

# Sustainable Aging in Place

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## **Introduction - Aging Americans**

According to AARP “more that 18% of Americans are now retired. But, that number has increased by 6% in just the last five years. It will climb even faster as the Baby Boomers exit the workforce.

These adults, who are nearing retirement, are now one of the fastest growing demographics in the country and this horde of Boomers will keep the retirement boom going for the next few decades.

- 83% of the retired adults in the U.S now own their own home
- Thirty percent of retired adults have cash, stocks and CD's valued at more than \$100,000, the highest figure ever reported”

Predictions by the Census Bureau state that the number of Americans age between 45 and 64 and up will soar to 154.8 million by 2025. Much of that represents the aging of the huge baby boom generation. Most of these individuals will be on fixed income and will not be able to endure rapid escalation in electricity, heating and cooling, transportation and elder care costs. We only need to review our own utility bills over that last ten years to know that the prices have doubled or tripled. Based on what we know today, this is not likely to abate in the next 20 years.

Many folks like my wife and I, have value in homes that are no longer sustainable. My house has three areas, basement, first and second floors. But as we age, we become trapped on one floor because we can no longer navigate the stairs to the upper and lower floors. The taxes and utility bills that we could afford when we were young and working are suddenly infeasible when on a fixed income. Many of us will be forced to sell their homes and use these receipts to fund assisted living or nursing homes because there is no cost-effective elder care.

## **Statistics**

According to American Association of Homes for the Aging (AAHA), the statics are as follows:

### **Need for long-term care**

- Among people turning 65 today, 69 percent will need some form of long-term care, whether in the community or in a residential care facility.
- By 2020, 12 million older Americans will need long-term health care

### **Availability of elder care housing**

- There are 16,100 certified nursing homes in the United States.

- There are 39,500 assisted living facilities in the United States.
- There are 1,900 continuing care retirement communities in the United States.
- There are more than 300,000 units of Section 202 affordable senior housing available in the United States.
- For each Section 202 affordable senior housing unit that is available, there are ten eligible seniors on waiting lists for it. The average time an eligible senior is on the waiting list is 13.4 months.

### **Cost for elder housing**

- The average daily cost for a private room in a nursing home is \$213.00 or \$77,745 annually.
- The average daily cost for a semi-private room in a nursing home is \$189.00 or \$68,985 annually.
- The average monthly cost of living in an assisted living facility is \$2,969 or \$35,628 annually.
- The average monthly cost of living in a not-for-profit Continuing Care Retirement Community is \$2,672 or \$32,064 annually.
- The average monthly rate for assisted living facilities that charge additional fees for Alzheimer's and dementia care is \$4,270 or \$51,240 annually.
- To move into a community, individuals must also pay an entry fee ranging from \$60,000 to \$120,000.
- The average hourly rate for a certified home health aide is \$32.37.
- The average hourly rate for a uncertified home health aide is \$19.00.
- The national average daily rate for adult day centers is \$61.00 (2007 MetLife Market Survey of Adult Day Services & Home Care Costs)
- The national average hourly rate for homemakers/companions is \$18.00 (2007 MetLife Market Survey of Adult Day Services & Home Care Costs)

### **Who Pays?**

- Nearly 40 percent of long-term care spending is paid for by private funds.
- Medicare, which covers rehabilitation services after an individual is discharged from a hospital, pays for 19 percent of all long-term care spending.
- Medicaid, which covers health care costs for low-income individuals, pays for 49 percent of all long-term care spending.
- Accounting for about 40 percent of total expenditures on nursing facilities, Medicaid's payments cover the care of more than half of all nursing home residents.

### **Use of elder care housing**

- There are more than 1.4 million nursing home residents in the United States.
- An individual's average age when he or she moves into a nursing home is 79.
- Women are almost three times as likely to live in nursing homes as men.
- More than 900,000 individuals live in assisted living residences.

- More than 150,000 individuals receive care and services at an adult day center.
- There are more than 1.1 million seniors in some type of senior housing community in the United States.
- There are approximately 745,000 older adults who live in continuing care retirement communities in the United States.
- The average age of an individual moving into a continuing care retirement community is 78.
- Nearly 1.4 million individuals receive home health services.
- The average lifetime nursing home use per individual is one year, and the average home care use is a little over 200 visits.

## **Disappearing Assets**

As you can see, the equity in existing homes of the elderly can be quickly consumed and the elders forced to go on welfare. What a terrible way to finish a wonderful life.

## **What is needed is a paradigm shift to a model of Sustainable Aging in Place.**

My wife and I live in Newton, Massachusetts, a suburb of Boston. Our way too big home was great when our five children were here, but now they have moved on with their lives and only visit from time-to-time. Starting in the late 1970's we began a sustainable conversion by adding water and energy conservation systems and in 1981, I designed and we built an attached two story greenhouse to provide heat in the winter, grow food, purify the air and provide a higher quality of life at a lower cost of living- a sustainable strategy. However, in 1996, I was severely injured with spinal cord damage that left me a semi-ambulatory paraplegic – it gave me a preview of what it would be like to be in my 90's living in a way-to-big house with an inaccessible second floor and basement. When our children moved away and my wife retired we provided additional home security by renting a couple of rooms to male students from a nearby law school. It was comforting to know that they were in residence and it provided supplemental income as well. We began to contemplate our future in our house and it looked pretty bleak.

