



**TOWN  
+GOWN:  
NYC**

**Culture+Data for Better Capital Project Delivery.2  
DYCD, 2 Lafayette, 14th Floor (Hybrid)  
December 14, 2022, 8:30 a.m. to Noon**

This event is in memory of Professor Fletcher (Bud) Griffis of NYU/Tandon School of Engineering, who inspired many of those presenting at this event with his work and his firm belief that changing the culture of construction projects by focusing on leadership is the key to the success of any construction project.

### **AGENDA**

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| <b>8:30 a.m. – 8:45 a.m.</b> | <b>Sign In</b>   |
| <b>8:45 a.m. – 9:00 a.m.</b> | <b>Introduction and Welcome</b><br><br>Terri Matthews, Town+Gown: NYC  |
| <b>9:00 a.m. – 9:45 a.m.</b> | <b>Construction Market Economics</b><br><br>Ken Simonson, AGC of America<br><br><u>Questions and Answers</u>   |
| <b>9:45 a.m.—11:00 a.m.</b>  | <b>Update on Metrics that Matter--Connecting Culture and Project Management to Data</b><br><br>Frank Darconte, NYU/Tandon and Joe Hogan, AGC NYS<br>Sara Venkatraman, Cornell Tech<br><br><u>Questions and Answers</u> |
| <b>11:00 a.m.—Noon</b>       | <b>BIM-Enabled Pre-Fabrication Case Study</b><br><br>Preston Lambert, Exyte<br>John Dunn, Exyte<br>Sam Spata, Exyte<br><br><u>Questions and Answers</u>  |

**Introduction.** At one of Town+Gown's<sup>1</sup> *Rebooting the Research Agenda* events, NYU/Tandon Prof. Fletcher "Bud" Griffis wrote the following on our research project worksheet:

Title: Improve Public Construction Projects

Background: Successful public construction projects are rare. Most people blame this on the Design-Bid-Build (DBB), low bid, process. Contractors blame the culture of public construction supervisors.

Questions: Both are correct because few understand the leadership and management necessary for successful projects. The magic bullet, results of research at NYU, is Rapid Alignment Initiated Delivery (RAID). This research is to develop a process to change the culture of public agency construction management and implement RAID.

At Town+Gown's November 14, 2019 *Culture+Data for Better Capital Project Delivery* (C+D.1) event (see <https://www1.nyc.gov/assets/ddc/downloads/town-and-gown/11-14-19-Precis.FINAL.pdf>; with links to event video), we presented an update on the data analytics research projects with Jiyeon Moon, a Columbia undergraduate student in Columbia's Data for Good program with the Systemic Construction Data Analysis Working Group (SCDA WG),<sup>2</sup> which began in 2018 with the *Issues in Systemic Construction Data Analyses: Top-Down, Bottom-Up and Middle Out* event (see <https://www1.nyc.gov/assets/ddc/downloads/town-and-gown/Construction%20Data%20Precis.Final.pdf>). The SCDA WG is now the Construction Culture +Data Working Group (CC+D WG). The first project, *DDC Project Data Analytics*, analyzed NYC DDC project data, and the second project, *NYC Capital Dashboard Data Analysis*, analyzed all city capital projects costing more than \$25 million. Both projects assessed the impact of factors internal to the datasets on cost increases and schedule delays as well as the impact of external factors related to the construction economy. At C+D.1, there was a presentation of NYU's RAID research, which began with Prof. Darconte's dissertation with Prof. Griffis. The first panel also discussed integrated project delivery (IPD) principles and the progressive or collaborative design-build construction delivery methodology.<sup>3</sup> There were also presentations on lean principles and building information modeling (BIM).

Today's event brings the Town+Gown community and the CC+D WG back together to hear a presentation on the construction economy, which presents exogenous factors that should be

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<sup>1</sup> The genesis of the Town+Gown program, especially its innovative Master Academic Consortium Contract, began with a meeting in 2007 with NYU/Tandon Professors Griffis, Juran and Falocchio. Prof. Griffis served as the first president of the Gown Advisory Council established by the master contract for the first important years.

<sup>2</sup> These projects are available at <https://www.nyc.gov/site/ddc/about/town-gown-working-groups.page>.

