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Green Design

Downtown Institute 2010

Maine Development Foundation/Maine Downtown Center

April 9, 2010

ARCHITECTURE PRESERVATION DESIGN

Green Rehab ▸ Overview

"Appropriate treatment of buildings makes them sustainable."

Margaret Gaertner, Barba + Wheelock

"The biggest footprint on this planet is buildings. If you want to be an environmentalist you work on buildings or you work on cars."

David Gottfried, Founder USGBC

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It takes energy to construct a new building.
It saves energy to preserve an old one.

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Overview ▸ A Common Timeline: A Common Good

Historic Preservation	Conservation Movement
	1848: Olmsted plan for Central Park, NY
Mt. Vernon's Ladies Association: **1853**	
	1872: Yellowstone National Park
	1885: Adirondacks declared "Forever Wild"
	1916: National Park Service established
Colonial Williamsburg restoration begins: **1926**	
Charleston, SC: First Historic District in U.S.: **1931**	
	1962: **Rachel Carson wrote** *Silent Spring*
McKim, Mead & White's **Penn Station Demolished**: **1964**	
First Historic Preservation Degree Program established: **1964**	
National Historic Preservation Act of 1966 enacted: **1966**	
Grand Central Terminal court battle **1968-1978** (HP as valid as zoning)	
	1972: Arbor Day enacted
First ***Preservation Briefs*** published: **1975**	
National Historic Tax Credits: **1976**	
State tax credit programs abound: **Ongoing**	
City of Portland, Maine enacts Historic Preservation Ordinance: **1990**	
	1993: USGBC formed, LEED Certification developed
	2002: ***Cradle to Cradle***, McDonough and Braungart
	2005: Energy Credits?
	2006: ***An Inconvenient Truth***, Gore
Maine State Tax Credit Adopted : **2008**	**2008:** Energy Credits updated

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Overview ▸ Why is this Important?

	Building Reuse/Preservation	Greening/Conservation
Cultural + Social Equity	Saving Places, Communities	Preserving Green Space Healthy Working Environment
Ecology + Environmental	Reducing Landfills	Smaller Carbon Footprint
Economics	Tax Credits Higher Property Values Longterm Investment	Lower Operating Costs Tax Credits Grants

