Developing Construction & Demolition Waste Recovery in Philadelphia

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Green Economy Task Force
building a green economy for all philadelphians

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Developing Construction & Demolition Waste Recovery in Philadelphia

Executive Summary

Construction and demolition (C&D) projects are one of the largest sources of waste generation in America. Despite the potential for reusing and recycling many of these materials, large amounts continue to be directed to our landfills. Over 1.9 million tons of C&D waste was directed to Pennsylvania landfills alone in 2008 — nearly 100 thousand tons of which originated in the City of Philadelphia.[1]

When these materials are sent to landfills or incinerators, they contribute to the same negative externalities created by all other types of waste, including: air and water pollution, the prevention of biodegradation, and the incurred costs and energy to transport the materials. Furthermore, additional energy and virgin resources are wasted in replacing these existing, valuable materials. Given proper forethought, much of this C&D waste – up to 90 percent by some estimates – can instead be redirected to more productive and profitable uses.

C&D waste recovery entails both the reuse and recycling of debris generated from construction and demolition projects. Individual elements, including doors and cabinets, can be re-used; and other materials, including lumber, brick and drywall, can be recycled. End markets for specific goods and facilities for separating mixed-materials already exist in Philadelphia with the capacities for scaling up their operations.

There are varying levels of C&D recovery efforts, from full deconstructions to the soft-stripping of the most easily accessible and valuable commodities. Selecting the appropriate level should be made on a case-by-case basis to justify the cost-effectiveness of time and resource investments. However, almost all projects afford recovery opportunities. Investing time at the front-end to consider types and amounts of resulting materials and identify existing end markets can allow C&D projects to realize profitability through reduced tipping fees and material resale profits.

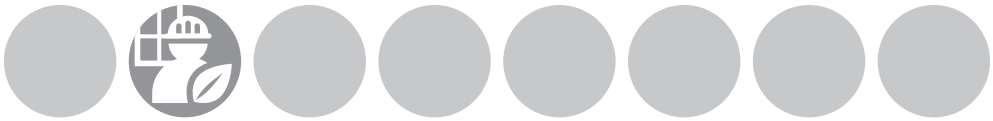
> Over 1.9 million tons of C&D waste was directed to Pennsylvania landfills alone in 2008 — nearly 100 thousand tons of which originated in the City of Philadelphia.

Thanks to the creation of Greenworks Philadelphia by the Nutter administration, Philadelphia now has a comprehensive framework for becoming the greenest city in America by 2015. C&D waste recovery offers an attractive method for achieving several of the plan's objectives, most notably the diversion of 70 percent of solid waste from landfills and the creation of 15,000 new jobs.

In addition to reducing harmful environmental impacts, recovering and reselling these commodities creates new jobs while growing ancillary industries. Growing both the supply and demand sides of this burgeoning industry, while intentionally retaining the commodities within the city of Philadelphia, allows multipliers of economic activity to flow throughout our local economy.

While the C&D recovery industry is starting to develop, it is nowhere close to reaching its full potential in Philadelphia. The presence of existing hurdles and the absence of effective policies are continuing to direct these materials to

1 County Waste Destinations in 2008, PA Dept. of Environmental Protection, 2009.
Number only relevant to landfill waste and does not include tonnage directed to incinerators.



wasteful and harmful ends. Many municipalities have already recognized the impact and importance of addressing their C&D recovery rates. From Woolwich, NJ to Chicago, IL to Oakland, CA, a number of cities have proactively implemented processes and policies to reduce their waste streams and stimulate their local economies as a result.

By committing to C&D recovery for its own projects, the public sector can take the lead in fostering these markets in Philadelphia, thus gaining the credibility necessary for encouraging city-wide recovery efforts. However, if significant waste recovery impacts are the desired goal, the public sector effort by itself will not be sufficient; public sector construction and demolition projects are entirely eclipsed by the volume of private sector activities. Further steps towards incentivizing city-wide recovery practices will be necessary in order to truly capitalize on the opportunity before us and realize Mayor Nutter's dream of making Philadelphia the "greenest city in America."

Summary of Recommendations

- **Develop C&D recovery informational materials and marketing campaign that includes:**
  - Importance and impacts of C&D recovery
  - Best practices
  - Contact information for existing end-markets
  - Educational workshops for contractors.
- **Develop local major retail yard.**
- **Conduct a thorough examination of Philadelphia's municipal waste stream through next waste management study (due in 2010).**
- **Create school curricula on C&D recovery practices.**
- **Identify available and relevant funding programs to help distribute marketing literature, create educational materials, implement job-training programs, and study waste streams.**
- **Mandate C&D diversion percentages for public sector projects:**
  - A minimum of 20 percent of the building materials, by weight and excluding asphalt, brick and concrete, will be reused;
  - A minimum of 50 percent of the building materials, by weight and excluding asphalt, brick and concrete, will be reused, recycled or beneficially used;
  - 100 percent of asphalt, brick and concrete will be reused, recycled or beneficially used.
- **Issue an annual RFP for architectural salvager to be given access to public sector demolitions.**
- **Commit to deconstruction for public sector demolitions when feasible, and include workforce development programs.**
- **Incorporate use of reclaimed materials preferences in RFPs for public sector construction projects.**
- **Enact city-wide ordinance requiring recovery activities in all C&D projects:**
  - Mandate the submission of waste management plans for demolition and construction permits;
  - Set similar C&D diversion percentages as those set for public sector projects

