

Blind Navigation

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Goals

Basics on how to create a more accessible and safe built environment for the visually impaired.



- ✦ Where am I?
- ✦ How to get from one place to another?
- ✦ Where is the bus-stop?
- ✦ What is the best and most safe route?
- ✦ Where can I cross the (motor) road?
- ✦ Where is the button for the traffic lights?
- ✦ How do I know when it is safe to cross the road?
- ✦ Where is the entrance to the building I want to go to?
- ✦ Where is the room that I am trying to find?

Better accessibility for the visually impaired

- ✦ Contrasts
- ✦ Lighting
- ✦ Using lights to guide
- ✦ Using sounds to guide
- ✦ Guiding stripes
- ✦ Stairs
- ✦ Keeping the routes clean
- ✦ Tactile maps
- ✦ Verbal maps
- ✦ Printed information boards
- ✦ Digital information boards
- ✦ Mobile phones
- ✦ *Other things*

Lightning

- ✦ Light the environment evenly.
 - ✦ Avoid creating distracting shadows and glare from bright light sources.
- ✦ Ideal light: cloudy but dry weather at daytime.
- ✦ Brings different objects forward and on sight.
- ✦ Can be used to emphasise dangerous spots.

Lightning



Contrasts

- ✦ Emphasise important objects using good contrasts.
 - ✦ contrast between the floor and the wall
 - ✦ furniture
 - ✦ contrasting stripes
 - ✦ information boards and signs
 - ✦ differences in elevation

Contrasts



Good contrast doesn't help and matter
if the lighting is poor.

Good lighting doesn't help and matter
if there are poor contrasts.

Lighting and contrasts are
codependent on one another.

Using lights to guide

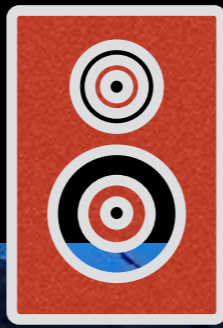
- ✦ Good lighting design can guide a person.
- ✦ It is possible to mount a light stripe to the ceiling (or floor) that can help finding the route to the destination.
- ✦ It is possible to mount a light in to the destination. Following that light will help the individual to find the destination.

Using lights to guide



Using sounds to guide

- ✦ Visually impaired persons use their sense of hearing a lot.
- ✦ Sounds and auditory cues can tell a lot about the surroundings.
 - ✦ road, air conditioning, a small river (stream), cash register, etc.
 - ✦ audible pedestrian signals (i.e. traffic lights)
- ✦ Sound beacons can attract attention to a specific location - follow the source of the sound and find the correct destination.
 - ✦ e.g. following a beeping sound will lead to a specific place such as the main entrance of a building or the elevator.



Guiding stripes / Tactile paving surfaces

- ✦ Guiding stripes help a person to stay on route and can also be used to alert the person.
- ✦ Guiding stripes are extremely important for persons with no or very low vision - persons using a white cane.
- ✦ It is even more important in large spaces where it is hard to get any tactile feedback using a white cane.



Guiding stipes (- - - - -) from Kamppi Shopping Mall



Guiding stipes / tactile ground surface indicators (Tokyo, Japan)





