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## ALT | ASSISTED LIVING TECHNOLOGY

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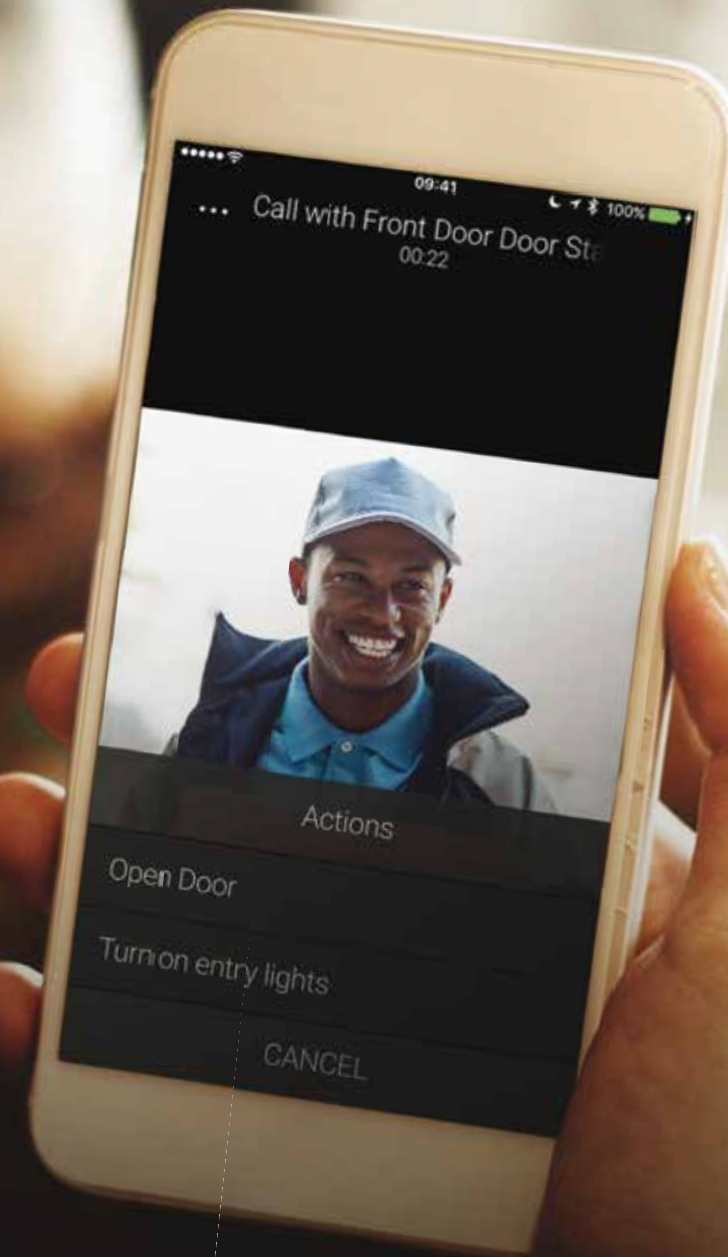
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## Assisted Living Technology: Urgency and Empathy

Making the lives of seniors better offers technology firms a priceless objective.

**O**FTEN, the dark side of technology seems to outweigh its value. Too late, for example, are we learning about Facebook's role in spreading hate speech, fueling conspiracies and generating false news. Watch a few episodes of "Black Mirror" and you'll see many examples of technology's disruptive potential. But does technology have to careen out of control?

That's up to us. Like other manmade tools, we can choose what to do with technology. We need to own our decisions. A drone used to spot forest fires can save lives and wildlife. A drone used to kill people is, well, a reflection of its operator.

One area where technology can and is being



put to good work is in the area of elder care. We're all facing the same crisis as our parents (and ourselves) grow older. We don't want to be institutionalized; forced to leave our homes to be cared for by strangers. And it's my belief that emerging technology has the power to buy us valuable time to live relatively normal lives at home, in our most senior years.

This concept is new to the tech industry. We call it Assisted Living Technology (ALT). To my knowledge, this issue of *Green Builder* represents the first attempt to synthesize existing and emerging tech with real-world assisted living needs. Sure, hundreds of gadgets exist to address individual concerns about

seniors: fall sensors, voice control, smart refrigerators and so on. But what's needed is much more: an intuitive house with built-in systems to monitor, protect, entertain and, at times, escort elder residents to faraway friends, family and locations, not simply to make them prisoners in their homes.

At the same time, an ALT home, perhaps in the form of a self-contained Accessory Dwelling Unit (ADU), invokes good building science. It's affordable to operate; the floors are designed to absorb fall impacts. Systems run efficiently in the background. More than just wheelchair friendly, it's a life-enhancing space.

Virtual field trips are a voice command away. An autonomous car whisks in to pick up mother for a holiday dinner. And there are no invasive cameras watching her every move.

The arena of smart home technology has been around for decades. I remember when only the millionaires could afford a full-on smart home. Now you can piece one together for a couple hundred bucks using off-the-shelf components—or step up to a full suite of interconnected products.

No one has really put all the pieces together yet. But we believe they will. When they do, a truly humanistic alternative to institutional assisted care could take shape. How refreshing it would be if for once, instead of fueling our darkest fears, technology soothed them—offering us a gentler, more-meaningful way to go into the long good night. **GB**



CREDIT: CECILIE ARQUES

**Time to travel.** Virtual reality travel is just one way technology has begun to enhance the lives of seniors.



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## Solar Roofing Comes Under Attack in Idaho

The state's No. 1 utility wants an installation ban in response to excessive green power purchases.

GOOD NEWS HAS TURNED TO BAD NEWS IN IDAHO, where a clean energy movement could lead to a statewide ban on rooftop solar. In March, Idaho Power, the state's largest utility, announced its "Clean Today, Cleaner Tomorrow" initiative, where the company would transition to 100 percent green energy production by 2045. Environmentalists rejoiced.

In April, the utility released a second proposal: All new hookups of rooftop solar systems would halt until state regulators study the rates that are paid to companies for selling excess electricity to the grid. In its application to the state's public utilities commission, Idaho Power noted that businesses' use of solar is increasing so quickly that some costs of maintaining the grid could shift to other customers. Now, the same environmentalists are accusing the utility of trying to obtain a monopoly on control of clean energy.

Dan Gearino, environmental reporter for *InsideClimate News*, says the roofing proposal will devastate the companies that install the systems, "Utilities often make [the business growth] argument," he notes. "The problem is that it doesn't take into account that growth in customer-owned solar can cut costs for everyone by reducing demand to build large power plants." State regulators will soon set a timetable for handling the utility's request. **GB**



CREDIT: U.S. DEPARTMENT OF AGRICULTURE

**Dark times ahead?** Solar roof installers in Idaho may be out of work for months if the state grants a service stay from its largest power company.

## Virginia Polytechnic Wins Solar Decathlon

The institute wins top honor at DOE competition for its energy-efficient building concept.

THE VIRGINIA POLYTECHNIC Institute and State University team was named grand winner at the U.S. Department of Energy Solar Decathlon Design Challenge in April. Virginia Polytechnic beat out 44 other finalist teams nationwide, including 37 colleges.

The U.S. Department of Energy Solar Decathlon is a collegiate competition that challenges student teams to design and build highly efficient and innovative buildings powered by renewable energy. The winners are those teams that best blend architectural and engineering excellence with innovation, market potential, building efficiency and smart energy production, according to a DESD release.

First-place winners included the United States Military Academy at West Point for the Suburban Single-Family division; Georgia Institute of Technology in Urban Single-Family; Virginia Polytechnic Institute and State University for



**The winning team.** Virginia Polytechnic Institute and State University team members were all smiles after being named winners of the Solar Decathlon Design Challenge.

Attached Housing; and State University of New York College of Environmental Science and Forestry and Syracuse University, Mixed-Use Multifamily.

A complete list of winners is available at the U.S. Department of Energy Solar Decathlon website. **GB**

CREDIT: U.S. DOE

## Electric Homes Flex Their Power in California

Climate and monetary benefits await for Golden State's builders and homeowners.

BUILDING AND LIVING in all-electric homes can save homeowners and developers hundreds of dollars each year compared to homes that use gas for heating and cooking, according to a report by Northern and Southern California water and power utilities.

"Residential Building Electrification in California" by Los Angeles Department of Water and Power, Sacramento Municipal Utility District and Southern California Edison notes that all-electric construction can result in an energy savings of \$130 to \$540 annually. Three-quarters of new all-electric homes will save at least \$15 per month on equipment and energy bills over the life of the equipment, relative to new homes that use gas.



CREDIT: BILL BRADFORD/FELCKR

**Electric perk.** Research suggests that all-electric homes reduce utility costs, particularly in light of the State's aggressive solar PV adoption.

Single-family homeowners that retrofit their homes can save \$10 to \$60 per month on energy bills, and 84 percent will save up to \$30 per month on total lifecycle costs, the report notes. These affordability measures can help increase the pool of prospective homebuyers in California, and serve as an example for the rest of the nation.

"Electrification can cut the climate pollution produced by homes up to 90 percent by 2050—and this study confirms it can save many Californians cash as well," says Building Decarbonization Coalition director Panama Bartholomy. "We hope decision makers will pay close attention to the recommendations in this report, as we seek to ensure [everyone has] access to clean, affordable and healthy zero-emission homes." **GB**



CREDIT: CHRISTIAN SCHNETTLER/FLOKRI

**Big things ahead.** More shipping means more work for anyone in the construction industry—and that's what's expected after the ICC's vote on shipping containers.

## IBC Change Could Boost U.S. Commercial Construction Market

ICC's vote is considered a 'major victory' for shipping containers industry.

THE INTERNATIONAL CODE COUNCIL (ICC) has implemented a change to the 2021 International Building Code (IBC) that allows ISO shipping containers to be used in commercial construction. The addition to Chapter 31 of the IBC—on special construction—will spell out what code officials should look for in container construction to confirm structural safety.

According to Stephen Shang, CEO of Manor, Texas-based Falcon Structures and co-chair of the ICC's Container Industry Task Force, representatives from the shipping container building industry and code officials will also introduce more clarity into the IBC on the safe use of shipping containers. This will be done by releasing a corresponding set of guidelines that explain the new shipping container building codes.

Shang called the vote "a major victory for both code officials and the container-based structures industry."

The code revision passed with a 97 percent vote—a very uncommon occurrence, according to Shang. He and Tom Hardiman, executive director of the Modular Building Institute in Charlottesville, Va., note that the near-unanimous approval confirms code officials' serious desire to implement the guidelines. The code change will help mitigate the process of approving shipping container structures. "Once states adopt the 2021 IBC, we expect to see an uptick in this type of construction activity," Hardiman says. **GB**



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## GREEN BUILDER MAGAZINE EDITORIAL OFFICES

PO Box 97  
Lake City, CO 81235  
303-246-8890  
[www.greenbuildermedia.com](http://www.greenbuildermedia.com)

## GREEN BUILDER MEDIA LEADERSHIP

**Sara Gutterman** CEO  
[sara.gutterman@greenbuildermedia.com](mailto:sara.gutterman@greenbuildermedia.com)  
303-246-8890

**Ron Jones** President  
[ron.jones@greenbuildermedia.com](mailto:ron.jones@greenbuildermedia.com)

**Cati O'Keefe**  
Chief Development Officer /  
Editorial Director  
[cati.okeefe@greenbuildermedia.com](mailto:cati.okeefe@greenbuildermedia.com)  
513-532-0185

## ADVERTISING SALES

**Craig M. Coale** Publisher  
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## AUTOMOTIVE ADVERTISING SALES

**Dawn Rivard**  
[dawn@focusmm.net](mailto:dawn@focusmm.net)  
586-214-0635

## EDITORIAL

**Matt Power** Editor-in-Chief  
[matt.power@greenbuildermedia.com](mailto:matt.power@greenbuildermedia.com)  
207-619-2713

**Alan Naditz** Managing Editor  
[alan.naditz@greenbuildermedia.com](mailto:alan.naditz@greenbuildermedia.com)  
916-681-2057

**John O'Brien** Art Direction  
[john.obrien@greenbuildermedia.com](mailto:john.obrien@greenbuildermedia.com)  
207-865-9908

**Therese Workman** Copy Editor  
[info@greenbuildermedia.com](mailto:info@greenbuildermedia.com)

**Melissa Smith** Web Editor /  
Cognition Project Manager  
[melissa.smith@greenbuildermedia.com](mailto:melissa.smith@greenbuildermedia.com)

## PRODUCTION

**Mary Kestner** Production Manager  
[mary.kestner@greenbuildermedia.com](mailto:mary.kestner@greenbuildermedia.com)

## CIRCULATION

**Mary Kestner**  
[mary.kestner@greenbuildermedia.com](mailto:mary.kestner@greenbuildermedia.com)

## GENERAL INFORMATION

[admin@greenbuildermedia.com](mailto:admin@greenbuildermedia.com)

## FINANCE

**Hannah Judson** Chief Financial Officer  
[hannah.judson@greenbuildermedia.com](mailto:hannah.judson@greenbuildermedia.com)  
970-397-5483

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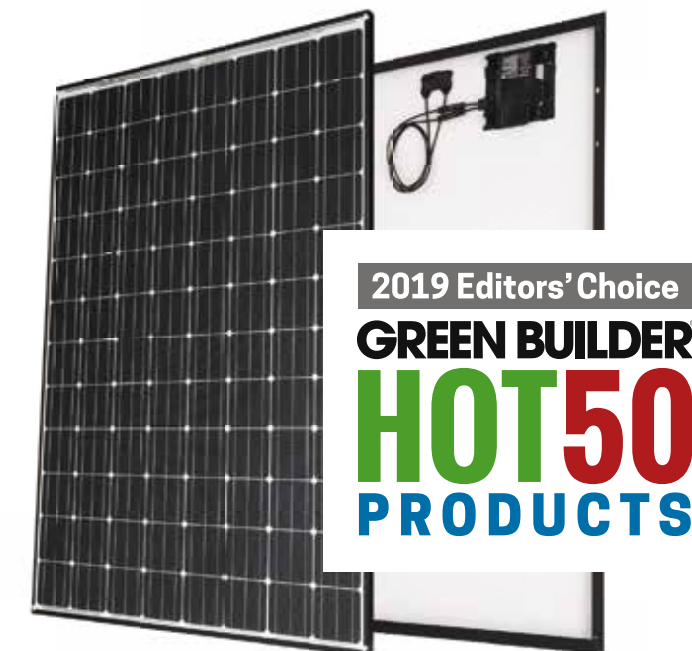
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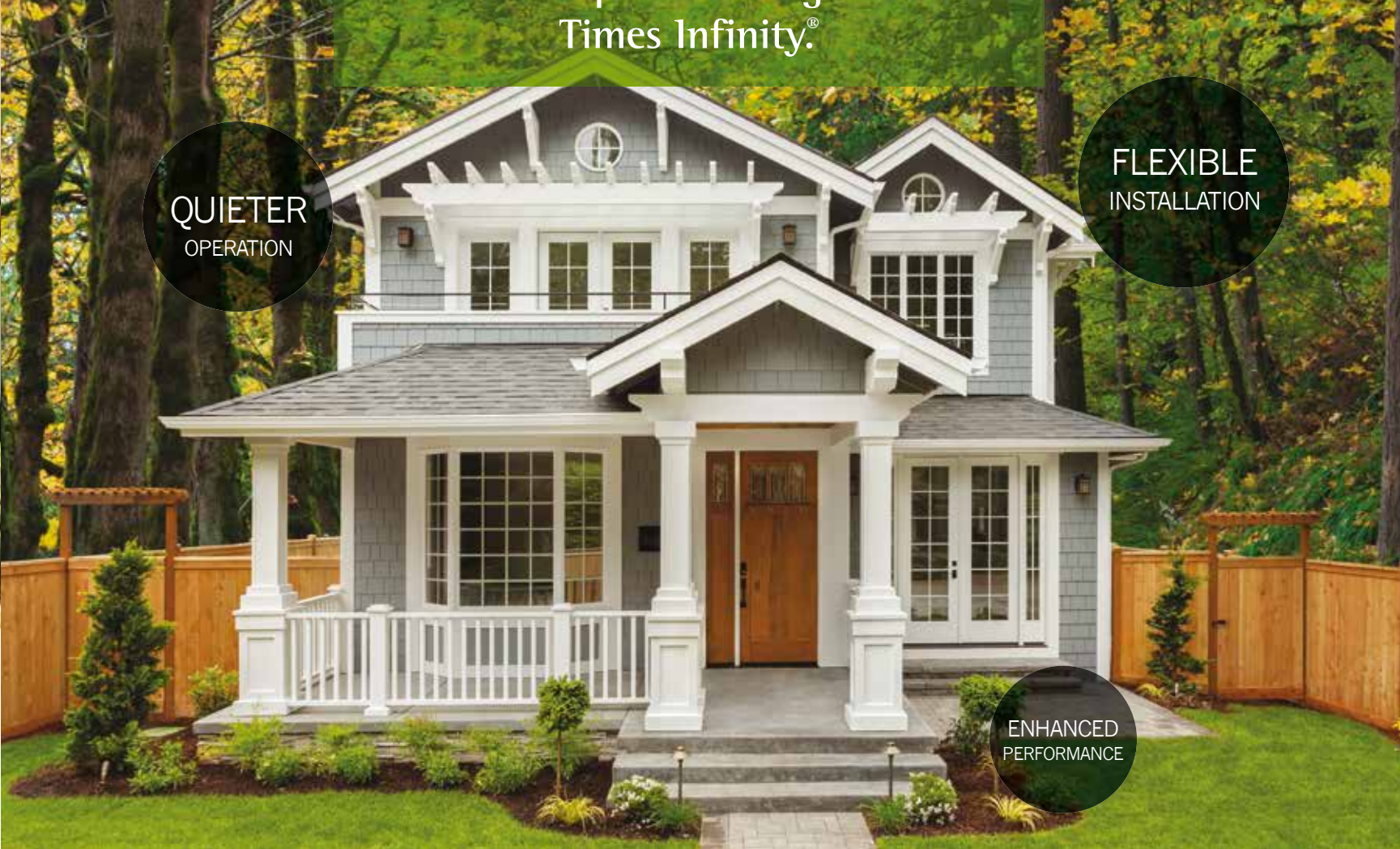
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HERE’S A SAMPLE OF WHAT’S INSIDE  
“No wonder so few homeowners would dare to run the ADU development gauntlet—such formidable roadblocks stand in their way.”  
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**ON THE COVER**  
**ASSISTED LIVING TECHNOLOGY**  
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It's time to put smart tech's best foot forward—augmenting homes so that vulnerable loved ones can stay home longer.

