BUILDINGENERGY BOSTON

Welcome to our workshop! While we're preparing to get started, introduce yourself to your table mates!

Building Material Reuse: The Time for Circularity Is Here!

Olivia Huang, Goody Clancy
Michael Orbank, STO Building Group

Curated by Stephen Stuart

Northeast Sustainable Energy Association (NESEA) | March 21, 2025

Who Are We?

Olivia Huang

Architect at Goody Clancy

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Michael Orbank

Sustainability Manager at STO Building Group

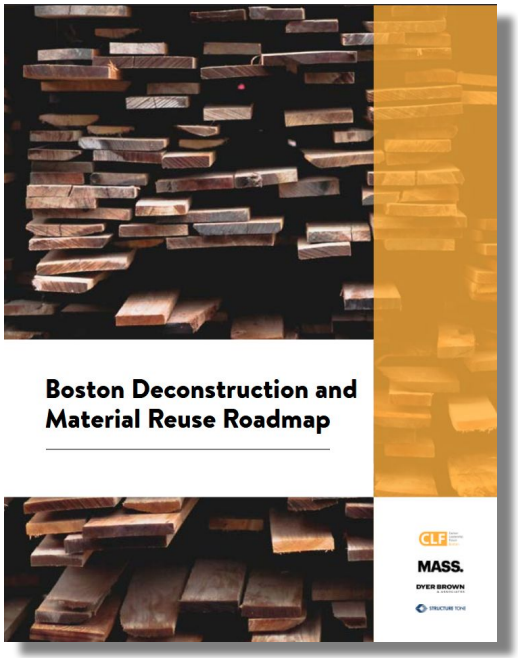
michael.orbank@stobuildinggroup.com

CLF Boston Deconstruction and Reuse Working Group

We envision a circular building industry that collaboratively respects and reuses materials.

The group gathers members across the industry in monthly meetings for presentations and workshops to learn, share, and practice waste diversion, deconstruction, and designing with salvage and for disassembly.

Reach us at *clfbostonreuse@gmail.com* to join!



Carbon Leadership Forum
Boston | Northeast

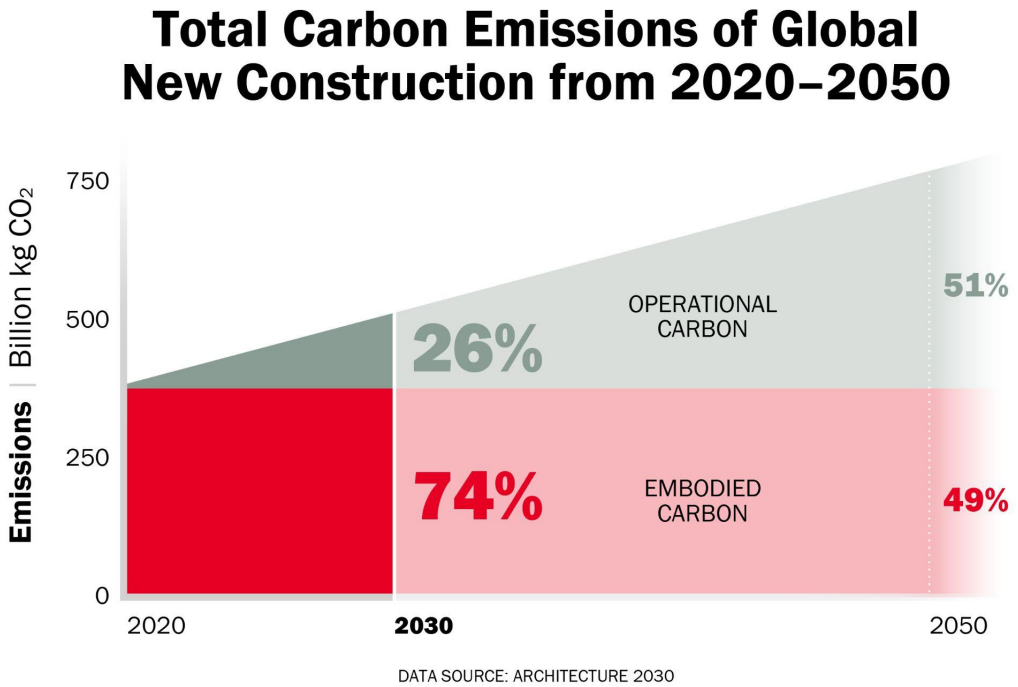
Session Agenda

1. Why reuse?
   Whose help do we need?
   What's stopping us?
   What can we do?
2. Circular Strategies Workshop!
3. Q+A

Why Reuse?

