PRESERVATION PRIMER

NAPC FORUM

PHILADELPHIA, PENNSYLVANIA

Nashville, Tennessee

Integrating Sustainability and Design Review – A New Trend in Guidelines

- How Have Design Guidelines Addressed Sustainability?
- Research – Contacted Each SHPO, National Trust, NPS and NAPC.
- Some Recent Guidelines Have Sections on Sustainability (Davidson, NC/Loudon County, VA).
- Oklahoma City was First with Policies Making Design Review and Sustainability Explicit Rather than Implied.

Developing Sustainability Guidelines for Historic Districts

By Nora V. Winter

NATIONAL TRUST FOR HISTORIC PRESERVATION

THE SECRETARY OF THE INTERIOR'S STANDARDS FOR REHABILITATION &

ILLUSTRATED GUIDELINES ON **SUSTAINABILITY** FOR REHABILITATING HISTORIC BUILDINGS

U.S. Department of the Interior
National Park Service
Technical Preservation Services

Why "Green" Your Guidelines?

- Align Historic Preservation with Community Sustainability Programs.
- Educate Property Owners on Making Their Buildings More Energy Efficient.
- Justify Review from Both Design and Sustainability Standards.
- Build Public Support for Historic Overlays and Design Review

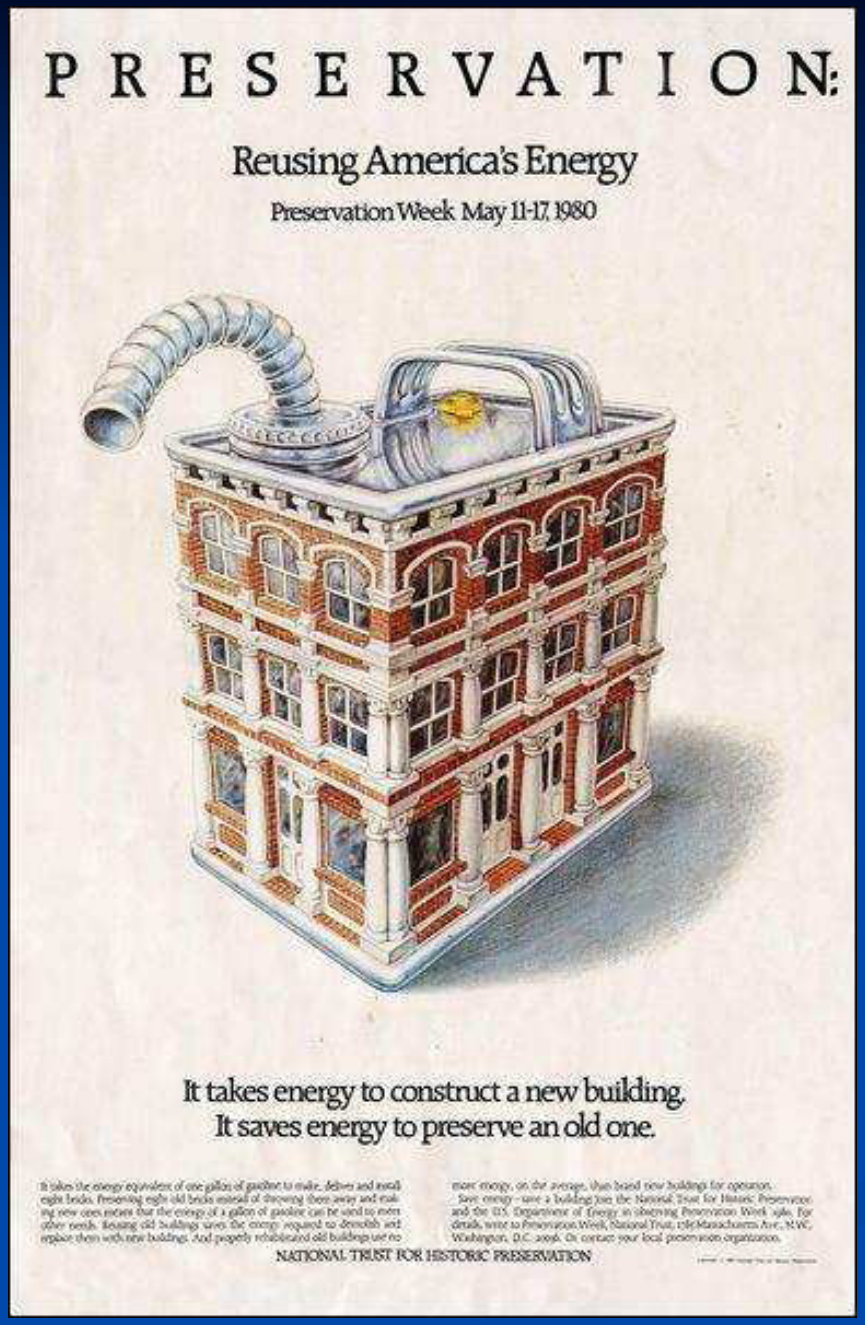
“Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.”

