Section II

Energy-Conscious Renovation

Be an Energy-Informed Buyer

You need to consider many factors when you select a building to convert for homeless use, including proximity to jobs, neighborhood support (for example, police protection and community centers), property cost, and access to public transportation. Being close to public transportation not only is necessary for the convenience of your staff and residents, it is environmentally wise as well.

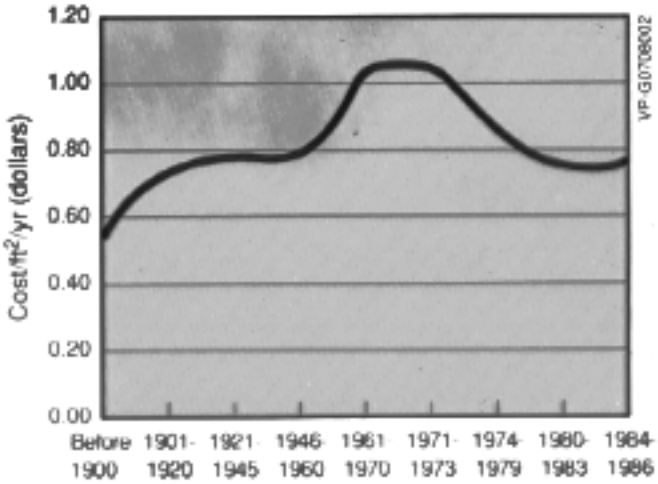
Energy use deserves as much attention as the other factors. So before you buy a building to convert, look carefully at its energy use. You want to avoid being saddled with a building—even one you might buy for a reasonable price—that is costly to operate and maintain. When considering a particular building, you may want to obtain its gas and electricity bills for the previous three years from your local utility company.

As the graph on the right shows, buildings constructed in the 1960s and early 1970s are generally not energy efficient and could strain your operating budget.

Although a building's vintage can tell you something about its energy use, you also need to check out insulation, quality of construction and materials, and significant drafts and air leakage. You probably won't find a building with a totally clean bill of health, but keep the following points in mind:

- Electric resistance space or water heating is generally the most expensive type of system to operate.
- Unshaded, west-facing windows can overheat a building and result in high air-conditioning loads, especially in warm climates.
- Single-pane windows have nearly twice the heat loss of double-pane windows.
- In hot, dry areas, buildings with central air conditioning are more costly to operate than buildings with evaporative coolers.
- No insulation in walls and limited insulation in ceilings increase both space heating and cooling expenses.

Energy Cost Versus Year Constructed



Climatic and Environmental Influences

Various environmental factors affect the way a building uses energy. Chief among these are vegetation and adjacent buildings and the building's shape and orientation.

Vegetation and adjacent buildings. The shade that these offer may provide welcome relief from intense summer sunlight. However, they can also prevent the warmth and light of the winter sun from entering a building. Deciduous trees are particularly effective for shade in the summer; they also let sunlight into a building during the winter. Other environmental conditions, such as prevailing breezes and natural topographic features, can affect how your building uses energy. As a general rule, place vegetation to shade east and west windows but not south windows.

Building shape. The shape of a building can affect its energy use. Different shapes have different ratios of exterior surface area to enclosed space. These ratios determine the amount of heat from the sun that strikes the building's surface. In cold and hot, dry climates, look for compact buildings that have minimum surface area exposed to the harsh environment. In temperate climates, shape is less of a constraint because a building won't lose or gain excessive amounts of heat.

Building orientation. In all climates, look for a building where the long axis runs east-west rather than north-south. It is best if most of the windows are on the south side; if not, consider whether you

could increase the south-facing window area during renovation. South-facing windows can reduce your energy bills 5%–15%, depending on climate.

Some Design Considerations

Numerous design elements influence how your building uses energy. These can also contribute to the comfortable, supportive environment so important to its occupants. Here are a few considerations to keep in mind as you design your renovation:

Building materials. The materials you select for the building's interior can improve the comfort of the residents and staff and reduce the need for purchased energy. Materials such as tile floors, interior brick, concrete block, stone or adobe walls, or water stored in plastic or metal containers even out fluctuations in indoor temperatures. In the winter, these materials store heat during the day and release it as the interior temperature begins to drop. In the summer, they can help keep the space cool.

Interior layout. You can plan the interior spaces according to their function as well as their different heating, cooling, lighting, and ventilation needs. For example, counseling areas, waiting rooms, or other places where people congregate for daytime activities might be grouped on the south side of the building in well-lit, cheery spaces. You may also want to locate outdoor play areas for children on the south side. The south side—both indoors and outdoors—is generally the most comfortable area for daytime activities.

Similarly, the sleeping rooms, storage and private spaces, and areas that give off heat such as laundry rooms and kitchens should be located on the cooler north side. Storage areas and sleeping rooms can generally be kept cooler than activity areas. Heat generated from the laundry and kitchen can offset some of the heating requirements in these spaces.

Entrances and vestibules. These areas can conserve energy, provide comfort, and enhance your shelter's public image. A large vestibule or south-facing sunlit area is a pleasant space for residents as they wait for admittance. This area can also serve as an airlock entry to prevent the loss of heat from a constantly opening door. The residents benefit from being protected from the elements. And neighbors are less likely to object to having homeless housing in their midst if its residents do not have to wait outside for admittance.