

# Energy Efficiency and Historic Preservation

Main Street Economic Vitality Workshop  
Rural Development Initiatives  
November 2025

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Clatsop Community College  
Historic Preservation Program



# Energy Efficiency and Historic Preservation Outline

- CCC Historic Preservation Program
- Sustainable Building
- Building Components
- Case Studies
- Conclusion

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# Historic Preservation Program

## Clatsop Community College

### New Student CHECKLIST

**GATHER INFORMATION**

- Check out Clatsop Community College to learn about programs and admissions!
- Schedule a visit or ask questions: admissions@clatsopcc.edu (503) 338-2417
- Visit [www.clatsopcc.edu/admissions](http://www.clatsopcc.edu/admissions) for more information.

**APPLY FOR ADMISSION**

- Complete the application online at [www.clatsopcc.edu/apply](http://www.clatsopcc.edu/apply) and pay the \$15 application fee.
- Take the ACCUPLACER for class placement evaluation, or submit transcripts to waive the test.

**APPLY FOR FINANCIAL AID & SCHOLARSHIPS**

- Complete the Free Application for Federal Student Aid (FAFSA) online: [fafsa.ed.gov](http://fafsa.ed.gov)
- Clatsop Community College's school code is 001149.
- Apply for Scholarships at CCC.
- Stop by our Financial Aid office or call (503) 338-2322 for help.

**AFTER ADMISSION**

- Attend an Orientation and Advising Session.
- Register for classes.
- Arrange payment for tuition.
- Go to class!



### Historic Preservation & Restoration

CHART YOUR COURSE

**Skill Building & Community**

Historic Preservation combines practical hands-on skills with history and theory. Students gain skills in traditional crafts, modern building techniques, sustainable building practices, building assessment, documentation and historical research.

Astoria has more historic buildings per capita than any city in Oregon and provides Clatsop Community College with a unique learning environment. In the Northwest Community projects within the Lower Columbia region are the classrooms where students develop preservation skills. Partnerships with regional nonprofits and government organizations provide program support, project sites and student work opportunities. Our instructors are actively involved in local and state historic preservation and include master crafts people working in the field.

**Associate & Certificate Programs**

**Questions?**

Contact Admissions | CCC Campus  
Columbia Hall Room 109 | 1601 Lexington Ave.  
Astoria, Oregon, 97103  
503-338-2411  
[www.clatsopcc.edu](http://www.clatsopcc.edu)



**Suggested PLAN OF STUDY**

Year One / One Year Certificate	Credits
Fall Term	
RLD100 Intro to Historic Preservation	2
RLD110 Construction Safety for HTP	1
RLD115 Tool Safety for HTP	1
RLD140 Framing/Joinery for Construction	3
RLD150 Construction Math	2
Workshops	4
Computer Aided Design I	4
<b>Total</b>	<b>17 Credits</b>
Winter Term	
RLD100 Residential Materials and Methods I	3
RLD110 Construction Safety for HTP	1
Workshops	4
Math (MATH 61 or 60)	3
<b>Total</b>	<b>11 Credits</b>
<b>Spring Term</b>	
WR 100 & Human Relations	2
RLD200 Carpentry Work Experience	2
RLD240 CMU Seminar	1
ARCH 110 or 200 Architectural Electives	3
Workshops	4
<b>Total</b>	<b>12 Credits</b>
<b>Year Two</b>	
Fall Term	
RLD200 Historic Preservation I	3
RLD200 Glass Building	3
Workshops	3
Electives	3
<b>Total</b>	<b>12 Credits</b>
Winter Term	
RLD210 Historic Preservation II	3
RLD240 Project Management	3
Workshops	3
WR 227 Technical Writing	4
<b>Total</b>	<b>13 Credits</b>
<b>Spring Term</b>	
RLD110 Building Codes I	3
RLD240 HTP & Restoration Project	4
Workshops	3
Electives	3
<b>Total</b>	<b>13 Credits</b>

*Subject to change*

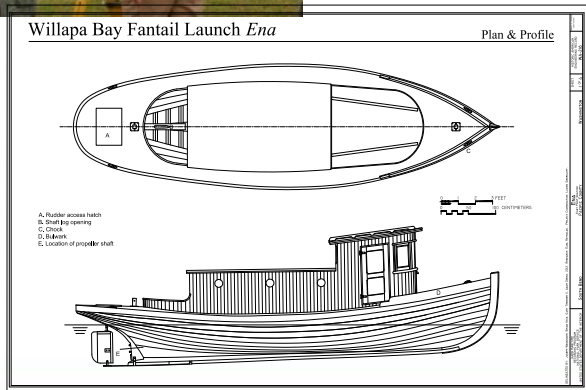
Graduates will be able to work as remodelers, carpenters, sub-contractors and general contractors. The average starting wage in Oregon for historic preservation craftsmen is close to \$20 per hour with the ability to earn more as skill levels increase.

*Clatsop Community College is an affirmative action, equal opportunity institution.*



**Clatsop  
Community  
College**

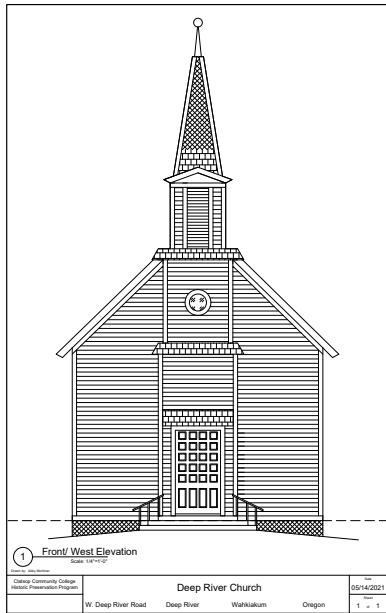


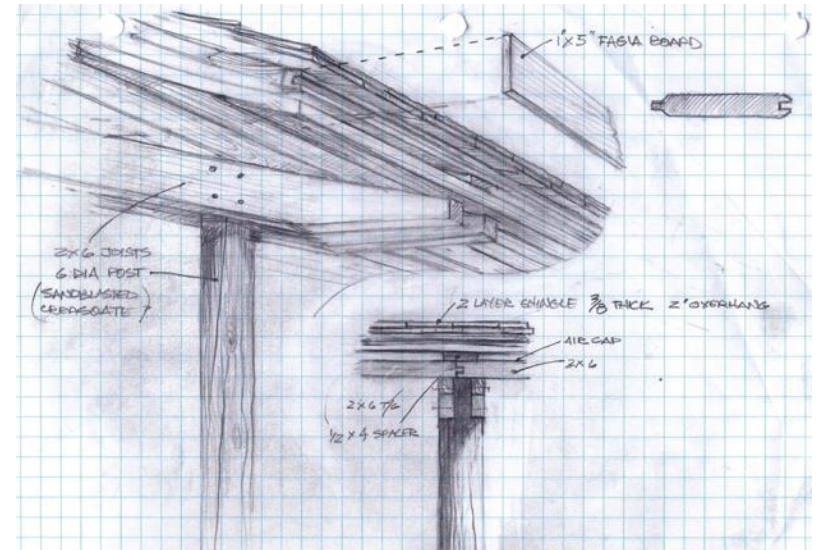
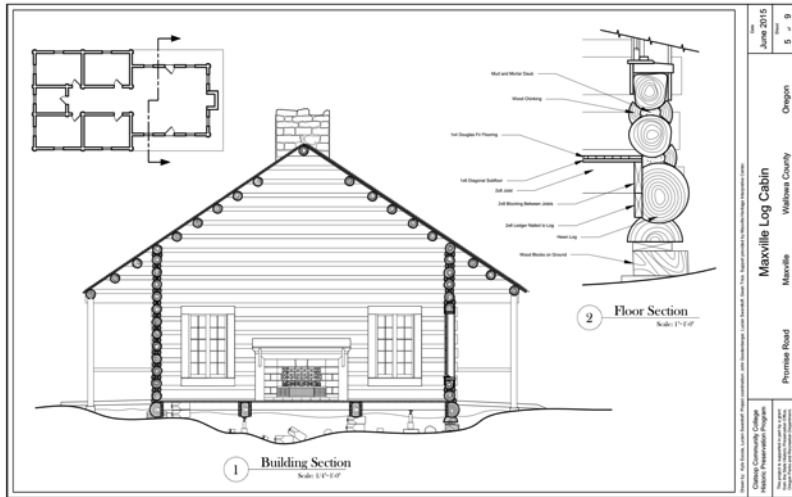














