

Muskegon Deconstruction Economic Cluster Feasibility Study

Michigan State University Center for Community
and Economic Development

West Michigan Shoreline Regional Development Commission



Background

- MSU CCED + WMSRDC + Muskegon County
- Funded by EDA
- Erasmus University collaboration



Purpose

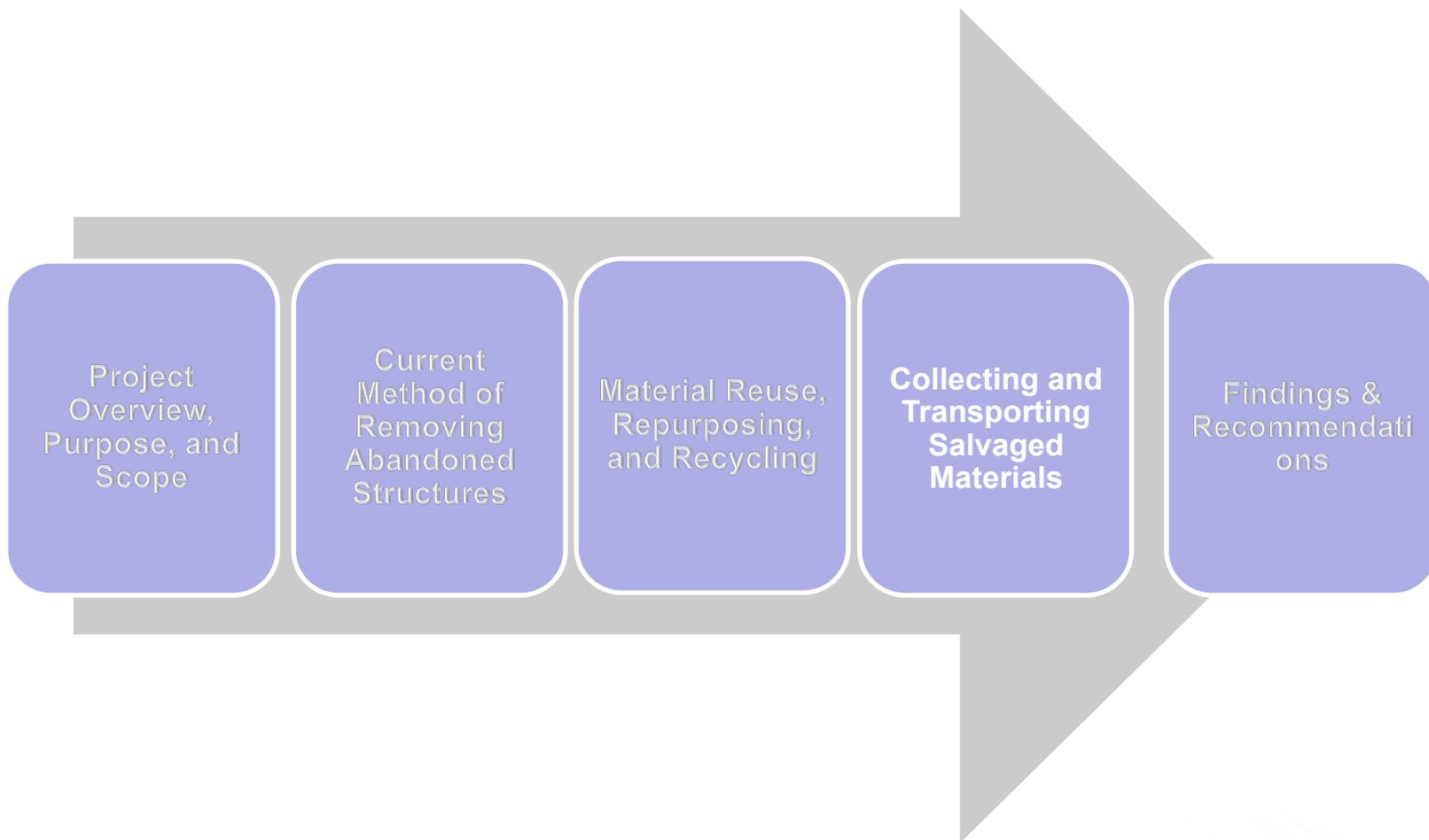
- To examine the feasibility of deconstruction as an alternative solution to the economic, social, and environmental problem of structural abandonment.



