

Town + Gown

Building Ideas

6

Volume 6

2014-2015 | Systemic Action Research in the Built Environment

Building Ideas Volume 6

Systemic Action Research in the Built Environment

**Academic Year
2014-2015**

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About Town+Gown

Town+Gown is a systemic action research platform linking academics and practitioners to increase applied built environment research across disciplines and sectors. As new and previously unresolved built environment issues become apparent, so too the unmet need for applied research to increase common understanding. Town+Gown scales long-standing structural hurdles—low levels of investment, low levels of public sponsorship, especially at the local government level, inadequate linkages between research and application and fragmentation in both industry and academia—that have made increasing applied research difficult. The city's inter-related physical and governance setting serves as a laboratory for applied research in the built environment, which is a complex and dynamic social system with “wicked problem” characteristics that are further complicated by issues of geographical and temporal scale. Thus, built environment research requires active attention to context and multiple modes of inquiry, research methodologies and types of academic-practitioner collaborations, all operating within a “interacting open system” and “over an extended—virtually an unbounded—period of time.”¹ Systemic action research, a form of cooperative inquiry involving both practitioner and academic as equal partners in knowledge creation, addresses the continual need to integrate research within the broader context and provides a “learning architecture”

¹Horst W. J. Rittel and Melvin M. Webber, “Dilemmas in a General Theory of Planning”, *Policy Sciences*, 4 (1973), pp. 155-169.

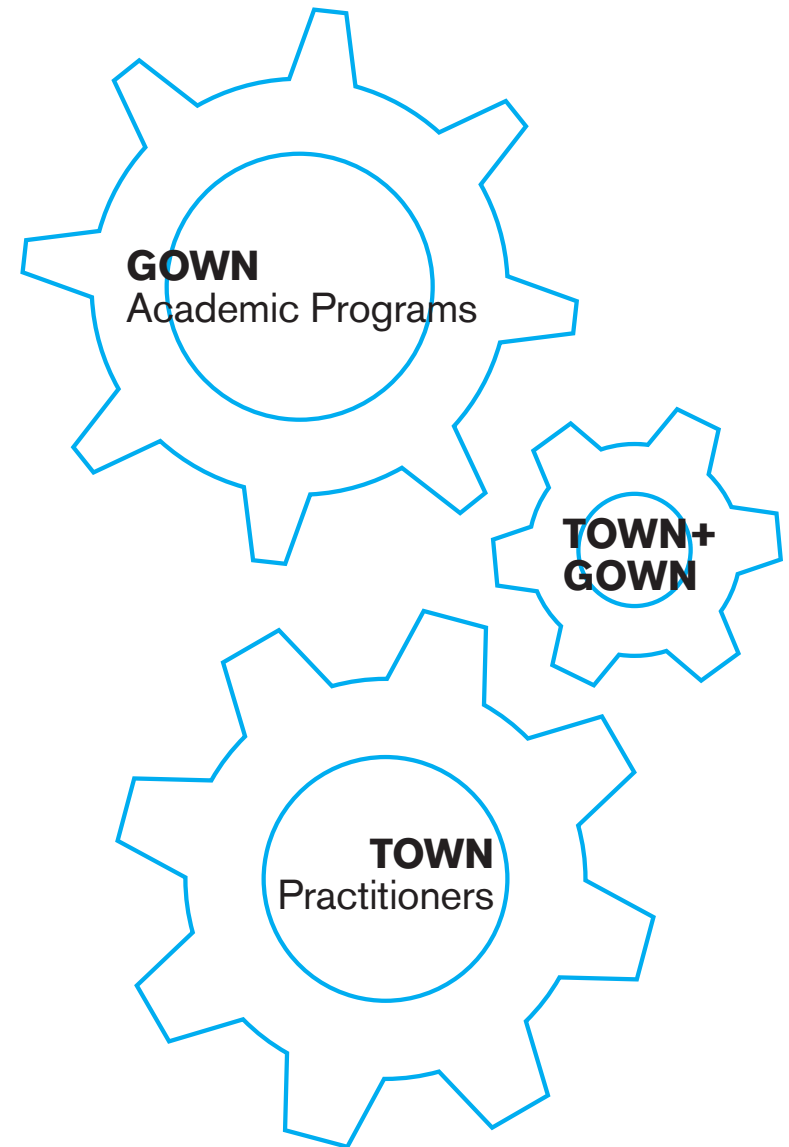
in which system stakeholders can bring about changes in practice and policy based on research results.²

The Town+Gown Research Agenda is one mechanism to engage academics and practitioners on applied research and encompasses a non-linear process, with multiple perspectives, research methodologies and types of academic-practitioner collaborations. The purpose of generating research results, within a broad, open and cyclical process, is to increase the common knowledge base and support systemic change over time. At the end of each academic year, Town+Gown abstracts the results of all completed projects in this annual review, *Building Ideas*, which is disseminated within the Town+Gown community, setting the stage for reflection among participants and future action based on research. Following the release of *Building Ideas*, the annual symposia series provides a space for Town+Gown members to explore the topics raised by completed projects so that they may collectively use research results to inform future changes in policy and practice. The action research methodology facilitates change through “the use of small working groups around participants’ practice—what action learning practitioners call ‘action learning sets’—with repeated cycles of action-reflection.”³

²Danny Burns, *Systemic Action Research: A Strategy for Whole System Change* (Bristol: 2007), p. 1.

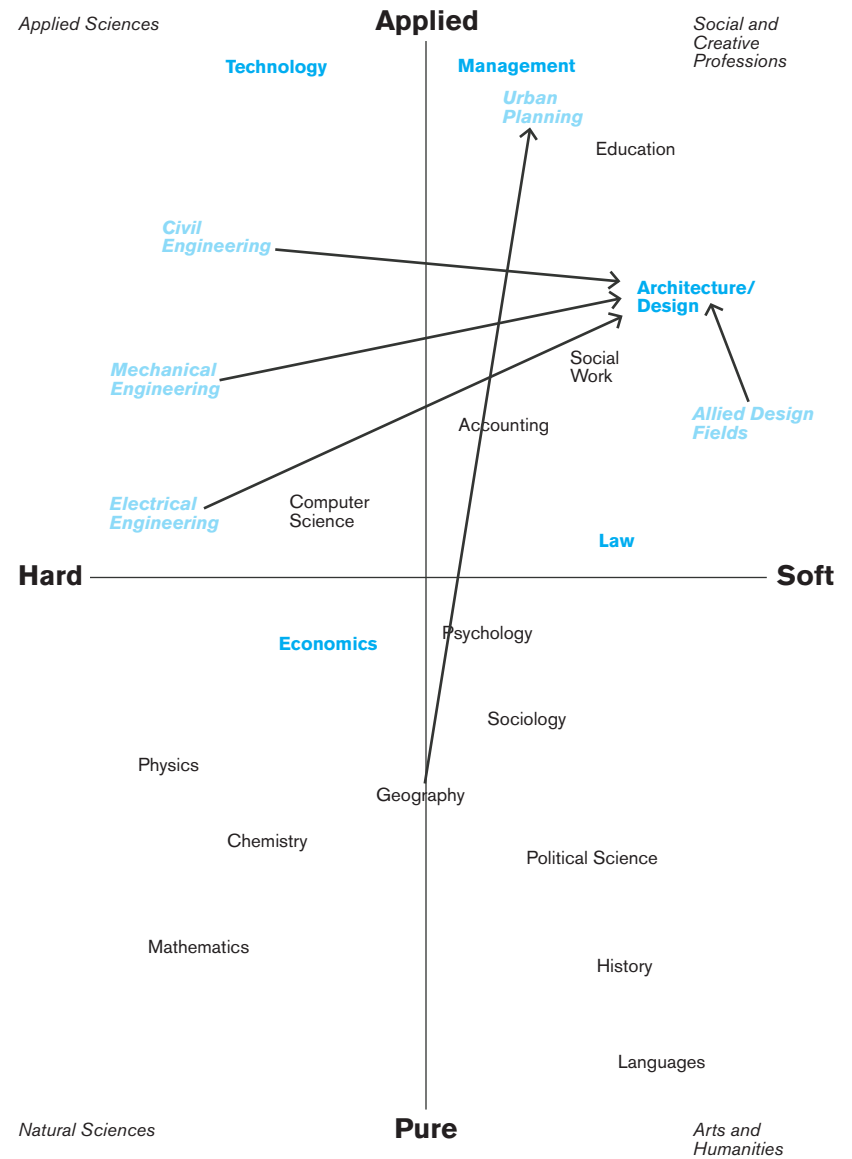
³Sonia Ospina, Waad El Hadidy and Amparo Hofmann-Pinilla, “Cooperative Inquiry for Learning and Connectedness,” *Action Learning: Research and Practice*, July 2008, 5:2 (Taylor & Francis), pp. 131-147; online reprint, Rider 6-A, https://upcommons.upc.edu/bitstream/handle/2099/5810/18_pap_Hofmann-Pinilla.pdf, accessed 04-11-17 @ 12:28 p.m.