Introduction

Construction and demolition (C&D) projects are one of the largest sources of waste generation in America. Approximately 170 million tons of C&D debris was created in 2003[1], while in that same year the general waste stream consisted of 236 million tons.[2] Despite the potentials for re-using and recycling many of these materials, large amounts continue to be directed to our landfills. Over 1.9 million tons of C&D waste was directed to Pennsylvania landfills alone in 2008, nearly 100 thousand tons of which originated in the City of Philadelphia.[3]

When sent to landfills, these materials contribute to the same negative externalities created by all other waste; air pollution, through the release of greenhouse gases and other toxins, and water pollution, by way of seepage into water tables. Materials that would otherwise naturally biodegrade are often prevented from doing so due to tight compaction and lack of oxygen. Energy is consumed in hauling and dumping existing materials, and virgin natural resources are wasted to replace them. Incinerators have been touted as more environmentally-friendly disposal options; however, they too contribute to air pollution, and represent the same inefficient uses of energy and natural resources when reuse and recycle alternatives are available.

Given proper forethought, much of this C&D waste – up to 90 percent by some estimates – can instead be redirected to more productive and profitable uses. Joists in historic buildings, which are currently scarce, can be re-milled. Perfectly good windows can be re-installed for a fraction of the cost of purchasing new ones. One hundred percent of asphalt, concrete, and brick, which comprise the majority of demolition waste, can be recycled.

What is C&D Recovery?

C&D waste recovery entails both the reuse and recycling of debris generated from construction and demolition projects. Often, for the sake of saving time, debris is directed to catch-all dumpsters, thereby earning the distinction of and treatment as municipal solid waste. Taking the time to separate out materials with marketable potential immediately transforms waste into commodities.

Many of these C&D "waste" materials can be effectively reused with minimal processing. Elements such as molding, lighting, plumbing, fixtures, doors and door frames, flooring, brick, and many others can either be reused on-site or taken away for reprocessing and resale. In the Philadelphia region there are already a number of companies, with huge potential for expansion, that provide this service.

Remaining materials can be repurposed for other productive uses. Concrete pavement can be ground and used as structural fill, asphalt shingles can be melted for use as blacktop, and gypsum from drywall can be recycled for other uses including soil amendment and cement production. Traditional recycling of materials, plastics, and paper waste generated by construction and demolition is also included under this practice and is an important part of C&D waste recovery.

In the Philadelphia region, there are also several facilities that sort and process both source-separated (materials separated at the work site) and mixed debris (dumpsters containing co-mingled wastes) materials from C&D projects. These C&D recycling facilities can incentivize contractors to separate on-site by charging less per ton for already

SOURCES

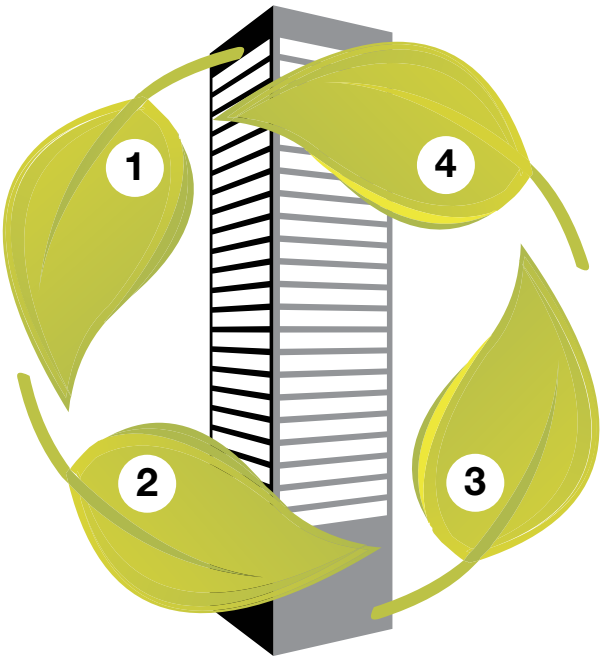
1 Estimating 2003 Building-Related Construction and Demolition Materials Amounts, EPA, 2009

2 MSW Characterization Report 2003, EPA Office of Solid Waste and Emergency Response, 2005

3 County Waste Destinations in 2008, PA Dept. of Environmental Protection, 2009. Numbers only represent tonnage to landfills, and does not include tonnage directed to incinerators.

separated materials, while also providing mixed-debris separation services for contractors who are unable or unwilling to separate on-site. The fees for the processing of mixed debris are often nearly identical to fees for traditional waste industry facilities right now. By charging similar fees, C&D recycling facilities are able to pay employees to separate the materials for resale and reuse.

