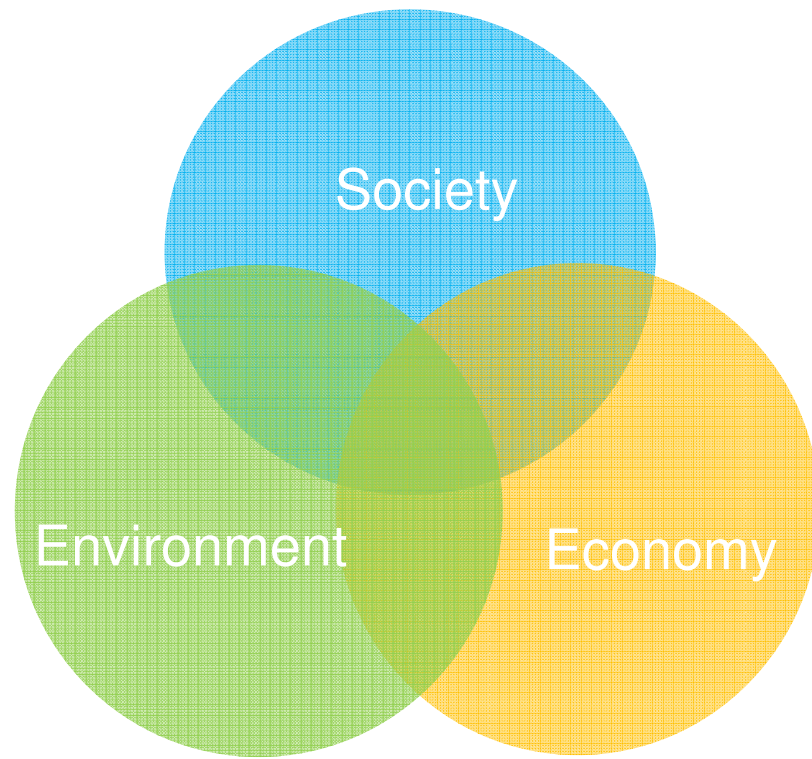
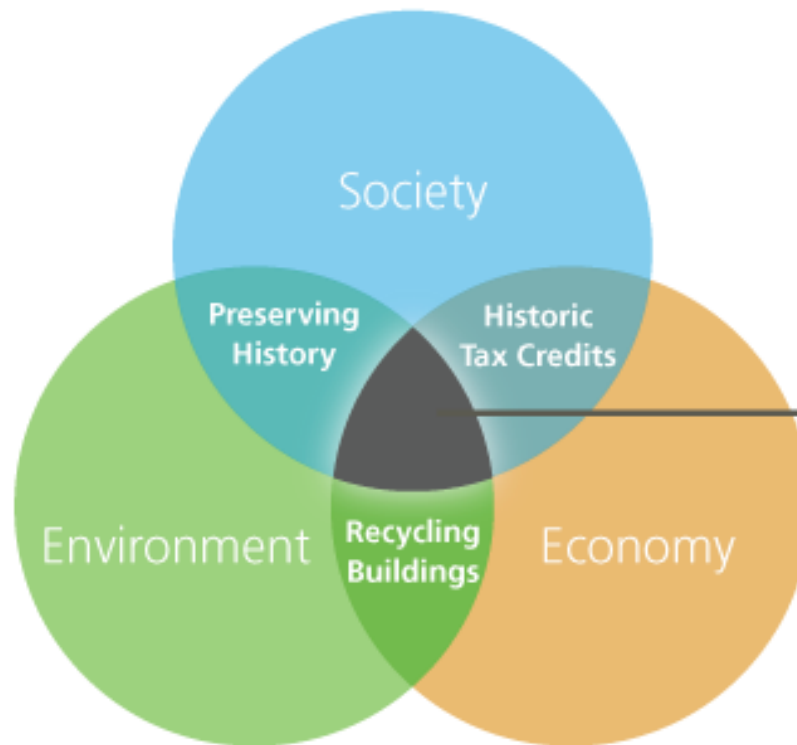




Historic + Sustainable:

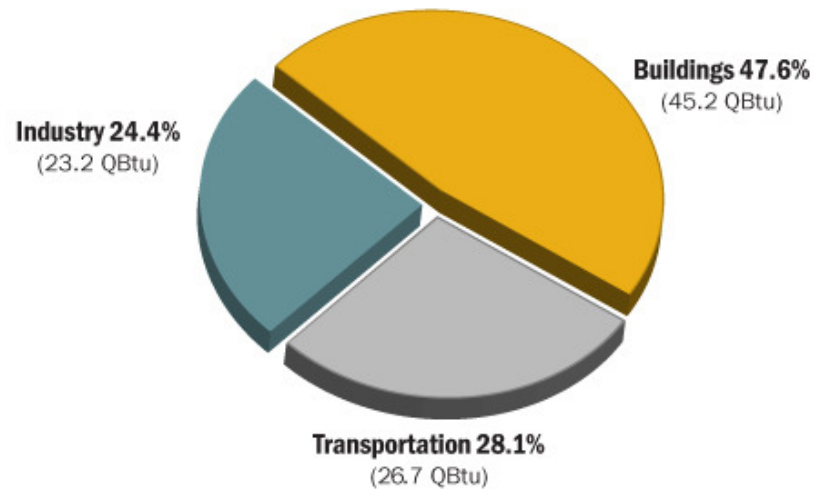
Two sides of the same coin





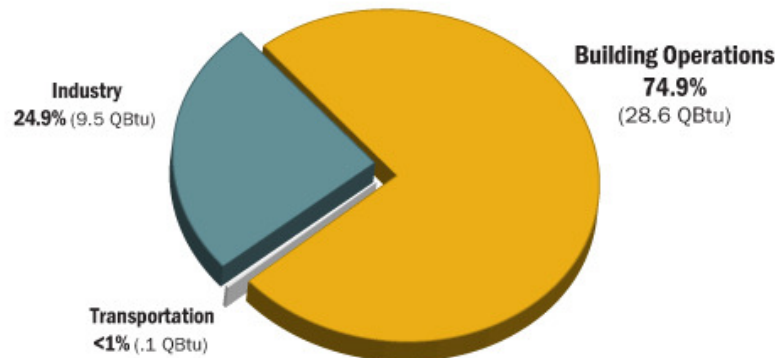
Sustainability

is the nexus of society, the environment and the economy.



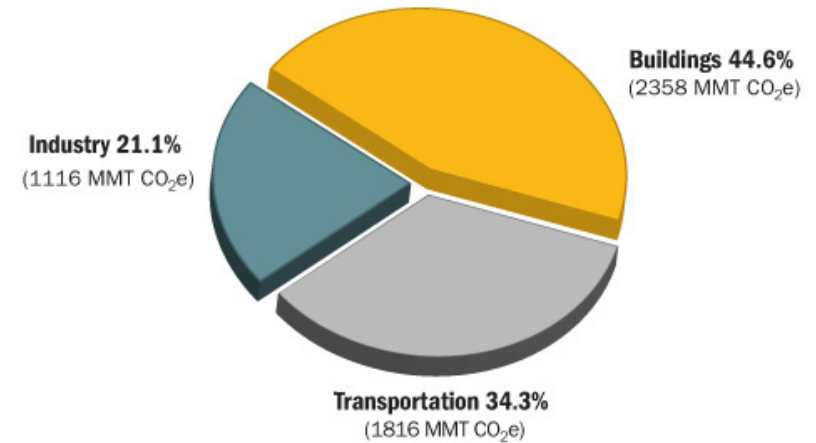
U.S. Energy Consumption by Sector

Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration (2012).



