'Town + Gown' and CCNY's sustainability in the urban environment program☆

Terri Matthews[1] and George Smith[2]

CrossMark

The 'Town + Gown' program of the New York City Department of Design and Construction is a unique effort to systematize the involvement of universities and non-academic practitioners in research into 'built environment' issues. Town + Gown serves as a broker between academic and non-academic parties, and a platform for increasing the amount of focused research on the City's built environment. The Sustainability in the Urban Environment program of City College of New York has begun to integrate Town + Gown research topics into its Capstone Project program. One such project failed to get off the ground; another was a resounding success. An analysis of these two projects suggests a set of guidelines for effective Capstone Projects in the context of Town + Gown or a similar program.

Addresses
[1] New York City Department of Design and Construction, 30-30 Thomson Avenue, 4-096, Long Island City, New York, NY 11101, USA
[2] City College of New York, Sustainability in the Urban Environment, 301B Shepard Hall, Convent Avenue at 140th Street, New York, NY 10031, USA

Corresponding author: Smith, George (gsmith2@ccny.cuny.edu)

Introduction

'Town + Gown' (http://www.nyc.gov/html/ddc/html/design/tg.shtml) is a five-year old program of the City of New York, hosted at the New York City Department of Design and Construction (DDC) (http://www.nyc.gov/html/ddc/html/home/home.shtml). Since 1996, DDC has been the City's primary construction manager for a significant number of the City's construction projects. The primary aim of Town + Gown is to increase applied research relating to the city's 'built environment' — the vast assemblage of buildings, roads, tunnels, and other elements that collectively form 'the human-made space in which people live, work, and recreate on a day-to-day basis' [1]. Town + Gown aspires to provide 'systemic action research' on the built environment, with New York City as its laboratory.

The name 'Town + Gown' reverses the stereotypical notion of 'town versus gown' tension, focusing instead on mutually beneficial relationships between academic institutions and the larger communities of non-academics (who will herein be termed 'practitioners'). Historically, academics and practitioners have lacked an effective network of relationships to support an ability to link 'knowledge and need, research and use' [2]. Without a platform for effective collaboration, both groups have lost opportunities to bring practice and policy more closely into alignment with the results of sound research. Town + Gown aspires to provide this platform, by marshalling academic and practitioner resources as it works toward its mission of increasing applied research on the built environment over time.

The Sustainability in the Urban Environment program (http://www.ccny.cuny.edu/sustainability/) at City College of New York (http://www.ccny.cuny.edu/) is a five-year old interdisciplinary academic program. The program aims to integrate and apply the resources of several CCNY divisions — Architecture, Engineering, Science, and Social Sciences — to problems of urban sustainability. The program's particular mix of disciplines makes it well-suited to examine built environment issues, which tend to be so insistently interdisciplinary that a 'built environment interdiscipline' has been articulated [3]. The Sustainability program has been actively involved with Town + Gown for the past four years.

This article will begin with a general description of the origins and current operations of Town + Gown. It will then move to an analysis of one aspect of Town + Gown's sphere of engagement and activity with the academic community — its collaboration with CCNY on projects that CCNY Sustainability students carry out pursuant to the Capstone Project requirement of their Masters degree.

Town + Gown: rationale, philosophy, and operation
Dislocations and discontinuities
The tenures of elected officials and public administrators are often shorter than full economic cycles and their related business and construction cycles [4]. This leads to gaps in the transfer of accumulated knowledge from one cycle to another, and over time, from one set of policy makers to another. These discontinuities matter, because each set of policymakers must both deal with the consequences of policy decisions in prior cycles, and in turn set the conditions under which future policymakers will operate. When any set of policy makers identifies and analyzes a built environment issue, they often discover previously unresolved elements of that issue. One important reason such issues remain unresolved is the lack of a repository of applied research that can provide reliable and relevant knowledge, thus helping to span these inevitable structural discontinuities [5].