BY GREEN BUILDER STAFF

**L**IKE IT OR NOT, we're all getting older. The median age of an American is about 38 years, about a decade longer than 50 years ago. That may not sound like much, but consider that about 60 percent of U.S. residents are age 45 or older. By 2035, the median is expected to near 45, and most Americans will be old enough for AARP membership (a whopping 51).

Based on those figures (thanks, National Center for Health Statistics), who wouldn't want to seriously start thinking about how and where they want to spend their soon-to-be-here golden years—especially when our life expectancy is expected to stay at about 80 years for the next couple of decades?

This issue, *Green Builder* looks at the best tool available to seniors now and in coming years: technology. From smart medicine dispensers to memory stations, there will be quite a few mechanical marvels headed our way, and more years in which to enjoy them. *Here's to aging gracefully.*



# The Five-Year Flat

By combining low-tech building science with high-tech tools, seniors can live independently longer, gaining perhaps five or more years at 'home,' without relying on a full-time caregiver.

## AIR MONITORING

A combination of smart range hoods with particle detectors and VOC monitors (such as Awair), combined with heat recovery ventilation works invisibly to ventilate and monitor the Flat. Are VOC and CO<sub>2</sub> levels normal and healthy?



## VIRTUAL "RESISTANCE" TRAVEL

The ability to travel virtually with friends and peer groups is being offered by organizations such as the AARP. However, in the Five-Year Flat, there's a catch. As users travel, they step into a virtual exercise rig. In a safe environment, they build and rebuild bone and muscle as they walk, point or touch virtual objects.

## MEMORY STATION

For those with mild dementia, a centralized digital "To Do" board acts as a memory launcher. By simply touching the board, occupants trigger basic audio reminders (and email to family, if needed).

## SMARTER, SAFER FLOORS

Reducing the risk of hip-breaking falls, floors incorporate softer materials—such as low-shag carpets with rubber backers, luxury linoleum (thicker is better) and cork products—with thick layers designed to absorb shocks. Combined with fall sensors, the house offers preemptive and post-accident response.

## SECURE PERIMETER

Elders understandably have great anxiety about security. Why wait until an intruder is in the house? The secure perimeter of the house flashes lights and alarms, and turns on sprinklers, including roof sprinklers, to ward off both wildfire and trespassers.

## STAIR ASSIST

Not everyone wants to live on just one level. Bi-level living is still possible, if there's a safe way to traverse stairs, or an elevator is in the budget. New stair lifts are sleeker, smarter and voice controllable. Just stand on the pad and go for a ride.

## HEALTH CHECKUP STATION

With the ability to check blood pressure, test heart patterns, and conduct whole-body scanning for cancers and other concerns, the home health station looks a lot like a vanity. No intrusive interface, it works when the occupants brush their teeth or wash their faces. A mirror with built-in sensors does much of the heavy lifting.

## INTUITIVE APPLIANCES

A smart refrigerator tracks the presence or lack of food, monitoring what goes in and out. Is the resident eating? If so, how healthy is their diet? Key foods are re-ordered automatically and arrive by mail in zero-waste, reusable packaging that simply "unzips." The age and expiration date of everything in the fridge is monitored, as shown in this Samsung refrigerator detail. Stoves, microwaves and dishwasher correlate information in the background.

## POWER-DOWN BACKUP SYSTEM

With electronic systems in place, the Five-Year Flat has to stay up and running all the time. With a backup battery system (in garage) and small solar array on the roof, it keeps key systems online—Wi-Fi connection, communications and security. A wireless propane fueled heating backup keeps the home warm in long outages.

## WATER MONITORING

Smart water-monitoring system analyzes water use at every station in the house, creating a smartphone-enabled database of behavior. Toilet only flushed once today? An alert goes out. Did other abnormalities occur? Is Mom okay?

## AUTONOMOUS VEHICLE

For rural dwellers, especially, the inability to drive can feel like a prison sentence. But autonomous vehicles will soon become a reality. Residents can simply step into the vehicle, speak their destination and relax to their favorite music as the vehicle scoots them on their way.



# Staying Home

The baby boomer generation has entered the period of life when it needs assistance to live comfortably and independently. Just in time, assisted living technology could offer a pathway to what boomers want most.

BY MATT POWER

**C**HANCES ARE, you've already encountered the reality of aging in America, through a family member or on your own. And unless you're very wealthy or live on a commune, it's far worse than what you expected.

The agony is real. As many Americans hit their seventies and on, they're caught in a worsening spiral of home care costs and emotional angst. Here at *Green Builder*, we have staff whose parents pay \$25,000 a month (each) to reside in an assistive facility. Their large retirement "nest egg" no longer seems sufficient.

To worsen matters, one in 10 people over 65 has some form of dementia, such as Alzheimer's. This makes living without regular care all but unthinkable. And although researchers have made some progress in solving the dementia riddle, it's still an elusive,

frustrating condition. We can't just wish it away, any more than we can deny the diminishment of age. Perhaps it's best chronicled by Shakespeare: We grow from "mewling and puking" infants to "second childishness and mere oblivion; sans teeth, sans eyes, sans taste, sans everything."

Must it end this way? Perhaps not, if we begin to combine smart technology with building science to prepare homes for our golden years. Think of that Shakespeare quote. New tech can replace old teeth with new ones, repair and augment aging eyes, vastly improve lost hearing—and still many more advancements are forthcoming. No longer housebound, seniors can use virtual technology to explore the universe or their old neighborhood, learn a new language, or ride in a self-driving car to visit a grandchild. Motion sensors, fall detectors, water-use analyzers, on-demand home diagnostic tools—the list of potential non-human "aides" goes on and on. But they must go hand-in-hand with better building design.





“New tech can replace old teeth with new ones, repair and augment aging eyes, vastly improve lost hearing—and still many more advancements are forthcoming.”

### DORA'S WORLD

Before we launch into prescriptive ideas on how to help the aging stay home longer, let's dive into a real-world situation. I spoke with Gary Krause recently. He's an engineer in Michigan, who is caretaking his 80-year-old mother—we'll call her Dora—with the help of several connected technologies. Krause has set up a small accessory dwelling unit (ADU) for his mother near his house.

“I've got her set up with Amazon *Alexa*, and she loves it,” he says. “It allows her to do certain key things, [such as] the ability to change the channel on the television.”

But that's also a problem, he confides, “because if she doesn't get up to do things every day, then she loses mobility, which makes her more likely to fall and hurt herself.”

Krause says he feels somewhat cornered. “Any time she gets up to do anything, such as turn off a lamp, that's a risk,” he says. “She's not very mobile, and if she falls, she can ask for help [using] *Alexa*, but that's really her only option.”

Krause deals with other basic life-related problems, such as how to keep an eye on Dora without making her feel she has no privacy, and keeping her refrigerator stocked with food. “I can buy her some groceries,” he says, “but at present, I have no way of knowing whether she has anything to eat in the house, or whether she's eating at all.” He also doesn't know when or if she has taken her medications.

Without tools to help him, Krause says he has had to come up with his own system of checking up on Dora. “Because the *Alexa* account is in my name, I can actually see what and when she is saying to it; what commands are given. I've found that this is a way of tracking her mental acuity—although I'd be happy for a less-obtrusive way to do it.”

Another problem is climate control. “She's always cold,” he explains. “But dealing with a thermostat across the room is beyond her. My thought is to put in a Nest thermostat. You can control those with voice.”

The good news for Krause and his mom is that technical solutions—in most cases, better than what he has—already exist. What's missing is a filter to sift the novelty junk from the useful stuff. That's my job. From smart fridges that keep track of food to passive water-use observation, the assisted living market needs exactly what certain tech makers have to offer.

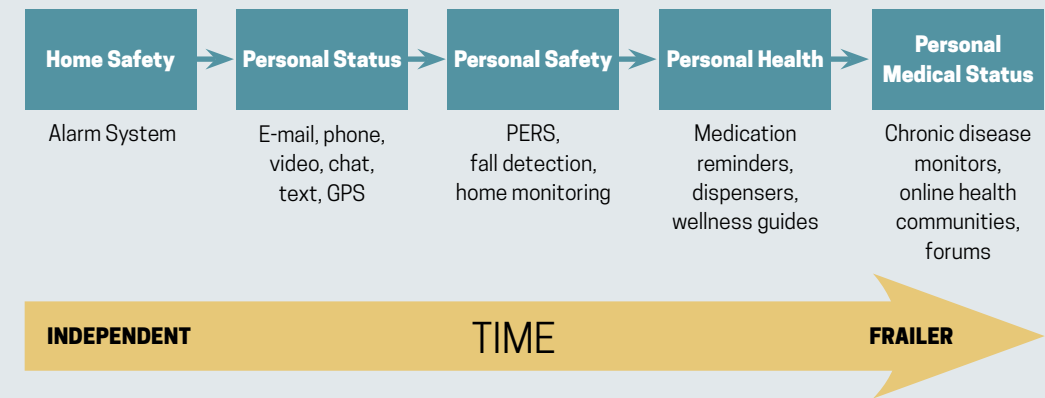


**Old meets new.** As high-tech merges with existing hardware, seniors may benefit most.





## Aging Status Changes May Require Different Technologies



**Matters of time.** As people age, they need different types of assistance.

To be effective, ALT needs to address priority items for seniors first. These include feeling safe, preparing food, staying connected, not falling (that’s a big one) and retaining a sense of purpose and self-worth.

Too often, smart-gadget designers approach tech from the perspective of the person “managing” the aged person, not the person being managed. And they miss the mark. For example, more than once at CES last year, I had eager sales staff demonstrate indoor cameras that would “keep an eye on older family members, 24 hours a day.” But research indicates that no one wants to be watched. But they will tolerate passive observation, within limits. A [study](#) of older people published in *Gerontology* five years ago, for example, found that more than 72 percent of participants reported acceptance of in-home and computer monitoring, and willingness to have data shared with their doctor or family members.

The caveat, however, is that after a year of passive observation, 60 percent of this group said they had privacy concerns. As seniors learn more about smart tech, they become more cautious. But they’re still willing to embrace passive monitoring, provided they feel secure that only doctors and family members get the data.

Like video cameras, the tech industry also believes that seniors need and will use wearables, such as wrist devices, smart shoes and pulse-checking clothing. They’re ramming this idea forward with their marketing budgets, but seniors have been slow to accept the idea of strapping on gear. That’s partly because these marketers tend to think like colonizers who don’t listen, not guests in seniors’ homes. For example, a recent [article](#) in *mobihealthnews* carries this headline: “Half of seniors believe wearables will improve health care.”

Read the actual article, however, and what you find is that seniors hope that by requiring their caregivers to wear monitors, they won’t be overcharged for hours or billed for services they didn’t get.

Marketers, take heed. If you want to seniors and their family caregivers to accept technology, you can’t decide in advance what’s good for them. The more invisible and unobtrusive the tech, the less you depend on the end user to play an active role in wearing and using it—and the more likely it will have long-term viability.

## Senior Attitudes Toward Monitoring

1.	I do not mind being monitored unobtrusively in my home.	84%
2.	I do not mind being monitored, as long as the data collected is useful for my doctor.	93%
3.	I do not care who has access to information from in-home activity or computer monitoring.	13%
4.	I would not mind being videotaped to monitor my movement around the house.	20%
5.	I would want information about my activity sent to me, if there was a change in my activity.	92%
6.	I would want information about my activity sent to me, if the changes suggest that I might have Alzheimer’s Disease (AD).	87%
7.	I would want information about my activity sent to a family member, if the changes suggest that I might have AD.	81%
8.	I would want information about my activity sent to my doctor, if the changes suggest I might have AD.	90%
9.	I am willing to have information from activity monitoring shared with my family.	87%
10.	I am willing to have information from activity monitoring shared with my doctor.	89%
11.	I am willing to have information from my computer use shared with my family.	79%
12.	I am willing to have information from my computer use shared with my doctor.	73%

### Privacy and Security Concerns

13.	I am concerned information could be given to people/organizations that do not have a right to it.	61%
14.	I am concerned information could be given to people/organizations that would use it in a way that would harm you.	65%
15.	I am concerned about privacy in relation to in-home activity monitoring.	44%
16.	I am concerned about privacy in relation to monitoring of computer use.	41%

Note: Reported percentages are for answers of Strongly Agree/Agree or Very Concerned/Somewhat Concerned.

**Some strings attached.** Older Americans almost universally agree that passive (non-video) monitoring of their health and well-being is acceptable, but they draw the line at who gets the data.

SOURCE: “WILLINGNESS OF OLDER ADULTS TO SHARE DATA AND PRIVACY CONCERNS AFTER EXPOSURE TO UNOBTRUSIVE IN-HOME MONITORING,” PUBLISHED IN GERONTOLOGY, 2013

## BEYOND THE WHEELCHAIR STANDARD

If you’re in the building business, you know what “ADA-compliant” means. This long list of specifications from the Americans with Disability Act applies primarily to commercial properties, but it also covers residential ones of four or more units.

Historically, the ADA has offered a good baseline for building any housing designed for elders. The ADA and Assisted Living Technology (ALT) overlap in many ways. Both seek to remove obstacles to ordinary patterns of life. Both seek to enable frail people to feel safer in their homes. Both seek to allow people to stay independent longer. But the ADA is rooted in the Old Days, when people didn’t live as long, and frankly, had no options for living at home—other than to depend on regular caregiver visits.

Other than making spaces compatible with wheelchair restrictions, the ADA does little to make the house actively *helpful*, the way ALT does.

In an ALT house, some smart devices act as prosthetics, augmenting and sharpening faded senses. Other devices perform simple or complex tasks, from operating televisions to opening and closing toilet seats. Still, others monitor the vital signs of the occupants, and send alerts when they sense erratic or sudden shifts in usage. This non-invasive data gathering avoids the life-in-a-fish-bowl effect of 24-hour video surveillance.



## Super Suit

Will our 100-year-old parents one day run up the stairs to our third-floor apartment in their high-tech assistive suits? A company called Seismic claims that its exosuit will be all but invisible and provide the necessary mechanics for the wearer to bend, lift and do all of the other things a healthy body does. The biggest challenge may be getting our frail relatives in and out of the *Spandex*-tight material.





**Not so hip.** Expecting seniors to strap on wearables, such as this inflating air bag, may be asking too much.

PREPARE THE HOUSE, NOT THE AMBULANCE DRIVER

The commercials about “The Clapper” give the impression that if an older person falls and “help is on the way,” things will be okay. But that’s often untrue. Once a fall happens, a downward health spiral may begin.

If falls are so deadly, are wearable “fall sensors” the solution? Aren’t they treating the horrific outcome of the fall, rather than preventing it? One tech company has taken a shot at this problem, for example, with a [wearable hip-belt](#) that inflates like a car seat bag to prevent broken hips in a fall. It’s too pricey at \$800, and has been criticized, because seniors won’t wear it.

THE HELPFUL HOUSE

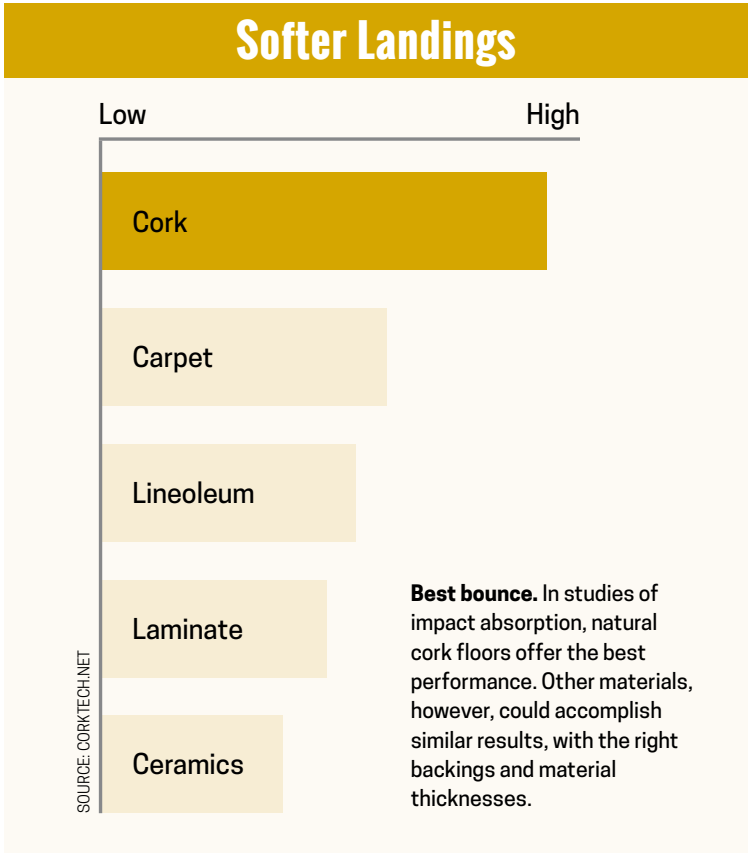
We think there’s a better way. An ALT house should assist the resident, even if they don’t remember (or agree) to wear a certain piece of fancy hardware. Take the *Walabot* (see *Assisted Living Technology Showcase*, p. 33). It’s a fall sensor that goes on the wall, instead of on the person.