# Energy Efficiency and Historic Preservation

- CCC Historic Preservation Program
- Sustainable Building
- Building Components
- Case Studies
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# Green Building

*The greenest building is the one that is already built.*

Carl Elefante, FAIA, Quinn Evans Architects





# Ballard Library

## 2005

- 15000 sq. ft. Replaced 7300 sq. ft. 1963 building.
- Green roof with 18,000 plants provides insulation and reduces water flow into storm drains.
- Solar panels generate electricity.
- Windows and skylights provide natural daylighting.
- Occupancy sensors control interior lights.
- Recycled carpet, glass and tiles.
- Waterless urinals.
- \$10.6 M.



# Ballard Carnegie Library

## 1904

- Exterior walls: brick walls.
- Interior walls/ceilings: lath and plaster.
- Stone foundation.
- Library, 1904-1963. Antique store. Restaurant, 2003-2010. Pub, offices and wellness center, 2011-present.
- \$15000. (\$1.0 M 2005?)





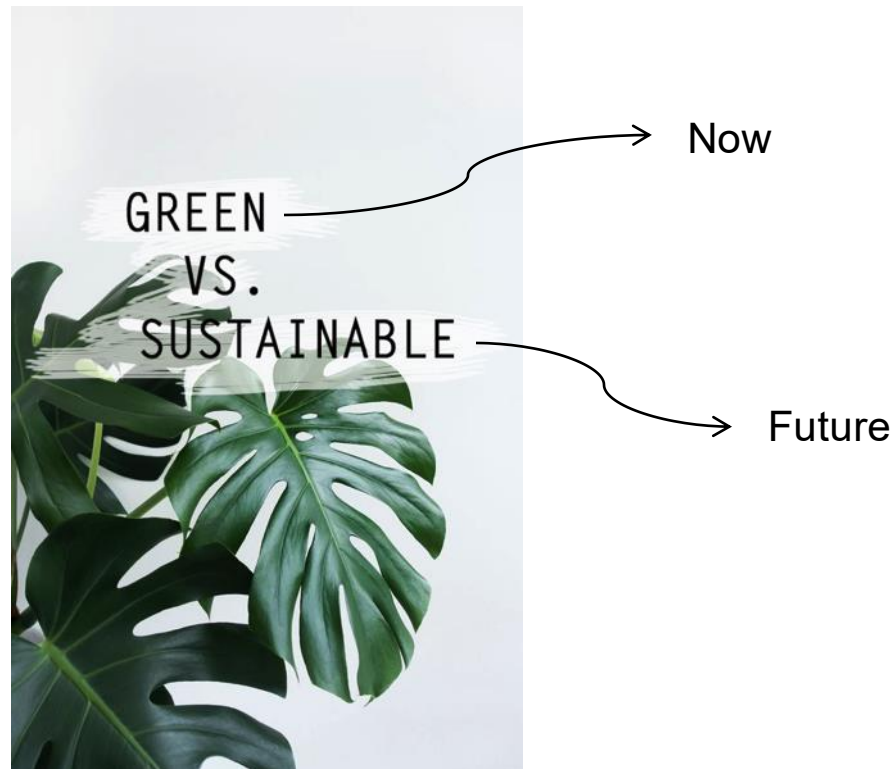
# Which is Greener?



It depends what we mean by green.

# Green vs. Sustainable

- Green: environmentally friendly.
- Sustainable: meets the needs of the present without compromising the ability of future generations to meet their needs.





# Examples

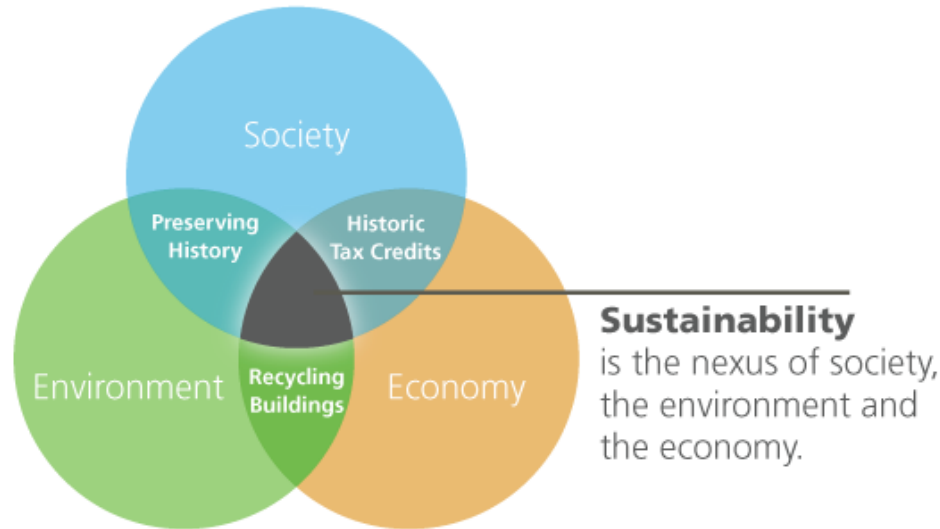
- Bamboo flooring: green (renewable, fast growing) but not necessarily sustainable (shipping, glues)
- Local recycled wood: green and sustainable
- Electric car: green (reduced CO<sup>2</sup> emissions), sustainable? (coal generated electricity, raw materials)



# Sustainability

## Historic Buildings are Inherently Sustainable

- Historic structures make up the heart of towns and cities (Society)
- Maintenance of historic buildings relies on local craftsmen (Economy)
- Traditional materials are durable (Environment)



# Sustainability

## Historic Buildings are Inherently Sustainable

- They were built with energy efficient features
- They can be made more efficient
- They are already here (demolition, new materials, transportation)





