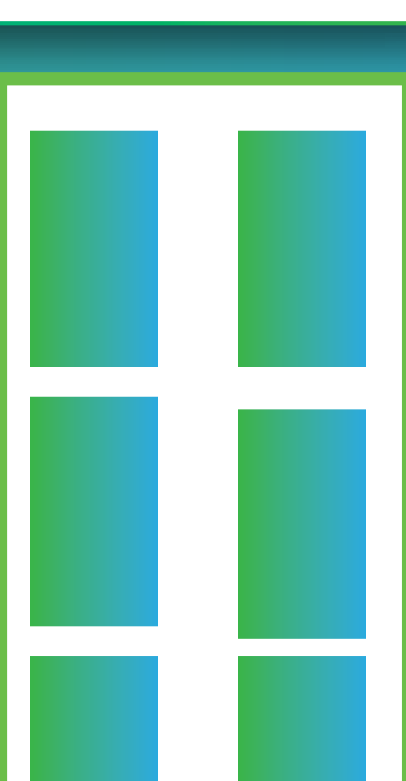
THE STUDY OF DOMICOLOGY

DOMICOLOGY IS. . .

The study of the economic, social, and environmental characteristics relating to the life cycle of the built environment. The goal of domicology is to use lifecycle thinking and circular economy practices to end structural abandonment and prevent valuable building materials from entering the landfill

https://domicology.msu.edu/about/what-is-domicology

The Term Was Coined in 2015
By Dr. Rex LaMore,
Ph.D. , Director of MSU Center for Community and Economic Development



WHAT DOMICOLOGIST DO

Learn More @
domicology.msu.edu

1. Recognize that man made structures have a life cycle

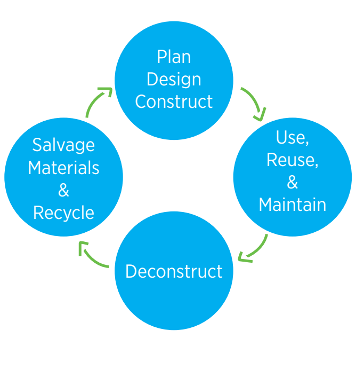
2. Examine the life cycle continuum of the built environment and plan, design, construct, and deconstruct in order to maximize the reuse of materials and minimize the negative impacts of a structure's end of useful life

3. Identify innovative tools, models, policies, practices, and programs that can sustainably address a structural life cycle

4. Conduct research on the technical, economic, and policy challenges present in a structure's life cycle and seek to reduce the negative social, economic, and environmental impacts associated with structural abandonment

WHAT DOES THE LIFE CYCLE OF THE BUILT ENVIROMENT MEAN?

plan, design, construct, and deconstruct



Advancing the Science of Domicology
Domicology.msu.edu
Dr. Rex LaMore

BLIGHT & ABANDONMENT

BLIGHT

(noun) a thing that spoils or damages something.

"the vacant properties are a blight on the neighborhood"

(verb) have a severely detrimental effect on.

Wikipedia.org/abandonment(legal)

As a region, the Midwest is estimated to have 3,481,986 vacant housing units, large portions of which are concentrated in the Chicago [341,014], Cleveland [155,403], and Detroit [221,533] metropolitan areas (U.S. Census, 2015).

ABANDONMENT

abandonment is the relinquishment, giving up or renunciation of an interest, claim, civil proceedings, appeal, privilege, possession, or right, especially with the intent of never again resuming or reasserting it.

Wikipedia.org/blight

COST TO HOMEOWNERS

- Higher Insurance Premiums
- Proximity to vacant/abandoned properties makes obtaining homeowner's insurance, mortgages, and loans for home improvement more difficult.
- Poorer Quality of Life
- Abandoned buildings = social fragmentation (Feelings of isolation weaken the community.)
- Increases likelihood that property values will continue to decline, resulting in further abandonment.

