Wayfinding Information for Pedestrians who are Blind: International Practice

Billie Louise (Beezy) Bentzen.
Accessible Design for the Blind

ITE Wayfinding Workshop, Oct. 23-24, 2004
Japan, 1967--the first country to use warning and guidance surfaces to provide location and direction information.

Dot tiles at curb-ramps, blended curbs, and transit platforms are now commonplace throughout Japan.

Dot tiles used in association with bar tiles. Where a route indicated by bar tiles changes direction, a square of dot tiles indicates this change of direction.
Japanese pedestrian approaches an attention field
Japanese pedestrian has turned at attention field
Japanese concerns about lack of standardization of tactile surfaces

- Dimensions and locations for dot and bar tiles not based on research.
- No standard. Sometimes pedestrians who are blind can’t discriminate between dot and bar tiles, confusing one with the other.
- In the last 10 years Japanese researchers have carried out extensive research to standardize dimensions.
Floor exchanger--Tokushima
French research on guidance surfaces
Use of warning and guiding surfaces in other countries
Copenhagen
Barcelona
Netherlands
Netherlands
Netherlands
Portland, OR—curb ramp and platform edge
France
Audible pedestrian signals used in Japan >20 years. Most are loudspeakers on pedestrian signal heads. Most provide information during the Walk interval only. Some also provide a clearance interval signal. Intended to indicate the time pedestrians should begin crossing, and to provide directional information for crossing.
Japanese audible signal on mast arm for good placement
Japanese concerns about audible pedestrian signals

- Directional information was not very usable—same sound came from both ends of crosswalks.
- Research has supported the use of a signal that alternates from one end of the crosswalk to the other, as providing better directionality.
- Audible signals have been quite loud, so they could be heard throughout the intersection. Consequently they have disturbed neighbors and most are now turned off at 8:00 pm.
Ordinary ATS System
“Simultaneous” “same sound”

Japan
ATS System (1997)
“Alternate”
“same sound”
“Two-speaker-system”
Japan—
Remote infrared audible sign
A different accessible signal developed in Europe and Australia

- APS incorporated into pedestrian pushbuttons
- Provided a quiet, slowly repeating, locator tone or tick, indicating the location of the pushbutton and its associated crosswalk.
- A tone or tick having a faster repetition rate was used as the WALK signal indication. In some locations, the WALK signal was indicated by a knurled knob at the bottom of the pushbutton housing, which rotated during the walk interval.
- Some APS products included an arrow that vibrated during the walk interval.
Ordinary ATS system:
“Simultaneous” & “same sound”

Australia
Sweden
In some countries there has been research on the features and installation of tactile surfaces and APS, but, for the most part, they have developed from the desires of pedestrians who are blind, and the ingenuity of manufacturers. Some countries have standards for one or both of these systems. It is more common to have guidance documents only. The features and installation of these systems must vary according to the basic pedestrian infrastructure of each country, in order to provide optimal information to pedestrians who are blind.
HOW PEDESTRIAN INFRASTRUCTURE AFFECTS WHAT WORKS
Curb ramps oriented in the direction of travel on the crosswalk

- In some countries curb ramps are required to be oriented with the running slope in the direction of travel on the crosswalk.
- Pedestrians may use the direction of the slope for alignment for street crossing, although many users are not able to achieve precise orientation from ramp slope.
- Additional alignment information may not be necessary.
Barcelona
Austria
Curb ramps **not** oriented in the direction of travel on the crosswalk

- In some locations, curb ramps may be located at the apex, entire corners may be blended to street level, or the entire intersection may be raised to sidewalk level
- Then, curb ramp slope and orientation gives incorrect information about direction of travel on the crosswalk.
- Pedestrians who are blind are likely to miss-align for crossing.
- Additional alignment information is necessary.
Fairbanks, AK
A possible way to provide directional information
Pushbutton poles well-located at both ends of each crosswalk

- In some countries pushbutton pole placement is standardized for the perceived benefit of all pedestrians.
- Poles placed at both ends of a crosswalk, near the curb, and near the edge of the crosswalk (extended) further from the center of the intersection.
- The location of the pushbutton and locator tone clearly indicate the crosswalk served by the pushbutton.
- Two pushbuttons on a corner should be separated by approx. 10’.
- Unambiguous information is provided regarding which crosswalk has the WALK signal. There is no need for a two-tone system or speech messages.
Two Poles Near the Curb
Two Tones or Same Tone
Arrangement of Pushbuttons

Key

● = pushbutton location
□ = obstacle

(Neighbors)

Corner A
Corner B
Corner C
Corner D
Stub pole
Pushbutton poles are not consistently well placed

- Locator tone is essential for users to find the pushbutton.
- Two pushbuttons on the same pole, common in the U.S., require speech WALK signals to provide unambiguous accessible information regarding which crosswalk has the WALK signal.
- Sample message--“Walker. Walk sign is on to cross Walker.” This message may repeat throughout the walk interval, or it may be repeated once, followed by a tone.
Single Pole Far from the Curb
Two Tones or Speech Messages
Pedestrians cross no more than two lanes at a time

- In Sweden, many islands and medians have been added so that pedestrians rarely cross more than two same-direction lanes at one time.
- Pushbutton-integrated APS having rapidly repeating tones, have been installed at many intersections that have been optimized for pedestrian safety in this way.
- An APS is placed on every island and median, resulting in many APS at some intersections.
- It is easy to progress from one APS to the next, on the basis of either the WALK signal or the locator tone during the clearance interval.
Sweden
Crossings are wide

- All pedestrians who are blind veer some.
- Even a 5 degree veer on a wide crossing can take pedestrians who are blind well outside the crosswalk, often into the center of the intersection.
- Consistent vehicular flow parallel to the direction of the crosswalk may be used to maintain a straight crossing direction.
- Many pedestrians who are blind require some type of beaconing to help them cross straight across the crosswalk.
Wide crossing--Tucson
Crosswalks are skewed

Where crosswalks are skewed, and especially where there is not consistent vehicular flow parallel to the crosswalk, many pedestrians who are blind require some type of directional information to help them align to face in the direction of travel along the crosswalk.
Skewed crosswalk--Charlotte
Ways directional information may be provided

- A tactile arrow on a pushbutton-integrated APS that is aligned in the direction of travel on the associated crosswalk.
- A guidance texture preceding the detectable warning, with ridges parallel to the direction of travel on the associated crosswalk.
- A tactile guidestrip across the crosswalk.
- An APS having beaconing capability.
- Remote infrared audible sign
Danish tactile arrow
Canadian tactile arrow--vibrates
U.S. arrow--vibrates

Arrow should be aligned with direction of travel on crosswalk
Guidance surface--Netherlands
Danish guide strip
Japanese guide strip
New Jersey—
tactile crosswalk lines
Providing APS beaconing

- WALK signal tones coming simultaneously from both ends of a crosswalk don’t provide effective beaconing.
- In Japan, WALK signal tones that alternate from one end of the crosswalk to the other have been found to promote straighter crossing.
- Increasing the volume of simultaneous WALK signals and subsequent locator tones has promoted somewhat straighter crossings in the U.S.
- Remote infrared audible sign.
- There are other options under investigation in the U.S.
New ATS System (1998)

“Alternate”

“different sounds”

“Two-speaker-system”
Pushbutton information message

- Pushbutton message to provide intersection information
- Plays when pushbutton is pressed for 1 second or more
Speech messages

Model pushbutton information message where crosswalk is skewed

- Wait to cross Howard at Grand.
- Crosswalk angles right.

Model WALK message

- Howard. Walk sign is on to cross Howard.
Remote infrared audible sign