At the end of its sixth year of operation, Town+Gown has hosted or captured a total of 105 completed projects with 32 practitioner partners and 36 academic programs and departments,



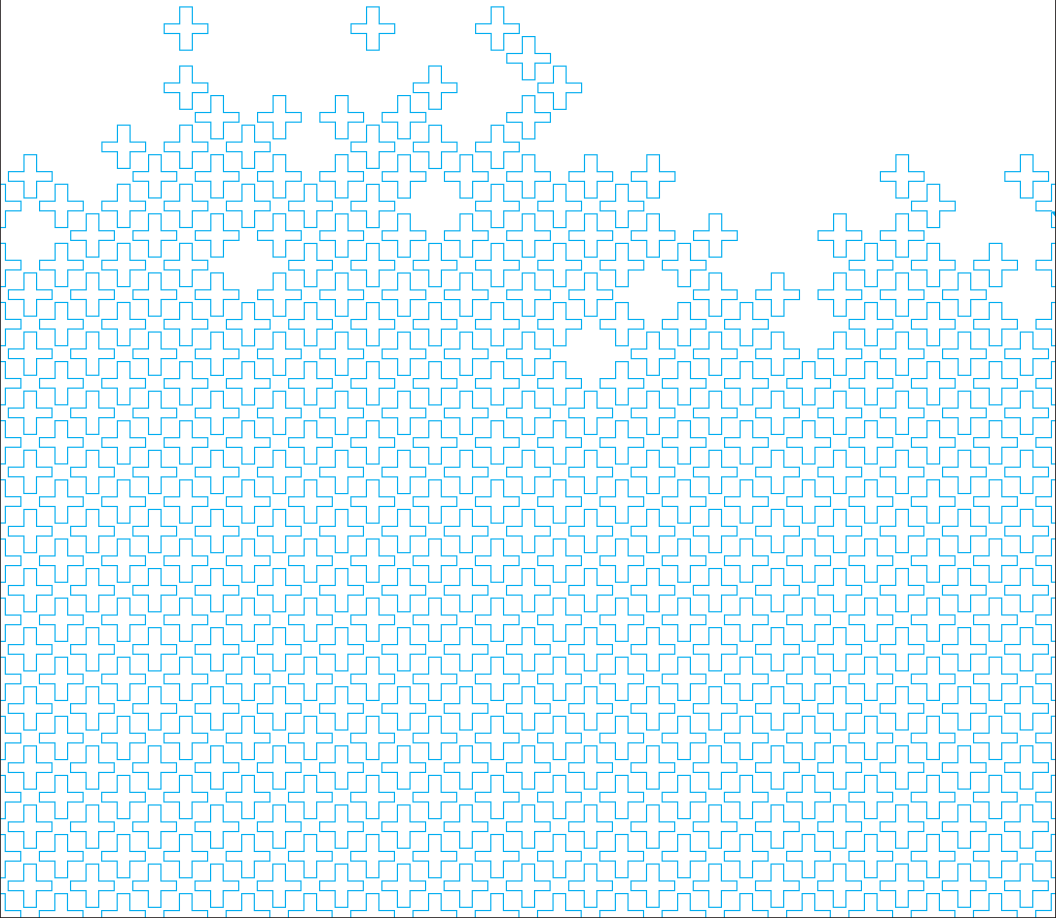
and has hosted four series of symposium events, consisting of 17 separate events, using completed research projects as the foundation for open-ended conversations among Town+Gown members. This Volume 6 of Building Ideas represents the capstone of Town+Gown's 2014-2015 academic year. See the Town + Gown website at <http://www1.nyc.gov/site/ddc/about/town-gown.page>.

This Volume 6 is organized along the lines of the six disciplines—Management, Geography, Economics, Law, Technology and Design—that Town+Gown uses to explore the recognized inter-disciplinary Built Environment field. Symposium events are recorded separately.



Biglan Disciplinary Model from Paul Chynoweth, The Built Environment Interdiscipline: A Theoretical Model for Decision Makers in Research and Teaching, Proceedings of the CIB Working Commission (W098) Building Education and Research Conference, Kowloon Sangri-La Hotel, Hong Kong, April 10-13, 2006, Rider 9-A, [http://usir.salford.ac.uk/12453/2/Interdiscipline\(SS-2009\).pdf](http://usir.salford.ac.uk/12453/2/Interdiscipline(SS-2009).pdf), accessed 04-11-17 @ 12:08 p.m.

Index of Abbreviations



Gown

BLS/Clinic—Brooklyn Law School/
Corporate and Real
Estate Clinic
Columbia/SIPA—Columbia
University/School of
International and Public
Affairs
Columbia/Statistics—Columbia
University/Department of
Statistics
CUNY/Hunter—City University
of New York/Hunter
College
Fordham/Gabelli—Fordham
University/Gabelli School
of Business
Fordham/Law—Fordham
University/School of Law
NYLS—New York School of Law
NYSID—New York School of
Interior Design
Pratt/Architecture—
Pratt Institute/School of
Architecture

Town

LICP—Long Island City
Partnership
MOCS—Mayor's Office of
Contract Services
NYC DCP—New York City
Department of City
Planning
NYC DDC—New York City
Department of Design
and Construction
NYC DOB—New York City
Department
of Buildings
NYC DOF—New York City
Department of Finance
NYC DOP—New York City
Department
of Probation
NYC DOT—New York City
Department of
Transportation
NYC PDC—New York City Public
Design Commission
NYC SBS—New York City
Department of Small
Business Services
NYPD—New York Police
Department



Dissemination: Abstracts of Completed Projects

Town+Gown disseminates research results in *Building Ideas*, as one way to foster ongoing discussions. Many completed projects have served as the focus of collaborative symposia and other events that bring academics and practitioners together to focus on the results of research with an eye to future research and potential action. Since Town+Gown functions as a clearing house for applied research in the Built Environment, the abstracts contained in *Building Ideas* volumes serve as resources for practitioners and academics, reducing the need to re-invent the research wheel each time a project focusing on recurring systemic issues arises. *Building Ideas* presents the work of academic programs to a wider audience of built environment practitioners and showcases the work of academic researchers outside the academic sphere.

MAN- AGE- MENT

The projects that follow under Management primarily focus on the built environment from the perspectives of its archetypal participants—owner, designer, constructor and financier. A critical objective for participants is to align their various interests in budget, schedule, safety and quality to make individual projects successful, in a context where information asymmetries continually change. Practitioners adapt to changes “on the ground” and changes in materials, building methods and information technology by using an evolving menu of service delivery methodologies and various management theories, techniques and tools, not dissimilar to those found in other industries or sectors. Research projects involving public projects also include separate analytical issues related to the public planning, budgeting and financing processes.

EXPLORING FACTORS RELATED TO SPREAD BETWEEN ESTIMATES AND BIDS: INFRASTRUCTURE

Objective: Construction project cost estimates are performed under conditions of uncertainty, which include changes that occur during the construction phase, after the project is awarded to the contractor(s) and execution of the contract(s), such as design failures, unforeseen site and environmental conditions and regulatory changes. NYC DDC had been analyzing historical data of its own initial cost estimates and the winning bids, which are based on cost estimates performed by contractors prior to submitting their bids, to understand the factors that might contribute to winning bids coming in with amounts that are greater than the agency's initial cost estimates. While NYC DDC's initial investigations focused on public building projects, the availability of the research team allowed NYC DDC to focus on infrastructure projects and explore the factors that impact the spread between the agency's initial cost estimate and the winning bid amount, including project-related variables from the dataset and external variables thought to affect construction

Town

NYC DDC

Gown

Fordham/ Gabelli

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Donqui Tian, Carol Xia

costs, such as interest rates, construction commodity prices and extreme weather conditions.

Exploring the spread depends on understanding the context of the estimation exercise. When a public owner performs an estimate, it is for the budgetary purpose of assuring adequate funds for the construction project and for the procurement purpose of not spending more than necessary to complete the construction project. When a contractor performs an estimate, in a competitive market where the contractor and its subcontractors are focused on providing a completed construction project within the context of a viable business model, it is for the business purpose of generating a profit to the contractor and its subcontractors.

Methodology: From the dataset for infrastructure projects that captured procurement process variables and project-related variables (internal dataset) and variables the team's literature survey indicated affect construction costs generally (external dataset), the team identified the relevant internal dataset variables, created three variables to measure aspects of the spread between the design-phase engineer's estimates and the winning bids for projects in the dataset (the spread), and cleaned and processed the variables and related project data. As part of this initial process, the team performed a data processing procedure, aggregating, categorizing and comparing variables to gain insight and identifying factors and creating an additional factor from the data that appeared to affect the spread as the foundation for the descriptive analysis and statistical correlation analyses that followed.

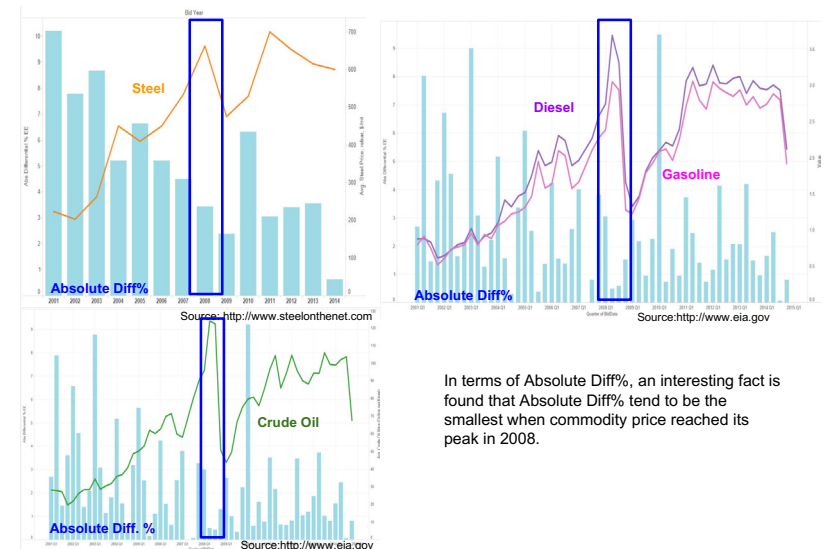
Findings: Since this was the first time that an administrative project dataset was subjected to data analytic techniques, the actual findings discussed below were less important than the fact that city administrative construction project data were amenable to business data analytic techniques and the concepts that emerged giving rise to ideas for future research.

