

Applicant Information Construction+Demolition Waste (CDW) Working Group of Town+Gown

Organization/Company Website

<https://www1.nyc.gov/site/ddc/about/town-gown.page>

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Organizational Description

Town+Gown is a city-wide action research program, resident at NYC DDC, that provides research resources for practitioners and academics in the built environment to develop and facilitate research projects, including experiential learning engagements with graduate students. Town+Gown will help work with the student team and the CDW Working Group, as client, on this project to bridge the academic practitioner divide and ensure this project is successful for both the student team and the CDW Working Group.

The CDW Working Group consists of representatives from NYC DOT, NYC DEP, NYC DDC and NYS DEC who are working toward expanding the recycling and reuse envelope to include CDW by leveraging the City's capital program to close CDW materials loops within the city.

Project Title Mapping Construction+Demolition Waste Flows to Re-Use C+DW in the City's Capital Program

Project Abstract

The State regulates CDW—its generation, recycling and reuse—and collects all data on CDW. There is no city source of data for CDW. For the city to innovate policy with respect to CDW by leveraging its capital program as one way to close material loops, which would generate environmental sustainability and financial sustainability benefits, understanding where CDW goes from the demolition process through the recycling process is the most important single step.

Project Description & Overview

The City is always building. As a part of this growth, materials are brought to and from private and public construction sites. Movement of CDW components, such as concrete, soil and gypsum, represents a significant portion of the waste and transit associated with construction in NYC. Currently, this material is reused in an untracked manner between project sites or sent to landfills. Opportunities exist for City agencies to reuse CDW components between sites for a myriad of benefits. NYS Department of Environmental Conservation (DEC) is responsible for the state's solid waste management regulations, which apply to all CDW consisting of materials from the construction and demolition of buildings and infrastructure. These regulations apply to all local governments in New York State, including New York City. CDW can be separated on construction sites into various components, such as concrete, steel, glass, gypsum, and soil, all of which can be recycled and reused as permitted by the regulations.

The environmental benefits of closing the CDW loops include expanded reuse of CDW with fewer emissions from trucking new materials into the city from outside the metropolitan area and reduction of

transportation of materials to landfills for disposal and associated reductions in environmental impacts due to reduction in landfills use and transportation of materials to landfills; and financial benefits include reduction in construction costs due to the reuse of some CDW components and reduction of transportation costs due to transport from outside the city for new materials. In addition, the ability for CDW recycling to move as a resource toward higher value uses, with the aid of engineering technology, also depends on understanding the pathways of CDW as a resource.

The CDW Working Group needs to understand from available NYS DEC the CDW material flows in this region—where, when, how much and what type of CDW materials are available for reuse—which is the basis for the research question underlying this project. What are the patterns of CDW generation, processing and recycling within the City (Region 1) and what recycled CDW materials are available for reuse on construction projects within the City (Region 1) to help New York City close material loops by leveraging its capital program? Developing a data visualization of the CDW waste flows from generation to recycling is critical for the CDW Working Group as it moves ahead with its goal of increasing reuse of recycled CDW elements on New York City’s capital projects and thus helping to close material loops. While LEED and Envision frameworks do contain credits for re-use of recycled CDW, there is no systemic citywide plan to support efforts in these areas, including economic and market efforts, so that more CDW ends up in landfills than might be feasible under the right citywide supportive plan.

Relevance

The City’s OneNYC plan focuses on recycling of putrescible waste not CDW, partly because the State controls the field and is the repository for the data. This is a complex issue area, and this project represents the first data visualization of the State’s CDW dataset. With a better understanding of the CDW material flows within the NYC region, the Working Group hopes to develop an innovation policy that would be implementable in the City’s next city-wide long-term sustainability plan, most likely to emerge in the next administration.

Datasets

Three years of data for the NYC region is publicly available at:

<ftp://ftp.dec.state.ny.us/dshm/>

Three years of data may be available at the time of this project. This is big data due to the different types of CDW, the number of firms filing reports, and the level of construction activity in the region.

While publicly available, it is tricky to find and is not digital. NYS DEC, a member of the working group, would be available to assist in getting to this publicly available data set.

Learning Outcomes/Deliverables

The deliverables will consist of an interactive visualization or similar product that illustrates the flow of CDW from construction demolition to transfer stations and recycling facilities and some of it to landfills as described above and final report that provides the methodology and analyses used and findings. Once the student team develops the methodology and data visualization tool for the NYC region, the State may be interested in applying the model to the entire State—the ability to map the data may also help speed future policy development.

1. As part of the domain research component, the students will gain a deep understanding of the urban built environment as it relates to construction and demolition waste within the environmental sustainability area.
2. This geospatial data analysis/mapping of precise raster-type data will enable the students to use all data analytic skills learned to date and possibly require them to pick up other techniques required by the project.
3. As part of developing the data visualization map, the students will should develop theories with respect to the circular economy for CDW and develop a predictive model for future use by the CDW Working Group. This is in addition to the map, the importance of which cannot be overstated.

Competencies *

All students should have excellent data analytic skills, since the bulk of the data is historical, and geospatial data analytic skills, and an interest in environmental sustainability and the need to increase reuse of CDW would be helpful.