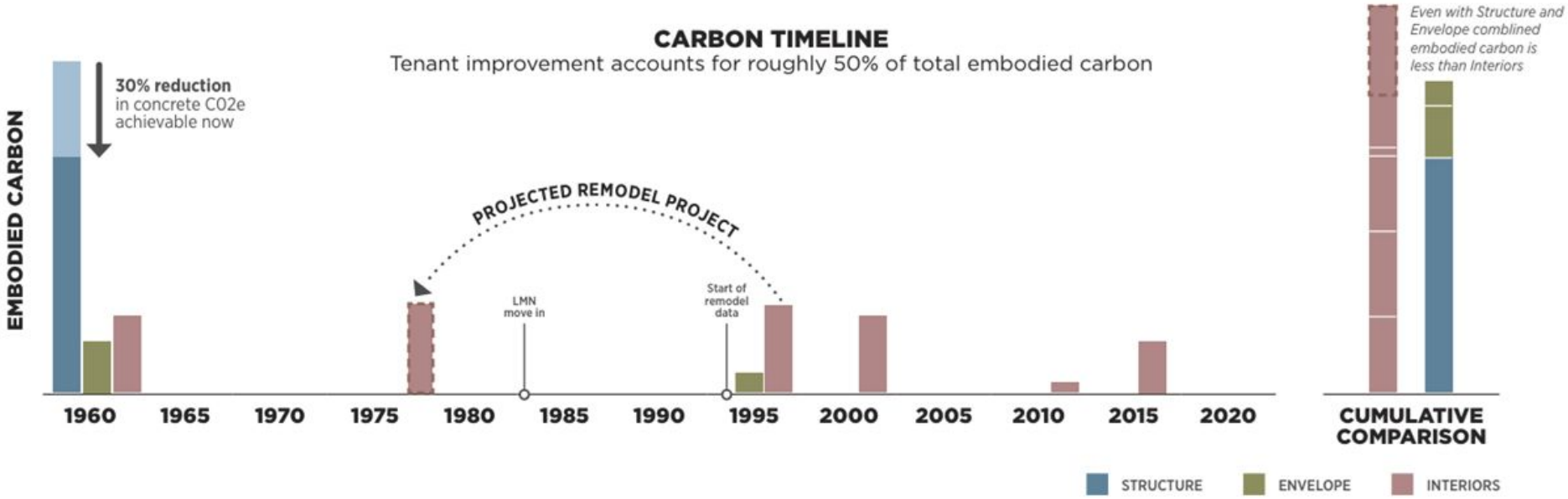
- ↓ embodied carbon
- ↓ C&D waste
- ↑ regional economies
- ↑ environmental justice
- ↑ creativity and beauty

Our building emissions today are mostly embodied carbon.



The New Net Zero, 2020

Even renovations of interior finishes add up.



[Tenant Improvements Embodied Carbon Study, 2022]

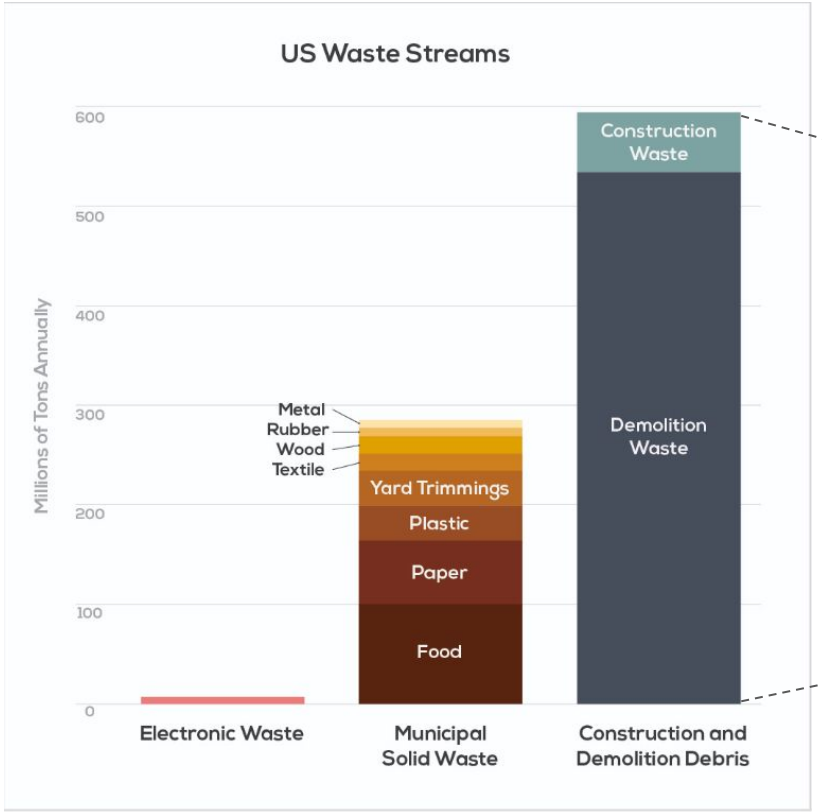
Landfills are reaching capacity.

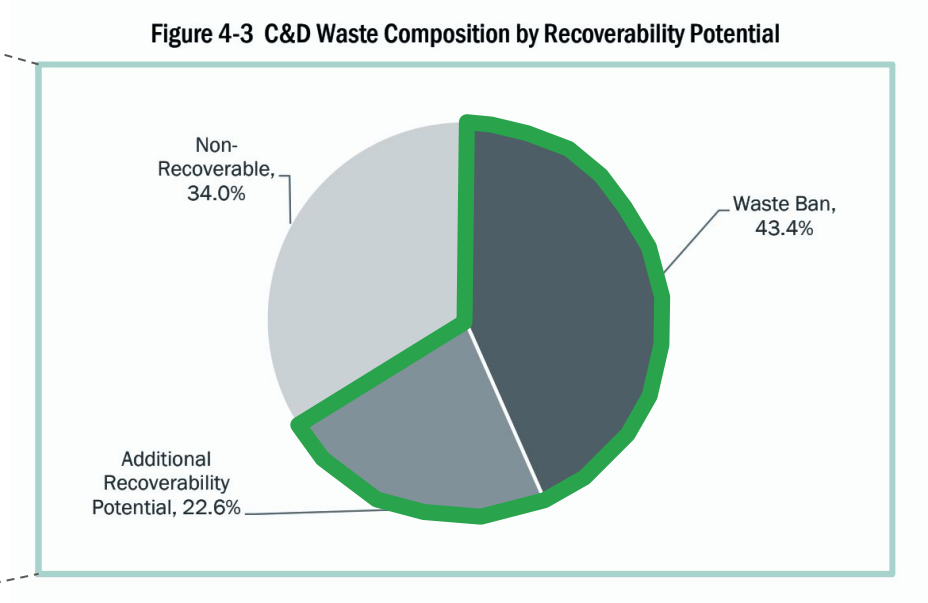
Projected Disposal Capacity

Municipality	Permitted Capacity	End of current permitted capacity	Lifetime of LF
Active Landfills			
Bourne	30,000	2024	**2040**
Dartmouth	115,000	2024	**2028**
Middleborough	60,000	2031	**2031**
Nantucket	26,000	2029	**2029**
Westminster	538,200	2030	**2030**

Massachusetts Dept of Environmental Protection, 2023 Solid Waste Data Update, Nov 2024

There is a lot of recoverable C&D waste.