WHAT IS SUSTAINABILITY?

Source: UN World Commission on Environment and Development, 1987, The Brundtland Report

Historic Preservation is "Green" and Part of Sustainability Initiatives

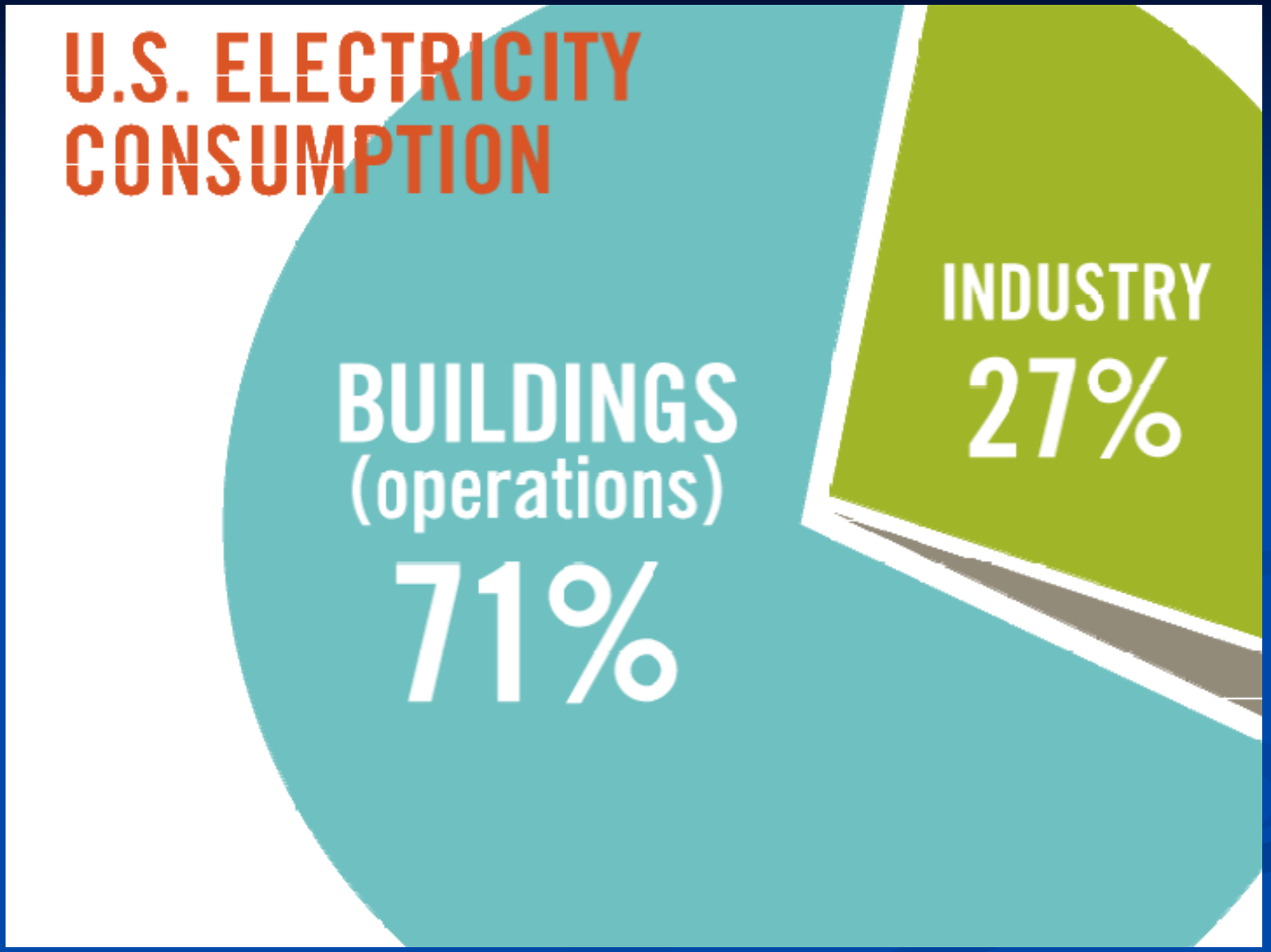
- Emphasis on reduce, repair, and reuse.
- The "Greenest" building is the one already built since it requires the use of fewer resources than new construction.
- Older buildings represent embodied and inherent energy conservation. Energy and resources have already been expended.