<sup>3</sup> Since that event, the NYS legislature passed legislation authorizing design-build for NYC construction agencies.

part of large construction owner planning and budgeting processes. An update of NYU's RAID research and a presentation of a data analytics project with a Cornell Tech Ph.D. student from the PiTech Fellowship program working last summer with NYC DDC's Project Controls group will follow. The last presentation will be on an upstate construction project that leveraged BIM for several key building components.

**Town+Gown: Culture.** NYC's standard construction contract (City construction contract), which establishes the relationships among public construction project participants during a project, came in for a fair amount of criticism at the C+D.1 event.<sup>4</sup> The discussion at C+D.1, reviewed and summarized by Christopher Collins, a clinic student from Brooklyn Law School below, suggests that the City construction contract is one root cause of the existing culture on city construction projects, especially those conducted through the DBB service delivery method.

- Public owners put heavy constraints on collaboration due to corruption concerns, but contractors need more efficient and nimbler alternative dispute resolution because the process is too administrative and precludes real-time dispute resolution.
- Principles of IPD could be applied to DBB contracts.
- Contractors do not believe that public owners provide fair value for change orders, leading to a substantial burden because the change orders are processed so slowly, and the contractor is forced to front the cost by taking on financing; solution is to apply IPD principles to change the cost/schedule/impact/change order provisions.
- Contract does not serve the needs of the project *qua* project in addition to needs of owner and contractor.

In fall 2021 Collins explored the gaps created by the City construction contract and a culture of successful projects facilitated by the RAID research. His resulting memo (see <https://www.nyc.gov/assets/ddc/downloads/town-and-gown/PublicConstructionContractProvisionsBrooklynLawSchool.pdf>) is the culmination of a series of research projects conducted within Town+Gown over the years to explore ways to align the interests of all project participants, especially the owner and its contractor (at the pinnacle of the contractor quasi-firm),<sup>5</sup> for efficient and effective capital project delivery. The owner and contractor share project objectives under the RAID model, but the construction contract governing the project should also seek to align parties' interests for the benefit of the project. Construction contracts—public or private—not only do not often succeed in this type

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<sup>4</sup> For video of event, see <https://www1.nyc.gov/site/ddc/about/town-gown-archives.page#symposia>.

<sup>5</sup> Robert Eccles, "The Quasifirm in the Construction Industry," *Journal of Economic Behavior and Organization* (2 (1981) 335-357.

of alignment for project optimization but also prevent establishment of culture of project success.

Owners desire projects be completed on time, at the lowest possible price, and meet quality and safety requirements.<sup>6</sup> Contractors also desire these objectives within the exigencies of a private firm that desired profit levels while preserving its position within a competitive marketplace.<sup>7</sup> (See related work of Prof. Griffis cited in *Construction+Finance in 2019* event precis (pp. 36-71) at <https://www1.nyc.gov/assets/ddc/downloads/town-and-gown/05-29-30-19-Precis.FINAL.pdf>.) In short, the owner desires to contain project costs ultimately paid through local taxes, and the contractor desires to retain profit on the same project.<sup>8</sup>

Realizing profit on construction projects requires more than a truing up at the end of a project. Contractors account for their projects on a percentage of completion basis,<sup>9</sup> and manage them with cost-loaded schedules and cash flow projections from progress payments.<sup>10</sup> Project profitability depends on the internal alignment of project schedule and payments received, which *changes during the project* can alter. Contractors continuously revise project schedule and cash flow estimates, with the earliest revelation of change by their project team members leading to the greatest opportunity for management to revise both to maintain a profit at the end. *When changes during the project occur, the extent to which construction contract provisions do not promote the earliest revelation of the impact of change to the owner's project team, owner's and contractor's interests can fall out of alignment and the entire project team can miss opportunities for collaborative efforts to realign them before resorting to the adversarial posturing embedded in typical construction contract provisions.* Information asymmetry changes over the course of a construction project, with the owner having the greatest level of project knowledge at the beginning that diminishes during the project while the contractor's knowledge increases to a point at which the contractor has a greater level of project knowledge than the owner. This information asymmetry profile also contributes to distrust, especially during the change order process, among the parties to a construction contract that assumes completeness at contract execution.

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<sup>6</sup> § 2:40. Risk allocation in the best interest of the project—Philosophies for dealing with risk, 33 N.Y.Prac., New York Construction Law Manual § 2:40 (2d ed.); William Ibbs and Dick Oliver, *Impact of Various Construction Contract Types and Clauses on Project Performance*, (Construction Industry Institute, 1986).

