



**TOWN
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NYC**

Urban Resource Recovery Working Group

Role of New York Local Governments in Increasing Recovery and Reuse of Construction and Demolition Waste

The local government action roadmap below reflects the work of the Town+Gown (T+G) Urban Resource Recovery (URR) Working Group within the Town+Gown:NYC action research program (see <https://www1.nyc.gov/site/ddc/about/town-gown-working-groups.page> and <https://www1.nyc.gov/site/ddc/about/town-gown-archives.page#symposia>). Since 2017, the URR Working Group has focused on applying “zero waste” theory to construction and demolition waste (CDW). The URR Working Group has developed a pilot framework available to all New York local governments to reform their construction practices and policies to help move New York State toward “zero waste” for CDW. New York local governments can contribute directly to meeting the requirements of New York’s Climate Act” through their control of local government assets such as streets, wastewater treatment plants and public buildings and their ability to enact local legislation, enact policies, and regulate land use. Local governments can also “lead by example” while achieving cost savings.

CDW includes excavated soil, concrete, metals, asphalt, and gypsum (calcium sulfate dihydrate) wallboard, some of which can be re-used directly and others that require additional processing. Pre-processing of recovered CDW into usable feedstock for construction material manufacturers (interim processing) is a critical first step in a multi-step process to turn what is often considered waste into a valuable new construction materials. Public capital programs represent an opportunity for local governments to deepen their sustainability policies and shift toward a more circular or closed loop economy where, consistent with New York State Department of Environmental Conservation (NYSDEC) beneficial use designations (BUDs), recovered CDW becomes a resource for their own projects by increasing direct re-use of recoverable CDW within their capital programs and a resource for construction material manufacturers by actively increasing indirect re-use of recoverable CDW through interim processing to increase feedstock for these manufacturers of new construction materials.

The specific absence of CDW in municipal solid waste (MSW) management and local environmental sustainability plans is largely due to several challenges, the first of which stems

from the fact that local governments, like most construction owners, primarily engage in construction activities through construction contracts with private sector firms, which puts CDW policy development at a remove from policy efforts primarily focused on government-managed MSW materials. The standard construction framework for public construction projects conducted with private sector firms operates as a challenge because construction contracts generally delegate CDW management and disposal to a contractor's "means and methods" discretion. Under these typical provisions, the contractor sends recovered CDW of monetary value to interim processing and transfer stations and retains whatever compensation they receive, which amounts had been previously calculated in their bid price, with the rest going to landfills. If a public owner were to require its contractors to do something beyond standard CDW practice without allowing some retention of value, it would likely lead to increased bid prices.

Another challenge stems from NYCDEC's regulatory assumption of a functioning "market" to generate sufficient private firm investment to expand and build necessary interim processing and manufacturing facilities for higher value construction materials without market supports beyond the regulations themselves. These supports include a reliable and predictable supply of recovered CDW as resources and a reliable and predictable demand for new construction materials using recovered CDW to permit firms to plan and invest; real time data matching of supply and demand for market efficiency and project schedule reliability; appropriate incentives and subsidies for private action and investments; and, a local market signal that public policy supports a continued transformation of CDW as a waste to a resource. Without such local market supports, existing price signals within the construction market (e.g., increases in landfill fees due to landfill environmental and capacity issues and increased new construction material costs) may not *on their own* be sufficient for efficient recovery and re-use market creation and increased levels of private sector investment.

Finally, insufficient local CDW material and volume data to inform policy analysis and implementation is the last challenge. Local project CDW data may be difficult to extract due to the construction contract framework. Some of NYSDEC's CDW data reports are publicly available, but they are in non-digitized form; and the NYSDEC CDW data report generated at project sites is not yet publicly available. The additional need to analyze the lifecycle of each specific CDW material separately—from material generation, physical properties for use and re-use, recovery interim processing requirements, and re-use in different applications or new materials—increases the complexity of necessary analysis. The prevalent construction practice of combining multiple CDW into a single container for off-site transport under current policy conditions further complicates analysis, never mind actual recovery.