U.S. Electricity Consumption by Sector

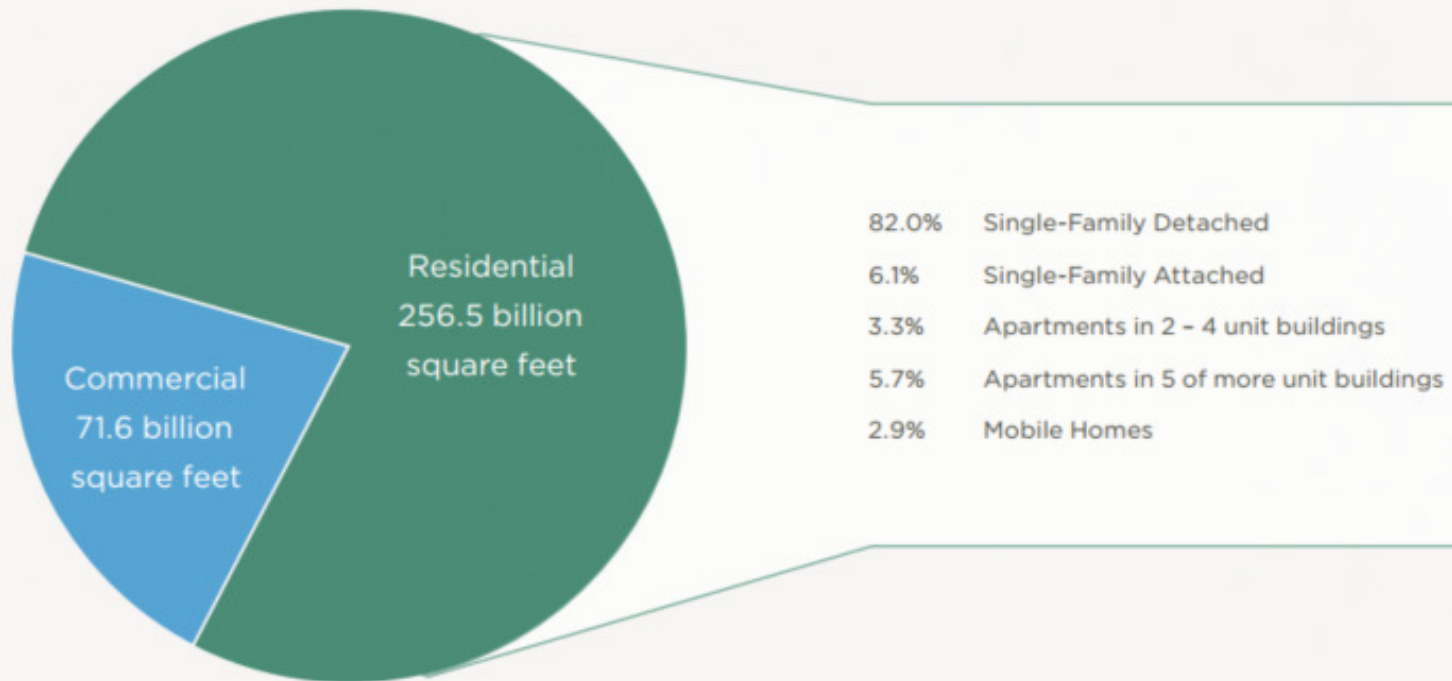
Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration (2012).



U.S. CO₂ Emissions by Sector

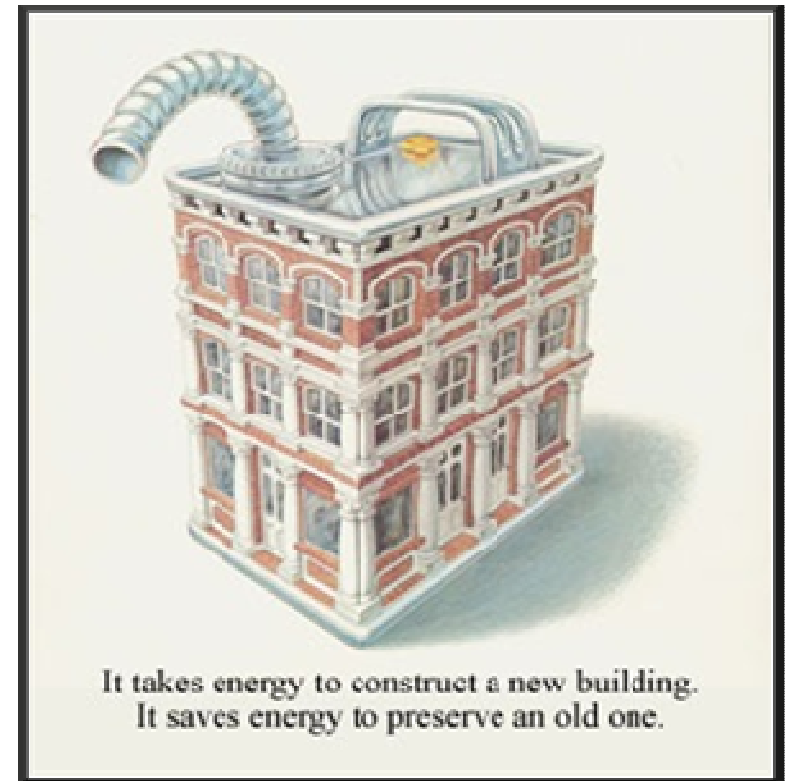
Source: ©2013 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration (2012).

Square Footage of U.S. Building Stock by Type

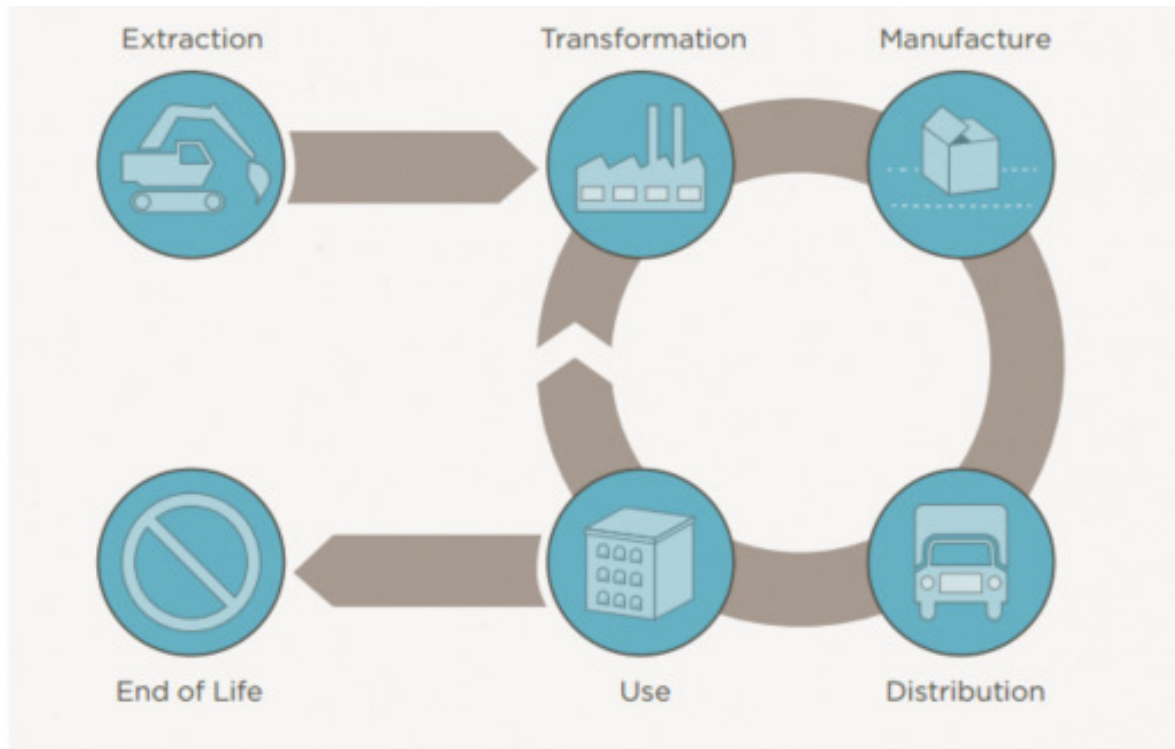


Source: U.S. Energy Information Administration

- **EMBODIED ENERGY** is required to produce a building.
It includes the up-front energy investment for extraction of natural resources, manufacturing, transportation, and installation of materials, referred to as initial embodied energy. Recurring embodied energy is needed over time to maintain, repair, or replace materials, components or systems during the life of a building.
- **OPERATING ENERGY** is needed to operate a building
and includes the energy required to heat, cool, and provide electrical services to a building over its life span.



Life Cycle Analysis



Extraction of raw materials for production of both new and replacement materials.

Transformation and refinement of raw materials.

Manufacture of products and distribution to suppliers.

Transportation of products to building site.