In the descriptive analysis, the team observed a relationship between the spread and the economic cycle, with the engineer's estimates generally exceeding the bid costs during the period following the 2008 financial crisis. The team also observed the importance of project location and the spread. The statistical correlation analysis observed statistical correlation in the relationships between (1) a spread differential percentage variable and the engineer's estimate, (2) the awarded bid amount and contract duration, (3) corrected bid amounts and a spread differential percentage variable, and (4) a spread differential percentage variable and interest rates and inflation rates. This analysis assumed that the engineer's estimates and awarded bid amounts could serve as proxies for project complexity. As engineer's estimates increased, the spreads decreased, suggesting that lower cost projects may attract less experienced bidders. Contract duration and the proxy for project costs are highly correlated with longer contract durations having higher costs or project complexity. As with increases in engineer's estimates, the frequency of corrected bid amounts increased with lower cost projects. The correlation of a spread differential percentage variable with interest rates and inflation rates followed economic cycle patterns, which during the study period included

the 2008 financial crisis, revealing two distinct and opposite trends.

Next Steps: The team recommended future analysis to explore the observed cyclical patterns, including testing correlation with external variables, identifying biases in the historical data and weighting certain factors with respect to the engineer's estimate variable. The team suggested other analytical techniques to examine further the correlation between project cost and the spread differential percentage variables as well as the correlation between interest rates and those variables.

Statistical correlation between Absolute Diff% and Commodity Price: steel, gasoline, diesel and crude oil



In terms of Absolute Diff%, an interesting fact is found that Absolute Diff% tend to be the smallest when commodity price reached its peak in 2008.

EXPLORING FACTORS RELATED TO SPREAD BETWEEN ESTIMATE AND BIDS: PUBLIC BUILDINGS

Objective: This research project mirrored the objective in the research project abstracted above, but focused on public building projects.

Methodology: The team followed the same methodological approach used by the team exploring infrastructure projects, as abstracted above. For public buildings, the analog to the engineer's estimate is the designer's estimate.

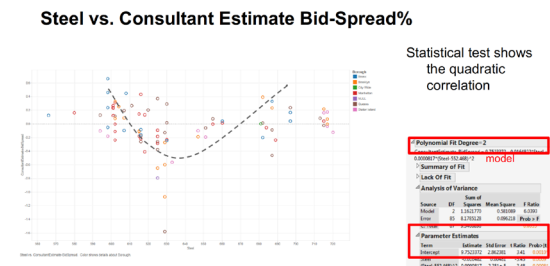
Findings: As noted above, since this was the first time that an administrative project database was subjected to data analytic techniques, the actual findings discussed below were less important than the fact that city administrative construction project data were amenable to business data analytic techniques and the concepts that emerged giving rise to ideas for future research.

The team explored the relationship between the initial designer's estimates and these estimates, as reviewed and adjusted internally by agency staff as part of the procurement process, and awarded

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bids, finding that the larger the project cost, the more accurate the estimate or the smaller the spread, and that project location by borough and project type appeared to be initially statistically correlated with the spread. Other factors explored as impacting the spread were internal-agency designation of a project as "historic", initial contract duration, actual contract duration, the cost range included in the bid package, project cost, commodity prices, interest rates, inflation, extreme weather events. Statistical analysis revealed the following individual factors to be statistically correlated to the spread: project type, "historic" designation, contract duration, weather events, and commodity prices. The team created a predictive model, identifying variables that had the highest predictive effect on the spread: project type, the Dow Jones home and heavy construction indices, inflation and the difference between initial and actual contract durations.

Next Steps: Throughout the project, the conversion of data underway to a new project management data system presented some data quality issues, and the team suggested that future analyses be conducted on similar data entirely derived from the new system, using additional data mining techniques, such as neural networks, to enhance model accuracy.



WHAT MAKES SMALL CONSTRUCTION BUSINESSES TICK?

Objective: A question in the Town+Gown research agenda—*What Are the Conditions for Construction Business Formation and Success*—had generated two earlier research projects, in academic years 2011-2012 and 2012-2013. These projects identified external and internal impediments that can act as barriers to small construction firm success, but limitations presented by city-generated administrative M/WBE data prevented the researchers from connecting the data to the identified impediments. NYC SBS and MOCS, along with NYC DDC, wanted to expand on these initial analyses to understand better the factors that contribute to the success of small construction firms.

Discussions about how to take these completed analyses forward concluded that available city administrative data—city-wide and agency procurement and contract data, including M/WBE firm data—operated as a limit to the next level of analysis, which led to a search for a larger external database of small business enterprises. The national Establishment Time-Series Database (NETS database) is constructed from annual snapshots of Dun and Bradstreet data collected

Town

NYC SBS, MOCS,
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every January since 1990, and is closest to a continual census of businesses. Auerbach and Lenssen analyzed the New York City business enterprise data from the NETS database to explore the dynamics of growth and continued development of firms in the local construction market. This study started with a macro-level approach to the issue, and the statistical analysis of longitudinal data pertaining to all construction firms in New York State, drilling down to those in New York City, was intended to identify the characteristics for survivability of small construction firms and gain further insight as a basis for future research.

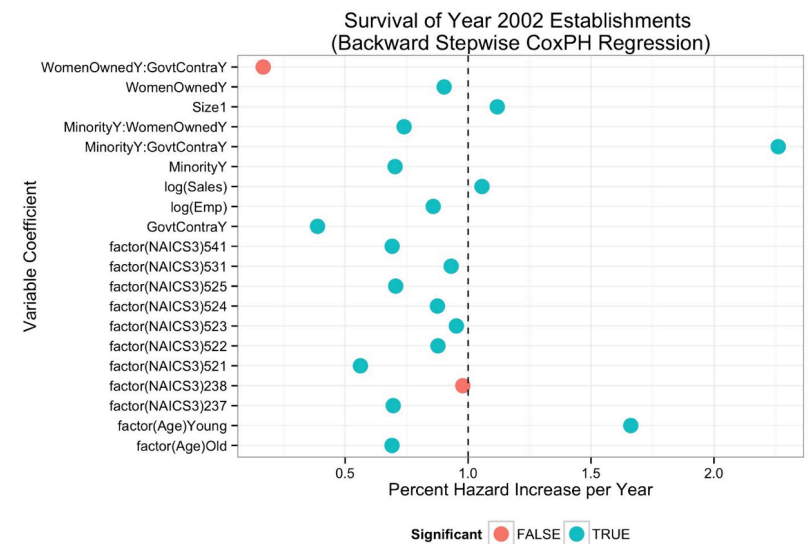
Methodology: The researchers analyzed the NETS database to explore the establishment characteristics associated with survival rates, examining construction, financial, insurance, real estate and architectural firms located in the New York City, MSA and State geographic levels over the 1989-2012 time period. They focused on whether the establishment was small (less than 10 employees), a M/WBE or a government contractor. The dependent variable of interest was the number of years a company survived before going out of business, as its “survival rate”. The researchers plotted Kaplan-Meyer survival curves, showing the probability establishments would still be in business x years after 2002. To consider multiple covariates simultaneously, they turned to a regression-type approach for modeling the hazard. In contrast to the survival rate, the hazard function can be thought of as the “death rate”, but the interpretation of the analysis remained nearly identical to that of the survival curves. The researchers then used the

Cox Proportional Hazards Model approach, which is a nonparametric survival regression method. This approach used a baseline hazard function, modified for each business by its covariates and coefficients determined through maximum likelihood estimation. The researchers noted how the model handles two complications that arise in dealing with survival data, which in the case of the NETS database includes both right censored and left truncated data. In addition, the researchers controlled for the economic effect over time, by including only companies that were established at or before 2002 and following them until the end of the study period in 2012, ensuring the analysis compared “apples” with “apples”. They selected variables that best explained the variability of the hazard rate through a stepwise process, performing both forward and backward selection the AIC criterion. The coefficient for a variable was interpreted as the proportional increase or decrease of the hazard, holding all other variables constant.

Findings: The researchers found that industry classification and M/WBE status have larger estimated regression coefficients than did establishment size and employment. The magnitude of the coefficients, however, did not necessarily reflect importance. Size and employment explained more variation since these coefficients are in log-units per dollar and employee respectively, and could thus be magnified by as much as five or six times. Much of the model confirmed conventional wisdom. Younger establishments had higher hazard rates, while older firms had lower. Firms with many employees had lower hazard rates, while small businesses with fewer

than 10 employees had higher hazard rates. The hazard rate increased with log-sales, but higher sales did not necessarily translate to higher profits and may instead correspond with establishments more vulnerable to the recessions in the early and late 2000s. Women-owned firms had much lower hazard rates regardless of government contracting, while, minority firms that contract with government did not. The coefficient for contracting with the government was roughly the inverse of the coefficient for the interaction between minority firm status and government contracting, so that the two appeared to cancel each other.

Next Steps: The researchers concluded that future analyses could investigate how the survivability of firms with M/WBE status varies by industry classification.



