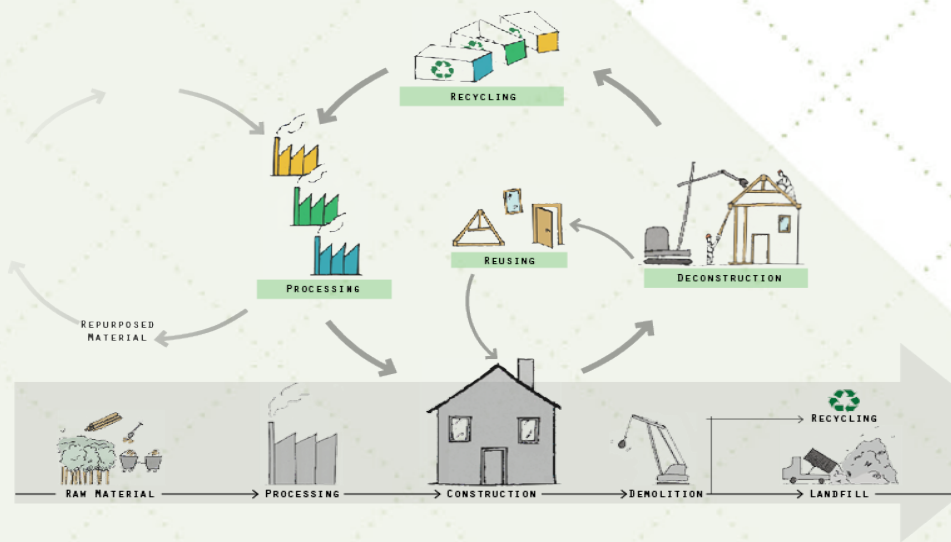


Guide to Local Ordinances: Deconstruction and the Management of C&D Material Waste



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INTRODUCTION

Every structure has a life span, from its inception and construction, to the eventual end of its usage. This process has often been viewed, in the past and today, as a series of sequences that concludes with demolition and the clearing away of what was, to prepare for what might be. Some would argue that this method has been the typical way of handling construction and demolition (C&D) projects across the United States, but improvements in technology and techniques have also allowed other approaches to be devised. Through this, we can ask important questions and develop future strategies. Is the system efficient? Does it allow for enough thought on environmental impacts? Can we be more sustainable? Another important aspect of C&D waste is generated through the abandonment of structures. Many older industrial cities (such as Detroit) have experienced significant economic and population declines over the past few decades, as such, a large accumulation of vacant buildings exist. Demolition is one way these communities have been dealing with eliminating empty, damaged, or hazardous structures, and thus providing another source of C&D waste into landfills. A new paradigm for both examining and practicing this topic is now seen, not as a straight line of events, but a cyclical process, one which all buildings share – a structural life cycle. This emerging field of study, aptly named Domicology (domi being the Latin word for house or building), is being advanced by researchers at Michigan State University. Objectives include, examining the built environment to improve planning and design of structures, reduce the negative impacts created at the end of a building's life, and finding tools, such as policies and programs, to expand the reuse of structural materials and help solve the issue of structural abandonment.

The Guide to Local Ordinances: Deconstruction and the Management of C&D Material Waste, has been designed to assist those interested in reducing the unsustainable landfilling of structural debris by highlighting local laws (both city and county levels) focused on deconstruction requirements or the management of waste created from C&D projects. Key terms were identified and referenced to find similar regulations, such as deconstruction, C&D material waste, reuse, recycling, and debris diversion. Research also included analyzing solid waste plans (or an equivalent) for major cities and counties.

Multiple geographic areas across the United States are represented, including California, Wisconsin, Florida, Illinois, Texas, and Oregon. While the concepts behind these ordinances are similar, each provides a

unique approach for guiding the process of C&D waste production and reuse/recycling with varying rules and specifications. Through outlining these policies, *The Guide to Local Ordinances: Deconstruction and the Management of C&D Material Waste* can provide communities with examples of current ordinance programs in place that handle reuse, reduction, and recycling of material debris created by C&D sites, providing both encouragement for future adoption and a reference point if and when such ordinances are developed and implemented.

