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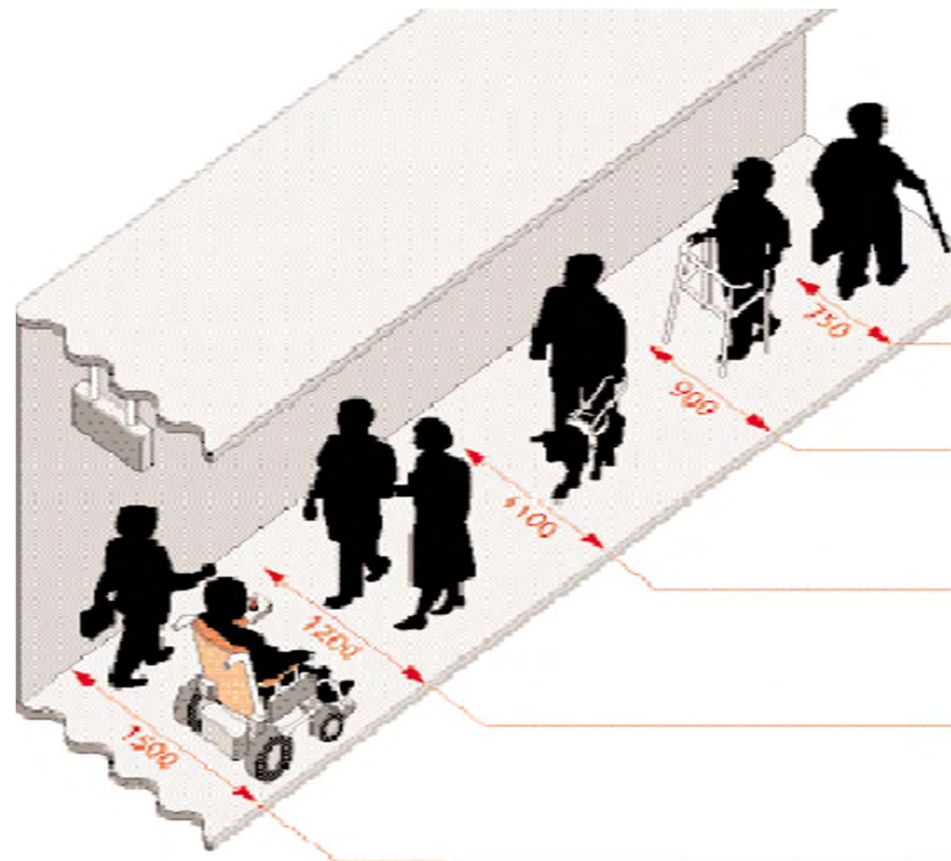BP International Consulting
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BP[i]international CONSULT[i]ng –
The company´s Services:

Source: Department for Transport, London, U.K.

Our speciality = Accessibility ->

• Advisory & Consultany for Stakeholders
Operators, Civil Engineers/Architects
on Accessibility Concepts for
interoperable & intermodular public
transport systems, covering all modes
of transport for
Persons of Reduced Mobility (PRM)

-> individual transport->
-> public tranport - underground/
tramway/urban/intercity bus –
lightrail -> railways -> aviation

BP[i]international CONSULT[i]ng –   The company´s Services:

- Door to Door Mobility Concepts and Development of Accessibility Services in order to provide social inclusion *-> part of Urban Mobility*

- R&D Project Management & Funding Advisory on e.g. Intelligent Tranport Systems

- Cooperation with Universities & Research Institutions e.g. for Dynamic Transport Planning, Railways and Transport Engineering on an int´l level

- Shared space projects, transport projects anticipating accessibilty & its critical interfaces

- safety for disabled people - Crash Severeness & Crashworthiness

Traveling Wheelchair Occupants:

tures, left:
strian Federal Railways ÖBB (Infrastructure Division&Transportation Division), right: WESTbahn (A)

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Persons with reduced Mobility