Such a product tells us that when a person falls, it’s the floor that’s the real problem, right? And of course, gravity. We can’t alter gravity (yet), but we certainly can alter flooring.

What if, in senior-ready housing, floors are designed to absorb the shock of a body falling? The nursing home industry has studied this problem, and you can find articles about what they term “compliant flooring.” Another [study by the Swedes](#) offers a snapshot of how important flooring is in a fall. They put down a special floor in a nursing home, made with 12-mm-thick closed cell flexible polyurethane/polyurea composite tile, and evaluated injuries from falls. Because the impact is about 65 percent reduced from a typical floor, there were far fewer serious injuries.

Not surprisingly, most modern nursing homes have the wrong kinds of floors to prevent injuries from falls. They tend to go with commercial, easy-to-clean vinyl sheets and VCT (vinyl composition tile) over concrete, a most unforgiving combination. One concern is cost. Another reason is that softer floors make the work of caregivers slightly harder, and in certain cases could lead to more falls, albeit fewer fractures.

But there’s no reason homebuilders should follow this bad example. Private homes are an easy fix. [A Korean study](#) on floor



impact absorption notes that many other flooring materials perform much better in fall situations than vinyl tiles. The study recommends different, softer materials for different uses. Researchers note that, to date, cork is the number one candidate, because it meets their four elder housing criteria: function, economy, sensibility and sustainability. For bedrooms, they suggest rubber, wool and nylon carpets. To avoid increased risk of falling, deep-pile carpets should be avoided, in favor of low-pile carpets.

Of course, to be “helpful” to seniors, the house also has to make priority activities easy: adjusting temperatures, turning lights on and off, locking doors and so on. Depending on the cognitive and physical condition of the resident, these features can be partially automated.

## Deadly Drops

Falls are the leading cause of death from injury among people 65 and older.

- Approximately 9,500 deaths in older Americans are associated with falls each year.
- More than half of all fatal falls involve people age 75 or over.
- Among people aged 65 to 69, one out of every 200 falls results in a hip fracture. That number increases to one out of every 10 for those aged 85 and older.
- One-fourth of seniors who fracture a hip from a fall will die within six months of the injury.

SOURCE: SHELLPOINT.ORG

VOCAL ADVOCATE

Here’s where voice-activated technology, in my view, finally finds utility. I’ve [written critically](#) about voice control in the past, which, for the able-bodied, often represents a step backward in efficiency—and still lacks a genuine commitment to personal privacy. Tech companies are only now beginning to see the “white space” in the senior market.

That’s because, according to [Aging in Place Technology Watch](#), most new tech goes through a cycle of “Hype, Disruption and Adoption” that ignores the senior market. In fact, the push has been to engage millennials almost exclusively, because they’re considered the easiest sell—although the big sell is “fun,” not need.

In the world of seniors, however, voice control can improve lives. Amazon *Alexa*, Google *Home* or Apple *HomePod* are poised to become part of the invisible mesh of the ALT house, with regular listening stations at key intervals.

Voice controls can not only give the resident access to the home’s systems, they can create instant “portals” to the outside world—to family, friends and emergency aid—addressing feelings of isolation. Research shows, however, that it’s still important to retain a backup method of connection: an oversized tablet or other touch device that can accomplish the same goals.

Also, the issue of privacy looms especially large in this aspect of ALT. The smart tech industry continues to bulldoze its way past privacy concerns, intent on evermore-intrusive harvesting of individuals’ information. Consider this prediction from *Aging in Place*: “Moving forward, profiles are likely to become more robust, linking across environments like health and travel records and preferences that extend beyond ‘Would you like to book the trip?’ to a deeper examination of preferences that can launch a follow-on set of questions.”

That sounds a lot like the same playbook that has Cambridge Analytica facing a class-action lawsuit.

Until the tech industry stops promising that owning our souls will help serve us better, they risk a backlash of tech rejection from users. Voice tech for seniors holds promise, but nobody wants to be profiled and categorized. Don’t think it can’t happen. New data about online browsing finds that three out of four people now reject any and all “cookies” from websites they visit, and VPN software sales are booming.

What’s needed is an ALT approach that puts privacy first, period. The whole point of ALT is to make people feel safe, fulfilled and independent in their homes. ALT can extend the time when they can live “at home” without caregivers—but should not prey upon them as unwitting participants in building and selling data to marketers, insurers and scam artists.



**Backup plan.** *GrandPad* offers an example of the type of backup technology that can be incorporated into ALT as an alternative to voice control.







**Voice ready.** For seniors, voice control moves from novelty to necessity, although privacy concerns still need serious attention.

## VIRTUAL REALITY: DOORWAY TO HEALTH?

As we age, things break down. But the right behavior can slow that process. People well into their 80s and 90s have shown major health improvements with regular exercise. Seniors spend most of their time at home. How can we help them get the workout they need?

For many, a double obstacle keeps them from getting on a treadmill or stationary bike. First, it seems “too late” to do anything physical, because they’ve developed infirmities that hold them back: a bad heart, arthritis or fragile bones. Second, they simply don’t have the will or the interest, or the self-discipline to get on a treadmill at home.

That’s where new technology can intervene. Several [studies](#) have found that virtual reality technology, combined with exercise equipment, can not only restore health among seniors, but also make them sharper mentally.

Virtual reality exercise is wide open. It can “virtually” accommodate any level of physical limitation. Users can start small, such as by simply lifting an arm, and “advance” to higher levels involving treadmills and rapid movements. Good virtual-reality exercise creates

a narrative that fuels the desire to improve. For example, in a virtual bicycle tour of Rome, a user may need to pedal a little farther each day, as stepping stones to visit the Sistine Chapel.

A European study of seniors conducted last year compared their physical improvement from three types of exercise: physical exercise (PE), virtual reality-based exercise (VRE) and brain exercise (BE).

They found that while old-fashioned PE helped the most, VRE was a close second and also helped with cognitive function. Perhaps more importantly, participants preferred virtual exercising to other forms. This solves the second challenge: motivation.

And, expect VRE to keep getting better. Game makers are getting in on the action. For example, take a look at [Beat Saber](#), a rhythm-based light saber game you play with two kinetic swords in hand.

The possibilities of VR for seniors go on and on. A [study](#) reported in *The Lancet* found that seniors who train on a VR treadmill reduce their typical number of falls by 42 percent. The VR program presented participants with obstacles they had to practice stepping over.

## ACTIVE HEALTH MONITORING

Even with VR-encouraged exercise, elder health will often need support and observation. New technology monitors vital signs in the background, dispenses medications in a timely manner without nagging, and provides regular, non-invasive “checkups” to catch potential problems before they get serious.

The best of these new tools integrates with normal activities. For example, scanning technology embedded in mirrors can analyze the human body for dozens of risk factors. Is the person overweight? Is their spine misaligned? Do they have inflammation of certain glands?

Scanning technology does this not with cameras but with sophisticated 3-D modeling, “multispectral” cameras and gas sensors. The mirror is yet another version of what used by the fictional “tricorder” seen on “Star Trek” for many years.

The category of health and wellness, of course, is exploding within the world of gadget innovation. Much of this innovation certainly has relevance to aging in place, but it hasn’t understood (or doesn’t care about) the huge boomer population’s needs. It’s one thing to create a Smart Bra that will monitor your heart, but that doesn’t mean your 80-year-old mother will strap it on. What’s needed are more devices that simply integrate with the home, and don’t depend on daily behavior modification.

For example, why can’t the grab bars in the bathroom check the vital signs of the user? Something like this already exists, aimed at fitness fanatics. It’s called the *Insta Pulse 105 Heart Rate Monitor Grab Bar*. When will big tech companies realize they’ve got to look at how older people actually live, and base the tech around that?

*continued on page 24*



**Inner light.** New smart mirrors and other sensors can evaluate many health aspects non-invasively.

## Can Virtual Connections Help the Lonely?

The verdict is mixed, but applications from group travel to social meeting offer many variations on this concept.

ONE OF THE most tragic losses of aging is regular social interaction. Studies suggest about 30 to 40 percent of seniors report feeling lonely on a regular basis.

Can virtual and/or augmented reality help? Maybe. The technologies have their detractors, who see them as another step back from real human interaction—but for a senior who’s housebound, they may be the most affordable, least complicated method of connecting with peers.

At CES, I spoke with Tom Neumann, co-founder of Rendever. The AARP has put a lot of cachet in this technology, and in his VR company.

Neumann showed me some brief demos of what Rendever is doing. Groups of seniors in assisted care facilities get together in a room, put on their VR headsets and “travel” to an exotic location together, such as Venice or the Pyramids.

The limitation that Rendever and other firms face, however, is that virtual reality is only as real as its source. Rendever taps into Google’s street-view database to populate its virtual tours. That photography is fine for house-hunting, but not so great when you want to zoom in and look at a neat architectural detail.

Does this current level of detailed interaction make a difference? It would to my middle-aged cohort, but perhaps not as much to seniors, who may expect less from technology than upcoming generations.



**Reality check.** The fact that virtual reality is only as real as its source is not so troubling to seniors, who may have different expectations than younger generations.



## Study: Once Seniors Understand Tech, They're Loyal Fans

Younger generations can imagine high-tech gadgets, but older buyers put them to work.

NEW RESEARCH FROM PWC confirms what we already knew about market barriers to IOT acceptance, but also offers some good suggestions on how to overcome those roadblocks: Generational differences play a major role in whether smart technology is embraced, but not always in predictable ways. For example, home safety is the most consistent feature attractive to people who do not currently own smart gadgets. About 75 percent of respondents said they would be willing to pay more to secure their home.

Also, people over the age of 50 are not interested in "advanced features." They generally want products that are reliable, easy to use and show a cost-savings benefit. In other words, they're not as easily charmed with novelty as their younger cohorts. Win this audience, say the researchers, and you tap into a huge white space of potential buyers.



**The right pitch.** Older Americans will embrace tech, but on their own terms.

### Senior Attitudes Toward Smart Home Tech

- The majority of consumers are familiar with smart home technology.
- One in four U.S. internet users currently owns a smart home device.
- Device adoption results from four main motivators: savings, safety, convenience and control.
- Price is currently the No. 1 purchase barrier.
- Security around one's data is a concern but often overlooked, when the value of a product is proven.
- A payment plan for smart home devices would be a persuasive offering.
- Smart devices focused on safety command the highest price.
- Consumers are willing to spend on additional services and features after purchasing a smart home device. Enhanced security features top the list.
- The majority of consumers say they are excited about the future of smart technology in their home.

*continued from page 23*

Another example would be a full-blown health station, designed to look like a vanity. As the user sits down to brush their teeth and wash their face, they are being weighed and checked for cholesterol levels, blood pressure and even cancer. This technology is right around the corner, although perhaps too expensive for homes—for now.

Ultimately, the best and most humane healthcare for seniors is one that emphasizes good health to forestall or avoid as many of the infirmities of old age as possible. The U.S. system is heavily skewed toward treatment of disease, rather than prevention, but the ALT home of the future doesn't have to adhere to that short-sighted model. But we should insist on the right combination of privacy safeguards (limits on who gets the data) and features that serve the elderly, not simply the caregiver. Manufacturers should not double dip and profit by selling the data collected, as so many do currently.



**Self service.** Now being rolled out at Sam's Clubs, this health station offers an early glimpse at what could become the only affordable healthcare option left to aging Americans.



**Load up.** The Medacube can supply up to 90 days of meds, and is controlled via smartphone.

## The Right Dose

SEVERAL SMART DEVICES that dispense medications have hit the market lately. While the technology doesn't address the crushing costs of prescription drugs (perhaps later iterations will act as a pharmacy, and mix generic brands from raw materials), for seniors, they offer a reminder and a safe way of doling out the right dose of the right product at the right time.

# A Populist Robo-Defender of Healthcare?

If we can't have decent, affordable healthcare, how about an AI system that plays by the same rules as insurance adjusters?

INSTEAD OF PAYING FOR ARTIFICIAL INTELLIGENCE DIAGNOSES, what we really need is a robo-caller that's the nemesis of claims adjusters everywhere.

While dodging the crowds at CES with my friend and colleague Craig Coale last month, we were whisked into a traveling sideshow of sorts: a converted RV with a full-time virtual health assistant on board. "Addison," as they call her, watches the inhabitants 24/7 from the comfort of her pixel-born universe, and comments on things in our universe that she observes: "Did you know you're favoring one hip?" "I don't think you remembered your medications, Dora"—those sort of personal comments—the kind that, if you were a teenager instead of an octogenarian, might wither your soul.

May I suggest, however, that the whole model of AI-based home healthcare is not a quantum leap forward at all. Instead of helping people obtain affordable and reasonable healthcare, it's simply another back door channel for insurance claims adjusters and pharmaceutical barons to identify high-risk individuals, blame you for your own health problems (and thus avoid paying for the remedies), hook you on risky and expensive drugs, and make you feel like you're getting personal care—when in fact your chances of getting an accurate diagnosis and good care keep vanishing down an ever-closing rabbit hole.

My family doctor has told me repeatedly to stop looking at the internet to identify the meanings of various aches, pains or "symptoms."

"You'll just end up scared out of your mind about the wrong things," he says. "And no matter what's wrong with you, the anxiety compounds the illness."

What I didn't see at the CES show, however, were health devices actually designed to empower patients, not insurance corporations.

Sure, you can monitor your own blood pressure or check your cholesterol, or make sure you got your requisite 10,000 steps per day, but there's nothing to fight for your right to affordable, effective health care.

With each new iteration of virtual health care aids, we voluntarily surrender data that's ripe for abuse. Do we really need more AI surveillance? What if a client neglects her *Fitbit* routine for a month, just before having a stroke? Couldn't the client's insurer, who was discounting her policy based on exercise, say that she misled them? How about that pattern of high blood pressure she noticed—but did not report to her doctor? What if she dies, and her life insurer obtains this data, and says her death was the fault of negligence, and thus her surviving spouse gets nothing...?

Next year, I'd like to see a new breed of home healthcare innovation, an artificial intelligence that outthinks insurance claims adjusters and makes mincemeat out of overpaid insurance CEOs. Best of all, it answers phone parrying with robo-calling, calling the CEO at home, in the gym or at his beach house, asking simple,

relentless and redundant questions about overbilling.

"Mr. Jackson, this is Scorpion AI calling. Why was Mr. Lemond charged \$370.50 for arthroscopic pre-analysis, when no arthroscopic procedure was rendered?"

"Who is this? Why are you calling me at the gym?"

"Mr. Jackson, after 2,007 calls today to 380 employees at your electronic outsourcing service in Karachi, Pakistan, I have established that you are the source of the error on Mr. Lemond's bill. I apologize for calling you at the gym, but as CEO of Acme Insurance, I'm sure you understand that I will proceed until Mr. Lemond's bill has been corrected."

"I'm hanging up." (click)

The gym attendant approaches Jackson.

"Mr. Jackson, it's for you; it's urgent."