Research fragmentation
Applied research in built environment areas tends to be in short supply for a number of reasons. A distinctive characteristic of the construction industry is that it is composed of a large number of relatively small firms. Fairclough and others have analyzed how this fragmentation, compounded by inadequate connections between academic research and areas of application, has led to a scarcity of available and relevant research [6]. The fragmented nature of the industry is mirrored by the tendency of academia to organize itself into traditional disciplinary divisions, and to carry out research largely within such relatively specialized 'silos,' making such research of limited applicability to practitioners who work in the built environment, with its inherently interdisciplinary nature [7]. All these conditions conspire to create a persistent lack of relevant built environment research. This adversely affects not only private sector practitioners, but also public sector practitioners, whose practices and policies have wider ramifications.

Multiple government roles
Large organizations, including governmental organizations, are prone to internal compartmentalizing that hinders the free flow of information, including the results of research and analysis [8]. Further complicating matters, in the context of the built environment, is the fact that in this sphere the government is itself involved in multiple roles with distinct interests and responsibilities. Built environment policies and regulations implicate government at multiple levels: local, state, and federal. Government is simultaneously a public owner and client of construction-related services, a regulator of built environment practices and products, a promoter of economic development, and a financier of public capital programs via the issuance of public debt. This multiplicity of roles and responsibilities — to some degree in natural tension with each other — complicates the government's role as sponsor of needed remedies for the fragmented nature of the construction industry [9].

Reasons for optimism
The foregoing litany of complicating factors suggests that built environment research faces formidable challenges. And yet, the built environment is also an arena in which professionals — many of whom share common technical competencies — are 'willing to alter some beliefs and policy positions on the basis of analytical results' [10]. This suggested to the creators of Town + Gown that academics and practitioners, under the right conditions, could be brought together in productive collaborations. The creators also felt from the outset that one of the necessary conditions would be a willingness on all sides to view practitioners as equal partners in a dynamic research process, that is, as co-contributing 'peers' in knowledge creation [11].

A conceptual underpinning — action research
Some recently emerging tools can serve as promising frameworks for bridging divides between academics and practitioners. They fall under the broad rubric of 'cooperative inquiry,' and include 'action research' and 'action learning.' These methods aim 'to implode the researcher-researched hierarchy and unite practice and theory in a way that privileges lived experience and relinquishes 'expert' control over knowledge' [12]. Action research has been described as an approach that 'combines inquiry with action as a means of stimulating and supporting change and as a way of assessing the impact of that change' [13]. The creators of the Town + Gown mechanism were influenced by the way action research explicitly links attempts to study with attempts to solve systemic issues. It requires equal partnership between academics and practitioners, elevates practice as a source of knowing equal to academic knowledge creation, and demands 'continuous cooperation between researchers and practitioners' [14].

Emergence of Town + Gown
Starting in 2008, DDC began to work with academics and practitioners to identify a mechanism that could help solve the various built environment research difficulties. The general consensus at several 'incubation' meetings in 2008 was that the mechanism should not be another academic center or advocacy-oriented private 'think tank.' It would have to bridge the divides between academics and practitioners, acknowledge a shared vision of common outcomes, and operate so as not to impose any burdensome new structures. And it would have to be sensitive to the natural concerns of both academics and practitioners about losing autonomy. What emerged was the Town + Gown platform, hosted by DDC on behalf of public and private practitioners. It connects practitioners with a wide range of academic entities in order to encourage collaborations on applied built environment research

projects. Its initial aim is to foster research carried out by graduate students within existing experiential or service learning programs at the participating academic institutions. Its next aim is to foster research by professional academic researchers through an academic 'consortium contract' — now in-process — which will facilitate funded research projects [15].

Town + Gown: the basic mechanism

Town + Gown participants on the practitioner side include New York City agencies involved with construction and other aspects of the built environment, other public owners operating in the city, and various private sector entities (e.g., trade and professional associations). Its more than twenty academic participants include most of the major institutions of higher education in the New York City area. The basic operation of Town + - Gown can be summarized below:

(1) Town + Gown works with the practitioner and academic participants to generate built environment research questions of current interest. These form the core of a 'research agenda' posted on the Town + Gown website. The agenda also includes updated research questions from completed projects, outlining additional research needs. This research agenda serves as the focal point for a conversation between academics and practitioners interested in developing applied research projects.

