

Deconstruction / reuse

an alternative for environmental, social and economic benefits

Bradley Guy

School of Architecture + Planning

The Catholic University of America

Washington, DC

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Impacts of building materials US

- Construction ~5-9% GDP
- Construction materials 11% global CO₂
- 60% of materials flow (ex. food / fuel)
- 3.4 billion tons of materials in 2000
 - 5% from renewable sources
- ~40% of waste from C&D

USA annual C&D debris



170-200 million ton/yr = height 3-4 story building; width 2-lane road; length continental USA coastline

C&D materials

Material	%
Concrete, masonry, brick	45%
Wood	25%
Gypsum drywall	10%
Asphalt shingles	8%
Metals	4%
Plastics	4%

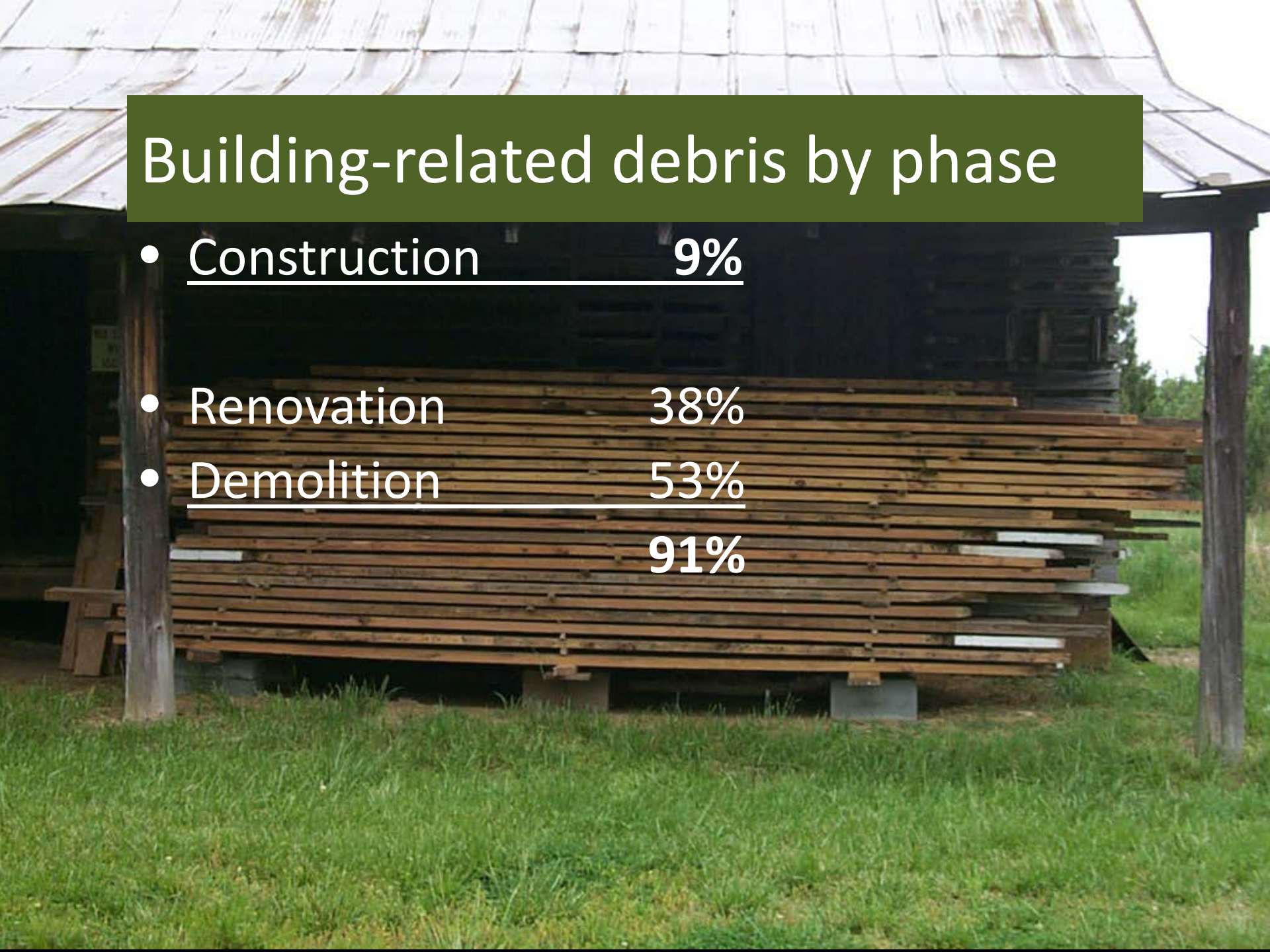


C&D recycling rates (International)

Country	% of total waste	% recycled
Netherlands	26	75
Japan	36	65
Germany	19	40-60
UK	50>	40
United States	40-45	30
France	25	20-30
Spain	70	17
Italy	30	10

Building-related debris by phase

- Construction 9%
 - Renovation 38%
 - Demolition 53%
- 91%**



C&D / MSW reuse and recycle goals

Massachusetts – landfill ban 2006

- asphalt brick concrete (ABC) wood metal
- 80% diversion rate

Seattle – landfill ban phased 2012-2015

- goal 70% diversion by 2020

California

- goal 75% diversion by 2020

District of Columbia

- goal 20% reuse and 80% diversion by 2032

Residential deconstruction / reuse

- Seattle
 - 20% (excluding ABC) reuse
 - 50% (excluding ABC) reuse or recycle
 - 100% of ABC reuse or recycle
- Chicago
 - 5% reuse
 - 70% reused or recycle



Deconstruction

The removal of buildings:

- 1) Safely
 - 2) Maximize reuse & recycle
 - 3) Environmentally responsibly
 - 4) Effectively
- through careful and selective dismantling

Benefits of deconstruction

- Conserve natural resources
- Extend embodied energy
- Reduce landfills requirement
- Management of hazardous materials
- Enhance profit & cost-savings
- New businesses, jobs, value-adding
- Reduced site environmental impacts
- Reduced environmental health impacts

Potential for deconstruction / reuse

- Demolition ~270,000 residential units / year
- 30% current recycling rate
- 50-75% potential recycling rate
- Recycling potential x2 to 2.5 current

- **0.2% current reuse rate**
- 5% - 25% potential reuse rate
- Reuse potential x25 to x125 current

Reuse

- The continuing use of a previously used or unwanted material or component in the same form, allowing for the removal of damaged parts, connectors, adhesives, mortars, and including the addition of minor components necessary for reinstallation.

Rucksack factors

- Wood 1.2
- Glass 2
- Plastics 2 - 7
- Cement 3
- Steel 7
- Paper 15
- Aluminum 85




Reuse / recycle jobs

- **Source separated recycling (& deconstruction)**
 - 8 jobs / 1,000 tons
- Processing recyclables
 - 5 jobs / 1,000 tons
- Reuse / manufacture use recycle
 - 3-10 jobs / 1,000 tons (3 wood, 4 metals, 10 plastics)
- Waste disposal
 - 1.3 jobs / 1,000 tons

Greenhouse gas benefits

- Increase national C&D recycling rate to 50%
75 MMT CO₂-e/yr
= offset 15 million cars / yr
- Increase national C&D recycling rate to 75%
113 MMT CO₂-e/yr
= offset 24 million cars / yr



“Waste is a resource...
in the wrong place”

Thank you !
GUY@cua.edu