Triple Bottom Line: (USGBC)
People, Planet, Profit

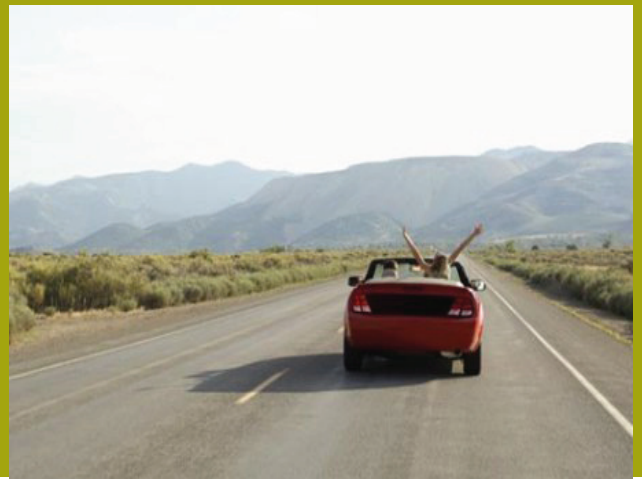
The lure of the suburbs

LAWNS

OPEN SPACE

FREEDOM TO TRAVEL BY CAR

- Christopher Leinberger, The Brookings Institute



Overview ▸ Turning Around Downtown

PARADOX of adding more activity to the suburbs

GEOMETRIC INCREASE IN AUTO TRIPS

MORE CONGESTION

POLLUTION

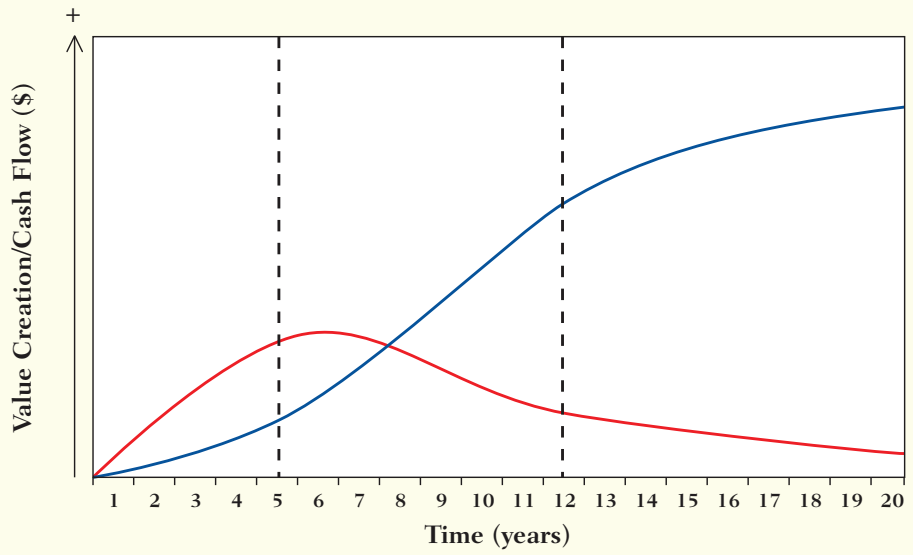
INCONVENIENCE

DESTRUCTION OF THE VERY FEATURES THAT ENTICED ONE TO THE SUBURBS

- Christopher Leinberger, The Brookings Institute

Overview ▸ Turning Around Downtown

Figure 1. Financial Characteristics of Downtowns with Critical Mass (Blue) versus Suburban Development (Red)



Source: Christopher B. Leinberger, Arcadia Land Co. and Robert Charles Lesser & Co.

DOWNTOWN DEVELOPMENT

Higher development costs = Financial returns less in early years

Build downtown for a mid- to long-term return

Suburban model peaks in 5 to 7 years = less sustainable

- Christopher Leinberger, The Brookings Institute

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Overview ▸ Pre-1800 - 1945: First Period to WWII

- Heating Individual Rooms
- Natural Cooling
  - Cross Ventilation
  - Monitors/Stack Effect
- Climate Responsive Elements
  - Shutters
  - Deciduous Trees / Street Trees
  - Porches
- Walkable Communities

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Overview ▸ 1946-1973: Post WWII to Pre-Oil Embargo

- Mechanical Ventilation
- Electrical Lighting

High energy consumers

Limited natural climate responsive elements

Car dependent

What To Do

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What to Do? ▸ Philosophies

Preservation Philosophy

- Repair
- Rehabilitate
- Replace

Green Philosophy

- Reduce
- Reuse
- Recycle

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What to Do? ▸ Think Local

- Reduce matieral needs, transport, etc.
- Labor intensive as opposed to material intensive
- Economic Sustainability

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What to Do? ▸ Follow LEED Process

NC - New Construction

Major renovation if replace the mechanical system or alter/add more than 50% of total building floor area

EB - Existing Buildings

Existing buildings and facility alterations and additions for commerical, institutional or high-rise residential buildings

IC - Innovative Credits

LEED-NC: Innovation in Design
Design or Exemplary Performance
LEED-EB: O&M: Innovative in Operations
Exemplary performance or upgrade not covered in EB:O&M

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What to Do? ▸ Follow Preservation Standards

Identify character defining Spaces + Features

Is the property National Register Eligible, Listed or Listed in a District?

- Landmark
- Significant
- Contributing
- Non-Contributing

Is there a Local or State Historic Preservation Review Board?