C&D waste recovery covers a full spectrum of approaches and methodologies. Several pilot projects, including the 2003 Susquehanna Project undertaken in the Strawberry Mansion section of Philadelphia, have shown the effectiveness of full deconstruction, which involves the complete dismantling and separation of a building's materials.[4] While complete disassembly is not always viable or cost-effective, almost all projects present opportunities for realizing diversion and profitability. Individual assemblies, such as dimensional lumber in rafters or floor joists, can be recovered; and "soft-stripping" can occur to salvage obviously desirable and easily recoverable elements, such as plumbing and electrical fixtures or HVAC equipment.



The building

1

Deconstruction – complete disassembly

Soft-stripping – Removal of specific building components or equipment prior to demolition of structure (plumbing, electrical, HVAC equipment, cabinets, doors, windows, hardwood, tile flooring)

2

Individual assemblies – Target particular building assemblies for removal prior to demolition (rafters, floor joists, wall framing members, architectural salvage)

Re-use – Molding, lighting, plumbing, doors and frames, flooring, brick, architectural salvage

3

Recycle – Metal to scrap yards; re-mill lumber, drywall, bricks, concrete, asphalt as onsite back-fill

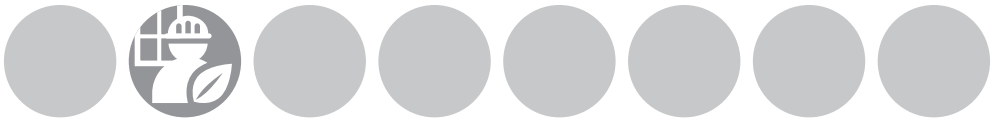
Ancillary markets develop; Vendors grow including marketing, transportation, creative/design, and retail sales; Indirect jobs grow; Revenue grows

4

New construction built with recovered materials and prepared for future deconstruction

SOURCES

4 "Susquehanna Deconstruction Pilot Project."Institute for Local Self-Reliance and the Hamer Center for Community Design. 2003. http://www.unbuild-rebuild.org/pdfs/SusqFINL.pdf



Cross- Sector Interest & Impacts

An entire industry, offering well-paying jobs and attractive revenue streams, is already developing around the existing market for reused and recycled goods. Bottom-line implications are causing contractors to divert materials, thereby saving money on tipping fees and earning profits through resale. C&D recycling facilities have emerged for the purpose of separating mixed debris to be sold to individual end-markets. Architectural salvagers are identifying and recovering specific elements of buildings that would otherwise be completely demolished, and selling them for considerable profits.

Additionally, environmental considerations will increasingly influence traditional business decisions. These developments have already been seen in the wide-spread acceptance of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) standards. Among the criteria of LEED certifications is the requirement for reusing and/or recycling set percentages of the total waste stream produced during construction and demolition. As the number of LEED certified buildings has increased, so too has the private sector's intentional efforts to redirect construction waste to more environmentally-friendly destinations.

Even with these developments, the C&D recovery industry is nowhere close to reaching its full potential in Philadelphia. The presence of existing hurdles and the absence of effective policies are continuing to direct these materials to wasteful and harmful ends. Many municipalities have already recognized the impact and importance of addressing their construction and demolition recovery rates. From Woolwich, NJ to Chicago, IL to Oakland, CA a number of cities have proactively implemented processes and policies to reduce their waste streams and stimulate their local economies as a result.

Thanks to the creation of Greenworks Philadelphia by the Nutter administration, Philadelphia now has a comprehensive framework for becoming the greenest city in America by 2015. One of the plan's 15 major targets is to divert 70 percent of solid waste from landfills.[5] C&D recovery presents a practical and attractive means for achieving this goal, considering the volume of materials generated, the amounts continually sent to landfills, and the promising reuse and recycling potentials. Recovery efforts in other cities demonstrate that 80 percent of C&D waste can be diverted given dedicated efforts and effective policies.

Yet, ultimately, C&D recovery is not strictly an effort to keep materials out of landfills; it is a commitment to redirect quality goods to the most productive and profitable uses possible.

SOURCES

5 Greenworks Philadelphia available online at http://www.phila.gov/green/greenworks/index.html

6 "A Guide to Deconstruction."U.S. Department of Housing and Urban Development. 2000. http://www.huduser.org/Publications/PDF/decon.pdf

Case for C&D Recovery

Case Study – Philadelphia Civic Center

As preparation began for the razing of Philadelphia's Civic Center in late 2004, deconstruction advocates moved quickly to collect as many materials as possible before they were destroyed and directed to landfills. Second Chance, Inc. and the University of Pennsylvania Health Systems formed a partnership in which each put up $35,000 to pay for the salvage work. As is often the case for projects of this size, tight timelines were set in order to bring structures down as soon as possible. Developing a plan for a complete deconstruction wasn't possible, and Avi Golen, who served as another partner in the venture and the project manager, had only three days to put the salvage plan together.

