variability on Trade Performance," 125 *Journal of Construction Engineering and Management* 304 (1999), pp. 304-05.

project team capacities.¹³ The requirement that selection of constructor entities be based on the lowest initial cost may have been an effective criteria when buildings were simpler, aligning more closely with the concept of commodity pricing, and when it was realistic to expect that final plans and specifications were indeed final, which is often no longer the case.¹⁴ Moreover, the lowest initial cost requirement may tend, in a public and political budget environment where what is required to be measured tends to drive attention, to become an impediment for the owner to maintain (assuming it had one) a focus on the total life cycle costs of the project, especially on more complex projects for which incrementally increased initial costs can reduce life cycle costs as compared to the lowest initial cost version.

It is now axiomatic that there is no single optimal project delivery methodology for all types of construction projects. In an environment that prohibits an owner from matching the service delivery methodology with specific project circumstances,¹⁵ the mismatch between service delivery and project needs will reduce the chances a

project team will be able to remain within parameters established by inter-related “project performance goals of budget, schedule, quality and safety.”¹⁶ This mismatch will thus generate costs that could have been avoided with a more appropriate match of service delivery methodology, project needs and owner capacity. On some projects, an owner’s concomitant inhibition from using modern project management techniques (see Tab 13) will exacerbate the forces driving a project outside its initial estimated budget, schedule and quality parameters.¹⁷

MIT Framework and Innovation in the Field. When things appear to go wrong at various levels, yet the response has often been to attempt to change the law, with little result.¹⁸ In the absence of momentum to modernize New York’s public construction procurement laws,¹⁹ the locus of innovation can be at the project level. A different approach, using the MIT Framework (see Tabs 7-11), which the Model Code for Public Infrastructure Procurement (MCPIP) expresses in the familiar procurement law vernacular (see Tab 12), may instead work better.

The MIT Framework integrates all necessary aspects of project delivery, regardless of artificial distinctions that may be present in any applicable law. It

¹³ Matthews, *op. cit.*

¹⁴ New York City Bar Association, Construction Law Committee, *21st Century Construction, 20th Century Construction Law*, February 2008 (<http://www.nycbar.org/pdf/report/ConstructionLaw.pdf>) (hereafter referred to as “2008 Report”), endnote 4.

¹⁵ For example, the extent of scope definition, the need for schedule speed as well as certainty, the need for flexibility to make changes to the project during construction, the capacity of the owner to participate in the process, and general market conditions. Matthews, *op. cit.*, citing New York City Bar Association, Construction Law Committee, *20th Century Construction, 21st Century Construction Law: Update*, March 2011 (<http://www.nycbar.org/pdf/report/uploads/20072050-21stCentConstruction20thCentConstructionLawUpdated.pdf>) (hereafter referred to as “2011 Update”), p. 9, and quoting C. William Ibbs, Young Hoon Kwak, Tzeyu and A. Murat Odabasi, “Project Delivery Systems and Project Change: Quantitative Analysis,” *Journal of Construction Engineering and Management* (Reston: American Society of Civil Engineers, July/August 2003), p. 382.

¹⁶ See 2011 Update, p. 9; and for analysis that captured “the interactions among changes, disruptions, productivity losses,” demonstrating the capacity of techniques to manage change, whether owner- or contractor-directed, and related costs, see also, William Ibbs; Long D. Nguyen; and Seulkee Lee, Quantified Impacts of Project Change, *Journal of Professional Issues in Engineering Education and Practice*, American Society of [Civil] Engineers, January 2007, p. 46. See also Love, Peter E. D., Irani, Zahir and Edwards, David J., “A Rework Reduction Model for Construction Projects,” *IBEE Transactions on Engineering Management*, Vol., 51, No. 4, November 2004, pp. 435-37.

¹⁷ Matthews, *op. cit.*

¹⁸ See 2008 Report, Footnote 14, for the saga of New York City’s experience with the Wicks Law.

¹⁹ See Update 2011, p. 10, as well as Matthews *op. cit.*, for discussion of how regulation can distort economic relationships as well as create “groups invested in preserving the earlier-distortion-that-becomes-the-status-quo.”

specifically brings, into the conventional view of project delivery, the related debt financing of the project and the project's post-completion operation and maintenance activities. Viewing all functional elements in this integrated way can permit the line agencies and oversight agencies to acknowledge artificial divides imposed by the various laws and implementing processes as artificial. To the extent they are at odds with project delivery on the ground, the dissonances can provide opportunities for owners, aided by modern technology and management tools and theories, to push the boundaries of the law²⁰ and reform practices for the benefit of delivering the project efficiently and effectively.