Develop a building chronology

Develop a preservation philosophy towards the building

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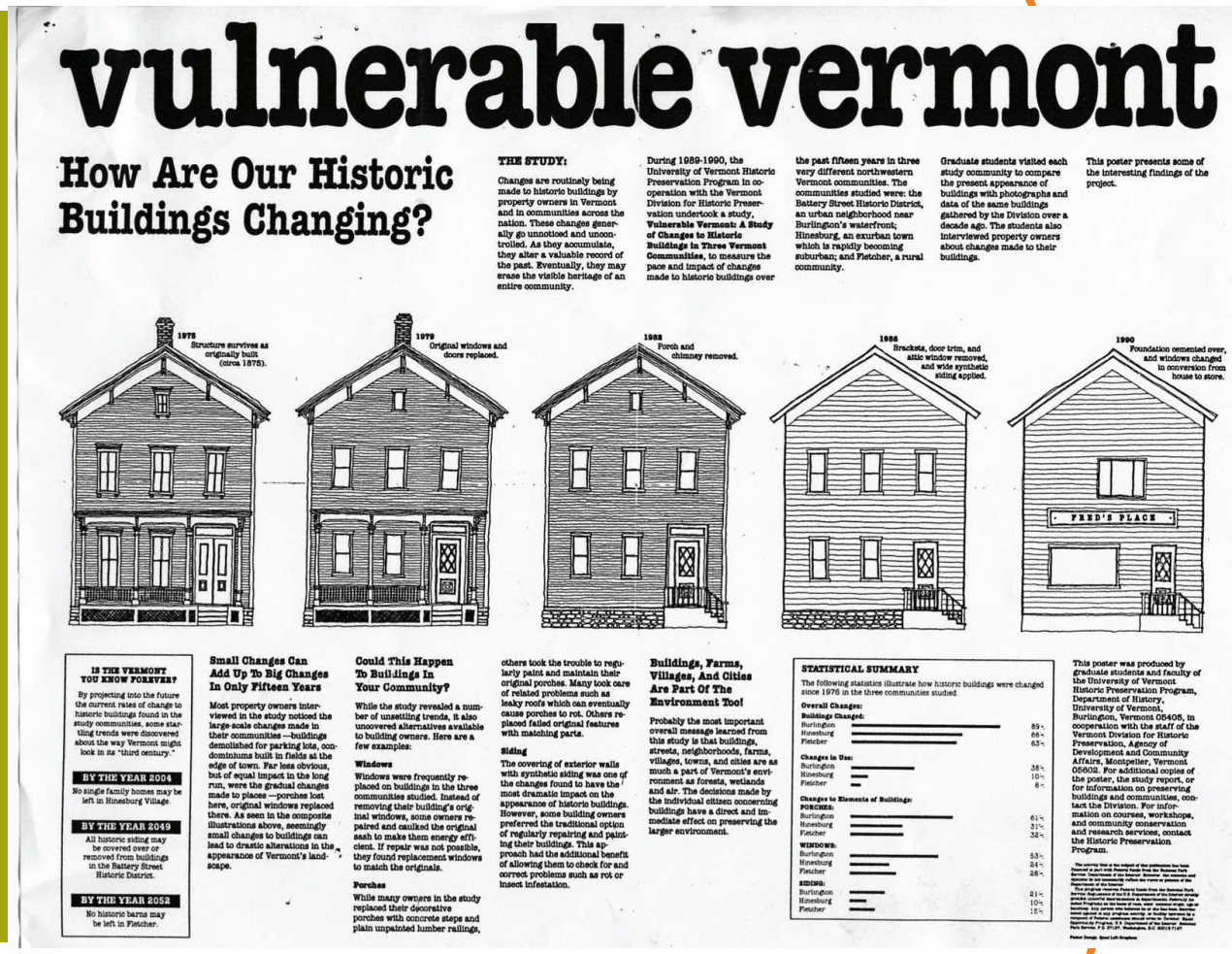
What to Do? ▸ Follow Preservation Standards

Incremental obsolescence

Minor losses add up to total loss

Following preservation standards are what keeps the downtown SUSTAINABLE



vulnerable vermont

How Are Our Historic Buildings Changing?

THE STUDY:

Changes are routinely being made to historic buildings by property owners in Vermont and in communities across the nation. These changes generally go unnoticed and uncontrolled. As they accumulate, they alter a valuable record of the past. Eventually, they may erase the visible heritage of an entire community.

During 1989-1990, the University of Vermont Historic Preservation Program in cooperation with the Vermont Division for Historic Preservation undertook a study, **Vulnerable Vermont: A Study of Changes to Historic Buildings in Three Vermont Communities**, to measure the pace and impact of changes made to historic buildings over the past fifteen years in three very different northwestern Vermont communities. The communities studied were: the Battery Street Historic District, an urban neighborhood near Burlington's waterfront; Hinesburg, an exurban town which is rapidly becoming suburban; and Fletcher, a rural community.

Graduate students visited each study community to compare the present appearance of buildings with photographs and data of the same buildings gathered by the Division over a decade ago. The students also interviewed property owners about changes made to their buildings.

This poster presents some of the interesting findings of the project.

1975 Structure survives as originally built (circa 1875).

1979 Original windows and doors replaced.

1982 Porch and chimney removed.

1986 Brackets, door trim, and attic window removed, and wide synthetic siding applied.

1990 Foundation cemented over, and windows changed in conversion from house to store.

FRED'S PLACE

IS THE VERMONT YOU KNOW FOREVER?

By projecting into the future the current rates of change to historic buildings found in the study communities, some startling trends were discovered about the way Vermont might look in its "third century."

BY THE YEAR 2004
No single family homes may be left in Hinesburg Village.

BY THE YEAR 2049
All historic siding may be covered over or removed from buildings in the Battery Street Historic District.

BY THE YEAR 2052
No historic barns may be left in Fletcher.