Embodied Energy in Historic Buildings, National Trust Poster, 1980

Historic Building Design and Energy Efficiency

- Designed with Long Lasting Materials.
- High Floor to Ceiling Heights for Air Circulation.
- Transoms Over Doors – Operable Windows for Air Circulation.
- Use of Wide Eaves, Large Porches and Awnings for Shade.
- Use of Trees and Landscaping on Southern Exposures.
- In the Southwest and South – Use of Stucco for High Reflectivity.


U.S. ELECTRICITY CONSUMPTION
BUILDINGS (operations) 71%
INDUSTRY 27%

Source: Commercial Building Energy Consumption Survey, 2003
http://www.eia.doe.gov/emeu/cbecs

Average energy consumption Btu/sq. ft Commercial Buildings (non malls)	
Before 1920	80,127
1920 – 1945	90,234
1946 – 1959	80,198
1960 – 1969	90,976
1970 – 1979	94,968
1980 – 1989	100,077
1990 – 1999	88,834
2000 – 2003	79,703

PERCEIVED ENERGY INEFFICIENCY

This Colonial Revival style house at 617 NW 14th Street illustrates several features that enhance energy efficiency.:

1. Light colored exterior for reflectivity.
2. Operable windows for ventilation.
3. Generous floor to ceiling ratio allows heat to rise away from living space.
4. Porch provides shade across entire façade.
5. Deciduous trees provide summer shade.
6. Wide eaves provide additional shade.

Illustrating Inherent Energy Efficiency

Illustrating Inherent Energy Efficiency

This Tudor Revival style house at 705 NW 42nd Street illustrates several features that enhance energy efficiency.:

1. Light colored exterior for reflectivity.
2. Operable windows for ventilation.
3. Steep roof allows for heat to rise away from living space.
4. Porch provides shade.
5. Deciduous trees planted to provide summer shade.
6. Light colored concrete on the driveway and walkway for reflectivity.

Inherent Energy Conservation – Use of Awnings

Inherent Energy Conservation – Use of Awnings

Inherent Energy Conservation – Longevity of Materials
Clay Tile Roof

Inherent Energy Conservation, Floor to Ceiling Heights

Inherent Energy Conservation – Wide Roof Eaves

Inherent Energy Conservation - Stucco Exteriors for Reflectivity

Appropriate Design Storm Doors

Increasing the Energy Efficiency of Historic Buildings

- Renewed Emphasis on Solar Energy
- Use of Reflective Roof Materials
- Increased Use of Geo-Thermal Systems