The report is broken into three sections – introduction, analysis of seven local ordinances, and a summary with recommendations for possible ordinance application. Section two includes the breakdown of each policy, and is organized alphabetically by local government, with each highlighted ordinance account containing:

- 1) Name of ordinance
- 2) Effective date of ordinance
- 3) Brief description of ordinance (*What it does*)
- 4) Requirements
- 5) Implications
- 6) Location of ordinance in code (*Where to find it*)
- 7) Contact information in locality for more information
- 8) Additional resources

Also presented in the report is a chart (see pg. 5) that compares all seven ordinances and any distinguishable requirements shared between them; this has been done to show both the similarities and differences of these policies and spotlight their key features. Because many Construction and Demolition terms are introduced, a list of definitions has been given to provide context for words or phrases used throughout both the graph and narrative (see next page). These terms relate to elements observed through the analysis of the ordinances and developed to allow for easy comprehension of the material.

TERMS RELATED TO C&D MATERIAL WASTE MANAGEMENT

Construction means the building of or improvements made towards any facility or structure.

Construction and Demolition Debris or C&D means commonly discarded materials removed from premises of a project - construction, remodeling, repair, demolition, deconstruction, renovation, etc. Examples of such materials include gravel, bricks, wallboard, cardboard, roofing material, carpeting, or wood.

Debris Diversion Rate means the percentage by weight or volume (or specified calculation by local government or waste processor) of the materials generated by a C&D project that is diverted from disposal in a landfill, to be used in a beneficial manner.

Deconstruction means the process to dismantle or remove useable materials from structures, aimed at maximizing the recovery of said materials for reuse and recycling to minimize the amount of waste disposed in landfills.

Limited Deconstruction Language means ordinance wording that encourages the use of deconstruction, but does not enforce it on demolition projects.

Deconstruction Requirements means regulations that mandate homes of a certain age be deconstructed rather than demolished.

Demolition means the razing or tearing down of any facility or structure.

Diversion Fee means any money submitted to cover diversion of C&D waste material from a project.

Landfill Disposal Rate means the total pounds of material generated by a project and disposed per square foot of floor area into a landfill (*lbs. / sq. ft.*).

Management Plan means a document submitted by a building, construction, or demolition permit holder that outlines recycling/reuse objectives, estimates, and other specified information, depending on individual administration rules.

Ordinance Focus is an assessment of the principal topic for a specific law, rule, or regulation. For this guide, the focus is marked as either Deconstruction or C&D.

Deconstruction and the Management of C&D Material Waste: Assessment of Elements to Local Ordinances

Local Government	Ordinance Focus	Deconstruction Requirements	Limited Deconstruction Language	Debris Diversion Rate	Landfill Disposal Rate	Diversion Fee	Applied to Construction Projects	Applied to Demolition Projects	Required Management Plans
Austin, Texas	*C&D			X	X		X		X
Cook County, Illinois	C&D			X				X	X
Fitchburg, Wisconsin	C&D			X			X	X	X
Lee County, Florida	C&D		X	X		X	X	X	X
Milwaukee, Wisconsin	Deconstruction	X	X	X				X	
Palo Alto, California	C&D, Deconstruction		X	X			X	X	
Portland, Oregon	Deconstruction	X	X					X	

*C&D refers to Construction and Demolition waste management focused ordinances

AUSTIN, TEXAS POPULATION: 947,890 (2016 US Census Estimate)

Ordinance: Construction and Demolition Recycling Ordinance

Effective: *Phase I* - October 2016, *Phase II* - October 2019

What it does:

The City of Austin mandates contractors divert a minimum of 50% of project debris, and dispose no more than 2.5 pounds of material per square foot of floor area into a landfill, for commercial construction projects. The ordinance is modeled after the city's green building efforts and is consistent with the city's zero waste goals.