EXPLORING VENDOR FINANCIAL DATA

Objective: NYC DDC's procurement practice has included receiving financial information from the lowest three bidders—apparent winning bidder with lowest competitive bid price and the two bidders with the next two lowest competitive bid prices—on each construction project, which the agency uses as part of its responsibility determination process. The resulting dataset represents long-term series data of an agency's vendor market for infrastructure and public building projects. In this third companion project to the two bid-estimate projects abstracted above, the business data analytic research team received de-identified vendor financial data for the period 1998-2015 and applied, for the first time, business data analytic techniques to explore the financial capabilities of public works contractors over time, as well as relationships to external variables reflective of economic conditions at the time of bidding.

Methodology: Literature about the construction industry has noted that the industry is a competitive industry with a high level of entry and exits rates due to low barriers to entry, especially for small business enterprises. In addition, there appears to be a relation of levels of competition on projects and economic conditions, with increased

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competition—and possibly more competitive pricing—being counter-cyclical, which is likely due to increasing levels of idle capacity among contractor firms when private sector construction slows down.

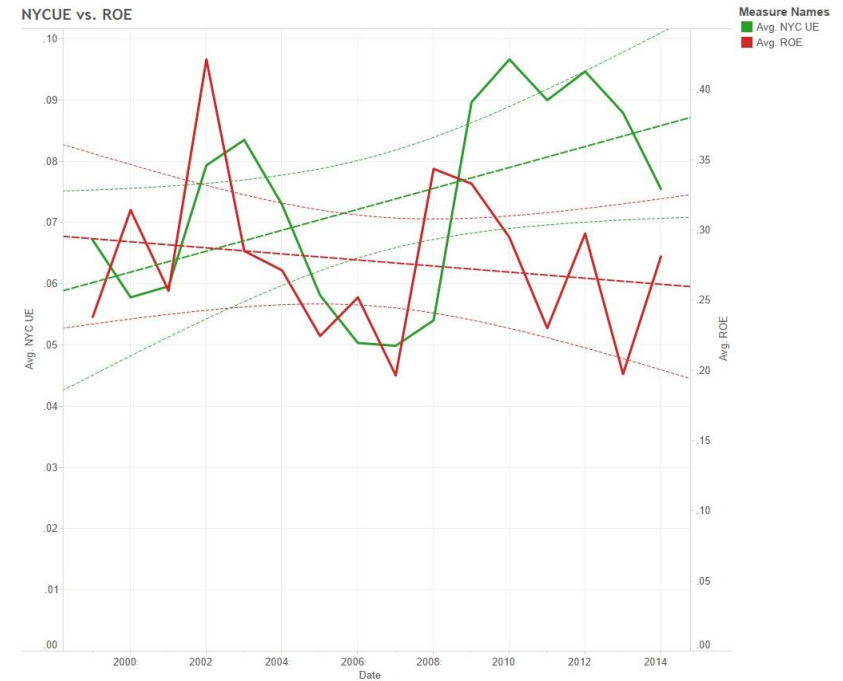
The team performed a standard data analytic methodology consisting of a descriptive analysis, data pre-processing for internal and external data analysis, followed by data mining and correlation analysis. With administrative project data corresponding to the projects for which the vendors bid/won, the team identified relevant project variables, such as project type, location and contract amount, for which they developed relevant intervals, and they identified relevant financial metrics from the financial data set, from which they created index variables to measure apparent financial capability of the firms. The team also identified external economic measures the literature suggested might affect construction business enterprises, such as interest, inflation rates and unemployment rates.

Findings: As noted above with respect to the two bid-estimate analysis projects abstracted above, since this was the first time that this type of data was subjected to data analytic techniques, the actual findings discussed below were less important than the fact that a combination of vendor financial data and city administrative construction project data were amenable to business data analytic techniques and the concepts that emerged giving rise to ideas for future research. Among the descriptive findings, the team observed that the majority of construction projects were within the \$1 million to \$5 million

range, though all project cost ranges increased over the test period except for projects valued at less than \$1 million and those valued at over \$50 million. During the period 1999-2009, awarded projects were diverse, as compared to the period after 2009, when water main and roadway projects dominated both in terms of total expenditures and levels of expenditures, possibly a reflection of a significant reduction in the city's capital plan in 2010. A two-step clustering approach with respect to the apparent financial capability index indicators revealed that the working capital/initial contract amount ratio and the net accounts receivables/aggregate accounts receivables ratio influence cluster results. The number of contracts awarded to vendors with the lowest apparent financial capability measures had been increasing during the test period, with the number of contracts awarded to vendors with middle measures fluctuating, and the number of contracts awarded to vendors with high measure flattening over the test period. Finally, there appeared to be a statistical correlation between the average US unemployment rates and the working capital/aggregate contract amount ratio, with the unemployment rate tending to increase over time and the lowest apparent financial capability measure declining slightly. There also appeared to be a correlation between the New York City unemployment rate and the return on equity variable, as both variables decline and increase together.

Next Steps: The team identified several areas for future research including further explorations into the countercyclical nature of public construction and trends in public construction during times of

fiscal crisis and catastrophic events, both of which occurred during the study period.



Combined Lines Chart between Avg. NYC Unemployment Rate and Avg. ROE/Year

GEO- GRA- PHY

Geography includes several related fields, commonly placed under the rubric of Planning, such as urban planning, regional planning and placemaking, as well as land use practices, which are also covered under Law.

SUNNYSIDE YARDS: ENVISIONING AN URBAN FRONTIER

Objective: The objective of this land use planning studio was to explore issues of planning for cities where land available for development in core urban areas grows scarce and large tracts of unpopulated and under-built land in conjunction with the use of air rights over transportation infrastructure networks remain as options. The Bloomberg administration saw the use of air rights over railyards in the development of the Atlantic Yards and Hudson Yards neighborhoods, and this studio used the Sunnyside Rail Yards, located in the middle of Long Island City, Queens, as a case study to explore a variety of issues such as multi-purpose infrastructure, resiliency, connectivity, movement, spatial scales, culture, environment and the public realm. The central proposition for this studio held that growth and economic development of an area must also be environmentally sustainable and accompanied by improvements to the quality of life of surrounding communities and future inhabitants of the developed site, taking into consideration the quantity, diversity and design quality of the public spaces.

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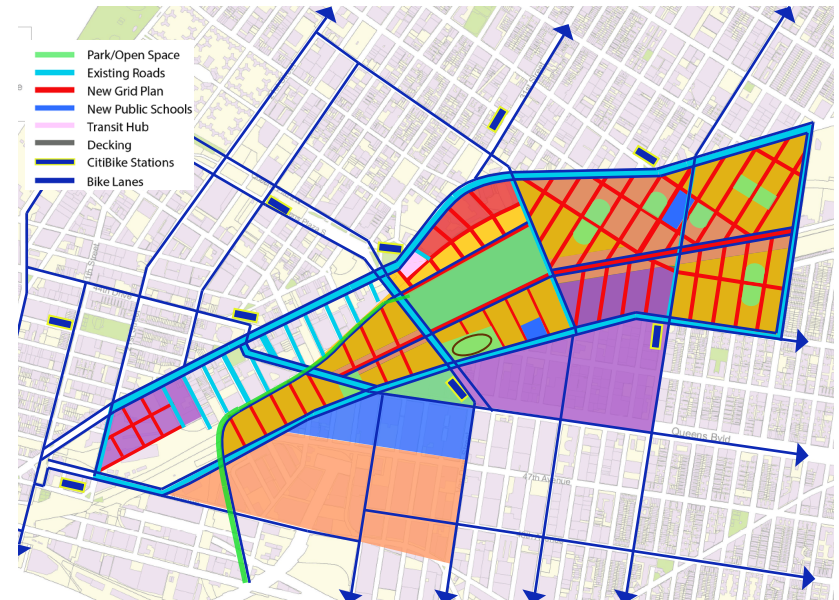
Methodology: The research team conducted a standard planning process, first researching and analyzing existing conditions of the study area and then conducting surveys of stakeholders to contribute ideas and identify concerns. From their initial analyses, the team developed a planning framework to connect and improve Long Island City while maintaining rail operations and neighborhood character.

Findings: The stakeholder Charrette process revealed neighborhood concerns related to issues such as housing, public/open space, arts and culture, transportation, neighborhood character, and economic development. These concerns translated into several challenges within the planning framework, such as increasing neighborhood connectivity, open space, neighborhood retail services and commercial space while reducing traffic congestion, which was counter-balanced by the concerns that resulting gentrification might negatively impact existing neighborhood affordability and the stock of manufacturing and warehouse space. The team recommended the creation of a redevelopment entity, using the Battery Park City Authority as a model, to ensure an integrated planning process for decking over Sunnyside Yards and a planned new community on the deck by managing the State's, City's and utilities' planning processes and a financing plan to support the future development. The team recommended extending the Special Long Island City Mixed Use District to the deck, within which to leverage available land use techniques such as paired districts, inclusionary housing districts, an industrial employment district, a creative economy district and a

“real” mixed use district. Options for ensuring environmental sustainability in the development plan included requiring or incentivizing net-zero energy consumption of resulting new structures, providing up to 30 percent of open green spaces, including spaces for neighborhood and local school recreation facilities, and local storm and waste water treatment capacity. Additional concerns related to residential affordability were addressed by requirements to create and preserve spaces suitable for artists, and concerns related to encouraging and maintaining manufacturing uses were addressed by the creation of an industrial relocation and promotion fund. Transportation concerns were addressed by creating a new transportation hub involving a new F-train stop and extending the Roosevelt Island Tram. The team developed several alternative strategies involving use sectors, street grids and open green space development, all of which could satisfy the planning framework challenges and concerns identified by stakeholders.

