accessible boarding for everyone –
system overview, customer and operator needs

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accessibility

- Is a today’s **must** for train and infrastructure **operators**
  - **Ethical question;** to allow everyone self-determination
  - **Regulations** (European and national regulations)
  - **Advantage** for all passengers and the train operator
    - easy boarding
    - shorter boarding time → punctuality
    - satisfied passengers
link vehicle - platform

• The link between the platform and the vehicle is an essential part regarding accessibility within the mobility chain.

• Various different and individual solutions do exist today in order to provide accessibility.
  – problem: different platform heigths
  – variety of solutions → expensive
EU-project: Public Transportation – accessibility for all

- **Project founded** by EU with **FP7**
- **Goal**: Find a solution for improving the boarding situation
  - System integration into **existing coaches** as a feasible must
  - System shall be **standardized** for most existing coaches
  - System shall be used by **ALL mobility reduced** passengers
- **Consortium**:
  - **Coordinator**: Rodlauer Accessibility Consulting
  - **Universities** (Vienna University of Technology, University of Belgrade)
  - **Manufacturers** (MBB-Palfinger, Siemens Austria, Bombardier Transportation)
  - **Operators** (SBB, ÖBB, MAV, SZ, BDZ, NRIC, VBK)
People with Reduced Mobility (PRMs)

Physical (sensory) Impaired
• Wheelchair occupants
• Blind and visually impaired people
• Deaf and hearing impaired users

Travel impairments
• Luggage, pram, non locals

“Life Cycle” impairments
• Children
• Pregnant women
• Elderly people

People with learning disabilities
Mobility reduced? – some further impressions

baby carriages
luggage

size (children)
elderly

Combination of difficulties!
Difficulties when boarding

- Cat 1: level boarding or one step
- Cat 2: ICE, TGV etc.
- Cat 3: typical passenger coach, 55cm platform
- Cat 4: Old passenger coach with steep entrance, low platform
Personal assistance required when boarding:

Cat 1: Level Boarding, one stair step max.
Cat 2: Access with two stairs
Cat 3: Access with RIC wagons 3 stairs from platform
Cat 4: Old-type vehicle (3-4 stairs from platform)
With luggage: help required

- **Boarding with luggage:** ca. 15% of female and ca. 4% of male passengers need assistance.
## Boarding assistance device – for whom?

<table>
<thead>
<tr>
<th>User with devices</th>
<th>wheelchair, walking frame</th>
<th>1-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical impaired</td>
<td>Walking disabled, with crutch or sticks, elderly, diminutive people</td>
<td>2</td>
</tr>
<tr>
<td>User with special needs</td>
<td>Visual and hearing impaired</td>
<td>2-3</td>
</tr>
<tr>
<td>General passengers</td>
<td>Passengers with luggage, children, pregnant, baby prams</td>
<td>2-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very important – critical to successful operation (‘must have’)</td>
</tr>
<tr>
<td>2</td>
<td>Important – high benefit for users and operators (‘nice to have’)</td>
</tr>
<tr>
<td>3</td>
<td>Less important – some benefit for users and operators, but not absolutely necessary</td>
</tr>
</tbody>
</table>
Group of mobility reduced is very large

- **Most** long distance traveller are mobility reduced
- **Many** of them wish or actually need assistance
- Only a **small number** of them needs **technical assistance**
- For the **main part** of traveller easy handling equipement or **service** is enough to be satisfied
- In order to offer **accessibility to all** technical devices are necessary (e.g. for wheel chair user)
Needs of the operators

• **Easy** and **quick** handling

• **Reliability**
  • System must work when it is needed
  • Under all weather conditions (ice, snow, heat, dust etc.)
  • No extension of stopp time → punctuality
  • Good service for as many passengers as possible
link vehicle - plattform

- **level** boarding
- **steps** (high floor)

- In both cases a **horizontal** and usually a **vertical gap** remain that has to be bridged.
system overview

gap-bridging
ramp
lift

diagram:

- manual
- electro-mechanical
- vehicle based
- platform based

theoretically 12 combinations
gap bridging

• gap bridging
  – moveable step
  – hinged step
  – bumper strip
  – manuel ramp
Ramps

- ramps
  - platform based
  - vehicle based
platform or vehicle based ramps - examples

Ireland, U.K.