Requirements:

- A. *Phase I* - the ordinance affects only contractors working on commercial construction (not demolition) projects with a size more than 5,000 square feet of new, added, or remodeled floor area
- B. *Phase II* - beginning in Oct. 2019, commercial demolition projects of all sizes will also apply
- C. Divert from the landfill at least 50% of generated debris (an authorized processor's rate is calculated as the tons of materials reclaimed divided by the tons of materials processed, multiplied by 100 percent)
 - a. Minimum of 75 %, starting in 2020
 - b. Minimum of 95%, starting in 2030
 - c. C&D debris can be processed by a C&D mixed use facility authorized by the Texas Commission for Environmental Quality or a qualified processor registered by the City of Austin
- D. Dispose no more than 2.5 pounds of material per square foot of floor area into a landfill
 - a. No more than 1.5 pounds, starting 2020
 - b. No more than 0.5 pounds, starting 2030
- E. A permittee shall provide the Austin Resource Recovery Department a report upon request for final inspection to complete building or demolition permit requirements

Implications:

- Allow for phased implementation to give stakeholders the ability to process and adapt to new rules
- Achieve maximum reduction in debris waste
- Focus on influencing the private sector to expand private/commercial investments in city services

In 2005, the City of Austin committed itself to achieving zero waste by the year 2040; with this pledge also came the Austin Resource Recovery Master Plan in 2011, which outlined specific goals and objectives for achieving this target. One of the main components to the master plan is the introduction of new rules and incentives to help build private sector collection and processing infrastructure, including the city's Construction and Demolition Recycling Ordinance.

Where to find it: City Code – Chapter 15.6.150

Contact: Department of Resource Recovery – <http://austintexas.gov/cd>

Additional Resources:

(Copy of ordinance) – <http://www.austintexas.gov/edims/document.cfm?id=244998>

(List of authorized processors) – <http://austintexas.gov/page/hauling-and-processing-construction-debris>

COOK COUNTY, ILLINOIS POPULATION: 5,203,499 (2016 US Census Estimate)

Ordinance: Demolition Debris Diversion

Effective: November 2012

What it does:

This ordinance establishes a program for the recycling and salvaging of demolition waste, consistent with the Cook County Solid Waste Plan. A minimum total of 70 percent by weight diversion is required for most residential and non-residential structures.

Requirements:

- A. Demolition debris diversion shall be required for all demolition activities affecting any structure except garages, sheds, utilities, and projects that are not demolishing any load bearing walls
 - a. For any residential structures, the demolition permit holder is subject to a minimum five percent by weight reuse requirement, and a minimum total 70 percent by weight diversion
 - b. For any non-residential structures, the demolition permit holder is subject to a 70-percent by weight recycling requirement, and reuse is encouraged whenever possible
- B. Demolition permit holder must submit a Demolition Debris Diversion Plan, estimating their respective required diversion goals, the transport means, and destinations of demolition debris

Implications:

- Reduce the amount of construction and demolition waste generated at the source
- Regulate the transport of salvageable construction and demolition material to prevent the improper disposal of construction and demolition debris within the county
- Recover materials for the purpose of recycling and reuse that would otherwise be discarded and return them to the economy in a beneficial manner
- Reduce environmental impacts of new material production

Cook County is the second largest county by population in the United States, with over 5 million residents, covering a significant portion of the Chicago metropolitan area. In 2012, construction and demolition waste made up the highest percentage, 26%, of all other waste categories, resulting in the need for an ordinance that fit within the context of the county's waste plan. Possible benefits from the program include: economic (employment opportunities and tax incentives), social (reuse local building material and preservation of historical detail), and environmental (reduction of landfill disposal and reduction of making new material through reuse).