Efficient and Economical Options - Solar Powered Footlights

Freestanding Solar Panels in Rear Yard with Screening

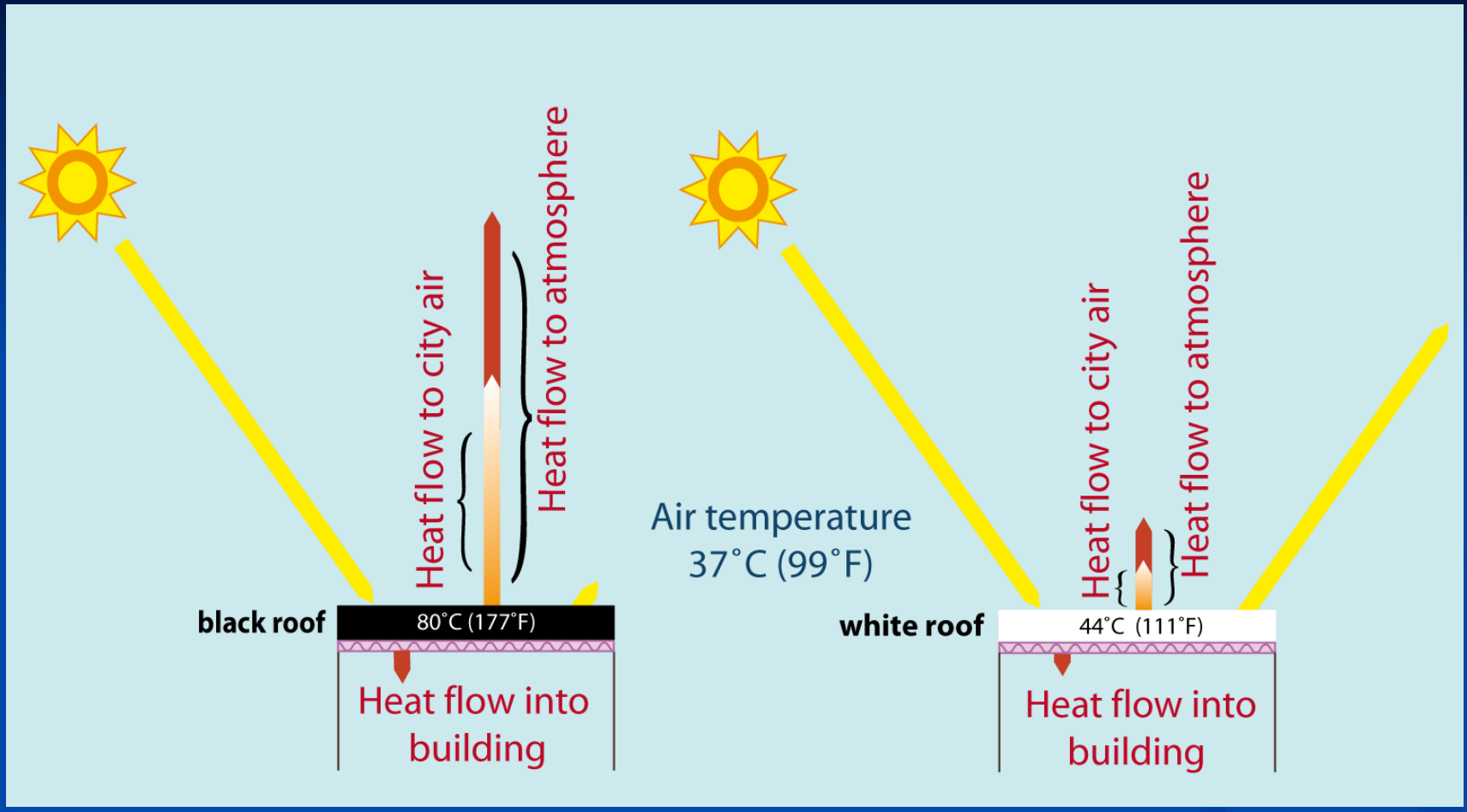
Rear Roof Line Solar Panels
(Above) and
Solar Shingles (Right)