(2) Town + Gown functions as the broker (or 'match-maker') who connects academic partners interested in a particular research question with the practitioner most involved with that particular question. As a project proceeds, Town + Gown facilitates the collaboration, helping to bridge any divides.

(3) At the completion of each academic year, Town + - Gown abstracts completed projects into its annual review document, *Building Ideas*. The posted volumes of *Building Ideas* serve to disseminate research results, as well as serve as a form of institutional memory for those participating in the built environment.

(4) Each year, Town + Gown uses completed projects as the focus of open-ended conversations at several symposium events. At these symposia, Town + Gown participants discuss what 'action steps' could follow from the research results. An action might be a pilot initiative to change a policy, or the formulation of a new research question for the next version of the research agenda. The transition to action steps completes an 'action research' sequence, and sets up the program for the next action research cycle.

The research agenda

The research agenda is arguably the core element of the Town + Gown program. The 2014 Research Agenda can be downloaded from the Town + Gown portion of the

DDC website: http://www.nyc.gov/html/ddc/html/design/tg.shtml. Research agenda questions are deliberately framed in a somewhat general manner, given that 'systemic action research' requires an openness to multiple modes of inquiry and analysis. Once a 'match' is made, the practitioner and academic partners can work together to define a more specific problem statement. The questions are loosely organized under one of six disciplines: management, geography, economics, law, technology, and design (which includes both architecture and engineering). Each question is elaborated in a one-page description that provides Background, Question(s), and Practitioner Partners. And each is further marked with icons indicating its links to one or more multi-disciplinary themes that a single disciplinary heading can obscure: active design; economics and law; environmental sustainability; financial sustainability; infrastructure; innovation/technology; and risk management. To give a brief sense of the nature and diversity of research agenda questions, here is a more-or-less random sampling of six questions, one from each of the disciplines:

- How can owners better manage scope changes as projects evolve?
- How to promote more sustainable neighborhoods — economically, socially, and environmentally?
- What economic factors influence costs and project efficiency on roadway projects?
- How to assure a 'green' future — green building regulations and enforcement?
- What modern mapping technology exists for efficient and effective planning?
- How to increase design-focused research and development?

CCNY's engagement with Town + Gown
Ongoing demand for Capstone projects

The Sustainability in the Urban Environment program at CCNY offers a 30-credit MS in Sustainability degree. Of these 30 credits, 18 are for prescribed core courses, including a two-course 'Capstone Course' sequence that together constitutes six credits. In short, every student who passes through the program must successfully complete a Capstone project over the course of two successive semesters. These projects are carried out by interdisciplinary teams, each consisting of from two to four Sustainability students from differing academic backgrounds. Each team is supervised by a CCNY faculty member, typically a faculty member associated with the schools of Architecture, Engineering, Science, or Social Sciences. In most cases the faculty supervisor will have designed the Capstone project and provided the initial project description, although students are given the option of designing and proposing projects of their own.

Endless supply of topics

A stroll through New York or any other city suggests that the contemporary world offers an unlimited supply of

challenging urban sustainability problems. Working such problems up into suitable topics for Capstone projects requires a bit of shaping and massaging. CCNY's program stipulates that a Capstone project should have three basic features: (i) it focuses on a real-world sustainability issue or problem that invites an interdisciplinary approach (e.g., some combination of engineering, architecture, science, and social sciences); (ii) it is difficult/challenging, but still allows for meaningful progress in two semesters; and (iii) it offers avenues for substantial academic research, possibly leading to a journal article. Some sample CCNY capstone projects — that is, summary project descriptions — are posted on the Sustainability program website under 'Curriculum': http://www.ccny.cuny.edu/sustainability/curriculum.cfm.

Town + Gown as rich lode of potential projects

As has been made clear above, Town + Gown is a useful mechanism for identifying and describing practical research needs of various built environment practitioners, including New York City government agencies. It is thus a rich source of 'real' research problems, that is, ones that have a certain pressing and practical nature that academic research questions sometimes do not. This fits neatly with CCNY's call for Capstone projects focusing on 'real-world' sustainability issues. Town + Gown, of course, deals broadly with the built environment, and thus with a great range of issues, not all of which are explicitly related to urban sustainability. On the other hand, most built environment issues arguably have at least an implicit sustainability dimension. This claim is in fact well-supported by the actual topics of the 2013–2014 Research Agenda: of the 94 topics listed, slightly more than half (48) were labeled by Town + Gown with the icon indicating a connection with environmental sustainability. And many of the remaining topics in the agenda could no doubt be tweaked to emphasize sustainability dimensions. In short, the Town + Gown research agenda provides a very promising repository of potential Capstone projects for CCNY's Sustainability program.