# Sustainability

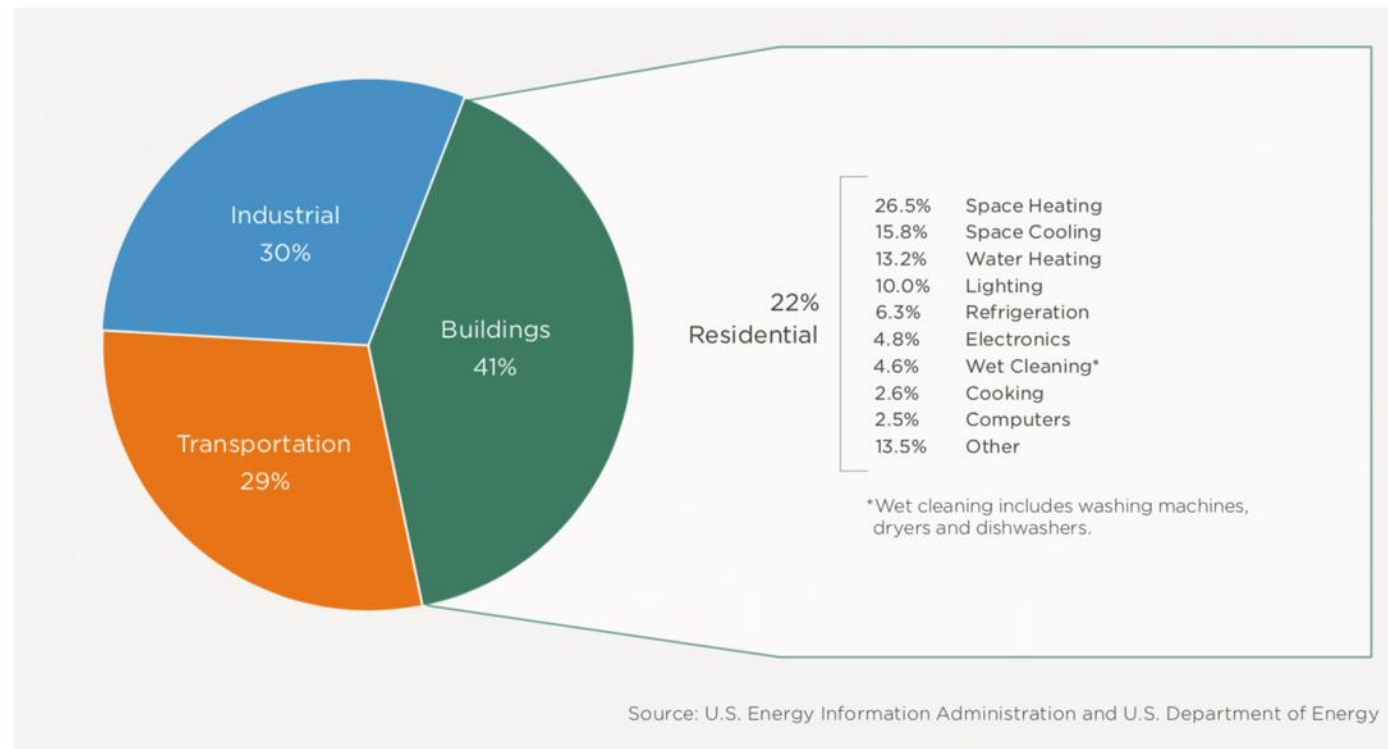
## Why Buildings Matter

- Buildings account for 40% of all energy use in the U.S. (more than industry or transportation; U.S. DOA).
- 60% of electricity is generated by burning coal, petroleum or natural gas (21% renewable, 19% nuclear; U.S. EIA, 2023).
- About 50% of buildings are more than 50 years old.
- Reuse of buildings preserves materials and embodied energy, and reduces demolition debris. (Demolition of 5000 sq. ft. commercial building generates 432 tons of debris; of 2000 sq. ft. house, 183 tons.)

# Sustainability

## Why Buildings Matter

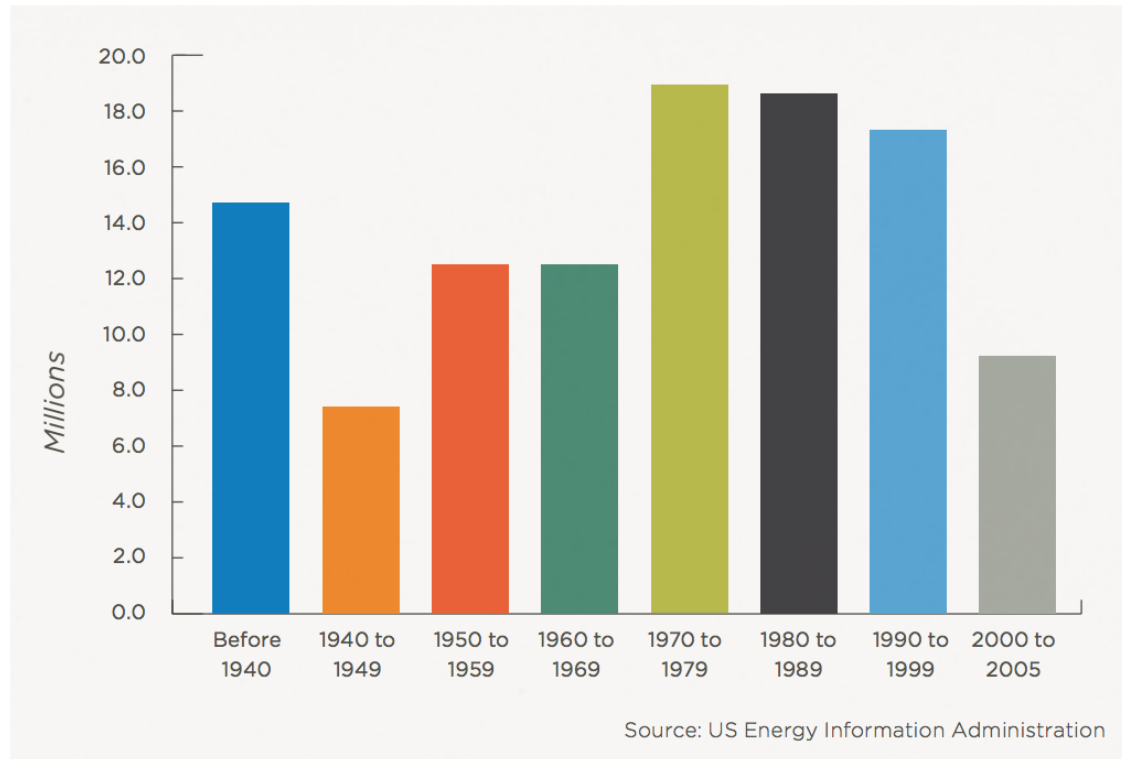
Figure 2: U.S. Energy Consumption by Sector