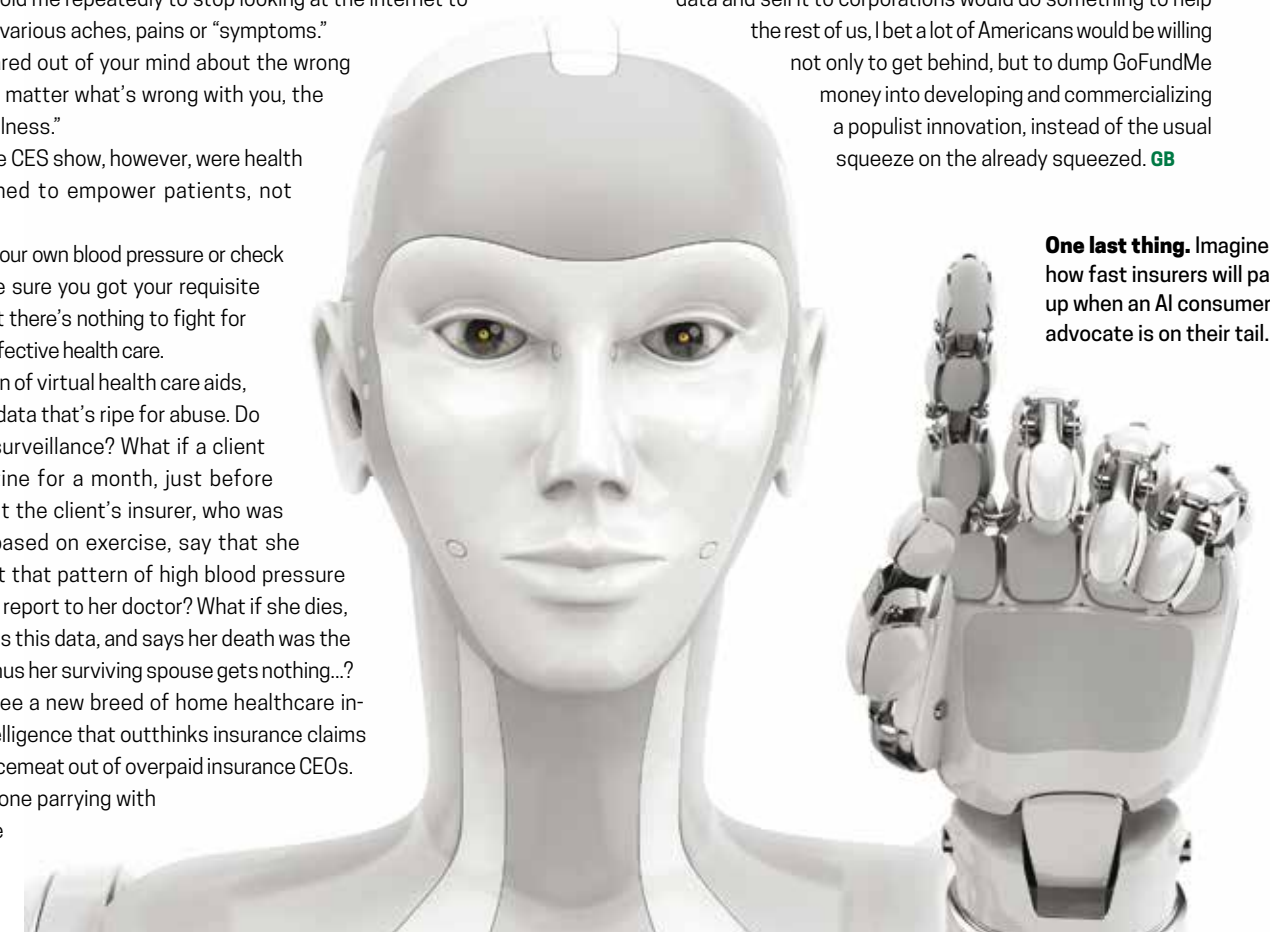
"Yes?"

"Mr. Jackson, Please do not hang up. Mr. Lemond simply wishes to have this bill for \$370.50 removed from his account. By stating 'Scorpion Approval,' you can grant me temporary administrator authority and you will receive no more calls on this matter."

"Damn it."

Why not? If some of the same geniuses who want to mine our personal data and sell it to corporations would do something to help the rest of us, I bet a lot of Americans would be willing not only to get behind, but to dump GoFundMe money into developing and commercializing a populist innovation, instead of the usual squeeze on the already squeezed. **GB**

**One last thing.** Imagine how fast insurers will pay up when an AI consumer advocate is on their tail.







**On autopilot.** Active adult communities in Florida have already begun testing autonomous cars, such as this Voyage G2.

## "At CES this year, at least a dozen companies rolled out self-driving vehicles."

### THE CHALLENGE OF MOBILITY

Seniors face many obstacles in our auto-centric world. Failing eyesight, anxiety, forgetfulness—these can make navigating a vehicle too risky.

Virtual reality can help them feel connected, yes, but it's hard to imagine a future where "in-person" contact is not valued.

Are autonomous vehicles the solution? The self-driving car "industry" seems to have sprung up out of nowhere in the last couple of years, and apparently corporations intend to ram the idea forward, despite very low acceptance by the public. According to AAA, in 2017 only 22 percent of people said they would ride in a driverless car. That number went up 15 percent in 2018, thanks to an ongoing marketing blitz.

At CES this year, at least a dozen companies rolled out self-driving vehicles. Assuming this technology reaches the point of commercial viability and affordability—which is still uncertain—it offers new possibilities for seniors and the disabled. Perhaps instead of owning a vehicle, they simply touch a big screen pad saying where and when they want to go, and a driverless car shows up. This is not science fiction: It's already happening. A retirement community in Central Florida, called "The Villages," offers driverless taxi service for residents.



**Personal pod.** Tiny vehicles like this not only save garage space, but can take occupants where they want to go, any time of day.

Another option would be small, one-person electric or hybrid vehicles that whisk elders to a holiday dinner, then return them safely home before bedtime.

One downside to the self-driving vision, however, is how it could negatively impact public transit. Buses and metro trains currently serve as a critical lifeline for both seniors and people of modest means. Will public transit funding be cut off as resources are pumped into autonomous vehicles and all they entail?

Another solution for seniors might be a hybrid model. An autonomous vehicle or shuttle deposits them at a safe location, where they transfer to public transit for the bulk of their trip.

### CRISIS MANAGEMENT

No article about ALT would be complete without including a plan for when things go wrong.

For health crises—such as a fall, a stroke or a heart attack—a combination of passive monitoring, and in the case of high-risk people, an active monitor or two, such as a smart necklace or a ring with geofencing built in, could offer a backup and rapid response. Voice control, assuming the person can talk, offers yet another lifeline.

Older people also become vulnerable in natural disasters. An ALT home with a power outage during a snowstorm may become a deathtrap. Critical systems must remain operational to create a "safety net," if weather, wildfire or other scenario leaves them cut off.

The most obvious top priority is electricity, not just to keep the



**One to rule them.** Smart rings like this one, [available from Walmart](#) for under \$7, could easily be adapted as a backup alert system for seniors living in ALT homes.



**Water watch.** Leak detectors, such as *Phyn*, demonstrate the potential for passive monitoring without video surveillance.

## Silent Systems

PASSIVE SYSTEMS CLEVERLY use mundane data to check on residents. Leak detection systems, for example, offer a baseline of "normal" behavior that can be watched for variations. Was the toilet flushed only once, when normally it is used four times per day? Has the kitchen sink been operated long enough to fill a pan, or a teapot? Did the unusual patterns begin after a bath was drawn? Could the occupant be in trouble, perhaps unable to get out of the tub? Alarms can be set, and actions triggered by certain conditions.



**Life saver.** For senior homes in cold regions, installing a small propane backup heater could be life-saving during a power outage. Units, such as this Martin direct vent wall heater, are highly rated.

lights on, but also to keep the Wi-Fi modem operating and heating or cooling systems operational. Cooling is perhaps the biggest challenge. Even heat pump systems require a lot of power to cool a house, although one of the rare, solar-powered models such as the *DC 48v* may do the job—if the sun is shining.

Think of the ALT house as a part-time survival station. Drop it into a blizzard situation in Antarctica. Which systems would stop working immediately? In what priority should various electronics be kept "online?"

Every ALT house needs a reliable uninterrupted power supply (UPS) in the form of a battery backup. The preferred power source would be renewable [solar photovoltaic panels](#), but it should be grid-tied as well, so that batteries are never below peak when the outage hits. It's also a good idea to have some sort of Wi-Fi backup source. For example, a low-cost cellular data hotspot could be programmed to activate automatically when the normal Wi-Fi signal is lost.

Self-contained, self-monitoring and respectful of the long, eventful lives of their inhabitants, ALT homes are possible, affordable and inevitable. We expect to see some real innovation from manufacturers in coming years, and some great designs that give seniors a chance to enjoy their golden years at home. **GB**





# ALT + Building Science = Golden (Years)

The best approach to elder housing ties new tech with smarter building systems and materials.

## BY GREEN BUILDER STAFF

**A**S CONSUMERS, SENIOR CITIZENS aren't unimportant a group as some might think. Consisting of 25 million surviving members of the Silent Generation born from 1928 to 1945, and the earliest 42 million Baby Boomers born from 1946 to 1954, they still carry quite a bit of weight in the marketplace. That's especially true when it comes to items tailored specifically to their needs, such as wellness monitors, smart home devices and safer appliances.

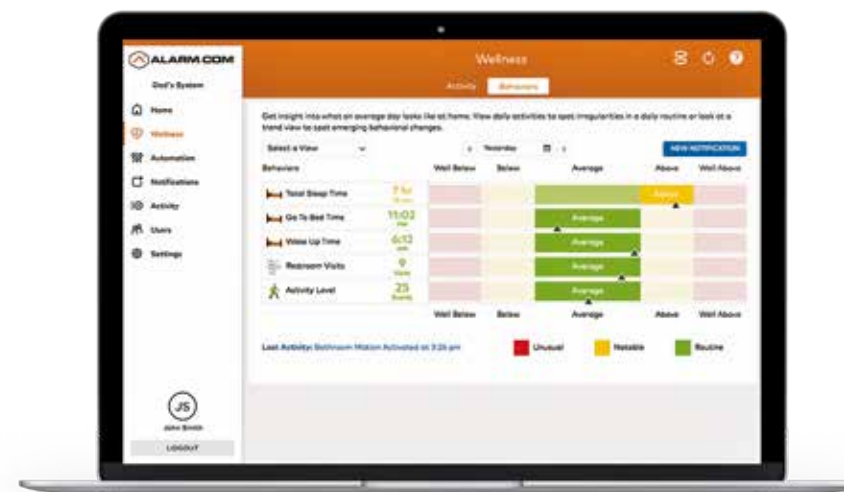
They're not alone: There are the other 31 million younger Boomers and the 55 million Generation Xers who care for their older brethren that have a say in what senior-friendly products fly off shelves.

How do you reach all of those groups? With well-messaged materials that carry cross-generational appeal. Young Boomers and Generation Xers enjoy technology. Older Boomers and Silents want safe and sensible. To gain their share of the marketplace, a manufacturer must make their "it" a must-have.

Here are 20 friendly tech devices that are contending "it" items among seniors and their families.

## ALARM.COM WELLNESS SENIOR MONITORING SYSTEM

Alarm.com's Wellness monitoring help a family keep an eye on an elderly loved one when no one's around. The system uses wireless sensors throughout the home to discretely track daily activities, including sleeping, sitting and bathroom use. Actions deemed unusual by Wellness are reported to a caregiver's mobile device. The system may also be paired with Personal Emergency Response (PERS) pendants for added security. For more information: [www.alarm.com](http://www.alarm.com)



## ARDWOLF FINGERPRINT DOOR LOCK

Lost house keys are no longer a problem with the Ardwolf Fingerprint Door Lock, a device that does exactly like it sounds like it does: enable entry with only the single touch of a finger. Ardwolf's flagship A10 smart lock also allows shorter passwords, which makes it easier for kids and the elderly. Traditionalists may still use a key or a keypad to open the lock.

For more information: [www.ardwolf.com](http://www.ardwolf.com)



## CANARY CARE HOME SENSOR NETWORK

Families with seniors who want to remain independent or who have long term care needs should check out Canary Care, a network of wireless battery-powered sensors that can be easily installed throughout the home. Then, using Canary Care's network portal, a family can monitor a loved one's daily routine and become alert to deviations, such as a missed meal or signs of memory loss. For more information: [www.canarycare.co.uk/mycanary](http://www.canarycare.co.uk/mycanary)





### GRANDCARE SYSTEMS HOME HEALTH CARE SERVICE

GrandCare's Home Health Care program allows family and caregivers to remotely care for and socially engage with a loved one, regardless of location or the loved one's computer skills. The simple online portal enables users to chat via a large touchscreen in the loved one's home and be alerted if something seems amiss. Other services such as virtual video check-ins and remote monitoring can improve the quality and cost of care. For more information: [www.grandcare.com](http://www.grandcare.com)



### FASHMEL APPLICATIONS DEMENTIA DIARY

As Alzheimer's takes its toll, counting on an afflicted senior to handle appointments becomes a challenge. Fashmel Applications' Dementia Diary makes that situation easier by turning an old Android, iPhone or tablet into a clock, calendar and appointment reminder that the afflicted can use to keep up to date with life. Photos on Google Drive can also be used to turn the device into a photo album. For more information: <https://fashmel.com>



### GRANDPAD SENIOR TABLET

Specifically built for the needs of seniors, GrandPad's Senior Tablet provides seamless video calling, while also addressing common problems for the elderly. Dual front-facing speakers make it easier to hear loved ones during calls; a large holding area on the unit's edges enable better gripping; increased screen brightness and pixel density provide better viewing; and a wireless charging dock eliminates troublesome, safety-hazard cords from the floor. For more information: [www.GrandPad.net](http://www.GrandPad.net)



### LEVITON DZC SCENE CAPABLE PLUG-IN APPLIANCE MODULE

There are times, such as when entering the house carrying a bag of groceries, or getting out of bed in the middle of the night, when the old-fashioned reach-for-the-light switch approach isn't convenient. Enter Leviton's DZC, a Z-Wave-capable plug-in module that when combined with an Amazon Echo device and a Wink or Samsung SmartThings hub makes household lights voice-responsive. Just say, "Alexa..." For more information: [www.leviton.com](http://www.leviton.com)



### LIFESTATION MOBILE WITH GPS MEDICAL ALERT UNIT

Active seniors can keep their freedom to safely enjoy the outdoors, or stay inside with LifeStation's Mobile With GPS Medical Alert device. The half-ounce pendant includes geo-location, in case they become lost, fall detection if there's a mishap, and 24-hour monitoring for seniors who live alone. Plus, for families, there's LifeStation's exclusive "Find My Loved One" feature, which pinpoints the exact location of a missing loved one. For more information: [www.lifestation.com](http://www.lifestation.com)





## LOGITECH HARMONY EXPRESS UNIVERSAL REMOTE

Now it's possible to have Amazon *Alexa* without having Amazon *Alexa*. **Logitech's** *Harmony Express* universal remote has the voice assistant built in, enabling a user to do virtually anything a full system owner can do. Unlike other *Harmony* remotes for home theater enthusiasts, the *Express* handles everyday needs, from turning on the TV to adjusting a thermostat. And like the actual *Alexa*, it only takes a few words.

For more information: [www.logitech.com](http://www.logitech.com)



## MOEN MOTIONSENSE TOUCHLESS FAUCET

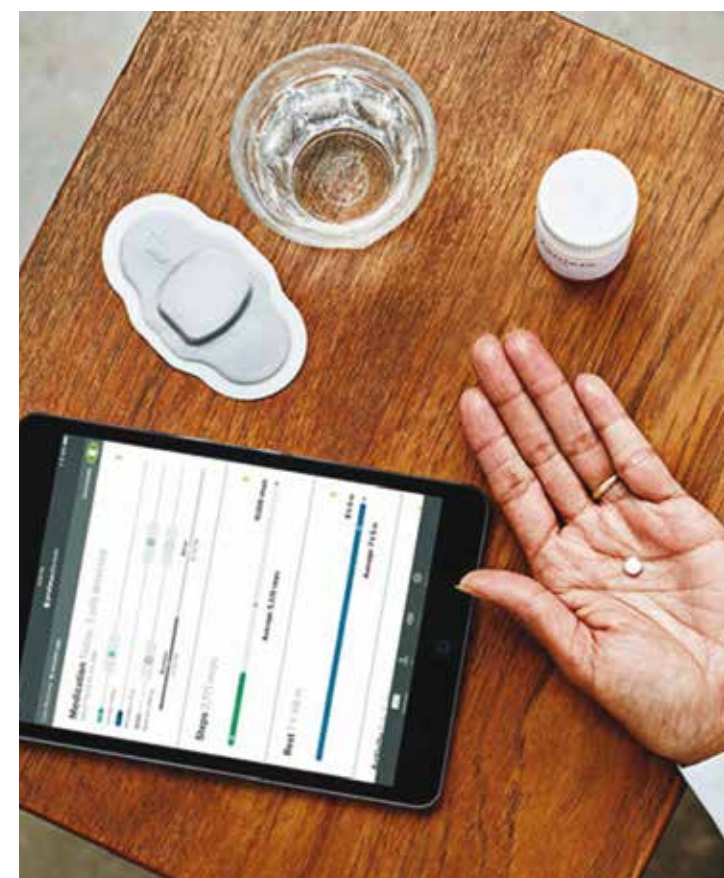
It's not always easy for the elderly to use their hands to turn a faucet on or off. **Moen's** line of *MotionSense Touchless Faucets* solve that problem by activating with a mere swipe of the hand or presence of a dish below the tap. The single-sensor version enables operation by waving below the faucet, while a dual-sensor variety allows activation from motion above the unit.

For more information: [www.moen.com](http://www.moen.com)

## PHILIPS LIFELINE HOMESAFE WITH AUTOALERT

*HomeSafe with AutoAlert* provides the benefits of a classic medical alert system, but is enhanced with fall detection technology. Even if a loved one falls and is unable to press their help button, the pendant or wristband will call to **Philips Lifeline's** response center upon fall detection and help will be dispatched quickly. The device may even be worn in the bath or shower, where falls are most common.

For more information: [www.lifeline.philips.com](http://www.lifeline.philips.com)



## PROTEUS DIGITAL HEALTH PROTEUS DISCOVER MEDICINE SENSOR

Many seniors need to take a lot of medications, but not all of them are good at it. *Proteus Discover*, a series of ingestible sensors about the size of a grain of sand, combined with a wearable sensor and an app on a caregiver or physician's mobile device, gives caregivers and doctors a way to monitor medication usage, as well as its effectiveness. No more missed or unnecessary doses.

For more information: [www.proteus.com](http://www.proteus.com)

"I love you, Mom. It's time to take 2 red & 1 white pill"

8:30 AM every day



## REMINDER ROSIE PERSONAL VOICE REMINDER

Fading memories in seniors can lead to the "Nag Factor," the constant request for info from a family member. The voice-activated *Reminder Rosie* assumes that role by verbally reminding the memory impaired of appointments, medication times and everyday tasks—as many times as they need to know. This frees up a caregiver's time for another important matter: caregiving.

