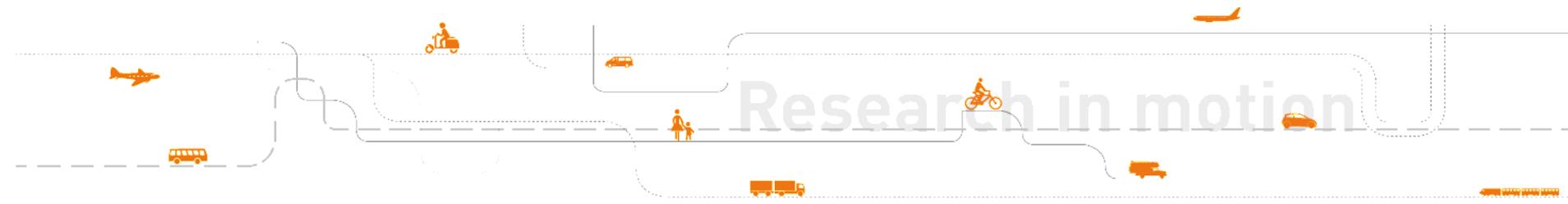


Searching for ways of improving usability, accessibility and safety for sight impaired people in complex transport environments

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Structure

1. Universal design and the situation in Norway
2. Research questions and methods
3. Usable environments and standards
4. Findings
 - *Knowledge*
 - *Standards*
 - *Practice*
5. Answering the research questions

Orientation and wayfinding

- *“The process of finding your way to a destination in a familiar or unfamiliar setting by using cues given by the environment” (Farr et al 2012:715)*
- *A common and easy process for sighted*
 - *Visually impaired to a greater degree rely on sounds, smells and changes in surface to orient*

What is Universal Design?

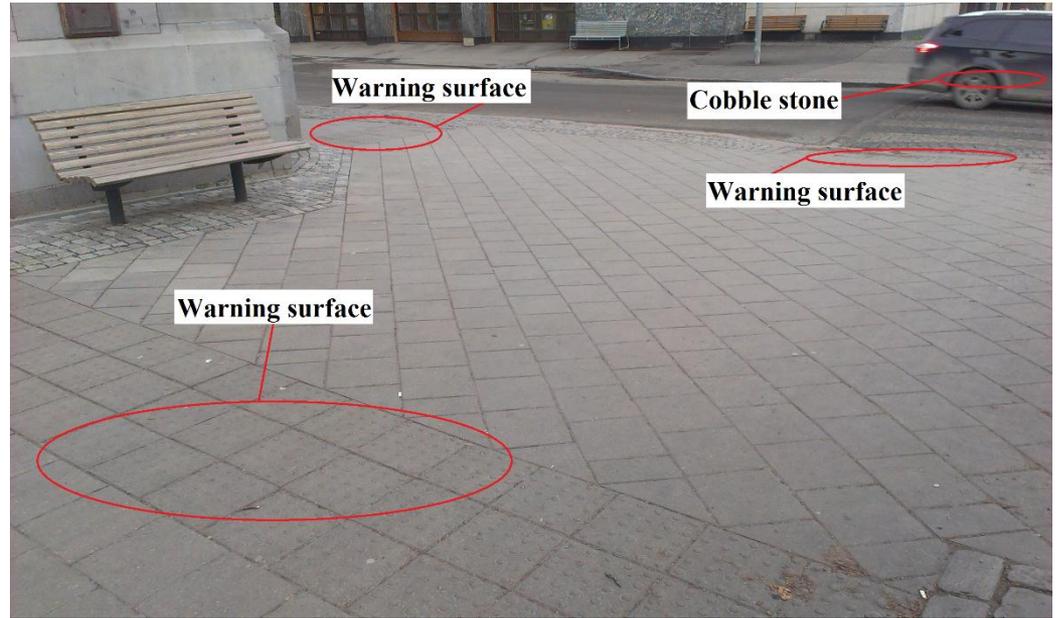
- Not one definition
- *The Norwegian Anti-Discrimination and Accessibility Act - “designing or accommodating the main solution [so it] can be used by as many people as possible”*