# Sustainability

## Why Buildings Matter

Figure 9: Number of U.S. Residential Units by Vintage

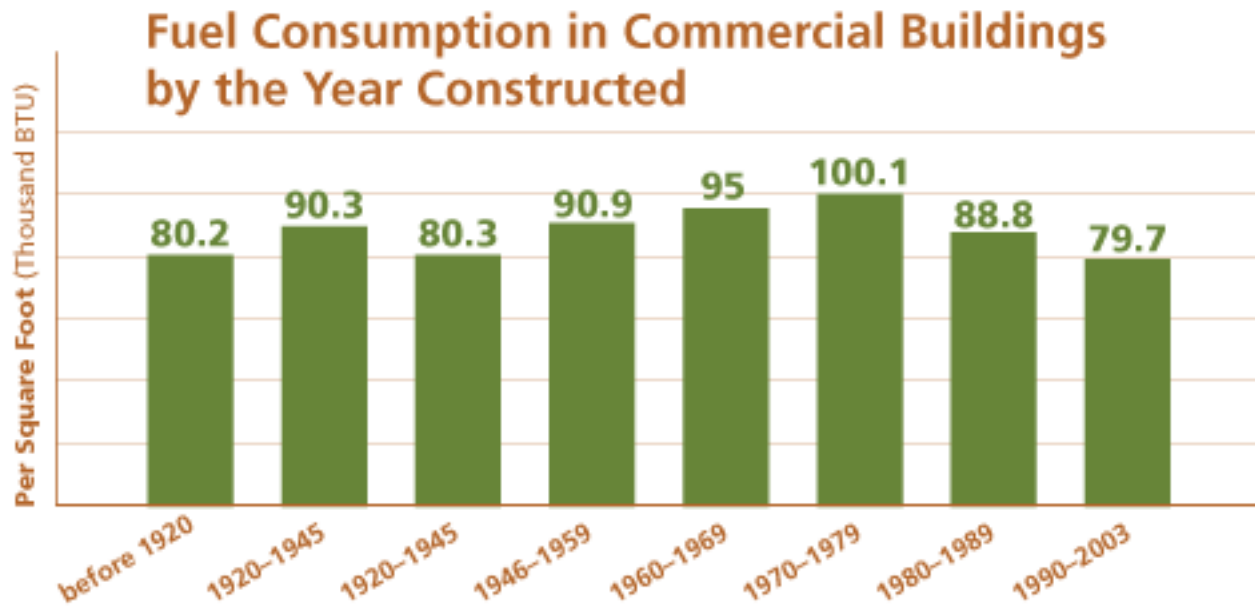




# Energy Efficiency

## Fuel Consumption

Historic buildings included energy-conserving features in their original designs. These features may have been altered over time, but often still exist.

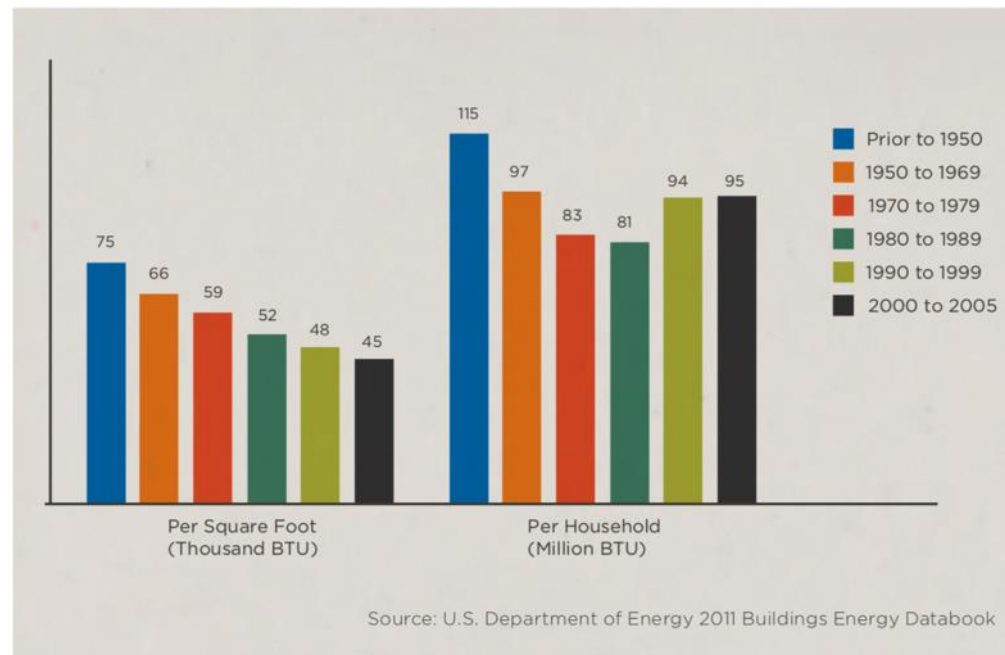


# Energy Efficiency

## Fuel Consumption

Newer homes are more energy efficient on a square foot basis, however this has been offset by their larger sizes.

Figure 3: Annual Energy Intensity by Housing Vintage



# Energy Efficiency

## Environmental Impact

When comparing buildings of equivalent size and function, building reuse almost always offers environmental savings over demolition and new construction.

Table 12. Number of Years Required for New Buildings to Overcome Climate Change Impacts from Construction Process

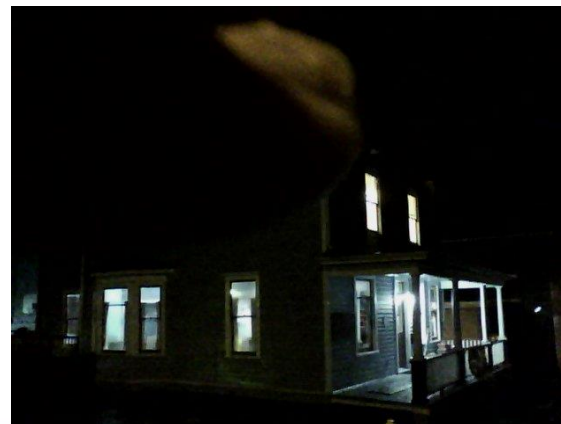
According to this study, it takes 10 to 80 years for a new building that is 30 percent more efficient than an average-performing existing building to overcome, through efficient operations, the negative climate change impacts related to construction. This table illustrates the number of years required for different energy efficient, new buildings to overcome impacts.		
Building Type	Chicago	Portland
Urban Village Mixed Use	42 years	80 years
Single-Family Residential	38 years	50 years
Commercial Office	25 years	42 years
Warehouse-to-Office Conversion	12 years	19 years
Multifamily Residential	16 years	20 years
Elementary School	10 years	16 years



# Energy Efficiency

## Infrared Camera

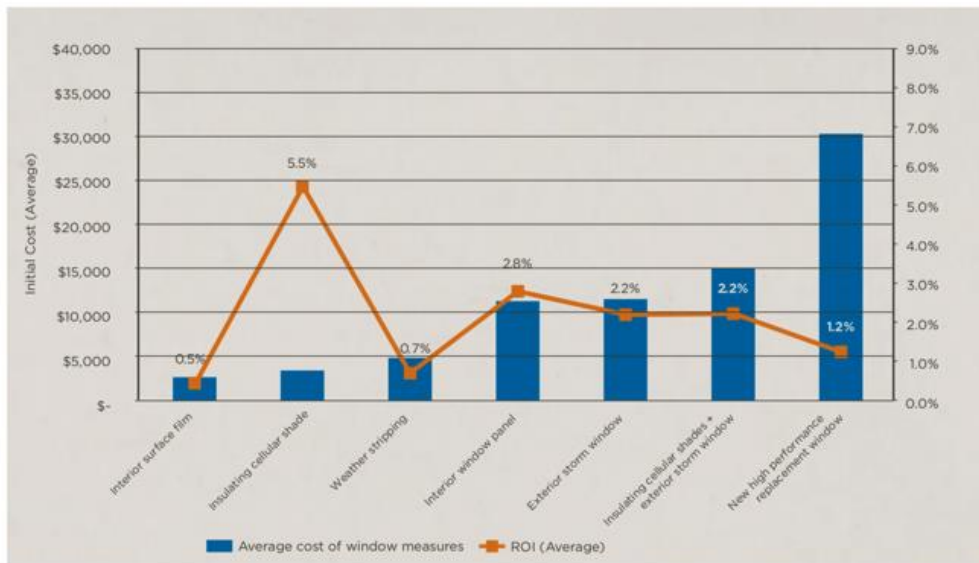
- An infrared camera can be used to detect heat loss.
- Insulation and window retrofit can be simple and cost effective treatments.



