

## How to Use Universal Design to Increase Your Business

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**Universal Design Living Laboratory:** Free report of the universal design features – A free chapter from the book *"Universal Design Toolkit"*; virtual tour; videos; articles; resource links; photos [www.UDLL.com](http://www.UDLL.com)

**Definition of Universal Design:** The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. *Ron Mace*

**Definition of Accessible Design:** Meets prescribed requirements set forth by the Americans with Disabilities Act, Fair Housing Act, or other mandatory requirements found in state, local, and model building codes.

**Definition of Adaptable Design:** Can be readily adjusted in a short time by unskilled labor without involving structural or finished material changes.

**Definition of Aging in Place:** The ability to live in one's own home for as long as confidently and comfortably possible. Livability can be extended through the incorporation of universal design principles, telecare and other assistive technologies.

**Definition of Barrier-free Design:** An approach to construction that takes into consideration the needs of those with a disability. Home feature examples include: ramps leading to the exterior doors; widened hallways that can accommodate wheelchairs; lower counter tops for ease of access; and the removal of doors and shelves under sinks for wheelchair access.

**Definition of Visitability:** An international movement to change home construction practices so that new homes offer three specific accessibility features. [www.ConcreteChange.org](http://www.ConcreteChange.org)

1. At least one zero-step entrance at the front, back or side of the house on an accessible route leading from a driveway or public sidewalk.
2. All main floor doors, including bathrooms, with at least 32 inches of clear passage space.
3. At least a half bathroom on the main floor that is wheelchair accessible.

**"Perceived Value of Visitable Housing in Ohio"**, Jack L. Nasar, City & Regional Planning, The Ohio State University and Julia R. Elmer, City & Regional Planning, The Ohio State University.  
<http://ddc.ohio.gov/Portals/0/visitability-report-6-15.pdf>

### Important Dimensions for Space Planning

- 5' turning diameter for wheelchair
- 30" X 48" – minimum approach in front of a sink & toilet
- Anthropometrics - Average adult in wheelchair
  - Vertical reach range – 18" - 48" high
  - Chair seat level – 20" high
  - Eye level – 4' high

**"Survey Finds Homebuyers Needs for Accessible Housing Are Unmet"** – August 21, 2015

Research conducted by Century 21

<http://adasoutheast.org/news/articles.php?id=7910>

## **PRINCIPLES OF UNIVERSAL DESIGN**

The authors, a working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments. *Text Copyright © 1997 NC State University, The Center for Universal Design*

### **PRINCIPLE ONE: Equitable Use**

The design is useful and marketable to people with diverse abilities.

- Provide the same means of use for all users: identical whenever possible; equivalent when not.
- Avoid segregating or stigmatizing any users.
- Provisions for privacy, security, and safety should be equally available to all users.
- Make the design appealing to all users.

### **PRINCIPLE TWO: Flexibility in Use**

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

- Provide choice in methods of use.
- Accommodate right- or left-handed access and use.
- Facilitate the user's accuracy and precision.
- Provide adaptability to the user's pace.

### **PRINCIPLE THREE: Simple and Intuitive Use**

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

- Eliminate unnecessary complexity.
- Be consistent with user expectations and intuition.
- Accommodate a wide range of literacy and language skills.
- Arrange information consistent with its importance. Provide effective prompting and feedback during and after task completion.

### **PRINCIPLE FOUR: Perceptible Information**

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings. Maximize "legibility" of essential information.
- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

### **PRINCIPLE FIVE: Tolerance for Error**

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

- Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warnings of hazards and errors.
- Provide fail safe features.
- Discourage unconscious action in tasks that require vigilance.

### **PRINCIPLE SIX: Low Physical Effort**

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

- Allow user to maintain a neutral body position
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

### **PRINCIPLE SEVEN: Size and Space for Approach and Use**

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

- Provide a clear line of sight to important elements for any seated or standing user. Make reach to all components comfortable for any seated or standing user.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.

