Universal Design,
A Key to Age-Friendly Salem

Valerie Fletcher, Executive Director
Institute for Human Centered Design
An international education and design nonprofit organization, headquartered in Boston and founded in 1978, dedicated to enhancing the experiences of people of all abilities, ages and cultures through excellence in design.
What IHCD does to meet that mission. . .

in the US and globally

◆ Education & Training on Accessibility and Universal Design

◆ Technical Assistance

◆ Consulting on Accessibility and Inclusive Design (physical + digital)

◆ Design Services (physical + digital)

◆ Research - Contextual Inquiry with “User/Experts”
Design powerfully and profoundly influences everyone and our sense of **confidence**, **comfort**, and **control**.

**2 core beliefs...**

Variation in ability is **ordinary**, not special, and affects most of us for at least part of our lives.

www.HumanCenteredDesign.org
“Why design if it doesn’t change the human condition?”

Niels Diffrient, Humanscale (1928 – 2013)
21st Century Demographics, Our gift from the 20th Century
20th Century Impetus
Social Sustainability

Profound *POSITIVE* impact of human behavior... 

We live longer and survive more than ever before in human history – across the globe
Global Aging

Number of people aged 60 or over: World, developed and developing countries, 1950-2050


Note: The group of “developed countries” corresponds to the “more developed regions” of the World Population Prospects: The 2010 Revision, and the group “developing countries” corresponds to the “less developed regions” of the same publication.
Distinct sub-sets with different life experiences and different needs and desires among people 65+
Old People are Not All the Same*

- Childhood/Adulthood/Oldhood
- Human diversity reaches its apex in old age
- Life is a three-act play

*13 August 2017
Louise Aronson,
Professor of Gerontology,
University of California Medical School
Massachusetts Ranks #14 for States for Median Age at 39.4 years

Baby boomers make up 24% of the Massachusetts population

The percentage of the population age 65+ has increased from 13.8% to 15.8% from 2010 to 2016
Massachusetts Demographic Realities to 2030

Figure 1: Projected Population Change by Age--Massachusetts, 2010 to 2030

- 0 to 44: 16,467 (0.4%)
- 45 to 64: -208,444 (-11.5%)
- 65 to 84: 500,556 (66.7%)
- 85+: 53,989 (34.2%)
1 in 7 people on the planet have a disability. 80% live in the developing world.
19% of the population

56.7 Million Americans with Disabilities

By age —
- 8% of children under 15 had disabilities.
- 21% of people 15 & older had disabilities.
- 17% of people 21 to 64 had disabilities.
- 50% percent of adults 65 & older had disabilities.

U.S. Department of Commerce

United States Census Bureau
Most common reasons for functional limitation among adults in the US

- Arthritis
- Back problems
- Heart disease
- Respiratory disease
- Sight + hearing limitations related to aging

★ Number of people with difficulty walking is 10X those who use wheelchairs
Sensory limitations of people in the US

Sight
17M over 40 with chronic visual impairments
(National Institutes of Health, 2014)
85% of people who are “legally blind” have low vision, just 15%
fully blind

Hearing
26.7M – 50+ with hearing loss (AMA, 2012)
15% of American adults (37.5 million) aged 18 and over report some
trouble hearing (NIH 2016)
.23% Deaf (cannot hear or understand speech)
Light!

Because of normal physiological changes, people in their 60s need three times more ambient light for comfortable reading than those in their 20s.
### Most prevalent types of disabilities for children in U.S.
13.1% of all youth age 3-21

<table>
<thead>
<tr>
<th>Disability</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Specific learning disabilities</td>
<td>4.9%</td>
</tr>
<tr>
<td>2. Speech/language impairments</td>
<td>2.9%</td>
</tr>
<tr>
<td>3. Other health impairments*</td>
<td>1.9%</td>
</tr>
<tr>
<td>4. Intellectual limitations</td>
<td>0.9%</td>
</tr>
<tr>
<td>5. Emotional disturbances</td>
<td>0.8%</td>
</tr>
<tr>
<td>6. Autism</td>
<td>0.8%</td>
</tr>
<tr>
<td>7. Developmental delay</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

* Other “health impairments “ include having limited strength, vitality, or alertness due to chronic or acute health problems. (US DoE)
A rising tide of brain-based conditions

