



Minnesota Manufactured-Home Characterization Study

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Funding



Conservation Applied Research and Development Program (CARD)

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Study goals

What are the energy-using characteristics of Minnesota's MHs?

How much energy do MHs use?

What energy-saving opportunities are there?

MH = manufactured homes

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Method



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What is a manufactured home?



Is this a manufactured home?



Is this a manufactured home?



A modular home, not a manufactured home



Is this a manufactured home?

Not according to the Census Bureau!

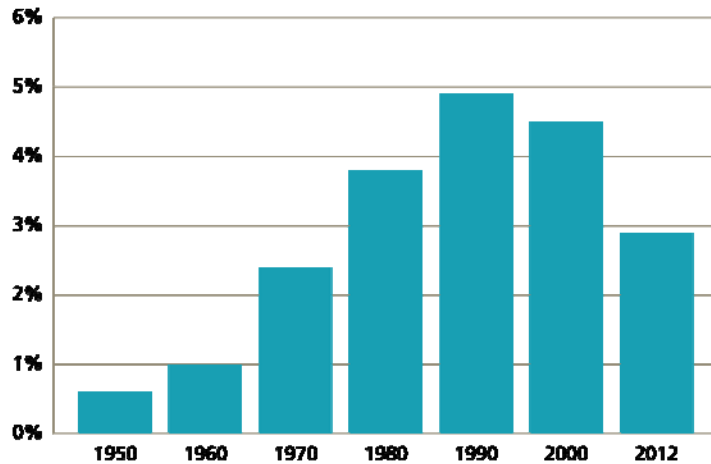


There are about
80,000
MHs in
Minnesota

3.5%
of all housing
units in the state

The MH share of MN housing is shrinking

MHs as a Percent of all Minnesota Housing



NORTH METRO

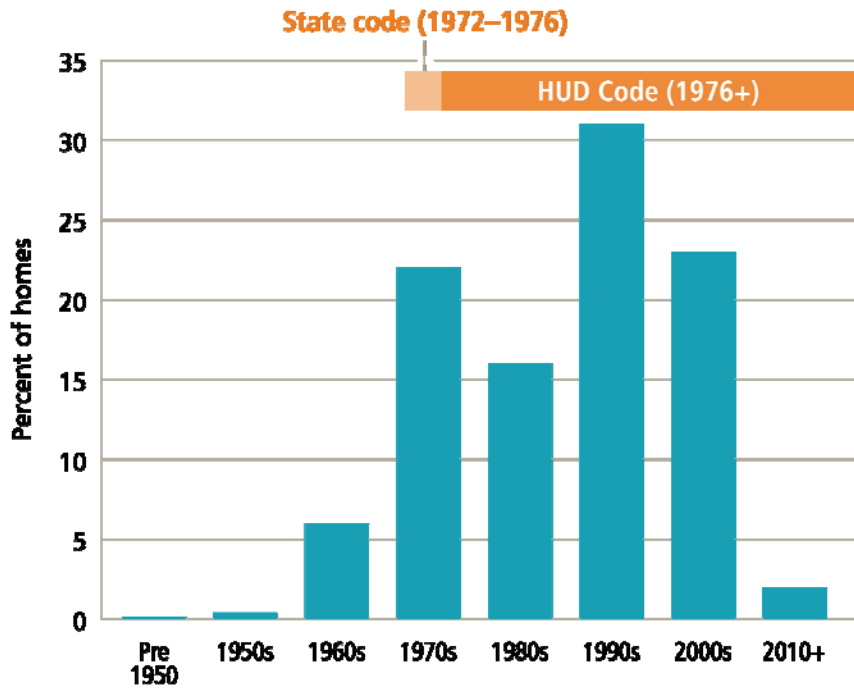
Met Council pushes to preserve mobile home parks in suburbs

By Shannon Prather Star Tribune | JUNE 25, 2016 — 8:08PM

Source: U.S. Census Bureau (does not include MHs with heated additions)

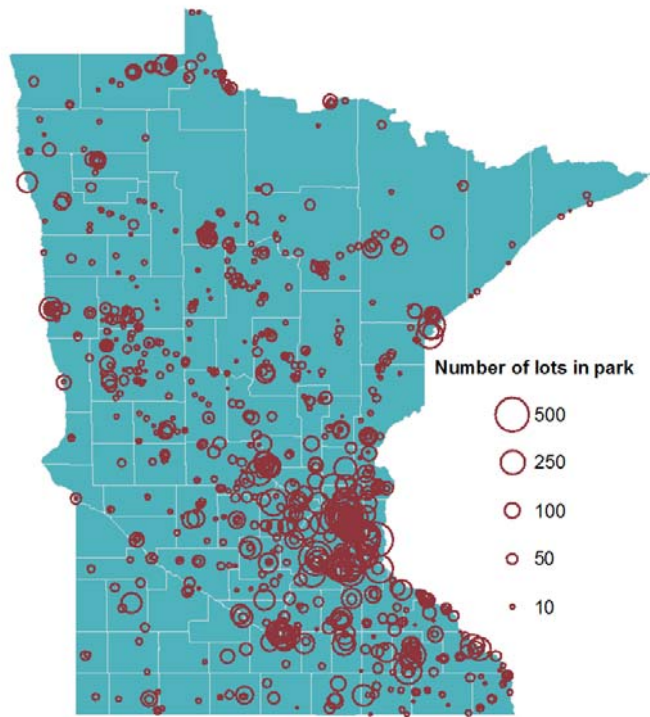
More than 50% built in 1990 or later

80% subject to federal or state code



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About half of MHs are in MH parks