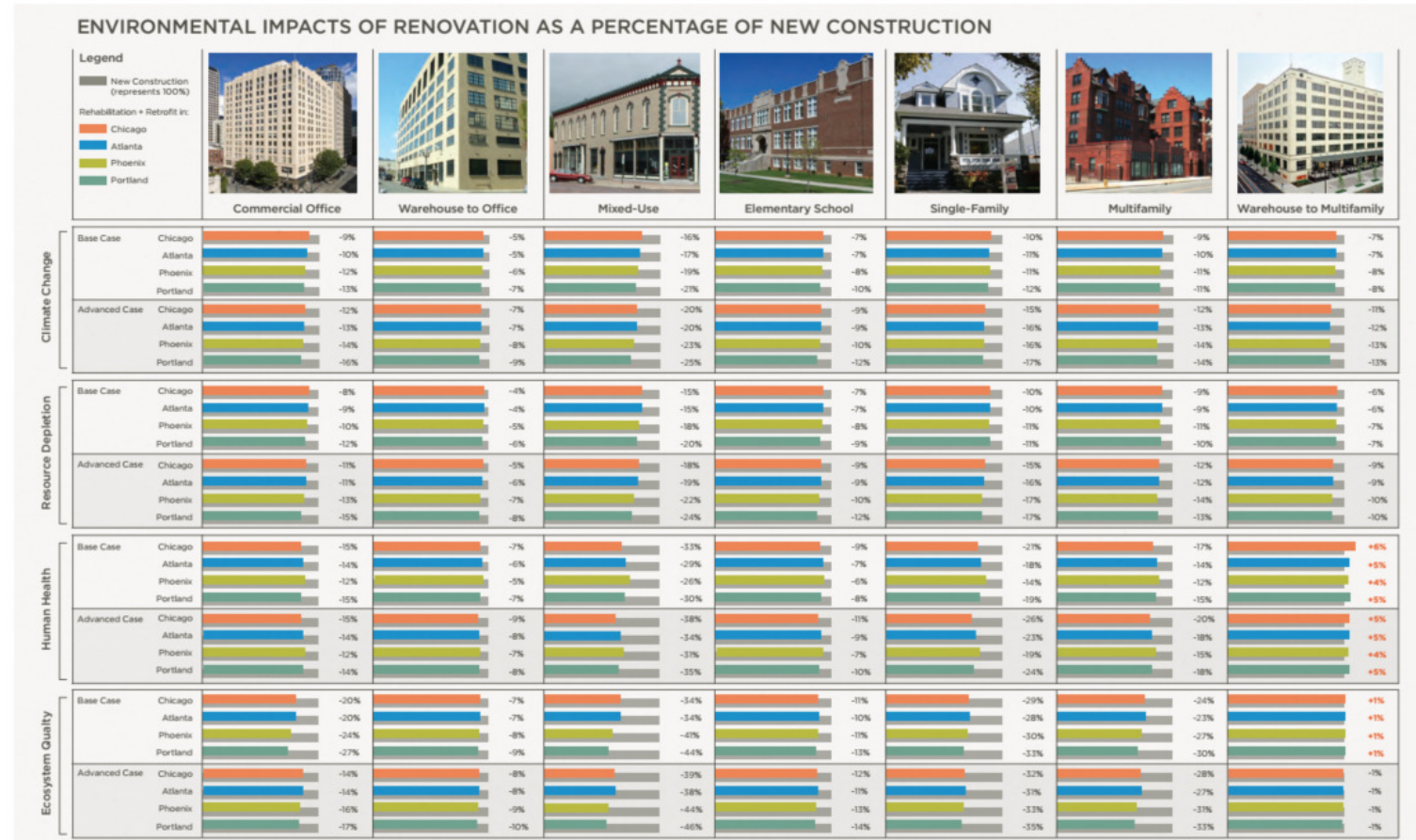
Use of building including construction-related activities and operating energy of the building over its lifespan.

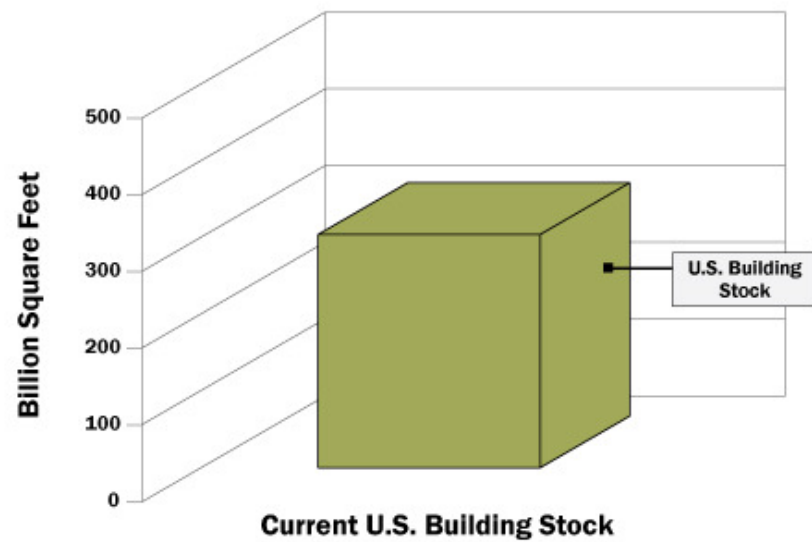
End of Life disposal of materials, including transportations, to landfill, recycling or incineration.

Summary of Results – The Greenest Building: Quantifying the Environmental Value of Building Reuse

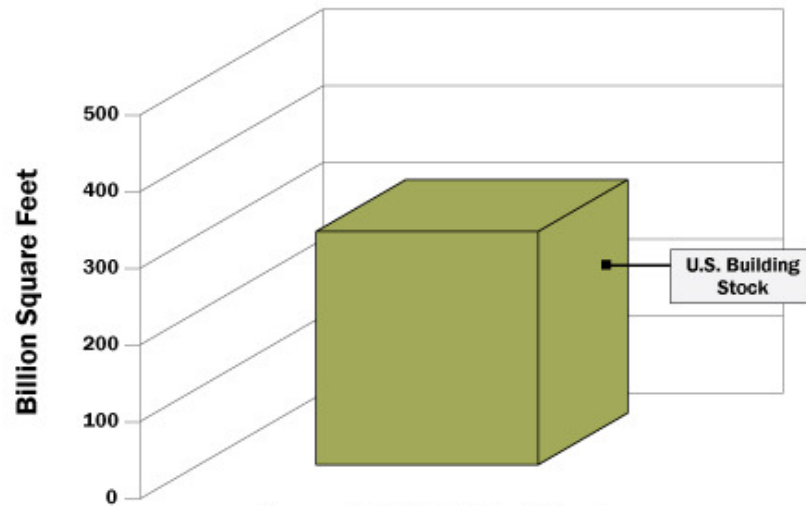
Avoided Impacts of construction

It takes 10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to the construction process.



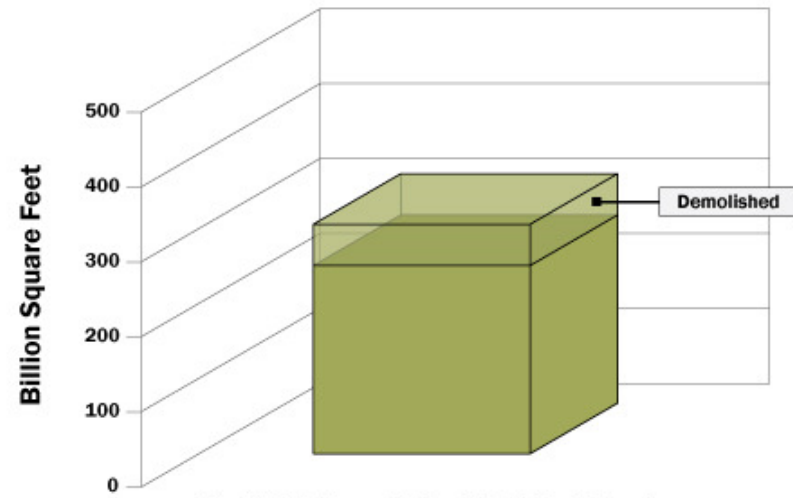


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Data Source: U.S. Energy Information Administration.



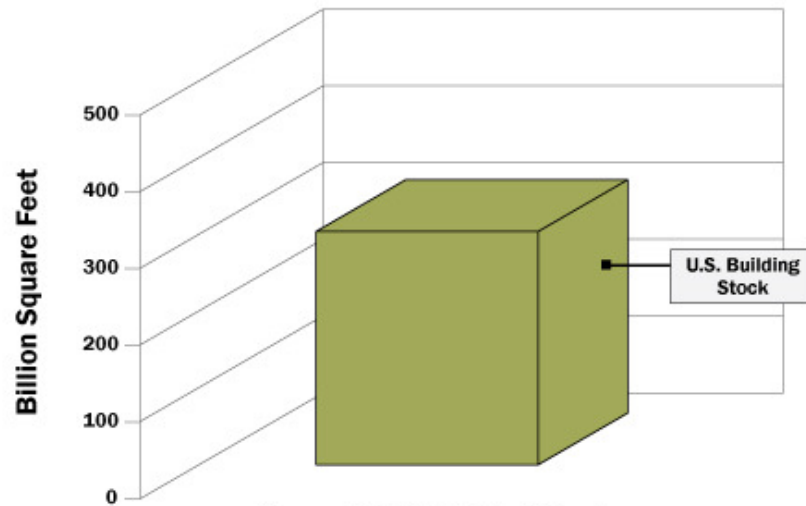
Current U.S. Building Stock

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration.