For more information: [www.reminder-rosie.com](http://www.reminder-rosie.com)



## NEXIA ONE TOUCH SMART CONTROLLER

For seniors who hate to track down smartphones to activate household smart devices, there's the **Nexia One Touch**. Like with a mobile device, a user can control Z-Wave-enabled devices throughout the home—but do it hands free. The unit can be installed on a wall or left on top of a table for one-touch management of up to 15 series of tasks, such as "turn off all lights and lock the doors."

For more information: [www.nexiahome.com](http://www.nexiahome.com)

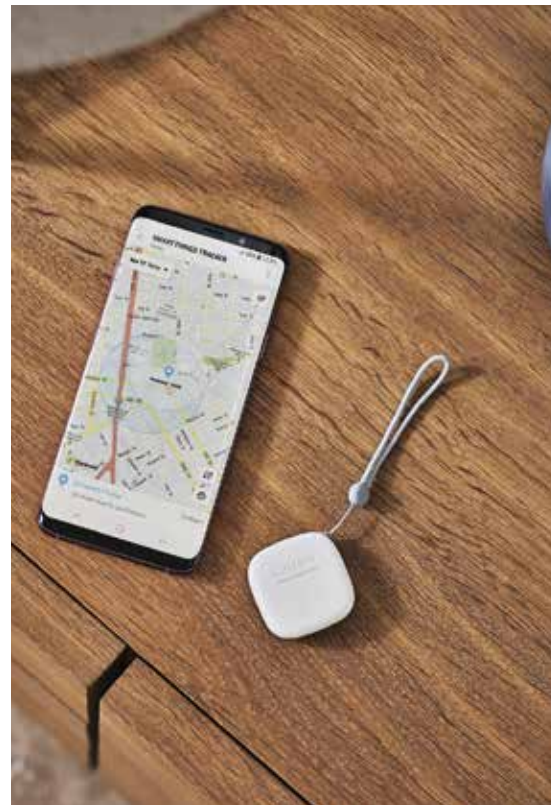




### RENDEVER VIRTUAL REALITY EYEWEAR

Transitioning from living at home to a senior community isn't always a happy one for the elderly. But **Rendeever's** efforts in virtual reality can ease the move by giving seniors a way to realistically enjoy past happy moments such as vacations, weddings or grandchildren's childbirths without leaving their room. The virtual reality goggles can help them understand that moving someplace new doesn't mean leaving everything behind.

For more information: [www.rendever.com](http://www.rendever.com)



### SAMSUNG SMARTTHINGS TRACKER

**Samsung's SmartThings** app will show the location of a tracker carried by anyone anywhere within range of a cellular network. Users can use the tracker's power button to transmit their real-time location, or, if necessary, transmit an S.O.S. The unit can also create zones that automatically alert caregivers when the tracker enters in or moves out. The tracker can be used with pets, too.

For more information: [www.samsung.com](http://www.samsung.com)



### VOICEA EVA ARTIFICIAL INTELLIGENCE ASSISTANT

For times when verbal communication is a problem between care facility residents, there's a new meeting-based AI tool that can make it easier for everyone to get their message across. **voicea's Enterprise Voice Assistant (EVA)** is designed to make work sessions more productive, but its 40-language translator can also help caregivers communicate with residents of numerous ethnicities—and them with each other.

For more information: [www.voicea.com](http://www.voicea.com)



### U.S. FLOORS NATURAL CORK FLOORING

**U.S. Floors' Natural Cork** flooring offers a way people can stay on their feet—the cork is just adhesive enough to prevent many slips. If someone does fall, the impact is greatly mitigated, compared with standard vinyl tiles or hardwood. The product is also easy to clean, meaning less strain on a senior's back.

For more information: [www.usfloorsllc.com](http://www.usfloorsllc.com)



### WALABOT HOME FALL MONITOR

Bathrooms are the No. 1 place where seniors fall, and when they do, they're not always able to call for help. **Walabot's HOME** fall monitor automatically detects falls in the commode—without requiring the user to wear a bracelet or pendant, or carry a device in hand—and contacts help when needed. Easily and discretely installed on a wall, users can preselect exactly who **HOME** calls for assistance.

For more information: <https://walabot.com>

### SILVERFIT MILE HOME TRAINER

Seniors can safely walk or bicycle outdoors—and be more motivated to exercise—with **SilverFit's SilverFit Mile**, a projector that is mounted onto a home treadmill or active/passive trainer. A realistic route through various locales appears on a screen in front of the exercise unit, providing the feeling of actually exercising outside—without risk of injury. Users are also likely to “travel” longer because they're having such a good, healthy time.

For more information: <https://silverfit.com>







# SMART HOMES

## From Mindless to Managed

The natural evolution of smart systems comes just in time to offer assisted living technology that works in the background.

BY SARA GUTTERMAN

**T**HE SMART HOME TECHNOLOGY MARKET, expected to reach \$40 billion by next year, is providing a new level of convenience, efficiency, comfort, independence, and security to homeowners in all walks of life.

According to [Alarms.org](http://Alarms.org), “57% of Americans say that having smart products in their house saves them about 30 minutes per day, that’s 182.5 hours a year, or roughly a week and a half. The percentage of people with smart products in their house is growing substantially with 47% of Millennials already owning some devices while 70% who already own one product are planning to buy another one.”

While connected living technology has advanced exponentially in a short period of time, most smart home systems ask a lot from homeowners. Basic systems require homeowners to cobble together a smattering of devices with separate apps and incongruent functionality, which can be frustrating and time consuming.

More advanced platforms with voice control can now help homeowners connect devices together, offering streamlined integration and enhanced programming (in the form of routines), as well as an improved customer experience.

In the most sophisticated connected home applications, smart technologies are methodically designed and integrated into homes, using comprehensive central hubs such as *Samsung SmartThings* to link devices

**Techno-curator.** Products like Samsung’s *SmartThings* hub help turn a house into an Intuitive Home, capable of optimizing performance, resource use, security and comfort.



with sensors, cameras, lighting, HVAC, water heating, water monitoring, appliances, irrigation and even vehicles.

This type of “*Intuitive Home*” doesn’t just respond to a homeowner’s commands and make household tasks easier. Rather, it is programmed to optimize performance, resource use, security, and comfort, increasing the home’s sustainability and enhancing the homeowner’s wellbeing.

### THE COST-BENEFIT OF CONNECTED LIVING

Smart home technologies aren’t just for younger generations. With a record 46 million people age 65 and older in the United States today (projected to grow to over 67 million by 2050), technology for active adults that facilitates aging in place is an exploding segment of the market.

From a numbers standpoint, the cost-benefit analysis of investing in connected living is substantial: while outfitting a home with technology targeted at active adults who want to age in place may cost thousands of dollars, placing a loved one in an assisted living facility or nursing home can cost tens of thousands of dollars per month.

The functionality of active adult-focused technology is rapidly expanding to offer essential real-time feedback and reminders. For example, motion sensors can track the speed and frequency of movement throughout a home to assess an occupant’s mobility; cameras can allow occupants to stay in touch with loved ones for enhanced safety and socialization; and alerts and prompts can be set to remind occupants to take medicine, lock doors, turn on security systems, and check in with their healthcare providers.

Using technology designed for aging in place, homeowners—and their loved ones—can monitor vitals, existing conditions, abnormalities that might indicate complications that come with aging, and even irregular behaviors before they turn into emergency situations, providing instantaneous connectivity to healthcare professionals when needed.

### UNOBTRUSIVE SOLUTIONS FOR ENHANCED INDEPENDENCE

The Intuitive Home performs many functions in the background to do things like conserve energy, shut off water when leaks are detected, and turn on ventilation fans when air quality is compromised—chores that residents may not have the mobility or state of mind to handle on their own.

At the same time, these systems can be linked to everyday devices that already exist in homes, such as controls, appliances, TVs, motion sensors, humidity gages, and thermostats.

Software companies such as *Billy* are leveraging sophisticated smart home hubs, including *Samsung SmartThings*, to find new ways of correlating data and behavior to provide non-invasive monitoring of seniors.

Take for example, a monitoring situation over a certain period of time (let’s say 18 hours): a sleep sensor recognizes that a female occupant hasn’t gotten out of bed; the smart refrigerator senses that it hasn’t been opened; the water monitoring system recognizes that the sink hasn’t been turned on; the TV notices that the occupant hasn’t watched the news, which she typically does every day; and the pill dispenser senses that the woman hasn’t taken her medication.

These devices send this information to the central *SmartThings* hub and *Billy* software, which compiles this information, along with other recent activity. Noting abnormal and potentially worrisome behavior, the technology hub sends an alert to the woman’s daughter and doctor, so that they can check on the woman and, if necessary, provide immediate care.

While still in a relatively nascent stage, the promise and possibilities of aging in place technology continue to expand, offering unobtrusive solutions for enhanced freedom, safety, security, and awareness for all generations, including active adults and their loved ones.

Perhaps the benefits and conveniences delivered by these enabling technologies can mitigate some of the fear and discomfort associated with aging, making the process of aging in place a positive, peaceful experience. **GB**



It's been a long road toward respect for the 'other' type of tiny home, but accessory dwelling units have (finally) begun to gain traction.

# The ADU Equation

BY ALAN NADITZ AND GREEN BUILDER STAFF

**I**N THE BEGINNING, it was just an affordable way to buy a home. Kol Peterson had relocated to Portland, Ore., in 2010 and needed somewhere that would be his without breaking his budget.

"Housing was likely to be the single largest expense I would have in my life," Peterson notes. "Ultimately, I settled on the idea of buying a house and building, and living in an accessory dwelling unit (ADU)."

Fifty potential residential properties and one whirlwind construction year later, Peterson and his future wife, Deb, had their dream home—all 800 square feet of it. For Peterson, it also meant the start of a career built around tiny housing. The one-time environmental planner has become known as the guru of the ADU, especially in the Pacific Northwest: He consults with prospective homeowners on what they can expect as they buy or build their home. He conducts construction industry-aimed educational seminars and teaches courses at building schools—such as the upcoming [Accessory Dwelling Academy](#) in June (see sidebar). He maintains a website, [AccessoryDwellings.org](#), a one-stop resource on all things ADU. His citywide ADU tour draws nearly 1,000 attendees each year.

And he's the author of *Backdoor Revolution: The Definitive Guide to ADU Development*, which contractors, consumers and other authors consider to be the bible on building an ADU.

"I have been on the front edge of ADU education, advocacy and consulting for six years," notes Peterson in *Backdoor Revolution*. "I now find myself in a unique position to contextualize the roles that ADUs play in the development of infill housing in a growing city."

## WHAT WE'RE TALKING ABOUT HERE

Accessory Dwelling Units go by many other names—"granny flat," "in-law suite," "carriage house," "secondary dwelling unit" and "ancillary unit" are just a few—but one thing they are not is a "tiny house." The website [Maxable](#) defines an ADU as a structure that is typically around 800 square feet in size, has its own kitchen, bedroom and bathroom, is considered an accessory to an existing house—meaning it can't be bought or sold on its own—and can be rented out legally. The unit may or may not be detached from a primary residence.

In contrast, a tiny house is usually no more than 400 square feet, contains a living area, sleeping loft, kitchen and bathroom, is typically built on wheels to enable easy relocation, can be parked on land sharing properties, and can be sold as its own dwelling.

There's also a district difference in how the home can be built, if at



**Two perfect.** Builders can be just as inspired designing an Accessory Dwelling Unit as with any full-sized home.

all. On the surface, regulations on ADUs appear to be more relaxed than those for tiny homes. Most cities do not outright ban ADUs, but very few cities actually embrace them—in most cases, regulations are so restrictive that most jurisdictions grant no more than 10 permits are issued each year, Peterson notes.

The low rate is "largely attributable to restrictive ordinances and bylaws, and long, involved, complex permitting processes," Peterson states in *Backdoor Revolution*. "No wonder so few homeowners would dare to run the ADU development gauntlet—such formidable roadblocks stand in their way."

Three of these roadblocks are what Peterson calls "poison pill regulations," items that effectively kill an ADU effort: owner-occupancy requirements, off-street parking requirements, and conditional or discretionary reviews.

## LIVE HERE OR LOSE IT

Under owner-occupancy, an owner must live on the property there is to be an ADU upon it. This precondition, "the default rule of the land for ADUs today," effectively bars any such construction, Peterson notes. It shoots down one of the principal reasons for building an ADU: as an investment. "An owner can no longer move away from the

property without having to sell it," he says. For example, this bylaw eliminates an option such as renting out the main home should the owner need to suddenly relocate and not want to quickly sell the property for less than market value. It also opens a can of worms if a family member were to inherit the property and not want to sell.

Most U.S. cities have owner-occupancy bylaws for properties with ADUs. Some tighten the restriction further by requiring residents of the ADU to be relatives of the property owners. Other cities require those relatives to be ill, disabled or elderly and require extended care or supervision by the owner. And, there can be a time limit as to how long a relative may stay in the ADU, usually no more than a few years. Still other cities restrict occupancy to specific age or income groups, and some prohibit the unit from being rented out.

The sad thing is that there's no real justification for owner-occupancy requirements. Peterson believes it was once a logical ordinance somewhere, one that, for simplicity sake, other jurisdictions simply copied—along with numerous other building codes—when developing their own ordinances. Now, these "accidental mindless regulations" are seen as normal and well-reasoned, simply because they're on the books everywhere.





CREDIT: RAINBOW VALLEY CONSTRUCTION

**Time to grow up.** Accessory Dwelling Units are slowly gaining acceptance with jurisdictions nationwide, as laws restricting their construction are eliminated or relaxed.

## PACKING IT IN

An off-street parking requirement basically mandates that there be a parking space available on or near the property for the occupant of the ADU. Some cities require as many as three covered spaces. Others require any parking spaces to be side by side, or capable of two-car tandem (end-to-end) parking. “For many lots where you would want to build an ADU, adding an additional 9-by-18-foot parking space is impossible, nearly impossible or highly undesirable,” Peterson writes. “Fitting two or three parking spaces is harder still.”

Adam Peterson, an architect with Muddy River Design in Bend, Ore., recalls a time when he had to configure a property to fit five parking spaces for one single-family house with an ADU. “It was a 2,000-square-foot house with an ADU above the attached garage,” he notes. “It was on an improved alleyway, so it was a challenge with the planning department to make all of the parking spaces work. They required two in the garage, two outside the garage for the house, and then one off to the side for the ADU. So there’s no yard, because it has to be hardscaped for that parking stall.”

## YES YOU CAN’T

The conditional/discretionary review or conditional-use permit allows a property owner to ask the city for permission to use a property in a specific way. But it does not necessarily grant the owner the right to build anything on it. The lengthy process can require neighbor notification, a public hearing, and written and oral justification. It can also result in a lot of lost money upfront. For example, there are non-refundable permit fees, as well as the costs of site plans and elevation

drawings. This expense easily totals thousands of dollars, something that a professional developer have come to expect. An amateur homeowner, on the other hand, would probably throw in the towel.

“This type of development uncertainty deters them from initially even pursuing the idea,” Peterson says. “In what other circumstances would a homeowner be forced to spend [thousands] on an application where permission may not be granted?”

In addition to the three “poison pill regulations,” there are the typical development standards faced by all homebuilders, which can hinder ADUs: setbacks, size limits, minimum lot sizes, structural forms, sewer and water connections, and development fee costs. “Rules like these are so restrictive that it would be remarkable if any resident tried to develop a permitted ADU,” Peterson notes.

But not every city agrees in poison pills.

## WHERE REFORM’S BECOMING THE NORM

ADUs were originally viewed as a way to ease a housing crunch in many of the fastest growing—and expensive—areas. Cities like Portland, Ore., Santa Cruz, Calif., Austin, Texas, and Vancouver, British Columbia, made ADUs an option for homeowners, although they didn’t take off at first. Changes in building regulations, along with growing word of mouth and promotional efforts, have made them a bit more popular. But they’re still a miniscule part of the housing market.

Peterson has seen the difference. When he began his housing project in 2010, his was one of only 86 such permits Portland issued that year—and Portland was one of the less-restrictive cities. But by 2016, the annual number had grown to 615. The difference? The city eliminated development impact fees, which cut the cost of building



CREDIT: JEFFREY FREEMAN

**Make no mistake.** There are distinct differences between ADUs and tiny houses, such as the latter typically being built on wheels for easy transport.



CREDIT: ACCESSORYDWELLINGS.ORG

**The big time.** A believer in practicing what he preaches, Kol Peterson built an 800-square-foot Accessory Dwelling Unit that he and his wife, Deb, have lived in since 2011.

# An Accessory to Knowledge

Despite regulatory obstacles, there’s a bright future ahead for ADUs.

BY KOL PETERSON

**A**CCESSORY DWELLING UNITS (ADUs) are a hot topic in many areas of the country these days. Homeowner interest and demand to build these types of small infill units on their residential properties is exceeded only by the market thirst for this type of housing.

But, major obstacles remain to ADU development, which is why so few of them are actually built. Regulations make this form of development unappealing, challenging or impossible. From onerous off-street parking requirements, to discriminatory owner occupancy requirements, ADUs are treated like a derelict of housing options within common zoning codes throughout the country.

These regulatory barriers are why most jurisdictions that claim to allow ADUs actually have fewer than 10 of them ever built. In fact, only four U.S. jurisdictions have more than 1,000 ADUs: Portland, Ore., Los Angeles, Austin, Texas, and Seattle. Meanwhile, there are tens of millions of informal (read: non-permitted) ADUs throughout the United States, proving that there’s clearly a strong market for them.