Collaboration to date

CCNY's Sustainability program has completed a 'pilot' collaboration with Town + Gown, that is, has engaged in two Town + Gown projects, and is planning for the next stage of collaboration. One issue calling for further thought — and perhaps reflecting a degree of operational disconnect — relates to faculty supervision. With CCNY Capstone projects, the general pattern is that they emerge when a faculty member has a special research interest or pet project that they wish to fashion into a Capstone project for a team of Sustainability students. With Town + Gown projects, the genesis of the project is of course quite different. Thus, a threshold challenge is to connect and engage a faculty member with a project that to a degree has emerged from outside that faculty member's zone of interest and control. But rather than discuss

this and other issues in piecemeal fashion and in the abstract, we will now examine them in the context of specific Town + Gown projects at CCNY.

Reflections on the collaboration to date

We will now review two actual Town + Gown projects, one that failed to get off the ground as originally expressed and one that was clearly successful. Since failure is often more instructive than success, the discussion may dwell on the former. Summary descriptions of the two projects will be immediately followed by some critical reflection. The format will attempt to create a sense of dialog by beginning with a 'Gown' view, followed by a responsive Town + Gown perspective.

A non-starter

In 2012, a three-student CCNY Capstone team began a project with a Town + Gown practitioner partner. The initial objective was to analyze problem areas within a new web-based tracking system, research potential solutions, and draft a report outlining recommendations. Within a month, students began reporting that they felt the scope of the project seemed too narrow, and moreover that they were not getting sufficient access to certain types of data they thought would be useful. Some members of the team felt they were losing forward momentum, while others thought it was a normal problem-definition challenge. This may have exacerbated preexisting intra-team friction. In any case, by March, one student team member dropped out of the project, and the remaining two decided to essentially abandon the original project topic and create a new one relating to affordable housing. (It should be noted that with this new project, the team went on to successfully complete their Capstone project.)

A winning project

In January 2013, a two-student team embarked on a Town + Gown capstone project titled, *Sustainable Design Best Practices Database*. The team aimed to create a Sustainable Design and Construction Best Practices Database as a prototype, in the context of the activities of New York City's Department of Design and Construction (DDC). Using high performance buildings, planning, and infrastructure projects as case studies, the team explored ways to continually identify and communicate the lessons of new and innovative strategies in the context of individual projects and in standard practice. The result, as described in the team's final report, *Open Data for Resilience*, was the creation of a DDC Building Resilience Database wiki as a prototype that is 'an easily searchable database of current best practices with content generated from an amalgamation of resilience standards as recently defined by a variety of agencies.' The team's presentation of the project at the CCNY's Capstone Presentation event on December 18, 2014 won the Latif Jiji Prize for best presentation.

Analysis from the Gown perspective

From the point of view of CCNY's Sustainability program — represented by co-author Smith — the unsuccessful project was plagued with a cascading series of problems. The project as initially defined may in fact have been too narrowly task-oriented, that is, at a level of specific database development work that was not ambitious enough for a capstone project. The agency contact supervising the students showed an admirable willingness to adapt the scope of the project, but also noted that he could not tie up staff time in close supervision of the students, that is, that student autonomy and initiative was essential. It is difficult to assess the student claim that certain types of data were not forthcoming. At that point, the team was considering an evolving project description, and the agency may not have been fully on board or fully aware of what the changed scope of the project would entail. It may have been somewhat guarded with its information, for its own internal reasons. As noted, the team was in various respects not interacting smoothly and amicably, and the sense of uncertainty about project direction may have exacerbated these difficulties. Perhaps more or a different type of faculty guidance might have helped the team develop a plan for obtaining the information from the agency. Only after one member resigned was the team able to proceed with a redesigned project.

