CORNELL UNIVERSITY
LIBRARY SIGNAGE

DEA 470: Applied Ergonomics

Course taught by Professor Alan Hedge

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Introduction

1. Wayfinding
2. Identification Signage
3. Instructional Signage
4. Emergency Signage
5. Decision Nodes and Path Complexity
1 Wayfinding
2 Instructional Signage
3 Identification Signage
4 Emergency Signage
5 Decision Nodes and Path Complexity
Wayfinding Signs

Wayfinding...

• Means knowing where you are, your destination, following the best route, recognizing your destination, and finding your way back out

• Principles for effective wayfinding include:
  1. **Differentiate regions** through differing visual character, while giving locations within a region a similar identity
  2. Provide signs at **decision points** to guide the user to their final destination
  3. Use **landmarks** to provide orientation cues and to indicate locations
  4. Create well-structured **paths** using sight lines to show what's ahead
  5. Don't give the user too many choices at one decision point
  6. Use survey views (give navigators a vista or map)

Remember ...

• **Location, location, location!**
• **Consistency is key**
• **Less is more**
Wayfinding Signs

Wayfinding tools include:
- Arrows and symbols
- Differentiation of basic sign types
- Sign Hierarchy

Arrows & Symbols
1. **Consistency**, in placement and size, is important to the legibility and success of your sign program

2. **Symbol signs** are much more effective when **incorporated** as an integral part of the overall program, and are required to accompany public facilities signing (i.e. toilet rooms), security signs (i.e. no admittance) and accessible entries and facilities (i.e. accessible ramps and entry doors)
Wayfinding Signs

Differentiation of Basic Sign Types
• This helps people to navigate throughout the building by following a series of sign types that eventually lead the user to their destination

• By strategically choosing and placing these sign types, information and direction are provided in the most useful and timely manner

• There are primary, secondary, supporting, destination, and branding/logo signs

• Signs can also be categorized into
  • Identification
  • Reinforcement
  • Orientation
  • Destination
Wayfinding Signs

Basic Sign Types: Identification, Reinforcement, Orientation, Destination

1. Identification/entry signage – Exterior
2. Reinforce arrival - Logos, flags
3. Reinforce arrival - Security desk
4. Orientation - Elevator floor range numbers/lobby services directional
5. Orientation - Lobby directory
6. Destination signage - elevators for an upper floor
7. Destination signage - specialty signage identifying a lobby tenant
Wayfinding Signs

Sign Hierarchy

There are two types of hierarchy:
1. Among signs
2. Within a sign

1. Among Signs
   • Identify appropriate location and type of each sign
   • Identify appropriate hierarchy and scale of each sign
     • Signs of equal size or emphasis do not distinguish the different messages - the user will not know where to find the most important information
     • You should emphasize certain sign messages through type size, typestyle or background color

2. Within an individual sign,
   • Information should be “layered” to improve legibility and help users make decisions faster and more accurately
Wayfinding Signs

ADA Wayfinding Sign Requirements

**Tactile Characters:**
- Raised 1/32"
- Accompanied by Grade 2 braille

**Typestyles:**
- Upper case & sans serif
- Width-to-height ratio between 3:5 and 1:1
- Stroke width-to-height ratio between 1:5 and 1:10

**Character height:**
- Tactile ADA characters at least 5/8" high, but no higher than 2"
- Minimum 3" high
- Sized to viewing distance

**Pictograms:**
- Text equivalent directly below
- Text outside of background area
- Background area 6” high

**Finish/Contrast of Characters/Background:**
- Eggshell, or matte non-glare finish 70% contrast between backgrounds

**Placement:**
- On wall next to latch side of door
- Avoids swinging doors - if door opens out, the horizontal center of the sign must be placed 9” from the edge
- Avoids protruding objects
- 60" from floor to sign centerline
- Minimum 80" clearance from floor
1. Wayfinding
2. Identification Signage
3. Instructional Signage
4. Emergency Signage
5. Decision Nodes and Path Complexity
Identification Signage

• Sign legibility is extremely important because users rely on identification to navigate the library.