Retrofitting Commercial Buildings – Rooftop Solar Panels

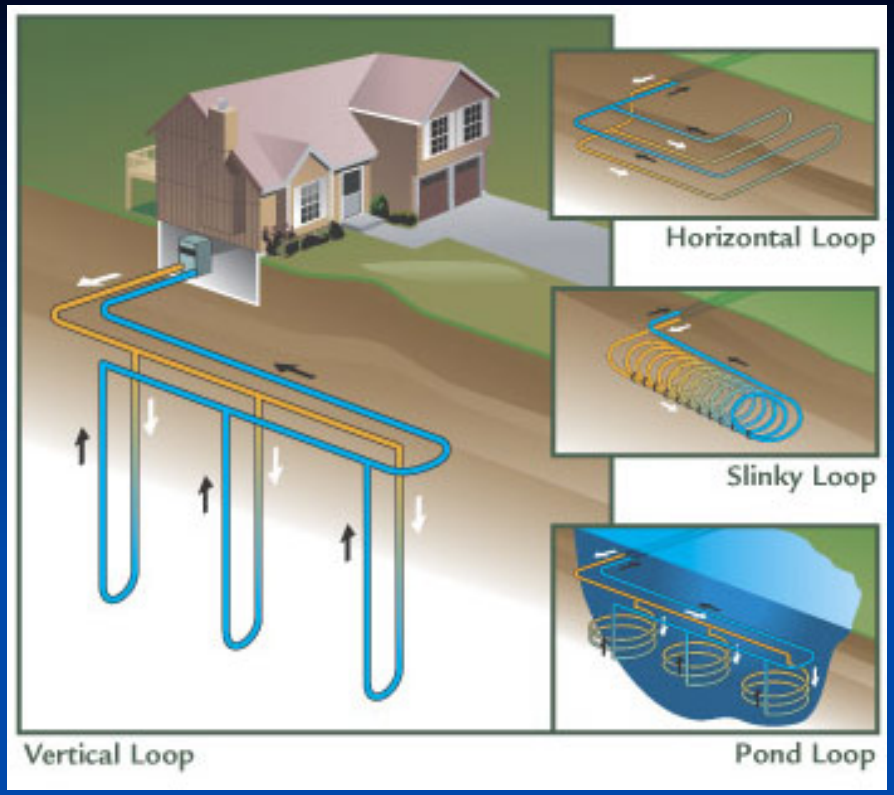
Retrofitting Historic Commercial Buildings - Rooftop Solar Panels

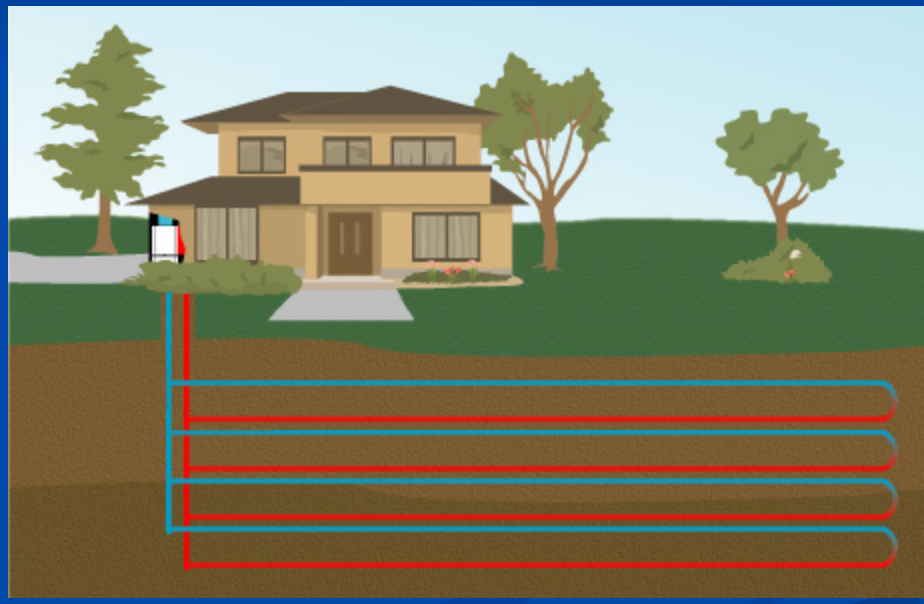
Replacement Shingles – Reflectivity and Appropriateness of Color