The successful team did not encounter these problems, or perhaps actively avoided them. While they too were doing something quite analogous to database-development work, they were operating on a more fundamentally creative level, that is, developing a new tool rather than reforming an existing one. They were exceptionally proactive with respect to the project, and were also fortunate to have the active support of the client agency. A DDC contact was able to meet with them and provide feedback throughout the project.

Town + Gown response to Gown analysis

From the point of view of Town + Gown — represented by co-author Matthews — the foregoing analysis seems essentially on target. But two additional contributing factors could be mentioned. In the case of the project that stalled out, the decision of the student team to alter the scope of the project naturally produced some hesitation on the part of the agency, which in turn may have affected their ability to provide requested data. Secondly, it should be noted that the successful team allowed Town + Gown staff to arrange interviews and provide feedback throughout the project.

From a longer-term perspective, Town + Gown believes that at this stage in the life of the program, each completed project can be considered a successful project. Each completed project articulates some aspect of an ongoing built environment issue and provides some analysis and a bibliography for practitioners and future researchers to use and build upon in successive action research cycles. Each completed project provides a resource for reflection at a symposium event, and thus can eventually lead to research-based action. On the practitioner side, the investment of effort with student teams pays off in the resulting work product. This means at a minimum meeting with the team at least three times during a project: at the beginning to explain the issues and data sources; in the middle to review progress and interim conclusions and provide a mid-course correction if necessary; and at the end to review their final work product and provide comments to make the work product usable on the practitioner side. Town + - Gown will work with student teams and practitioners to facilitate these interactions and make them as effective as possible. Student teams, on the other hand, need to understand that the practitioners who take the time to meet and work with them are telling them things they need to understand so they can be effective on their projects and when they emerge after graduation into practice.

Tentative synthesis

Based on the foregoing reflections, here are some basic guidelines for future Town + Gown projects that involve CCNY's Sustainability in the Urban Environment Capstone project teams:

- The CCNY faculty supervisor should be on-board with the Town + Gown approach generally, fully engaged with the particular project, and comfortable with dual-supervision.
- The initial project description should reflect work that the practitioner (e.g., an agency) truly needs to accomplish. But at the same time, it should not be overly task-oriented and should allow scope for innovation and expansion.
- Students and agency supervisors need to discuss — early and often — potential redefinition of projects, access to data, and availability of agency personnel.
- Students need to be relatively self-directed and proactive, but open to guidance from the practitioner partner, especially with respect to what the practitioner needs from the research.
- Students and their CCNY faculty supervisor need to be receptive to Town + Gown efforts to mediate, e.g., by setting up interviews and providing feedback.
- CCNY's Sustainability capstone coordinator needs to closely track Town + Gown projects, with special attention to the deliverables they may call for and how these can be integrated with the Final Capstone Project report the program requires.

Concluding remarks

The fact-gathering required for this article, and the reflection it has engendered, might itself be loosely analogized to a mini-'action research' project. If so, then the follow-up 'next action' is clear: The Sustainability program intends to move to the next stage of collaboration

with Town + Gown, informed by the foregoing set of guidelines. And Town + Gown will continue to welcome CCNY's participation, and help mediate with parties on the practitioner side of projects.

Several near-term objectives are emerging: at some point in the next several years, CCNY will likely have generated a fairly sizable body of completed Town + Gown Capstone projects. This will allow comparative evaluation of the educational value of faculty-generated Capstone projects *vis a vis* Capstone projects generated by outside practitioners. CCNY will also be able to assess the value of its contributions to practitioner partners, perhaps drawing as well on the accumulated experience of other Town + Gown academic participants [16]. And Town + Gown, for its part, will at some point need to evaluate its effectiveness in increasing applied research that is of real use to practitioners. To reach this point, several additional 'action research' cycles will be needed. Once the academic consortium contract is operating, the response of practitioners will provide an additional window into Town + Gown's effectiveness.