**Alzheimer’s Disease**
- 5.4 M now
- 13.8 M by 2020

**Depression** is the most common mental health condition among older adults – 80% treatable

**Autism Spectrum Disorder**
- 1 in 68 children has been identified with ASD (CDC)

**Anxiety Disorders**
- 40M US adults per year 18 and older
3 broad categories of functional limitation:

<table>
<thead>
<tr>
<th>Physical</th>
<th>Sensory</th>
<th>Brain-based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>Sight</td>
<td>Neurological</td>
</tr>
<tr>
<td>Dexterity</td>
<td>Hearing</td>
<td>Learning</td>
</tr>
<tr>
<td>Strength</td>
<td>Speech</td>
<td>Developmental</td>
</tr>
<tr>
<td>Stamina</td>
<td>Touch</td>
<td>Mental health</td>
</tr>
<tr>
<td>Balance</td>
<td></td>
<td>Cognitive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brain injury</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substance Abuse</td>
</tr>
</tbody>
</table>
The floor of universal design: key issues from accessibility
Accessibility laws and codes recognize that design is a civil and human right for people with disabilities – now nearly global.

Accessibility is framed in terms of Rights + Responsibilities
But, today two unintended consequences prevail:

- An assumption that there is a sharp line between ‘us’ and ‘them’
- “Just tell me what I have to do” is inadequate
AND the standards focus overwhelmingly on one group:

- People who use wheelchairs
Two architects who had polio illuminated a new way to think about designing for people today

Ron Mace, FAIA - **US**

Stressed that we need to be clear about the difference between accessibility and universal design. Accessibility focuses on people with disabilities. Universal design anticipates human diversity and offers solutions at the general level.

1941 - 1998

Selwyn Goldsmith - **UK**

Critiqued accessibility as “top-down” provisions for people with disabilities. He argued for a shift to a “bottom-up” way of thinking that *reframes normal* as anticipating diversity of ability.

1932-2011
Universal/Inclusive Design
universal design...
inclusive design...
design-for-all?

...a framework for the design of places, things, information, communication and policy that focuses on the user, on the widest range of people operating in the widest range of situations without special or separate design...

Human centered design
(of everything)
with everyone in mind
Principles of Universal Design

Using the Principles of Universal Design one can better understand how good, thoughtful, design can affect all of us.

[Developed by a group of US designers and design educators from five organizations in 1997. Principles are copyrighted to the Center for Universal Design, School of Design, State University of North Carolina at Raleigh.]
Redefined Disability in 2001 . . .

- Functional limitation as a *universal* human experience
- *Equalized* mental and physical reasons for limitations
- Defined disability as a *contextual* variable:

Functional limitation becomes disabling based upon the intersection of person + environments

Environment holistically defined:

- Physical
- Communication
- Information
- Policy
- Social/Attitudinal
In refining disability as a contextual . . .

WHO recommended Universal Design as the most promising framework for identifying the “facilitators” responsive to the rising proportion of functional limitation and support independenc, quality of life and full community integration.
Ensuring enabling and supporting environments
Illustrations of Universal Design at Home
1. Equitable Use

The design is usable by people with diverse abilities.
Equitable Use

Features:

A. Multipurpose porch with electrical outlets
B. Entry with clear door width of 40”
C. Wide internal hallway with closet storage
D. U-shaped kitchen with more than 6 feet between opposing work surfaces
E. Adaptable layout with flex doors to change to two-bedroom layout from one or reverse
F. Bathroom next to main bedroom
G. “hard spots” included in ceiling construction for potential lift
H. Accessible half-bath in center of space
Equitable Use

- Good non-glare lighting
- Sidelight
- Zero step threshold
- Close parking area
- Sloped ramp with level landing
- Adequate coat storage
- Sidelight
- Large recessed walk-off mat
Equitable Use - the home office

Flexible height corner desk - Evodesk

Humanscale
Horizon light & Liberty Chair
Principle

The design accommodates a wide range of individual preferences and abilities.

Flexibility in Use
Flexibility in Use – renovation
Flexibility in Use

Rolling work bin

- Expands counter space
- A little truck for moving heavy things from one place to another

Courtesy: Jane Langmuir
The Use of design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.
Simple and Intuitive Use – the holy grail of remotes!

**HOW DOES IT WORK?**

Avoid Mistakes

**Locking** set-up prevents accidental reprogramming

Only Three functions

One-Touch **on/off** works both the TV & set top box, **volume** controls the TV and **channel** operates set top box

Program **favorite** channels for personalized viewing
Simple and Intuitive Use

Better Homes and Gardens
Sept 2001
Photograph
Joan Vandershuit
Simple and Intuitive Use

**caru**

Age where you want to.