• Includes signs that identify individual areas and rooms, as well as signs that identify the objects and applications found in these rooms.
  – Examples include restroom signs, signs designating a computer research area as well as those computers available for e-mail.
Within the Library

• Include:
  – Work desk signs
  – Café, food & drink, and vending signs
  – Room identification signs
  – Shelf identification signs
  – Computer workstation signs, availability of printers, e-mail, internet, etc.
  – Area signs for other resources (photocopies)
Considerations

- Legibility
- Color/Shape of sign
- Finish
- Contrast
- Fonts
- Braille
- Pictogram Usage
Identification Signage

Sign Legibility Rules

• All signs should be able to be seen immediately upon entry of building.
• There should be no obstructions between the signs and the users point of view.
• ANSI sign standards uses the ratio of 25 feet per inch of text to guarantee readability.
Identification Signage

Sign Legibility and ANSI Recommendations

Guide to Sign Legibility

The ANSI Z535.2 sign standard uses a ratio of 25 feet of viewing distance per inch of text height, assuming favorable viewing conditions. For unfavorable viewing conditions, this ratio lowers to 10.5 feet of viewing distance per inch of text height.

For more optimistic traffic sign ‘rule-of-thumb’ is 50 feet per inch of text height.

The safe viewing distance for a sign must be determined in your environment. Legibility depends upon many factors, including lighting, type font and visual acuity. Other factors to consider in choosing your sign size include the complexity of the message, the reaction times necessary to avoid hazard and the likely viewing angle of the sign. In the example above, a larger sign may be required if the person is moving or approaches the sign from an angle. In many cases, it is better to use multiple smaller signs that are strategically positioned than just a single large sign.
Identification Signage

Olin Library Legibility

• Measured distances from:
  – Second door to first overhead sign (15 feet)
  – To information desk (28 feet)
  – To circulation desk and Kroch sign (46 feet)
  – Total from second door to Reference desk info. Sign (89 feet)
    • Optimally this sign would have a font size of 3.5 to 4 inches (3.56 inches exactly)
• Overall, good sign legibility and font size in Olin Library
Identification Signage

Uris Library Legibility

- Security Desk: unidentified to users
  - Unknown purpose
- Circulation Desk: new signage needed
  - Identification sign blocked by users
  - Low contrast, fading, peeling
  - Small font size
  - Options include creating boundary lines to stop blockage or to place additional signage in front of line.
Identification Signage

Color and Shape

• Color
  – Blue or green for advisory or information

• Shape
  – Square or rectangle for advisory or information
According to the ADA, characters must have eggshell, matte or non-glare finish.

Notice the “dull” appearance of the first accessible entrance sign.

For easier readability, avoid signs with shiny or gloss finish (including metal, glass, and stone finishes).
Contrast

• According to ADA, characters must contrast with background by at least 70%
• Color value and contrast calculators available online (example shown below).
Identification Signage

Fonts

- Must use a sans serif or simple serif font
- Characters should be in title case if containing mixed information or all upper case if used as a title or headline.
- For room signs the font should be no less the 5/8” high and no more than 2” high
- Refer to sign legibility system shown earlier

Use Approved Fonts
- Use San Serif Fonts
- Serif Fonts are NOT Compliant
# ADA Quality Evaluation Table

<table>
<thead>
<tr>
<th>ADA Characteristics</th>
<th>Permanent Room</th>
<th>Directional</th>
<th>Overhead</th>
<th>Projecting</th>
<th>Temporary</th>
<th>Directories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finish</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Contrast</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Tactile</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Grade 2 Braille</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Case</td>
<td>U/C</td>
<td>U/C &amp;/or L/C</td>
<td>U/C &amp;/or L/C</td>
<td>U/C &amp;/or L/C</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Character Height Min - Max</td>
<td>5/8&quot; - 2&quot;</td>
<td>Table 2</td>
<td>3&quot; min.</td>
<td>3&quot; min.</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Character Width</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Line Spacing</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Character Spacing</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Stroke Thickness</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Mounting</td>
<td>48 - 60&quot; from copy baseline to floor. See Fig. B</td>
<td>40&quot; minimum from copy baseline to floor</td>
<td>Minimum 80&quot; clearance. Fig. C</td>
<td>Minimum 80&quot; clearance. Fig. C</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

Y = Required; N = Not Required
Identification Signage

Current Library Signage

Map Collection

This sign has:
- Good distance legibility
- The correct color and shape for identification signage
- The correct finish
- Good contrast
- The correct viewing font size
Braille Usage

• Room signs should use grade 2 Braille
• Should also have raised characters of at least 1/32”
• ADA does not require Braille on inserts, however should be used whenever possible to aid handicapped users.
Identification Signage

Pictogram Usage

- Cornell’s campus is very diverse: signs should be pictorial and as universal as possible

- This allows the signs to be independent of language barriers
Pictogram Usage

- Although optional, pictograms must be at least 6” high if used.