Source: Housing Justice Center

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Homes in parks versus non-park homes



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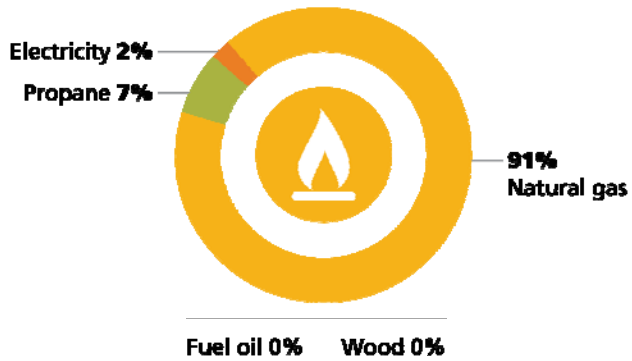


Park homes mostly heat with natural gas.

Many non-park homes heat with propane.

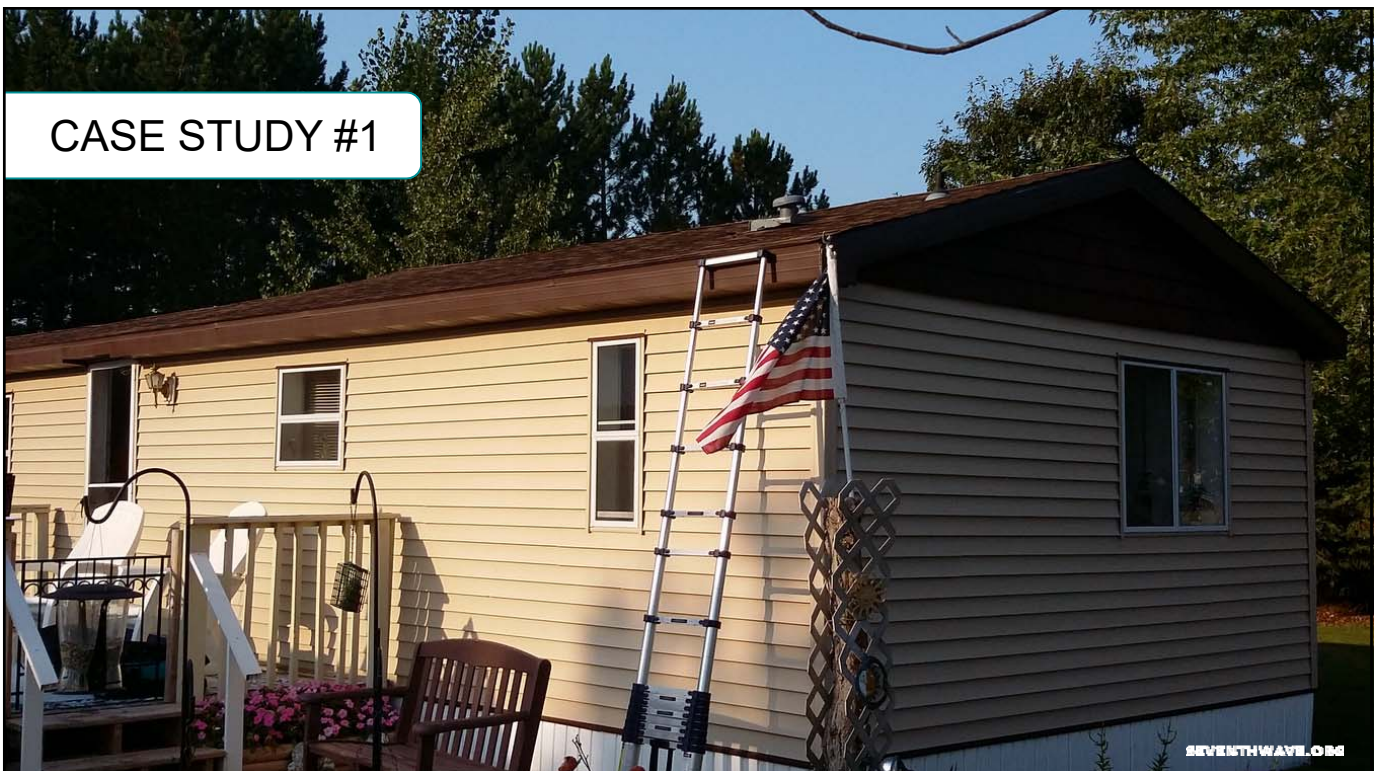
Park MHs

Non-park MHs



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CASE STUDY #1



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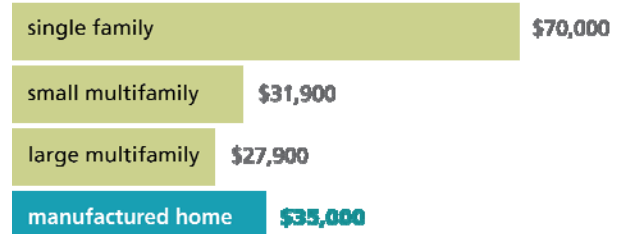




MH households resemble apartment dwellers in terms of income and poverty...