# Energy Efficiency Windows

- Retrofit measures can achieve performance results comparable to new replacement windows.
- Almost every retrofit option offers a better return on investment than replacement windows.

Figure 10: Average Annual Return on Investment — Portland



**SAVE ENERGY  
SAVE MONEY**

**24 MONTH ZERO INTEREST**

**SAVE UP TO 35% ON ALL WINDOWS AND DOORS**

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**270-506-3406 • 800-571-3186**

**Low E Glass**  
Prevents heat from entering in the summer and escaping in the winter

**Durable • Low Maintenance • Affordable • Energy Efficient • Attractive**

**Claim**

**BBB**

Saving Windows, Saving Money: Evaluating the energy performance of window retrofit and replacement. Preservation Green Lab. 2012.

# Which is ~~Greener~~ More Sustainable

- Energy efficiency
- Demolition (debris and transportation)
- New construction (manufacture and transportation of materials)





# Energy Efficiency

## Green Roof

Historic buildings can be green and sustainable.



Turf House, Iceland

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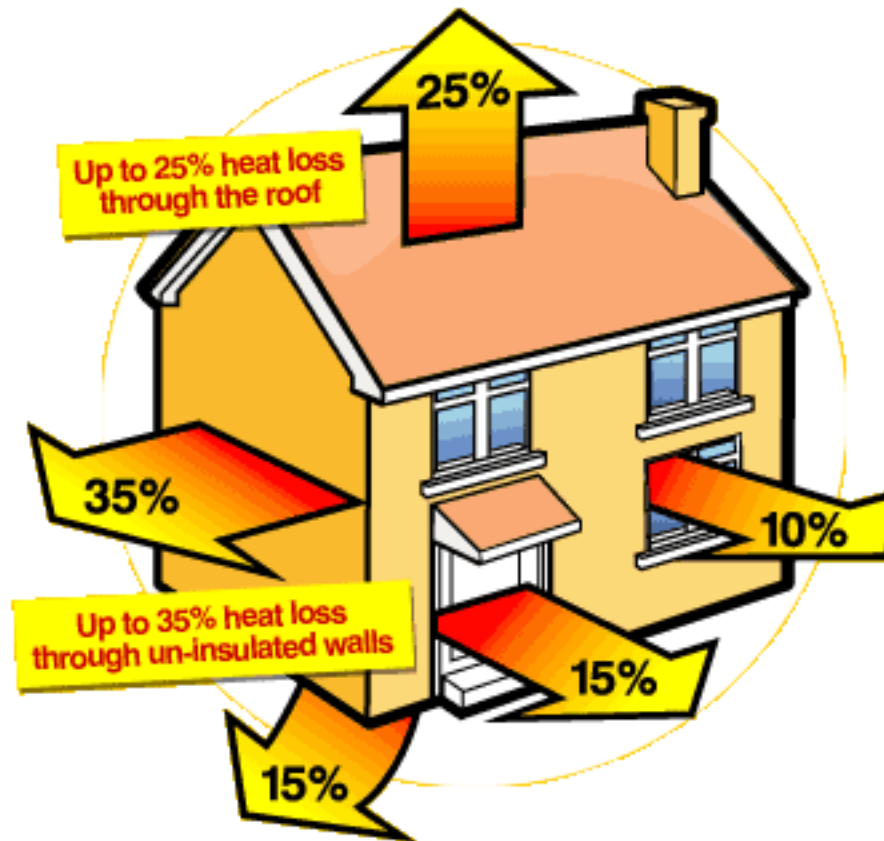
# Historic Buildings Can Function Efficiently...