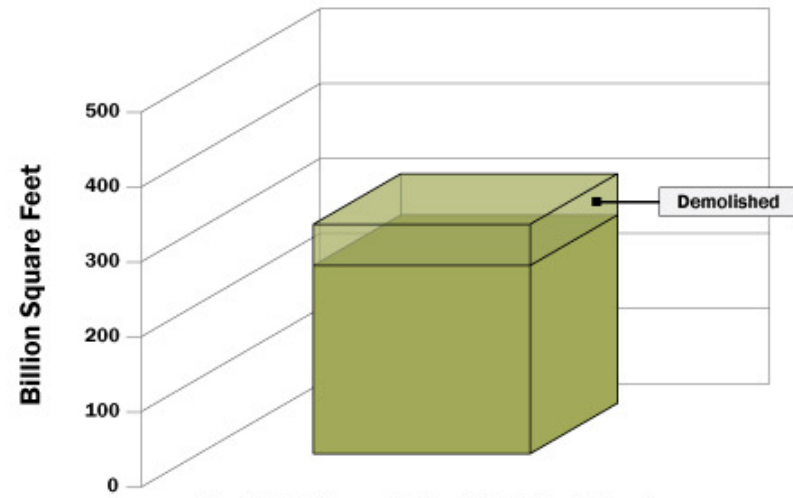
By 2035: Demolished Building Stock

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Data Source: U.S. Energy Information Administration.



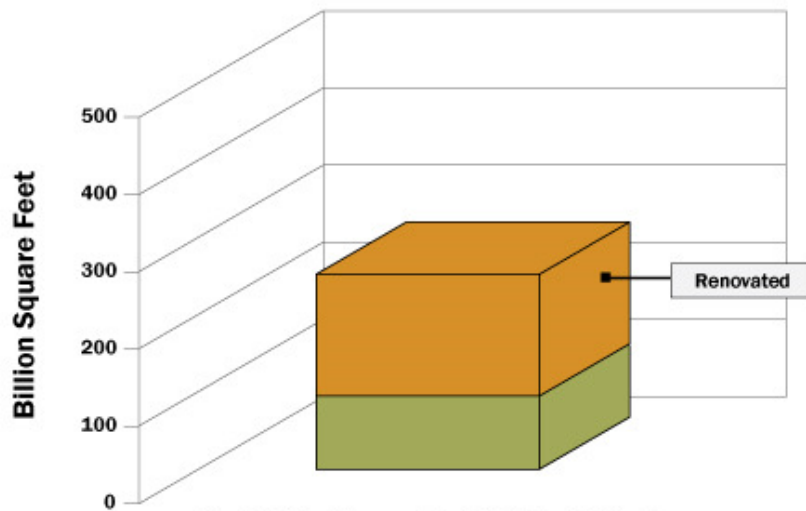
Current U.S. Building Stock

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Data Source: U.S. Energy Information Administration.



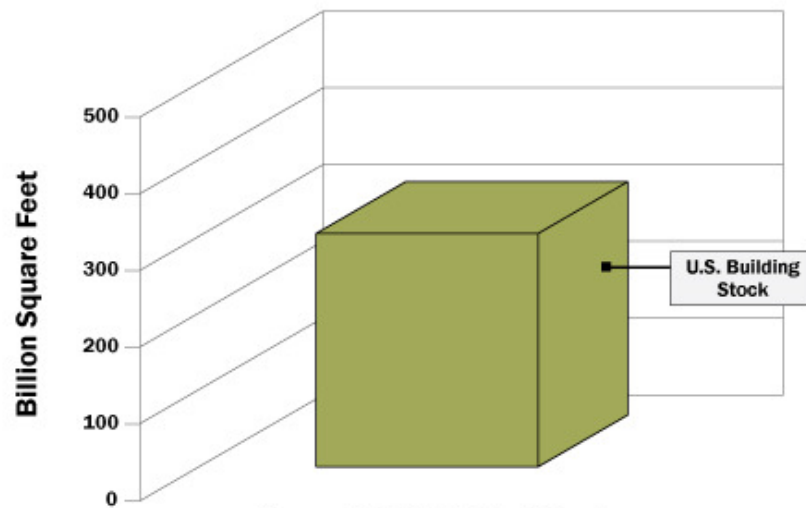
By 2035: Demolished Building Stock

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration.



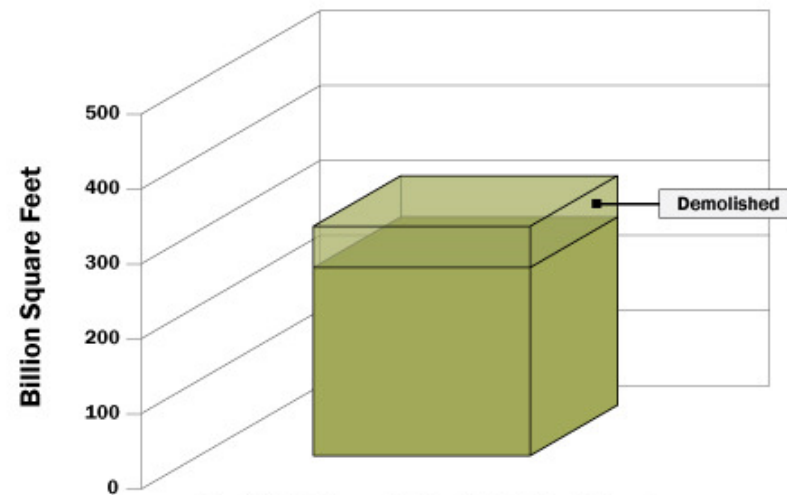
By 2035: Renovated Building Stock

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration.



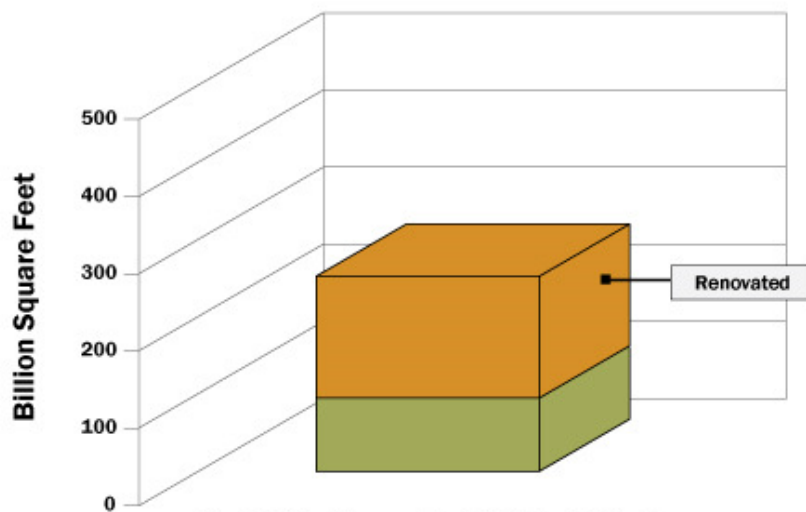
Current U.S. Building Stock

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration.



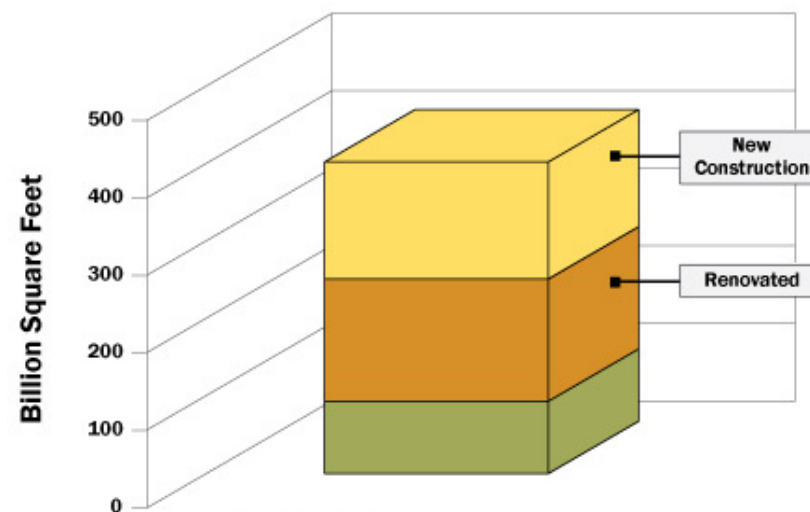
By 2035: Demolished Building Stock

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration.