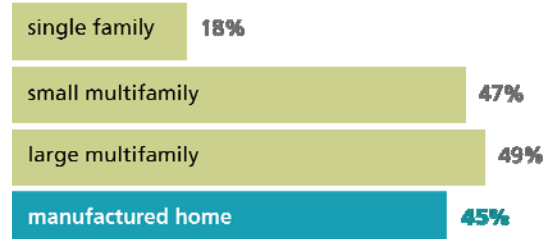
(Census data)

Median Income



Low Income

Note: At or below the 200% of Federal Poverty guideline

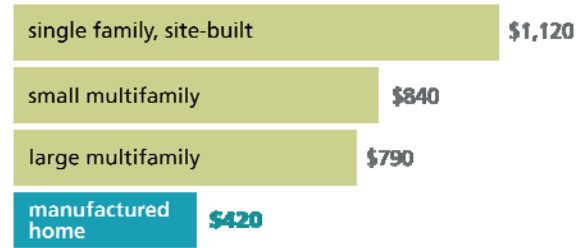


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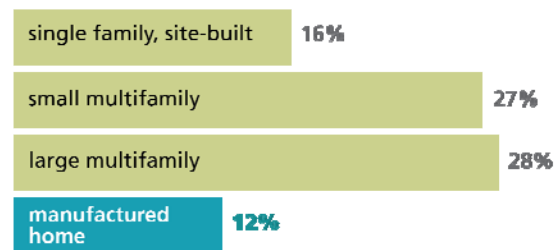
...but have lower housing costs

(Census data)

Monthly housing costs



Percent of income



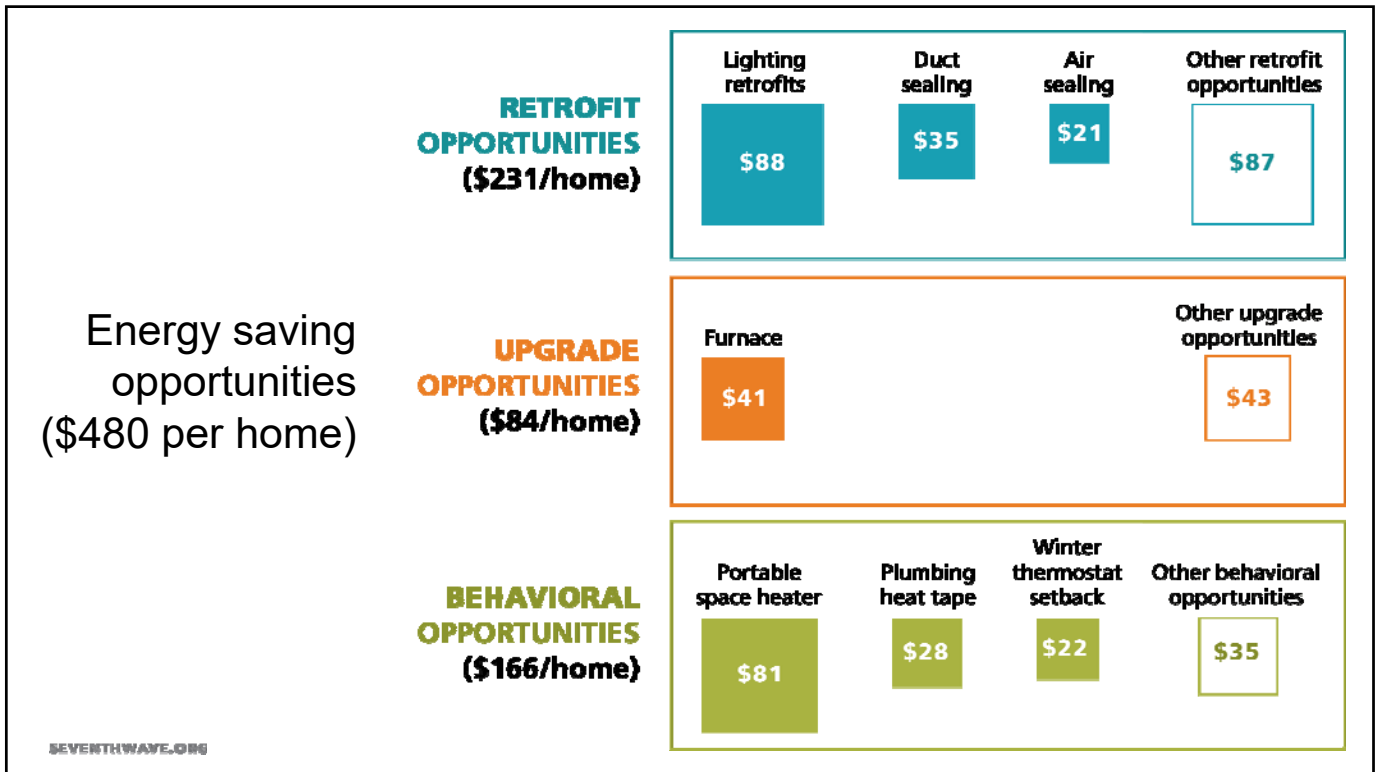
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Energy costs

Heating fuel	Percent of homes (survey)	Annual total energy costs*
Natural gas	59%	\$1,860
Electricity	3%	\$2,930
Propane	30%	\$2,330
Fuel oil	4%	\$2,280
Wood	4%	\$1,930
Weighted average	100%	\$2,050

*Includes heating fuel, electricity and utility monthly fixed charges.