<sup>7</sup> William Ibbs and Dick Oliver, *Impact of Various Construction Contract Types and Clauses on Project Performance*, (Construction Industry Institute, 1986). .

<sup>8</sup> *Idem*.

<sup>9</sup> Steven J. Peterson, *Construction Accounting and Financial Management*, (New Jersey: Pearson, 2020), pp. 13, 21-27.

<sup>10</sup> *Ibid.*, pp. 104-106; 164-178, 194-210. Project cash flows and profits/losses aggregate at the firm level to a firm's overall profit or loss.

Public contract law leads to the assumption within the public construction procurement process and the resulting construction contract of a DBB project that drawings and specifications in the contract are complete, while in reality they and the contract itself are not complete.<sup>11</sup> The construction contract lays out roadmap to handle post-contract execution change, which is based on this assumption of completeness. This roadmap is a rigid process involving change orders and claims that creates an adversarial environment from contract execution for the project team's cultural practices during the project, which is not conducive to the earliest possible identification and resolution of problems from whatever root cause, leaving potential early solutions that include consideration of what is the best solution for the project *as a project* no longer available to the owner and contractor when they initiate formal contract provisions.

Change on a construction project is almost never good for a project's budget or schedule. When change leads to rework, the rework operates to add cost and delay through a "ripple" effect on the partially completed project.<sup>12</sup> The later that problem identification and resolution leading to rework occurs during the construction process, the higher the level of increased costs and delay will be due to rework's "ripple" effect.<sup>13</sup> Regardless of the root cause of change, however, the earliest possible time during construction that the project team can identify and resolve them will reduce the level of negative cost and schedule impacts from resulting rework.

Collins analyzed dispute resolution mechanisms in the City construction contract that act as constraints on the cultural and behavioral practices to optimize project delivery for both owner and contractor. Even for public DBB projects with lowest cost award and fixed-price contract requirements,<sup>14</sup> a contract that includes collaborative principles would increase the chances of achieving a successful project for both owner and contractor.<sup>15</sup> Collins proposed a collaborative Early Problem Identification and Resolution Board ("EPIRB") process, as a contract specification,

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<sup>11</sup> There are two root causes of incomplete contracting, with the first based on transaction cost economic theory and the second emerging from City systemic budget and procurement institutional practices, which are also based in law.

<sup>12</sup> William Ibbs, *Impact of Change's Timing on Labor Productivity*; Peter E. D. Love, Zahir Irani, and David J. Edwards, *A Rework Reduction Model for Construction Projects* (2004).

<sup>13</sup> *Idem*

<sup>14</sup> DarConte, *Best Value Alignment Process for Public Works Construction in New York State*; William Ibbs and Dick Oliver, *Impact of Various Construction Contract Types and Clauses on Project Performance*, (Construction Industry Institute, 1986).

<sup>15</sup> § 16:1.Introduction, 33 N.Y.Prac., *New York Construction Law Manual* § 16:1 (2d ed.); *see also* Peter E. D. Love, Zahir Irani, and David J. Edwards, *A Rework Reduction Model for Construction Projects* (2004) (stating "[c]lients and their project team members must communicate and work together harmoniously if projects are to be delivered on or ahead of time.")

aimed at increasing the likelihood of successful project delivery by providing a space during construction for early problem identification and resolution before the parties resort to the standard City construction contract's dispute resolution provisions. The EPRIB process would be available earlier to the parties than City construction contract's existing change order, claims, and formal dispute resolution provisions,<sup>16</sup> in order to encourage and support the earliest possible problem identification and least expensive available solutions through a process to resolve problems before engaging in the formal dispute resolution provisions. The EPRIB specification focuses on problem resolution, not disputes, by adding a collaborative and flexible contractual relationship within the existing standard City construction contract that facilitates early avoidance of disputes and minimization of total project cost overruns and delays.