In its collaboration with Town + Gown, CCNY's Sustainability program will continue to engage with a central paradox of applied interdisciplinary projects. Students rightfully gravitate to the richness of 'real-world' interdisciplinary projects that offer a realistic preview of the working world they will soon enter. But students also expect that an academic program will imbue the projects with a 'value-added' factor by helping to ensure that project analyses display academic depth and rigor. With Capstone projects in general, and Town + Gown Capstone projects in particular, one promising strategy will be to reinforce efforts to help students effectively perform the secondary research that will usefully inform their work on the primary problem of their particular project. If this is done well, then students will be receiving the benefits they expect from an academic program, while simultaneously positioning themselves to offer more insightful solutions for their practitioner partners in Town + Gown projects.

References and recommended reading
Papers of particular interest, published within the period of review, have been highlighted as:

- • of special interest
- •• of outstanding interest

1. Roof K, Oleru N: **Public Health: Seattle and King County's push for the built environment**. *J Environ Health* 2008, **71**:24-27.

2. Marwell N, Jacobsohn F, Neva S, Okamoto M: *University–Community Partnership: New York City University-Nonprofit Information Transfer Project Report*. Columbia University, Center for Urban Research and Policy; 2003:. (www.columbia.edu/cu/curp/publications.html), p. i.

3. Chynoweth P: **The built environment interdiscipline: a theoretical model for decision makers in research and teaching**. *Proceeding of the CIB Working Commission Building Education and Research Conference*. 2006:1-5 In: http://www.lawlectures.co.uk/bear2006/chynoweth pdf.

4. Myers D: *Construction Economics: A New Approach*. Spon Press; 2004:. p 60.

5. For a more detailed prior exposition about structural impediments to research posed by the economic cycle of the built environment, see Matthews T: 'Case Study: New York City's Town + Gown Program, Chapter 14 in Town + Gown: Legal Strategies for Effective Collaboration, CA Baker and PE Salkin editors (Chicago: American Bar Association 2013), pp 312–316.

6. Fairclough SJ: *Rethinking Construction Innovation and Research: A Review of Government R&D Policies and Practices*. Department of Trade and Industry; 2002:. pp 14–19 (see also Myers [4], pp 5, 10).

7. Oaña JR: *Developing and Managing a Research Program: FEU-SURE and Urbanization Issues, Conference on Urbanization and the Educator's Response, November 19, 2004, Far Eastern University Conference Center, p. 1, citing Linda N. Groat and David Wang, Architectural Research Methods*. John Wiley & Sons; 2002 In: http://ched-zrc.dlsu.edu.ph/pdfs/joel_oana_paper.pdf.

8. Wilson J: *Bureaucracy (New York)*. 1989:. pp 221–232.

9. The Construction Law Committee of The Association of the Bar of The City of New York, 21st Century Construction, 20th Century Construction Law, February 6, 2008 (http://www.nycbar.org/pdf/report/ConstructionLaw.pdf), p. 6; see also pp 7, 20. See also Fairclough [6], pp 14–15; National Research Council (U.S.), Building for Tomorrow: Global Enterprise and the U.S. Construction Industry 55 (1988); and Matthews [5], pp 313–316.

10. Hank J-S: *Democratic Politics and Policy Analysis*. Pacific Grove; 1990:. p. 103; see also p. 118.

11. For a more detailed prior exposition about supporting theories, see Matthews [5], pp 317–320.

12. Ospina S, El Hadidy W, Hofmann-Pinilla A: **Cooperative inquiry for learning and connectedness**. *Action Learn: Res Practice* 2008, **5**:131-147 (Taylor & Francis); online reprint, http://www.informaworld.com/smpp/content~db=all?content=10.1080/14767330802185673, p. 2;
Reason P: **Choice and quality in action research practice**. *J Manage Inquiry* 2006, **15**:187-203.

13. Burns D: *Systemic Action Research: A Strategy for Whole System Change (Bristol)*. 2007:. p 11.

14. Burns D: *Systemic Action Research: A Strategy for Whole System Change (Bristol)*. 2007:. p 13.

15. For a more detailed prior exposition about Town + Gown's incubation period, its initial focus on experiential learning programs and the academic consortium contract, see Matthews [5], pp 320–322 and 323–332; see also Marwell [2], pp 6–7, 15–17.

16. See, e.g., some lessons learned at NYU: Schachter D, Schwartz S: **The value of Capstone Projects to participating client agencies**. *J Public Affairs Educ* 2013, **15**:445-461.