Next Steps: In the context of a class setting, resulting analyses and ideas were ends in themselves, but they can provide the foundation for future work focusing on developing the area above Sunnyside Yards as well as focusing on issues on the Long Island City area east of the Yards, which was not covered by the 1999 rezoning of Long Island City. The integrated land use and urban design proposals that emerged from this studio, treating the study area holistically, could provide a basis for stakeholders to align the City’s interests in guiding future economic and residential development and anticipated growth, the interests of the impacted and affected communities, and

the City’s policy objectives and priorities set out in OneNYC.



Land use as divided into sections and separated by parks and/or streets.

ECO- NOM- ICS

Projects that follow under Economics make it possible to see government acting in and on the built environment in the different roles it often plays simultaneously. Public capital programs are, in essence, work orders for facilities relating to “social” or “public” goods and to “mixed goods” that correct for negative and positive externalities. Yet, at the same time government participates in the built environment as an owner, it also operates in its other roles—economic catalyst and policy maker, regulator and financier—increasing the complexity of built environment systems and affecting the effectiveness and efficiency of public and private capital programs and projects.

PREDICTING THE EFFECT OF NEW YORK CITY CAPITAL PROJECTS ON NEARBY PROPERTY SALES PRICES

Objective: The City’s diverse capital program rehabilitates, maintains, and expands public infrastructure and public building stock of a large and complex built urban center. While the City’s capital budget is large, its capital needs are larger, requiring choices that balance a variety of competing needs. While the budget process does not lack for the quantitative articulation of public needs, there is an almost total absence, on the other side of the civic ledger, of a quantitative assessment of the external benefits that public projects generate in their neighborhoods. Until recently, however, there was no way to assess rigorously the impact of a public project on its neighborhood that quantitatively demonstrated a causal link between the project after completion and changes in the neighborhood surrounding the project. Analyses conducted over the past decade have, however, begun using hedonic regression techniques to examine the neighborhood impacts of public investments so that it is possible to

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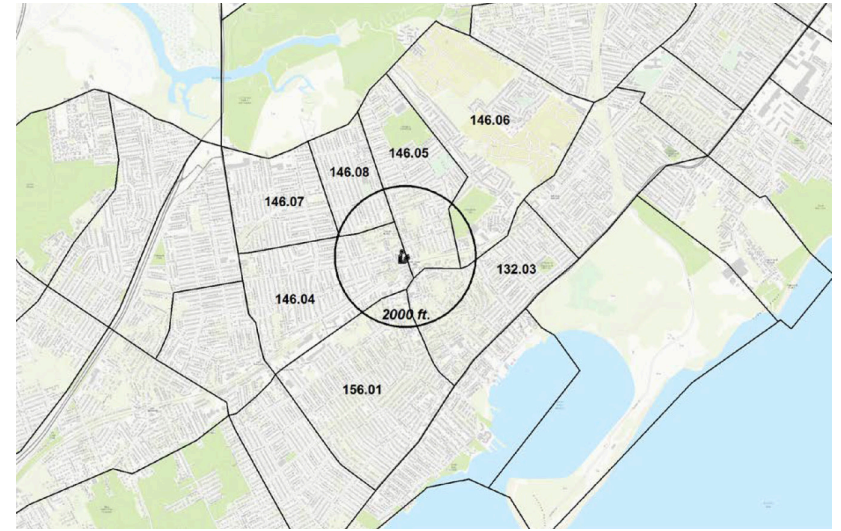
ascertain whether property value improvements resulted from a prior place-based investment. The research team was tasked with developing a hedonic regression model, using geocoded NYC DDC project data and NYC DOF property sales data, to permit future assessments of the economic impact of the City’s routine capital projects.

Methodology: After an extensive literature review, the team developed a hedonic regression model integrated with a difference-in-difference approach, which permits a comparison of property sales prices in small rings surrounding a completed capital project with property sales prices of properties outside the ring area but within the same census tract. Since a decision had been made to test the model they developed on projects in Staten Island due to the homogenous housing types in Staten Island, as compared to other boroughs, the team also conducted a site visit to several completed NYC DDC projects in Staten Island to identify those that would be suitable to test the model.

Findings: Since much of the time during this one-semester project was taken up with creating the actual model, which was transmitted to NYC DDC, the team chose to focus the testing the model on only one completed NYC DDC project—the Great Kills Library renovation in Staten Island—and the team concluded that the model worked and was viable for future use by the City.

Next Steps: Many believe that public capital programs serve higher political functions that can be expressed generally as the civic experience. There has also been an intuitive sense that

some types of public projects are beneficial to neighborhoods and others, perhaps, less so. With the ability to apply this model and methodology to the wide variety of public projects, the City would be able to develop New York City-specific quantitative metrics for capital program planning. The ability to apply this methodology to the broad array of routine public project types would enhance understanding of the costs and benefits of all types of public projects that are initiated and completed on a routine basis in every neighborhood, such as street reconstruction projects (with and without “amenities” such as landscaping and lighting) and new and renovated City structures such as firehouses, police precincts, schools, shelter facilities, court facilities and agency ancillary structures, and new and renovated cultural facilities and libraries, the operations of which are subsidized by the City. Applying hedonic regression to the City’s many routine project types would begin to show the relative impacts of project types in City neighborhoods—for example, the impact of a public school in a neighborhood relative to a court house, library, police precinct or homeless shelter as well as the impact of street reconstruction without amenities relative to those with amenities. With such quantitative results, City agencies would have the ability, assuming multiple sites, to choose among various possible locations for regular programmatic investments to maximize social and economic benefits in neighborhoods across the City.



Overview of Census Tract around Great Kills Library Project

LAW

Projects under Law focus on the impact of law on built environment activities from the perspective of the archetypal participants—owner, designer, constructor and financier. Statutes and regulations, contractual forms and provisions, and related case law all affect the relationships among built environment participants, their expectations and their behaviors. Deconstructing the law in the context of its impact “on the ground” can provide powerful explanatory insight for the other disciplines analyzing built environment issues and provide a foundation for policy and practice change.

WHY DOES IT COST SO MUCH TO BUILD IN NEW YORK—PRIVATE PROJECTS?

Objective: The reality that year after year, in rising or falling markets and whatever the building type, construction costs in New York City top all lists of construction costs among major American cities gave rise to one hypothesis, initially explored in earlier Town+Gown projects, that unexamined state and local government laws and regulations on their own and in combination with each other and without reference to their relation to initial costs of private construction and to post-construction operation and maintenance costs are significant cost drivers within the New York City market. Timmerman added a detailed analysis of real property tax and building code provisions to an existing annotated database of regulations that include licensure requirements and land use provisions. This annotated database of state and local built environmental regulations would provide a basis to develop a methodology to link identified regulatory cost drivers to pro forma investment decision (construction) and operations and maintenance (post-construction) cost models.

Methodology: Timmerman reviewed the State's Real Property Law, including the many related real

Town

NYPD

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BLS/ Clinic

Researcher(s)

Stanislav Timmerman

property tax abatement and subsidy provisions intended to increase various types of construction, and the City's Building Code, and their related legislative histories, and documented his findings in extensive and detailed charts and memorandum.

Findings: As this project is part of creating a database of statutory provisions that appear to drive the costs of private building construction, operation and maintenance, there were no findings apart from the detailed analysis of legislative history and the complex set of provisions themselves. The results of Timmerman's work, along with the work of other researchers on prior projects, have been represented on the accompanying info-graphic. This info-graphic begins to illustrate the drivers of private construction and post-construction costs that are within the regulator's control; the kinds of changes to regulations that might minimize cost increases or reduce costs over time; and, the countervailing public policy concerns that operate within the regulatory spaces.

Next Steps: The accompanying info-graphic, summarizing Timmerman's research and the work product from other completed Town+Gown projects, would support a follow-up project to develop a model to predict the costs of existing and proposed regulations on private construction projects and ongoing operations and maintenance.

1. INCOME STATEMENT

Gross revenue
 Discounts
 Net revenue
 Cost of goods sold
 Gross margin
 Operating expense
 Operating income
 Interest expense
 Other income and expense
 Pretax income
 Income tax expense
 Net profit

2. BALANCE SHEET

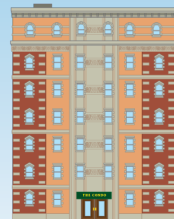
CURRENT ASSETS
 Cash
 Accounts receivable
 (Less doubtful depreciation)
 Inventory
 Temporary investment
 Prepaid expenses
TOTAL CURRENT ASSETS
 Fixed assets
 Long-term investments
 Land
 Buildings
 (Less accumulated depreciation)
 Plant & equipment
 (Less accumulated depreciation)
 Furniture & fixtures
 (Less accumulated depreciation)
TOTAL NET FIXED ASSETS
TOTAL ASSETS

CURRENT LIABILITIES
 Accounts payable
 Short-term notes
 Current portion of long-term notes
 Interest payable
 Taxes payable
 Accrued payroll
TOTAL CURRENT LIABILITIES
LONG-TERM LIABILITIES
 Mortgage
 Other long-term liabilities
TOTAL LONG-TERM LIABILITIES
SHAREHOLDERS' EQUITY
 Capital stock
 Retained earnings
 Total shareholders' equity
TOTAL LIABILITIES & EQUITY