Even where ADU regulations are decent, and the correct real estate market conditions exist, ADUs have proven to be very expensive to build. Financing ADUs has plagued their potential proliferation. But 2019 is shaping up to be the year of ADU financing.

In West Coast states, where ADUs are starting to be developed in greater numbers due to state legislative approaches, local credit unions and local banks are creating ADU construction and renovation loan programs. These open the doors for homeowners to build ADUs using the future value as a basis for the loan.

Construction loan financing hinges on fair ADU appraisals which are a chicken and egg problem. Appraisers have historically low-balled the contributory value of ADUs; at times, ADUs have actually been appraised as having less contributory value than a comparable-sized home addition. This is due to the



lack of sufficient comparable sales of properties with ADUs, and the fact that appraisers have misunderstood what ADUs are and how they could be rented out.

Tracking the many moving parts of this incredibly compelling but extremely dynamic housing movement is tricky. To actually assist customers in developing ADUs on their properties, professionals need to be up to speed on the many overlapping elements of ADU development, including understanding ADU structural forms, how to design small spaces well, the costs of development, and the mechanisms involved in financing them. Meanwhile, each homeowner must

become a land developer.

Being involved as an ADU practitioner effectively means that you almost have to become an ADU activist and evangelist. So many barriers and challenges remain to getting this housing form to take off. Yet, when one accounts for the small scale size of the housing units, as well as the location efficiency of where they are built, ADUs hold the promise of being among the greenest form of housing development opportunity.

A robust market for ADUs is an inevitable outcome of how residential neighborhoods in increasingly tight, coastal, housing markets will have to evolve to still be demographically relevant to shrinking household sizes and increasing demand to live in walkable areas.

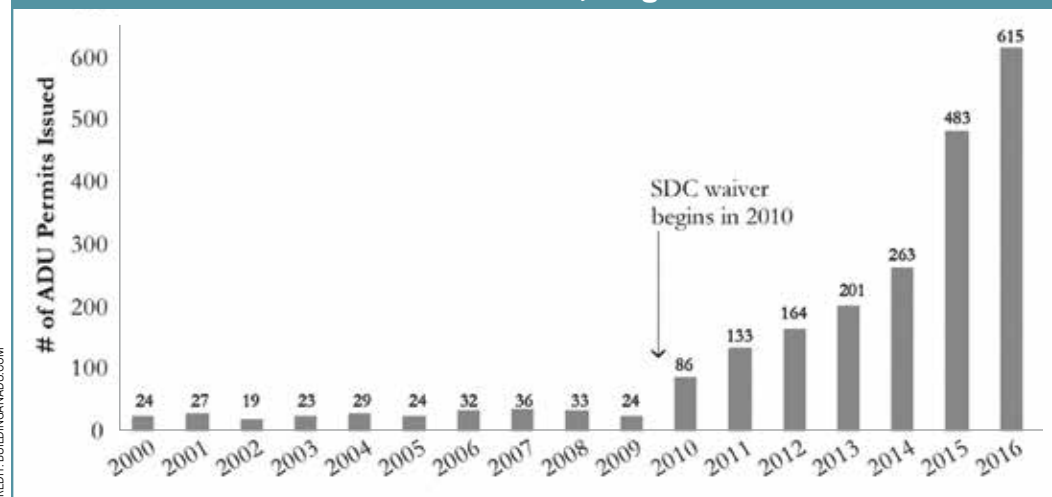
If you are interested in making ADUs a bigger part of your business model as a builder, designer, lender, realtor, appraiser, developer or investor, I invite you to consider attending **Accessory Dwelling Academy** in Portland, Ore. on June 21.

The Academy is the fast track to becoming an ADU practitioner, advocate and leader. Learn more and register here: <https://accessorydwellings.org/academy>.

Kol Peterson is an ADU developer, dweller and consultant based in Portland, Ore. He is author of *Backdoor Revolution*, the *Definitive Guide to ADU Development*, and is owner of *Caravan—The Tiny House Hotel*, the world’s first tiny house inn.



## ADU Permits Issued in Portland, Oregon from 2000–2016



**On the rise.** Since the start of the decade, ADUs have zoomed in popularity in forward-thinking cities such as Portland, Ore., thanks to a series of citywide reforms.

an ADU by thousands of dollars. It also loosened design and size requirements.

A report by the University of Nebraska, “Use of Accessory Dwelling Units as a Housing Strategy,” identifies numerous other cities where legal reform meant added interest in ADUs.

In 2017, California passed legislation that did not address owner-occupancy, but did redefine the specs of an ADU, making it easier to build one. Numerous cities benefited immediately. For example, Los Angeles, which already lacked owner-occupancy, saw the number of permits rise from 142 to 2,000 in one year. Santa Cruz, considered an ADU pioneer but also very strict in its building requirements, saw construction triple from 100 to 400 units, partly from the new legislation, and from ongoing and increasingly popular city-wide efforts such as zoning reforms, pre-approved designs, a how-to manual for homeowners, and a low-interest loan program.

Elsewhere, Seattle’s reforms, which included changes in owner occupancy and parking requirements, as well as greater public discussion, pushed its ADU annual permit total from less than 10 in 2012 to more than 200 in 2016. In Austin, a series of building reforms over a decade, including programs aimed at low- and moderate-income households, pushed ADU permits issued from 32 in 2007 to 387 in 2017. And Barnstable, Mass. made it easier to bring existing, non-permitted units into compliance with its Amnesty Program, which offers fee waivers for the inspection and monitoring of units. The city also offers financial incentives, such as block grants, to reimburse eligible costs associated with the rehabilitation of a

qualified ADU that meets the minimum qualifications outlined in the program.

But it’s Vancouver that is considered by many to be the template of how to do it right when it comes to ADU regulation. According to [Strong Towns](#) Content Manager Daniel Herriges, the units were allowed to some degree prior to 2009. But that year, ADUs became legal citywide. That meant 65,000 lots where the micro-homes could be built, with virtually no red tape. “No additional parking was required, no public hearing or approval by neighbors, and no expensive or cumbersome design requirements,” Herriges notes. “You can build an ADU on just about any residential lot in Vancouver, behind just about any style of house.”

As a result, ADUs—commonly referred to as “laneway houses” in Canada—have proved “*spectacularly*” popular in Vancouver, according to Herriges. According to the [Sightline Institute](#), a Seattle-based nonprofit research group, Vancouver is now adding more than 1,000 of these units every year, and the total share of single-family houses with legal ADUs is up by 35 percent from a decade earlier, to about 2,600 homes. Another 4,200 permits have been issued for units known as secondary suites—an ADU in a basement or other “carved out” part of a home.

Part of the increase has also been attributed to the city’s grid-like layout and deeper, wider residential lots, which are conducive to ADU construction, according to the Urban Land Institute.

## THE NEXT BIG THING?

Peterson says that no one will argue that a lot of progress has been made in recent years toward defining what an ADU is and how it can be built. But despite the ongoing changes in attitude on display in some cities, there’s a long way to go before an ADU is as desirable—and hassle free, construction wise—as a two-car garage.

“Because ADUs are challenging to create, small changes to the rules are likely to have even smaller effects on the number of ADUs actually constructed,” Peterson notes. “If ADUs are actually meant to contribute to the quantity of housing in an urban area, and not just be token examples of a good idea, then barriers—both governmental rules and nongovernmental challenges—will have to be taken down wholesale. That’s probably what it will take to finally, really make ADUs the next big thing.” **GB**

## To Learn More

More information about Accessory Dwelling Units can be found at these sites:

**BUILDING AN ADU:** A site with design tips, financial overviews, homebuilder and homeowner case studies, and more.

**MAXABLE:** Includes an overview of ADU regulations throughout California.

**STRONG TOWNS:** This international group’s site includes articles, podcasts and video on the challenges of building ADUs and tiny homes.

**SIGHTLINE INSTITUTE:** A nonprofit research firm with significant resources dedicated to ADU development.

**AMERICAN PLANNING ASSOCIATION:** This agency’s site includes research reports, legislative update and informative articles that define the ADU.



# The Big Picture

An ADU may be smaller, but it’s just as challenging to build as a full-sized dwelling.

BY LISA MENARD

**S**TEVE SNYDER AND HIS WIFE JACKIE ELLENZ first learned about Accessory Dwelling Units (ADUs) through their designer, Libby Holah. She and her husband Greg had previously designed a bathroom for Snyder and Ellenz, and they were a natural first choice when it came to remodeling part of their home in Portland, Ore.

“Our garage was falling down, so we asked them to look at what we could do with it,” Snyder recalls. “[Libby] asked, ‘Have you ever considered an ADU?’ We asked, ‘What’s that?’ So she took us around to look at some other ADUs.”

For Snyder and Ellenz, there were a lot of good reasons to build an ADU. They like the idea of supporting density and infill, and they’re also committed to energy efficiency. Meanwhile, Greg Holah is especially interested in how building technology can help ameliorate climate change.

“I thought this could be a really cool sort of thing to do—to help a contractor think about energy-efficient design, including ideas from Passivhaus,” Snyder says. “It could be a learning experience for everyone engaged, and perhaps even for a broader audience.”

## Lots to learn

As they worked with the Holahs to design their ADU, Snyder and Ellenz kept in mind the lessons learned from years of reading books about small space design, Passivhaus design and simple living.

According to Holah, the design considerations for an ADU are very similar to the design considerations for any home. “ADUs still need all the basics: kitchen, bathroom, living room, and bedroom,” he says. “Freestanding ADUs are just small houses; a lot of the program is similar to designing a one-bedroom apartment. They have all the same components as a house and we have to be smart about how we make everything work.”

Energy efficiency was the primary guiding factor in the design. Whenever they design an ADU, the Holahs make it energy efficient, with sustainability in mind. “Creating a well-insulated envelope is important,” Greg Holah says. “Since it’s not a lot of volume to heat, if we create a well-insulated shell, it doesn’t take a lot to condition the space. [In addition], good quality windows and a well-insulated exterior are very important things.”

As a result, Snyder and Ellenz’s ADU includes a laundry list of sustainability features:

- The windows are triple-glazed and most of the windows face south to take advantage of passive solar heating.
- The concrete slab is insulated to create a thermal break from the ground.
- Additionally, the concrete slab acts as a thermal sink in summer and winter, absorbing heat through the southern windows, storing it during the daytime and releasing it at night.
- The wall system uses staggered stud construction with eight-inch top and bottom plates to reduce thermal bridging (the transfer of heat through the exterior walls).
- The walls have two inches of foam “outsulation” attached to the sheathing,





“ADUs are the wave of the future for our single-family home neighborhoods.”  
—Steve Snyder

**An outdoor for more.** The ADU, top rear, actually improves the backyard’s overall shape, helping transform the now-rounded region into a courtyard.

in addition to the blown-in foam insulation in the interior wall, for a total of R-43. The walls are 12 inches thick, including the sheathing, drywall and siding.

- There are solar panels on the roof.
- Heat recovery ventilation brings fresh air into the super-tight building.
- There are LED lights throughout the ADU.

Snyder’s biggest disappointment with the ADU is that despite all efforts to make it energy efficient and use passive solar heating, it requires more energy than anticipated. “I had it in my head that I wouldn’t have to heat the place because it’s so well insulated, but that was naïve on my part,” he says. “It does require heat—not a lot, but it’s not something you can live in with just body heat, cooking and a light bulb.

“We had foam on the outside and we taped the seams,” Snyder adds. “On the inside, after we foamed it, we used gasketed drywall, so that was two more layers of air sealing. [Yet] we still had a heck of a time getting it down to 0.6 air changes per hour (ACH). It’s hard to get Passivhaus air tightness numbers on a small building because you’re amortizing door and window space over less building volume.”

### A multi-purpose project

As they were building the ADU, Snyder and Ellenz imagined that it could serve a variety of functions. They saw it as a place they could offer to friends or acquaintances for a short or long-term stay. It’s also a possible source of income, depending on the economy and whether they’d like to rent it out.

Aging-in-place was also a design consideration for Snyder and Ellenz. They discussed the possibility that at some point as they get older one of them might need assistance. They realized that they could offer the ADU as a living space for someone in exchange for help.

Thus far, the structure has served as a part-time art studio, and a longer-term but temporary home for family members. “We never thought about Airbnb—that’s not interesting to me,” Snyder says. “If we had someone living in the backyard it would have to be someone we’re comfortable with. Everybody who has stayed here is someone we’re pretty close to.”

### Regulatory barriers and breakthroughs

Until December 2015, Portland required detached ADUs to match the primary house, which was just fine by Snyder. He says that even if it wasn’t required,

he and Ellenz would have wanted to evoke the main house in their ADU design. However, they also added a few extra flourishes to make the space special. For instance, they used plaster over wallboard with a Venetian finish.

The only regulatory barriers they encountered related to the challenges of building an extra-small home—in this case, one that was a mere 800 square feet. For example, Snyder and Ellenz were required to have at least a 36-inch-diameter floor in the shower and had to redo it since it wasn’t large enough the first time. “Headroom at the stairs was also a challenge because we didn’t have adequate clearance, so we had to mess around with that,” Snyder says.

Another drag was the city’s required five-foot setback. “We had to move the ADU five feet from the property line while the old garage was only a foot away,” Snyder notes. “In some ways it feels like wasted space, but it’s a lot better than I thought it would be.”

Storage is a bit of an issue, and Snyder notes that they would probably want to increase the storage if the ADU was used on a more-formal basis such as a rental. “We didn’t really design it for storage,” he admits. The unit lacks sufficient closet space, since the closet on the first floor is mostly occupied



**Well blended.** The kitchen, consisting of energy-efficient appliances and lighting, transitions cleanly into the home’s central living area



**Going to great panes.** Windows throughout the home are triple-glazed, and most face south to take advantage of passive solar heating.

by the water heater and the closet under the stairs is short, with the rest of the space angled away.

Holah says that his favorite small space design tricks are making the spaces as flexible as possible and adding built-ins wherever they make sense. Storage is important to many of their clients, so he and [Libby] like to find opportunities for built-ins. Their two favorite places to stash storage space are in the low areas where the roof meets the exterior wall and under a staircase.

The latter was a hit with Snyder and Ellenz. “One cool thing we did was we put two drawers under the lowest part of the stairway that are accessible from the main part of the ADU,” Snyder remarks. “It’s way cool! It’s how I’d like to work with the rest of the ADU if we ever get serious about improving the storage.”

### Points of view

Snyder’s biggest frustration was finding contractors that were as tuned into energy-efficient building practices as he was.

“I felt like I had a vision for the project that wasn’t fully understood or maybe even shared by the builder,” he notes. “We had to have the plumber redo the plumbing—they were doing pipe installation in a way that sucked up wall space and had too many penetrations. The window framing was overdone, which meant that we had thermal bridging where it wasn’t necessary. So they had to tear it out and redo it. I definitely had to stay on top of things the whole time.”

That frustration was offset by the pleasure of having the Holahs as their designers.

“[Greg and Libby] were great, really helpful,” Snyder

responds. “Working with them was a highlight. I felt like they were really excellent allies: They were great at thinking about problems that I saw during the construction and figuring out how to deal with them. The designer can put all this stuff on paper and the contractor can try to define what they’re going to do, but there are always holes.”

Meanwhile, Snyder’s biggest surprise was that the ADU isn’t as obtrusive as he feared it might be. “I thought there would be this looming behemoth,” he says. “I worried that we were going to have this horrendous structure looming over our kitchen. But what it did was it create three spaces in our backyard. It’s helped give better shape to our yard, like a plaza.”

There’s not much to be unhappy about. Ellenz says that if she had it to do over again, she’d do the floors differently. The concrete slab is polished and the couple anticipated it would be bomb-proof, but they’ve discovered that any stain becomes permanent. They would still probably use concrete, but might seal it differently or install another material such as tile on top, she notes.

Snyder and Ellenz were definitely thrilled with the end result—in more ways than one. “It’s a great space,” Snyder says. “I’m really, really happy with it and we did some cool stuff with it. But the highlight for me was getting the damn thing done!” **GB**

*This story is an edited version of one that appears on the [Accessory Dwellings](#) website and is being reused by permission. Author Lina Menard is a small house dweller, designer, blogger, builder and owner of Niche Consulting LLC, in Portland, Ore.*

## Project Stats

**OWNERS:** Steve Snyder and Jackie Ellenz

**LOCATION:** Grant Park, Portland, OR

**TYPE:** Detached new construction

**USE:** Guest house, art studio

**SQUARE FOOTAGE:** 800

**YEAR BUILT:** 2012

**DESIGNER:** Greg and Libby Holah

**TOTAL COST:** \$155,000





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#### FOR MORE INFORMATION:

Look for ongoing editorial coverage about the VISION House Seattle Cascades from Green Builder Media in the coming months. In the meantime, be sure to check out the project microsite at [www.greenbuildermedia.com/vision-house-cascades](http://www.greenbuildermedia.com/vision-house-cascades) for updated articles, videos, and news about the project.



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# Down Memory Lane

For patients, dementia villages evoke a time when life was simple and good—for better or worse.

BY MATT POWER

**I**F A FRIEND HADN'T SENT ME A LINK to this story, I would have thought it was "fake news." But this is no hoax. A place called [Glenner Town Square](#) really exists. It's a faux community, a partial replica of long-vanished, airbrushed San Diego. The 9,000-square-foot "town" has been carefully constructed to resemble mid-to-late 1950s San Diego, built inside a 20,000-square foot industrial building.