If they are allowed to function as originally intended



# Energy Efficiency

## Heat Loss





# Building Envelope

## Masonry Structures



# Building Envelope

## Wood Structures





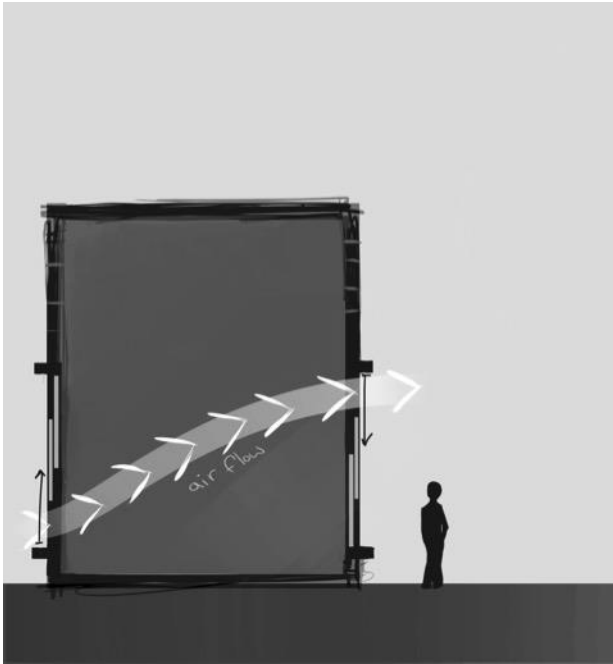
# Building Envelope

## Shared Walls



# Ventilation

## Tall, Operable Windows





# Ventilation

## Bulkhead Grates

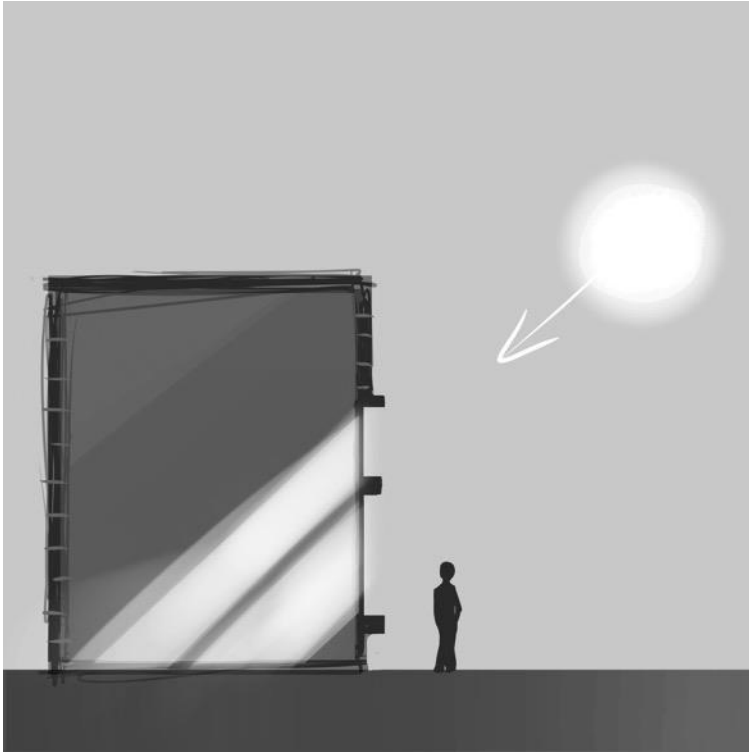


# Ventilation

## Awning Windows



# Natural Light Transoms

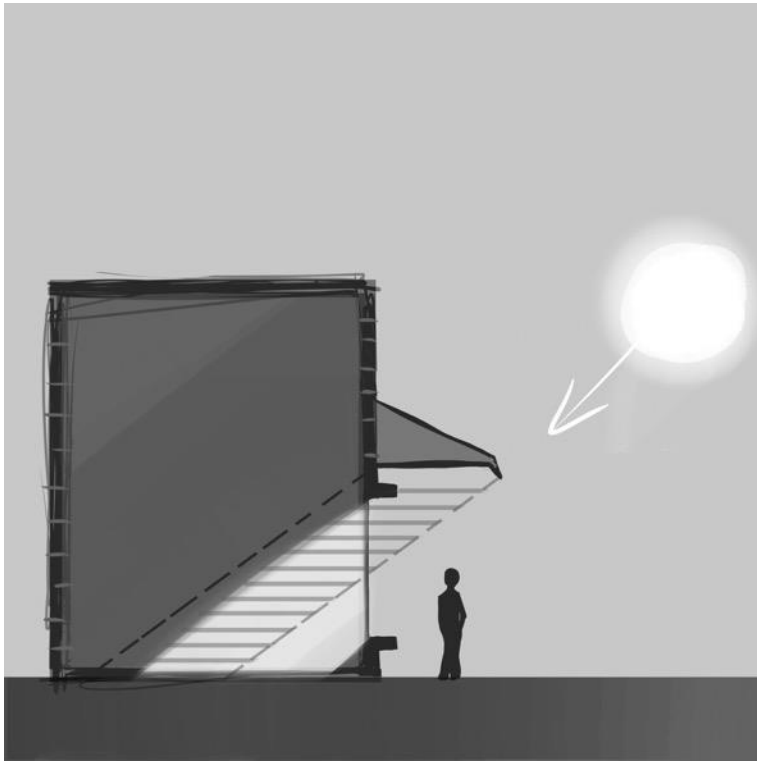


Prism glass



# Additional Aids

## Awnings





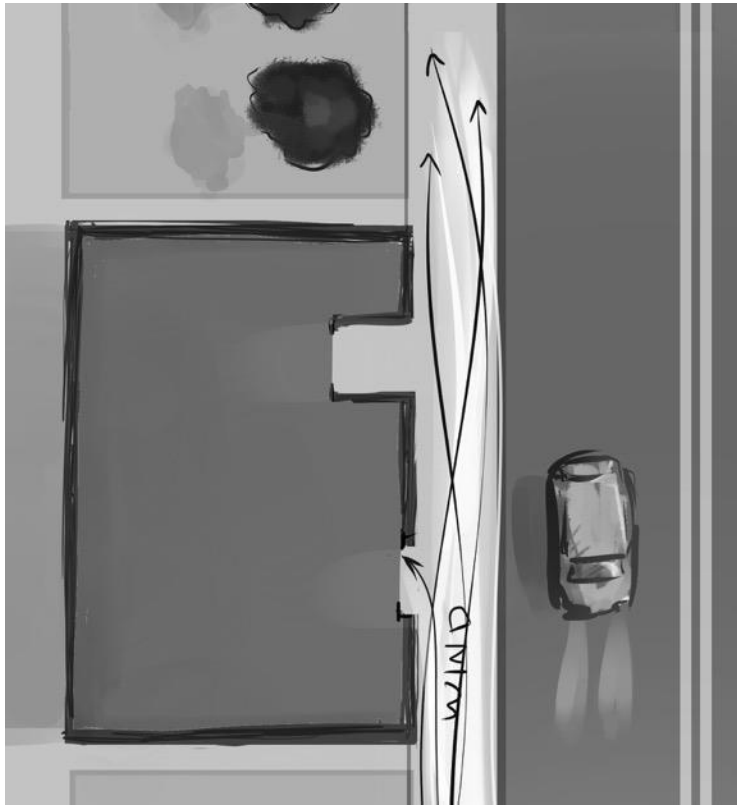
# Additional Aids

## High, Reflective Ceilings



# Additional Aids

## Recessed Entries



# Why Restore?

## Windows

- History/aesthetics: character defining
- Quality: materials and craftsmanship
- Economics: use local craftspeople, lifecycle costs
- Sustainable: existing material, longevity, improve efficiency
- Repairable: windows are inherently repairable





# Energy Efficiency

## Building Preservation





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# Getting Passed The Intimidation Of Renovating Historic Buildings



# Farmer's Union Cooperative Building

## Eugene







## Accomplishments

- Ceiling insulation installed
- Wood windows repaired
- High-efficiency, gas, condensing furnace installed
- Replaced lights with high-efficiency T8 ballast