Months were spent carefully removing historic ticket booths, plaques, chandeliers, terra cotta artwork, windows, brass door hardware, and many other near priceless materials. By the end of the effort, the partnership had generated over $600,000 from the resale of the salvaged elements. As Golen said at the time, "I'm selling things even before we can get them out of the building." Without this salvage work, tons of materials would have been hauled away to take up space in landfills at the cost of thousands of dollars. Instead, substantial profits resulted because they took the time to salvage these materials and direct them to interested buyers.

Although the Civic Center case study is great example of the potentials of C&D recovery, it only included soft-stripping, and captured merely the low-hanging fruit. In the end, further opportunities for both recovery and profitability were lost.

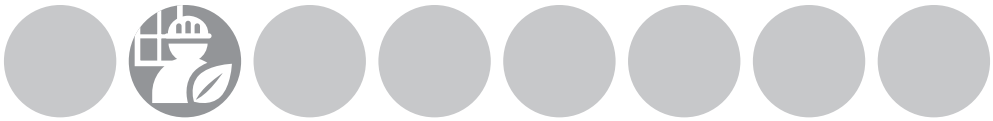
Assessing materials and markets beforehand can allow contractors to justify what level of recovery makes sense. The U.S. Department of Housing and Urban Development has created a "Guide to Deconstruction" that provides an overview of what the process entails, best practices, and potential benefits. Many of the considerations that make deconstruction cost-competitive are found throughout Philadelphia's historic building stock, including wood-frames (with heavy timbers and beams or with unique woods), specialty materials (hardwood flooring, unique doors, molding, fixtures), and high quality bricks.[6] The community heritage throughout our city's buildings and homes further encourage initiatives to recover as much as possible. Since many of these goods are no longer commercially available, and thus are in very high demand, C&D recovery presents opportunities for saving valuable, historic, and sometime unique, commodities.

Environmental Impact

Proper planning is necessary to ensure economic profitability, however there is no denying the positive impact C&D waste recovery has on the environment. Every material that is recovered and put to another productive use saves space in landfills and preserves virgin materials.

SOURCES

6 "A Guide to Deconstruction."U.S. Department of Housing and Urban Development. 2000. http://www.huduser.org/Publications/PDF/decon.pdf



In 2003, the Powell Center for Construction undertook the Wesley House Project – a study for the U.S. Environmental Protection Agency (EPA) in which a building was fully deconstructed with the intent of incorporating as many of the existing materials into the construction of the new facility taking its place. Forty-four percent of the original building's materials were reused or recycled. This diversion equated to the total avoidance of 2.7 metric tons of greenhouse gas carbon equivalent (GHGCE), 10 metric tons of carbon dioxide equivalent (GHGCO2), and 42 million BTUs of energy use. Every square foot of materials diverted equated to the avoidance of 4.29 lbs of GHGCE, 15.75 lbs GHGCO2, and 33,470 BTUs.[7]

Job Creation

Salvaging elements, separating materials, and deconstructing buildings can all be labor and time-intensive efforts. As a result, the development of the C&D recovery industry offers many exciting opportunities for growing sustainable and valuable green collar jobs. These opportunities are especially relevant given the Greenworks plan objective of creating 15,000 new green jobs in the next 6 years.

A study completed in 1997 by the Institute for Local Self-Reliance found that every job in the traditional waste industry is equal to 10 recycling facilities jobs.[8] Rough estimates suggest that a facility capable of processing up to 600 tons per day could employ about 80 people, offering wages from $12-$20 per hour and $40,000-$65,000 per year for salaried personnel. Increased C&D opportunities will also introduce additional salvage and deconstruction work, both of which can similarly provide quality, sustainable jobs.

Deconstruction projects also provide significant workforce development opportunities, as the care and precision involved in deconstruction make the skills needed very similar to construction, only in reverse. These projects can serve as an ideal ground for providing valuable entry-level jobs with upward mobility into higher-skilled construction trades.

Economic Impacts

In order for these practices to become widely accepted, the investment of time and resources must be justified for developers and contractors. Anecdotes and research both prove that these investments can be, at the very least, cost-neutral through reduced waste hauling fees and the re-sale of separated commodities. The Civic Center case study demonstrates the profitability of merely soft-stripping; the full deconstruction effort of the Susquehanna project, while not necessarily universally replicable, still presents a strong return-on-investment afforded by separating and selling individual materials.

Several studies have shown deconstruction to be cost-competitive with average hand demolitions, but not necessarily with mechanical demolitions due to the time involved. However, the two need not be mutually exclusive. By determining beforehand the types and quantities of resulting materials and the demand markets for the specific commodities, contractors can use any combination of demolition, deconstruction, or architectural salvage to recover as much materials as makes sense economically.

