How architects see accessibility: code compliance
How owners see accessibility: ADA standards
How architects see accessibility: minimum = maximum
How the community sees accessibility
How the community sees accessibility

21% of population has a disability
Statistics: disability type by percentage (2005)

less than 10% of population has mobility impairments
less than 2% of population uses a wheelchair
Universal Design: Where we are coming from

1920s-1950s: no access...front door or rear
A brief history of accessible schools

1960s: some feeble...and dangerous...attempts
A brief history of accessible schools

1970s Rehabilitation Act: response and ineffectiveness
A brief history of accessible schools

1980s: change happens!
The ever-changing landscape of Federal accessibility standards
The ever-changing landscape of Federal accessibility standards
A brief history of accessible schools

1980s: effective standards
A brief history of accessible schools

1980s: effective standards, implementation challenges
A brief history of accessible schools

1980s: effective standards: **but does this work?**
A brief history of accessible schools

1995 to present: accessible design, but minimum becomes maximum
Universal Design: the challenge of social isolation
Where to put the door actuator buttons?

Where next? Going beyond the standards...
Where next? Going beyond the standards...
Universal Design: whole population

Where next? Going beyond the standards...
Universal Design: whole population

Where next? Going beyond the standards...
Seven Principles of Universal Design

1. **Equitable Use:**
The design is useful and marketable to people with diverse abilities.

2. **Flexibility in Use:**
The design accommodates a wide range of individual preferences and abilities.

3. **Simple and Intuitive:**
Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

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

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

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

7. **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.

(from http://www.design.ncsu.edu/cud/univ_design/princ_overview.htm and other sources)

These don’t always apply well in design fields. Perhaps follow them up...
Universal Design: Four Questions to Test a Design

• **Is it universal?**
  - Is it designed for a wide range of abilities and needs?

• **Is it effective?**
  - Does it actually work for the specific needs?
  - Has it been tested or at least reviewed by representatives of a wide range of users?
  - Is it supported by research, design standards, or other sources?

• **Is it welcoming?**
  - Does it feel natural and comfortable for all users?
  - Does it discriminate unnecessarily on the basis of ability?
  - Does it give the impression of disability-based discrimination?

• **Will the design solution be durable over time?**
  - Can it accommodate change through flexibility, adaptability, or adjustability?
4.27.1 **General.** Controls and operating mechanisms required to be accessible by 4.1 shall comply with 4.27.

4.27.2 **Clear Floor Space.** Clear floor space complying with 4.2.4 that allows a forward or a parallel approach by a person using a wheelchair shall be provided at controls, dispensers, receptacles, and other operable equipment.

4.27.3* **Height.** The highest operable part of controls, dispensers, receptacles, and other operable equipment shall be placed within at least one of the reach ranges specified in 4.2.5 and 4.2.6. Electrical and communications system receptacles on walls shall be mounted no less than 15 in (380 mm) above the floor.

EXCEPTION: These requirements do not apply where the use of special equipment dictates otherwise or where electrical and communications systems receptacles are not normally intended for use by building occupants.

4.27.4 **Operation.** Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N).
309 Operable Parts

309.1 General. Operable parts shall comply with 309.

309.2 Clear Floor Space. A clear floor or ground space complying with 305 shall be provided.

309.3 Height. Operable parts shall be placed within one or more of the reach ranges specified in 308.

309.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2 N) maximum.

EXCEPTION: Gas pump nozzles shall not be required to provide operable parts that have an activating force of 5 pounds (22.2 N) maximum.
Pattern:

Can the control be operated with a closed fist?

Many standard plumbing, electrical, and hardware controls can be. However, others can't, in particular door knobs, thumb latch locks, faucets that require grip, and so forth.
The standard uninspired solution to grade differences is to pick a ramp from the building code or from the ADA Standards. The results are seldom beautiful and sometimes don't work well for almost anyone. And if you try to build it at the maximum slope (1:12), it will almost invariably end up too steep.
Integrated Path

Make sure that accessible routes are a meaningful main route used by all.