Retrofitting Historic Commercial Buildings - Reflective Roofs



Retrofitting Historic Commercial Buildings – Reflective Roofs





Use of Geo Thermal Heating and Cooling

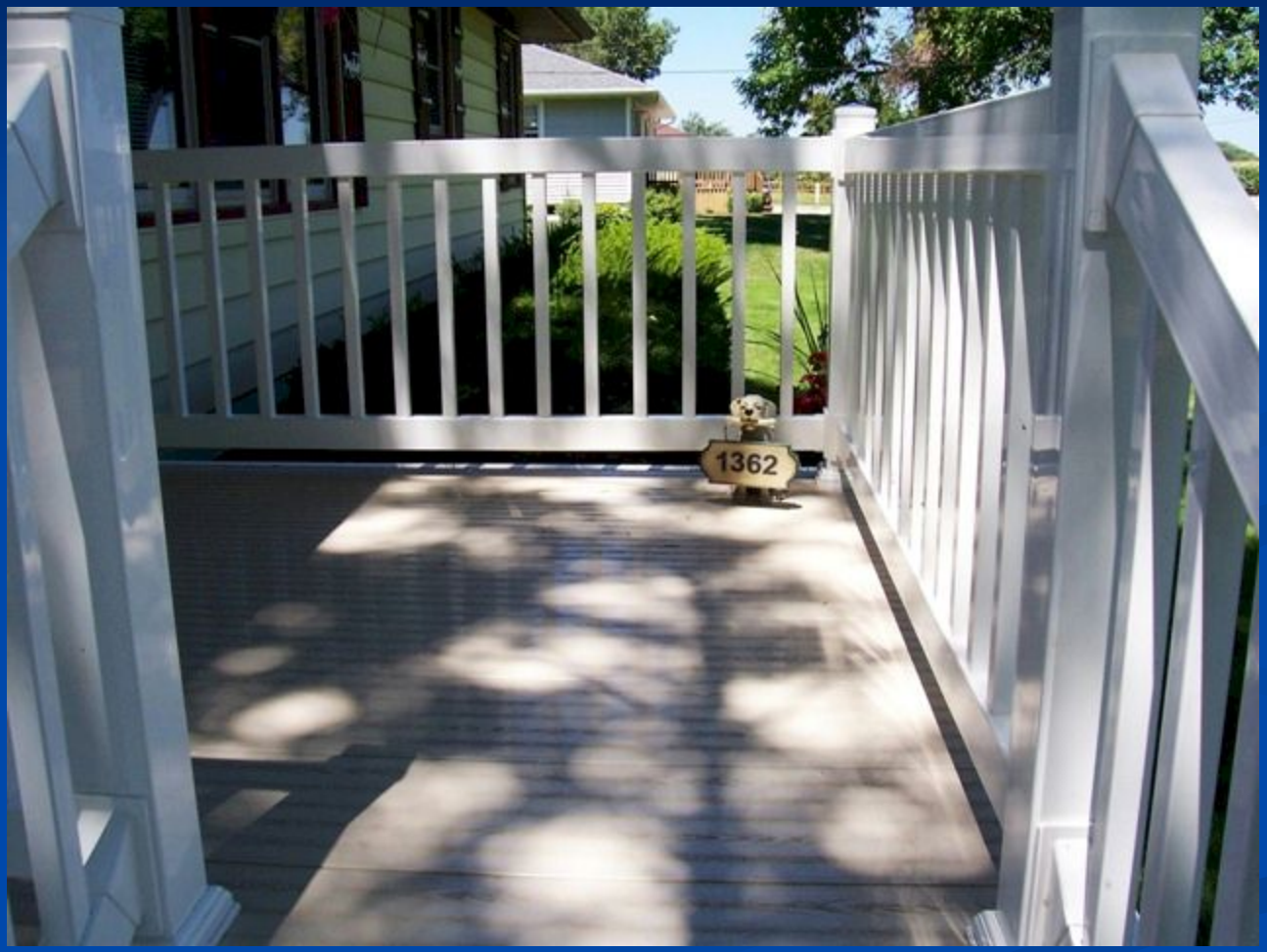
Increased Use and Approval of Sustainable Building Materials

- Cementitious Siding
- Recycled Plastic and Wood for Porch Floors
- Use of Fiberglass Columns
- Synthetic Slate
- Aluminum Clad and Fiberglass Windows

Cementitious Siding

Porch Materials - Floors

Composite Porch Floor



Porch Materials – Fiberglass Columns

Fiberglass Columns

Fiberglass Columns

Roof Materials – Synthetic Slate

Aluminum Clad Wood Replacement Windows: Longevity/ Maintenance

- Advantages
  - Can Have Compatible Profile and Appearance
  - Longer Life Expectancy Than Vinyl Windows
  - Can Meet NPS and Local District Guidelines
- Disadvantages
  - Comes From New Growth Wood and Aluminum – Less Sustainable
  - Appearance May Lack Some Aspects of Compatibility

Composite/Fiberglass Clad Wood Replacement Windows

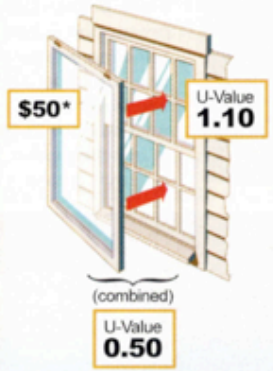
- Advantages
  - May Have Compatible Profile and Appearance
  - Longer Life Expectancy Than Vinyl Windows
  - Fiberglass is a Recycled Material
- Disadvantages
  - Costs 30% More Than Wood or Vinyl and Aluminum Clad
  - Unknown Life Expectancy
  - May not be Approvable by NPS and in Overlay Districts