Diverting materials as profitably as possible also involves considering the most productive reuse opportunities for recovered commodities. Many contractors already grind bricks on-site to be reused for infill and foundations. The separation of the bricks from other waste materials can be time-consuming and costly; grinding has become

SOURCES

7 "Design for Deconstruction and Reuse" Powell Center for Construction and Environment. 2003. http://www.unbuild-rebuild.org/pdfs/DfR03-20.pdf

8 Institute for Local Self-Reliance, Washington, DC, 1997. http://www.ilsr.org/recycling/recyclingmeansbusiness.html

accepted because it makes sense economically. Contractors that grind and recycle bricks in this manner are not paying to haul away their largest amount of waste material, and as a result are enjoying substantial waste disposal savings. Infill, however, is not the most productive use of the commodity. Recovered bricks can be cleaned, resold, and re-used as a high-quality building material. Projects seeking to incorporate historic bricks into their design can purchase recovered bricks for less than the cost of new bricks. Rather than paying to have bricks hauled to landfills, contractors can be paid for providing a valuable commodity, which can then be reprocessed and resold.

In this way, C&D recovery not only offers profitability for the projects at-hand, but also opens opportunities for ancillary industries and indirect job growth. The growth of the ancillary industries, from the brick re-furbishers to the lumber re-millers, will in turn develop their own vendors, including transportation, design/creative, marketing, and retail sales. Keeping these materials local allows for the commodities, jobs, and multipliers to be captured within the local economy.

Connections and Considerations

Marketing/Outreach

It takes time and effort to develop awareness of yield potentials and end-market demands; and some activities, like on-site grinding, may not always be feasible. Encouraging the wide-spread implementation of C&D recovery will require a mixture of incentives and education. Creating materials and marketing efforts to provide information on the importance of C&D recovery, the value of individual materials, and the existing end-markets should be among the first steps taken in developing the C&D industry in Philadelphia. Demonstrating the potential for profitability through resale and reduced hauling fees can incentivize contractors to begin undertaking these efforts on their own.

Other cities, like Chicago and Oakland have created literature on best practices to assist contractors in achieving the most effective and profitable results for converting commodities into cash. Dispersing this information has increased the use of existing infrastructure and been integral in ensuring the success of their more proactive attempts at increasing C&D waste recovery. Additionally, educational workshops for contractors would ease apprehensions caused by uncertainties, instill knowledge on the value of C&D recovery, and provide best practices. Practitioners could easily and quickly develop skill-sets to ensure profitability for individual projects and high recovery rates city-wide.

A private-public partnership may provide the best method for creating these promotional materials and workshops. A city agency could take the lead in the program development. Non-profit advocacy groups could provide key support roles to inform the production, assist in distribution, and assume specific tasks, such as the identification of model environmentally-friendly businesses, which may be inappropriate for the public sector. Businesses already operating within this industry should be willing partners and may even be the most appropriate entities for some promotional activities given the benefits they stand to gain.

Connecting the Markets

Best Practice – Second Chance, Inc.

Second Chance, Inc. is a major retail yard in based in Baltimore, MD that collects, processes, and resells materials collected from construction and demolition projects. Their compound includes four warehouses of building materials (including wood, metal, plaster, and stone), architectural elements, doors, lighting, flooring, and plumbing fixtures that have been salvaged from existing buildings for re-use in new constructions.

The scale of their operation has made them a steady and reliable connector to incentivize the recovery of building materials and publicize less-expensive re-use alternatives to the purchase of new goods. As a non-profit that has the capability to provide tax credits for materials donated, they are an especially effective model.

Since developing in Baltimore, they have expanded their reach into other markets, including here in Philadelphia, and have incorporated other services besides the resell of salvaged materials - most notably a job-training program to provide low-income individuals with a variety of construction craft skills.

While informational programs are a necessary first step, C&D recovery will ultimately depend on establishing consistent supply and demand markets, and ensuring reliable connections throughout. Waste separating facilities, recyclers, retail yards, and other end markets already exist, and have the capacity to scale up. Specific commodities such as scrap metals, dimensional lumber, masonry, and many other high-value commercially-unavailable goods are present throughout Philadelphia's historic building stock. However, growing these supply and demand markets will require that they develop stronger relationships.

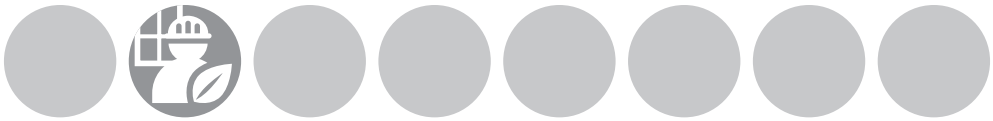
King County, Washington has created an impressive mechanism in their "online material exchange," which serves the dual purposes as a strong market connector, and a convenient and accessible C&D marketing device.[9] The website, hosted by the county government, allows contractors and salvagers to post listings for materials, and allows anyone to browse and purchase listed items. The site functions as a natural auction to incentivize recovery and resale efforts, and determine cost-effective prices encouraging consumers to purchase recovered, rather than new, products.

In Philadelphia, recovered materials, such as brick and masonry, are already being incorporated into new construction projects, and innovative manufacturers are beginning to utilize existing materials in the production of new goods. These practices would undoubtedly increase as architects and manufacturers became certain that there would be steady supplies from reliable sources. Likewise, contractors would also be more likely to recover, separate and sell these materials if they knew there'd be consistent demand markets to ensure the economic worth of separation.