The roadmap outlined below consists of deliberate local government “leadership by example” interventions through practice and policy innovation that leverage local governments’ capital programs to transform CDW as a *waste* into *resources*. This roadmap is a well-considered way to bring CDW into the Draft Scoping Plan that is within the powers of local government and has the potential save costs for localities and their taxpayers while reducing the negative environmental impacts of construction. It addresses local government challenges of applying “zero waste” theory to recovery and re-use of CDW at the local level and reforming construction practices and policies to close CDW material loops and bring CDW into local “zero waste” policies.

NYCDEC BUD regulations operate as a “safe harbor” for the re-use of recovered CDW materials because a particular recovered material and re-use meeting the conditions of a BUD is no longer deemed a solid waste subject to other regulations and its re-use is permitted pursuant to the BUD designation. While NYCDEC BUD regulations are the foundation for systemic transformation of CDW as a resource, they are insufficient on their own for industry transformation. As discussed above, these regulations and public construction contracts assume and rely on an efficient and functioning “market” to generate sufficient private investment to expand and build new facilities in or near localities generating significant amounts of CDW. New York’s local governments can use their construction activities to activate the potential of NYSDEC BUD regulations because, in many local construction markets, public construction spending often functions as a market maker. An additional State regulatory pathway is the local government, as planning unit, requirement to create and update a solid waste management plan (SWMP), which can include CDW material flows. The SWMP requirement provides an area-wide framework within which local governments can continually identify CDW materials that are feasible within their capital programs and develop and refine waste-to-resource policies and practices to keep CDW away from landfills and support the local construction and re-use markets.

This roadmap for local government action links public capital programs to NYSDEC BUD and SWMP regulations to support and fully activate the State’s regulatory scheme and to change the market “calculus” so that contractors’ failure to recover and re-use CDW is no longer the economically rational choice.

Material Flow Analysis

The local government should collect and analyze available CDW data from its construction departments to get an “order of magnitude” sense of public construction materials flows. This data, which may not be initially complete, would include: CDW materials and volumes, demolition and transportation costs, and volumes and prices for new materials that would be

substituted by recovered CDW from other projects (including their transportation costs). The prospective production of project-level CDW material and volume data under the CDW reporting specification discussed below would supplement initial data for ongoing analysis. NYSDEC CDW data could possibly supplement local material flow analysis.

NYSDEC publishes CDW data from transfer stations (Permitted C&D Debris Handling and Recovery Facility Annual Report) and landfills (Active Construction and Demolition (C&D) Debris Landfill Annual/Quarterly Report) that allow creation of CDW “trip” data (origin and endpoint) by CDW material and volume. These data show the middle and end of the CDW journey but are currently submitted in typed or handwritten forms scanned by NYSDEC. A research team¹ extracted this trip data to import into a data visualization tool created for the URR Working Group that enables additional order of magnitude and directional CDW flow analysis and help illuminate the transport impacts of moving CDW in current flows as well as potential GHG emissions reductions from closer, more transit efficient (less fossil diesel use) material loops.² Local governments could use this tool for their analyses. NYSDEC data from carters (Part 360 Series Waste Tracking Document-C&D Debris), which show the beginning of the CDW journey from the project site, are not yet publicly available. A contract specification discussed below would enable local governments to get this data.

Cost Benefit Analysis

Moving beyond an “order of magnitude” material flow analysis, the next level of analysis would be a cost benefit (savings) analysis of the direct re-use component, which involves recovered CDW material generated from one capital project (referred to here as the input project) that can be substituted for material on the same project *or another capital project* (referred to here as the output project). This initial cost benefit model would use the construction departments’ existing CDW data, which would improve over time. Analysis of increasing indirect re-use would be more difficult and depend, in part, in implementation of the direct re-use component. A baseline cost benefit model would create relationships between input project typologies and output project typologies, updating volumes and prices and refining or adding typologies over time as more accurate data resulting from the initiative arrives. Examples of local government project typologies include wastewater treatment plant, roadway, firehouse, police precinct, school and library projects.

Determine the CDW Materials for the Initiative.

From the material flow analysis, the local government should determine the CDW materials to be covered by new policy and practice. A waste-to-resource initiative should initially focus on those recoverable CDW materials for which a strong re-use market does not currently exist, and

each local government will need to go through its own analysis to determine the right CDW materials for its policy.