- The equivalent verbal description should be placed directly below it, along with Grade 2 Braille.
Identification Signage

Pictogram Specifics

- Solid shapes, not outlines
- Closed, simple, and unified boundaries
- Left/right symmetrical if possible
- Similar height and width
- Permit reversal (especially with directional)
- Placed in enclosures (preferred square or diamond)
Examples of Universal Identification Pictograms

<table>
<thead>
<tr>
<th>Identification Signage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Examples of Universal</strong></td>
</tr>
<tr>
<td>Identification Pictograms</td>
</tr>
<tr>
<td><strong>Fire Extinguisher</strong></td>
</tr>
<tr>
<td><strong>Telephone</strong></td>
</tr>
<tr>
<td><strong>First Aid</strong></td>
</tr>
<tr>
<td><strong>Litter Disposal</strong></td>
</tr>
<tr>
<td><strong>Information</strong></td>
</tr>
<tr>
<td><strong>Elevator</strong></td>
</tr>
<tr>
<td><strong>Restaurant</strong></td>
</tr>
<tr>
<td><strong>Lost and Found</strong></td>
</tr>
<tr>
<td><strong>Toilets</strong></td>
</tr>
<tr>
<td><strong>Coffeeshop</strong></td>
</tr>
<tr>
<td><strong>Stairs</strong></td>
</tr>
<tr>
<td><strong>Drinking Fountain</strong></td>
</tr>
</tbody>
</table>
Universal Disability Signage

- 54 million citizens with disabilities
- ADA provides pictogram icons that are universally accepted and should be used when possible.
Application of Pictograms

• These wall signs are examples of effective signs because they use symbols, text, and Braille.

• Substitutions may have to be made for services that don’t yet have international symbols (internet and e-mail)
1 Wayfinding
2 Identification Signage
3 Instructional Signage
4 Emergency Signage
5 Decision Nodes and Path Complexity
Instructional Signage

• Signage that describes behaviors, rules, or multistage tasks to the user.

• It informs students how to act in certain areas, what to expect, and where to go.
Within the Library

• Includes:
  • Cell phone areas
  • Talking/No talking areas
  • Rules
  • Hours
  • Restrictions
  • Guidelines (where to find printers, etc)
Considerations

- Legibility, Contrast, and Fonts
- Color
- Pictogram Usage
- Simplification
- Avoid Mixing Instructional with Identification Signage
Legibility, Contrast, and Fonts

- The same principles of these characteristics in identification signs apply for instructional signs as well:
  - Follow the ratio to determine font height for legibility
  - Have at least 70% contrast
  - Use a sans serif, solid font with proper use of uppercase or lowercase
Instructional Signage

Cornell Library Legibility

• Printer instructional signage:
  – Improved placement to warn users beforehand
  – Increased font size and high contrast color combination to get user’s attention
  – More concise, possible use of symbols
Instructional Signage

Color Characteristics

- This chart indicates the color associated with each type of sign along with their instructional meaning

<table>
<thead>
<tr>
<th>Type of Sign</th>
<th>Colours Used</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prohibition</td>
<td>Red</td>
<td>You must not / Do not do / Stop</td>
</tr>
<tr>
<td>Mandatory</td>
<td>Blue</td>
<td>You must do / Carry out the action given by the sign</td>
</tr>
<tr>
<td>Warning</td>
<td>Yellow</td>
<td>Caution / Hazard ahead / Risk of danger</td>
</tr>
<tr>
<td>Safe Condition</td>
<td>Green</td>
<td>The safe way / Where to go in an emergency</td>
</tr>
<tr>
<td>Fire Equipment</td>
<td>Red</td>
<td>To indicate fire equipment</td>
</tr>
</tbody>
</table>
Pictogram Usage

• Again, similar rules apply to Instructional pictograms as did to identification pictograms
  – Try to use universal symbols
  – Appropriate height of at least 6 inches
  – Solid symbols in enclosures
Instructional Signage

Simplification

• Use less colors to aid in hierarchy of information

• Use universal pictograms and restriction symbols
  – Will also reduce wordiness and make the sign more concise.