NPRA on Universal Design

- *“The walking area should be clearly defined [...] both visual and physical [...], and they should be continuous and easy to follow. Sidewalks or walkways with well defined borders are the easiest road elements for the visually impaired to follow. Most visually impaired will search for a marked border free of obstacles and dangers.”*

The situation in Norway

- Distinguish between natural and artificial lead lines
- *Natural* lead lines is the ideal facilitation
- *Specialized* tactile paving used for
 1. Warning surfaces
 2. Guiding path surfaces
 3. Information surfaces



Research questions

- Tactile paving seems to be chosen as a solution in situations where natural guidance could be possible
- There is a lack of consistency and homogeneity where tactile paving is laid out
- *How and why are some planning- and design processes producing such non-optimal results?*
- *How can the situation be improved?*

Methods

- Literature reviews and document studies
 - *Research literature*
 - *Norwegian standards, handbooks and guidelines*
 - *Scandinavian and foreign standards, handbooks and guidelines*
- Semi-structured in-depth interviews
 - *Authorities responsible for developing standards*
 - *Organizations representing visually impaired*
 - *Practitioners involved in planning, designing, building and maintaining built environments*
- Seminars with relevant stakeholders involved in or working with facilitation for visually impaired
 - 1st seminar – *input and contribution to our preliminary findings*
 - 2nd seminar – *quality control of findings and conclusions*

Which qualities makes a usable environment?

- Simple and logical organization of the physical environment
- Short distances
- Obstacle-free walkways
- Warning of danger
- Smooth, even paving
- Crosswalks perpendicular to the kerb
- Strong tonal contrasts
- A coherent system of natural lead lines complemented with tactile paving where necessary

The standards should

- ...contribute to ensure coherently designed streetscape
- ...ensure that usability for visually impaired is given priority (in competition with other considerations)
- ...be based on practical and scientific knowledge on how visually impaired:
 - *orient themselves,*
 - *find their way,*
 - *use different elements in the built environment for this.*
- This knowledge must be translated into relevant and usable requirements and recommendations.

Findings: Scientific knowledge

- The research literature mainly focus on tactile paving, and how visually impaired use these
- Little empirical research relate to how the built environment should be organized and designed to facilitate orientation and wayfinding for visually impaired
 - *Atkin (2010) - empirical studies on how visually impaired* make use of natural and artificial guiding elements*
 - *with different grades of sight loss and different assistive devices
 - *Ståhl and Almén (2007) - found that natural guiding elements are superior to artificial when it comes to orientation and wayfinding*

Main finding: Scientific knowledge

A lack of systematic and empirical research leads to standards, handbooks and guidelines not being able to carry on knowledge into standards and to practitioners on how streetscapes should be designed to be usable and safe for visually impaired

Findings: Standards, etc.

- Natural lead lines are the first choice and best solution
- There is a general lack of descriptions, examples and illustrations of natural lead lines
- Tactile paving is described in much more detail
- Recommended solutions are not justified or explained

Main finding: Standards, etc.

Current standards, handbooks and guidelines are not sufficient guidance for encouraging practitioners to emphasize natural lead lines as the preferred solution and ensure consistency in tactile paving systems.

Findings: Practice

Our interviewees

- ...good knowledge of the basic principles in universal design
- ...try to facilitate the built environment with natural leading elements
- ...standards not being helpful in complex situations