Small Changes Can Add Up To Big Changes In Only Fifteen Years

Most property owners interviewed in the study noticed the large-scale changes made in their communities —buildings demolished for parking lots, condominiums built in fields at the edge of town. Far less obvious, but of equal impact in the long run, were the gradual changes made to places —porches lost here, original windows replaced there. As seen in the composite illustrations above, seemingly small changes to buildings can lead to drastic alterations in the appearance of Vermont's landscape.

Could This Happen To Buildings In Your Community?

While the study revealed a number of unsettling trends, it also uncovered alternatives available to building owners. Here are a few examples:

Windows

Windows were frequently replaced on buildings in the three communities studied. Instead of removing their building's original windows, some owners repaired and caulked the original sash to make them energy efficient. If repair was not possible, they found replacement windows to match the originals.

Porches

While many owners in the study replaced their decorative porches with concrete steps and plain unpainted lumber railings, others took the trouble to regularly paint and maintain their original porches. Many took care of related problems such as leaky roofs which can eventually cause porches to rot. Others replaced failed original features with matching parts.

Siding

The covering of exterior walls with synthetic siding was one of the changes found to have the most dramatic impact on the appearance of historic buildings. However, some building owners preferred the traditional option of regularly repairing and painting their buildings. This approach had the additional benefit of allowing them to check for and correct problems such as rot or insect infestation.

Buildings, Farms, Villages, And Cities Are Part Of The Environment Too!

Probably the most important overall message learned from this study is that buildings, streets, neighborhoods, farms, villages, towns, and cities are as much a part of Vermont's environment as forests, wetlands and air. The decisions made by the individual citizen concerning buildings have a direct and immediate effect on preserving the larger environment.

STATISTICAL SUMMARY

The following statistics illustrate how historic buildings were changed since 1976 in the three communities studied

Overall Changes:

Buildings Changed:

Burlington	89%
Hinesburg	66%
Fletcher	63%

Changes in Use:

Burlington	38%
Hinesburg	10%
Fletcher	6%

Changes to Elements of Buildings:

PORCHES:	
Burlington	61%
Hinesburg	31%
Fletcher	32%
WINDOWS:	
Burlington	53%
Hinesburg	24%
Fletcher	28%
SIDING:	
Burlington	21%
Hinesburg	10%
Fletcher	15%

This poster was produced by graduate students and faculty of the University of Vermont Historic Preservation Program, Department of History, University of Vermont, Burlington, Vermont 05405, in cooperation with the staff of the Vermont Division for Historic Preservation, Agency of Development and Community Affairs, Montpelier, Vermont 05602. For additional copies of the poster, the study report, or for information on preserving buildings and communities, contact the Division. For information on courses, workshops, and community conservation and research services, contact the Historic Preservation Program.

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What to Do? ▸ Do Your Homework and Plan Ahead

Conditions Report

Energy Audit

Energy Modelling

Maintenance Plan

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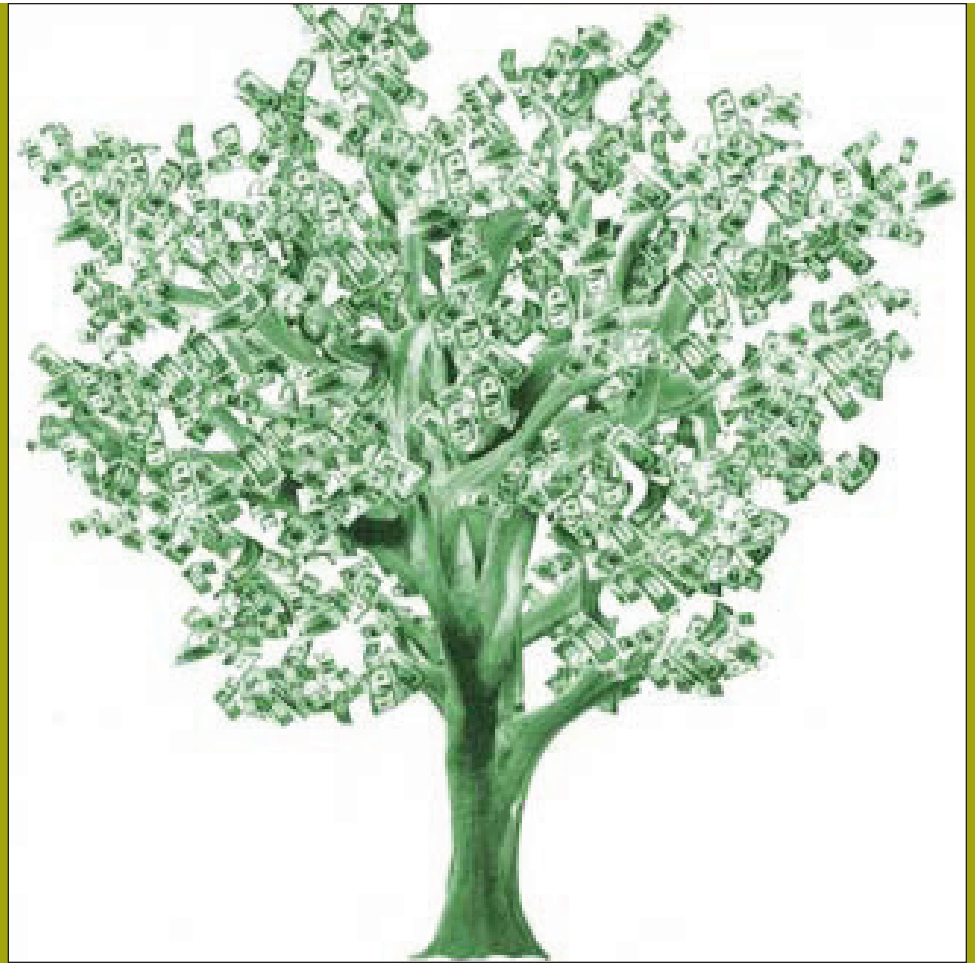
Green Rehab ▸ How to Fund It



