Platform-based devices for accessible railway boarding

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Platform-based devices and services for accessible railway boarding

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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 \( \rightarrow \) 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)
  – **Manufactureres** (MBB-Palfinger, Siemens Austria, Bombardier Transportation)
  – **Operators** (SBB, ÖBB, MAV, SZ, BDZ, NRIC, VBK)
EU-project: Public Transportation – accessibility for all

• EU-project focuses on vehicle based solutions, because the bigger part of train operator preferre having vehicle based than platform based systems.

but:

• Basic research within the project serves both, vehicle and platform based systems

• The basic needs and expectations from operator and user are the same independent froem which system is used.
People with Reduced Mobility (PRMs)

Travel impairments
Luggage, pram, non locals

“Life Cycle” impairments
Children, Pregnant women, elderly people

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

People with learning disabilities

Source: “Inclusive Mobility” Report, Department for Transport. U.K.
Wheelchair Occupants – „typically impaired“
Blind Users

• Gap between Platform and Rail Vehicle
• Entrance area with steps
• Handrails

Visually Impaired users

• Sufficient Contrast to identify entrance
• Contrast / Steps
• Flooring of the entrance area
Hearing Impaired / Deaf People

• Entrance situation bearing no Problem
• Information in real time
• Assistance of the staff
Elderly People

- Not only defined by age
- Combination of impairments
- Steps with handrails
- Need personal assistance
Prams

- Ramp preferred, no lift
- Easy of use, not too steep
- Only if there is no other help available
Passengers with luggage

- Long distance: ca. every second has got oversize luggage
Boarding with luggage

- **Difficulties:** for 30-50% of all travellers with luggage
With luggage: help required

- **Boarding with luggage:** ca. 15% of female and ca. 4% of male passengers need assistance
Number of impaired passengers

- Over the age of 60 the number of passengers with mobility reduction increases
Number of impaired passengers

- Over the age of 60 number of passengers with mobility reduction increases
Medical devices – walking-aid

Required Mobility/Walking-Aid

- walking-stick/crutches: 82.9%
- wheeled walker: 4.7%
- manual wheelchair: 7.8%
- power wheelchair: 4.7%
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
Wish for assistance

Ratio of Railway Passengers wanting assistance with accessing the train based on gender

What do you basically wish assistance for when accessing the train?
Wish for assistance

Making use of technical devices while accessing the train, based on gender

- Female: 70% No, 30% Yes
- Male: 75% No, 25% Yes

Would you make personal use of a technical device while accessing the train?

Making use of technical devices while accessing the train, based on type of mobility-impairment

- Without/With limited impairment: 60% No, 40% Yes
- With impairment: 55% No, 45% Yes

Would you make personal use of a technical device while accessing the train?
group of mobility reduced is very large

• **Most** long distance travellers 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 equipment or **service** is enough to be satisfied
• In order to offer **accessibility to all** technical devices are necessary (e.g. for wheel chair user)
link vehicle - platform

- **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

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

theoretically 12 combinations
gap bridging

- moveable step
- hinged step
- bumper strip
- manuel ramp
Ramps

- ramps
  - platform based
  - vehicle based
Lifts

– platform based
– vehicle based
Ramps

- ramps
  - platform based
  - vehicle based
Lifts

- platform based
- vehicle based
Needs of the operator

- 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
platform based 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 17°)
- Steep ramps can be dangerous
platform based ramps - examples

Germany/ DB, MediVent
platform based ramps - examples

Norway, NSB
platform based ramps - examples

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

Ireland, U.K.
platform based ramps - examples

- Two rail ramp
- Very problematic solution, only a compromise
- Dangerous for wheel chair user and staff
- But it works under all weather conditions (snow, ice – northern Scandinavia!)

Norway, NSB
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)

Belgium
Manual gap closing systems - examples

- Only for little height difference
- Very easy to handle
platform based permanent installed ramps - examples

- Examples USA and underground station Hamburg
- System not flexible
- Exact stop of the train/waggon necessary
- Always same tain configuration
- All passengers can use the ramp
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
platform based lifts- examples

Lithuania

Germany/ manufacturer: Herkules
platform based lifts - examples

Denmark/DSB, France/SNCF; manufacturer: Guldmann
platform based lifts- examples

many countries; manufacturer: Mirolit
platform based permanent installed lifts - examples

- System not flexible
- Exact stop of the train/waggon necessary
- Always same train configuration
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)
Accès Plus of SNCF (simplified)

• Door to door service
  • Assistance also in pre trip phase (ticketing, travel information etc.)
  • For everyone who needs help
  • Focus on „typical“ handicapped persons

• Must be ordered two days before trip
Service Atendo (“I am awaiting you”) – Service of RENFE

- Special service at the station for everyone
  - Service desks at the stations (2010: stations with 83% of all travelers in Spain)
  - For everyone who needs help
  - Service can be ordered before the trip (12h) but it can also be ordered direct at the station if staff is available
  - Assistance in the station, while boarding and for finding a seat
  - Staff operates boarding assistance devices (like lifts) but offers also personnel assistance
Service Atendo

- 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
Service Atendo

- Service started in 2008
  - 2008: 100,000 passengers made use of the services
  - 2009: 235,000
  - 2010: ~300,000

Service is very liked and well accepted
Summary

- 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** can also be used for **all other** traveler
  - **Ramps** are easy to handle and always work under extreme weather conditions
  - **Platform** based systems can be operated much quicker than **vehicle** based
- Additionally **personnel service** must be offered at the vehicle entrance
  - **Quick** help and assistance for **everyone**
  - Service to satisfy customers