By 2035: Renovated Building Stock

Source: ©2010 2030, Inc. / Architecture 2030. All Rights Reserved.
Data Source: U.S. Energy Information Administration.



By 2035: A Historic Opportunity

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Data Source: U.S. Energy Information Administration.

Preservation's Sliding Scale

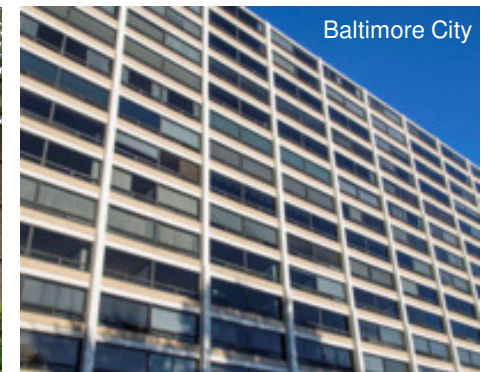


Current Year – 50 Years = Eligible to be listed on
National Register of
Historic Places

Preserving the Recent Past



M
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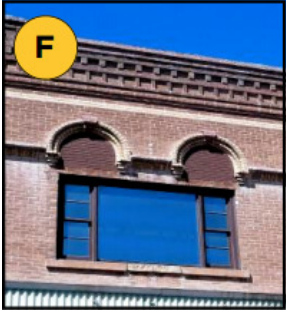


Adapting the conversation...

These



None of these



Adapting the conversation...



Adapting the conversation...



TEXTURED

SMOOTH

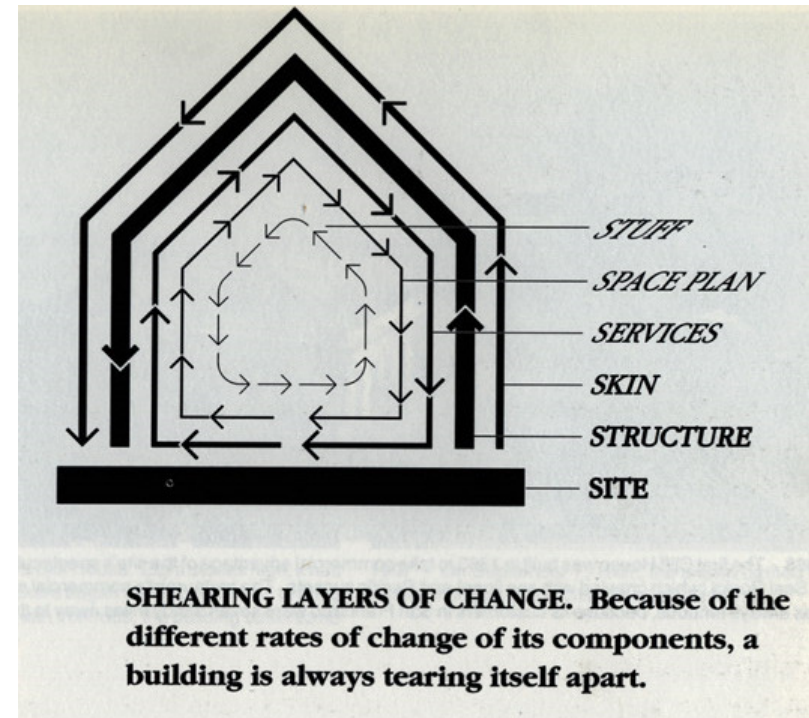
TUSCAN

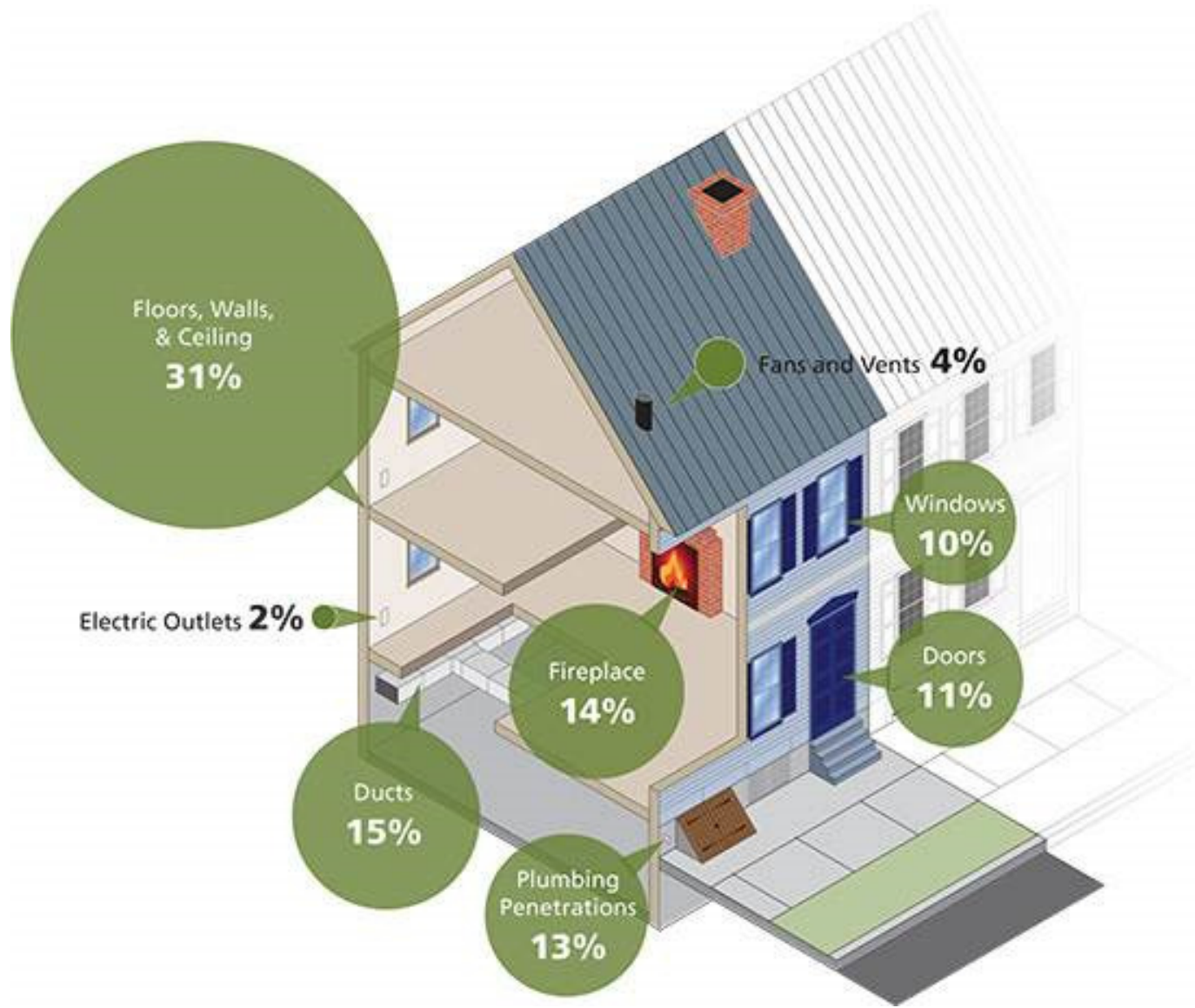
SLATE



Energy Upgrades in historic buildings

- Mechanical Systems
- Plumbing Systems
- Improving Building Insulation
- Renewable Energy Systems
- Improving Window Insulation
- Operations – reduce internal loads