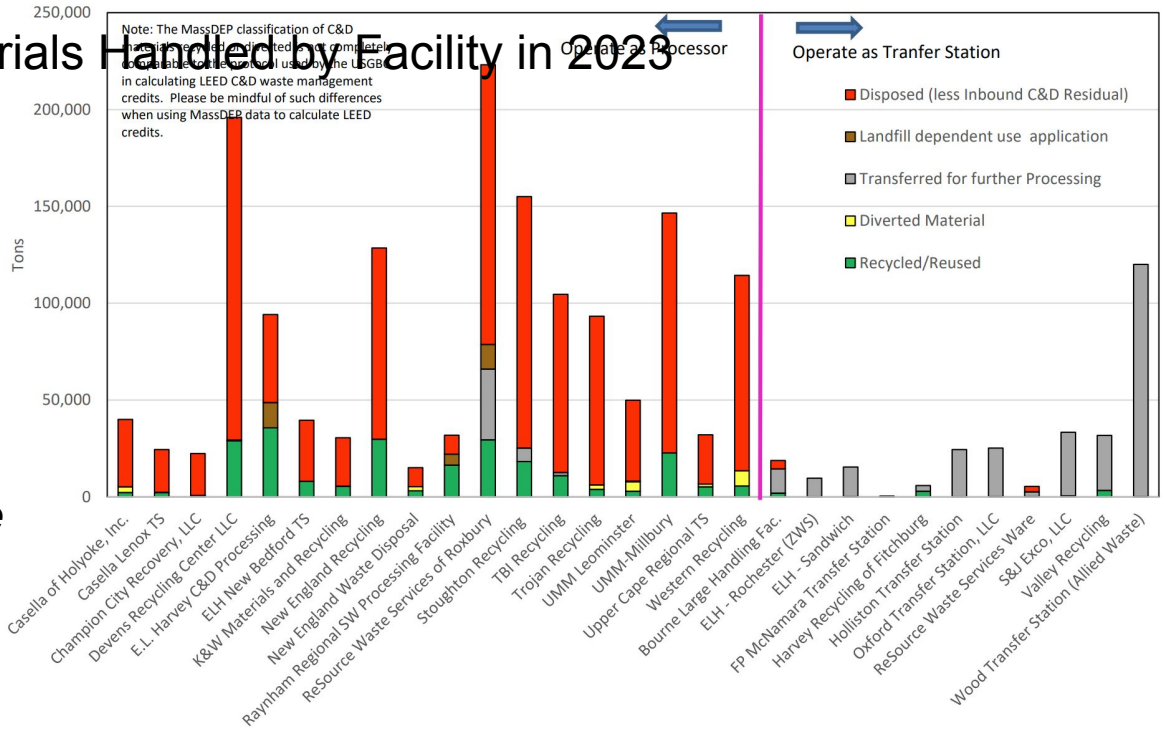




[MA 2030 Solid Waste Master Plan](), *October 2021*

Recycling rates are not what you think.

MA Disposition of C&D Materials Handled by Facility in 2023



Disposed

Recycled

Diverted

Landfill-dependent use

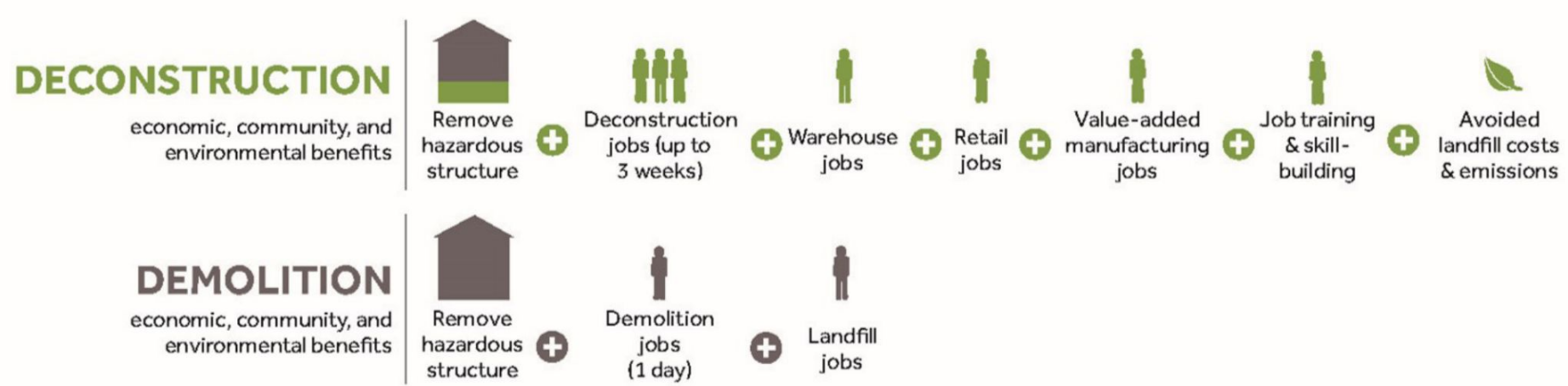
Transferred

[*MA 2023 Annual C&D Report Data Summary*]