"It's always about money."

David Gottfried, Founder USGBC

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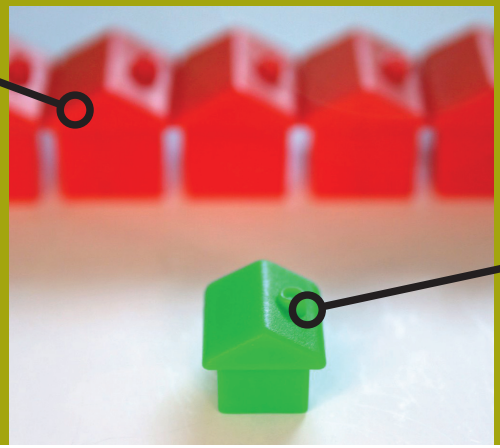
How To Fund It ▸ First Cost vs. Payback

- Green materials are more affordable
- Preservation is all about retaining original durable materials with long life spans
- Plan ahead / Early design decision
- Case by case analysis

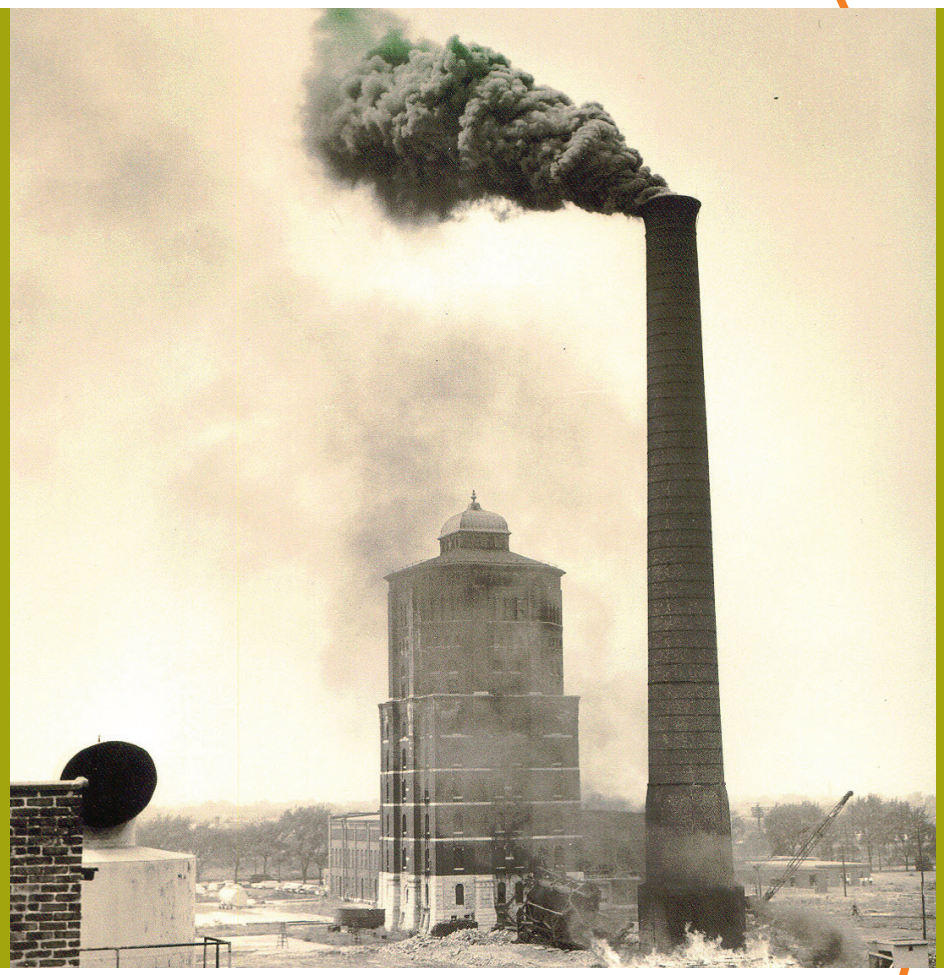
  Changing economic and political climate creating shorter payback times through rebates and incentives