Current Periodicals and Newspapers Reading Room
Olin 101

This is a quiet research area

Please no cell phones, laptops, food or drinks

Please go to Olin 116 for library cards and billing questions.

Please go to Olin 213 for faculty study, graduate carrel, and locker questions.
Avoid Mixing of Identification and Instructional Signs

- Use international symbols/icons
- Try to avoid conflicting messages. If prohibition signage, keep it simple.
• Separate restriction and identification messages into two separate signs
• Use universal symbols where possible
  • Reduce the amount of overall text
Instructional Signage

Possible Solutions to Reduce Mixing of Identification and Instructional Signage

• Allows for separation of information
• Insert picture or text
• Can insert all restrictions into one feature
• Easy to change and replace with dynamic library needs.
Instructional Signage

Additional Solutions

- Can use one column to identify room and features while use other for instructional behavior and rules
- Allows change
- Easily accessible and identifiable
A New Idea for Possible Library Signage

- Place signage outside rooms that have the room name/number as well as pictograms of available services and resources found inside (printers, computers, café, etc)

- In addition, have written and/or pictogram representations of the regulations of the room (hours, talking, cell phones, etc)
1. Wayfinding
2. Instructional Signage
3. Identification Signage
4. Emergency Signage
5. Decision Nodes and Path Complexity
Emergency Signage

• **Objective** - draw attention rapidly and unambiguously to objects and situations capable of causing specific hazards.

• There are three different **failure modes** for safety signs:
  1. **Poor Positioning**: the sign is placed in an obscured or inconspicuous area
  2. **Information**: the sign fails to convey information in a comprehensible manner
  3. **Risk level**: the sign fails to develop a proper appreciation of the hazard

• **Effective Emergency Signage** should …
  1. Emphasize Action
  2. Use a Symbol
  3. Choose an Appropriate Heading
  4. Write in a Headline Style
  5. Describe Hazards and Consequences
  6. Provide Emergency Information
Emergency Signage

- ANSI Z535 standards defining proper format and content
- A safety sign is a visual alerting device, which advises the observer of a potential hazard
- The sign should be eye catching, and clearly convey the intended message
- “Safety signs may consist of a signal word, message panel, and/or a symbol.”
  - Signal words signify the degree of severity of an immediate hazard.
  - For uniformity, ANSI specifies certain colors for relative levels of risk.

Emergency Signage should …

1. Be eye catching
2. Clearly convey message
3. Include: signal word, message panel and/or symbol
## Emergency Signs

<table>
<thead>
<tr>
<th>SIGNAL WORD</th>
<th>RISK LEVEL</th>
<th>BACKGROUND COLOR</th>
<th>FONT COLOR</th>
</tr>
</thead>
</table>
| Danger      | • Imminently hazardous situation which, if not avoided, will result in death or serious injury  
• Should be limited to the most extreme situations |
|             |                                                                                                                                             | RED               | White      |
| Warning     | • Potentially hazardous situations that could result in death or serious injury                                                           | ORANGE            | Black      |
| Caution     | • Potentially hazardous situation which, if not avoided, may result in minor or moderate injury  
• May also be used to alert against unsafe practices                        | YELLOW            | Black      |
| Safety      | • Identification of safety equipment, first aid, or emergency egress locations                                                            | GREEN             | White      |
| Notice      | • Safety information and notices                                                                                                             | BLUE              | White      |
## SAFETY COLORS, SHAPES AND APPROPRIATE USES

<table>
<thead>
<tr>
<th>Safety Color</th>
<th>Shape</th>
<th>Meaning or Purpose</th>
<th>Examples of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED</td>
<td>ü</td>
<td>Stop</td>
<td>Stop signs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prohibition</td>
<td>Emergency shutdown devices</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prohibition signs</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td></td>
<td>This color is also used to identify fire fighting equipment</td>
</tr>
<tr>
<td>YELLOW</td>
<td>△</td>
<td>Caution</td>
<td>Identification of dangers (fire explosion, radiation, chemical hazards, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible Danger</td>
<td>Identification of steps, dangerous passages, obstacles,</td>
</tr>
<tr>
<td>GREEN</td>
<td>□</td>
<td>No danger</td>
<td>Identification of Emergency Routes and Emergency Exits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>First Aid</td>
<td>Safety Showers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>First Aid Stations and Rescue Points</td>
</tr>
<tr>
<td>BLUE</td>
<td>ü</td>
<td>Mandatory Signs Information</td>
<td>Obligation to wear individual safety equipment</td>
</tr>
<tr>
<td></td>
<td>□</td>
<td>Information</td>
<td>Location of Telephone</td>
</tr>
</tbody>
</table>
## Emergency Signs

