



America's First Universal Design "Smart" Home

A call to action for a new \$20,000 tax credit for Universal Design homes and remodels.

By Charles M. Schwab, AIA, LEEDAP, NAHB, AARP with technical review by Walton Dutcher

By providing a \$20,000 tax credit for Universal Design (UD) housing, when new housing construction begins anew, the United States has a real opportunity to save hundreds of billions of dollars in long-term healthcare while encouraging long-term economic growth.

Universal Design (also known as Inclusive Design or "Aging in Place" when referring to housing) is the design of homes, products, and systems that work for people of all ages and abilities, a concept that was invented over 20 years ago by Mr. Ron Mace, AIA, an architect at the Center for UD in Raleigh, NC.

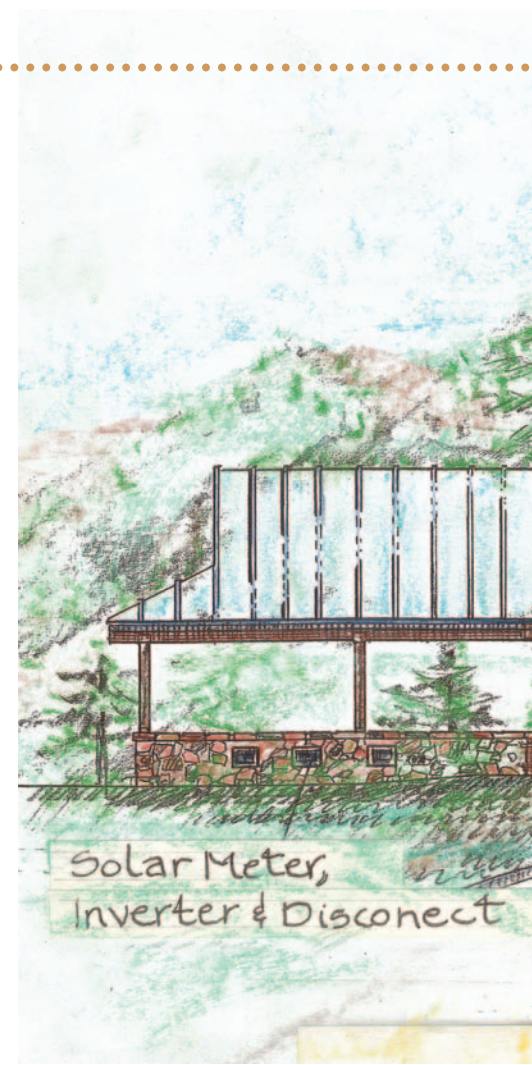
I believe that UD and "green" home building create the perfect synergy for new and existing homes if we are to "age in place" and build responsibly as we move through this 21st century. It is a precept for which I have been a proponent for many years. In July 2004 *EP* magazine featured an article I wrote entitled "A Stroll Through the Universal Designed Smart Home." It described the