Several local operations already exist to serve this purpose. Restore and Provenance are two such facilities that collect materials recovered from C&D projects and re-sell them in one location. However, no single major market-connector exists in Philadelphia, as Second Chance, Inc. does in Baltimore. This absence presents a void between the C&D industry's supply and demand markets, which is hindering the development of both.

SOURCES

9 Available online at http://your.kingcounty.gov/solidwaste/exchange/



Furthermore, current capacity limitations are, in some cases, causing those materials that are recovered from local projects to be directed to external facilities outside the region. The local market is surrendering opportunities to retain these valuable commodities, resale profits, and the job creation opportunities. Philadelphia should develop a major retail yard to allow existing companies to expand their capacity and connect burgeoning markets.

Understanding Our Waste

Current Pennsylvania Department of Environmental Protection (PA DEP) reports demonstrate that C&D materials comprise a significant percentage of Philadelphia's waste stream, and that large amounts are continually directed to landfills and incinerators. However, a deeper understanding is lacking due to the absence of a comprehensive study of the city's municipal waste stream.

Every county is required by the Commonwealth of Pennsylvania to conduct a waste management study every ten years. As a compulsory requirement, these studies often address bare-minimum conditions and considerations. This mandate affords the opportunity to conduct a more thorough examination of the Philadelphia waste stream in order to fully understand specific materials and amounts, where they are currently directed, and alternative re-uses and destinations. Act 101 Planning Grants from PA DEP can be used to fund this study. When preparations begin for Philadelphia's next study, due in 2010, this waste management study requirement should be viewed and treated as an opportunity for economic development rather than a mere obligation.

Education

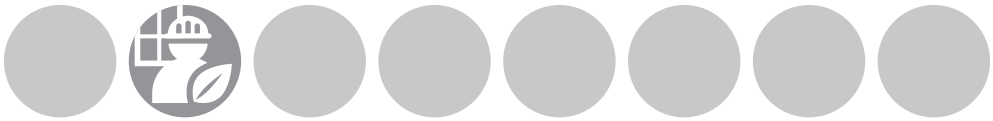
Incorporating C&D recovery into existing academic curricula and introducing new programs could raise awareness of these practices and develop a new class of sustainability-minded architects, contractors, and developers in Philadelphia. Construction management programs at local technical schools, colleges, and universities could begin to address the importance of and best practices within C&D recovery. Architecture and Design schools could create programs for deconstruction design, a school of design which focuses on making structures easier to maintain, repurpose, and ultimately take down and reuse with minimal waste and effort. Deconstruction programs are already in existence at other institutions, including Penn State University and the University of Florida, offering available curricula to consider and replicate.

Environmental Justice

The growth of the sustainability movement in America has involved the development of new opportunities and the inclusion of new ideas. In this process, different and even competing concerns have emerged, and ensuring environmental justice for all communities has become an important issue. Naturally, while there is broad-based support for recycling efforts and recognition of the need for facilities to separate materials, there are, justifiably, concerns about noisy trucks hauling waste into residential communities.

Waste processing facilities are often placed in low-income or minority neighborhoods, as these communities are unlikely to have the connections or resources to prevent these developments. Conversely, C&D recycling facilities – while still introducing waste, trucks, and noise to neighborhoods – also offer sustainable, living wage green jobs for residents that will grow over time. It is important to ensure these occupations are made available and accessible to those currently facing barriers to employment. For instance, Blue Mountain Recycling, in the Grays Ferry section of Philadelphia, demonstrates that it is possible to site and operate urban facilities that are environmentally sound, minimize harm to neighborhoods, comply with OSHA standards, and provide good jobs.

Increased C&D activities in Philadelphia would inevitably lead to the growth of C&D recycling facilities. As such, the capacities of current facilities and the locations of new operations should be a key component considered in the overall



growth of Philadelphia's C&D industry. The Delaware Valley Regional Planning Commission's current environmental-justice map and the industrial land use study jointly commissioned by the Philadelphia Department of Commerce, Planning Commission, and Philadelphia Industrial Development Corporation should serve as vital tools in identifying appropriate locations. Communities should be included in these processes and given the option of first refusal when jobs become available.

Additionally, particular emphasis should be given to identifying sites near rail lines and introducing new lines, where feasible, to existing operations. Rail is the least expensive method of transportation, has the lowest environmental impact, and eliminates the need for trucks, which often serve as a main point of contention for nearby communities.

Funding

Funding will be required to develop and distribute marketing literature, create educational materials, implement job-training programs, and study waste streams; and programs are available for financing these activities. State grants exist for waste studies, and federal grants exist for marketing and educational programs around sustainability. Both levels of government also provide funding for workforce development activities.

Additionally, the American Recovery and Reinvestment Act (ARRA) has created one-time funding programs that can be tapped. The City of Chicago, for instance, has identified a job training funding stream from ARRA for use in a public works deconstruction program. As a result, the city has secured external funds allowing them to lead the way in public sector commitments to deconstruction while also providing individuals with quality experience and training.