Findings: Practice

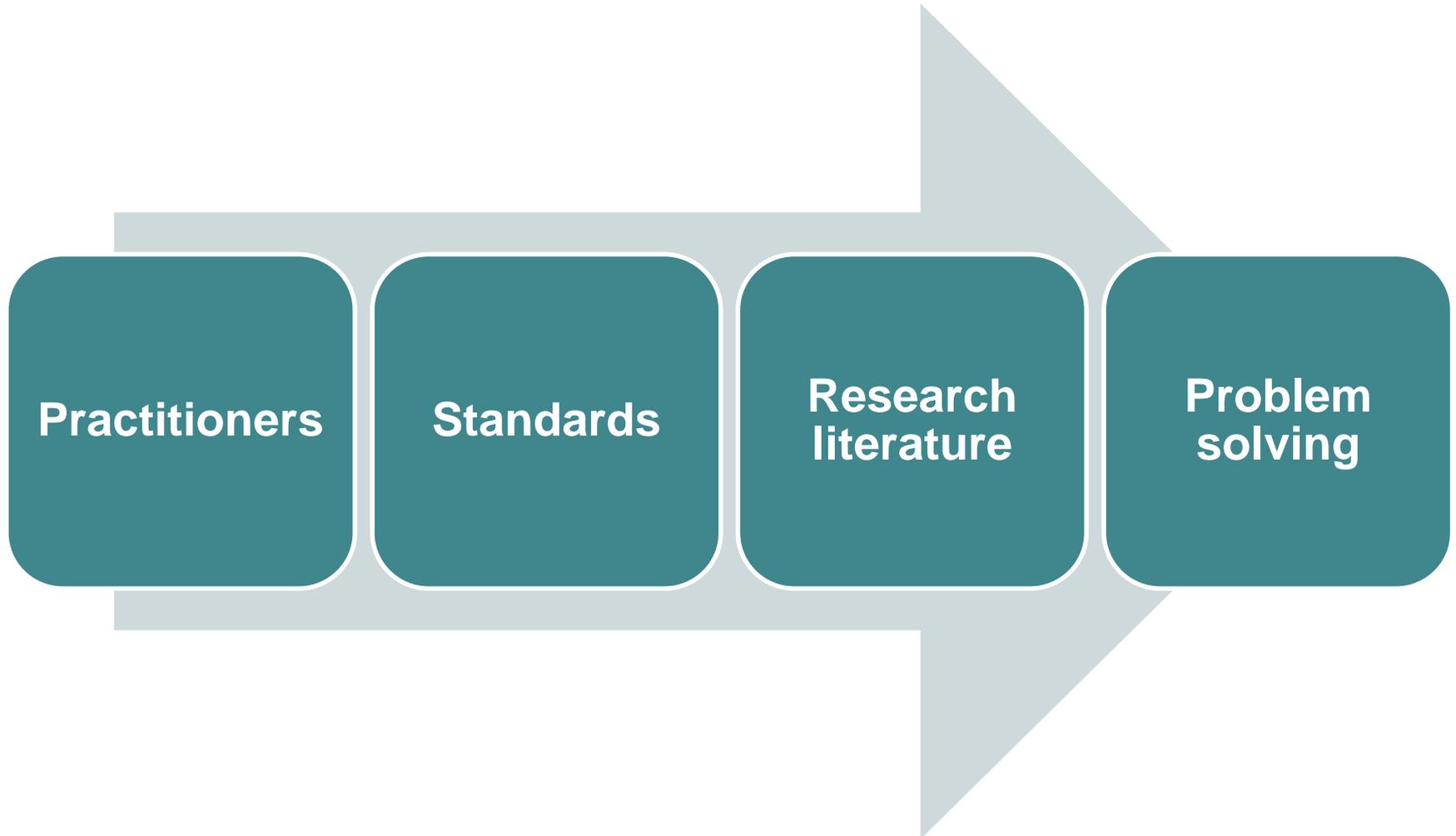
- Universal design are often considered too late in the planning and design process
- Struggle regarding prioritization between various groups, values and objectives
- User consultations in need of professionalism?

How and why is tactile paving used where natural lead lines would be a better solution?