## **Questions to Ask your Clients when Discussing Universal Design**

- Who will be living in the house with you?
- Are your parents, children, grandparents or grandchildren planning to live with you?
- Does someone in your home have special needs due to physical, sensory and/or medical impairments and will need selected features in the home to accommodate them?
- What health limitations do you or others you live with have that may impact the ease of living in your home?
- Do you or anyone you live with have difficulty entering or exiting your home, moving from room to room, or using the kitchen or bathroom?
- Do you have family members come to visit? Stay overnight? Do any have a disability?
- How long do you want to live here? Do you plan to live in your home through retirement?
- Have you engaged a design or building professional who is knowledgeable in adapting your living space to your lifestyle?
- Will it be cost effective to remodel the home with universal design features to make it accessible, adaptable and visitable?
- If something happens (i.e. a fall, broken bones, stroke, or dementia), can you and/or others still live in the home?
- Is it important to you to have a full bathroom and bedroom on the first floor?
- Did you know that many home improvements for disabilities are tax deductible?

## **Words to Better Communicate the Concept of Universal Design**

- |                    |                     |
|--------------------|---------------------|
| • Ease of living   | • Adaptable         |
| • Comfortable      | • Inclusive         |
| • Sustainable      | • Flexible          |
| • Safer            | • Convenient        |
| • Easier to access | • More independence |
| • More ergonomic   | • Better living     |

## Universal Design Books

- “Universal Design Toolkit: Time-Saving Ideas, Resources, Solutions and Guidance for Making Homes Accessible,” Rosemarie Rossetti, Ph.D., Rossetti Enterprises Inc., 2016
- “Human Factors in the Built Environment”, Linda L. Nussbaumer, Fairchild Books, 2014
- “Modern Ideas, Modern Living: Taking the Next Step in Home Design and Planning for the Lifestyle You Want”, The Hartford Center for Mature Market Excellence, March 2013.
- “Simple Solutions: Practical Ideas and Products to Enhance Independent Living”, The Hartford Center for Mature Market Excellence, March 2013.
- “Knack Universal Design: A Step-by-Step Guide to Modifying Your Home for Comfortable, Accessible Living” (Knack: Make It Easy), Barbara Krueger and Nika Stewart, Knack, an Imprint of Globe Pequot Press, 2010
- “AARP Guide to Revitalizing Your Home: Beautiful Living for the Second Half of Life”, Rosemary Bakker, Lark, 2010
- “Houses That Work for Life!”, Lisa Sandlin, Booksurge Publishing, 2009
- “Residential Design for Aging in Place”, Drew Lawlor and Michael A. Thomas, Wiley, 2008
- “Universal Design for the Home: Great-Looking, Great-Living Design for All Ages, Abilities, and Circumstances”, Wendy A. Jordan, Quarry Books, 2008
- “Accessible Home Design: Architectural Solutions for the Wheelchair User” Second Edition, Thomas D. Davies and Carol Peredo Lopez, Paralyzed Veterans of America Distribution Center, 2006

## Universal Design Checklists

- **“Easy Access Housing for Easier Living”** Developed by Easter Seals and Distributed by the Century 21 System.  
[http://www.easterseals.com/shared-components/document-library/easy\\_access\\_housing.pdf](http://www.easterseals.com/shared-components/document-library/easy_access_housing.pdf)
- **Remodeling Today for a Better Tomorrow:** Design Ideas for the Kitchen and Bathroom, The Hartford Center for Mature Market Excellence.  
<http://www.thehartford.com/sites/thehartford/files/remodeling-guide.pdf>
- **Shared Solutions America** is a national non-profit organization and resource center for education, technology, and funding alternatives for seniors and people of all ages with disabilities. Includes checklists, articles and information on livable and universal design homes.  
<http://www.livablehomes.org/checklist.html>
- **AARP** has a list of seven physical disabilities that can be addressed with universal design solutions.  
[http://www.aarp.org/home-garden/home-improvement/info-04-2005/home\\_special\\_needs\\_checklist.html](http://www.aarp.org/home-garden/home-improvement/info-04-2005/home_special_needs_checklist.html)
- **UniversalDesign.org** has 10 checklists that detail over 130 universal design features for homes. Use them to make sure you don’t miss anything important when working on a design.  
<https://universaldesign.org/checklists>