Bathroom designs to ease aging

Buffalo researchers develop fixtures to meet changing needs.

By Alan J. Heavens
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The reasons for universal design are simple.

One is that people 45 and older buying trade-up housing don’t plan to move every seven years, which has long been the national average.

The other is that, as people age, they will progressively have trouble doing everyday tasks such as reaching down to open a kitchen drawer, reaching up to get a book on the top shelf of a bookcase, or stepping over the raised base of a shower stall without having something to grab onto.

The goal of universal design is to accommodate the needs of aging homeowners, and make the solutions attractive and comparably priced at the same time.

For researchers at the University of Buffalo’s Rehabilitation Engineering Research Center, it is part of the job.

“We feel that the universal-design idea offers tremendous potential to serve a wide range of users and offer innovative design not yet explored by the design community,” said Abir Mullick, an associate professor of architecture at the university.

The center’s most recent effort produced two bathrooms — one with movable fixtures and the other with movable panels and fixtures — that readily adjust to the changing needs of the users.

“The fixtures in both bathrooms are the same,” Mullick said. “The difference is that, in the movable-panels bathroom, the walls move horizontally.”

Why focus on the bathroom?

“The bathing area is where frail, older people have the most difficulty,” said Edward Steinfeld, director of the universal-design center. “Not being able to use the bathroom makes the difference in whether you can live independently.

“Kitchens aren’t as important, because there’s always Meals on Wheels,” he said.

The bathrooms designed by Mullick, Steinfeld, and design consultant Drew Kelley are an outgrowth of an earlier project in which Mullick designed a “universal bathing center.”

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Bathroom fixtures developed to meet changing needs

BATHROOMS from 11 an accessible shower.

Mullick began working on the bathing-center project in 1996.

The current project, which began in 1999, is funded by the National Institute on Disability and Rehabilitation Research and the U.S. Department of Education.

Some residential builders suggest that most home buyers accept the principle of universal design but balk at living in a house where such designs serve as a reminder of the inevitability of aging and the health problems that are often associated with it.

Steinfeld is quick to draw a distinction between universal design and accessible design, which he also calls “assistance technology.”

“Accessible design focuses on accommodating people with disabilities, and the result usually is a rather invisible-looking place with plastic seat risers and grab bars made of chrome or stainless steel,” he said.

“In universal design, appearance is important. If you just focus on function, people won’t buy it.”

The two bathroom models at the center are not working prototypes, but “are proof of the concept,” Steinfeld said — meaning the fixtures can be adjusted to demonstrate the universal-design features.

“This sink in the model can be hooked up to water and drainage to demonstrate how it would work,” he said. “The shower floor and the toilet are not operational.”

The universal bathroom consists of a lavatory unit, a toilet unit, a shower unit, and a support unit.

These units can be used independently or in combination, and they can be used in place of existing fixtures or in new construction.

The lavatory unit has a sink, work surface, storage, lighting, and mirrors. The counter has pull-out shelves, and can be extended to increase the work surface when needed.

The unit has built-in lights for additional illumination, and has wrap-around grab bars for support and storage.

Specially designed hooks can be mounted on the support bars to store daily-use accessories. There are two tilting mirrors for improved viewing conditions.

The lavatory unit is height adjustable. The sink has three clearance for wheelchair users and clear space underneath for wheelchair-turning.

The shower unit consists of three basic components: the shower column, the drainage floor, and the shower door.

The shower door has a lightweight telescoping screen stored inside that, when extended, creates a shower enclosure. When not in use, the screen stores flat against the wall in a locked position.

The drain grate consists of specially designed tiles that are gently tapered to direct water along their edges into a trough underneath. They drain quickly and keep the floor dry to prevent falls that may be caused by wet, slippery floors.

An entire bathroom floor could be designed in this way, which would allow the bath to be hosed down for easy cleaning and maintenance.

The support unit is an architectural solution that consists of a multipurpose grab-bar system that can be used as structure, support, and storage.

The fixtures are not motorized, though that is a possibility in future higher-end models.

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Steinfeld said the mechanisms for moving the fixtures and the panels are counterweighted, so to move the sink up to where you can use it doesn’t mean you have to lift 100 pounds.

“You just unlock it, lift it, and move it upward or to the side and then relatch in place,” Steinfeld said.

The toilet is a standard fixture, although the ones in these models hang from the wall instead of being anchored to the floor.

Adjustments to accommodate changing heights — say, a child followed by someone in a wheelchair — are accomplished with a multi-layered seat.

Other than the toilet, the fixtures are designed to be interchangeable, in case they fail to function properly.

The size of the models — 5 feet by 8 feet — was chosen because that is the typical size of an American bathroom.

“If you can do that size, you can do larger,” Steinfeld said. “A side benefit is that it could be used to meet requirements of remodeling.”

The center already is negotiating with manufacturers and is hoping to come up with the next prototype of the bathroom within two years, Steinfeld said.

“In that time, we’ll be testing it and put it on public view for more testing by consumers and plumbers,” he said.

Steinfeld said he believed that the bathroom could be on the market within five years.

Price is an issue.

“Our objective in the next phase of the project will be to examine the technologies and materials to make the bathrooms cost-effective,” Steinfeld said.

“We realize that people will always pay for a better design and function, but we don’t want to come up with that and put it out of the financial reach of the average person.”

Toll Bros. ’Zvi Barzilay said he appreciated the value of research and saw benefits for both builders and consumers in gadgets and materials that are cost-effective and that improve the quality of construction and enhance lifestyle.

However, Barzilay, Toll’s senior vice president, said he did not think universal design was one of those good ideas.

“I don’t see this as practical,” he said. “A family with two or three children in a four-bedroom house will grow out of that house and move into a bigger one. That means the parents will want to buy a new house, which will be filled with the results of new ideas and new technology and more efficient use of space.”

“After all, how many people would buy a 20-year-old car with a new engine and none of the other improvements in car manufacturing over those 20 years?” Barzilay asked.

“Most people want new,” he said.

For information

To learn more about the designs, visit the Web site http://designs.ap.buffalo.edu/~recud/projectDV2.htm, and then link to the universal bathroom.

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