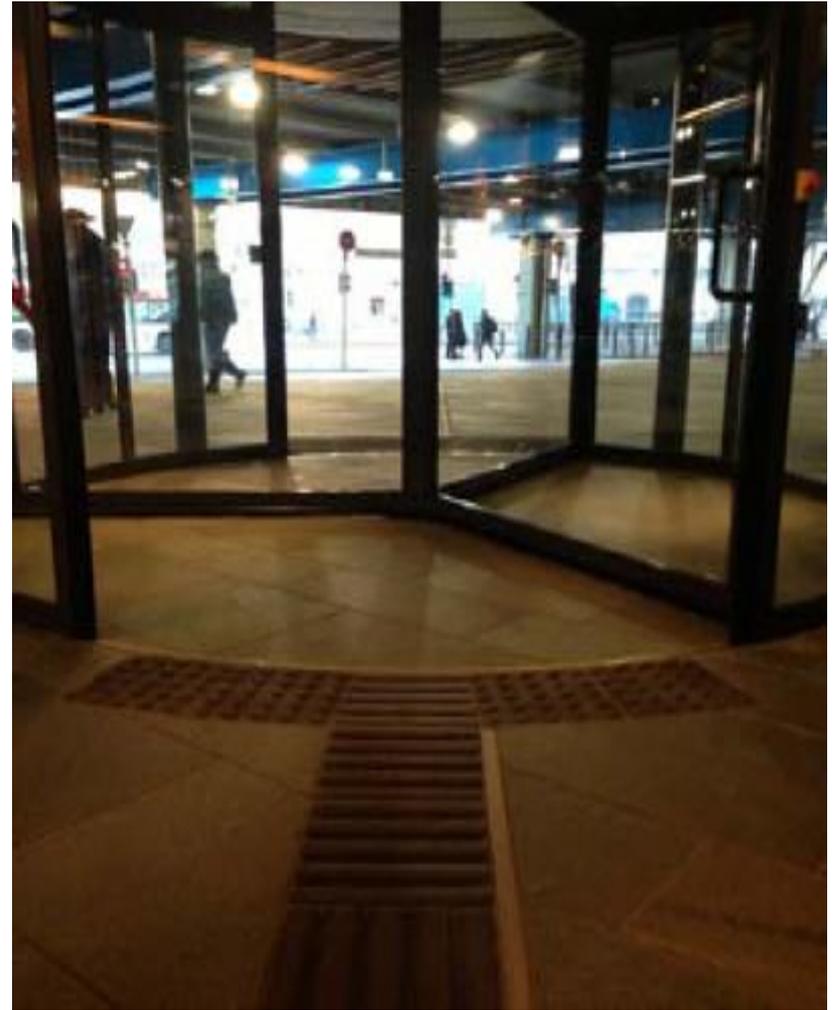
Practitioners

- *...face complex situations where several considerations must be taken into account*
- *...face situations where they introduce changes of elements*
 - i) in already existing streetscapes,
 - ii) where main structures are already in place,
 - iii) where a zoning plan with sub-optimal frames has already been decided upon
- *...when turning to standards, find vague descriptions of natural guiding elements, but elaborate descriptions of tactile paving*
- *...lack documented knowledge they can draw upon, describing how visually impaired orient and find their way*
- *...do not possess the relevant knowledge regarding these issues*

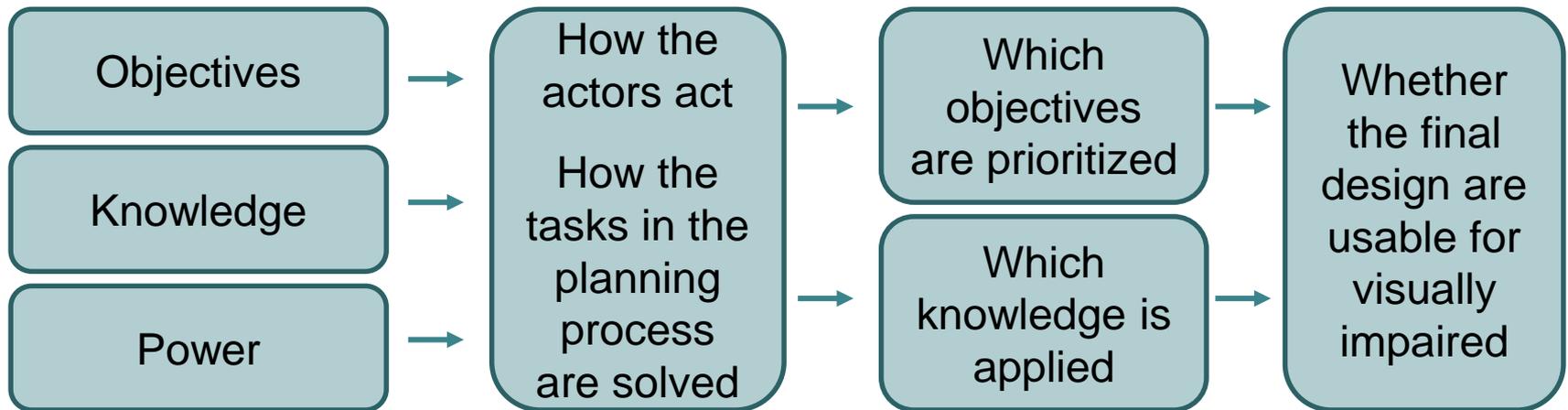
Why do inconsistencies in systems of tactile paving occur?