Low Slopes / Short Ramps

Keep slopes at 5 percent or less except for short ramps (up to 12 - 15 feet long)

Shortest Path

Make accessible routes a direct and as short as possible (within the context of Low Slopes / Short Ramps). This suggests integrating grade changes into the direction of desired travel and avoiding back-and-forth ramps. [add UHCC examples]

Easy Climbs

Total vertical ascents of more than about four feet can be very tiring for many people. Avoid them or provide alternative means (such as an elevator).
Universal Design Case: Mobility, Cascade Courtyard
Universal Design Case: Mobility, Cascade Courtyard
Universal Design Case: Mobility, Cascade Courtyard

MOBILITY PATTERNS
- Integrated Path
- Low Slope/Short Ramps
- Shortest Path
- Easy Climbs
Universal Design Case: Mobility, Cascade Courtyard

Universal Design:
Is it universal? Does it discriminate unnecessarily on the basis of ability? Does it give the impression of disability-based discrimination?

Welcoming Design:
Is it welcoming? Does it feel natural and comfortable for all users? Does it give the impression of disability-based discrimination?

Effective Design:
Is it effective? Does it actually work for the specific needs? Has it been tested or reviewed by representatives of a wide range of users? Is it supported by research, design standards, or other sources?

Durable Design:
Will the design solution be durable over time? Can it accommodate change through flexibility, adaptability, or adjustability?

MOBILITY PATTERNS:
- Integrated Path
- Low Slope/Short Ramps
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Is it possible to use 5% slopes to create walks that connect levels without making people loop back and forth?
Is it possible to use 5% slopes to create walks that connect levels without making people loop back and forth?

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Universal Design Case: Mobility & Wayfinding, Knight Arena
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MOBILITY PATTERNS
- Integrated Path
- Low Slope/Short Ramps
- Shortest Path
- Easy Climbs

MOBILITY PATTERNS

60 feet

FUTURE UNIVERSITY
USE - ALUMNI CENTER
60,000 SF.

202'-3"
ABOVE-GRADE

180 feet
Universal Design Case: Mobility, Johnson Hall entrance

MOBILITY PATTERNS
Integrated Path
Low Slope/Short Ramps
Shortest Path
Easy Climbs
Universal Design Case: Mobility, Johnson Hall entrance

MOBILITY PATTERNS
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Universal Design Case: Mobility, Johnson Hall entrance

- MOBILITY PATTERNS
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MOBILITY PATTERNS
Integrated Path
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**Universal Design Case: Mobility, Johnson Hall entrance**

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**MOBILITY PATTERNS**
- Integrated Path
- Low Slope/Short Ramps
- Shortest Path
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## MOBILITY PATTERNS
- Integrated Path
- Low Slope/Short Ramps
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Universal Design Case: Mobility, Lawrence Hall
### Universal Design Case: Mobility, Lawrence Hall

#### MOBILITY PATTERNS
- Integrated Path
- Low Slope/Short Ramps
- Shortest Path
- Easy Climbs

#### Questions

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Universal Design: Vision

PATTERNS:

No Protrusion Hazards
Avoid items that protrude more than 4" above 24" (ADA Standards say 27") so that blind and low vision users are safe

Safe Crossings
Design vehicular areas with clear separation from pedestrian areas, either
- curbs at 1:12 slope, or
- 3' band of tactile pavement, or
- bollards with 3' maximum gaps

Effective Shorelines
Provide consistent edges to guide cane users and others
- vertical edges such as walls and curbs, or
- textural contrasts such as pavement to planting, or concrete to gravel, or paving type, and
- provide visual contrast along shorelines as appropriate

90 Degree Corners, No Curves
Provide clear circulation to enhance imageability
  Avoid curves and angles, use a rectilinear organization for circulation

Visual Contrast
Use light/dark contrast to emphasize stair hazards, shorelines, etc.
Universal Design: Curb Ramps - Mobility vs. Vision?