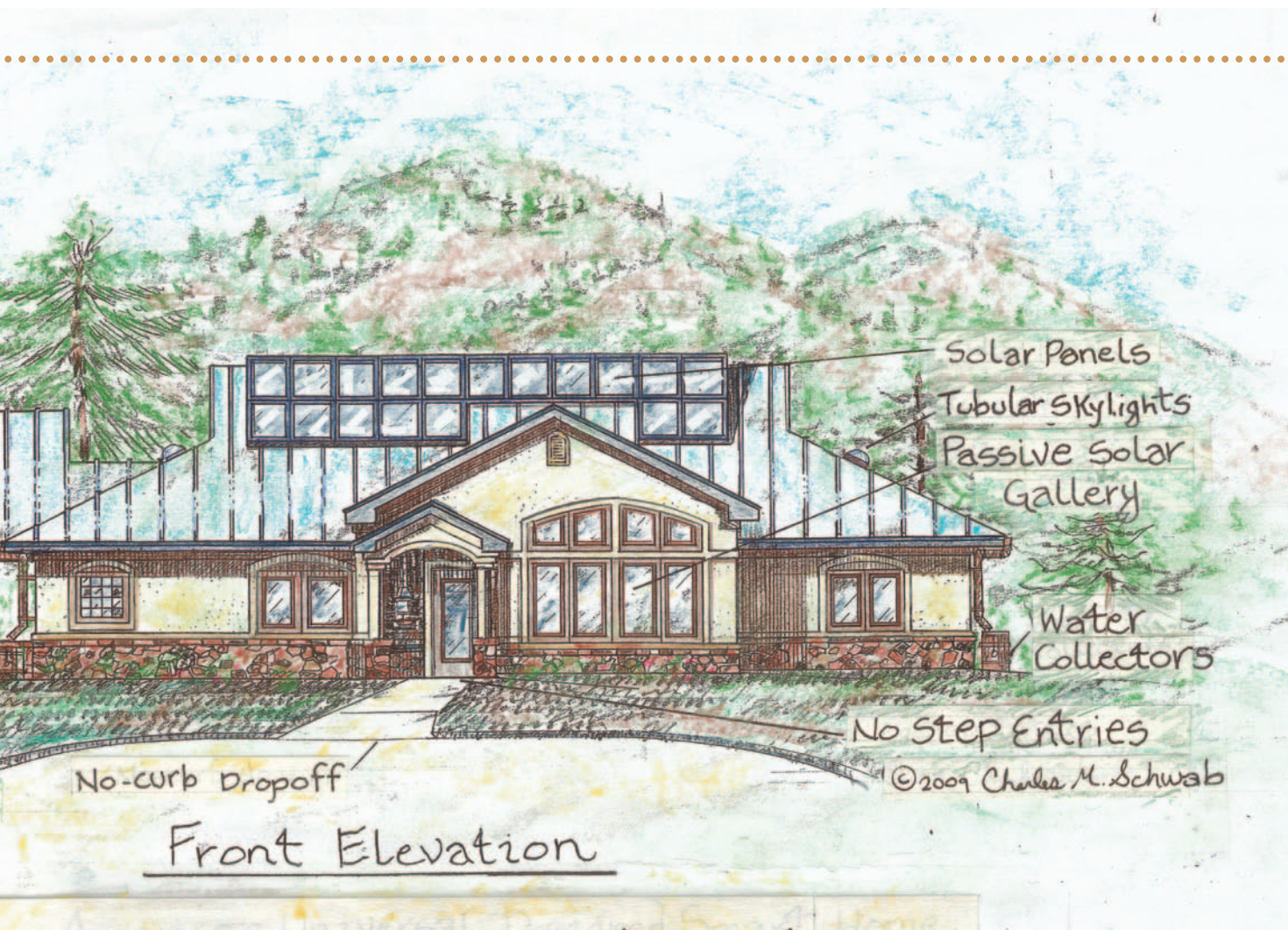
room-by-room features and benefits of a home that is designed for people of all ages and abilities, which forms the basic premise of Universal Design. In February of that year I also wrote and published the book, *Universal Designed "Smart" Homes for the 21st Century*, the country's first home plan book that includes both universal design and "green," sustainable design and products. At that time, the book contained 52 plans; the third edition now has 102 plans that can be ordered for construction. It also has a 25-page, room-by-room section that offers features and benefits, complete with resources and references that are applicable to both new homes and remodels/renovations.

Today, UD and green design make more sense than ever before. Consider this: On May 11, 2009 President Obama introduced "a new foundation for the economy." In his words, "As far as healthcare goes, we are currently on an unsustainable course. In the next 10 years, one-fifth of our economy will be spent on healthcare and costs will continue to

climb as baby boomers continue to age." In addition to the aging of the Boomers, there is also an increasing number of veterans returning home with disabilities. Additionally, we need to remember the growing numbers of children and adults who are overweight who would benefit from UD/ inclusive homes.

As part of the recent federal economic stimulus package, there were a myriad of "green" tax deductions or credits that include home products like solar panels, low-e window retrofits, weather stripping, energy efficient air conditioners, and point of use water heaters. This is fantastic, however, "green" home building is only a portion of what should be the long-term U.S. housing solution. In addition to a home being ecologically friendly, it should provide its occupants with a setting for "aging-in-place." Also, when homes are adaptable, people can live in them, but they can also work in them with telecommuting becoming ever more popular and a wonderful way to reduce the strain on transportation systems.





Prior to the recent passing of the economic stimulus package, the National Association of Homebuilders (NAHB) lobbied for a \$16,000 tax credit for new home construction. In the end, that provision failed. It may have failed because there are currently too many homes on the market. It would have also encouraged the same building practices that were developed at the end of World War II, when the Boomers were babies. These obsolete standards do not in any way allow for aging in place.

I believe there is another flaw; the NAHB proposal does not allow for home remodels/renovations or for accessory dwelling units (ADUs) that are essentially extra home space in the form of an ancillary apartment often used as lodging for elderly family members, thus the ADUs other alias, the “granny flat.”