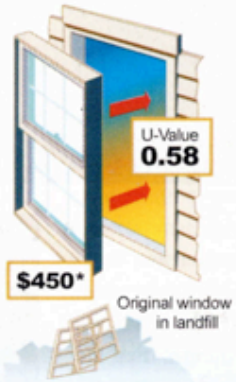
WINDOWS

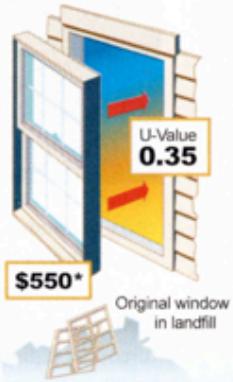
Retaining historic windows is often more environmentally friendly than replacement with new thermally resistant windows.

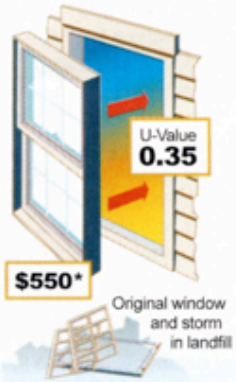
Window Replacement - Economics

Let the Numbers Convince You: Do the Math







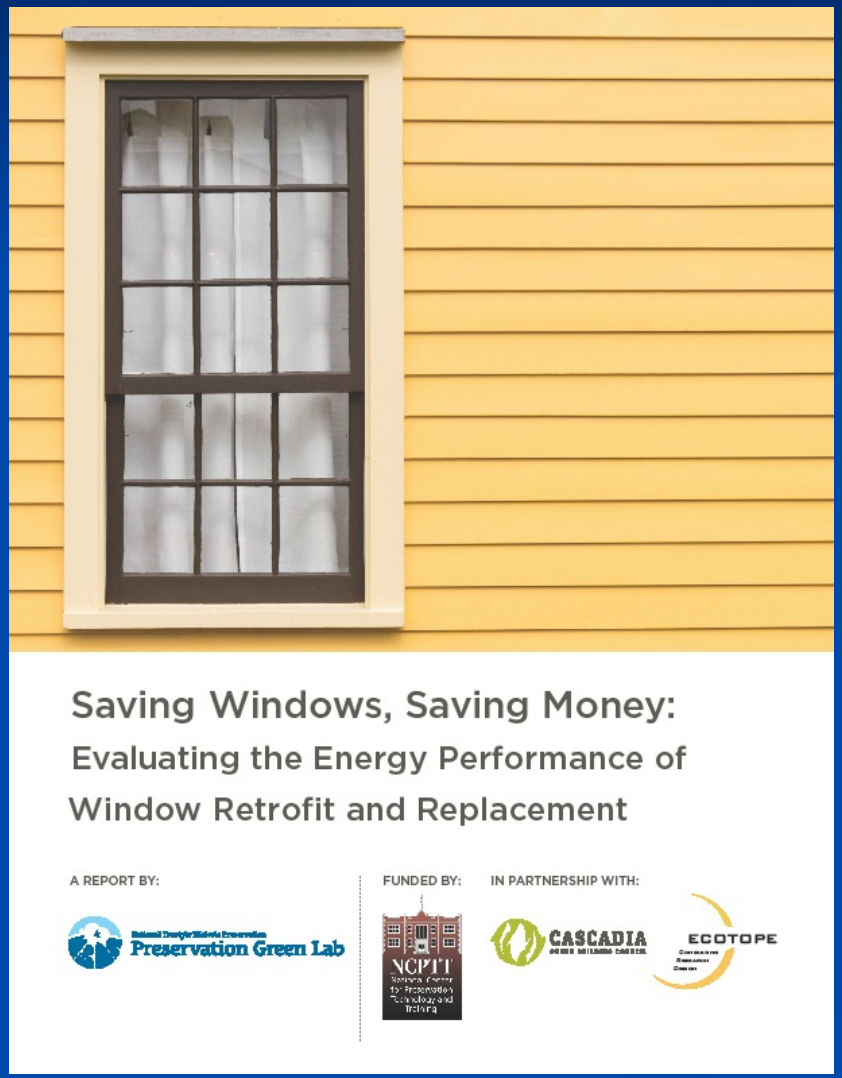


	TUNE-UP STRATEGIES			
	Storm window over single-pane original window	Double-pane thermal replacement of single-pane window	Low-e glass double-pane thermal replacement of single-pane window	Low-e glass double-pane thermal replacement of single-pane window with storm window
ANNUAL ENERGY SAVINGS	722,218 Btu	625,922 Btu	902,772 Btu	132,407 Btu
ANNUAL SAVINGS PER WINDOW**	$13.20	$11.07	$16.10	$2.29
SIMPLE PAYBACK	$50/$13.20 = 4.5 Years	$450/$11.07 = 40.5 Years	$550/$16.10 = 34 Years	$550/$2.29 = 240 Years

*Cost of 3' x 5' window, installed
**Assuming gas heat at $1.09/therm

Source: Keith Haberern P.E., R.A.
Collingswood Historic District Commission