EXIT

kitchen

Line Starts  
Here







# Pacific Cooperative Poultry Producers' Egg-Taking Station Building

Eugene

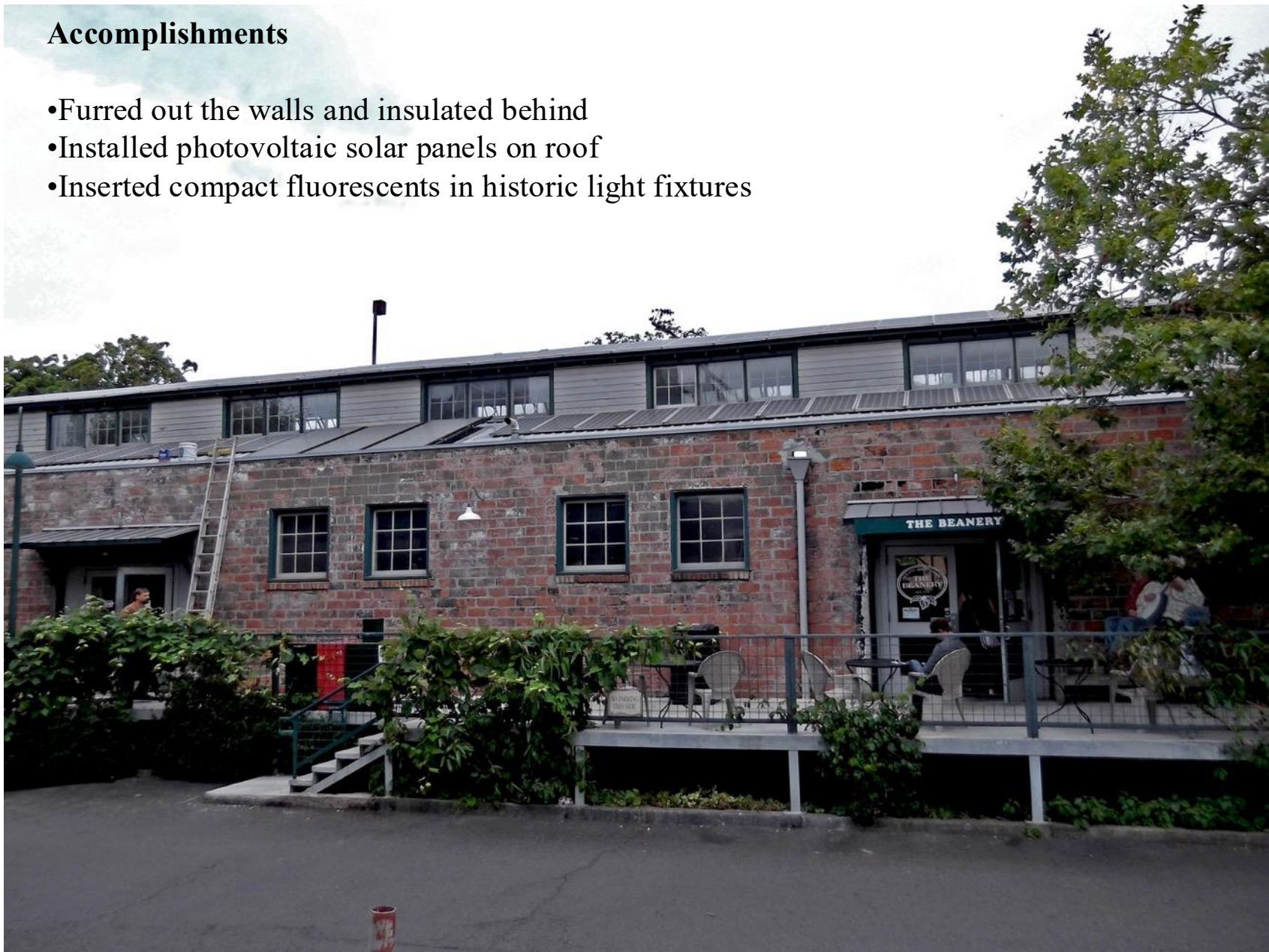






## Accomplishments

- Furred out the walls and insulated behind
- Installed photovoltaic solar panels on roof
- Inserted compact fluorescents in historic light fixtures





**Figure 23.** Solar collectors installed in a compatible manner on low sloping sawtooth monitors. Top Photo: Neil Mishalov, Berkeley, CA.

Solar panels installed on a historic property in a location that cannot be seen from the ground will generally meet the Secretary of the Interior's Standards for Rehabilitation. Conversely, an installation that negatively impacts the historic character of a property will not meet the Standards.



# Conn & Huston Grocery Building

## Albany





## Accomplishments

- Insulated building, better heat retention and cooling
- New heating system
- Daylighting and ventilation through transoms, double-hung windows and skylights
- Increased ventilation by incorporating fans on 15' ceilings
- New Energy Star refrigerator and washing machine in apartment
- Embodied energy retention by saving wood floors, retaining lath-and-plaster walls, re-using windows and renovating the building









# Allen Building

## Astoria



# Allen Building

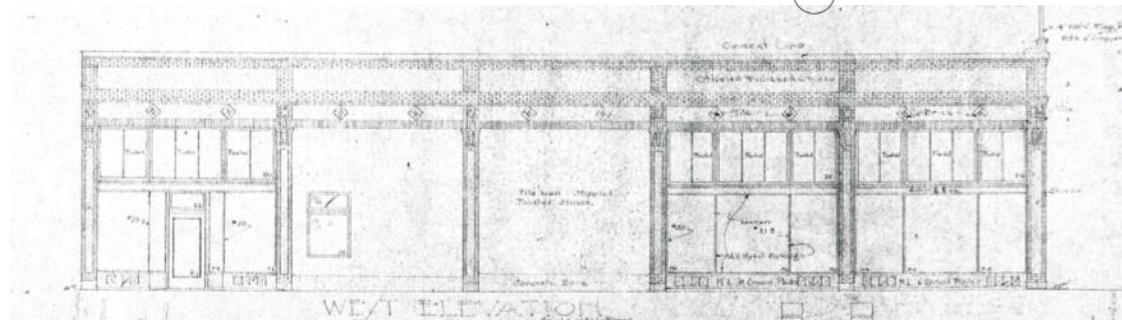
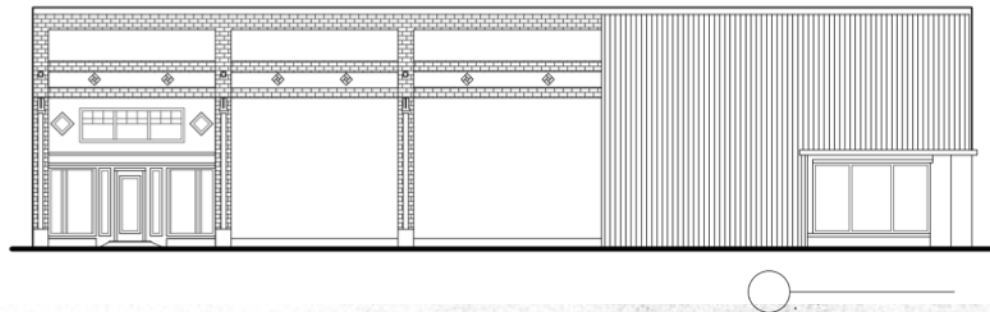
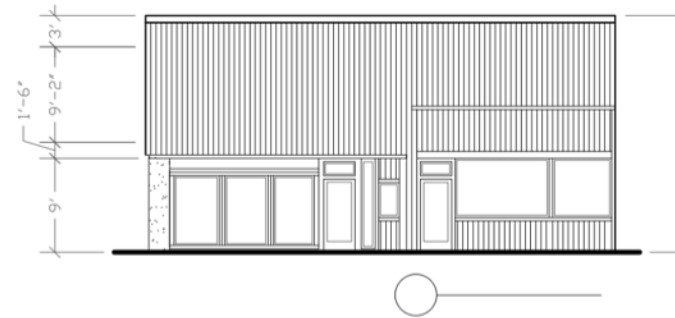
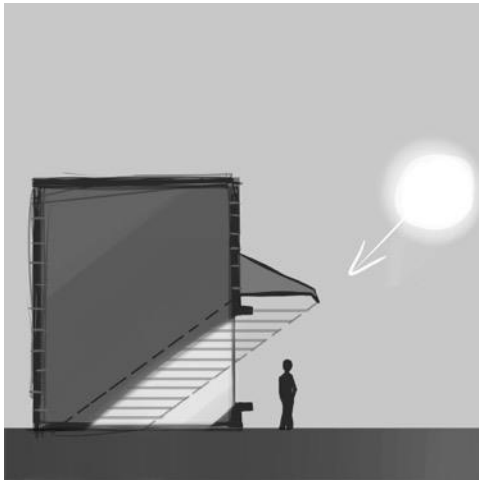
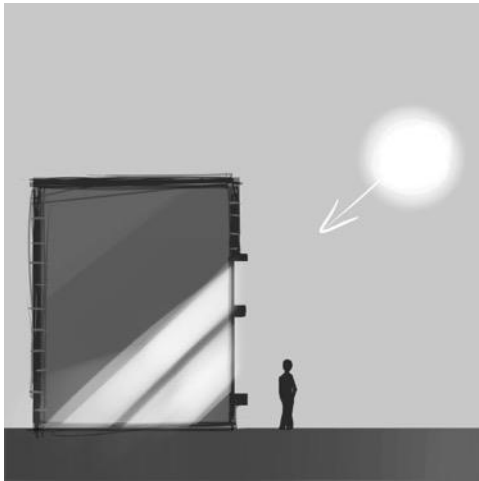
## Astoria





# Allen Building

## Astoria



# Allen Building

## Astoria



# Allen Building

## Astoria



### Accomplishments:

- Added R12 and R18 insulation on exterior walls and R33 insulation below roof.
- Upgraded the heating system to a ductless heat pump HVAC unit.
- Installed ceiling fans.
- Restored original skylight openings.
- Painted ceilings white to aid light reflectivity.
- Reconstructed storefront window system included double-pane transom windows for heat retention, operable transom windows for air circulation and increased natural light for visibility and solar gain.