Stairs

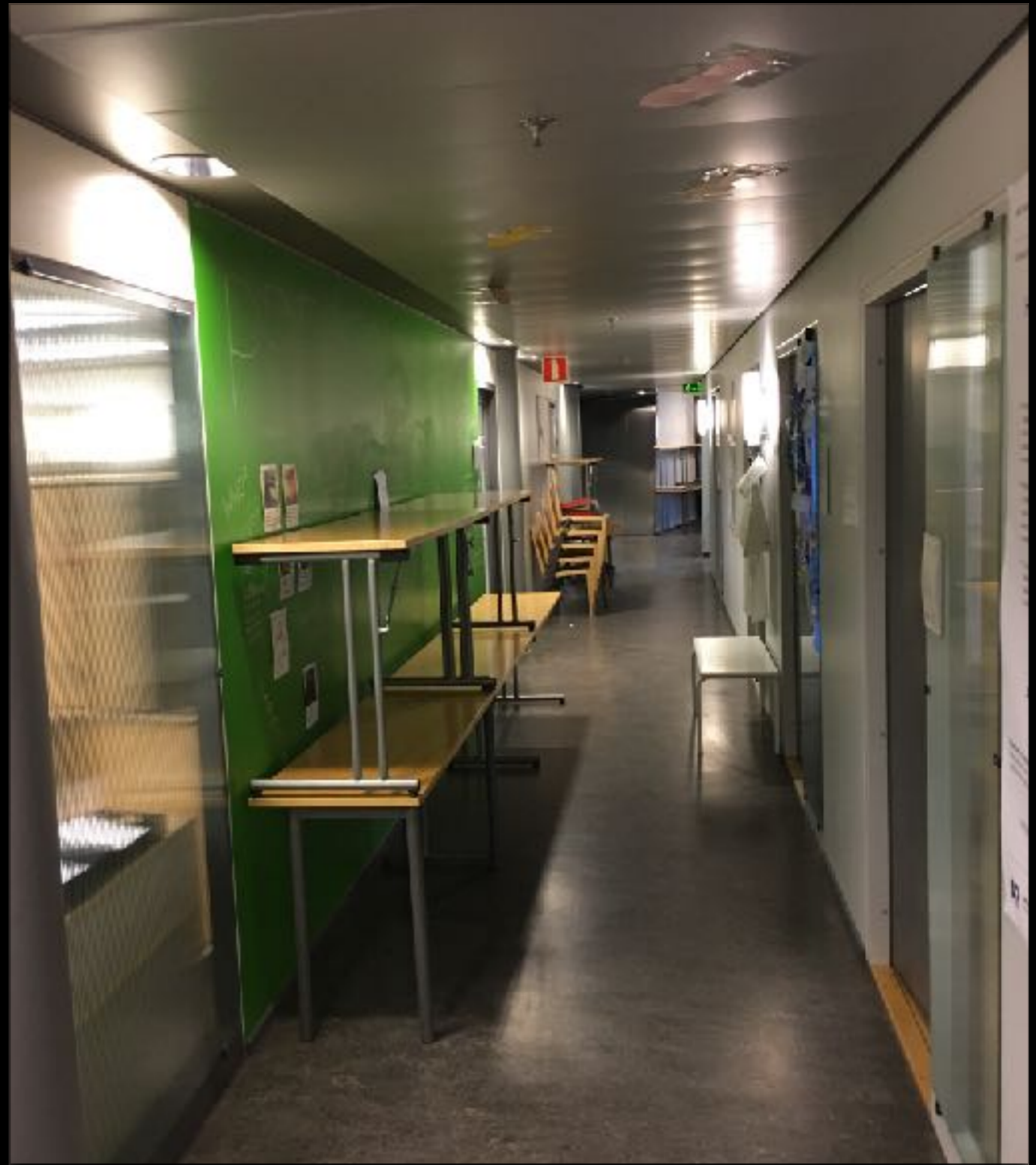
- Accessibility of stairs is a **safety issue**.
 - contrasting stripes at the step nosing
 - handrails - two handrails on each side at 70 cm and 90 cm
 - handrails should start 30 cm before the stairs and should be continuous all the way from the first step to the last step
 - good lighting - 500 lx (beginning and end) and 300 lx in the middle
 - tactile ground surface indicators (alert) 120 cm before the stairs
 - handrail: tactile braille type writing to indicate the floor





Keep the main routes clean and well organised

- ✦ Improves safety.
- ✦ In some situations the person needs to choose a different path (e.g. construction work, a lot of snow)
 - ✦ snow should be removed,
 - ✦ no unnecessary “stuff” laying around,
 - ✦ bicycles should be parked at their own places...

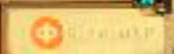






↑ ASPO

WUNDERDOG



COFFEE

LUNCH

WINE

ROASBERG

Tactile map

- Tactile maps that can be touched with hands made of a building or an area.
- It is important that tactile maps are kept simple and used to represent only the most important places:
 - WC / toilets
 - Information desks
 - Entrances
 - Elevators
 - Etc.



http://www.nkl.fi/fi/etusivu/esteettomyysratkaisut/ymparisto/opasteet-ja-ohjaavat-materiaalit/index.php?_file_display_id=5365

Verbal map

- Verbal description of the surroundings and the route.
- Makes it possible to describe long and complex routes.
- People can familiarize themselves with the route in advance
- Verbal maps are flexible and can be made very personal - for a specific person and/or for a specific location.