Groups according to TSI PRM

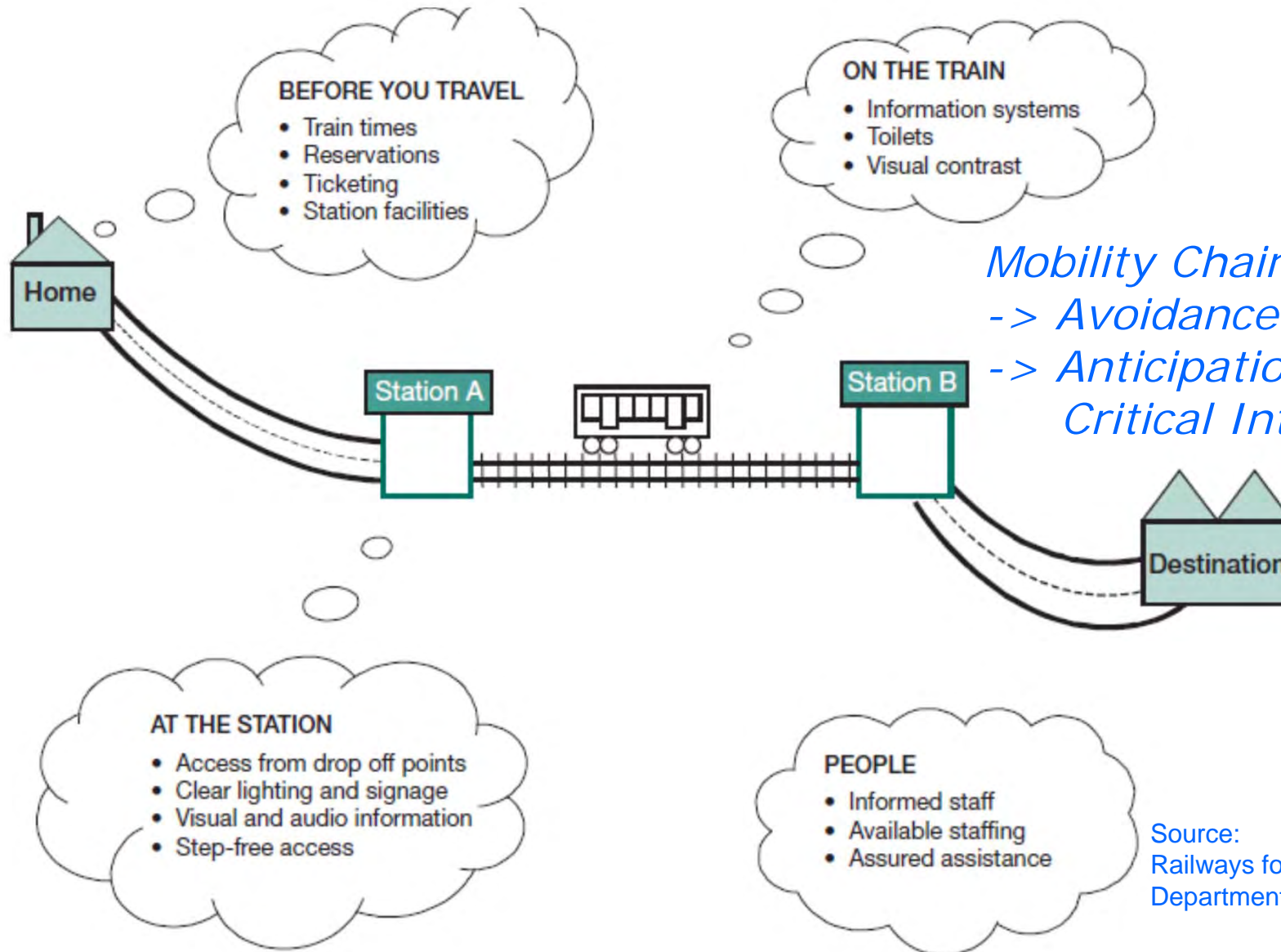| Travel impairments	"Life Cylce" impairments	Physical impairments	People with communication difficultie
Luggage, prams, 3 and more children non locals	Children, Pregnant women, elderly people	Wheelchair occupants	learning difficulties
		Blind and visually impaired people	
		Deaf and hearing impaired users	

Source: Barta/Petutschnig, 2010, Conference on Public Transport at the Ministry of Transport, Innovation & Technology, Austria

4

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Accessibility for Public Transport Systems

BEFORE YOU TRAVEL
- Train times
- Reservations
- Ticketing
- Station facilities

ON THE TRAIN
- Information systems
- Toilets
- Visual contrast

Home

Station A

Station B

Destination

Mobility Chain – Key Aspects
-> Avoidance of Missing Links
-> Anticipation of
  Critical Interfaces

AT THE STATION
- Access from drop off points
- Clear lighting and signage
- Visual and audio information
- Step-free access

PEOPLE
- Informed staff
- Available staffing
- Assured assistance

Source:
Railways for All Accessibility Strategy,
Department for Transport, London

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Accessibility of Public Transportation Systems – Legal basis:

- "Equality & Social" Inclusion:
  Accessibility for Everybody ->

- Fundamentals of the
  UN Human Rights Convention =

- Basis of the
  European Disability Act &
  EU Strategy 2010-2020

- Bundes-Behindertengleichstellungsgesetz 2006-2016 (Austria)
- Disability Discrimination Act (UK)

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Accessibility for Public Transport Systems

Interoperability Directives   2008/57/EC, 2004/50/EC ...