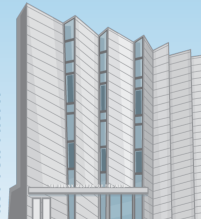
1-3 FAMILY HOME



APARTMENT BUILDING:
 CONDOMINIUM/CO-OP



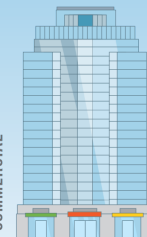
NOT-FOR-PROFIT



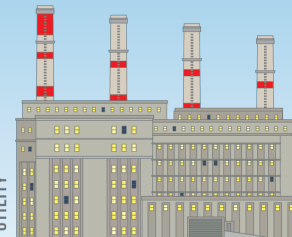
3. STATEMENT OF CASH FLOW

CASH FLOW FROM OPERATING ACTIVITIES
 Net income
 Depreciation expense
 Increase in accounts receivable
 Decrease in inventory
 Decrease in accounts payable
 Cash provided in operating activities
CASH FLOW FROM INVESTING ACTIVITIES
 Capital expenditures
 Proceeds from sale of property
 Cash provided by investing activities
CASH FLOW FROM FINANCING ACTIVITIES
 Borrowings of long-term debt
 Cash dividends
 Purchase of treasury stock
 Cash provided by financing activities
 Net increase in cash
 Cash at beginning of the year
 Cash at the end of the year

COMMERCIAL



UTILITY



REAL PROPERTY TAXES

1961 ZONING CODE & AMENDMENTS TO ZONING CODE

BUILDING CODE REGULATION OF BUILT ENVIRONMENT OBJECTS AND PARTICIPANTS

OTHER REGULATIONS OF BUILT ENVIRONMENT PARTICIPANTS AS LOCAL BUSINESSES

REAL PROPERTY TAX EXEMPTIONS, ABATEMENTS, PHASE -INS

OTHER TAXES RELATED TO BUILDINGS AND BUILDING OPERATIONS

LANDMARK DESIGNATION

ENVIRONMENTAL-BASED BUILDING CODE PROVISIONS

THE PEOPLE'S PRECINCT AT THE 73—BUILDING CODE ANALYSIS FOR RELOCATABLE PRE- FABRICATED MODULAR STRUCTURES

Objective: As noted under Design, in the abstract of *The People's Precinct at the 73—Technical Specification and Estimation of the Community Connection Pavilion*, two Pratt/Architecture students performed preliminary technical specifications and cost estimates for the Community Connection Pavilion pod (CCP pod). This legal research project, along with a companion project abstracted below, focused on evaluating regulations for the CCP pod, as designed.

Methodology: Pre-fabricated modular construction for buildings is a fairly recent innovation, and Hajian conducted a legal review and analysis of all applicable building code regulations that would impact the permitting and construction of the CCP pod, designed as a movable structure to be constructed off-site, under controlled conditions, and then transported to the side of the 73 Precinct.

Town

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Researcher(s)

Shabnam Hajian

Findings: Pre-fabricated modular construction for buildings can serve as a cost-effective and practical alternative to traditional construction. Hajian concluded that since state building code provisions only applied to factory manufactured modular homes in the city, state law did not apply to permitting and construction of the CCP pod in the city. Hajian found, at the time of the analysis, that the city did not have an extensive set of regulations covering pre-fabricated modular construction, with one applicable NYC DOB bulletin designating the Office of Technical Certification and Research (OTCR) to review and approve permit applications and granting OTCR broad authority to determine the specific requirements for each project, based on its scope. The bulletin requires that all modular construction work be performed by city-licensed trades people and that the fabricator submit a certification from a quality assurance agency approved by OTCR, among other things. OTCR's involvement begins early during the design and engineering phase, and the bulletin also mandates an extensive inspection process that continues during manufacturing and assembly through final completion, including approval of all construction materials. Hajian also noted that the CCP pod would likely also be subject to review and approval of NYC PDC.

Next Steps: This project was intended to support the work of the Pratt/Architecture students in *The People's Precinct at the 73—Technical Specification and Estimation of the Community Connection Pavilion* abstracted below and thus concluded with no next steps.

THE PEOPLE'S PRECINCT AT THE 73—ZONING AND LAND USE ANALYSIS FOR RELOCATABLE PRE- FABRICATED MODULAR STRUCTURES

Objective: As noted under Design in the abstract of *The People's Precinct at the 73—Technical Specification and Estimation of the Community Connection Pavilion*, two Pratt/Architecture students working with one of the professors from the studio project *The People's Precinct at the 73—Design of the Community Connection Pavilion* (see abstract below) performed preliminary technical specifications and cost estimates for the student design of the Community Connections Pavilion pod (CCP pod). This legal research project, along with the companion project abstracted above, supported the work of the Pratt/Architecture students by focusing on various regulations for the CCP pod, as designed.

Methodology: Chisholm conducted a legal review and analysis of applicable regulations other than the building code that impact the permitting and

Town

NYPD

Gown

Fordham/ Law

Researcher(s)

Emily Chisholm

siting of the CCP pod, designed as a movable structure to be constructed off-site and then transported for location on the sidewalk next to the 73 Precinct building.

Findings: Chisholm's research revealed that, assuming city-owned projects are subject to the city's rules in the same way that privately-owned projects are, placement of the CCP Pod on the sidewalk had the potential to trigger several local regulatory processes. The sidewalk location suggested a need for a revocable consent from NYC DOT to occupy space on the city's sidewalk. To the extent the planned plumbing and electrical hook-ups for the moveable structure render it more like a permanent structure for regulatory purposes, there could also be a need for related review and approvals by the NYC DCP under the city's uniform land use review procedure and the NYC PDC. To the extent the moveable CCP pod could be considered a vestibule to the building, the city's building code requirements related to stoops, vestibules and other entrance details could be triggered, limiting the dimensions of the CCP pod and its relation to surrounding buildings. To the extent the CCP pod could be viewed as an enlargement to the existing building, the city's zoning code provisions would apply; and, since the lot relates to more than one zoning district, the zoning analysis would be complicated due to the need to analyze each portion of the lot corresponding to its related zoning district.

Next Steps: Like the project abstracted above, this project concluded with no next steps.

DESI- GN

The projects under Design can focus on any aspect raised by this complex disciplinary field. Both public and private construction projects become part of the visible built environment, and this aspect of Design includes both Architecture and Engineering. Within or surrounding built objects, several other design disciplines also operate and contribute significantly to the overall success of any built environment object. Interior design, lighting design, landscape design, service design, communications (or visual) design, digital design and product design comprise a suite of integrated design services that interface with Architecture and Engineering and are included under Design as well.

THE PEOPLE'S PRECINCT AT THE 73—DESIGN OF THE COMMUNITY CONNECTION PAVILION

Objective: Having followed earlier Town+Gown projects related to service design in the criminal justice field and multi-disciplinary building information modeling (BIM) using a “kit of parts” pre-fabricated modular construction methodology, NYPD approached Town+Gown to use academic-based design research to help implement NYPD’s policy of turning its precincts into “People’s Precincts”, using the Los Angeles Police Department’s program and the 73 Precinct, as the case study site. The two physical elements of that model consist of (a) an automatic teller machine (ATM) located in the precinct building and (b) a community space, located in the space between the precinct’s front door and the sergeant’s desk where police work takes place, in which members of the community and the police precinct staff could engage in joint programming. Implementing these two elements would signal a change of policy intent to improve police-community relations in physical space, which had been constructed in 1985 in the fortress style common to that period.

Town

NYPD

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Pratt/Architecture

Researcher(s)

Heather Alford, Anthony

Andrews, Frederic Bellaloum

Theron Bowers, Raymond

Chen, Chris Edgemon

Abigail Hancock, Dillon Keane

Gayoung Lee, Nicole

Mastrantonio, Steven Woo

The facility presented immediate challenges after a tour of the two-story building revealed an inability to create space within the building for a community space.

Pratt/Architecture developed a three-semester series of classes intended to explore community engagement, design and technical innovation and fully integrated project delivery in the form of a team-based design build effort. The three seminar courses, which incorporated building information modeling tools, were structured conceptually along the lines of the Yale University/Charles W. Moore design-build studio sequence, proceeded from design (spring) to estimation/specification (summer) to build (fall), culminating in a student-involved build of the student-designed structure (fall).

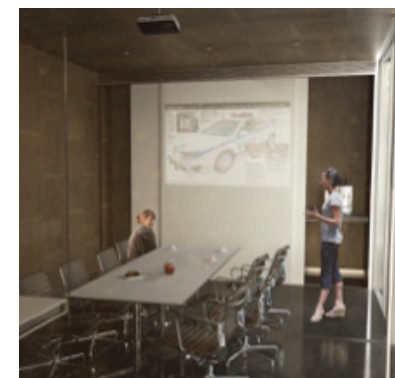
Methodology: In this programming and design studio class, the research team engaged in an architectural design process with staff at the 73 Precinct and engaged in participatory co-design with members of the Community Precinct Council to discuss and establish the character of the community space and its program of uses. The team conducted five highly-structured, interactive working meetings with NYPD staff and Community Precinct Council members, using Pratt/Architecture’s program of service- and community-based design. The team conducted one open meeting with community representatives at the Community Precinct Council as well as another meeting with the Made in Brownsville program. The team also researched site planning, structural systems, mechanical, electrical and plumbing systems, transportation logistics and

foundation systems, building code provisions, and community-engaging design features found in police precincts across the world. Eleven concepts evolved into three archetypal schemes—at the front of the building, the street corner and the side of the building—that developed, through continual stakeholder feedback, into the final design for the Community Connections Pavilion (CCP) pod to be located at the side of the building.