The AARP (American Association of Retired Persons) studies have, for years, concluded that 75 percent or more of elderly adults would prefer to stay at home and age in place. So why not provide finan-

cial incentives and encourage them to remodel and live the rest of their lives in their own home? According to www.statehealthfacts.org, which is a project of the Henry J. Kaiser Family Foundation, states currently pay \$319 billion per year in Medicaid costs. A huge portion of this is for long-term care. By 2017, Medicare will be without funds; Social Security will spend more than it takes in by 2016 and be without funds by 2030. The year 2017 is only 8 years away! The time for UD home design is now.

A recent Met Life study showed that in Maryland assisted living averages \$3,700 to \$4,400 a month and a shared room in a local nursing home will top \$7,000 per month or \$84,000 annually! The least expensive annual cost for nursing home care is in Mississippi and Louisiana at about \$44,000 per year; the most expensive is in Alaska at about \$120,000 per year. For purposes of the calculations to follow, lets use a median of \$82,000 per year for institutional home care. Taxpayers typically carry

the burden of 75 to 80 percent of this cost.

The Nations Bureau of Labor Statistics reports that personal home healthcare aides are the nations second-fastest growing occupation. It projects a more than 50 percent increase in such jobs by 2016. Home care is also less expensive but not cheap, averaging \$19/hour in Maryland according to the Met Life Mature Market Institute. Hiring someone for four hours each weekday adds up to roughly \$1500 per month. Family members and friends continue to help on weekends and evenings. Many find themselves in the role of family caregiver as I did with my grandfather, and readers of *EP* are certainly familiar with the rigors of being a caregiver. My grandfather also wanted to stay in his own house as long as possible. After a series of strokes, his home did not work for him or for me and his other professional caregivers. Physical strain on caregivers naturally leads to physical problems and mental distress, and paid caregivers have a high incidence of physical injuries as a

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result of their profession. A home designed for aging in Place eases physical and emotional distress for everyone.

Advances in telemedicine and traveling doctors also make staying in the home setting and out of the hospital a viable alternative. Hospital stays continue to be the most costly of all healthcare expenses.

So instead of providing tax dollars for housing models that do not provide a long-term healthcare investment, why not invest in housing and remodels that utilize universal design? A one-time tax credit for a UD home makes infinitely more long-term financial sense than, for example, the median \$82,000 per year mentioned above, a number that will, quite likely, continue to rise in the coming decades.

When a person moves away from a UD home, that means an additional accessible home on the market, a home which will undoubtedly rise in value as the number of Baby Boomers entering their senior years peaks and demand grows for homes where they can age in place. Children with physical disabilities have these same needs for their entire lives. The long-term savings for them and for taxpayers would be immense. Because, remember, with universal design the precept is “design for all.”

According to the Harvard Joint Center for Housing Studies, in 2001 there were 119,117,000 homes in the U.S. Approximately 72,265,000 or 68 percent were owner-occupied. In the housing boom years between 2002-2007, there were an additional 8,447,000 new homes built, peaking with 1,613,000 in 2005 alone. It is fair to say that in normal building years, one million new homes per year is a reasonable estimate. In 2009, there may be only 400,000 new homes. According to the National Association of Remodelers, (NARI), exact figures of home remodels are not obtainable, but the Harvard Joint Center for Housing Studies notes that in 2007 homeowners spent \$174,235,000 on total home improvements. These figures are noteworthy in establishing a baseline of what is realistically possible with a new universal design home-build tax credit.

Using the median figure noted above of



\$82,000 spent on institutional care per year per person if a combined one million housing units, including both remodels and new homes, were built with UD/inclusive standards that would calculate to a savings of \$82 billion per year. Subtract the \$20,000 tax credit, which would reduce that to \$62 billion per year. Keeping in mind that there are roughly 80,000,000 Baby Boomers, when the Baby Boomer population peaks in about 10 years, that figures to a savings of over \$620 billion or more per decade.

In 2005 Illinois enacted an Accessible Housing Grant Demonstration Program. This program was only for new, speculative homes that had to meet four simple criteria. 1) The main front door had to be a no-step entry with a 36-inch wide door. 2) All interior passage doors in the home had to have a 32-inch wide clearance between doorjamb (casing). 3) Electrical outlets could not be lower than 15 inches and switches could be no higher than 48 inches. 4) Blocking had to be installed for future grab bars around the commode and tub/shower unit. (Remember: Universal Design is more comprehensive than the above minimums.) In the Illinois program, an architect was required to prepare and seal the drawings. The building inspector then reviewed the drawings for

compliance upon completion. The contractor was then sent a \$5,000 check.