“Turn left from the elevators. Walk 20 meters forward. You should be able to use the wall on your left side from orientation. After walking 20 meters you should be able to find a guiding stripe with your white cane. Turn right and follow this guiding stripe for 25 meters and...”

Printed information boards (1/2)

- Good lighting (500 lx).
- In-line with the other information boards and guiding systems.
- Use language that is clear and easy to understand.
- Use standard well known symbols.
- Make sure that the information boards are easy to find.
- Make sure the information board can be read from a short distance as well.
- Accessible while standing or when using a wheel chair (140 cm to 160 cm).
- Use antireflective materials (- do NOT use glass).

Printed information boards (2/2)

- Room information is attached to the same side as the door handle.
- Good contrast between the text and background.
- Usually (not always) it is best to use light text on a dark background.
- Use sans-serif (i.e. without serifs) type fonts (such as Arial).
- Do not write everything in CAPS.
- Font size (height):
 - 15 mm: if read from a short distance
 - 25 mm - 40 mm: if there is a possibility to read from a short distance as well
 - 70 mm - 100 mm: when the reading distance is from 1 m - 3 m.

5

Näkövammaisten Kulttuuripalvelu ry
Retinitis-yhdistys ry
Fysioterapia-alan Näkövammaiset ry
Kokous 6, 7
Senioripalvelut
Oikeuksienvalvonta
Kuntoutus-liris
Lasten kuntoutus
Harjoituskoti
Majoitushuoneet 501-520
Daisy-projekti

6

Helsingin ja Uudenmaan Näköva
Näkövammarekisteri ja tie
Vapaaehtoistoiminta
Jäsenpalvelu
Järjestölehdet
Liikunta, nuorisotoim
Tiedonhallintapalvelu
Kokous 8, 9
Kansainväliset asiat
Tiedotus ja materiaalit
Hallinto ja talous
Äänittäjä
Takkahuone



Ensimmäiset lähdöt
Första avgångar
First departures

ma-pe
mån-fre
Mon-Fri

la
lör
Sat

su
sön
Sun

Matinkylästä Från Matby From Matinkylä	Vuosaareen Till Nordsjö To Vuosaari	5.09	5.09	6.09
Tapiolasta Från Hagelund From Tapio	Mellunmäkeen Till Mellungsbacka To Mellunmäki	6.00	6.00	6.37
Vuosaaresta Från Nordsjö From Vuosaari	Matinkylään Till Matby To Matinkylä	5.05	5.15	6.15
Mellunmäestä Från Mellungsbacka From Mellunmäki	Tapiolaan Till Hagelund To Tapio	5.20	5.20	6.20
Itäkeskuksesta Från Östra centrum From Itäkeskus	Matinkylään Till Matby To Matinkylä	5.11	5.21	6.21
	Vuosaareen Till Nordsjö To Vuosaari	4.54	5.04	6.04
	Mellunmäkeen Till Mellungsbacka To Mellunmäki	5.09	5.09	6.09



Viimeiset lähdöt
Sista avgångarna
Last departures

ma-su
mån-sön
Mon-Sun

Matinkylästä Från Matby From Matinkylä	Vuosaareen Till Nordsjö To Vuosaari	23.09
Tapiolasta Från Hagelund From Tapio	Mellunmäkeen Till Mellungsbacka To Mellunmäki	23.20
Vuosaaresta Från Nordsjö From Vuosaari	Matinkylään Till Matby To Matinkylä	23.05
Mellunmäestä Från Mellungsbacka From Mellunmäki	Tapiolaan Till Hagelund To Tapio	23.00
Itäkeskuksesta Från Östra centrum From Itäkeskus	Matinkylään Till Matby To Matinkylä	23.11
	Vuosaareen Till Nordsjö To Vuosaari	23.44
	Mellunmäkeen Till Mellungsbacka To Mellunmäki	23.49



Vuorovälit
Tunntervaller
Train intervals

ma-pe
mån-fre
Mon-Fri

18.30-20 ja
19.10-20
18.30-20 och
19.10-20

ma-pe 9-14
18.30-20 ja
19.10-20
18.30-20 och
19.10-20

min
min
min

matka
avstånd
other
times

Tapio - Itäkeskus Hagelund - Östra centrum Matinkylä - Tapiola	2,5	3,75	5
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14, 18, 20X,
180, 181,
183, 184



HSL
HRT

Kiitos, kun...

