Durability & Energy Efficiency

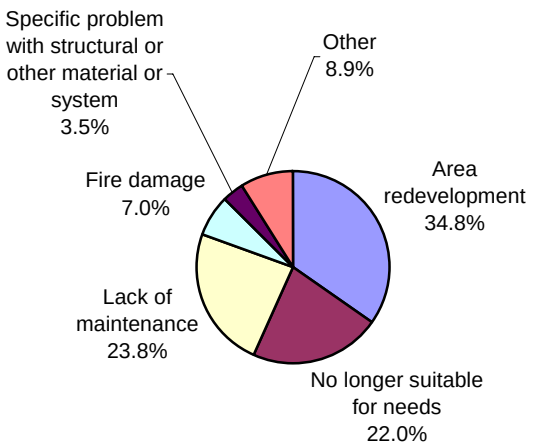
- **The durable materials and structural characteristics of heritage buildings enable their adaptive reuse**
- **Heritage buildings are inherently energy efficient**
- **Easy retrofits can make heritage buildings as energy efficient as most modern buildings**

Heritage buildings are durable, and usually outlive their intended use

A Canadian study examined the age, structure, and reason for demolition of 227 residential and commercial buildings demolished in St. Paul, Minnesota. As the pie chart shows, most buildings were being demolished for reasons that were not related to their structural system or actual useful life. Most buildings were likely being demolished far before the end of the useful life of their structural system. Only eight (3.5%) of the buildings identified a specific problem with structural or other material or system as a reason for demolition, six of which were older than 75 years.

(The Athena Institute and Forintek Canada Corp., 2004)

Reason for Demolition



The old growth wood used in heritage buildings is a superior building material

The wood used in heritage buildings incorporates both hardwoods and softwoods, often harvested from unfertilized old-growth stock, with a denser and more naturally occurring grain structure than the second-growth stock or fertilized tree-farm wood used today. Such materials are stronger, more stable and durable than their modern counterparts.

(APT Bulletin, 2005)

Heritage buildings have inherent energy efficient characteristics

Prior to 1941, buildings were constructed in a manner that resulted in less energy usage for heating and cooling by maximizing the natural source of heating, lighting and ventilation.

Energy Saving Features of Heritage Buildings

Feature	How Energy is Conserved
Operable windows	Provide natural ventilation and light Reduce heat gain or loss since less than 20% of wall surface is often composed of windows
Interior light/ventilation courts, rooftop ventilators, clerestories, or skylights	Provide energy efficient fresh air and light
Interior or exterior shutters, interior Venetian blinds, curtains and drapes, or exterior awnings	Minimize the heat gain or loss from windows
Wide roof overhangs, exterior balconies or porches	Minimize heat gain
Heavy masonry walls, thick brick walls, or stone walls	Minimize heat loss Provide high thermal inertia (slowing heat transfer from exterior to interior)

(National Park Service, 1978)

With some upgrades, the energy efficiency of heritage buildings can be increased

With windows, for example, cold air leaking in and warm air leaking out is the principal culprit affecting energy efficiency. It can account for as much as 50 percent of the total heat loss of a building. Once retrofit components, such as weatherstripping and weatherseals, are incorporated, the energy efficiency of traditional windows can meet and even exceed the efficiency of replacement units.

(APT Bulletin, 2005)

A traditional, single-paned window has an R rating (a measure of a material's ability to decrease heat flow) of about 1. A new, standard double –paned sealed window unit has an R rating of about 2, which is comparable to a traditional window and storm combination. Filling a sealed window unit with argon or krypton gas can raise its R rating to about 3.5. The seals on these units, however, have a finite and rather short life. When they fail and the gas escapes, the units return to an R rating of 2. (*Heritage, 2006)*

Resources

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