Where to find it: City Code – Chapter 30.769

Contact: Department of Environment and Sustainability – <https://www.cookcountyil.gov/agency/environmental-control>

Additional Resources:

(Copy of ordinance) – https://library.municode.com/il/cook_county/codes/code_of_ordinances?nodeId=PTIGEOR_CH30EN_ARTVASRESU_DIV3DEDEDI

FITCHBURG, WISCONSIN POPULATION: 28,875 (2016 US Census Estimate)

Ordinance: Construction and Demolition Reuse/Recycling Program

Effective: May 2012

What it does:

This ordinance requires the reuse and/or recycling of materials from construction, roofing, remodeling, and demolition projects (outlined below). The contractor or owner must also complete a preliminary and final reuse and recycling plan, submitted to the city's public works department.

Requirements:

- A. *New Construction or Demolition of Single, Double, or Triple Family Dwelling* - Dwellings must reuse/recycle the following materials produced on-site¹

¹ Clean Drywall, Clean Wood, Corrugated Cardboard, Non-Toxic Metal, Shingles

- B. *New Construction or Demolition of Multi-Family Dwellings* - Dwellings that use concrete and steel support must recycle 70% of their construction material produced on-site, as measured by weight or volume. New construction projects that use wood framing must reuse/recycle the following materials produced on-site¹
- C. *New Construction or Demolition of Commercial Buildings Projects* - Projects where the total square footage of the space involved is over one thousand (1,000) square feet must reuse/recycle 70% of the construction material produced on-site, as measured by weight or volume
- D. *Building Moving Projects* - Any building moving project, which requires a permit, must reuse/recycle 70% of the construction material produced on-site, as measured by weight or volume
- E. *Remodeling and Roofing Projects* - Remodeling projects with a value in excess of \$20,000 and all roofing projects must reuse/recycle the following materials produced on-site¹
- F. Contractors or individuals holding building permits are required to submit a preliminary Construction and Demolition Reuse/Recycling Plan (CDRR) and a final report within 60 days of the completion of the construction or demolition project
- G. Submit a C&D reuse/recycling deposit, refunded when requirements have been met

Implications:

- Regulate a variety of construction and demolition projects through specific outlined requirements
- Reduce the amount of materials disposed of in landfills and increase the conservation of resources
- Continue the city's tradition of recycling and reusing C&D waste materials

Where to find it: City Code – Chapter 41.151

Contact: Department of Public Works – <http://www.fitchburgwi.gov/141/Public-Works>

Additional Resources:

(Copy of ordinance) – https://library.municode.com/wi/fitchburg/codes/code_of_ordinances?nodeId=TIIVSE_CH41SOWARE_ARTVCODERERE

(CDRR Sample Report Plan) – <http://www.fitchburgwi.gov/DocumentCenter/View/9611>

Ordinance: Construction & Demolition Debris Recycling Program

Effective: January 2008

What it does:

As part of a larger recycling ordinance, Lee County necessitates 50% diversion and recycling of solid waste, construction, and demolition debris from certain permit seeking projects, with the aim to extend the life of county operated landfills and waste-to-energy facilities.

Requirements:

- A.) Ordinance applies to...
 - a. Covered projects, which are defined as any project for which a building, demolition, or other similar permit is required
 - b. Residential and Commercial construction greater than \$90,000 in value
 - c. Alterations greater than \$10,000 in value
 - d. Roofing projects requiring old roofing removal
- B.) 50% diversion of waste (volume or weight) created during C&D projects, accomplished through...
 - a. Use of new construction methods that reduce the amount of waste generated
 - b. On-site reuse of the waste
 - c. Delivery of the waste from the site to a county approved recycling facility
 - d. Other approved methods
- C.) Diversion fee paid to the county, calculated by the type of project (examples: roofing \$100; residential home \$300; commercial less than 10,000 sq. ft. \$500)
- D.) Permittees for building or demolition permits involving the removal of all or part of an existing structure shall consider deconstruction, to the maximum extent feasible.

Implications:

- Satisfy the county's goal for an integrated solid waste management system
- Preserve the region's natural resources
- Reduce C&D waste disposal rates to preserve landfill space
- Create job opportunities in the community

C&D waste accounts for approximately 1/3 of all waste in the State of Florida. With updated waste-to-energy and material recycling facilities, Lee County handles around 900,000 tons of waste each year, with the Debris Recycling Program serving as one of the components to managing this system.