Working through state statutory requirements, practitioners can use modern project management tools and techniques to approximate, as much as possible, the benefits from modern methodologies. For example, an owner's expanding use of building information modeling (BIM) technology from the design phase into the construction phase can help approximate some of the benefits that accrue to the design-build methodology from earlier collaboration between designer and constructor (see Tab 6).

Once an owner fully expands BIM across a project's life cycle, from project planning to life cycle operations and maintenance, as other industries have done much earlier, it is possible for the owner and project team to use the shared information platform to apply elements of industrial production and related management techniques, such as total quality management (see Tab 12), to discrete projects. The construction industry has adapted total quality management as "lean construction" and it permits project teams to increase the efficiency of producing capital projects and reduce waste, by identifying

areas amenable to industrial production management techniques.²¹

The aggregated project data from the BIM models can then feed back into the enterprise-wide processes, informing and linking to future capital planning and expense budgeting processes more effectively—giving the existing sets of processes established under local and state laws renewed purpose and utility.²² For example, change order types and costs can inform enterprise-wide contingency policy and practice, while operation and maintenance expenses from discrete projects can be traced to the agencies responsible for initiating and using the projects, reducing negative operational impacts from the temporal realities of construction.

The expanded use of BIM across the project life cycle and the application of lean construction principles and techniques during construction not only permits an owner to avoid the costs associated with segmented data flows but also permits the project team to reduce information asymmetries that traditionally have been responsible for certain types of contract provisions and allocations of risk. Assessing the impact of innovative service delivery practices that change the arrangements of archetypal project participants—owner, designer, constructor and financier—expressed in the various contracts, to perform the project tasks, from "defining and designing the project" to "operating and maintaining the assets in order to deliver the product/service"²³ more effectively makes it then possible to consider revisiting conventional relationships and related provisions in the contracts, not merely in the context

²¹ Matthews, *op. cit.*, citing Glenn Ballard and Greg Howell, "What Kind of Production Function is Construction" (1998) and the American Institution of Aeronautics and Astronautics, "Current State of the Art on Multidisciplinary Design Optimization" 36 (1991).

²² Financial Control Board, *op. cit.*

²³ Matthews, *op. cit.*, citing Jean-Etienne de Bettignies and Thomas W. Ross, "The Economics of Public-Private Partnerships", 30 *Canadian Public Policy* 135, (2004), p. 140.

²⁰ But, of course, consistent with law.

of implementing laws but also in the context of maximizing “the economic efficiency of various options to deliver capital projects, which economics views as asset- and relationship-specific investments, at two points in time—before the deal is struck, or *ex ante*, and after the deal is struck, or *ex post*.”²⁴

Questions for Discussion.

- On the divide between planning and budgeting:
 - In Fiscal Year 2008, the City implemented its Capital Scope Development Program, bridging the structural divide between capital and expense funds for projects prior to inclusion in a capital budget. What other similar opportunities are there to bridge gaps between planning and budgeting, between capital and expense funding?

- The BIM Ph.D. Project suggested the expanded use of BIM on City project would generate system-wide areas for cost avoidance (financial plan savings in the outyears). How can we explore the magnitude for long-term recurring savings from expanding the application of BIM in the capital program? from the application of BIM’s close relative, integrated project delivery principles? from expanding the application of lean construction principles?

- What technical issues might arise from expanding the application of BIM across the City’s capital program? expanding it to the planning phase? expanding it from the design phase to the construction phase?
- As the City increases its use of BIM, generating data and the potential for data that can, over time, reduce information asymmetries in construction under what conditions could the City explore reforming its standard construction contract to reflect practice enabled by BIM? What types of research (and on what topics) would be helpful to assist the exploration?

²⁴ Matthews, *op.cit.* Viewed from the lens of recent transaction cost economic theory combined with relational contracting theory, the tendency in construction, especially public construction, for contracts to assume they are complete because they have anticipated all future events and have negotiated price accordingly becomes noticeably untenable (though, in some instances, the public procurement statute requires that position), because empirical observations on the ground reveal project participants actual projects, distinct from what the drafters wrote:

“ . . . (1) negotiate these issues *ex ante* based on *ex ante* information and related information asymmetries; and (2) work within an incomplete contractual framework to negotiate within the *ex post* environment, where a totality of change—on the ground, within the external environment, and between the parties themselves, exacerbated by changing related information asymmetries—requires functional *ex post* negotiation to reflect such modifications.”

See, e.g., Oliver E. Williamson, *The Theory of the Firm as Governance Structure: From Choice to Contract*, 16 *Journal of Economic Perspectives* 171 (2002), p. 174, and Ian R. Macneil, *Contracts: Adjustment of Long-Term Economic Relations Under Classical, Neoclassical, and Relational Contract Law*, 72 *Northwestern University Law Review*, 854 (1978); see also Bajari and Tadelis, *op. cit.* and Ibbs, Nguyen and Lee, *op. cit.*