Dollars, Sense and Data

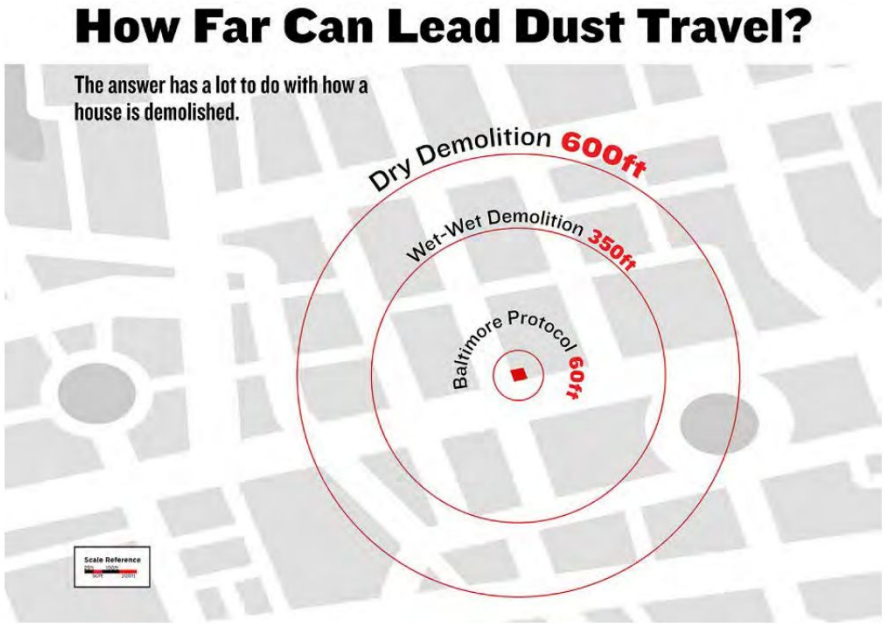
Constructing a Circular Economy in NYS: Deconstruction and Building Material Reuse, 2024

Deconstruction and reuse create more jobs.



"Deconstruction & Building Material Reuse: A Tool for Local Governments & Economic Development Practitioners," 2018.

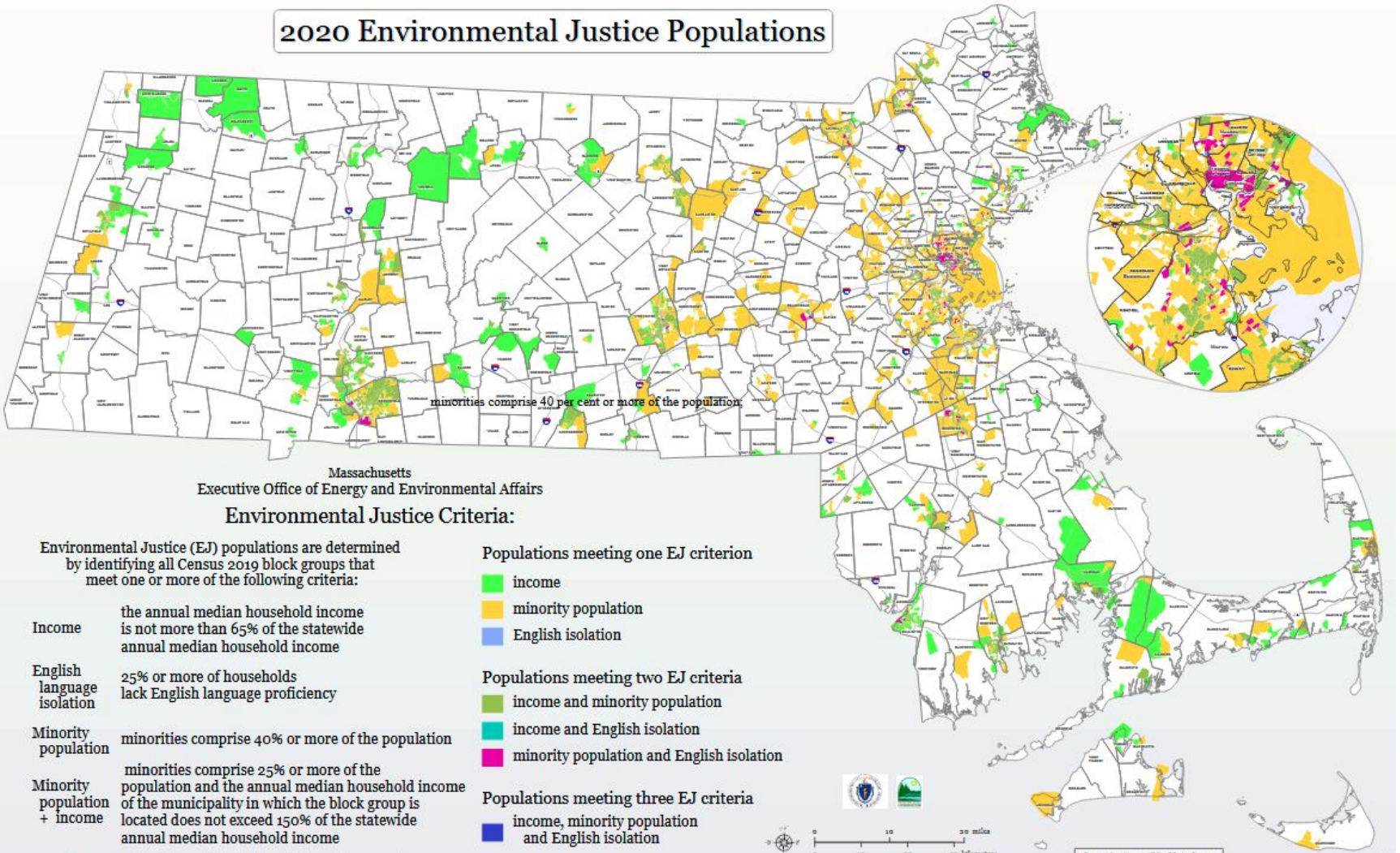
Deconstruction policy is public health and environmental justice policy.