Objective

- Assess the feasibility of **collecting** debris from abandoned structures in the Great Lakes regions and of **repurposing/recycling** them in Muskegon into new marketable products, via **the Port of Muskegon**

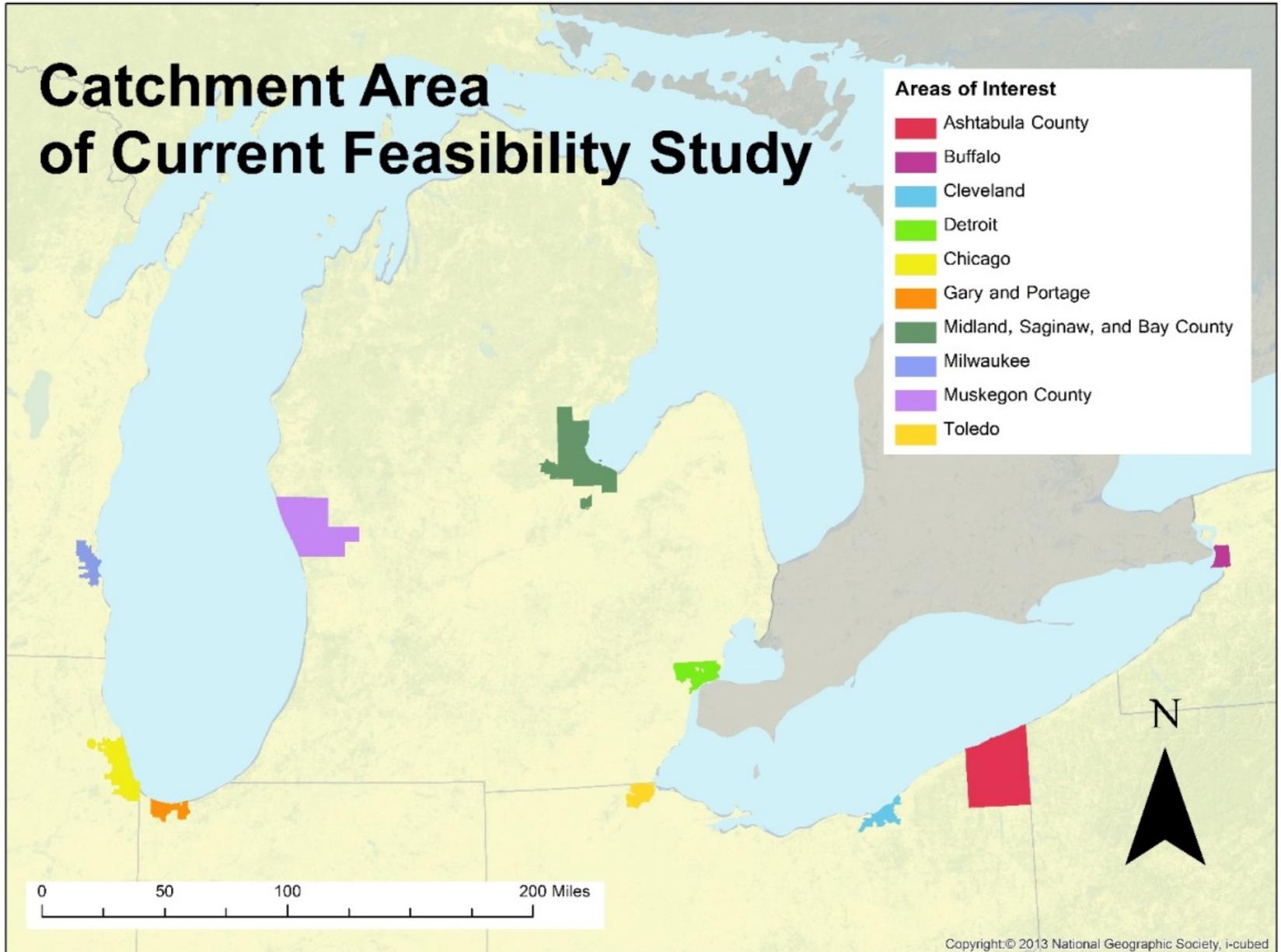
Study Outline



Catchment Area of Current Feasibility Study

Areas of Interest

- Ashtabula County
- Buffalo
- Cleveland
- Detroit
- Chicago
- Gary and Portage
- Midland, Saginaw, and Bay County
- Milwaukee
- Muskegon County
- Toledo



Three-Skim Paradigm

- 1st Skim: Removal of Metal Items
 - Within days or weeks of structural abandonment
 - Such as copper wire, stainless steel fixtures, and cast iron pipes
- 2nd Skim: Items of Architectural Value
 - Fireplace mantels, wood molding, carved banisters, cabinets and fixtures, lighting, and architecturally valuable windows and doors



Three-Skim Paradigm

- 3rd Skim: Everything That's Left
 - High volume / low value
 - Types of Salvageable Material Available

Concrete

Masonry

Framing Lumber

Roof and Wall Sheathing

Flooring

Roofing

Interior Finishes

Wall Finishes

Floor Finishes

- Dimensional lumber is most commonly salvaged

Estimated Quantities of Salvageable Material

- **Framing Lumber** - 966.65 million board feet
(1 BF = 12" x 12" x 1")
- **Flooring** - 271.85 million square feet
- **Standard Bricks** - 1.2 million
- **Concrete** - 8.94 million cubic yards
- **Asphalt Shingles** - 157.07 million square feet
- **Concrete** - 8.94 million cubic yards
- **Drywall** - 349.17 million square feet
- **Siding** - 782.91 million square feet

Limitations

- The major limitation to repurposing these salvaged items from pre-demolition and deconstructed sites for their original intended use is that they may be coated with lead-based paint, or may not meet sustainability, safety and energy-efficient guidelines prevalent today.
- Wood is recovered in multiple forms, sizes, and conditions.
- Wood must be treated