The EPRIB specification involves the creation of a project-based dispute resolution board (DRB) process, which is midway along the "alternate dispute resolution" (ADR) spectrum, that involves informal, non-binding dispute review and resolution methods to resolve changed conditions and problems before they become intractable issues leading to disputes and claims that proceed further along the ADR spectrum under the City construction contract's dispute resolution provisions in Article 27 and, possibly, to litigation. DRBs, "operate in an informal and flexible manner"<sup>17</sup> and have distinct advantages over reactionary and later formal dispute resolution. The first advantage is the earliest possible intervention because the EPRIB would be in place from project initiation for simultaneous analysis and discussion of problems arising from change, pertinent data, and a menu of potentially less costly solutions available to the parties.<sup>18</sup> The second advantage is that DRBs can permit quicker resolution as compared to formal dispute resolution, which has the effect of "avoiding the intense adversarial relationship and exacerbations of other contract problems that can develop when a dispute is dragged out and allowed to interfere with the work," as well as reducing the overall costs of dispute resolution.<sup>19</sup> Finally, the mere presence of a DRB is thought to encourage "cooperation and reasonableness" between owners and contractors, regardless of whether problems have actually arisen,<sup>20</sup> which is attributable to the DRB process that includes site visits beginning with an informal roundtable meeting to discuss work progress and anticipated problems,

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<sup>16</sup> Results from a DRB process resulting in no agreement could inform future change orders, reducing adversarial posturing during that process.

<sup>17</sup> AAA DRB Operating Procedures 2.0

([https://www.adr.org/sites/default/files/AAA\\_Dispute\\_Resolution\\_Board\\_Operating\\_Procedures.pdf](https://www.adr.org/sites/default/files/AAA_Dispute_Resolution_Board_Operating_Procedures.pdf)).

<sup>18</sup> § 16:7. Informal dispute resolution—Dispute review boards, 33 N.Y.Prac., New York Construction Law Manual § 16:7 (2d ed.); § 14.05 DISPUTE REVIEW BOARDS, CDPGF § 14.05.

<sup>19</sup> *Idem*

<sup>20</sup> *Idem*

followed by a field inspection to assess the ongoing work and further supplemented by periodic progress reports, provided by the owner and contractor to the DRB.<sup>21</sup>

The EPIRB specification could be implemented as a pilot program on selected projects to test its effectiveness in minimizing total cost increases and schedule delay as compared to similar projects without the EPIRB specification. Prior analysis has demonstrated the effectiveness of DRBs that “review symptoms and patterns of *potential* problems, and to resolve disputes between the parties *as they arise*.”<sup>22</sup> The EPIRB specification would make the DRB process a condition precedent to moving along the ADR spectrum to the contract dispute resolution board in Article 27, which is an adjudicator that issues final and binding decisions regarding disputes *after* the agency commissioner has made certain determinations on the dispute and the contractor appeals such determination to the comptroller.<sup>23</sup>

**Town+Gown: Data (BIM)** The use of BIM technology, with design, cost and scheduling features, from the design phase, through construction and including the post-construction project operations and maintenance, represents a way for project owners to constrain costs and maintain schedule predictability. Off-site prefabrication in conjunction with BIM also represents a way for project owners to constrain costs and maintain schedule predictability. Prof. Griffis started Town+Gown off on BIM-related research in spring 2012 with his NYU/Tandon Information Systems in Project Management Course, as a controlled experiment, (1) to identify and document the information and skills needed to successfully implement building BIM and four-dimensional fully integrated and automated project processes (FIAPP) that integrate BIM and other relational databases during the construction phase of a public sector project and (2) to identify, assess and document BIM’s role in the context of IPD principles practiced by project participants. For the first ten classes, student teams, acting in the role of general contractor, performed standard operations leading up to the bid process for a public construction project, using BIM and FIAPP programs. The teams used these programs to develop bidding strategies, prepare preliminary bids, conduct project schedule and time cost trade off analyses, and prepare final bid submissions. The “winning” bid formed the basis for the final five classes when re-formed student teams acting as construction participants—owner, designer, contractor and steel fabricator subcontractor—applied IPD principles to typical case

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<sup>21</sup> AAA DRB Operating Procedures 4.0

([https://www.adr.org/sites/default/files/AAA\\_Dispute\\_Resolution\\_Board\\_Operating\\_Procedures.pdf](https://www.adr.org/sites/default/files/AAA_Dispute_Resolution_Board_Operating_Procedures.pdf)).