How to Fund It ▸ Environmental Cost

Consider That:

- Creating electricity uses Nuclear, Coal, Oil
- Total Carbon Footprint includes upsteam impacts
- Cost to the Environment
- Reducing use is almost always an option



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How to Fund It ▸ Funding Sources

Tax Credits for Historic Preservation Certified

Tax Incremental Financing (TIF)

New Market Tax Credits

Local Initiatives
- Facade grants
- Collective utilities

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How to Fund It ▸ Trends in Funding and Regulation

"Follow the Green Wave of the Future..."

- More Green Tax Credits
- More Green Grants
- Maine State Tax Credits Until 2013
- City of Porltand - all new municipal-owned property

needs to follow LEED standards for new construction

efficiency MAINE

Saving energy for Maine

energy

ENERGY STAR

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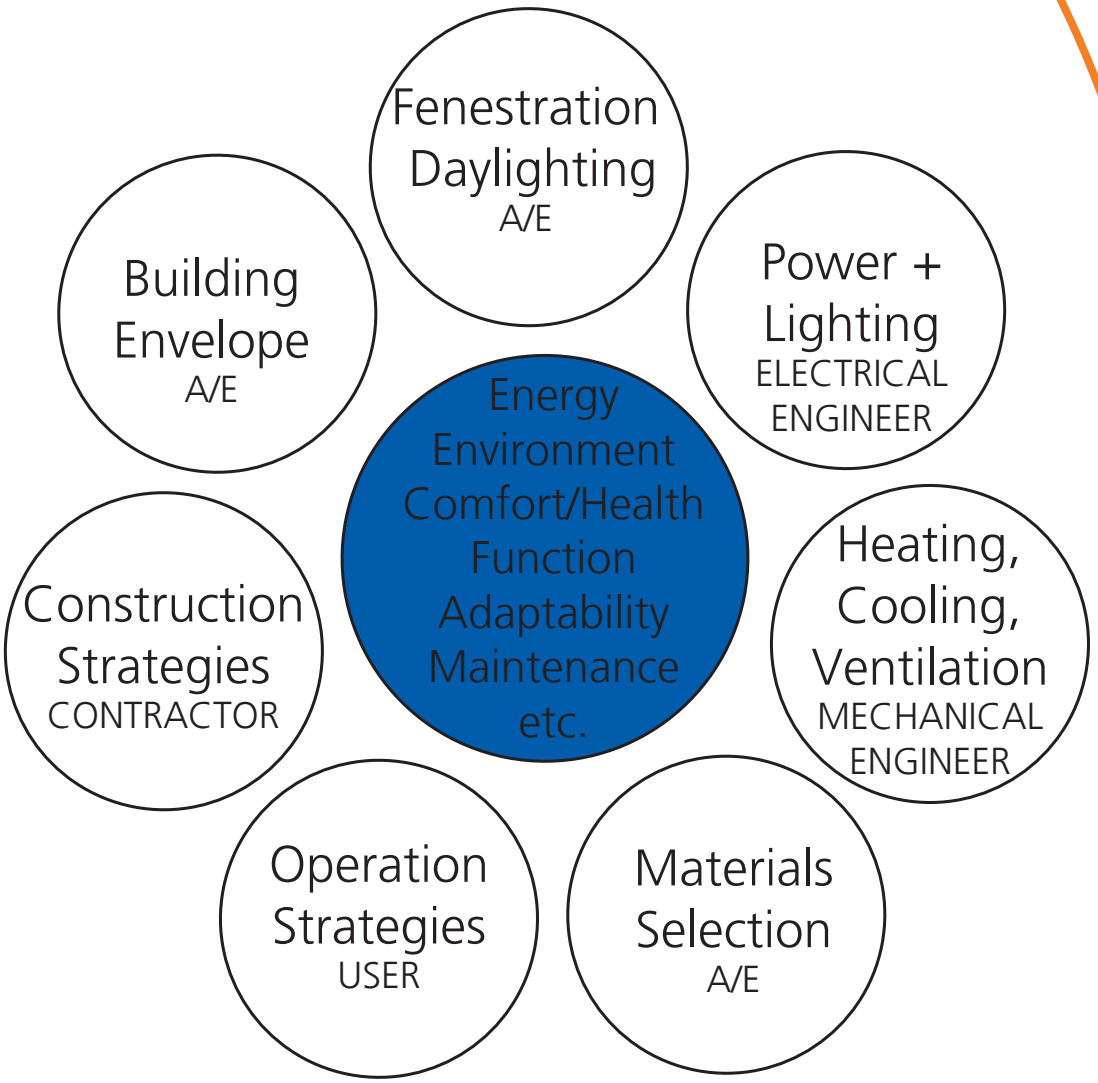
How To Fund It ▸ Summary