Some examples...



A more generic explanation



How can the situation be improved?

- A need for further systematic and research-based knowledge on
 - *how people with sight impairments orient and find their way in complex transport environments*
 - *how they use elements of the physical environment in these processes*
 - *and hence how the built environment ought to be designed in order to be usable for people with sight losses*

How can the situation be improved?

The standards should

- ...present more comprehensive descriptions on how to design environments facilitating easy and safe wayfinding
- ...contain more, better and concrete discussions, examples and illustrations of good facilitation - also in complex situations
- ...explain and justify recommended solutions
- ...put greater emphasis on natural lead lines, and how they can be used to reinforce good facilitation
- ...present clear guidance on when tactile paving *should* and *should not* be used

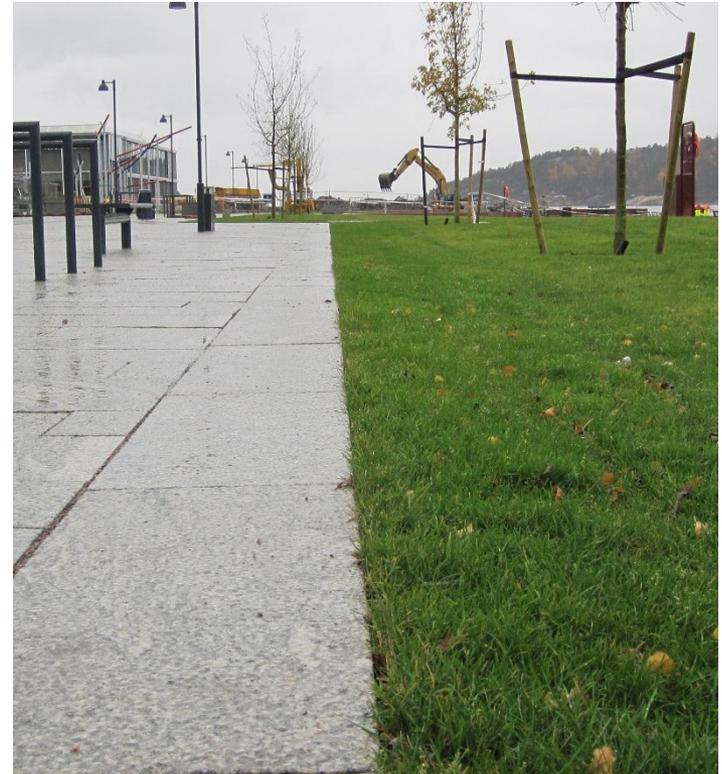
How can the situation be improved?

Regarding practice and processes

- It is critical to improve the knowledge of planners, designers and other relevant practitioners
 - *Mandatory training programs?*
 - *Recurring refresher courses?*
 - *Or, put in place a system of certified mobility consultants?*
- Universal design should be considered on an early stage in the zoning and planning processes, preventing sub-optimal frames for facilitation

Thank you for your attention!

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