Tack för att du...

Please...



Käytä alijäsenen käsissä tai
tuolien pyöräkorissa,
mikäli ne on käytössä
tai trappeissa.
Use a staff or a bicycle
rack on the stairs to move between floors.



Viidat aina pyörää asemalaiturilla.
Alltid leder du cykel på plattformens bord.
Always walk your bike on station platforms.



Odota seuraavaa junaa, jos vaunu
on jo täynnä.
Väntä, på nästa tåg om tåget är fullt.
Wait for the next train if the carriage is full.



Ät lukitse tai kiinnitä pyöräsi tai jätä sitä
muiden tielle.
Inke låser, fäster eller lämnar din cykel så att den
blockerar gånger och utrymningsvägar.
Do not lock or leave your bike blocking
the way for others.



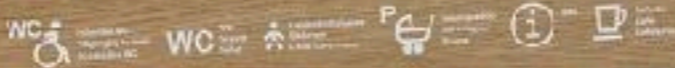
Huolehdi, ettei pyörä kaadu toisten päälle.
Seur till att din cykel inte faller på
medpassagerare.
Make sure your bike does not fall on other
passengers.

3

Leeren tapahtumatila
Satuluona
Leikkipöytäloru
Lasten aineisto
Aikakauslehdet
Kaupunkikirjallisuus
Varaukset
Lainaus
Tietokirjailisuus
Sanomalehdet
Kätkö Dodi

Aktivitetarum för barn
Sagorom
Lekparken Loru
Material för barn
Tidskrifter
Skönlitteratur
Reservetinner
Utåning
Facklitteratur
Tidningar
Kafe Oodi

Event space
Story room
Playground Loru
Children's materials
Magazines
Fiction
Reservations
Checkout
Non-fiction
Newspapers
Cafeteria Oodi

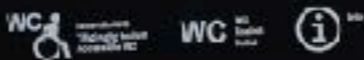


2

Ryhmätilat
Studiot
Pelitilat
Oppimistilat
Kopinointi
Tietokoneet
Kaupunkiverste
Lukusali
Kuntio
Työtilat
Kettio, oppimistila
Fitva-tietokanta

Grupprum
Studior
Spelrum
Rum för lärande
Kopiering
Datorer
Cityverkstaden
Läsod
Kuben
Arbetsrum
Kök, rum för lärande
Databasen Riiva

Group rooms
Studios
Game rooms
Learning spaces
Copying
Workstations
Urban workshop
Reading room
Kuntio
Workspaces
Kitchens, learning spaces
The Riiva Database