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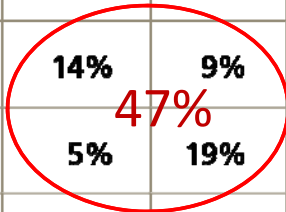
Opportunities by interest and ability of homeowner

		ABILITY			
		Low	Medium	High	Total
WILLINGNESS	Not willing	1%	<1%	0%	1%
	Somewhat willing	18%	11%	<1%	30%
	Willing	20%	14%	9%	42%
	Very willing	3%	5%	19%	27%
	Total	42%	30%	28%	100%

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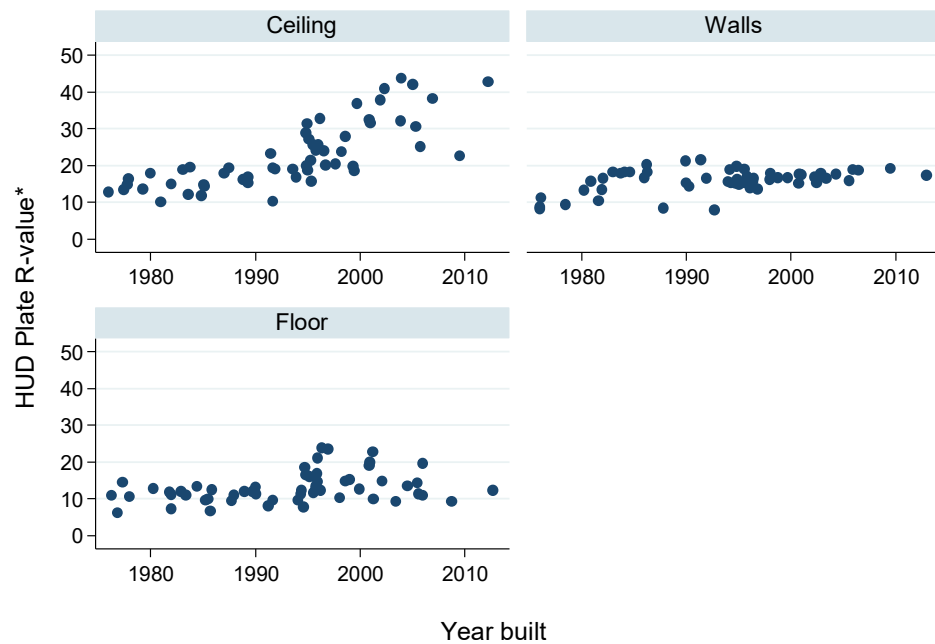
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Nominal Insulation levels



*inverse of listed U-value

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Minnesota Administrative Rule 1350.3800

1350.3800 CONSTRUCTION ALTERATIONS.

Subpart 1. **Effect on seal or label.** Any alteration of the construction, plumbing, heating, cooling, fuel-burning system, electrical equipment, installation, or fire safety in a manufactured home that bears a seal or label, prior to receiving review and approval, and prior to obtaining permits, which include necessary inspections, shall void the approval, and the seal or label shall be returned to the commissioner.

Subp. 2. **Acts not constituting alterations.** The following shall not constitute an alteration: repairs with approved components or parts; conversion of listed fuel-burning appliances in accordance with the terms of their listing; adjustment and maintenance of equipment; or replacement of equipment in kind.

Subp. 3. **Application.** Any person proposing an alteration to a manufactured home bearing a seal or label shall make application for review and approval of the alteration to the commissioner or to the local authority having jurisdiction on the form issued by the commissioner.

Subp. 4. **Inspection.** Upon completion of the alteration, the applicant shall request the commissioner or the local authority having jurisdiction to make an inspection pursuant to part [1350.2100](#) to determine code compliance of the approved alteration.

Subp. 5. **Replacement construction seal.** If approvals and inspections for alterations were not obtained, and the home's construction seal or label is removed by the commissioner, or the commissioner ordered removal by the local authority having jurisdiction, then the applicant may apply for a replacement construction seal upon inspection and approval of the alteration. Replacement construction seals shall require submission of an application in accordance with part [1350.0500](#), subpart 2.