Treasure in the Walls: Reclaiming Value Through Material Reuse in San Antonio, 2021

Photo: David Jacobs, What's With the Demolition Dust? — City Bureau

2020 Environmental Justice Populations



Massachusetts
Executive Office of Energy and Environmental Affairs

Environmental Justice Criteria:

Environmental Justice (EJ) populations are determined by identifying all Census 2019 block groups that meet one or more of the following criteria:

Income	the annual median household income is not more than 65% of the statewide annual median household income
English language isolation	25% or more of households lack English language proficiency
Minority population	minorities comprise 40% or more of the population
Minority population + income	minorities comprise 25% or more of the population and the annual median household income of the municipality in which the block group is located does not exceed 150% of the statewide annual median household income

Populations meeting one EJ criterion

- income
- minority population
- English isolation

Populations meeting two EJ criteria

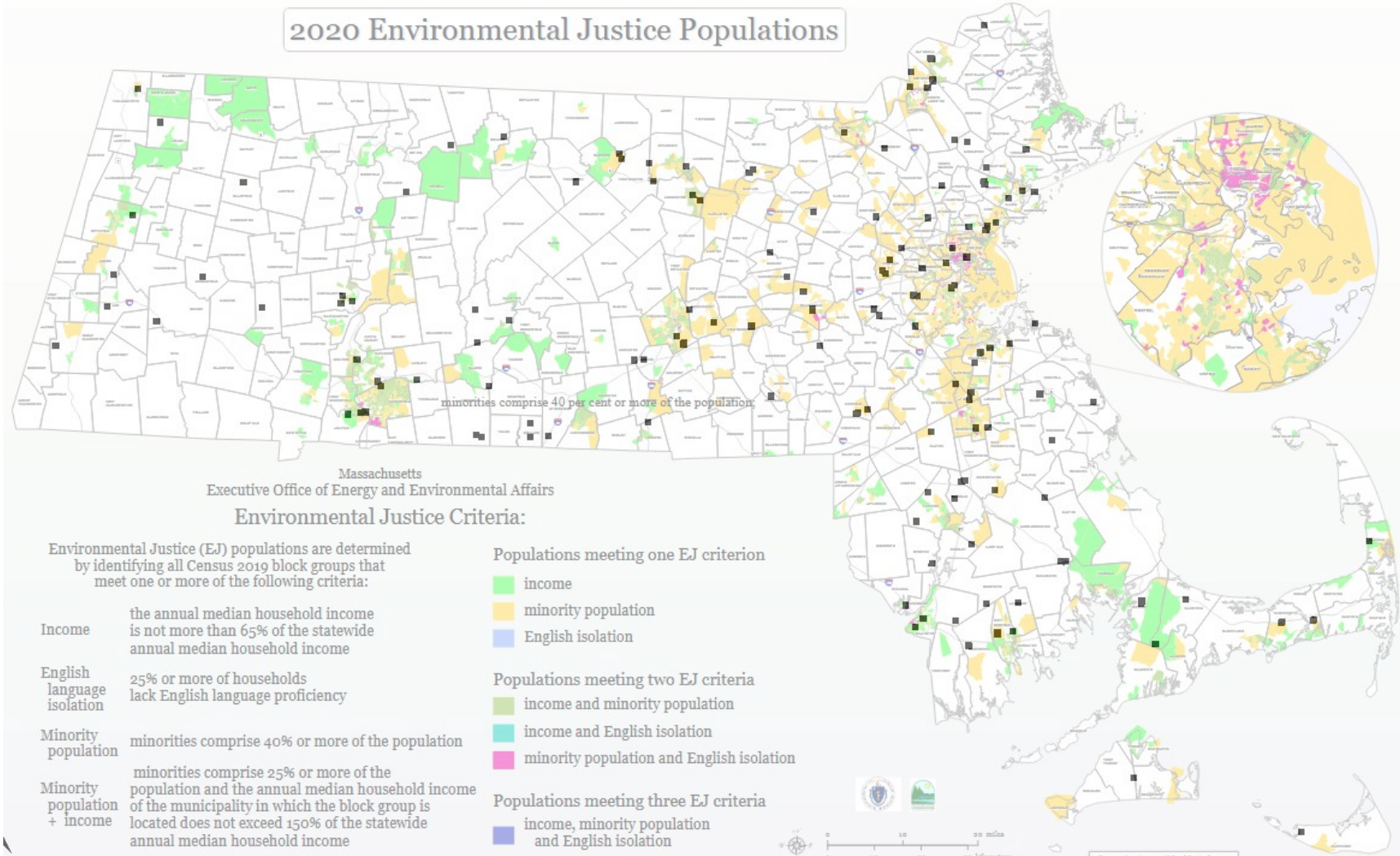
- income and minority population
- income and English isolation
- minority population and English isolation

Populations meeting three EJ criteria

- income, minority population and English isolation

MassGIS Data: 2020 Environmental Justice Populations

2020 Environmental Justice Populations



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MassGIS Data: MassDEP Solid Waste Diversion and Disposal

Reuse is creative and beautiful.