Identifying available programs and connecting them to specific initiatives will require intentional and dedicated efforts. Certain funding applications may be lead by private sector organizations; others, most notably those affiliated with ARRA programs, will require the city itself to be the lead in determining where it chooses to invest its time and resources.

Social Costs

Encouraging C&D recovery activities will very much depend on the profitability of these practices. People will continue sending materials to landfills and incinerators as long as it is less expensive. Directing re-usable and recyclable materials to these unproductive ends represents a social cost that, if reflected in actual prices, would compel beneficial reuses through natural private sector activities. Ensuring proper price points – either through tipping fee taxes or limitations on traditional transfer stations – may be a longer-term consideration, but would be an effective and appropriate method for incentivizing desirable activities.

Policy for Philadelphia

Public Sector Commitment

There are a few logical steps the City of Philadelphia can take to begin driving both the supply and demand sides of the C&D recovery market, the first of which would be to incorporate waste recovery practices into its own projects. In this scenario, all public sector projects would have mandated waste recovery percentage goals as part of their initial request-for-proposals (RFP) to inform applicants of this commitment and select contractors on their ability to demonstrate material recovery.

Reporting requirements in contracts would ensure recovery practices occur, and could be upheld through a system of withholding payments, levying fines, or barring participation in future contracts with the city. Due diligence would be necessary beforehand to ensure the absence of any environmental hazards and the soundness of the buildings' structures to ensure safety.

Public Deconstruction

Committing to the practice of deconstruction for public demolitions could achieve several objectives. First, deconstruction projects can help the city demonstrate the importance of recovery efforts. Secondly, these efforts could also afford significant workforce development opportunities, given the job-training prospects within deconstruction, which could introduce additional funding streams and produce a new class of laborers able to obtain viable green collar jobs in the City of Philadelphia.

Public Works Architectural Salvage

Best Practice – Architectural Salvage RFPs

Regardless of deconstruction potentials, almost all projects present architectural salvage opportunities for removing the most valuable and easily accessible elements. Through the selection of an official architectural salvager, the City of Baltimore has developed a mechanism to ensure efforts are made to collect these materials from all public sector demolitions.

Baltimore identified a capable firm by posting an RFP. Ultimately, the selection was made based upon experience, capabilities, and demonstrated understandings of yield potentials and existing end markets. Mandated time periods for salvage activities were thereafter included in all planned public demolitions to allow the selected firm time to remove as many valuable commodities as possible.

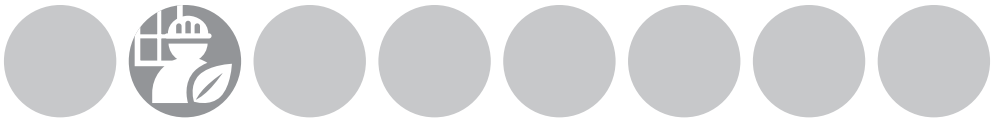
The city could further streamline waste recovery through the incorporation of phased demolition RFPs to allow for architectural salvage in public sector projects, and to identify a vendor capable of providing this service. An RFP would be issued annually for public sector demolitions. Like many of the other recommendations laid out in this report, the fact that this program has already been examined and implemented in other cities, including Baltimore, demonstrates its feasibility.

A contract that would allow for the sharing of profits earned between the vendor and the city could be arranged. The primary benefit for the City of Philadelphia, however, would be the amount of material diverted from landfills. The $65 tipping fees the city currently pays for every ton of waste hauled (which totals approximately $47 million annually) makes waste recovery financially attractive.

Driving Demand

In addition to increasing the supply side of the waste recovery market through its own construction and demolition projects, the city could also drive demand markets by incorporating the use of recovered goods into future public works. For instance, offering preferences in RFPs for the use of reclaimed commodities, such as bricks, in new construction would develop a steady demand market for these commodities.

Given proper outreach and awareness efforts, such a requirement would encourage contractors – on both private and public projects – to not only divert recovered bricks from landfills, but to direct them towards more productive and profitable purposes. The same example holds true for masonry, wood, and many other recovered commodities.



A City-wide Ordinance

Public sector projects represent a logical first step in both increasing these practices and providing the city with credibility for encouraging city-wide C&D recovery. However, if significant waste diversion impacts are the desired goal, the public sector effort by itself will not be sufficient. Further steps towards mandating city-wide recovery practices in the private sector are necessary.

Mandating private sector C&D recovery opens up a new range of concerns. First and foremost, ensuring private sector compliance would require oversight and enforcement. This presents valid apprehension for many, considering the current limitations of the city to monitor and enforce regulations that are already on the books. However, the effectiveness of enacted ordinances in regional neighbors and national comparative cities, demonstrates that city-wide mandates to compel C&D recovery activities are both feasible and effective.