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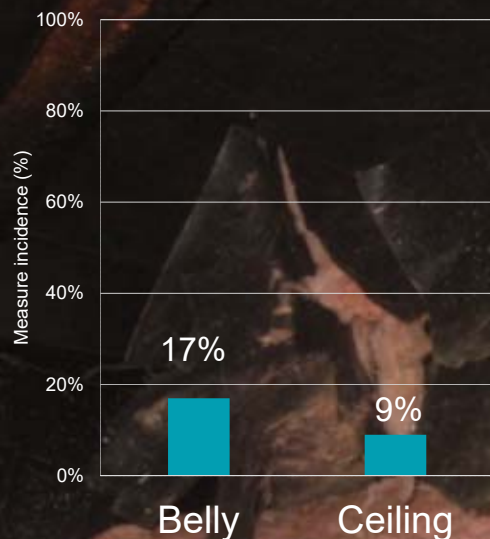
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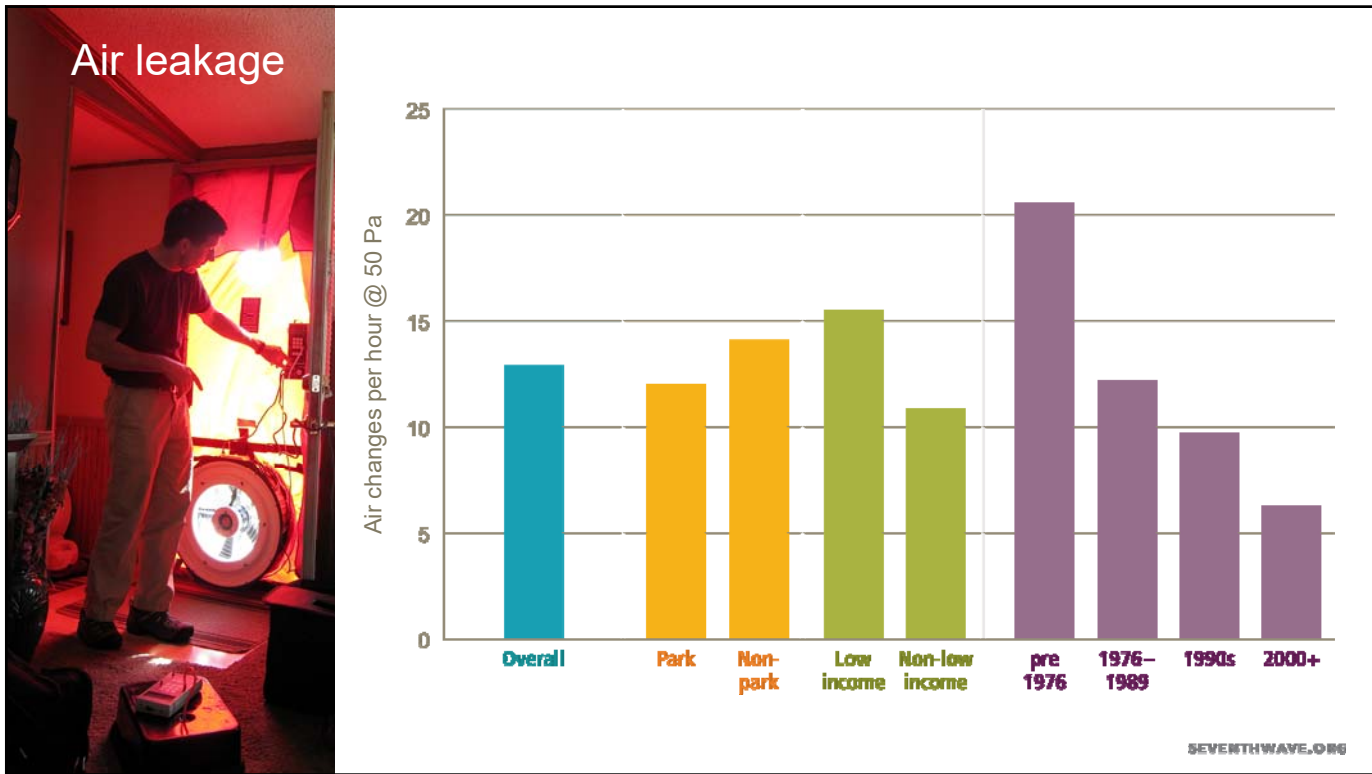
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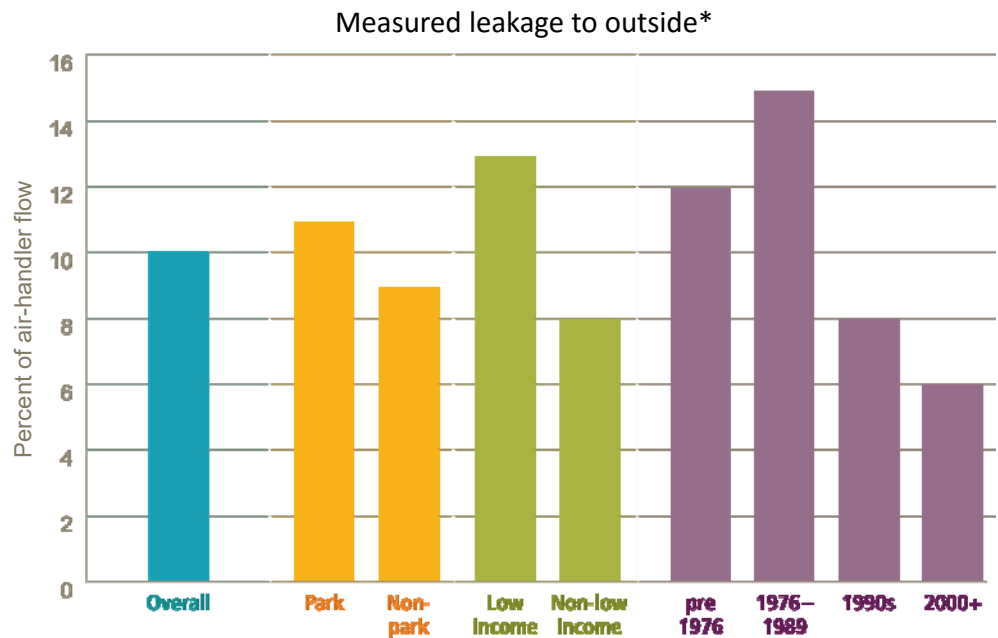
Insulation is limited in MN to restoring to original condition