HEALTH IMPACTS

- Industrial and commercial sites may contain other contaminants.
  - There are approximately 450,000 sites considered brownfields in the U.S.
- Lead and asbestos are highly dangerous health and safety hazards and found in many older structures.
  - Lead can cause lifelong learning and behavioral problems in children if they are exposed at a young age. Asbestos is a carcinogen.
  - Demolition can produce large amounts of ambient lead and asbestos dust.
- Pre-removal of asbestos by certified workers is often required (increases cost of demolition and deconstruction)

ECONOMIC IMPACTS

- A 2016 report by the EPA showed that recycling C&D materials created 230,000 jobs.
- It's projected that 28,000 US jobs will be a direct result of the C&D Recycling Industry.
- Abandoned properties inherently decrease the tax revenues available to public entities to support public safety, debt retirement, public works maintenance and other critical social needs.
- Local government financial stress due to loss revenues.

ENVIRONMENTAL IMPACTS

Construction & Demolition waste (US EPA) 136 million tons generated each year ¼ of all landfill waste 650 shipping containers/3months (DLBA 2019)

(Source:https://www.cityofpacificgrove.org/living/green-pg/solid-waste-recycling/solid-waste-recycling-information-business/debris-recycling)

- Hazardous materials Increase the potential for public health concerns
  - Substantially increasing the public costs of demolition and clean up

(Source: https://www.todayshomeowner.com/video/how-to-remove-and-dispose-of-asbestos-siding-and-roofing/)

– Cleaning up and reinvesting in these properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment.

DEMOLITION & DECONSTRUCTION

DEMOLITION

the action or process of demolishing or being demolished.

Demolition, the most common weapon used to fight against abandonment in lower income neighborhoods, invokes more hazardous health risks to the community than does deconstruction (USDN, n.d.).

Demolition is the current mode of addressing this problem, 270,000 buildings are demolished each year, generating 90% of total construction and demolition waste that almost entirely is disposed of in a landfill.

Our solid waste is mostly coming from Construction & Demolition, followed by household waste. We have a plan for our household waste, but right now all C&D waste goes in a landfill. Globally, only 20-30% of construction waste is recovered.

5-15% of Materials Cannot Be Reused or Recycled

Up To 70% of Materials Can Be Recycled

Up To 25% of Materials Can Be Reused

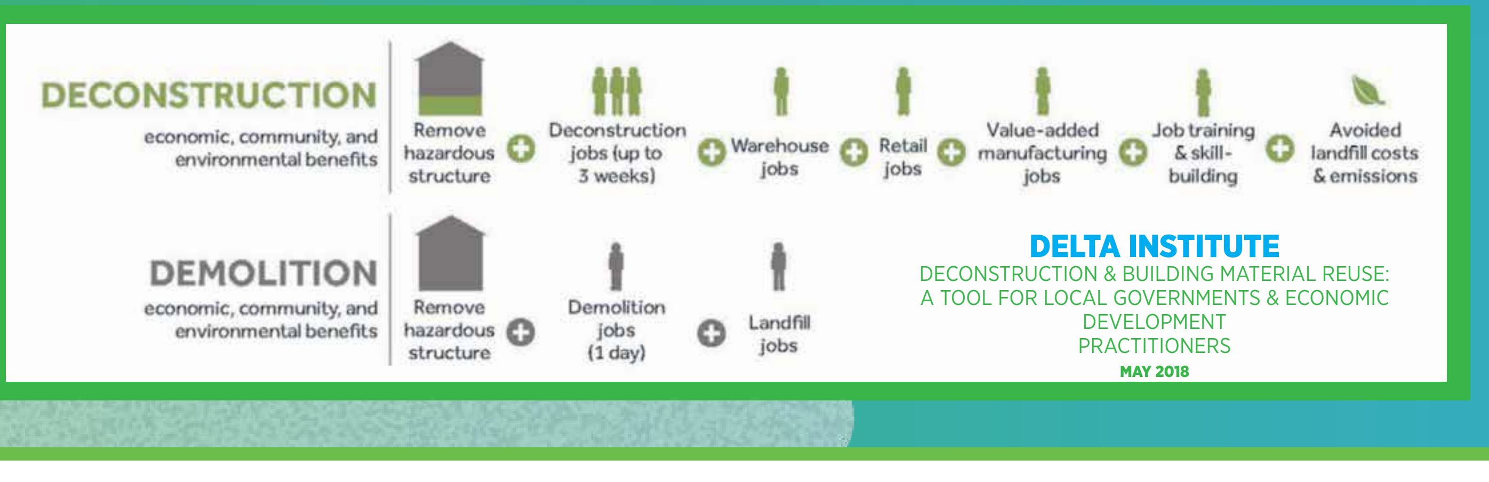
DECONSTRUCTION

deconstruction is the selective dismantlement of building components, specifically for reuse, repurposing, recycling, and waste management. It differs from demolition where a site is cleared of its building by the most expedient means.