	Historic Preservation	Green
Money	20% Federal Certified or 20% State of Maine 10% Housing Project Historic Preservation Grants Facade Grants	Grants (partial to 100%) Low interest/No Down Payment Loans Tax Credits/Incentives Cash Rebates - Efficiency Maine
Review	Maine Historic Preservation Commission National Park Service	USGBC Efficiency Maine LEED Certified Platinum, Gold, Silver, Certified
Fame	Certified Tax Credit Project Marketing/Cache	Marketing/Cache
Other	Press Local and State Awards	Press Maine Chapter USGBC Awards

How To Do It

How To Do It ▸ Integrated Design



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How To Do It ▸ Data Collection/Baseline

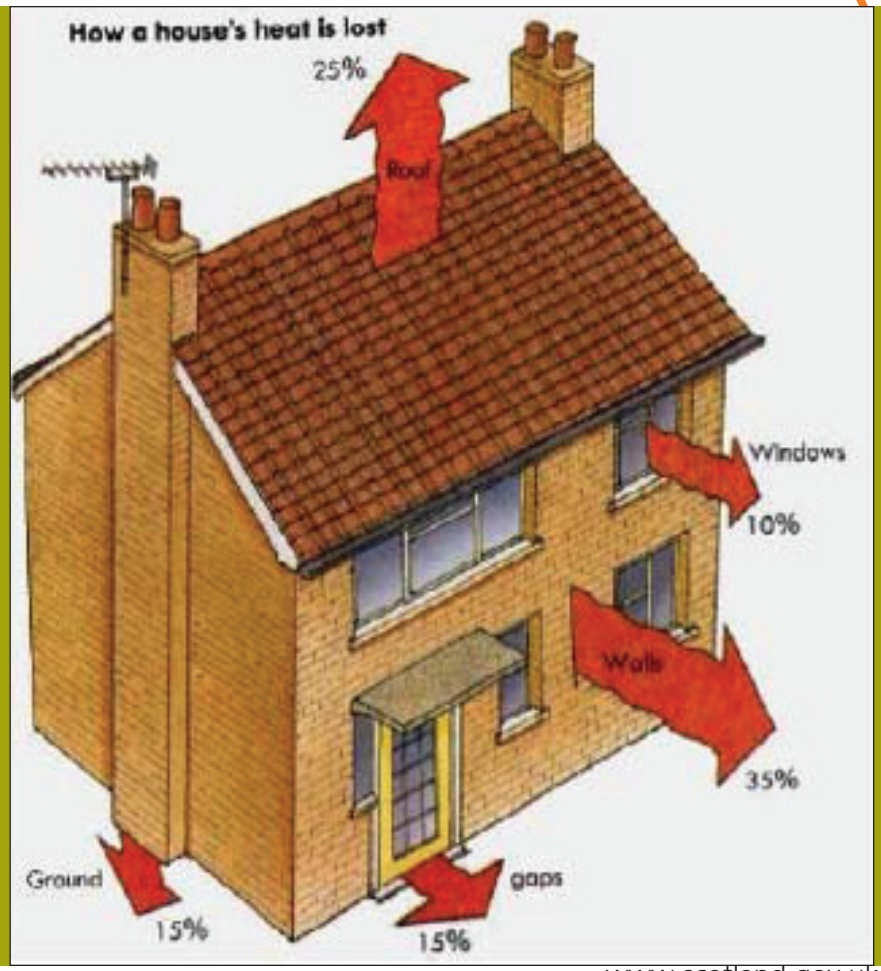
Measured Drawings

Energy Audit/Thermal Imaging

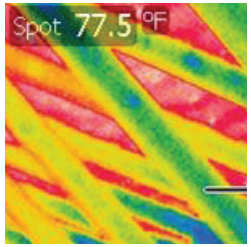
Survey of Thermal Envelope
- Non-Destructive Testing
- Selective Removals