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Duct leakage

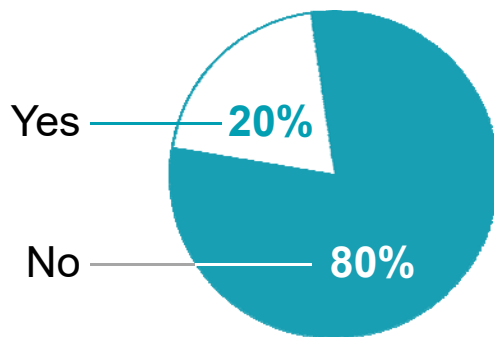


*from duct pressurization testing at 25 Pascals

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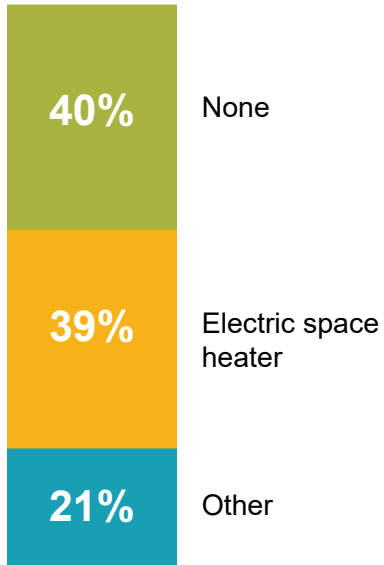
Furnaces

Condensing furnace?

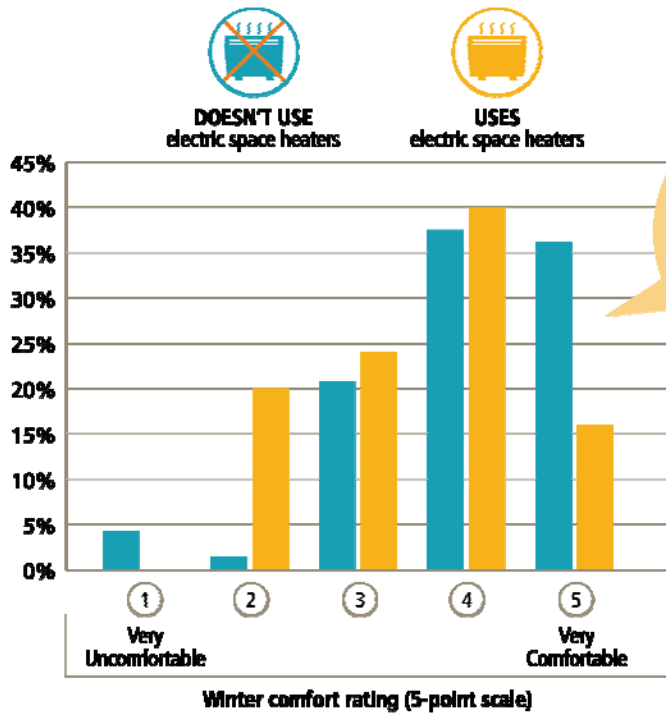


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Supplemental heating systems



Space heaters and comfort



People who use space heaters are less likely to say they're very comfortable (5) and more likely to say they're somewhat uncomfortable (2)...