Register normal routines
- Analyses the sensor data of room parameters – without using a camera.

Detects active alarm
- Reacts to keywords, such as "help!", or to the push of an emergency button.

Detects inactivity
- Recognizes altered routines and notifies the user.

Speakerphone
- Connects user to a trusted person or to an emergency call center.
Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user’s sensory abilities.
Perceptible Information – increasing natural light

Somerville renovation

(IHCD project)

- Extra light with new windows
- Work surface with good lighting and contrast
- Wall-mounted ovens
Perceptible Information

**Bed Light** Lighting When You Need Feeling Safe At Night

Undercabinet motion-sensitive lighting under the bathroom counter
Perceptible Information – visually permeable for a deaf couple

Courtesy, Robbie Nichols, AIA
Perceptible Information - thermostats

Nest Thermostat

- High contrast
- Easy to turn

VIP Talking Thermostat

announces day, time, room temperature and temperature setting.
Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.
Tolerance for Error

Induction cooktop
Tolerance for Error

Induction cooktop
Tolerance for Error

House numbers
2012 International Property Maintenance Code
Tolerance for Error – Stair safety

Integrate lighting into the stairs

Add a board to eliminate the nosing
Tolerance for Error

Stairs

- Handrails on both sides
- Color variation from tread to edge
Tolerance for Error

Toto Washlet

RETROFIT in any toilet – just needs an electrical connection
6 Principle

**Low Physical Effort**

The design can be used efficiently and comfortably and with a minimum of fatigue.
Low Physical Effort

Level threshold with good drainage
Japan
Low Physical Effort

Trash Compactor

Carrying & storing of household trash can be reduced by 75% to a single compactor bag per week for small households
Low Physical Effort

Easy reach everything – mix of natural and artificial light

Courtesy: James Pirkl
Low Physical Effort

Delta Faucet 2.0 technology

 Courtesy: Delta Faucet
Low Physical Effort

- Washer/Dryer
  - Front loaders with front controls
  - Well lighted area
  - Working surface above
Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user’s body size, posture, or mobility.
Size and Space for Approach and Use

Entry
(new construction)

Level entrance with a drain

Light above the door

Canopy

Side light for light in the hall and to see out

Door is good contrast to surrounding wall

Clear number
Size and Space for Approach and Use

Basement Renovation (Major) Arlington VA

- Overhead & “telephone” shower
- Lots of lighting
- Level shower
Limited Use Limited Application Home Elevator

- 25 feet maximum travel
- 18 square foot maximum car size
- Fully automatic controls
- Reasonably affordable as a retrofit or new construction
Size and Space for Approach and Use

Adjustable beds

Makes a significant difference for:

- Edema
- Back Pain
- Sleep Disturbances
- Pain Disorders
Size and Space for Approach and Use

Soaking bathtub

- Generous edge for sitting
- Easy to reach controls whether you’re inside or outside
- Window blinds are remote controlled
- Teak flooring on top, teak surround below

Courtesy: James Pirkl, FIDSA
How do we get there?
How do we get there?

Catalyze a community of **learners** and **innovators** who believe that life in all its variety is our collective good fortune and a vehicle for richer experiences.
**Strategy:** Still need to know what people need & want – Research *with real people in real places!*

- We need to understand what works and what fails for the **wide range of functional issues** among people.

- **Contextual Inquiry Research with “User/Experts”** who have developed expertise by means of their lived experience in dealing with the challenges of the environment due to a functional limitation.

- It builds data that informs design and helps to set priorities.
Strategy: Use municipal policy to make universal design a tool for age-friendly cities

- **Zoning adjustments** – support homeowners to create Additional Dwelling Units (ADU) in their homes for use by a family member

- **Loan Assistance** for home repairs & avoidance of foreclosure

- **Universal Design** as a policy for new multi-family residential projects permitted by the City

*In place now in California, Ireland, England, Norway, Singapore, Japan...*
Last points. . .

- Difference in ability is ordinary and *universal*
- Limitations are contextual – universal design is a framework for minimizing them
- Think holistically across the WHO 5 environmental contexts: physical, information, communication, attitude, policy.
Muchas Gracias!

vfletcher@IHCDesign.org
www.HumanCenteredDesign.org