The purpose of deconstruction is to maximize material salvage and minimize waste

Types of materials that usually are able to be recycled include dimensional lumber, certain wall systems and ceiling tiles, steel and many concrete elements can be crushed and reused.

New methods are being developed every day to recycle and reuse structural materials in new ways. Difficult to recycle materials include: gypsum drywall, fixtures, shingles, carpet, screws and nails, rebar in concrete, vapor barriers, insulation, etc.

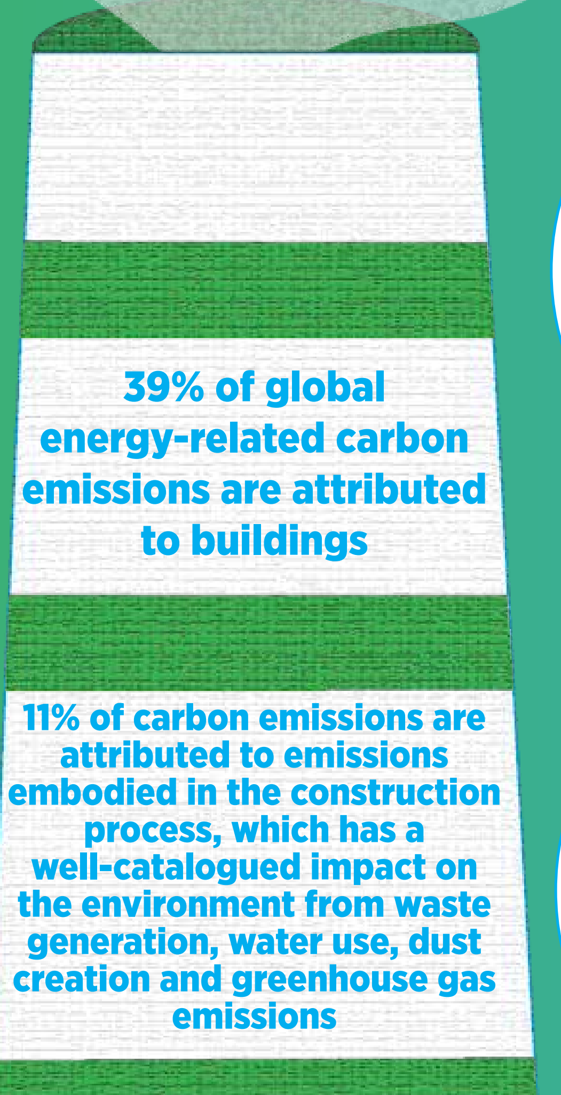


DECONSTRUCTION economic, community, and environmental benefits	Remove hazardous structure	+	Deconstruction jobs (up to 3 weeks)	+	Warehouse jobs	+	Retail jobs	+	Value-added manufacturing jobs	+	Job training & skill-building	+	Avoided landfill costs & emissions
DEMOLITION economic, community, and environmental benefits	Remove hazardous structure	+	Demolition jobs (1 day)	+	Landfill jobs								

DELTA INSTITUTE
DECONSTRUCTION & BUILDING MATERIAL REUSE: A TOOL FOR LOCAL GOVERNMENTS & ECONOMIC DEVELOPMENT PRACTITIONERS
MAY 2018

POLLUTION

FOR MORE INFORMATION



39% of global energy-related carbon emissions are attributed to buildings

11% of carbon emissions are attributed to emissions embodied in the construction process, which has a well-catalogued impact on the environment from waste generation, water use, dust creation and greenhouse gas emissions

1,500 billion bricks are produced each year to construct our buildings

Brick kilns contribute to up to 20% of global black carbon emissions, alongside steel and iron production.

SOURCES AND MORE RESOURCES

Michigan State University Center for Community and Economic Development
EPA
Delta Institute
Wikipedia (for definitons of blight and abandonment)
Learn more about Domicology @ ced.msu.edu and domicology.msu.edu

Scan for more resources