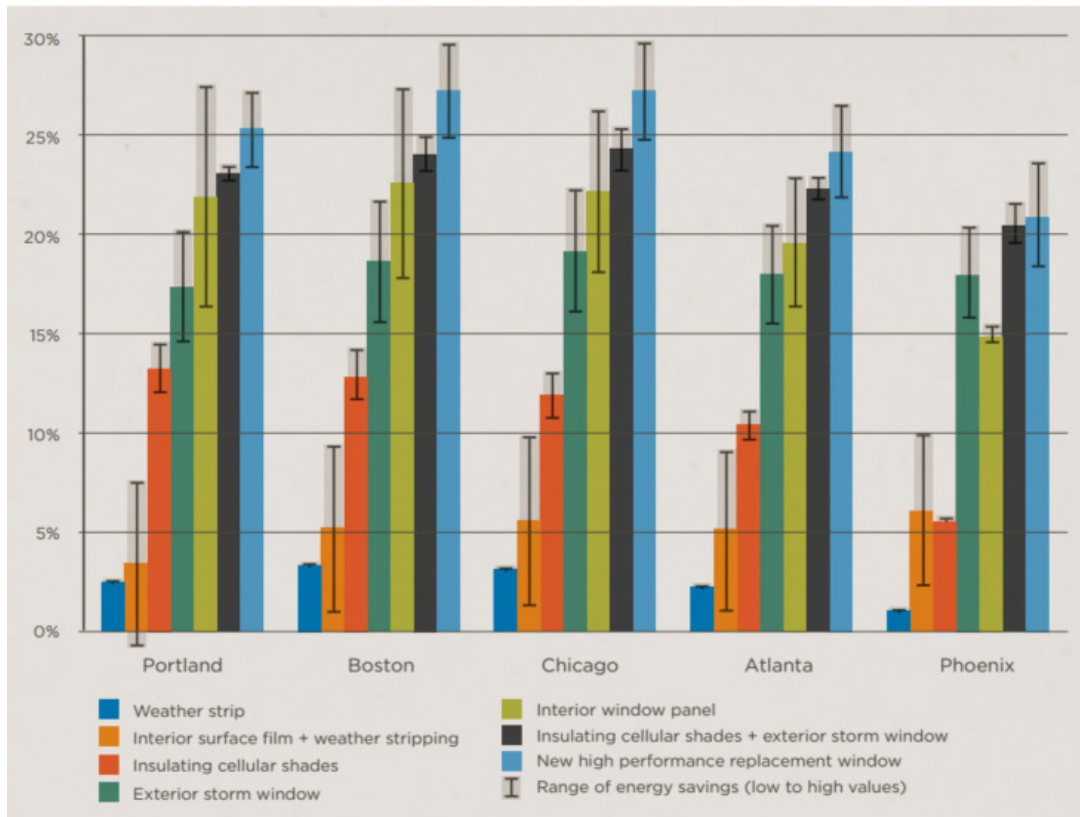


Insulation Options

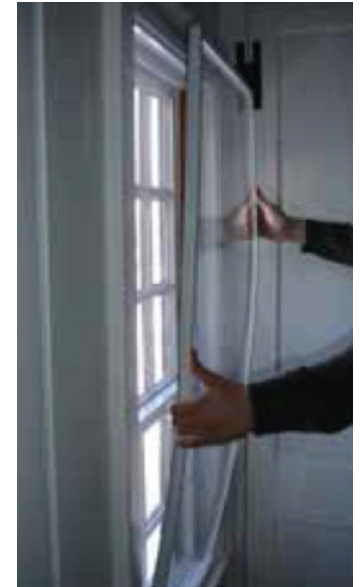


Window options

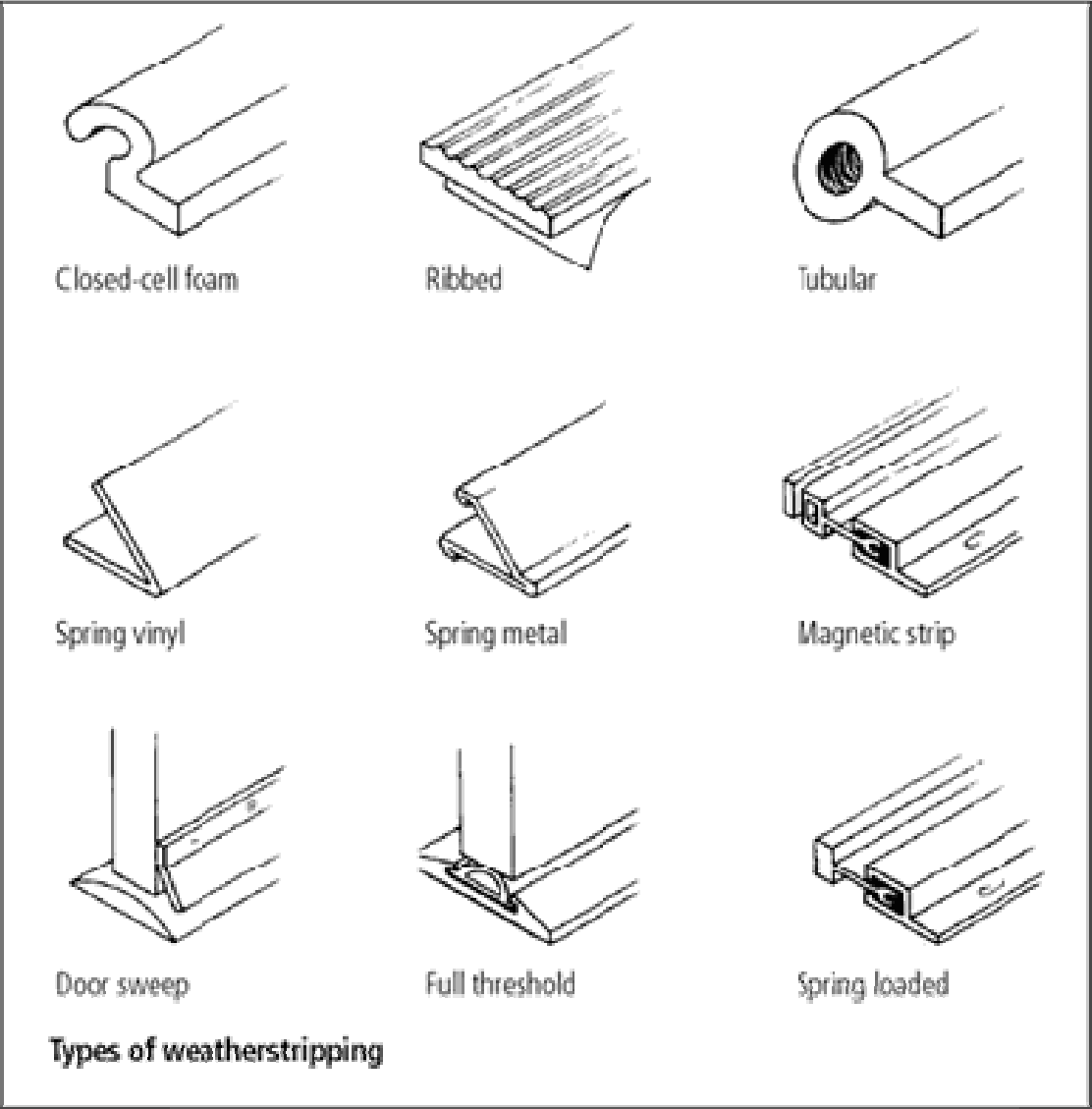
Annual Percent Energy Savings For Various Window Upgrade Options



Old Growth windows vs. Replacement windows



Weatherstripping Doors



McCormick Goodhart Mansion (aka Langley Park)

Constructed in 1924

Listed on the NR in 1975

LEEDv2.2 Certified Gold

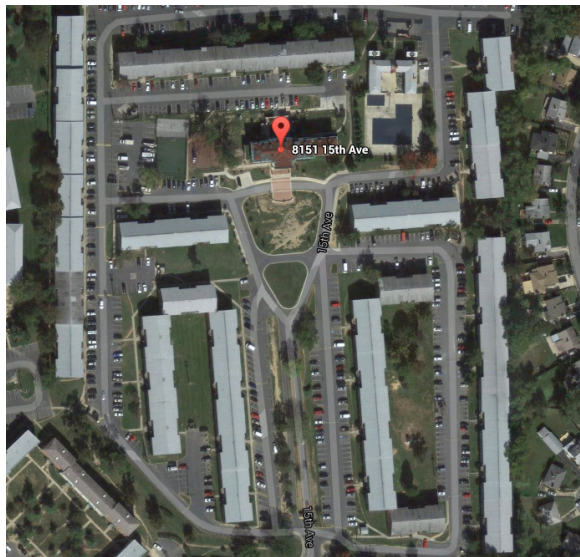
18.3% Improvement over ASHRAE 90.1-2004

In the Year of 1924:

- US President is Calvin Coolidge
- Greece proclaims itself a republic
- Metro Goldwyn Mayer (MGM) founded in LA
- J. Edgar Hoover appointed head of FBI