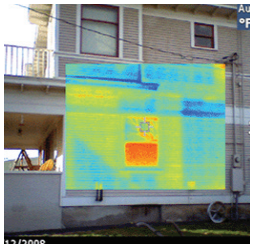
Identify Character Defining Elements and Preservation of Sense of Place

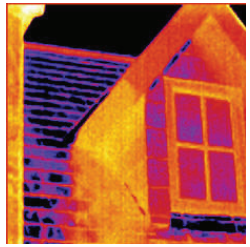
Energy modelling



www.scotland.gov.uk







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How To Do It ▸ Preservation and Green Rationale Opportunities

Solar Opportunity

On-site energy creation/ Green Energy

Systems Upgrades

Better insulation and ventilation

Seal gaps - unwanted air infiltration

Envelope thermodynamics

CLIMATE RESPONSIVE ELEMENTS

- Exterior shutters and lightshelves
- Interior shutters and lightshelves
- Awnings
- Porches
- Interior shades and storm windows
- Deciduous trees: "Urban Forest Strategy"

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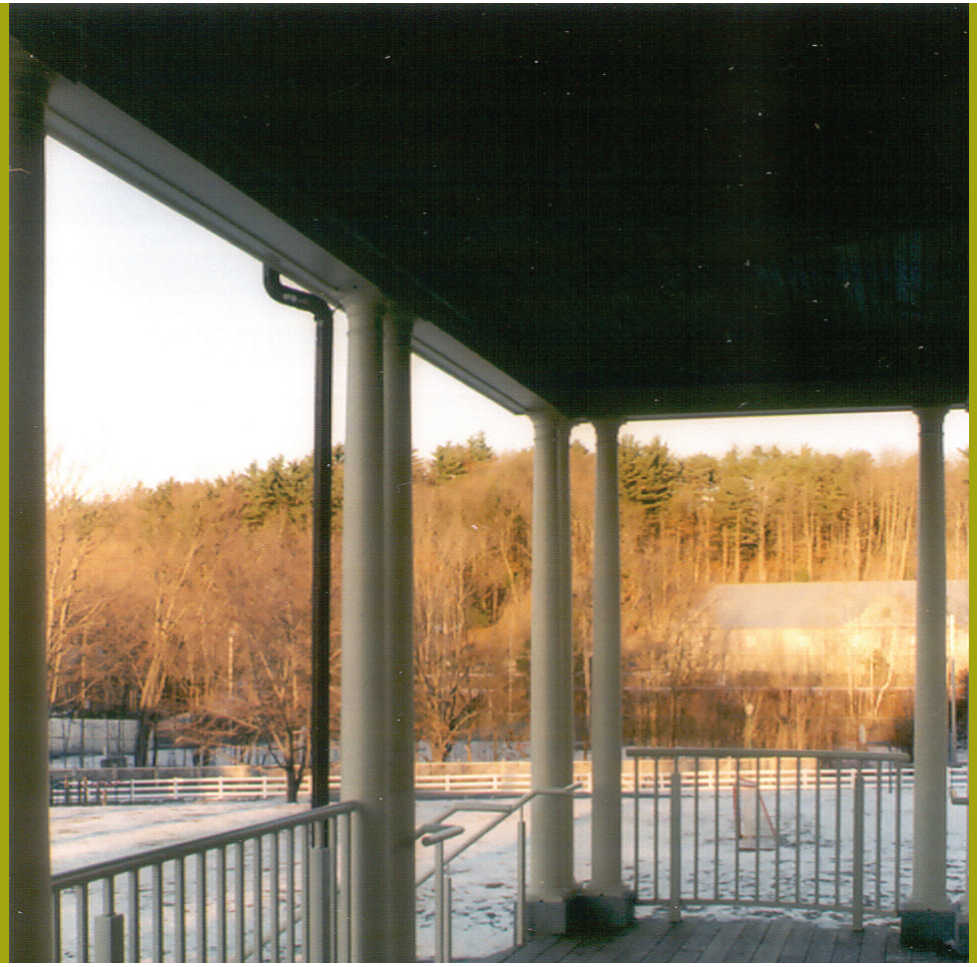
How To Do It ▸ Final Recommendations



Develop a strategy for Green and Rehab

Use report to approach funding sources

ARCHITECTURE PRESERVATION DESIGN

Architecture, Preservation + Design

New Construction, Existing Buildings

Historic Preservation and Sustainable Design

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