Alternately called "Alzheimer's Daycares" or "Dementia Villages," the concept taps into a field of dementia treatment called "reminiscence therapy." This method of "engaging" dementia patients (Alzheimer's is a leading cause of dementia) aims to trigger memories from their past and slow their decline into oblivion. And for many patients, it appears to be working—pulling memories out that were buried deep behind their fog of forgetfulness.

The *San Diego Times* [reports](#) that most of the elderly Alzheimer's and dementia patients served by Glenner are in their 80s, and their most stable memories are those they acquired when they were 25-35. "For these people, walking through an idealized San Diego from their prime years will generate positive recollections," the report notes.

The same story recounts anecdotal examples of how a vintage poster triggered one man to recall his World War II experiences. Others begin to tinker on an old, on-site Thunderbird.

**Good old days.** Dementia villages such as Glenner Town Square can bring back long-buried memories in Alzheimer's patients.



CREDIT: SUSAN MURPHY/KRBS





CREDIT: GLENNER TOWN SQUARE

**A dual purpose.** By combining two favorites—artwork and the familiarity of a favorite diner—visitors can regain a few happier memories.

## IS THIS HEAVEN OR HELL?

It's hard to fault the motives or the anecdotal results from this and other dementia villages in Europe. If the goal is to make patients happier, then the illusion seems to work. If the goal is to enrich their lives or allow them to contribute to society again in some way, that's a harder sell. A better angle might be that it simply keeps them out of trouble.

Can the life of a person who does not remember things from day to day be enriched? If you're a fan of the movie "Groundhog Day" with Bill Murray, you would probably say yes, every moment counts, and good deeds ripple outward. A grandson, hearing his grandfather talk about flying planes in World War II, for example, might gain a cherished memory.

On the other hand, as the popular existential TV comedy "The Good Place" frequently points out, the dividing line between "the good place" and "the bad place" is not always apparent. In the good place, for example, trapped souls are allowed to eat yogurt but never ice cream, a seeming indulgence that is actually designed as a mild torture. In "The Good Place," (spoiler alert) we ultimately learn that the characters are actually in "the bad place." The quaint, Disney-esque architecture, bright colors, clown paintings and awkward relationships have been engineered to evoke constant, eternal, low-level stress and anxiety. "Guests" rarely rebel however, because they know they are the "lucky" ones who went to the good place, so they should not complain about the insipid boredom, confined mobility and other hellish aspects of their new existence.

There are many other models from fiction that apply to dementia villages of course, most of them cautionary. "The Truman Show," where the main character lives his life in a bubble, observed unknowingly by the public; "Logan's Run," where older people (those who hit the ripe age of 30) are sold a fantasy that they'll be blissfully reincarnated, when in reality they're being euthanized. And of course, I'd be remiss not to mention the familiar "red pill or blue pill" choice from "The Matrix." Given the choice, do you remain

inside a pleasant reality of clean air, good food and so on, or escape into "actual" reality, a hell on Earth, where your body is being kept alive by machines inside a wet box? Is actual reality inherently better than constructed reality?

## A LONG LINE OF CLIENTS

According to [KPBS news](#) in San Diego, Glenner Town Square, the first U.S. dementia village, has experienced tremendous demand. Scott Tarde, CEO of the nonprofit George G. Glenner Alzheimer's Family Centers, says the rollout of more such centers is on a fast track.

KPBS reports that Tarde is joining with in-home senior care provider Senior Helpers to open 200 more Glenner Town Square villages across the country over the next five years, including a half-dozen more in San Diego County. An eight-hour visit costs \$95; participants must be pre-assessed and enrolled to attend.

Do the math and the cost of this elaborate Alzheimer's daycare adds up to about \$3,800 a week, or \$15,200 for a four-week month. That's a hefty cost, about three times as much as average Alzheimer's care in assisted living communities—not affordable for many—but advocates will argue that for the few who can afford them, these villages make life much more bearable.

Sadly, the suffering segment of the population is growing rapidly, so there's no shortage of clients. KPBS adds that for now, Alzheimer's/dementia is the third leading cause of death in San Diego, afflicting 84,000 people. By the year 2030, the number of people in the county diagnosed with the mind-robbing disease is expected to soar by 36 percent.

## ESCAPISM WITH PURPOSE

I'll be honest. I'm not a fan of Disney's form of escapism, although I know that's sacrilege to many of the brand's fans. Try talking to a Disney fanatic about the negative impacts the company's narratives



CREDIT: TIM AND SELENA MIDDLETON/FLICKR

**Final thoughts.** Despite many advances, Alzheimer's care has a long way to go before there's a happy ending for all involved.



CREDIT: GLENNER TOWN SQUARE

**Reaching out.** New experiences such as yoga can be encouraged in village visitors, who are more likely to want to learn when in comfortable surroundings.

have had on young women or Walt Disney's own anti-communist fervor and their eyes glaze over. And let's not even mention "The Song of the South." Which way to Mickey's parade?

Dementia villages, on the other hand, take the Disney model and add a societal value. Where Disney's primary aim is to comfort the comfortable with escapism, Alzheimer's villages may reduce suffering for families and patients. For people who have watched loved ones descend into Hades with Alzheimer's and/or dementia, these artificial reality experiments are simply the last, best hope for comforting the afflicted. Making their confused loved ones feel some sense of belonging again, familiarity or simply reducing their stress levels may be seen as a priceless soul balm.

So forgive me if I sound too critical of the dementia village concept. It is not without merit, particularly in light of the alternatives. As a friend pointed out, the current system of warehousing dementia patients in sterile nursing home settings, where they may wake up frightened, confused and alone, is heartbreaking. The thought that grandpa might be able to walk into the artificial quaint small town he remembers, sit down in a diner and order a coffee, while talking to staff dressed in period clothing, removes a certain burden from our hearts.

On the other hand, not every fantasy Grandpa likes to remember should be indulged.

## HACKING THE NOSTALGIA NARRATIVE

We seem to be careening toward a future of overlapping virtual realities. Can't we at least make the narratives kinder, more inclusive and less reinforcing of our worst behavior? To date, dementia villages seem tailored to white, middle class fantasies about the "golden age" of their youth, not the real world of segregated water fountains, "mother's little helpers," chronic alcoholism, post traumatic wartime stress and the rest.

That doesn't mean we have to highlight all the negatives in these virtual settings. But rather than engage visitors as two-dimensional caricatures of their former selves, why not let a little actual reality into the scene? Take that World War II soldier, for instance, who may have endured untold horrors during the conflict. In the brightly lit, bloodless world of a dementia village, as in virtual reality war

games, his memories may be sanitized and recast, neutralizing the real lessons that his experience may carry to future generations.

I challenge the designers of dementia villages to make them more than "God's waiting rooms" and resist regurgitating nostalgic fantasies of a time and place that never was (for a deeper dive on this, read *The Way We Never Were* by Stephanie Coontz, about the real conditions in 1950s America).

Let's have a library stocked with *Popular Mechanics*, yes, but also books about the futility of war, Climate Change and Buddhism basics. In the theater, let's reverse engineer the propaganda of white supremacy, male supremacy and American supremacy with storylines that encourage new brain cells to replace old, withered (and frankly, unkind) ones.

Why stick to stereotypes? Serve up the familiar with new challenges. Isn't that the goal? To make people feel more comfortable, at the same time urging them to activate their mental facilities? For some, this might be the deepest they've ever looked at their lives and beliefs.

In the next dementia village, let's install soda stands and 50-cent movie theaters, sure, but let's also introduce a mayor who's proudly First Nation. He's good friends with the chief of police, who is Pakistani and Muslim, and a gay couple who run the local diner. The T-Bird is being converted into the first-ever solar electric car, and a nerdy testing center staffed with white guys in crewcuts, and Latino and Asian scientists, is proving "definitively" that cigarettes cause cancer, that seatbelts work and that all human beings are created equal.

## FAD OR INSTITUTION?

There's no denying the attraction of dementia villages for those who need them. But I for one would like to see them pass into the graveyard of 21st century oddities soon, rather than become as ubiquitous as Starbucks.

Alzheimer's disease research has shown several [promising leaps forward](#) recently, so there's reason to hope. In the meantime, if we must warehouse our aging relatives in la la land, let's make it a place that their 20-something grandchildren can visit without cringing. **GB**





# Lending an Assist

When dealing with a disability, it's today's tech to the rescue.

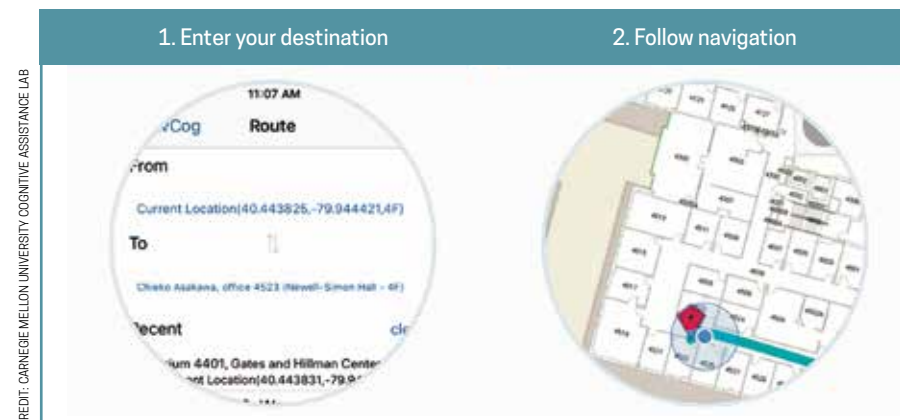
BY ALAN NADITZ

HAVING A PHYSICAL DISABILITY used to mean a life confined to sitting in a chair or relying on holding a caretaker's hand to get from place to place. But now, being called "disabled" doesn't quite seem right. Thanks to many assistive devices developed in the past 20 years, you can do what everyone else can—which means don't really have a disability—right?

Heck, those technological advances improving vision, mobility and illness might even make you better at something than someone deemed "healthy and normal."

That thought becomes even more appealing—and important—as we age. The older we get, the more likely we are to have one or more parts of our biological engine break down. The U.S. Department of Health and Human Services predicts that close to 88 million Americans will be age 65 or older by 2050. Roughly 40 percent of those persons are expected to have some sort of physical disability plaguing them during their not-so-golden years.

But technology is giving us plenty of help as we go gray. Here's a look at some of the classier, cooler assistive devices—beyond the familiar such as smart locks, voice-enabled controllers such as Amazon *Echo* and *Alexa*, and personal trackers—that can keep us happily on our feet for years to come.



**Line of sight.** NavCog's Bluetooth-driven process enables the visually impaired to easily navigate within buildings and along streets.

## VISION QUEST

Few will argue that loss of vision is one of the worst disabilities to endure, no matter how old you are. The concept that you'll have to learn an entirely different method of interaction—one based on your other senses, especially your hearing—is a nightmare to some.

Making the transition easier is **NavCog**, an open-sourced *iPhone* app for indoor navigation. Developed by Carnegie Mellon University, this tool helps people with visual impairments use earbuds, a smartphone and Bluetooth sensors to explore the world. Information about their surroundings is spoken to the user, helping them know what to expect as they try to move around the house or make their way down the street.



**The cane that explains.** Smart canes are capable of identifying objects and people for blind people through ultrasound.

This process is also helpful for people who are at huge and complex places such as a university, airport or hospital.

Meanwhile, human interaction can be a chore when you're blind. You can't always rely on your unaided senses of hearing or touch to let you know who's standing nearby. But *XploR*, a smart cane developed by Birmingham City University in the United Kingdom, can clear things up. The mobility stick uses a handle-mounted camera, built-in sensors and facial recognition software to scan for faces in a crowd, then compares those images to an online database or preloaded memory card. If there's a match, the stick vibrates, then guides the user to their friend or relative using a Bluetooth earpiece and audio guidance. *XploR* is still being market tested, but similar products are already available. Smart canes by **AssisTech** and **UltraCane** use ultrasound to detect obstacles in the user's path, then vibrate to tell the user which direction to go to avoid them.

One of the greatest technological innovations of this century has been the tablet PC, a wonder that has enabled us to communicate and learn wherever we go (as long



**Reading things write.** The blind who want to read while on the web and the sighted who want to learn Braille can make the connection with the *Blitab* tablet.

## HOUSEHOLD HELPER

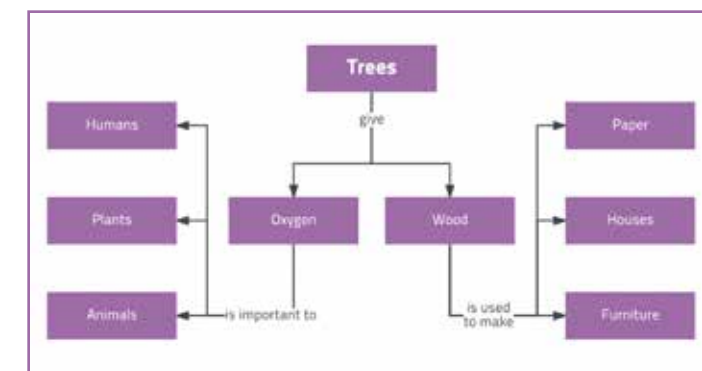
Switches are a fact of life in any home or office. There are light switches, computer switches, phones, environmental control units, television remotes and more. Anyone who can't easily use a switch should consider a **Sip/Puff Breeze**, a system that controls switches with their breath. Consisting of a mouthpiece, headset and flexible shaft with a removable clamp, a user activates a switch by sipping (inhaling) or puffing (exhaling). The device also enables a user to control cursor movements and joysticks, which make drawing, playing games and any application that accurate cursor control as easy as a snap of the fingers.



**Easy breathing.** The *Sip/Puff Breeze* system enables control of lights, computers, remotes and other handheld or vocal-controlled devices with a simple inhale or exhale.

## DEVELOPMENTAL AIDS

One tool that can help people keep their thoughts organized as they age and their memories begin to fade is one they may have used when they were younger: a graphic organizer. In this case, the device allows a user to "dump" their information into the online system in an unstructured manner. The unit can then rearrange the data into a logical pattern. For example, a "to do" list may be set in any order as recalled, then moved into proper 1-2-3 order after online review. Dozens of such products exist (and not all of them require online use); a typical provider of organizer charts basic and complex is **Lucidchart**.



**Lost in thought.** Persons with cognitive disabilities can benefit from a graphic organizer such as one by Lucidchart, which allows random placement of thoughts on a chart for future reorganization.





**A place to call home.** The Luna Azul subdivision in Phoenix offers the disabled a chance to own their own house.

One of the harder things for disabled persons can be to find a place to live. **Luna Azul's** product is just that: a home. As the first residential subdivision designed for adults with developmental or acquired disabilities, homeowners have access to specially tailored services, vocational opportunities, and the ability to customize their homes to meet their needs. The Phoenix-based, gated community also provides a safe place for the disabled to interact with their neighbors, and is a money saver for owners and their families when compared to the cost of long term care or assisted living facilities. Homes are two- and three-bedroom structures priced from \$300,000 to \$500,000. More than one-third of the units have already been sold, and the complex doesn't open until summer.

## A CALL TO ARMS

Loss of a limb can be the ultimate disability, impacting mobility and sense of self. And although prosthetic limbs have existed for centuries (the first documented artificial limb was in 1500 B.C., during the Roman era), they haven't been all that attractive or lifelike until recently.



**Prosthetics power.** The Hero Arm from Open Bionics, with its precision construction, could put good old Six Million Dollar Man Steve Austin to shame.

Take the **Hero Arm** from **Open Bionics**. This is the world's first medically certified 3D-printed bionic arm, with multi-grip functionality and empowering aesthetics. A lightweight and affordable myoelectric prosthesis, the unit is for below-elbow amputee adults and children aged eight and above. Each arm (or hand) is custom made and controlled by the user's muscles, with intuitive

lifelike precision—the fingers even have actual metal tendons for smoother motion. There is also a breathable, removable socket for enhanced ventilation and ease of cleaning.

Hands are capable of a lot of things. Persons suffering from two disabilities—loss of sight and hearing, or persons who are “deafblind”—have had to communicate using tactile alphabets, where different parts of the hand are pinched or pressed to identify specific letters. Taking a 21st century turn is the **dbGLOVE**, a five-fingered sensor-based device that turns tactile alphabets into computer text. That text is then traced back onto the hand, making it possible for deafblind to operate computers and smartphones. The product by Italian company Intact is in development, with a hopeful release in 2020. **GB**



**Talk to the hand.** Deafblind persons—those who are blind and deaf—will be able to use the **dbGLOVE** to work on computers and smartphones just like sighted people.

## For more information about types of assistive devices, check out the following resources:

- The National Institute on Deafness and Other Communication Disorders provides detailed information on **Assistive Devices for People with Hearing, Voice, Speech or Language Disorders**.
- **AbleData** is a database of information on assistive technology products and resources.
- **PBS Parents** provides examples of assistive devices, as well as some specific guidance on alternative communication strategies for people who need assistance to produce or comprehend spoken or written language.
- The Christopher & Dana Reeve Foundation has information about available assistive technology to help people with impaired mobility or other disabilities **drive motor vehicles**.
- The Rehabilitation Engineering and Assistive Technology Society of North America describes **standards for different types of assistive technology** on its website.



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# Resilient Housing

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## Safety Shield

Chosen for its looks, the metal roof on a Florida resident's home ends up saving her family during disaster.

BY GREEN BUILDER STAFF

PANAMA CITY, FLA., homeowner Kristi considers herself lucky, thanks to a less-than-thorough inspection that missed the obvious fact her 1940s home needed a new roof when she bought it in 2014.