Before





Geothermal Well Drilling



Geothermal System





Restored Front (South) Façade



Restored East Façade



West Façade Before

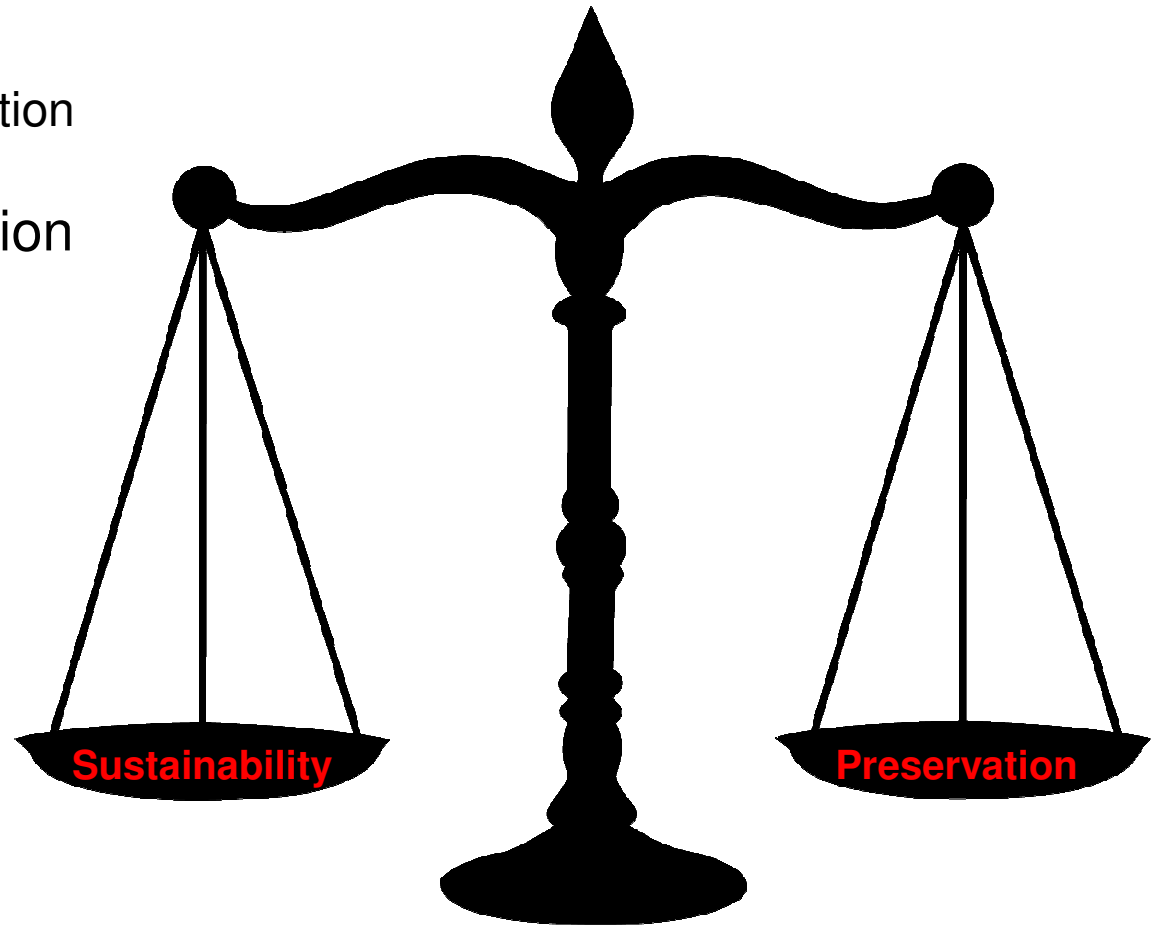
Sustainability > Preservation

~~Sustainability > Preservation~~

Sustainability < Preservation

~~Sustainability > Preservation~~

~~Sustainability < Preservation~~



Potential Conflicts

Preservation & Sustainability

“Historic preservation is an important way for us to transmit our understanding of the past to future generations.”



“We don’t inherit the earth from our parents but we borrow it from our children.”

are about our future

Historic Rehabilitation Tax Credits



Megan Klem, Preservation Officer
Office of Preservation Services
Maryland Heritage Structure Rehabilitation Tax Credit
July 12, 2017



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Maryland Historical Trust

The Maryland Heritage Structure Rehabilitation Tax Credit

What it is:

A 20% refundable state income tax credit on eligible rehabilitation expenses on certified historic structures

Three project types:



Competitive Commercial



**Small
Commercial**



Homeowner



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The Federal Historic Preservation Tax Credit

What it is:

A 20% federal income tax credit on eligible rehabilitation expenses of commercial properties that are listed in the National Register.

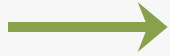
- Administered by the National Park Service and reviewed in coordination with the Maryland Historical Trust
- Can be used in conjunction with state commercial tax credits
- Applications accepted on a rolling basis year round



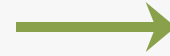
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Application Process

Part 1



Part 2



Part 3

- Certifies that the property is historic
- Valid for 5 years
- No fee
- Certifies that the proposed project meets the *Standards* for Rehabilitation
- \$10 review fee
- Certifies that the project was completed in accordance with the Part 2 approval
- Certifies eligible expenses
- Review fee is 3% of estimated or actual credit, whichever is greater

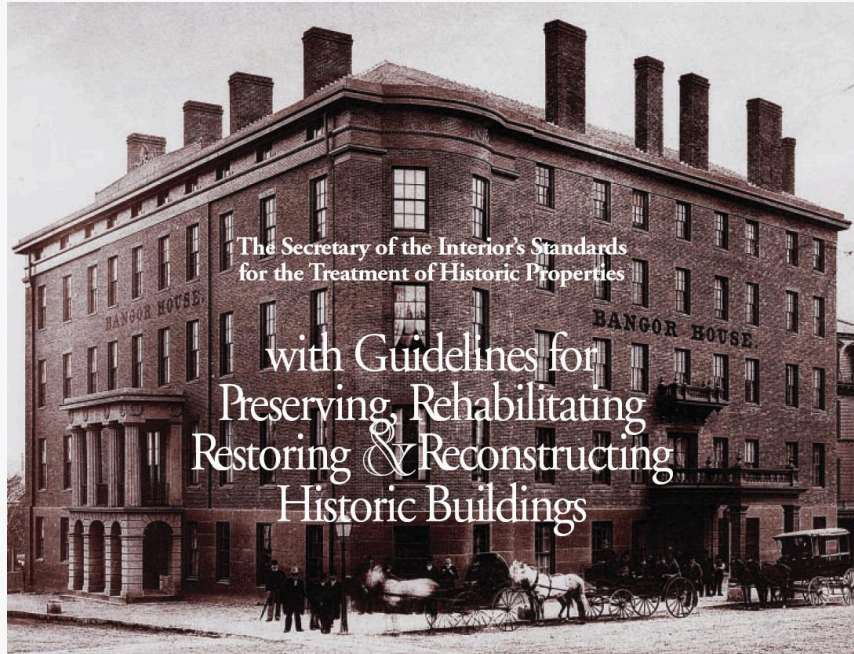


Submission to the Trust is highly recommended before submitting to any other review board / commission



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Secretary of the Interior's Standards



Three Main Principles:

- Distinctive features that characterize a property must be preserved. (*Standard #2 and #5*)
- When deteriorated beyond repair or missing, features must be replaced to match. (*Standard #6*)
- New construction and additions must be compatible with, but differentiated from the historic architecture. (*Standard #10*)



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Repair vs. Replacement

- Most historic buildings are constructed with materials that are of superior quality to modern building materials.
- Always try to repair damaged elements rather than replace them.
- If an element is truly beyond repair, it may be replaced in kind.
- Alternative synthetic materials like vinyl, aluminum, composites, etc. are typically not appropriate.



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Standard No. 6

Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities, and where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.



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Replacement Considerations

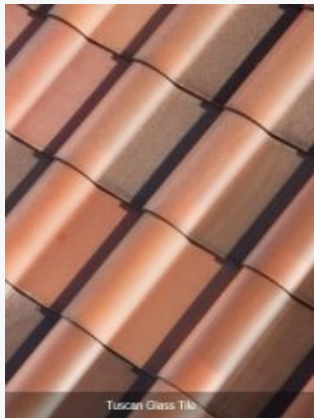
Process:

- Deteriorated beyond repair / sufficient evidence
- Availability of material(s)
- Building type and construction
- Recurring system failures (design issues, material, or construction technique)
- Accessibility and maintenance
- Cumulative effect



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Replacement Considerations - Materials



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Thank you

megan.klem@maryland.gov

410.697.9560



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REDUCING LEAD-BASED PAINT HAZARDS IN BALTIMORE'S LOCAL HISTORIC DISTRICTS

City of Baltimore Commission For Historical and Architectural Preservation



The Commission for Historical and Architectural Preservation (CHAP) was established in 1964. Today CHAP oversees 33 local historic districts, over 200 landmarks (ca. 13,000 structures), and manages a local historic preservation tax credit program. All exterior changes to properties in local historic districts must be reviewed and approved by CHAP. We also survey and designate historic properties and participate in all aspects of Planning and HCD activities.