Findings: The architectural solution revealed itself as a moveable free-standing modular structure that could be placed on the sidewalk next to the building and later moved to other precincts over time to test the “People’s Precinct” model across the city. NYPD’s desire to create a community room at a space-challenged location created the opportunity to provide a new “front door” for the fortress-style building where the entrance to the building was hard to see from the sidewalk as well as explore the targeted and temporary use of pre-fabricated modular design and construction to address the city’s systemic capital funding process that tends to favor full rehabilitation of older buildings or new construction. Specific design elements of the CCP pod reflected stakeholder input that included: a necessary balance between public accessibility and security for NYPD staff, with a transparent entry fitted with ballistic glass; an external neighborhood-specific identity able to utilize different local artists’ work and balance day lighting and users’ needs for privacy; an informative and welcoming reception area to be staffed by community liaison officers; interior space to accommodate computer stations for residents to search police-related information, an ATM, a public restroom, and flexible meeting and conference

spaces to support a variety of police-community uses; practical, durable and long-lived systems and materials intended to require minimal maintenance; and, finally, fast deployment and flexible use at multiple sites.

Next Steps: During the design phase, NYPD decided to include a community space within the 40th Precinct in the Bronx, which was in the design phase. The CCP pod design from the spring semester was to be the subject of a technology development (Summer 2015) course, in which students were to develop the technology and detailing of the design in association with one or more professional offices related to Pratt’s faculty. This planned course became a federal work study engagement for two students working within a professional office and is abstracted below.



THE PEOPLE'S PRECINCT AT THE 73—INTERIOR REDESIGN OF THE VESTIBULE

Objective: An ATM, one of the two elements of the “People’s Precinct” model described in the abstract above, was installed in the vestibule of the 73 Precinct. Owing to the crenelated building front, the vestibule was not only oddly shaped but also small, with small transom windows at the top of the exterior walls providing the only natural light and dark ceramic tiles covering the walls, a floor-to-ceiling artwork taking up the entire largest wall in the space, a small number of standard City-procured chairs, and an officer’s window near the interior door that provided neither privacy to visitors with inquiries or complaints nor comfort to the officer stationed there and inhibited free flow from the entrance to the door leading to the sergeant’s desk. The ATM had been placed in the corner of the vestibule, the only available space, with no exterior signage indicating it was there. The research team in this four-week summer experiential learning seminar was tasked with developing interior design options for the vestibule and a palette of options useable in vestibules in other precincts to support NYPD’s

Town

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NYSID

Researcher(s)

Daniella Brecher, Anna Daubey, Hsien-Huei We

Orianna Ellison,

roll-out of the ATM component of the “People’s Precinct” program across the City, all of which were intended to convey a sense of welcome and information.

Methodology: Following a user-centered design research methodology similar to that used in the Pratt/Architecture project abstracted above, the research team conducted four structured design meetings with the staff at the 73 Precinct and Community Precinct Council members to create two related designs—the first to be a simple re-design of the vestibule, constrained by cost and physical space limitations at the 73 Precinct, and the second to articulate a “civic standard” palette of design features that could be applied to spaces across NYPD’s inventory of existing buildings.

Findings: The design for the 73 Precinct, reflecting physical space limitations, provided improved lighting and made small changes to an interior non-load bearing wall to increase privacy for those speaking to an officer at the reception desk, shielding the arrestee intake space from the view of visitors and improving traffic flow at the interior door. The materials chosen reflected operational needs for durability and ease of maintenance, and the colors chosen lightened the interior space that received only small amounts of natural light during the day. The design also included exterior signage to clearly identify the entrance and coordinated with the interior design features pointing to the ATM located in the corner of the vestibule. The team also designed signage specifically for the ATM to be used on the exterior and in the interior. An electronic bulletin board was to replace the floor-to-ceiling artwork to

provide useful information, including information tied to the ATM, such as City-funded financial literacy programs available within the community. The civic standard design palette, consisting of these elements, provided a useful foundation for the NYPD as it thinks about how to redesign other precincts' vestibule areas to implement elements of the "People's Precinct" program in advance of full-scale precinct renovations.

Next Steps: The proposed interior design changes for the 73 Precinct were the subject of discussions in connection with ongoing operations and maintenance efforts and, by the end of academic year 2014-2015, had not been implemented.



THE PEOPLE'S PRECINCT AT THE 73—TECHNICAL SPECIFICATION AND ESTIMATION OF THE CCP POD

Objective: As noted above in the abstract of *The People's Precinct at the 73—Design of the Community Connection Pavilion*, Pratt/ Architecture developed a three-semester series of classes structured conceptually along the lines of Yale/Moore design-build studio sequence, which included a specification and estimation class to follow the design class. Instead of a class, as originally planned, however, one of the professors hired two students *via* federal work study to work at his professional office (Garrison Architects) to perform preliminary technical specifications and cost estimates for the student design of the Community Connection Pavilion pod (CCP pod).

Methodology: Building information modeling (BIM) supports greater use of off-site fabrication and modular construction, including manufactured products, and has the potential to increase integration of design with constructability analysis during the early stages of design, minimizing the

need to resolve questions in the design when construction commences and related delays and additional costs; to permit materials requisition on an “as needed” basis, reducing costs associated with traditional stockpiling of materials on site; and, to increase labor productivity in construction. For the technical specification and estimation exercise applied to the CCP pod, the student team used BIM programs, assuming a computer numerical control production process and off-site pre-fabrication.

Findings: Due to the technical and limited objectives of this project, there were no findings. Evaluating the accuracy of an estimate depends on the context in which it occurred during the public construction process. The ability to evaluate the accuracy of the estimate from this project would be possible with the final build of the CCP pod academic demonstration project.

Next Steps: While the fate of the final build of the CCP pod academic demonstration project is unknown at the moment, “action” occurred when, earlier in the spring, NYPD decided to include a community space and ATM in the design of the new city-funded building for the 40th precinct, during the design phase at NYC DDC.

Town

NYPD

Gown

Pratt/ Architecture

Researcher(s)

Frederic Bellaloum

Abigail Hancock

TECH- NOL- OGY

Technology, including information technology, can assist built environment participants in their respective domains. While technology can be analyzed in conjunction with, for example, management techniques and methodologies, technology has aspects resulting from technology *qua* technology and how it relates to society, and projects under Technology can highlight one or more of these aspects.

Large public owners have an ability to advance technology innovation, as economic policy makers and as collateral from their public capital programs by participating in research and development activities necessary for innovation in construction- and built environment-related technology.

There were no projects in the Technology discipline in academic year 2014-2015.

Reflection: Proceedings from Symposium Events

The systemic action research methodology provides structure for stakeholders to use research results to help bring about changes in practice and policy within a complex and dynamic social system. In the built environment, where complex issues are embedded, it is necessary to conduct research explicitly within its context. The action research methodology facilitates change through repeated cycles of research and reflection aimed at eventual action, which the action learning methodology calls 'action learning sets'.

Since 2011-2012, Town+Gown has been using the symposium format as a space for reflection, where practitioner and academic participants, in an open-ended conversation focusing on particular completed project results, can move toward appropriate action. There no particular agenda other than what is suggested by the completed project or projects, and these events are simply research-based conversations within a broader context aimed at action.

The following summaries of symposium events held during 2014-2015 evidence the state of reflection on the completed projects that were subjects of the events.

Issues in Civic Visioning

In collaboration with AIGAINY, AIANY/Center for Architecture and the AIANY/Public Architecture Committee, as part of Archtober, Architecture and Design Month

October 22, 2014

Purpose: This event was the fifth in Town+Gown's ongoing exploration of Design. Prior events focused on NYC DOP's Neighborhood Opportunity Network (NeON) program as a case study project to explore the many meanings of design and explored how design-based research methodologies and techniques turn data into knowledge in a cyclical process that includes policy recommendations, implementation and evaluation. Other events continued exploring the meanings of design by bringing some of the engineering disciplines, as designers, into the design conversation, and highlighting the role that the allied design fields, such as interior design, communications design, service design and industrial design, play in the delivery of public services. A chart, referred to as a "Rosetta Stone"—*10 things public policy analysts should know about design and 10 things designers should know about public policy analysis*—provided the foundation for cross-disciplinary conversations at another event to help both sides reach across the divide and increase cross-

disciplinary collaborations. The last event focused on three completed Town+Gown projects and began to tie the theme of creating sustainable neighborhoods with ever-present theme of design, exploring the relationship between design and planning scale.

Conversation: One theme woven through all the prior events was the role of the city's design-related academic institutions in supporting the design sector of the local economy by focusing on pedagogical programming to integrate basic business and entrepreneurial skills with the design curriculum and ways to connect the design programs with New York's other economic sector businesses, developing city-wide academic partnerships. Another theme was the role of government and how public agencies can use design in their work to inform program function and outcomes. The first conversation at this event used the discipline of placemaking to discuss various approaches to neighborhood improvement by the combined use of data, communication design and visual arts to engage communities in producing change and lasting benefits. The second conversation brought forward the focus on design thinking combined with technical aspects related to design—building information modeling (BIM) technology and lean design and construction principles. The focus on BIM, with academics who have used the classroom setting for Town+Gown projects, also explored how BIM will change traditional relationships during the design and construction phases.