Resource Row, Lendager Group, 2019

Cornell University Balch Hall, Goody Clancy, 2024

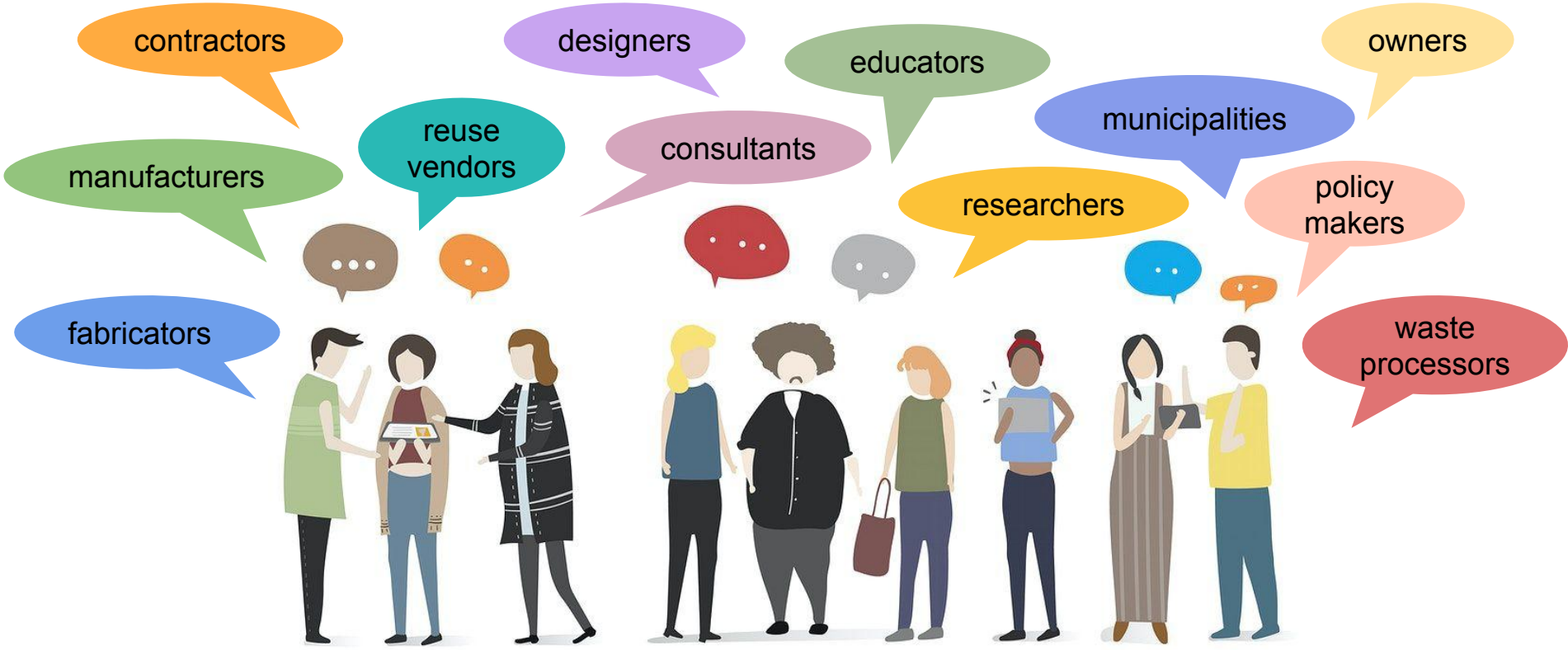
KEVN, Superuse Studios, 2020

Headquarters of the European Union, Samyn and Partners, 2015

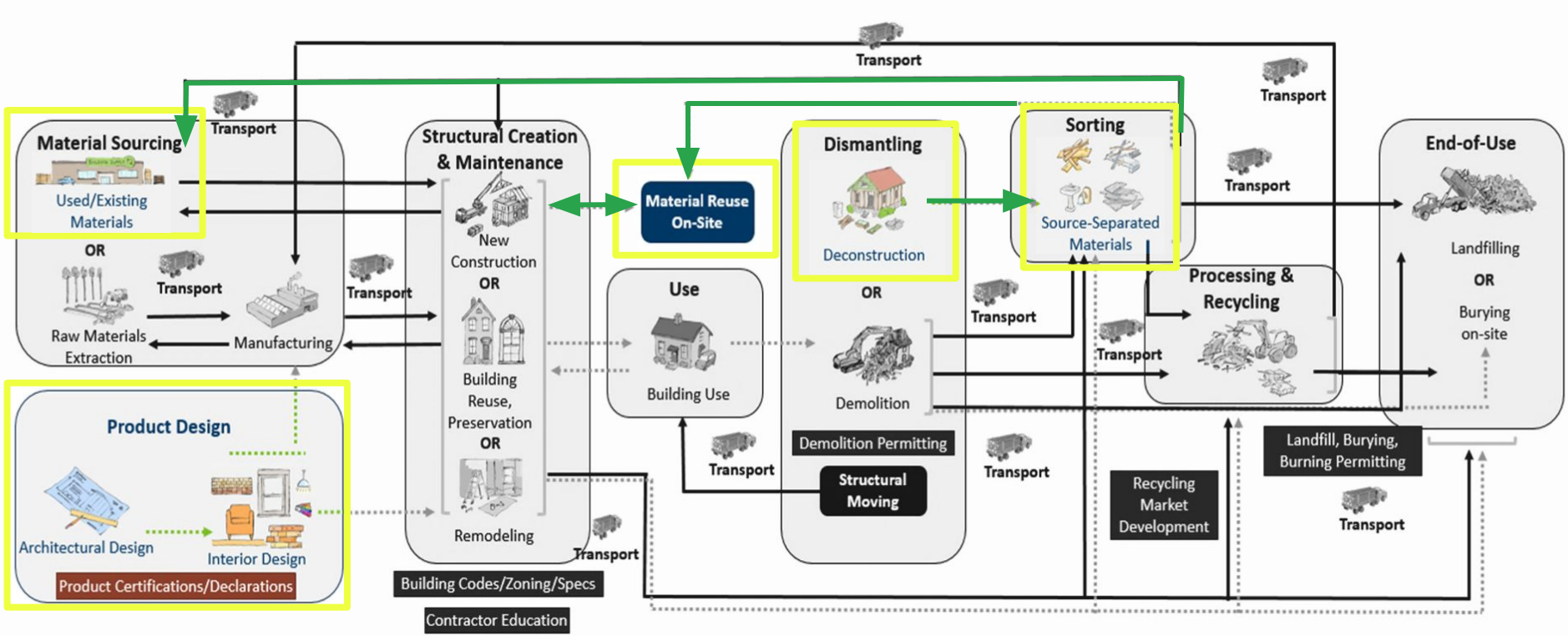
Big Dig House, Single Speed Design, 2006

Whose help do we need?