<sup>22</sup> Dispute review boards, 33 N.Y.Prac., New York Construction Law Manual § 16:7 (2d ed.)). § 16:7. See also Informal dispute resolution—Dispute review boards, 33 N.Y.Prac., New York Construction Law Manual § 16:7 (2d ed.) (stating “...the effectiveness of dispute review boards cannot be questioned. Of 63 projects studied that had dispute review boards, none had disputes that ended up in court—an outstanding success rate.”). § 14.05 DISPUTE REVIEW BOARDS, CDPGF § 14.05 (emphasis added).

<sup>23</sup> § 14.05 DISPUTE REVIEW BOARDS, CDPGF § 14.05

study problems encountered on projects. The documented student team experiences suggest that it is feasible to use BIM tools in the context of IPD principles on public construction projects, although until existing public construction procurement laws permit bidding in BIM, they will continue to impose constraints on full application and implementation of BIM and FIAPP after the design phase, thus limiting BIM's full potential to avoid costs and delay.

Students in Pratt's spring 2014 ARCH 521B/CM 423P multi-disciplinary seminar class brought a BIM focus to the design phase and the construction management phase of case study projects for post-emergency structures that involved a "kit of parts" prefabricated modular design that anticipated a post-emergency life in neighborhoods. When "place matters" for buildings providing emergency services, the ability to efficiently construct temporary facilities depends on developing a practicable methodology to mobilize after the immediate emergency by designing, in advance, a suite of building typologies with "off the shelf" components in a way that respects the neighborhood context and addresses constructability and installation issues during design. This seminar simulated an interchange between the design process and the construction process, which are often distinct and serial, using virtual design and construction tools as the hub of all exchanges of information during the design phase. BIM permits a high level of interaction among members of the architect, engineer and contractor (AEC) team at an early point of the design process and can link together all AEC team members in a single workflow, resulting in greater accuracy and productivity in building execution. Using two use case study typologies—an administrative office in which human service agencies could co-locate and a muster and storage site for agencies providing infrastructure repair and restoration services—the student teams used several BIM programs to collaborate on the design, cost estimation, procurement, scheduling and installation of prototype temporary structures at vacant Red Hook sites. BIM scheduling and cost modules incorporated data to increase installation efficiency, and BIM design modules permitted final designs to contain sufficient interior flexibility to accommodate other likely long-term uses. Six student teams produced three designs for the human services facility and three designs for the infrastructure facility. The students concluded that BIM-enabled multi-disciplinary collaboration permitted them to create more efficient and effective designs with realistic construction implementation methodologies embedded into the designs. The completed designs, with associated schedule and cost data, also provided evidence of the feasibility for local government to create a "kit-of-parts" design and procurement strategy for post-emergency mobilization across a spectrum of public services in any neighborhood, with neighborhood context, fabrication and standard site issue solutions reflected in the designs.

BIM-focused architectural studio explorations continued at Pratt with the spring 2019 ARCH 364 studio and the spring 2020 FM-722P/CM-419 BIM for CM and FM studio, both with Prof.



Lennart Andersson. The first studio was inspired by the Vancouver, B.C., innovative program using modular design and construction techniques to build more temporary modular housing more quickly to provide shelter to homeless individuals and families with supportive health and social services.<sup>24</sup> The conceptual user agency for this studio was the New York City Department for Homeless Services, as a basis for other applications by other city agencies providing services to a service population that emerges quickly and does not remain stationary (see abstract above for spring 2014 studio). This Pratt studio homeless shelter building design envisioned a less-than-permanent (or temporary) 4-story structural steel frame structure on concrete pads with minimal impact on the site, into which off-site prefabricated residential modules, using a kit of parts methodology, could be slotted in. Using a city-owned vacant case study site on Kent Avenue in Brooklyn, the student used BIM 360 in the design of the residential modules,<sup>25</sup> the site survey, site logistics, site preparation design, materials quantification and cost estimation; assembly sequencing, scheduling and coordination with mockups (means and method), building assembly and a post-assembly operations focus building assembly, and operations. This exercise turned building construction into building assembly, while the entire building design accommodated social and health service provision, a community garden, energy generation and biophilic facades. Unlike a construction contract scheme for “stick” construction under the DBB service delivery method, the construction contract scheme for the Pratt case study project would involve (1) a combined design and construction contract with off-site fabricator or a separate design contract with designer and a separate construction contract with fabricator and construction contract for onsite work and (2) a construction contract for the site and installation of modules, including site prep, foundation, the steel structure (into which the modules are loaded) and electrical, plumbing and HVAC work to hook up the modules. Town+Gown assembled a group of current and former NYC agency representatives (including from NYC DHS) and a private architect and Pratt academic experienced in BIM-enabled prefabricated modular design and construction to serve as the crit panel for this studio, providing feedback to the students to increase the case study model’s feasibility in practice. The planned spring 2020 studio was to extend construction management and facilities management focus on the case study project, but technical difficulties with students working from home due to the early COVID pandemic restrictions prevented further exploration of the case study project.