Service Delivery Not Procurement— At the State Law Level

*In conjunction with Albany Law School, ACEC New York, AIA New York State, Citizens Budget Commission, New York Building Congress and the New York City Bar Association at **Modernization of New York's Built Environment Laws: If Not Now, When?***

November 12, 2014

Purpose: Town+Gown has been focusing on service delivery, as distinct from public construction procurement, since a symposium event in April 2013. The tendency of referring to project delivery as procurement and/or contracting, which New York State law encourages public owners to do, can obscure thinking of ways to improve service delivery within the public owner enterprise. It is possible that the words themselves can inhibit innovative thinking because they obscure relations to other large system processes and, in particular, to the underlying functions they facilitate. At an earlier event, the participants identified impediments to innovations at the lowest unit level—the construction project and the project delivery function—as owners attempt to translate them to higher enterprise-wide system-wide processes. Sources of the dissonance include

a structural disconnect between the work of construction agencies and the enterprise-wide capital budget planning and implementation processes arising from differences in planning functions and budgeting functions. This disconnect is exacerbated by the temporal realities of capital projects as well as the several, but inextricably related, roles the enterprise government plays in the built environment, often simultaneously. The purpose of this event was to explore the benefits that could accrue to public owners from the ability to use the full range of modern service delivery methodologies in construction, which would require state law change.

In the broader statutory context, one significant impediment to project-level innovation that the are state laws that authorize a single service delivery—the segmented design-bid-build methodology with the award for construction projects going to the bidder with the lowest responsible and responsive price. 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, it remains essentially the same reflection of theory and practice today as when they were enacted.

Conversation: The first conversation explored the role of the built environment from an economics and public policy perspective, focusing specifically on the roles that effective and efficient public infrastructure programs and efficient and strong construction markets play in local, regional and state economies and related public policy issues. The second conversation discussed specific case study construction projects for public owners with

flexibility in matching service delivery methodology with project needs and owner capacity. The range of case study projects permitted a multi-disciplinary discussion of the benefits of using alternative service delivery methodologies balanced against the risks that the mandated design-bid-build methodology was intended and is often assumed to guard against. The last conversation explored how service delivery methodology reform was accomplished many years ago in another state—Massachusetts—whose construction industry stakeholders and urban/suburban/rural composition resembles those of New York's in important respects. This final exploration identified reform elements and process that appeared to be useful for New York to consider.

Roadway.3—A Work in Progress Continues

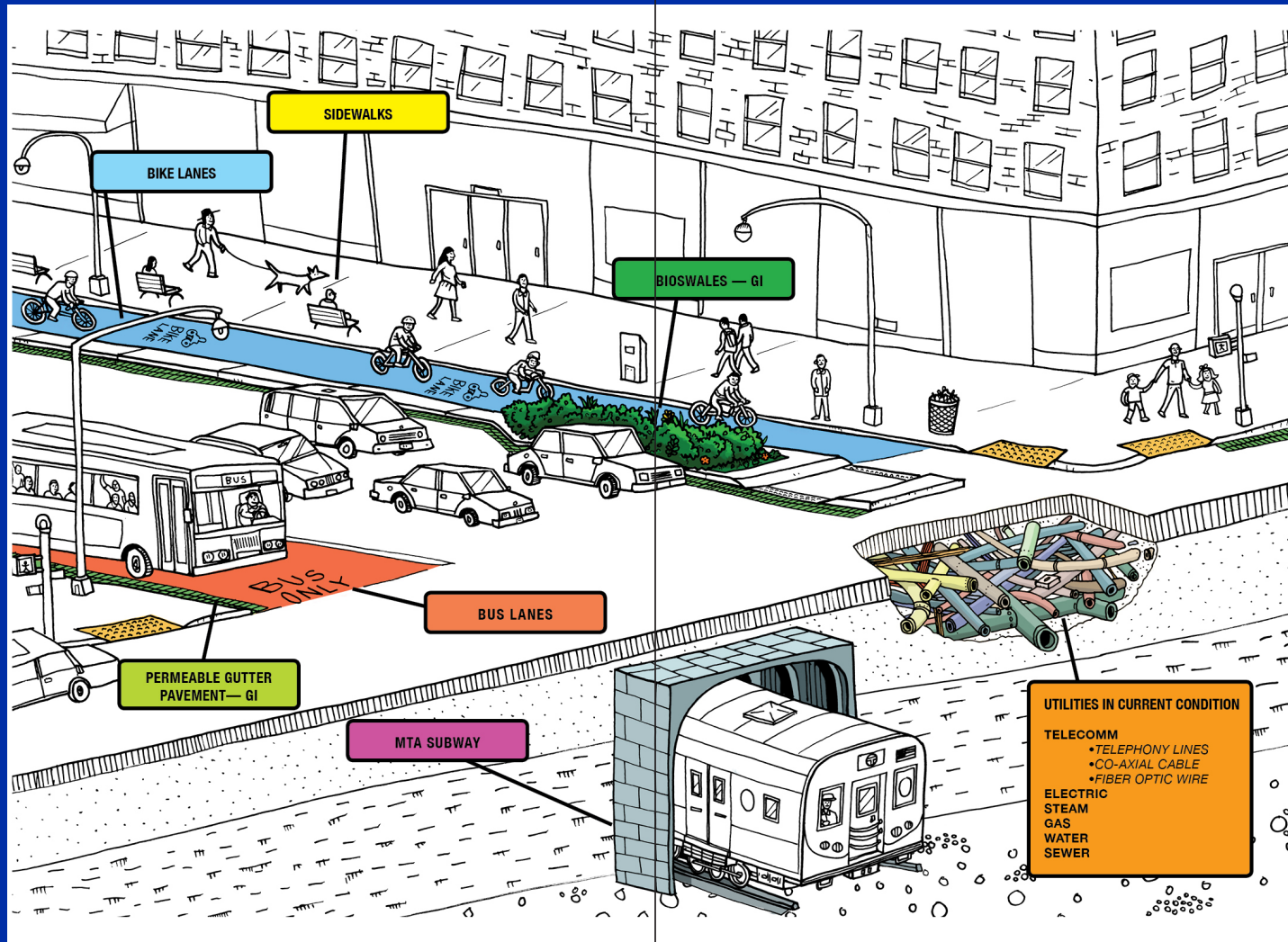
April 23, 2015

Purpose: This event was a smaller and more tightly focused conversation event to continue advancing a series of action research sets on issues related to the roadway. The targeted objective was to explore implementation of actions and strategies that look at the “whole street” for integrated planning, financing, budgeting and communications purposes.

Several action research sets emerged from an early Town+Gown project that explored how the city might incorporate long-term life cycle cost and full cost/benefit analyses to evaluate proposed sustainable roadway projects, which at the time had not been fully embraced by the city. This early project encountered data issues that subsequent action research cycles attempted to solve in different ways. The first action research set focused on historical practices and practices involving a complex set of relationships among the city, as owner of the streets on behalf of the public, and the private and public utilities operating beneath those streets. The resulting operational and financial impacts partially resulting from the nature of the roadway’s regulatory environment appeared to create or exacerbate the conditions for recursive collective action that tend to inhibit the use of innovative engineering design options that would increase the useful life of roadway surfaces

and avoid costs incurred by current practices and policies. The second action research set focused specifically on projects for green infrastructure add-on elements to standard roadway reconstruction projects, for which data had begun to be captured by city agencies or for which proxy data was available, and created a workable life cycle cost benefit model for such add-on projects as a route to create the expanded roadway life cycle cost benefit model that could be used in the capital planning and budgeting processes. The last action research set was a communications design-based investigation into the city’s infrastructure projects in the public right of way that New Yorkers encounter every day as they navigate the city, exploring how these countless interactions represent moments of opportunity for the City to engage, inform and even elicit feedback from its communities. The design of construction-related signage was thought to help provide this explanation and render these casual, everyday interactions into teaching moments with the potential to increase public awareness and stewardship.

Conversation: During these action research sets, various operational and design options emerged as ways to resolve aspects of the recursive collective action problem of the City’s roadways. The conversation involved assessing these strategies’ comprehensiveness in providing a solution in relation to geospatial incidence, initial and ongoing technical feasibility, and ease of implementation across many variables including coordination among stakeholders within and without government, enforcement, and financing.



Policy, Meet Design.2

In collaboration with Parsons Desis Lab, Public Policy Lab, AIGAINY and NYCxDesign

May 13, 2015

Purpose: *Policy, Meet Design.2* was the sixth event in Town+Gown's ongoing exploration of Design and a follow up event to *Policy, Meet Design* the year before, when a "Rosetta Stone" infographic of *10 things public policy analysts should know about design and 10 things designers should know about public policy analysis* was developed as part of a conversation about how city agencies could become better clients of design and collectively implement more effective design on a citywide basis. The purpose of this event was to further explore how design-based research methodologies and techniques turn data into knowledge in a cyclical process that includes policy recommendations, implementation and evaluation by using this Rosetta Stone as a tool for cross-disciplinary conversations to help both sides reach across the divide and increase cross-disciplinary collaborations

Conversation: The first part of the conversation explored design pathways in public policy, from an academic perspective involving researchers using the various design disciplines in the criminal justice area, beginning with a service design project in 2011-2012 for NYC DOP that turned into its

Neighborhood Opportunity Network (NeON) program, and moving forward into the series of NYPD design projects with Town+Gown in 2014-2015, as abstracted above. The second part of the conversation explored participant experiences with respect to several completed city agency service design projects, while the third part of the conversation explored issues encountered as NYPD embarked on a service design effort that began as part of the series of NYPD design projects in Town+Gown in 2014-2015, as abstracted above.



Building Ideas 6
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Bill de Blasio, Mayor

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