A new UD home can cost as little as \$500 more than the current home building model. With comprehensive UD features, a family could pay four to five percent more for a new home with a basement; however, as illustrated above, in some states that can mean a long-term healthcare savings of \$100,000 or more per person per year. Thus the extra upfront building cost would pay for itself in time.

Home building is still and always will be the backbone of the U.S. economy. Home building contractors are in every state and city. AIA architects, NAHB contractors, and building inspectors are well-trained and ready to work. A recovery in our economy should begin with responsible housing construction.

The immediate job creation and economic stimulus will happen relatively quickly. This “smart” housing investment would provide long-term healthcare savings and provide long-term U.S. economic growth. The time is now to build and remodel homes with this country’s long-term healthcare needs in mind!

How can you help to promote the concept of UD and inclusive housing? Contact your elected officials on both sides of the

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Universal Design features in America's first UD "Smart" home

The home portrayed here is currently under construction in Vernal, UT. It is the first in America to include both universal design (UD) and "green" building features. The owners are ambulatory Baby Boomers who believe the long-term virtues of aging in place.

ENTRANCE AND SITE DESIGN FEATURES

- ◆ Entrances have a no-step entry and a minimum 5'-0" covered entry porch
- ◆ Carport is 28'-0" wide providing a 5'-0" center aisle between cars
- ◆ Min. 1'-6" maneuvering space adjacent to the latch side of doors
- ◆ Motion sensor yard light at all entries
- ◆ Walkways with a 1/20 slope. 1/2" maximum thresholds at doors
- ◆ A dedicated outlet located above the doors for installation of an automatic door opener
- ◆ Door lever handles throughout
- ◆ Adequate lighting at the large and easy to read street address
- ◆ Package bench at the front and back door.
- ◆ Entry doors are 3'-0" wide.

INTERIOR

- ◆ Clear opening of all passage doors is 32" minimum.
- ◆ 18" minimum is provided on the pull side of all doors.
- ◆ Adjustable closet rods in all closets and 50% min. of storage is no more than 54" high
- ◆ Glare free floor surfaces and counter tops,
- ◆ Floors are non-slip tile or low pile carpet.
- ◆ Casement windows are easiest to operate for seated people and those with arthritis.
- ◆ Stair to lower level is wide enough for future installation of a stair lift.
- ◆ Both sides of stairs have railings and extended 1'-6" at top and bottom for safety.
- ◆ Electrical outlets and floor jacks are 18", switches are 42" and environmental controls are 48" above the floor.
- ◆ Electrical box is 48" to the top for easy access.

KITCHEN

- ◆ A clear knee space of 29" min. allows a seated person to use the sink.
- ◆ Disposal is offset so a seated person can use it.
- ◆ Sink has a lever handle faucet, spray hose and a basin that is 6-1/2" deep for easy use.
- ◆ Varying height work surfaces allow for seated or standing use
- ◆ A built-in oven with open knee space and front controls for seated use between the cook-top.
- ◆ The oven has a pull out counter at the same height as the adjacent counter.
- ◆ Microwave oven is the new accessible drawer type with an adjacent pull out counter.
- ◆ The island has variable heights for sitting and standing and also has a prep sink opposite the double door refrigerator.
- ◆ Accessible electrical outlets are provided on the side of the island and in front of the counters or base cabinets.
- ◆ An open knee space is provided adjacent the refrigerator and has a rolling cart underneath a sliding pass thru window to the patio and near the eating area for easy rolling transport of dishware.
- ◆ The dishwasher is raised above the other counter heights.
- ◆ The counter tops have a bevel edge with contrasting color that make it easier for people with limited vision to differentiate the edge.
- ◆ The upper cabinets are 15" above the counter (not the typical 18") that makes it easier to reach above for seated people. Some have optional pull down-pop up shelves.
- ◆ The lower cabinets have an 8" kick space allowing use for a person who uses a wheelchair.
- ◆ All drawers have full extension hardware and open loop pulls.

- ◆ Halogen under cabinet lighting.
- ◆ A desk with open knee space adjacent adjustable shelves. There is a view from the desk to the carport and the mudroom entry door.
- ◆ Large pantry has narrow double doors and full extension shelf hardware.
- ◆ Vertical dish racks at counter height near the sink and near the rolling cart that can be used to serve the eating area.
- ◆ Tubular skylights and cove molding with dimmable up-lighting at the vaulted ceiling.