VISION PATTERNS
No Protrusion Hazards
Safe Crossings
Effective Shorelines
90 Degree Corners
Visual Contrast
Universal Design: Curb Ramps - Mobility vs. Vision?

VISION PATTERNS
- No Protrusion Hazards
- Safe Crossings
- Effective Shorelines
- 90 Degree Corners
- Visual Contrast
# Universal Design: Curb Ramps - Mobility vs. Vision?

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VISION PATTERNS
- No Protrusion Hazards
- Safe Crossings
- Effective Shorelines
- 90 Degree Corners
- Visual Contrast
Universal Design: Vision on Broadway

VISION PATTERNS
No Protrusion Hazards
Safe Crossings
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Universal Design: Vision on Broadway

VISION PATTERNS
No Protrusion Hazards
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90 Degree Corners
Visual Contrast
Universal Design: Vision (and mobility) on Broadway at Oak
Universal Design: Vision on Broadway

VISION PATTERNS
No Protrusion Hazards
Safe Crossings
Effective Shorelines
90 Degree Corners
Visual Contrast
Universal Design: Vision on Broadway at Willamette

VISION PATTERNS
No Protrusion Hazards
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Visual Contrast
Universal Design: Vision on Broadway at Olive

VISION PATTERNS
- No Protrusion Hazards
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- Effective Shorelines
- 90 Degree Corners
- Visual Contrast
Universal Design: Vision on Broadway

VISION PATTERNS
No Protrusion Hazards
Safe Crossings
Effective Shorelines
90 Degree Corners
Visual Contrast
Nice building!
Universal Design: Vision at the Health Center

VISION PATTERNS
No Protrusion Hazards
Safe Crossings
Effective Shorelines
90 Degree Corners
Visual Contrast
Universal Design: Mobility at the Health Center
Universal Design: Mobility at the Health Center
Universal Design: vision

Shoreline

Safe crossing

Wayfinding
Universal Design: Hearing

PATTERNS:

Protection from Fire
Provide visual alarms as part of the main fire alarm system. Provide bed shakers in sleeping areas.

Assistive Listening Systems
Provide personal amplification systems in all assembly areas and all areas with amplification systems.

Excellent Communication Acoustics
Design the room acoustics to maximize sound quality for all. In rooms designed for discussion, design for two-way acoustics. In rooms limited to presentation, maximize for presenter-receiver acoustics. In office environments, control ambient noise.
Universal Design: Hearing & Safety

HEARING PATTERNS
Fire Protection
Assistive Listening
Communication Acoustics
Universal Design: Hearing
First slide: Universal Design: Hearing

Second slide: HEARING PATTERNS
- Fire Protection
- Assistive Listening
- Communication Acoustics
Universal Design: Hearing

HEARING PATTERNS
Communication Acoustics
Universal Design: Hearing

HEARING PATTERNS
Communication Acoustics
Classroom materials of high sound absorption placed at ceiling/wall intersections, combined with carpet to reduce noise at the source, have the maximum effect on reinforcing speech in a classroom or seminar room. This approach works for the primary presenter and also for enhancing discussions.

Diagrams above from www.nonoise.org for use in teaching at the University of Oregon.
Universal Design: Four or Five Concepts to Test a Design

- **Is it universal?**
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- **Will the design solution be durable over time?**
  - Can it accommodate change through flexibility, adaptability, or adjustability?

and...
Universal Design: Conclusion

DON'T BE STUPID!

N.B: This is in no way a comment on any person, present or past, who has every worked as or for the Dean of the School of Architecture and Allied Arts at the University of Oregon. This image has been placed here to demonstrate to architecture students the importance providing vertical transport, in the form of elevators, at or near the main entrance of a building. In the example in the AAA Dean's Office shown above, what appears to be a round white column is in fact the hydraulic piston of an elevator added in the 1990's. It was designed at the right horizontal location but it only served upper floors, which is (to be blunt) stupid. If you still don't get it, send me a note and we'll talk about it sometime.
http://pages.uoregon.edu/ftepfer/access/