Technical   Specifications of Interoperability TSI PRM, TSI PAS ...

European Standards / Norms: CEN, national Bodies

Source: Ministry of Transport, Innovation and Technology Austria,

- Directive 2008/57/EC

(conventianal and High-Speed Railway System)

TSI PRM

Technical Specifications for Interoperability – Persons with Reduced Mobility

TSI PAS / Infrastructure,

all TSI subject to revision conducted by ERA ->

basis for CEN Norms

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Other European Transport Legislation and int´l Norms (national/international)

- ISO 7193, ISO 7176-19 (ISO 10542) : Design Requirements for wheelchairs (crashtested) & certified for use in Transportation (crash tested with 50kmh, 20g frontal/rear impact)

- Universal Acces Code (U.S.A) for accessible buildings and infrastructure, according to ADA (Americans with Disability Act), FMVSS (Federal Motor Vehicle Standard), ASI Norm B1600 Austria

Best Practice Example: ÖBB Railjet – MBB Palfinger Lift
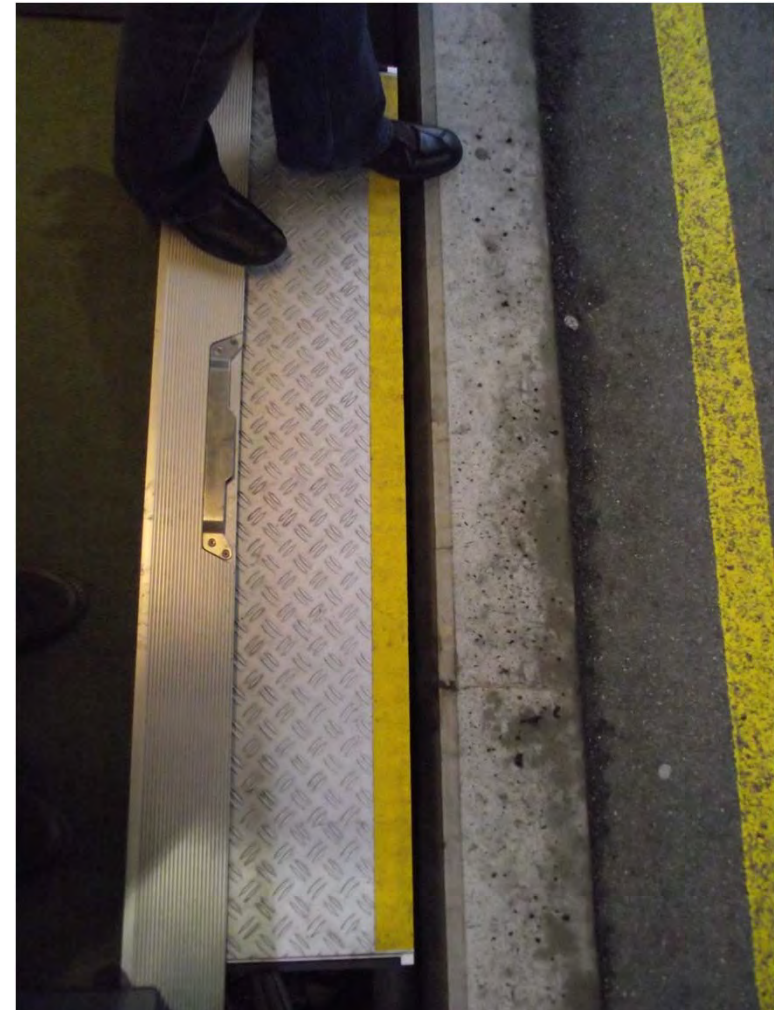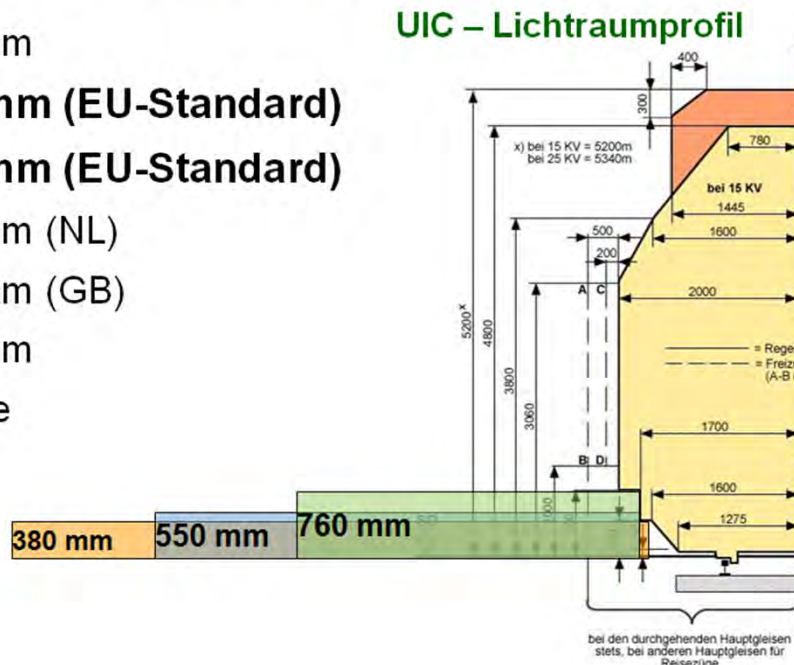
Accessibility for Public Transport Systems