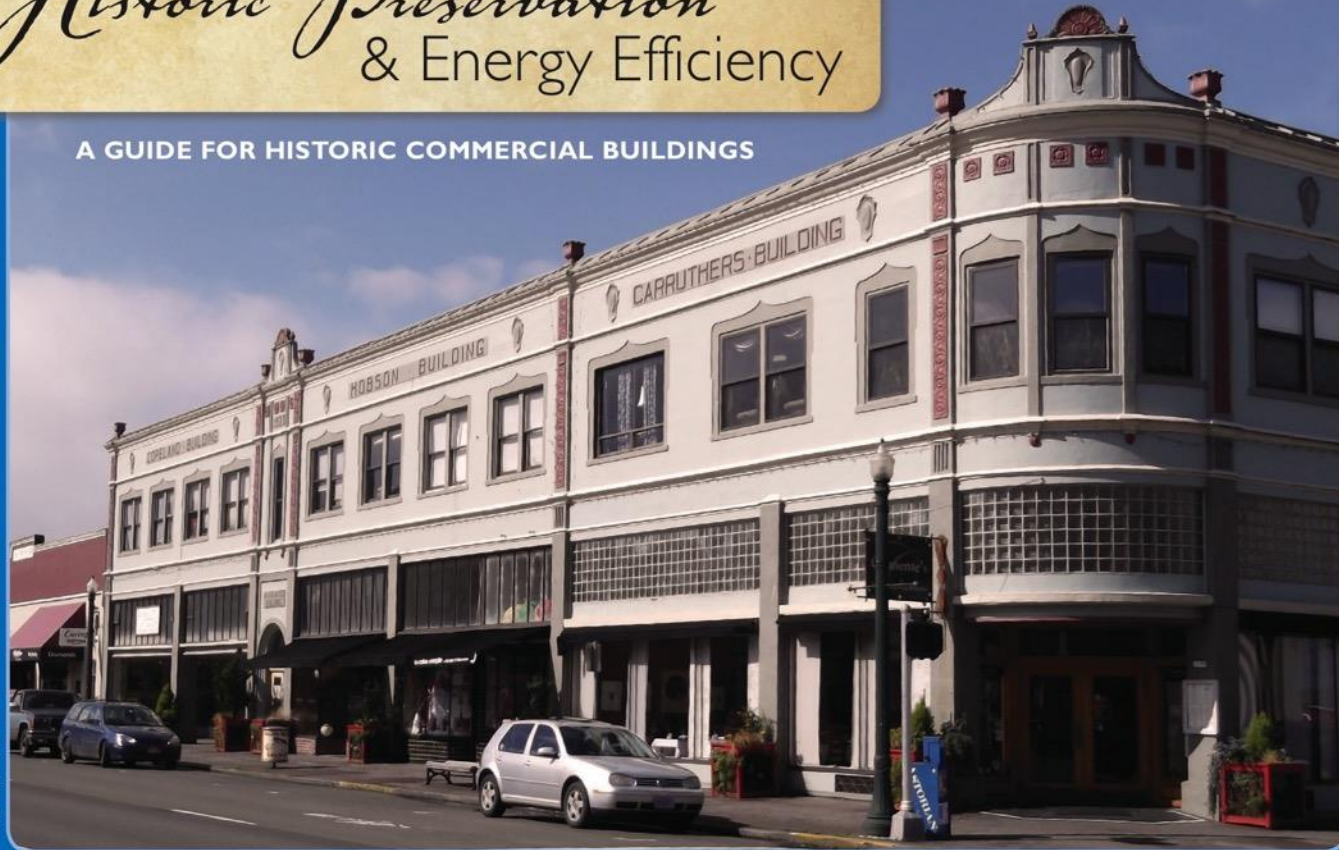


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# *Historic Preservation* & Energy Efficiency

A GUIDE FOR HISTORIC COMMERCIAL BUILDINGS



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[https://www.pacificpower.net/content/dam/pcorp/documents/en/pacificpower/savings-energy-choices/wattsmart-business/PP\\_OR\\_Historic\\_Preservation\\_and\\_Energy\\_Efficiency\\_Booklet.pdf](https://www.pacificpower.net/content/dam/pcorp/documents/en/pacificpower/savings-energy-choices/wattsmart-business/PP_OR_Historic_Preservation_and_Energy_Efficiency_Booklet.pdf)

# Resources

NPS Sustainability: <https://www.nps.gov/orgs/1739/sustainability.htm>

Energy Efficiency in Historic Buildings: <https://www.nps.gov/orgs/1739/upload/preservation-brief-03-energy-efficiency.pdf>

Building Stronger Communities: <https://savingplaces.org/building-stronger-communities>

Energy Trust: <https://www.energytrust.org/>

Pacific Power Efficiency: <https://www.pacificpower.net/savings-energy-choices.html>

Rural Development Initiatives (RDI): <https://rdiinc.org/>

# Contacts

CCC HP Program: <https://www.clatsopcc.edu/study/historic-preservation-restoration/>

CCC HP Instagram: <https://www.instagram.com/hpclatsopcc/>

CCC HP Facebook: <https://www.facebook.com/ClatsopPreservation>

John Goodenberger email: [jgoodenberger@clatsopcc.edu](mailto:jgoodenberger@clatsopcc.edu)





# Community Case Study

# Fenton Building

## Warrenton

**Building Description:** Mixed use with residents on second floor and 5,000 square feet of commercial space below



# Fenton Building

## Warrenton

**Restoration Plans:** The building has significant deferred maintenance and the goal is to improve the space by prioritizing structural improvements and removal of hazardous materials. The upstairs will have 7 residential units with new windows, HVAC, plumbing, flooring and kitchens. For the downstairs, we will provide affordable commercial spaces for local entrepreneurs, reducing barriers to entry for small business owners. The planned buildout includes a coffee shop, children's play studio with after school care, and micro enterprise spaces providing businesses with affordable commercial space, helping them launch and sustain their operations.





# Fenton Building

## Warrenton

**Goals:** Complete the project by April 2025. Future plans include restoring the exterior facade, improving the exterior stairs, and adding an outdoor patio in the alley between the building and neighboring business.

**Budget:** \$1.8 Million to update major systems, add structural support, add a studio to the second floor.