Reuse Roles - Meet the Cast!



Ecosystem Map



Source: Minnesota Pollution Control Agency, Building Sector System Map (2019) via Build Reuse Wiki

CIRCULAR BUILDING INDUSTRY PATHWAYS

ADVOCACY

- legislation
- building code
- education
- culture
- financial incentives
- data

PROCESSES

- timeline
- standards
- contracts
- templates
- collaboration
- digitalisation

DESIGN

- material selections
- material passports
- detailing
- standards
- flexibility
- efficiency

EXECUTION

- deconstruction
- refurbishing and refabricating
- workforce training

What’s stopping us?

Myths and Barriers

You may think…	But don’t give in!
No one else on the project is interested; I’m alone.	Mention reuse to your colleagues and clients and you’ll discover allies.

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It will look old and second-hand.	There are long standing practices in refurbishing and renewing materials.
Why try when no system exists?	The system will never exist if we do not try, fail, learn, and try some more!

What can we do?

Challenge Yourself!

- “Our project has… which is an opportunity to…”
- “We typically disposal of… how can we use it for…?”
- “What is the carbon and dollar cost of this waste stream?”
- “What steps would need to be implemented during… to achieve…”

Know that others have taken these first steps

- Pre-demo salvage assessments
- Manufacturer take back programs
- Onsite reuse
- Whole-building deconstruction

Let’s Strategize!

Strategies we're workshopping today:

1. Establish circularity in the project goals, requirements, and narrative.
2. Replace demolition scope with deconstruction, salvage, donate or material take-back programs.
3. Require and plan for 75% waste diversion standards with auditable backup.
4. Salvage and reuse onsite materials.
5. Procure, purchase and install reused materials.
6. Establish embodied carbon guidelines to quantify the impact of reuse.

1

Establish circularity in the project goals, requirements and narrative.

Items to consider:

- Early action leads to improved acceptance
- Owner buy-in trickling down
- Corporate/Institutional requirements

2

Replace demolition scope with deconstruction, salvage, donate or material take-back programs.

Items to consider:

- Are there take-back specifications?
- Are there notes in the drawings?
- Are you installing new products that have a take-back program?

3

Require and plan for 75% waste diversion with auditable backup.

Items to consider:

- Include demo and construction scope
- How is the waste organized onsite?
- Where is the waste going?
- How can these strategies be incentivized?

4

Salvage and reuse onsite materials.

Items to consider:

- What level of deconstruction is possible onsite?
- Can you soft-strip fixtures, doors/frames, furniture?
- Do materials need to have a changed use type?
- Can you reuse materials in the back of house?

5

Procure, purchase and install reused materials.

Items to consider:

- How can design requirements ease acceptance of reuse?
- Where are typical items procured?
- What are the cost savings of new vs. reused?

6

Establish embodied carbon guidelines to quantify the impact of reuse.

Items to consider:

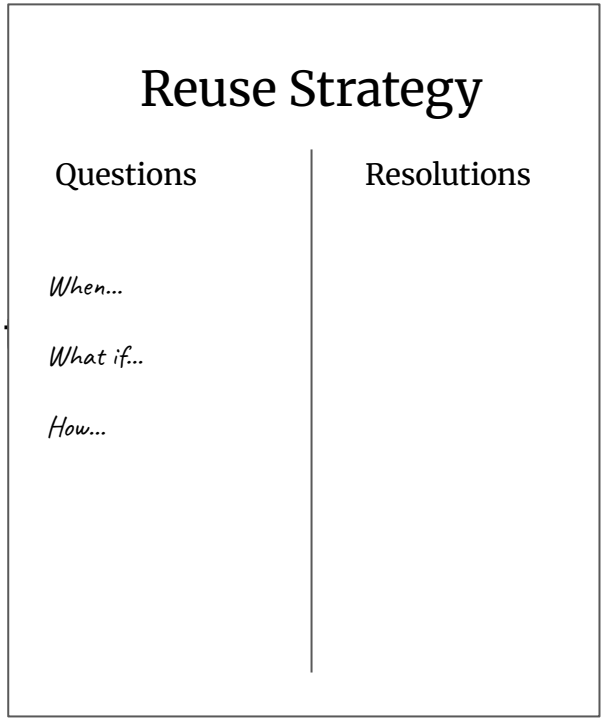
- What education and data is needed?
- Which software can be used to quantify?
- Reuse eliminates new A1-A3 emissions

1 BRAINSTORM

Write down **any and all questions and considerations** implementing your strategy.