 - Paint and nails must be removed
 - Wood must be planed
 - May need to be kiln-dried to remove moisture or pests

Wood Recycling

- Conventional Uses
 - Architectural, landscaping elements
 - Furniture, wall art, and paneling
 - Formwork boards and wooden ties
 - Fuel for energy generation
- Markets for CDW wood exist in Europe
- Industries in Michigan may have potential to utilize salvaged wood.
 - Wood Pellet Manufacturing
 - Michigan claims 14% of the national industry
 - Over 800,000 rural residents are not currently connected to natural gas
 - Composite/Engineered Wood Products
 - Oriented strand board (OSB)
 - Torrefied Wood
 - Potential replacement for coal in combustion boiler-based power plants
 - Can utilize low quality salvaged wood, pre-processed into chips

Findings

- Scale
 - There appears to be sufficient material available to sustain a deconstruction sector.
- Transportation
 - Truck transportation is the preferred method of transportation (over Great Lakes shipping and rail).



Findings

- Current Methods
 - Practice of removing abandoned structures is weighted towards demolition, limiting capacity to extract materials
 - Low tipping fees disincentivise recycling and repurposing
- Materials Available
 - The Midwest has a generally weak materials reuse/repurposing supply chain
 - Wood and brick show the most immediate promise
 - Job potential for the deconstruction sector is promising



Take-Aways

- Demolition is currently more economical than deconstruction.
- The value of deconstruction comes in the form of social and environmental benefits, as well as materials.
- Local, state, and federal policy may be needed to make deconstruction more feasible.
- A robust supply chain is needed for deconstruction to compete with demolition.
 - Access to abandoned structures and materials (land banks)
 - Skilled and efficient workforce
 - Low-cost transportation of materials

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