10%
None

66%
Central

24%
Room

Cooling



90% Interior closet

Exterior closet 10%

Water heating



61%
Electric



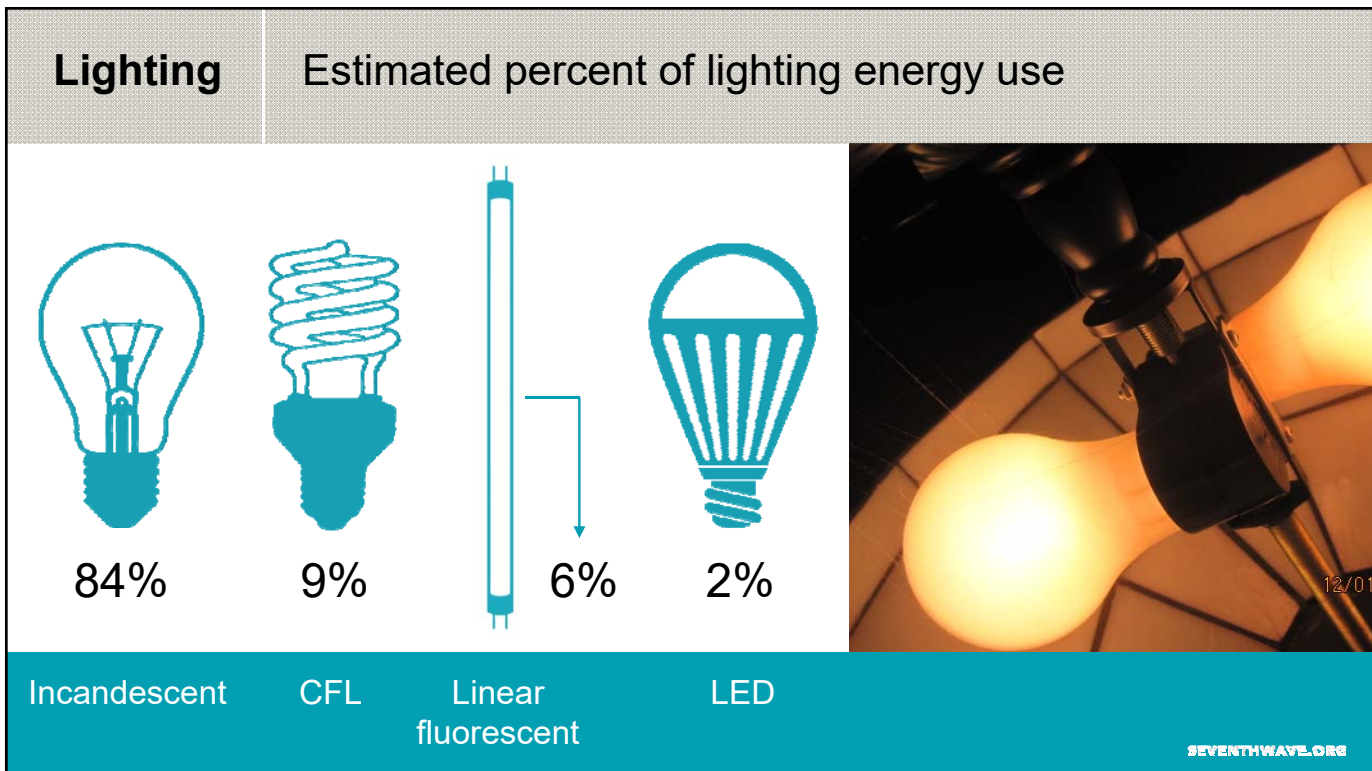
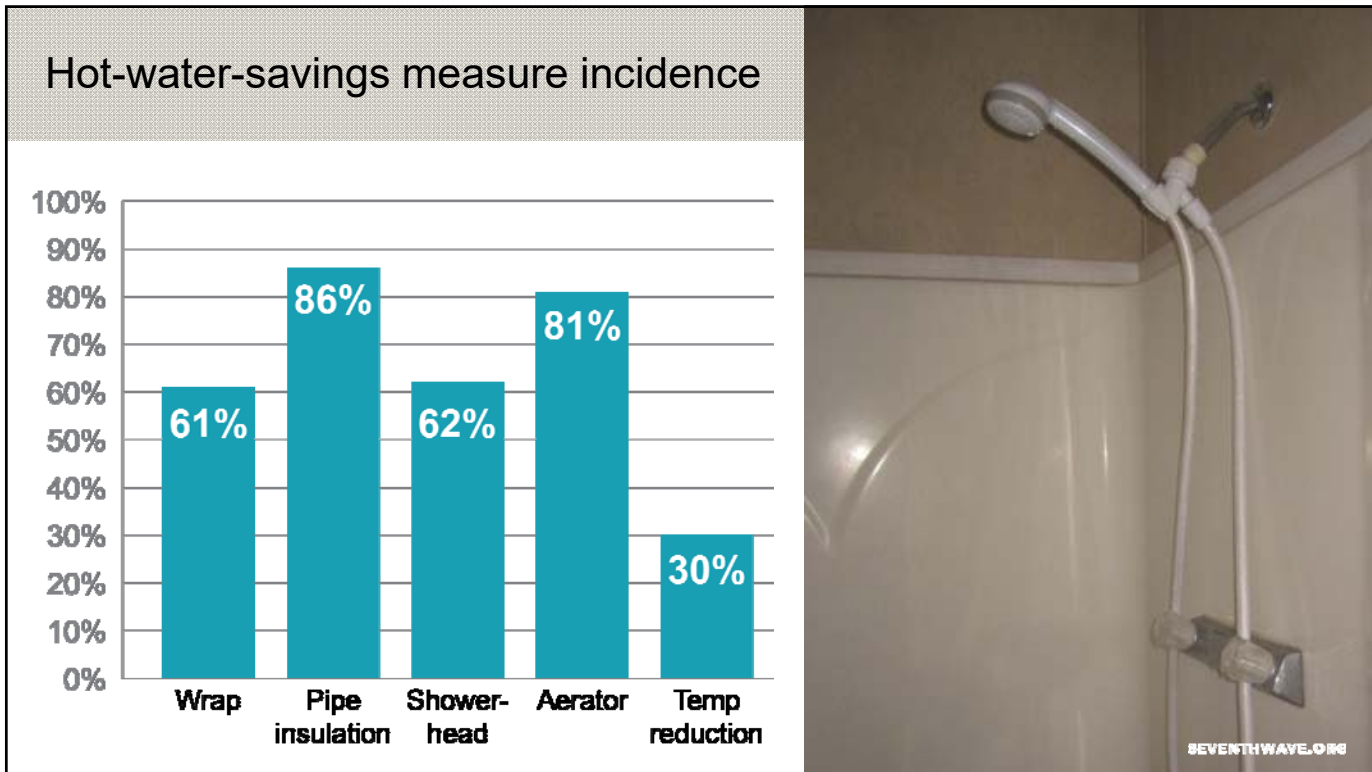
28%
Natural gas