Where to find it: City Code – Chapter 7.25

Contact: Department of Solid Waste – <http://www.leegov.com/solidwaste>

Additional Resources:

(Copy of ordinance) – <http://www.leegov.com/solidwaste/Documents/Ordinances/Lee%20Ordinance%2007-25.pdf>

(Material Handling Worksheet) – <http://www.leegov.com/solidwaste/Documents/CnD%20Material%20Handling%20Worksheet.pdf>

MILWAUKEE, WISCONSIN POPULATION: 595,047 (2016 US Census Estimate)

Ordinance: The Deconstruction Ordinance

Effective: January 2018

What it does:

This ordinance specifies that any primary dwelling built in 1929 or earlier, designated historic structures, or structures in a historic district, must be deconstructed rather than demolished.

Requirements:

- A. Deconstruction on buildings that are...
 - a. Primary dwellings built in 1929 or earlier
 - b. Primary dwellings designated as a historic structure
 - c. Primary dwellings located in a historic district
- B. Salvaged material may be sold, donated, or reused on or off site
- C. Every deconstruction project shall achieve an 85% landfill diversion rate by weight, unless economic or practical infeasibility is determined by the Department of Neighborhood Services after inspection
- D. The department shall also conduct a deconstruction certification training program

Implications:

- Maximize the salvage of valuable building materials, especially old-growth structural lumber
- Reduce the amount of demolition waste disposed of in landfills
- Create employment opportunities for city residents
- Reduce carbon emissions associated with demolition activity
- Minimize the adverse impacts associated with building removal by increasing the likelihood of discovering materials containing lead and asbestos for safe removal and disposal
- Reduce the releasing of dust and other hazardous airborne substances
- Preserve Milwaukee's historic architectural features and building materials

As of 2018, Milwaukee's deconstruction ordinance serves as the most recent advancement of reuse/recycling waste policy. While some of the guidelines follow that of Portland's similar (and slightly older) legislation, this ordinance expands beyond those guidelines to include: an expansion of covered homes under the ordinance, project waste diversion for each project, and the inclusion of a certification program to ensure deconstruction is a priority for construction and demolition stakeholders. Among the other possible benefits of the Deconstruction Ordinance, the reduction of demolition waste also presents the opportunity to save taxpayers from higher landfill tipping fees.

Where it can be found: City Code – Chapter 218.10

Contact: Department of Neighborhood Services – <http://city.milwaukee.gov/Decon>

Additional Links:

(Copy of ordinance) – <http://city.milwaukee.gov/ImageLibrary/Groups/dnsAuthors/Decon/DeconOrdinance170188.pdf>

PALO ALTO, CALIFORNIA POPULATION: 67,024 (2016 US Census Estimate)

Ordinance: Deconstruction Survey & Construction and Demolition Debris Diversion Program

Effective: January 2017

What it does:

Based on the statewide California Green Building Code, the city of Palo Alto created a debris diversion program for all demolition permits and building permits with a value of \$25,000 or greater. In 2016, the city council also passed an amendment that requires a deconstruction survey to be conducted on single family homes slated for demolition.

Requirements:

A. Deconstruction Survey

- 1) All single family residential dwelling units seeking to obtain a demolition permit shall complete a deconstruction survey provided by a third party approved by the Chief Building Official
- 2) The survey shall include a list of materials that are reusable in the project, as well as the values of such materials

B. Construction and Demolition Debris Diversion Program

- 1) All demolition permits (whole structure and interior non-structural) and all building permits with a valuation of \$25,000 or greater are subject to these requirements
- 2) A minimum 80% C&D waste reduction by weight is required for all covered residential projects
- 3) A minimum 80% C&D waste reduction by weight is required for all covered commercial projects

Implications:

- Comply with the California Green Buildings Code update enacted in 2016
- Present deconstruction as a viable alternative through the survey requirement
- Encourage the use of deconstruction as an elective measure for stakeholders as a tool during the demolition of residential homes
- Enhance the city's construction and demolition waste reduction

While not an implicit requirement for deconstruction, Palo Alto's ordinance highlights the materials that can be salvaged, reused, or sold during the demolition process, allowing for the feasibility of deconstruction to at least be examined by both homeowner and contractor. Along with this, the city also has set up a debris diversion program that includes a high percentage of future C&D projects.