Two later related research projects—one with a Brooklyn Law School clinic student and the other with a CUNY/Baruch masters data science capstone team—explored issues to support the feasibility of implementation of this “not forever” design and construction concept. The use of

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<sup>24</sup> See <https://vancouver.ca/people-programs/temporary-modular-housing.aspx> and <https://vancouver.sun.com/news/local-news/vancouver-wants-more-modular-housing-built-to-help-homeless>.

<sup>25</sup> Prof. Andersson designed the residential module so that the students could focus on the other studio aspects.

factory manufactured buildings in NYC public construction has the potential to reduce construction costs and reduce construction scheduling due to the efficiency of factory prefabrication, the lack of weather elements during indoor fabrication, and the ability to deploy prefabricated units directly to areas in need. In addition to reductions in cost and speed in construction and siting, use of factory manufactured buildings would enable an agency, such as DHS, to match need with available sites and possibly move these buildings to other sites where future needs emerge. In spring 2020, Maxim Maeillo, the BLS clinic student, analyzed state and local regulations governing factory manufactured buildings (modular buildings) outlined the applicable provisions that would apply for fabricated off-site for shelter facilities and supportive housing to be sited within NYC.

Since the “not forever” construction assembly methodology is intended for agencies with emerging immediate needs to match with available lots—either NYC or privately owned—in spring 2022, a CUNY/Baruch data science masters capstone team closed the conceptual implementation loop. Using only publicly available data sets that are not as complete or as current as data sets available to agencies, the students developed a methodology and data visualization tool that linked place-based demand by homeless families with children for shelter services with available vacant lots within the zip code of these families. The capstone team created a data visualization tool that provided a general representation of the distribution of homeless children located in the five boroughs, with the ability to see the location of increasing demand for family shelters, accounted for beds in homeless shelters dedicated to children, integrated using Student Information Repository System data in conjunction with a public-school directory, that was aggregated and applied over NYC vacant lot data. Combining these data sources in a visual tool that can identify areas where the “not forever” construction assembly methodology would be helpful to DHS meet place-based needs by quickly developing shelters for families with children in or near the district where the children were located when housing became an issue. The team used the vacant lot dataset from Livinglots.org: NYC Vacant Lots, PIT and HIC data from Hud Exchange: HIC (Shelter Beds), data on student homelessness from NYSTEACHS.org: Student Homelessness and public-school information from NCES: Nonfiscal directories, and performed advanced data cleaning and merging in Jupyter Notebooks using Python, and Tableau for visualizations to analyze the results. Their model was able to identify conceptually areas in which homelessness among children is increasing more rapidly than in other areas and where there fewer available shelter beds that are linked to vacant building lots suitable for the “not forever” construction methodology to get shelters on the ground more quickly than “stick” construction.

**TOWN+GOWN**

Town+Gown, a systemic action research program, facilitates partnerships between academics and practitioners on research projects aimed at making changes in practices and policies. Town+Gown's Research Agenda is a key tool to move the systemic action program along through the academic year cycles. Town+Gown continually works with participants to update the Research Agenda to reflect built environment trends in academic thought and research as well as in practice. All are welcome to suggest new research questions.

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**Research Question Worksheet**

TITLE: Improve public construction projects.

BACKGROUND:  
Successful public construction projects are rare. Most people blame this on the Design-Bid-Build (DBB), low bid, process. Contractors blame the culture of public construction supervisors.

QUESTION(S):  
Both are correct because few understand the leadership and management necessary for successful projects.  
The magic bullet, results of research at NYU, is Rapid Alignment-Initiated Delivery (RAID).  
This research is to develop a process to change the culture of public agency construction management and implement RAID.

PRACTITIONER PARTNER(S):  
NYU USA Corps of Engineers (?)  
DDC PA NYNJ (?)