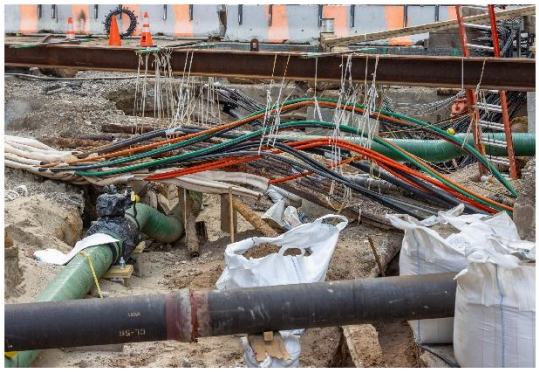
TOWN +GOWN: NYC

Under the Ground.3

It's 10 P.M., January 1, 2075
Do We Know Where Our Subsurface Infrastructure Is, Actually?
Can We Get to It Easily to Minimize Disruptions?
Do We Still Have Subsurface Spaghetti?

4 WTC, 43rd Floor, HRA Dumpson Center
June 5, 2025, 8:45 AM—5 PM



Town+Gown | Building Ideas

Precis

This Event. Since our last *Under the Ground* event, on April 28, 2021, there has been much work within and for the Utilidor Working Group (@ Town+Gown Working Groups: Utilidor) that has advanced our collective thinking on ways to deal with the historical "subsurface spaghetti" of public and private utility distribution infrastructure under the public right of way (PROW) caused by the "direct burial" method. While an "everything everywhere all at once" approach to righting the "subsurface spaghetti" problem is not possible in an active and established dense urban environment like NYC, a long-term systems-based approach may be possible. See also @ 01-29-20-Precis.FINAL.pdf for the first *Under the Ground* event on January 29, 2020, which might have been one of the last in-person events before the "lock down".

The academic year 2021-2022 Columbia/SIPA project, @ LifeCycleCostBenefitAnalysisSupportCreationSmartCityInfrastructureAuthority.pdf, discussed below, became the occasion for a professional study with NYC agencies and other subsurface PROW stakeholders conducted over Fall 2023 through Summer 2024, on the idea of future utilidor

implementation. Much knowledge was exchanged and developed, leaving us with a "multi-modal" framework that initially considers what we are doing now and can do more of in the near term and what we need to think about doing to move us toward some version of utilidor implementation in the future. The presentations at this *Under the Ground* event bring forward what we have learned in that study to more stakeholders in the subsurface PROW so that we may continue to move forward toward desired long-term change.

A systemic approach to change over time requires understanding the **context** for the "baseline" problem and various possible interventions (in all their economic, social, environmental and political glory), with knowledge of **interdependencies** with other systems and all **actors** capable of influencing the intended change. It requires understanding how the **outcomes** of intervention would improve the baseline problem, who would ultimately **benefit** from them, and **sequencing a process** of change over time.[1]

The Utilidor Idea Emerges.

In 2006, City agencies involved in roadway construction engaged in a professional study on Roadway Repair Technology and Best Practices to investigate ways to improve and maintain street infrastructure at a lower cost per mile, with less disruption. Among the study's recommendations was a proposal to implement a pilot program for utility tunnels in various locations with concentrations of underground utilities, which would allow utility lines to be installed, upgraded and repaired without road disruption and also permit utilities to install remote sensor equipment to monitor flow for system monitoring to identify potential breaks requiring emergency repair and predict state of good repair needs for effective and efficient state of good repair capital programs. This recommendation was expected to reduce the need for street cuts, extend the time between resurfacing, and improve street conditions. Focusing on that study recommendation, Town+Gown has conducted several projects discussed below.

Research within Town+Gown.

- In academic year 2010-2011, Town+Gown began its focus on the subsurface PROW during an NYU/Wagner capstone project for DOT to explore how the City might incorporate long-term life cycle cost and full cost/benefit analyses for projects adhering to DOT's sustainable street design guidelines. This student team identified significant data gaps to use for their model, and the "spaghetti subsurface problem" kept rearing its head during interviews and discussions with the student team.

- At the February 22, 2012 *Lifecycle Costing Data for Roadways* symposium event, @ Town+Gown Symposia, participants began to explore where data or proxies might exist for use in a future version of the Wagner model when the conversation quickly and decidedly became a collectively experienced introduction to the "spaghetti subsurface problem." A key takeaway from that conversation was that state regulatory practices governing the portion of approved rates attributable to private utility capital programs contributed to the spaghetti subsurface condition and the related data environment.

[1] Chris Rogers, Lewis Markana, Joanne Leach and the UKCRIC Community, *The Little Book of Theory of Change for infrastructure and Cities*, pp. 6-7 (Theory of Change for Infrastructure and Cities.pdf, accessed 04/28/25, 6:27 PM).

- In academic year 2012-2013, Brooklyn Law School students conducted extensive legal policy research that focused on the nature of the regulatory environment in which the private utilities operate in the context of a hypothetical utilidor. @ UtilityRegulationWorkBookBrooklynLawSchool.pdf, which was followed by a February 12, 2013 event, *Roadway.2—A Work in Progress* @ Town+Gown Symposia, which pointed in the direction of utilidor financing.

- The subsurface PROW work within Town+Gown went into hiatus after a small lifecycle cost benefit model for green infrastructure installations in the PROW was completed in academic year 2014-2015 and re-emerged in 2018-2019, with the creation, in January 2019, of the Utilidor Working Group

- At the May 30, 2019 *Construction+Finance in 2019: Innovative Delivery and Finance* symposium event, @ 05-29-30-19-Precis.FINAL.pdf, there was a case study presentation on the federal Revenue Procedure 82-26 (formerly Revenue Ruling 63-20) "63-20" financing vehicle to lay the foundation for utilidor finance analysis due to public and private use aspects of utilidors.

- There were two Columbia/SIPA capstone projects that performed a lifecycle cost benefit model analysis of implementing utilidors. The academic year 2019-2020 project, @ RoadToSmartCityColumbia-SIPA.pdf, included direct and indirect costs, and the academic year 2022-2022 project, @ LifeCycleCostBenefitAnalysisSupportCreationSmartCityInfrastructureAuthority.pdf, only focused on direct costs. Both LCCBAs used the same NYC capital project (with joint bidding data) for Beekman Street and showed benefits exceeding costs over the life of a utilidor.

- An academic year 2022-2023 NYU/Tandon-MOT project, @ Capstone Project 13 Report v1.0, used publicly available surface data (including excavation permit data) to suggest subsurface infrastructure vulnerabilities in a heat map for Queens as one way to suggest initial locations for utilidors. This project followed earlier projects @ LAMP (for Manhattan) and @ Final Presentation.pptx (for traffic disruptions).

- An academic year 2022-2022 NYU/CUSP project, @ Capstone Final Report - Reverse Engineering to Estimate Subsurface Utility Infrastructure Density for Financing Smart City Infrastructure, used surface densities to "reverse engineer" subsurface PROW infrastructure densities to serve as another way to suggest initial locations for utilidors.

- A summer 2024 NYU/Wanger project repeated the LCCBA methodology from the Columbia projects on another more recent NYC capital project (with joint bidding data) for Worth Street, showing benefits exceeding costs, with several sensitivity analyses added @ WorthStreetLCCBAUtilidorvsTradCostsNYUWagner.pdf.

- A summer 2024 NYU/Tandon project created a GHG emissions calculator to estimate GHG savings from not having to do excavations for all but sewers in a utilidor @ Street Excavation Emission Calculator.