Assess Impact of Local Laws.

While most of the legal issues for a local government initiative involve State laws, some local legal issues require investigation. The local government should confirm that existing local law and/or its construction contract terms do not deem recoverable CDW material to be the property of the local government in ways that prohibit direct re-use, increasing indirect re-use, or the sharing of savings with contractors from expanded recovery and re-use. The local government should also review any specifications that restrict project site or near-site stockpiling for expanded separation of recovered CDW materials to keep them segregated for BUD testing purposes and temporary storage for direct re-use or sending to interim processors to increase indirect re-use.

Develop Construction Contract Specifications.

A local government's construction contract is a significant lever for policy development, and the local government can add new or revise existing contract specifications to support the new policy. These specifications fall into four categories:

- A reporting specification requiring contractors to send copies of the NYSDEC Part 360 Series Waste Tracking Document-C&D Debris to the local government, as project owner, would increase production of reliable local CDW material and volume data and permit updates to the initial cost benefit model.
- A cost savings sharing specification to increase market supply without increasing costs on public capital projects due to the initiative itself is necessary. This type of specification would incentivize public contractors' innovation and participation in a pilot initiative within their bid price, by permitting an appropriate sharing of cost savings produced by public bid contractors to leverage their "means and methods" contract discretion and engage in innovative CDW management functions not contemplated in the original bid documents, such as increasing source separation functions generally and engaging in partial demolition to approximate deconstruction.
- A project stockpiling specification to support direct re-use and increasing indirect re-use for expanded recovery, source separation, BUD testing, and re-use avenues, while addressing local concerns with respect to stockpiling on or near a public right of way, including traffic and stormwater management.

- Revised performance-based departmental materials specifications for materials using recovered CDW would increase demand for new construction materials using recovered CDW on future public capital projects, which could be standardized across construction departments. Material specifications developed through the statewide GreenNY process (see <https://ogs.ny.gov/greenny/executive-order-4-tentatively-approved-specifications>) is also available for local government use.

Local Government Market Support Mechanisms.

Local economic supports, such as the specifications described above, will increase the efficiency of CDW materials recovery and re-use markets by generating a reliable and predictable supply of recovered CDW resources and demand for materials made with recovered CDW in order for firms to plan and invest, but other local government actions would further support the private sector as part of the waste-to-resource initiative.

For example, a virtual CDW matching digital platform would optimize capital project operations in a waste-to-resource initiative and increase market efficiency. For an initiative to succeed, contractors for both Input and Output Projects will need to know *on a real time basis* **what** input projects generate CDW, **what** output projects need these materials for direct re-use and, most important, **when** they are available and needed, so that the initiative does not create delay for direct re-use on either input or output projects. With respect to increasing indirect re-use similar, real time data exchanges between contractors and interim processors for indirect intentional re-use, would support project schedule certainty.

In addition, tax-exempt industrial development bonds (IDBs) can support private firm investment in expanded and new facilities and related technology. Existing local industrial development authorities (IDAs) that issue IDBs and revenue bonds with tax-exempt interest rates and local tax features under current law can support private sector investment in expanding existing or creating new interim processing and manufacturing facilities and implementing new technologies. If a local IDA has the ability to create pooled bond issuances, they would also be an effective support for a waste-to-resource initiative.

Develop a Governance Structure for Implementation.

Efficient implementation would require a locality-wide structure to work across departments to collaborate on the initiative and with non-governmental stakeholders to share knowledge and develop support.

Increase Construction-Related Research and Development Partnerships.

Built environment and construction practices point to a need to increase research in CDW recovery and re-use. Without some government support of targeted applied research and development, the local construction industry will continue to be limited by their existing practices and the spread of new learning will remain at sub-optimal levels. A local government working group like the URR Working Group could leverage local experiential learning programs as a start and can collaborate with local schools on their research grant applications in this area.

Endnotes

¹ J.P. McKay, Parth Singal and Dina Wagdy, New York University/Center for Urban Science and Progress capstone program, Class of 2021.

² See also [Mapping CDW: Capstone \(accomplishedcode.github.io\)](https://github.com/accomplishedcode/Mapping-CDW).