Recent Window Studies



WINDOW PRESERVATION STANDARDS COLLABORATIVE

What to Do With Mid-20th Century Storefronts/Facades on Older Buildings?

- Are Storefronts and Upper Façade Materials from this Era Significant?
- Preservation vs. Restoration
- Difficulty of Matching Materials for Repairs

Yes- Preserve ca. 1920 – ca. 1950 Storefronts

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Preserve ca. 1950 – ca. 1970 Storefronts and Slipcovers ??

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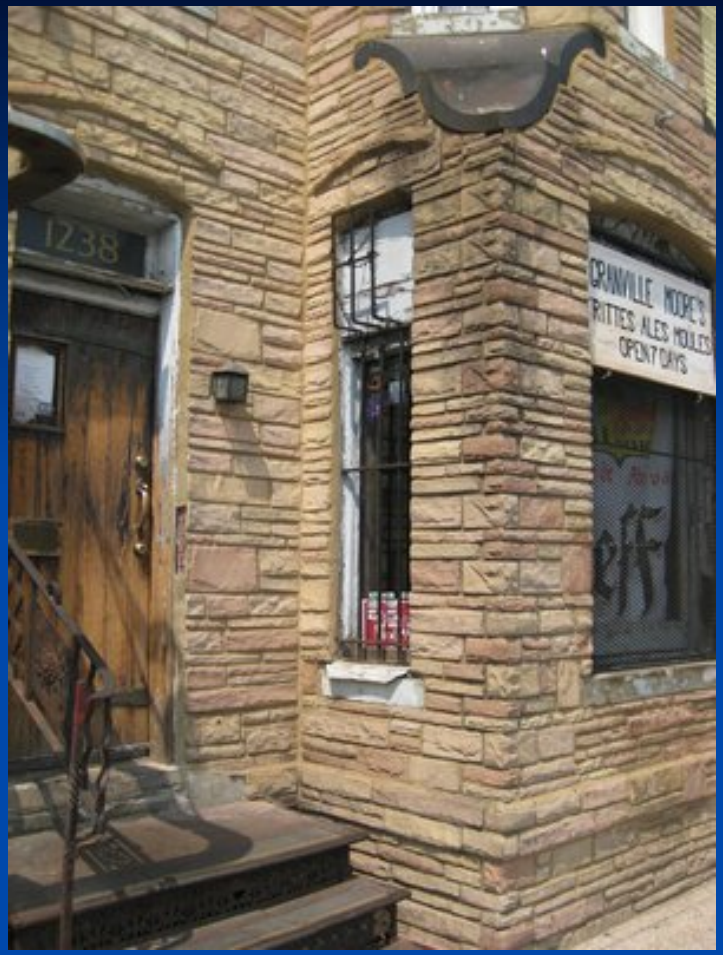

Difficulty of Repair of Materials, ca. 1950 – ca. 1970 Formstone and Permastone

Difficulty of Repair of Materials, ca. 1950 – ca. 1970 Tile and Roman Brick

What to Do With Mid-20th Century Storefronts/Facades on Older Buildings?

- Need Consensus on Historic District's Period of Significance
- Establish a Clear Policy on Mid-20th Century Commercial Building Preservation vs. Restoration
- Recognize the Difficulty of Matching Materials for Repairs

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