- **Easy** to handle
- Useable by **everyone**
- Non slippery surface
- Only for **small height** difference
- Storage at platform and in vehicle
vehicle based ramps - example

Danmark/ DSB, Guldmann
platform based ramps - examples

- Parallel ramp around the corner
- Less problems with height and length
- Swivel base plate for wheel chair
- Quite difficult handling (folding, weight)

Norway, NSB; Belgium
ramps

+ relatively easy to handle
+ can be used by everyone (some operator in U.K. do that)
+ very good reliability (especial under extreme weather conditions)

- Height difference is limited
- Large height difference leads to a long ramp (max. angle 18%)
- Steep ramps can be dangerous
platform based lifts - examples

Denmark/DSB, France/SNCF, (Guldmann); Switzerland (Mirolit)
platform based lifts

+ relatively **easy** to handle (*problems in winter compared to ramps*)

+ **Height difference** is not limited (*but not downwards*)

+ **quick operation** (*if staff is used to operating lifts*)

+- **good reliability** (*but more problems than ramps → especial under extreme weather conditions*)

- can **not** be used by **everyone** → usually only for wheel chair user
vehicle based lifts - examples
vehicle based lifts - examples
vehicle based lifts - examples

Norway/ NSB
vehicle based lifts - examples

Norway/ NSB
vehicle based lifts - examples

Switzerland/ Zentralbahn
vehicle based lifts - examples

Sweden, SJ
vehicle based lifts - examples

Sweden, SJ
vehicle based lifts - examples

ÖBB-railjet, MBB-Palfinger
vehicle based lifts

+ Operators are independent from infrastructure
+ Height difference is not limited

+- Reliability (depends on the condition)

- Can not be used by everyone $\rightarrow$ usually only for wheel chair user
- Operation needs a long time, complicate to handle
- Entrance is blocked
Boarding assistance devices

– Lifts (or ramps): only for wheelchair occupants

– Exemption, example:
  Regina train in Sweden
Lift – Regina train in Sweden

• Lift can be operated by ALL passengers by THEMSELVES

+ simultaneously boarding by other passengers
+ independent use
+ also for baby prams
- entrance → only for 55cm
- possible „misuse“
experience – needs: operator

- Many **different** needs and experiences of operator
- Technical system: regular problems in **winter** period
- Majority of operator prefers **vehicle** based systems
- „the **simpler** the better“
- Especially for **UIC-cars** (entrance door with 80cm) a technical solution has to be developed
Service for everyone

- Many passengers need or wish to get help
  - Handicapped, baby prams, luggage, elderly etc.

- Technical assistance is required only for a very small group
  - Wheel chair user, some heavily walking disabled

**Ramps** can provide accessibility for everyone (in some cases)

**Lifts** can only provide accessibility to a very small group
Service for everyone

• **Personnel assistance** at the station or at the vehicle entrance

  ➔ **Quick** and **easy** assistance **for everyone** who wants help

  ➔ **E.g.** for passengers with luggage or baby prams

  ➔ **No technical equipment required, no problems with punctual train operation**

• **Examples:**

  ➔ Service Accès Plus of SNCF (France)

  ➔ Service Atendo (“I am awaiting you”) – Service of RENFE (Spain)
Service Atendo

- Special **service at the station for everyone**
- Significant colour: orange ➔ easy to find
- Help desk at the station close to the entrance
Service Atendo

• Staff serves devices like lifts

• Staff gives assistance to everyone who wants

• Assistance in the station, while boarding and for finding a seat
Summary

• Only a small group of passengers needs technical devices

• Platform based lifts and ramps are liked by passengers and operator
  • Lifts can only be used for wheel chair user / Ramps also by others
  • Ramps are easy to handle and always work under extreme weather conditions
  • Platform based systems can be operated much quicker than vehicle based

• But: Vehicle based systems give independence from the infrastructure

• Most difficulties: UIC waggons (entrance at the end, 80cm door width)

• Additionally personnel service must be offered at the vehicle entrance
  • Quick help and assistance for everyone
  • Service leads to satisfied customers
Thank you for your attention

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