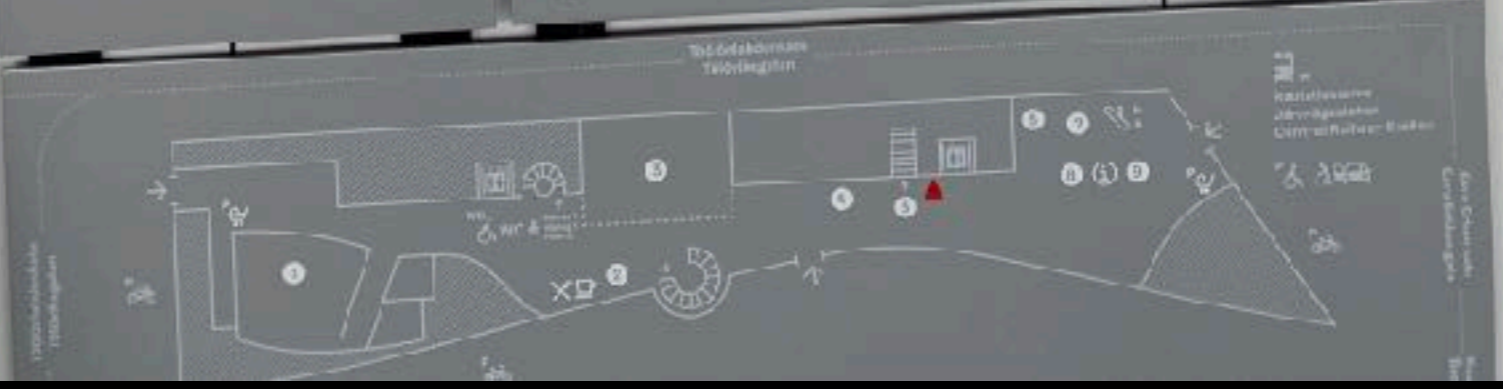


1

1 Kino Regina
2 Ravintola Oodi
3 Majansali
4 Palautus
5 Parvi
6 EU@Oodi
7 Pikakoneet
8 Helsingin info
9 Laina

1 Kino Regina
2 Restaurang Oodi
3 Ma ja-salen
4 Återlämning
5 Läffet
6 EU@Oodi
7 Drop-in datorer
8 Helsingfors-Info
9 Utåning

1 Kino Regina
2 Restaurant Oodi
3 Majansali
4 Resturres
5 The Loft
6 Europa Experience
7 Drop-in computers
8 Helsinki-Info
9 Checkout





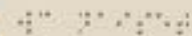
WC



WC



WC



KERROS / 2. FLOOR



1. KERROS / 1. FLOOR



HSL HRT **18 33**

AVGÅNG	LINJE	ÄNDSTATION	AVGÅNG	LINJE	ÄNDSTATION
18:34	95	Gungvägen	18:51	95	Gungvägen
18:34	550	Westendstationen	18:52	94	Gårdsbackabågen
18:35*	58	Munkshöjden	18:54	58	Munkshöjden
18:36	94	Gårdsbackabågen	18:54	561	Aviapolis
18:36	97	Mellungsbacka(M)	18:55	92	Kvarnbäcken
18:37	92	Kvambäcken	18:59*	54	Sockenbacka
18:39	554	Alberga	18:59	550	Westendstationen
18:42*	550	Westendstationen	19:00	841	Söderkulla
18:44*	54	Sockenbacka	19:05	97	Mellungsbacka(M)
18:44*	58	Munkshöjden	19:05	98	Rastböle(M)
18:45	98	Rastböle(M)	19:06	82	Hertonäs(M)
18:48	82	Hertonäs(M)	19:09	58	Munkshöjden
18:50	93K	Landbo	19:09	550	Westendstationen
18:50	97V	Mellungsbacka(M)	19:09	554	Alberga
18:50	550	Westendstationen	19:10	94	Gårdsbackabågen



Using mobile phones for navigation (1/2)

- ✦ Visually impaired persons can use their mobile phones for outdoor and indoor navigation.
- ✦ The most used mobile app for outdoor navigation for the visually impaired is BlindSquare.
- ✦ Indoor navigation works with bluetooth beacons (e.g. iBeacons) or using electromagnetic radiation that is unique in each spot.
- ✦ Outdoor and indoor navigation for the visually impaired is at its infancy but has seen a lot of development during the past few years.

Using mobile phones for navigation (2/2)

- ✦ Depending on the output power used bluetooth beacons have a range from 1m up to 70m.
- ✦ The battery inside a beacon can last almost two years.
- ✦ When a person is at the beacons range (e.g. 5m) the beacon can send a message directly to the user:
 - ✦ “You are now *here*. In front of you at 15 meters there is *...*. 20 meters from your left there is *...*.”

Other things

- ✦ Objects that are attached to the ceiling or the wall should have at least 230 cm free space underneath.
 - ✦ If the objects are placed lower than 230 cm there should be some tactile ground surface indicators to notice those using a white cane - mind your head.
- ✦ Good acoustical environment.
- ✦ Multi-sensory - if one sense is weakened other senses can be used to replace that - favourably all (other) senses.

Criteria (1/2)

- ✦ **Accurate:** The person knows where he/she is.
- ✦ **Safe:** It is safe to move and walk from one place to another for everyone.
- ✦ **Robust and reliable:** The design choices are robust and work even in rough circumstances (eg. winter storm, no electricity).
- ✦ **Continuous:** The guiding needs to be continuous from beginning to the end. Otherwise a person may get lost.

Criteria (2/2)

- ✦ **Multi-sensory:** Different guiding solutions complement each other. Eg. a person sees a guiding light, feels the tactile ground surface indicators with a white cane and hears a sound beacon.
- ✦ **Scalable:** The design solutions should be made so that they can be used in other places and situations as well.
- ✦ **Universal:** The selected solutions should support as many people as possible - not just a specific user group.

References and more info

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That's it!

Any questions?

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