10%
Propane

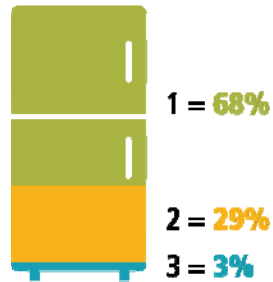


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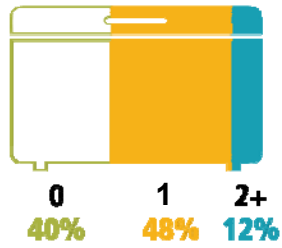


Refrigerators and freezers

Number of refrigerators

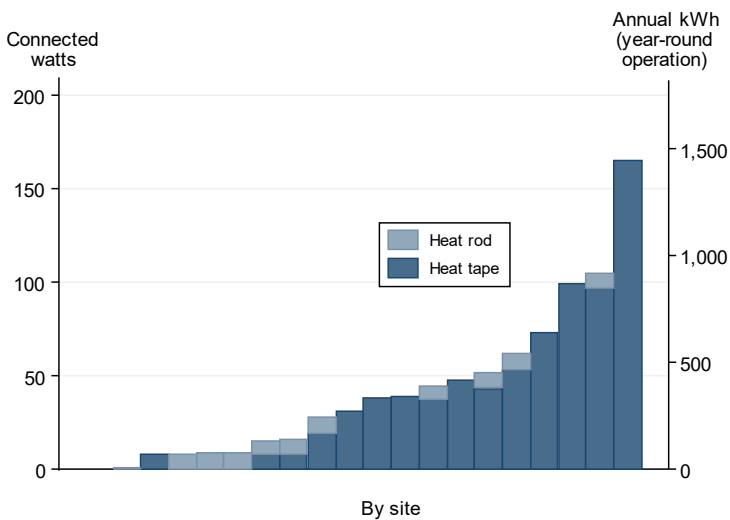


Number of freezers



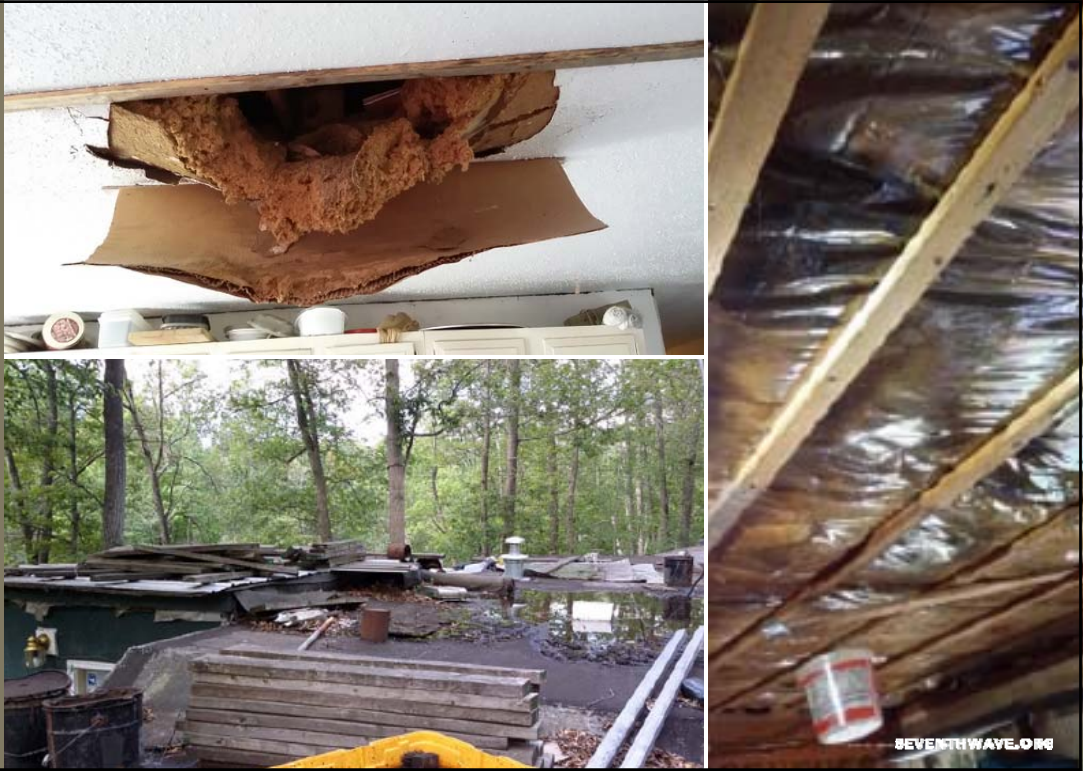
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Plumbing heat tape



03

Repair issues



Recommendations

- 1 Utilities should **work closely with the Minnesota Weatherization Assistance Program**
- 2 Engage with WAP by **helping identify the many manufactured homes on private property** for targeting low-income services
- 3 Manufactured-homes parks provide an **opportunity for “blitz” type programs** specifically targeting this housing
- 4 Utilities and the State could coordinate on ways to address the significant use of **electric space heaters**
- 5 Utilities could expand the scope of their existing residential new construction programs to provide incentives for the purchase and installation of an **ENERGY STAR manufactured home**

Thank you

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