## **The premise**

Please keep this in mind: This is a new paradigm for the elderly and the retiring boomer community. The concept is to sell your inefficient home and buy or build one of the new energy and water autonomous homes such as the Del Porto Sustainable Duplex. Many will only use the second unit for visiting family. Others will use it to house elder-care folks and still others will rent as they need the income. A good rental tenant would be a young family who needs the benefits of an energy autonomous house that has a center atrium where the elderly owners could provide babysitting for their young children while they were out. The elderly benefit by have a young family who is looking out for them and providing security and assistance if required.

## **The mind set**

To understand this approach, you have to think like a 70 year old retiree who is contemplating, with fear and trepidation, what it will mean to live to be a 100 or so and what problems will be faced in the future. This is also true for every future generation, if we are to believe the revised life expectancy projections. Personally I can't imagine what it will be like to be on a fixed income and face, buying gas for a car, escalating heating, cooling, water and electricity costs. We are also concerned with personal security. The elderly and infirm are easy targets for muggers and home invaders. These were the motivating factors for my designing the Sustainable Duplex

## **Aging in place**

There is a new group of Newton women and men who are meeting on a regular basis to share issues and ideas about growing old in your existing home. Heretofore the idea was "Growing old in place" or a way to keep your old home and figure out how to stay in it by renting out rooms, installing stair climbers & elevators, renting basements for storage and learning how to find handy and elder care persons who do house calls. Now they are discussing selling their unsustainable homes wherein they reared their family and building or buying new energy autonomous homes like the Sustainable Duplex.

## **Sustainable aging in place**

Now I am offering something very new. The focus is on economic and physical security and the ability to access all parts of the home in a wheelchair, afford your old age and avoid expensive nursing home care. The exterior provides a secure defensible perimeter. The interior solar atrium or central courtyard provides a secure space to harvest solar energy, perhaps including mobile raised beds for flowers or food production or just to sit in the sun with friends. These folks will only need one plug-in or hybrid car and an electric scooter or two. These electric vehicles can be recharged by the photovoltaic system that powers the house. Therefore only one garage and an accessible storage area are needed per unit.

## **New Urbanism for the elderly**

The location should be in village centers so that the elderly can shop, socialize and attend to their medical needs by using an electric scooter - not a car. This is a form of new urbanism for the elderly.

Conventional building lots would be available, but often too expensive and far away from centers of activity. However, I'm also envisioning sites such as old commercial and industrial building lots in urban village centers that can be rezoned to provide more elderly and rental units. In our neighboring cities of Watertown and Waltham, I have seen many ancient, unsafe and often empty commercial buildings and deteriorating parking lots that should be sustainably razed (recycling demolition material) and replaced with a small cluster of Sustainable Duplex units. In Newton, many of the 13 villages have some of these downtown areas often behind the

commercial buildings fronting the streets. But what is important is that they should be located in villages that can be accessed by electric scooters and the basic services that the elderly will require.

## **Program elements for the Del Porto Sustainable Duplex (DSD)**

The following are elements that we want to see in the house:

The over-arching program is to have a home that is inherently secure in the broadest sense of the word for those of us who are elderly or infirm. The fundamental design will protect us from future, unpredictable expenses that will rise by inflation, climate or unforeseen changes. In order to achieve this goal the DSD will have the following elements:

- Building-integrated solar energy production to meet the entire need of the home
- HVAC that ensures health and productivity
- Natural day lighting
- Rain and stormwater harvesting treatment and storage
- Fire proof structure to reduce insurance requirements
- Universal design (unrestricted access for the elderly or handicapped)
- Greenhouse enclosed atria/center courtyard that can, if necessary, grow food
- Ecological sanitation or water reuse
- Minimal maintenance by design. Pipes and wiring chases on interior walls etc
- Security systems (internal and external)
- Electric vehicles that can transport us to local medical, shopping etc services
- Communication systems (wireless internet in every room)
- Not so big
- A second unit for rental income or living area for help or family

## **Some details**

The next are stream of thought elements that come to our mind as we develop the program and are not in any particular order:

- Fire-proof Structural Insulated Panels (SIPS) or Aerated and Autoclaved Concrete (AAC) wall, roof and floor systems with fire-proof windows. Or steel frame with non-flammable insulation, exterior concrete cladding and non-flammable interior wall board
- Solar thermal and photovoltaic power with combined heat and power (CHP) backup
  - All controls and heating units in a fireproof room supplied by outside air
- Roll-down external metal window and door security systems
- Radiant heating and cooling zones with PEX tubing in walls and floors.
- Heated driveways and walkways to eliminate hazardous ice and the need for snow shoveling
- Wall-mounted plumbing and wiring so walls need not be entered for repair or routine service
- Energy and heat recovery ventilators (ERV/HRV)

- Greenhouse with operable vents, window shades that save energy or provide shade
- Gardens with raised beds for wheel chair access
- Fire-resistant interior elements
- Proximity to village services and medical services that can be accessed by electric vehicle (EV)

### **In Summary**

So these are the programmatic issues that designers will be facing in the future and my wife and I are trying to address them for ourselves and for others who face an uncertain future. I hope this is helpful.

### **David Del Porto's Short Biography**

- Founding director: Newton Green Decade Coalition
- Chair: Sustainable Newton Committee
- Co-chair: Newton Renewable Resources Committee
- Vice Chair: Newton Solid Waste Commission
- Member: Newton High-Performance Building Coalition
- Professional activities: [www.ecological-engineering.com/delporto.pdf](http://www.ecological-engineering.com/delporto.pdf)