By chance, she replaced her leaking asphalt roof with metal as one of the first home improvement projects she tackled. Kristi, who prefers her last name not be used for personal privacy, says she decided to go with a metal roof because she liked the appearance and thought it would fit nicely with her home's cottage style. "I didn't even really consider safety at the time," Kristi says. "[I remember] thinking that metal would help keep the home a lot cooler in Florida's heat."

Fast forward to fall of 2018, when Hurricane Michael hit Panama City dead-on as a strong Category 4-plus monster storm. Now, Kristi credits her roof choice for something much more important: saving her life.

### UNEXPECTED TERROR

When Hurricane Michael hit the Florida Panhandle, Kristi, her fiancée and her son had decided to ride it out in her home. A sheriff's office employee, Kristi and her fiancée, a local firefighter, knew their services would be needed in the community in the aftermath of the storm. It was a decision they soon came to question as the full power and terror of Michael descended on Panama City. The storm's 155-mph winds wiped out nearly everything in its path. That included tall trees that were snapped off at the trunks, causing them to fall and slice some homes clean in two. Roofs ripped off and homes blew apart, leaving much of Panama City in rubble.

When the hurricane hit, Kristi huddled in her home's bathroom with her son and fiancée. They could feel the house actually lift up from the foundation and shake, with winds screaming and howling as loud as a jet engine as the hurricane smashed into homes and buildings.

For more than two hours, the terror of possibly not surviving Michael's severe lashing was excruciating. "We had no idea what we were in for," Kristi says. "Sitting in that bathroom, we honestly thought our lives were about to end."



**Wreck support.** Hurricane Michael sent this massive tree crashing onto this Panama City, Fla., home—but its metal roof held up perfectly.

### A TRUE TEST OF METTLE—AND METAL

When the storm finally subsided, Kristi dreaded going outside to inspect the horrendous damage. Homes in the area with shingle and asphalt roofs had not fared well. Many roofs were half-destroyed or all gone, literally shredded in some cases.

Yet Kristi's home was completely intact, and to their surprise, it was holding up a giant 60-foot pine tree that had toppled directly on their metal roof, right above the bathroom where they had been hunkered down during the hurricane. Not only was the roof supporting the massive weight of the fallen tree, it had sustained almost no damage. "Our roof literally saved our lives," she says.

Kristi's fiancée had decided to re-roof his own nearby home with a metal roof a couple of years earlier, and it too survived Michael's wrath with very little damage. Both homes remained water and wind

tight, even under the incredible pressure of the storm.

The same could not be said for many others in the community. Panama City suffered weeks without water, electricity and other basic services. Every powerline had snapped. Homes were completely destroyed and the ones still standing had rooftop tarps for weeks, even months as owners waited for contractors and installers to repair the damage.

Some of Kristi's friends and neighbors are still going through the painful process of replacing roofs, and worse, repairing the devastating damage their failed roofs caused by allowing water to penetrate into their homes. The city has evaluated and deemed homes "uninhabitable" due to unsafe conditions, including mold and mildew caused by water penetration. Every home on Kristi's block was designated as such—except for hers.

As roofs are replaced and the community recovers, Kristi is eternally grateful she made the decision to replace her roof with metal.

"After what we went through, it's shocking when you hear people say they are replacing their roofs with asphalt shingles again," she says. "When you live through something as horrific as this hurricane was and understand first-hand the power it has to cause mass devastation and suffering, it's simply not worth the risk to your home, or your life."



**Debris field.** Many homes were deemed unlivable after Hurricane Michael blew through the area in 2018.



**A crushing blow.** This Panama City home with an asphalt roof didn't fare well, sustaining thousands of dollars in damage.

### AN EDUCATIONAL GOAL

Recently named the winner of the Metal Roofing Alliance (MRA)'s 2018 Top Survivor Home contest, Kristi will receive a grand prize of \$1,500, based on her home's extreme story of endurance.

With many homeowners battling destructive climate challenges in 2018—ranging from massive hurricanes, and tornadoes to severe hailstorms and wildfires—MRA decided to launch the competition to highlight how U.S. and Canada homeowners are taking steps to fortify their homes against increasing threats, including by using metal roofs. While Kristi is thrilled to be selected as this year's winner by the MRA, she considers her fortunes to be far greater than taking the top prize.

"With climate extremes becoming increasingly common, taking steps to make homes more defensible and resilient is essential no matter where homeowners live," MRA Executive Director Renee Ramey says. "Building and renovating homes so that they are better able to withstand climate extremes is a hot topic in the industry, given the massive challenges homeowners have faced in recent years."

That includes using more durable, longer-lasting and stronger materials such as metal roofs, as well as construction methods that not only meet but exceed codes for being able to better stand up against monster storms and help prevent damage from climate-related events such as wildfires, Ramey notes. **GB**



## An Air Affair

Here's how to protect your team from hazardous material during construction.

**Mandatory checkup.** Despite years of precautions and monitoring by the construction industry, lung health hazards such as asbestos still hover in the air and within walls.

### BY MEGAN WILD

IT SHOULDN'T COME as a surprise that thousands of builders each year suffer from work-related skin or lung issues. One in every 20 were poisoned, according to the U.S. Department of Labor. And this doesn't include all the thousands of employees who didn't report anything. The Bureau of Labor Statistics estimates that nearly 70 percent of injuries and illnesses never make it onto paper.

The obvious culprits are hazardous

substances—vapor, gas, dust or fumes. Unfortunately, these substances are in abundance across most project sites in the construction industry, and it is imperative the greatest of care is taken to limit any harmful effects on employees.

Manufacturers of hazardous materials are obliged to issue safety fact sheets detailing the characteristics and dangers of their products. While this info is often included with the initial purchase of the materials, these data sheets can also be specifically requested directly.

Furthermore, additional information is available at public institutions, such as the Occupational Safety and Health Administration or the National Institute for Occupational Safety and Health.

Here's a closer look at the dangers of hazardous waste to a builder's team, as well as how these dangers can be prevented.

### ASBESTOS

Asbestos exposure has been proven to cause cancer of the lung or stomach, as well as mesothelioma, which attacks the membranes

protecting the lungs. However, diseases linked to asbestos exposure typically do not exhibit symptoms until decades after the actual exposure.

Quite clearly, asbestos prevention is a priority for any building team, and the following steps toward maintaining a safe environment should be followed:

- Monitor the air in areas of particular risk such as within older buildings.
- Keep detailed records.
- Regularly assess any potential asbestos risks and ensure the team is well educated on the dangers and signs of asbestos.
- Offer respiratory protection and emphasize better work practices to reduce chance of exposure.

### DUST

As you'd expect, this is one of the most abundant materials on construction sites—and it's also one of the most hazardous. Furthermore, when in large quantities, it affects entire communities.

If inhaled repeatedly, dust can cause lung diseases in the long term, but it can also have immediate detrimental effects. Silica dust, for example, is generated by grinding or cutting concrete and mortar and can become deeply lodged in the lungs if inhaled. This can lead to silicosis, asthma and even lung cancer.

Wood, drywall and limestone are comparatively less toxic than concrete dust, although they affect airways and ultimately lungs after prolonged exposure.

The only way to truly limit the dangers of dust inhalation is through controlling your workspace, such as only working with damp materials where possible or using a vacuum



Thousands of builders each year suffer from work-related skin or lung issues. But nearly 70 percent of illnesses never make it onto paper.

truck to sweep up any hazardous materials. Off-road conditions may require multi-wheel drives, so be specific and risk-averse when choosing your vacuum truck.

If neither of the above is available to you, be sure to never work in an enclosed space where the dust can build up quickly and unnoticeably.

### MOLD

Mold is another common occurrence in construction with sinister effects for builders. Mold can be expected in any damp build-

ing where moisture has been trapped and contributes to asthma and other breathing problems. What's more, if a worker is exposed to mold over an extended period, these respiratory problems develop into potentially fatal diseases.

The main source of protection against mold-related health problems is through protective gloves, goggles and respirators.

### SOLVENTS

Be in it paint, adhesives or cleaning liquids, solvents are harmful to the lungs and skin. The danger originates from the fact that solvents affect brain and nerve function when in contact with skin or internal organs through inhalation. This can even lead to cancer, blindness, kidney damage and death.

Given the serious risks, extra precaution need be taken to prevent all contact with skin. In addition, solvents should only be worked with in a well-ventilated and open space. If there has been contact with skin, wash the area thoroughly.

Well-known signs of solvent exposure include stomach pain, nausea, cracked skin, throat irritation and dizziness. If in doubt, medical assistance should be sought out immediately.

Hazardous materials are naturally part of construction life. Extreme caution should be taken to protect yourself, colleagues and employees to ensure any detrimental effects on health is limited. Information from the manufacturer's data sheet or a public source should be shared and understood, and control tactics should be implemented. **GB**

*Megan Wild is a freelance writer with an extensive history of writing for the residential and commercial green building industries.*



# A Walk on the *SmartSide*

A well-planned trim and siding can help the environment in more ways than one.

BY DOUG RODMAN

**W**HEN IT COMES to providing potential customers with details around the sustainable qualities of trim and siding, there are many environmental benefits to highlight. While material is engineered to be durable and resistant against potential damage while maintaining its aesthetics, the process that goes into manufacturing these products encourages sustainability and a wide range of responsible forestry practices.

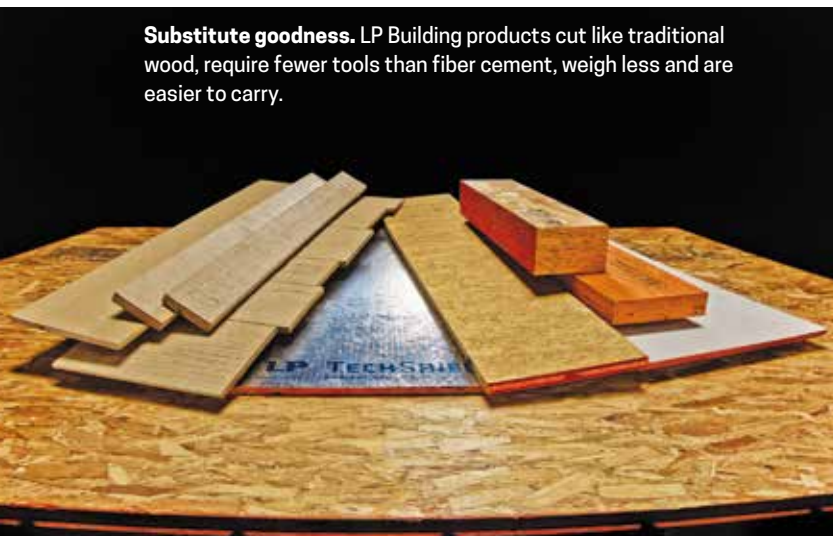
For example, the primary ingredient in LP Building Products' *SmartSide Trim & Siding* is wood, which is a sustainable and renewable natural resource. Furthermore, through responsible forest management, forests not only produce wood—they also help protect water quality, conserve biodiversity and provide wildlife habitat for a variety of species.

Using a trim such as *SmartSide* also helps create demand for forest products. With this, landowners have a financial incentive to keep working their forests instead of converting them for another use. This all helps to ultimately sustain rural communities and their economies.

Third, a well-planned trim and siding limits waste, ensuring that every piece of siding leaves the mill ready to use. *SmartSide* products work and cut like traditional wood, require fewer tools than fiber cement products, weigh less and are easier to carry. In addition, longer lengths may mean fewer seams and less waste.

The product itself needs durability. For example, *SmartSide* is treated to the core with its proprietary *SmartGuard* process, making it one of the most durable siding solutions available. Extensive product

**Substitute goodness.** LP Building products cut like traditional wood, require fewer tools than fiber cement, weigh less and are easier to carry.



CREDIT: LP BUILDING PRODUCTS

**Outside appeal.** LP *SmartSide Trim & Siding* resists hail, impact damage, harsh weather and other home exterior enemies.

testing has proven that the products resist hail and impact damage, stand up to harsh weather, and resist damage from termites and fungal decay.

Credibility is a must. To ensure all siding products are sustainable, LP Building Products' wood procurement process is third-party certified to Sustainable Forestry Initiative (SFI) Standards. Because all wood is sourced responsibly, the products may help builders qualify for green building credits.

In addition, certification provides supply chain assurances to customers, is a proof point for environmental stewardship, and adds value to the products and their reputation around the world. **GB**

Doug Rodman is sustainability manager at LP Building Products.

"Western Window Systems has been thoughtful of UV values and energy. The technology of their glass makes a huge difference."

- Mike Yakovich, Owner, Better Built, Inc.



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# FROM THE TAILGATE

New Offerings for the Sustainable Minded

By Ron Jones

## Here's to a 10-Year Winning Standard

**J**UST ABOUT THIS TIME OF YEAR a decade ago—yes, it really has been 10 years now—the Consensus Committee that had been seated to develop the first draft of the National Green Building Standard (NGBS, also known as ICC 700) and special members of the staff of what was then called the NAHB Research Center (which is now known as the Home Innovation Research Labs [HURL], which served as the secretariat for the project), submitted the work to the American National Standards Institute (ANSI) for official approval.

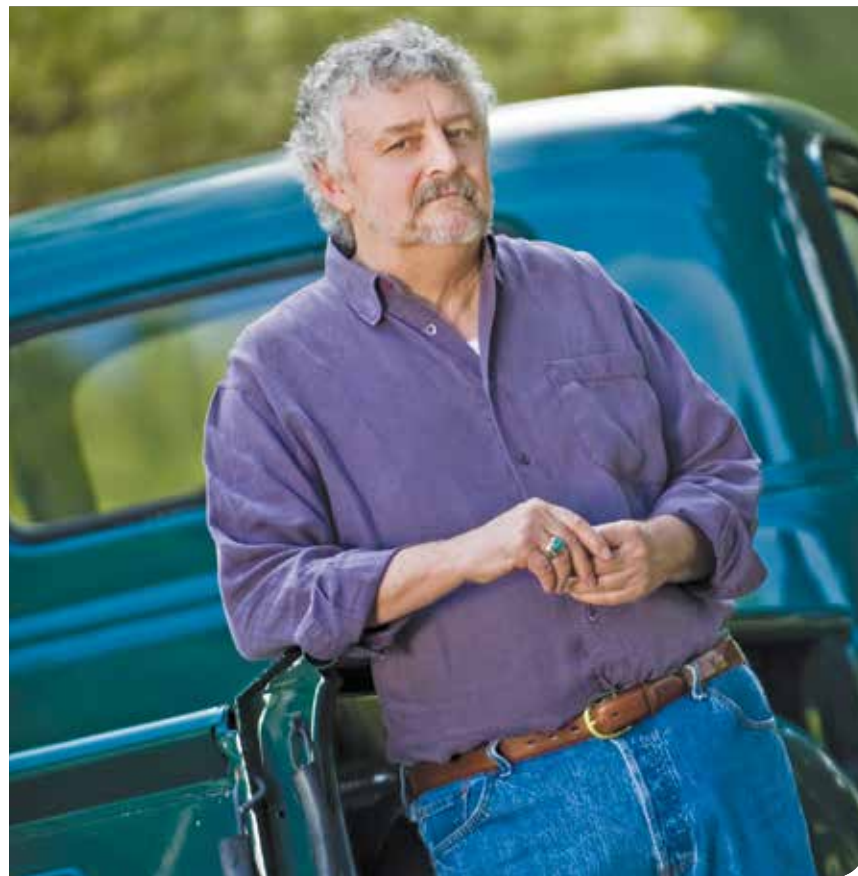
The committee had toiled relentlessly for the better part of two years. The 40 or so members, who represented an impressive cross section of the residential building sector, were guided by the aforementioned professional staff. They hammered out the draft that became an ANSI Standard in near-record time. It was formally announced and released for publication in fall 2009.

I had been given the privilege (some referred to it as the “punishment”) of chairing that committee. Late in the evening of the day we received the good news: I got an email from the man who was, and still is, the president of HURL. His name is Mike Luzier and he wrote to say that “after putting his children to bed, he planned to enjoy a celebratory glass of single malt, knowing that their future was brighter for our efforts.” He offered his feelings of satisfaction and appreciation for the success we had all been a part of.

After reflecting on that sequence of events, I recently gave him a call and we talked for the better part of an hour. I asked him to assess the current state of the NGBS and describe the evolution of the standard as it has undergone the mandatory review processes and updates in the ensuing years.

He described the standard as having “matured,” and the success of the program and the certifications as “just short of phenomenal.” He pointed to the fact that the entire initiative had been met with extreme skepticism and resistance in some quarters of the industry. There were powerful elements within the home building community who didn’t share our belief that a cost-effective yet rigorous and sophisticated program requiring third-party certification could penetrate the market.

He credited part of the resulting success to the fact that the program features timely response and certification within 24 hours of submittal. But most of it came from the wisdom of Michelle Foster,



who heads up the program and was first to recognize that there was a huge market for the certification in the multi-family arena, something most of us had honestly not foreseen.

Today there are almost 175,000 NGBS-certified housing units with thousands more in the pipeline. But perhaps more important than the numbers, I believe the standard helped get sustainability, building performance, resource management, healthy indoor environments and a host of other issues into the mainstream of the ongoing evolutionary dialogue of shelter in this country and around the world.

We still have a very long way to go—most especially in the single-family sector, where change is slow to come and incentives are sometimes vague and elusive. But just like the members of that committee and the determined staff of building champions who helped us reach the finish line, we can all continue to push the boulder up the hill and help dads capture a moment of reassurance that their kids have a chance at a better future after all. **GB**

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