CHAP works with a wide-range of neighborhoods, issues, and opportunities



Baltimore has many areas of vacancy and abandonment - unit block of South Fulton Avenue (Union Square Historic District).

Baltimore City Department of Planning





Two blocks away, there are meticulously restored mid-19th century rowhomes overlooking Union Square.





CHAP oversees design review in Dickeyville, a mill village, and Ten Hills, an early 20th-century suburbs.





Built in ca. 1797, these structures were originally timber-frame whitewashed wattle and daub structure.



CHAP reviews many landmarks in Downtown Baltimore - Looking south on Calvert Street

CHAP uses one set of guidelines to review all of Baltimore's historic Resources



Baltimore City Historic Preservation Design Guidelines

Adopted by the
Commission for Historical and Architectural Preservation
Baltimore City Department of Planning
City of Baltimore, Maryland



Date of Adoption - December 8, 2015

Table of Contents

Chapter 1: Design Guidelines for Building Exteriors	7
1.1 Identifying and Preserving Historic Building Fabric	7
1.2 Masonry	8
1.3 Wood	13
1.4 Metals	15
1.5 Alternative Materials	17
1.6 Doors	18
1.7 Windows	20
1.8 Roofing and Roof Drainage Systems	25
1.9 Porches, Steps, and Railings	30
1.10 Paint and Color	32
1.11 Lighting	35
1.12 Signage and Awnings	36
1.13 Mechanical, Electrical & Plumbing	38
1.14 Modern Equipment	39
1.16 Accessibility	40
1.17 Lead-Based Paint Hazards	41
1.18 Alterations and Additions	42
Chapter 2: Design Guidelines for Additions, New Construction, and Non-Contributing Buildings	45
2.1 Guiding Principles for New Design	45
2.2 Site Design	46
2.3 Scale and Form	47
2.4 Building Features	48
2.5 Materials and Detailing	49

In August of 2014, CHAP revised its guidelines to directly address lead-based paint hazards. CHAP began this process in early 2012.



When we began our revision process, CHAP first answered the question ‘what are Lead-based paint hazards?’ We discovered they are many things...





CHAP adopted HUD's definition of a lead-based paint hazard, "any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects as established by the appropriate Federal agency" (HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing [2012 Edition]).

Then we asked ‘why are lead-based paint hazards such a big deal?’ Public Health officials are continually learning more about the negative effects of lead poisoning:

Lead Paint Effects on Children

- Learning Disabilities
- Violent, Aggressive Behavior
- Language Delay
- Attention Deficit Disorder
- Hyperactivity
- Decreased Intelligence (I.Q.)
- Reduced Motor Control and Balance
- Hearing and Memory Problems

Lead Paint Effects on Adults

- 46% increased rate of early mortality
- 16% to 19% risk of cardiovascular disease
- Hypertension
- Depression
- Reproductive Problems
- Complications related to osteoporosis
- Possible link to Alzheimer's disease

From Coalition to End Childhood Lead Poisoning *Lead Paint Hazards in Older Properties – The Case for Developing Greater Flexibility in Historic Preservation Properties*



‘what has been the public sector’s response to address lead-based paint hazards?’

Since 1994 there has been changes in lead paint law and policy:

- Center for Disease Control has lowered the accepted lead level from 10 ug/dl to 5 ug/dl. Recent reports suggest that no lead level in the blood stream is safe.
- 2012 Reducing the Incidence of Lead Poisoning Law (HB 644) expanded the definition of an effected property to include houses built between 1950 and 1978.
- 2011 Jackson v. Dackman Company invalidated the limited liability section of the lead law. In other words, the Court of Appeals essentially removed the “law's \$17,000 cap on payments to victims of lead poisoning from landlords who comply with the law (Sun 10/24/2011).”



1.17 Lead-Based Paint Hazards

The Commission may consider the replacement of architectural features because they are a lead-based paint hazard on an accessible, friction, or impact surface. CHAP may require the retention of historic features and the use of other lead-based paint hazard reduction techniques. For more information on current lead-based paint laws and requirements, please contact the [Maryland Department of the Environment](#). CHAP follows HUD's definition of a lead-based paint hazard, being "any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces that would result in adverse human health effects as established by the appropriate Federal agency." ([HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing \[2012 Edition\]](#))

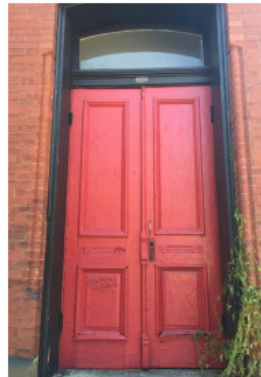


Figure 47: Historic door with layers of paint.

- The term "Accessible Surface" means an interior or exterior surface painted with lead-based paint that is accessible for a young child to mouth or chew.
- The term "Friction surface" means an interior or exterior surface that is subject to abrasion or friction, including certain window, floor, and stair surfaces.
- The term "Impact surface" means an interior or exterior surface that is subject to damage by repeated impacts, for example, certain parts of door frames.
- Lead paint is a common hazard associated with historic buildings. Applicants must follow Maryland Department of Environment's Lead Poisoning Prevention Program and all federal, state and local laws pertaining to the safe removal of lead paint. Contractors must be certified by the Maryland Department of the Environment and accredited by the U.S. Environmental Protection Agency.
- Painted surfaces should be carefully maintained to reduce the risk of lead exposure from flaking or chipping paint or lead paint dust.
- Historic buildings typically display a high quality of design and materials which should be retained. Special features that are custom designed or crafted, or that represent a high degree of styling or detailing, or that are composed of more unusual building materials warrant particular care and every effort should be made to preserve them. Elements that were mass-produced, do not have distinguishing characteristics or that are easily replicable may be considered for replacement if they are a lead-based paint hazard. Replacement features must follow the existing CHAP Guidelines for replacement.
- Every effort should be made to repair and eliminate lead-based paint hazards on special features. If a special feature is deteriorated beyond repair or a lead-based paint hazard cannot be eliminated without removal, a special feature must be replicated per CHAP Guidelines for replacement. CHAP may require the use of alternative methods rather than removal. For more information on addressing lead-based paint hazards, please contact the

[Maryland Department of the Environment and the U.S. Environmental Protection Agency:](#)

- When an applicant requests the replacement of a historic feature because it presents a lead-based paint hazard, the applicant must present the following:
 1. A test result that demonstrates that a feature has tested positive for lead.
 2. Documentation of the existing original feature, including profiles, dimensions, configuration, etc. This documentation should include drawings, photographs and any other relevant materials.
 3. A detailed proposal for a replacement feature, that includes a cut sheet or shop drawing of the proposed replacement feature, and a detailed description of the profile, dimensions, configuration, material, color, finish, etc. A sample may be requested by CHAP.

All proposed replacement materials must meet the CHAP Guidelines for replacement features.

It took CHAP several years to craft, review, and approve a page and a half of new guidelines!



In summary, the Lead-based paint guidelines address the following:

- Allow for the replacement of historic fabric because they are a lead-based paint hazard.
- *define* lead-based paint hazards into three categories of accessible, friction, or impact surfaces (based on HUD guidelines)
- All work must follow state and federal law.
- Defines special features as “features that are custom designed or crafter, or that represent a high degree of styling of detailing, or that are composed of more unusual buildings materials,”
- Allows for preservation in that “CHAP may require the use of alternative methods [to eliminate lead-based paint hazards] rather than removal.”
- Calls for a process.







These windows are of a unique design, but the originals were in terrible condition (rot at sill level and broken and cracked rails, stiles, and muntins). The applicant replicated them in wood with true divided lights.







Since we revised our guidelines to approve of replacing historic components because these features are lead-based paint hazards, we have reviewed and approved five applications.

Conclusion:

- In order to be responsible stewards of the built environment, we must acknowledge and address lead-based paint hazards.
- Creating a process allows for flexibility in being strict or lenient on design reviews.
- Always make sure the Commission supports underlying premises and assumptions prior to revising guidelines. Commissioners must understand the seriousness of lead-based paint hazards.
- If you plan on revising guidelines, be inclusive, transparent, and take your time.