LAUNDRY

- ◆ Laundry sink and counter top are 34" high with open space underneath for seated use.
- ◆ Combined washer dryer is vent-less and has a front load door. It is raised for easy access.
- ◆ A gas line is provided for an optional front load dryer with a dryer box.
- ◆ Electrical panel is located at an accessible location.

BATHROOM

- ◆ Master shower is 4'-0" deep and 5'-6" wide and has a curb-less threshold with a flexible water retainer and a curtain or full open shower door. The shower unit can be equipped with grab-bars that can withstand 250 lb. vertical and horizontal forces.
- ◆ Water controls are offset and toward the front with an anti-scald / pressure balance control. The shower system has a hand held adjustable spray unit on a sliding pole and double showerheads.
- ◆ 5'-0" diameter turning space in the master bath and guest bath. The toilets in those rooms have a 3'-0" space in front of and beside the toilet for wheel chair transfer.
- ◆ Toilets are centered 18" from the sidewall.
- ◆ Walls are reinforced for future grab-bars.
- ◆ Master vanity is at an accessible height of 34" with an open knee space underneath. The other vanity is 36" high.
- ◆ Lower vanity has full extension cabinet hardware and hot pipe protection.
- ◆ Quality non-glare lighting is selected. The shower has a vapor tight fixture. There is
- ◆ A heat lamp is near the shower in both bathrooms and has a separate quiet exhaust fan.
- ◆ The master bath has an acrylic glass block operable window that provides natural light while providing privacy.
- ◆ The master bath exterior door provides access to the front porch and emergency egress. It also has glass block panels in the door that provide privacy and light.

HOME AUTOMATION

- ◆ The home has category 5 wiring for home automation and allows for installation of a Tele-medicine unit and home security. This allows for in home monitoring.
- ◆ Lights use dimmable linear slide switches.
- ◆ A thermostat that is programmable and has easy to read numerals.
- ◆ Motion detector sensor lights inside and out.

GREEN FEATURES IN AMERICA'S FIRST UNIVERSAL DESIGNED "SMART" HOME

- ◆ Insulated concrete formed walls (ICF) provide R-36 insulation and reduce air infiltration. They can withstand winds up to 150 mph.

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aisle and send them a copy of this article. I will be doing the same, including President Obama. Universal Design in home building, and beyond, is a positive change that makes good sense for everyone! •

Mr. Schwab, AIA is an architect and author of *Universal Designed "Smart" Homes for the 21st*

Century, which is available from the EP Bookstore at www.EPBookstore.com or 800-372-7368 or from Mr. Schwab directly. Mr. Schwab can be reached at 563-359-7524. Visit the Universal Smart Homes Web site at www.UniversalSmartHomes.com.

NOTE: CHARLES SCHWAB, AIA, AND ARCHITECT, IS NOT AFFILIATED WITH THE BROKERAGE FIRM BEARING THE SAME NAME

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- ◆ Photo Voltaic (PV) Solar panels for electric-ity generation
- ◆ South facing Solar Gallery collects heat during the day and releases it at night
- ◆ 2'-0" overhangs keep the heat off of the walls except at the solar gallery
- ◆ A complete Geothermal Heat Pump system for heating and cooling and hot water generation.
- ◆ Photovoltaic solar powered attic vents
- ◆ Energy recovery ventilator removes stale air, brings in fresh and retains heat or cooling.
- ◆ Four tubular skylights for natural light deep into the home
- ◆ Vaulted ceilings direct natural light deep into the home
- ◆ Low E windows
- ◆ Energy Star rated appliances.
- ◆ 1'-0" heel in truss provides complete R-38 formaldehyde free batt insulation within pre-fabricated trusses designed to eliminate wood waste.
- ◆ Point of use water heaters.
- ◆ Low flow aerators on faucets, shower heads and hand held hoses
- ◆ Water saving toilets at comfort height
- ◆ Water- less urinals in all bathrooms
- ◆ Rain water- bin collectors
- ◆ Native, indigenous landscaping
- ◆ Compact fluorescents that last 10 times longer and use 75% energy.
- ◆ Low VOC paints, stains and sealants promote clean indoor air. I refer to clean indoor air as the common denominator between "green" and universal design
- ◆ Passive radon emission system
- ◆ A safe-room protects from high winds and provides security

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