Take turns sharing them with your group. (15 min)

MIX Go to a different table/strategy

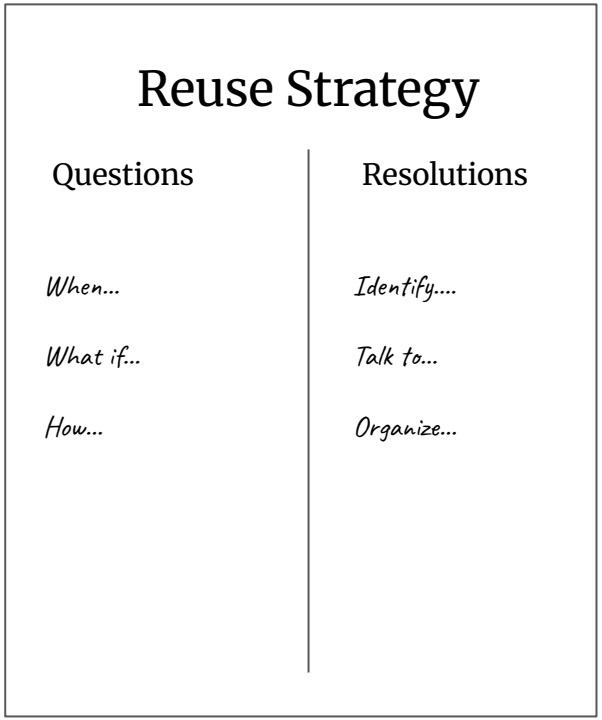


2 SOLVE

Address the questions posed by the previous group. Discuss ideas and recommendations as a team.

Write down your solutions to each question.

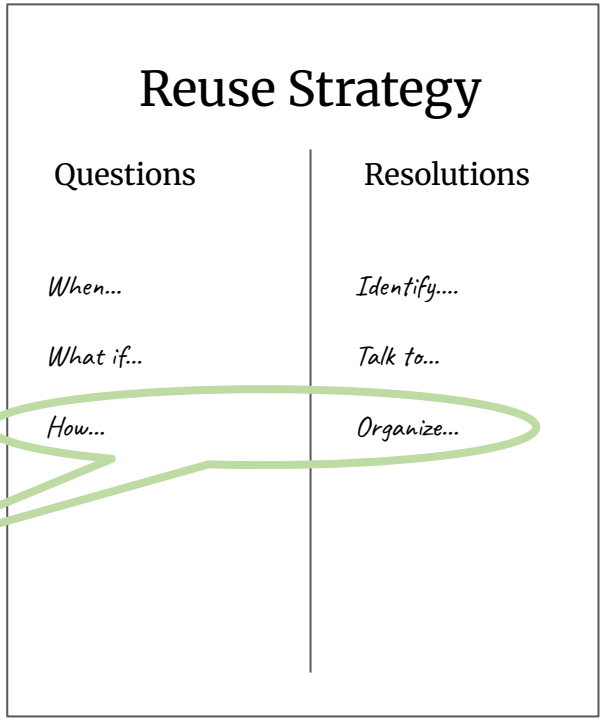
(15 min)



3 SHARE

What collaborative solutions did your team develop to resolve questions and implement reuse on your projects?

Each group **recite your strategy and share the solutions you developed for one of the questions.**



One More Exercise:

Make a Commitment

What can you commit to after this workshop?

Examples:

- Ask a manufacturer's rep about take-back programs
- Donate excess materials to a reuse vendor
- Reuse a door in my next renovation
- Visit a salvage restore
- Attend a CLF Boston Reuse working group meeting
- Tell my colleagues about what I learned here today

Workshop (behind the scenes)

(our goal: get feedback on reuse roadmap, and dive into weeds on implementation)

- People sit at round tables of 6-8 people
- Reuse strategies assigned to tables - printed out text on large sheet
- Blank sheet
- Mix up groups

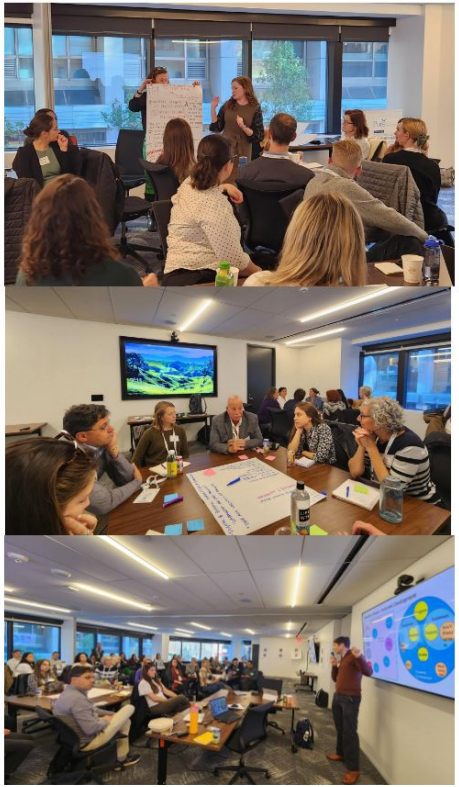
What gets written down? What gets shared out? Confirm supplies (post it colors, easels, etc.)

NESEA Session Preview - Building Material Reuse

- Presenters - Reuse Group Co-Chairs
  - Michael Orbank
  - Olivia Huang

- Topic: Building Material Reuse + Circularity
  - Why Reuse?
  - Circularity + Embodied Carbon
  - “Build the Movement”

- Workshop Format
  - Welcoming all roles in AEC and beyond
  - Tables of ~8
  - How could you utilize known reuse strategies?



NESEA Session Preview - Building Material Reuse

Why present at NESEA about reuse?

- Expand CLF Reuse Group audience and impact
- Advocate for reuse as a sustainability measure
- Benefit from industry collaboration and feedback

How do we promote reuse?

- Disrupt current AEC linear and silo'd frameworks
- Connect the dots between circularity and environmental impacts
- Demonstrate the carbon and cost benefits of circularity
- Expand & refine current circular pathways
- Connect regional reuse + decon entities into a growing network
- Encourage implementing circularity as early as possible

NESEA Session Preview - Building Material Reuse

Reuse Strategies to be workshopped:

1. Specify salvage and reuse in design & construction documents
2. Implement material take-back programs over demolition
3. Require minimum (verifiable) C&D waste diversion and reporting
4. Reuse materials on projects, onsite or internally
5. Purchase reused materials, donate excess construction materials & products
6. Identify reuse opportunities and establish circular project requirements and goals early