Where it can be found: City Code – Chapter 16.14.135(Survey); 16.14.260 (Residential); 16.14.370 (Commercial)

Contact: Department of Sustainability – https://www.cityofpaloalto.org/gov/depts/ds/green_building/cnd_debris_diversion_program.asp

Additional Links:

(Copy of ordinance) – <https://www.cityofpaloalto.org/civicax/filebank/documents/54976>

(Debris Diversion Program Handout) – <https://www.cityofpaloalto.org/civicax/filebank/documents/56695>

PORTLAND, OREGON POPULATION: 639,863 (2016 US Census Estimate)

Ordinance: The Deconstruction of Buildings Law

Effective: October 2016

What it does:

Mandates that to receive a demolition permit for a house or duplex built in 1916 or earlier, the structure must be fully deconstructed so salvageable materials are diverted away from landfills.

Requirements:

- A. Demolition permits for *homes* or *duplexes* that are...
 - a. Primary dwelling structures that were built in 1916 or earlier according to building permit records
 - b. Primary dwelling structures that have been designated as a historic resource, subject to a demolition review
- B. Salvaged material may be sold, donated, or reused on site

Implications:

- Help maximize the salvage of valuable building materials for reuse
- Reduce carbon emissions associated with demolition
- Reduce the amount of demolition waste disposed of in landfills
- Minimize the adverse impacts associated with building removal and increase the likelihood of discovering materials containing lead and asbestos for safe removal and disposal
- Create job opportunities that act as a pathway for construction careers

By implementing the Deconstruction of Buildings Law, the city predicts that approximately 33 percent of single-family demolitions will now be subject to the deconstruction requirement (this is out of an estimated 300 single-family home demolition per year). In tandem with this, increased deconstruction will divert a projected 8 million pounds (4,000 tons) of materials for reuse annually.

Where it can be found: City Code – Chapter 17.106

Contact: Department of Planning and Sustainability – <https://www.portlandoregon.gov/bps/article/136170>

Additional Links:

(Copy of ordinance) – <https://www.portlandoregon.gov/bps/article/586234>

SUMMARY

These ordinances are key examples of localized initiatives aimed at promoting sustainable approaches to construction and demolition. While these policies contain varying features, together they underscore the growing interest in C&D reuse and recycling. It is apparent from this research that multiple cities have taken the steps to reduce structural waste, but many more communities across the United States may want to consider this tool to reduce pressure on landfills and allow for regional growth in the reuse economy. These communities who work to create a more sustainable built environment and minimize blight and material waste might consider the following steps as they move forward:

- 1) What is the current practice with material salvage and disposal in your community?
- 2) What is the scale and scope of C&D waste in the community? What are the current collection and disposal methods and can they accommodate this waste stream?
- 3) What is the capacity of the C&D industry to support material salvage? Will incentives be needed? Is there a need for workforce training to build the human capital for material, salvage, and reuse?
- 4) What is the current demand for reuse and salvaged materials in the region? What business opportunities might exist for material repurposing and reuse?
- 5) As with any public policy, initiative community engagement it is critical for successful adoption and implementation. Build community awareness through education and opportunities to gain input from key stakeholders.

To view more research on Domicology or other policy outreach resources, visit <http://ced.msu.edu/> (Center for Community and Economic Development) or <https://domicology.msu.edu/>.

The statements, findings, conclusions, and recommendations expressed herein are solely those of the respective authors, and do not necessarily reflect the views of Michigan State University