A city-wide ordinance could be structured with the same diversion percentages as the public sector mandates. This structure of percentages could allow considerable leeway in the amount, timing, and types of material diversion requirements. Brick, asphalt, and concrete materials tend to comprise a substantial percentage of project's wastes, and 100 percent of these materials can be reused. Failing to recognize this through a 100 percent diversion requirement for these specific goods can greatly water down the impacts to be had by diverting other, less-obvious materials. Additionally, mandated percentages could also be phased in over a number of years to allow the private sector to learn effective practices and scale up activities.

Waste Management Plans

An ordinance could begin with the requirement of a completed waste management plan prior to the issuance of demolition and construction permits. A waste management plan requirement would compel project managers to identify expected waste materials at a project's onset, and provide literature on existing end-markets. For these reasons, waste management plan requirements enacted in a number of other cities have been essential elements to the success of C&D recovery programs.

The development of a waste management plan need not be onerous task; several existing plans in other locations, including Woolwich Township, NJ and Portland, OR, are no longer than one page. Connecting the submission of waste management plans to the issuance of permits also presents possibilities for incentivizing recovery activities beyond minimum percentages. Ambitious management plans can receive expedited demolition permits while construction permits are still processed, or be offered write-downs on permit costs. The requirement for waste management plans for LEED building certification further demonstrates the practice's growing use and practicality.

A potential hurdle is presented, however, as contractors currently do not have to be named in order for the project's developer or owners to be issued permits. Developers will be accountable for promising to recover materials, but the contractors will be ultimately responsible for ensuring recovery activities take place. This could potentially present a situation in which no single entity can be ultimately held accountable for follow-through with C&D recycling.

Cities with similar circumstances have found ways to effectively incorporate waste management plan requirements into their ordinances. The City of Oakland, CA has done so by holding the lead applicant accountable throughout the process. Permits are withheld until a signed waste management plan, fulfilling recovery requirements, is received. Oakland also provides literature on best practices, and offers technical assistance to support projects in developing plans that work based on the project type and location. Contractors, once selected, are also afforded the opportunity to submit an amended plan if they choose.

Ensuring Compliance

Final reporting requirements are necessary to ensure that recycling activities occur, careful records are kept, and that promised recovery activities do in fact take place. Receipts from end-markets could be sufficient to document materials separated on-site by contractors. Mixed-materials directed to recycling facilities would require contractors to obtain documentation from these facilities demonstrating the amounts of materials that were separated and where they were ultimately directed.

PA DEP permitting regulates facilities that are able to separate and beneficially re-use materials. While the PA DEP permit recognizes this ability, it does not mandate recycling rates; effectiveness of individual facilities varies as a result. However, all facilities are required to maintain precise records on the amounts of materials they process and the locations to which they are ultimately directed.

These current record-keeping requirements would allow facilities to provide documentation for individual projects, and could be used in identifying the most the most effective C&D recycling facilities. Participating facilities would likely be willing and interested in showcasing their recycling rates to attract additional C&D business. As C&D recovery activities increased, additional facilities would likely begin offering separation and recycling services and to achieve the highest recycling rates possible.

Different cities have implemented various enforcement mechanisms to guarantee accountability. Several, like Oakland, withhold certificates of occupancy until summary reports are submitted. This practice may appear unattractive in that tenants are kept from populating already completed projects. However, this has not been an issue in Oakland, which allows for occupants to move in while still motivating owners/contractors to complete the process. Requirements specific to Philadelphia's certificate of occupancy process and regulations could be examined and addressed to make this enforcement mechanism both palatable and effective.

Chicago issues a series of scaled fines which they have found to be particularly effective in ensuring reports are submitted and appropriate recycling rates are achieved. Reports that are either not submitted or demonstrate zero recycling rates can be fined up to $50,000. A series of scaled fines are in place depending on both the size of the discrepancies between expected and actual recycling rates, and the size of the project. Additionally, future permits of applicants are held until past reports are submitted.

Cities that have implemented similar city-wide C&D recovery ordinances have enjoyed consistent success as a result. In Chicago the ordinance has not driven up the cost of development for private projects, and bids for public projects are not coming in any higher than before. Overall the city achieved an 85 percent C&D recycling rate in 2008. Oakland's recycling rate has been a bit higher, around 90 percent over the last few years. Woolwich Township's average has been slightly lower, closer to 60 percent, but has received highs of up to 95 percent. These programs have worked because the right incentives are in place and ultimately because C&D makes sense both environmentally and economically.

Next Steps

The execution of individual recommendations included in this report would achieve C&D waste recovery results and pave the way for the continued growth of the industry. However, in order to achieve the most substantial results, decision-makers should consider and prioritize the opportunities with the most impact. Public sector projects represent a small percentage of the C&D activities in Philadelphia - private sector recovery must be addressed.

The city-wide ordinance, though necessary and technically feasible, may still face political hurdles. A phased-in approach implemented over a number of years may be more politically feasible, allowing the city to streamline and perfect the process. Such an approach may also allow the private sector to scale up activities on its own. It is worth acknowledging then that improving C&D recovery rates in Philadelphia will still be possible in the absence of a city-wide ordinance. However, without the enactment of this ordinance, full potentials and specific recovery rate goals will never be realized.