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Indicates the risk level</th>
<th>Danger, Caution, Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Suggested Action</strong></td>
<td>Give the observer instructions on how to avoid the hazard</td>
<td>Do Not Enter</td>
</tr>
<tr>
<td><strong>Symbol</strong></td>
<td>Provides a quick reinforcement of the danger or safety message. Also, symbols are universal, broadening the audience able to comprehend the message.</td>
<td></td>
</tr>
<tr>
<td><strong>Border</strong></td>
<td>Used in addition to the symbol – Universal. Indicates how to act (i.e. Prohibition)</td>
<td></td>
</tr>
<tr>
<td><strong>Headline Style</strong></td>
<td>Use direct commands rather than informative statements.</td>
<td>“Wear Hard Hats” is better than “Hard Hats are Required”</td>
</tr>
<tr>
<td><strong>Mixed Case Lettering</strong></td>
<td>Legibility is increased if the lettering is mixed case. All uppercase lettering is difficult to read from far distances, or in poor conditions.</td>
<td></td>
</tr>
<tr>
<td><strong>Letter Height</strong></td>
<td>Signs should be the size which allows the first line of the message to be read from a sufficient distance to avoid the hazard.</td>
<td><em>See legibility table.</em></td>
</tr>
<tr>
<td><strong>Font/Background Contrast</strong></td>
<td>A minimum contrast of 70% is recommended for all safety signs. Anything less may make the signs difficult to read in unfavorable conditions.</td>
<td>Contrast calculators available <a href="http://www.asimodulex.com/servlet/doc">here</a></td>
</tr>
</tbody>
</table>
Legibility Guidelines

- Legibility depends on lighting, angle, type font and visual acuity
- The ANSI sign standards are based on a ratio of letter height to reading distance
  - Good lighting conditions - ratio is 1 inch of letter height for the sign per 25 feet of viewing distance.
  - Under less than favorable conditions - the ratio drops to 1" for 11.9 feet.

<table>
<thead>
<tr>
<th>Capital Letter Height of Warning Text</th>
<th>Reading Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (inches)</td>
<td>Good Conditions</td>
</tr>
<tr>
<td>1.0</td>
<td>25.0</td>
</tr>
<tr>
<td>1.5</td>
<td>37.5</td>
</tr>
<tr>
<td>2.0</td>
<td>50.0</td>
</tr>
<tr>
<td>2.5</td>
<td>62.5</td>
</tr>
<tr>
<td>3.0</td>
<td>75.0</td>
</tr>
</tbody>
</table>
1 Wayfinding
2 Instructional Signage
3 Identification Signage
4 Emergency Signage
5 Decision Nodes and Path Complexity
Things to note:
- Destination signage can come before secondary signage
- Destination signage should be perpendicular to the wall
  - Bathrooms
  - Stairs and elevators
- Exit signage to assist exit wayfinding
- More emphasis needed on location of stacks

Possibilities for location:
- Glass wall
- Hanging from ceiling

Possibility for relocation:
- Hanging from ceiling
- Sign Stand

Key
- Red Circle: Primary Decision Node, Sign Needed
- Blue Square: Secondary Decision Node, Sign Needed
- Red X: Destination Sign Needed
- Triangle: Existing Sign
First Floor

Possibility for additional sign location:
• Kiosk with floorplan

Things to note:
• Exit signage to assist exit wayfinding
• More emphasis on location of stacks

Key
- Primary Decision Node, Sign Needed
- Secondary Decision Node, Sign Needed
- Destination Sign Needed
- Existing Sign

Olin Library
Things to note:
- Primary Sign at entrance should include floorplan
- Secondary signage should emphasize location of stacks
- Destination signage should be perpendicular to the wall
  - Bathrooms
  - Stairs and elevators
- Use exit signage to assist exit wayfinding

Key
- Primary Decision Node, Sign Needed
- Secondary Decision Node, Sign Needed
- Destination Sign Needed
- Existing Sign
Possibility for relocation:
• Sign Stand
• Larger directional sign on wall
Thank You!