critical Interface:

Rail Vehicle / Station Platform

Floor heigt vehicle / platform height

Bahnsteighöhen in Europa

- 380 mm
- **550 mm (EU-Standard)**
- **760 mm (EU-Standard)**
- 840 mm (NL)
- 915 mm (GB)
- 960 mm
- andere

UIC – Lichtraumprofil
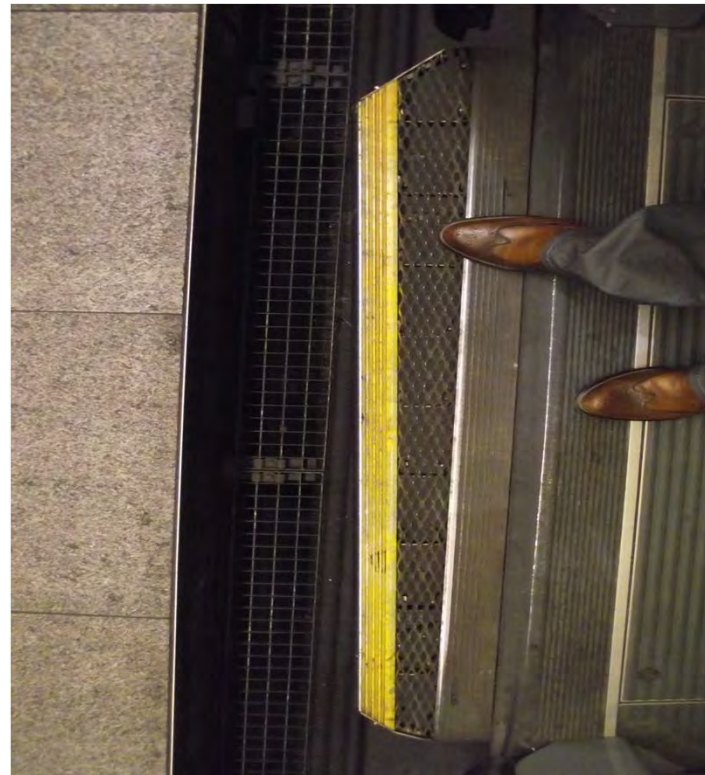

Source. Kollman/Wieder, Siemens A

TSI PRM Structure

Infrastructure

critical Interface:

Rail Vehicle / Station Platform

Floor heigt vehicle / platform height

Rail vehicle: Entrance Door Width) → Boarding/alighting Steps → Lighting of Steps/Entrance Area → Accessibility Aids → Room to manouvre → Handles → Level Differences → Passenger Information System → Doors inside Vehicle → Allocated Seats for the Disabled → Wheelchair Area → Standard Toilet → Universal Toilet (incl Baby Care Facilities) → Wheelchair adapted Sleeping Compartments

- European Legislation - EU Directives within Public Transportation:

  Bus Directive 2001/85 ECE*:

  Accessibilty of the vehicle (ramps, kneeling systems, lifts)
  & wheelchair & occupant restraint systems (WTORS) for wheelchair occupant & bus passenger safety

  *Annex VII:
  Directive specifies minimum requirements vs.
  "Free-Will" higher national requirements,Sweden:
  implemented higher requirements for WC-Occupant
  3-Point Belts in Busses – e.g. Scandinavia (Volvo, Scania)

National Norm UK: Rail Vehicle Accessibility Regulations RVAR

National Norm GER: DIN 75078
Covering individual automotive transport and community transport
  services (minibuses), [M1]

NL: Code VVR minibus – rolstoel verfoer
(community transport)

Space for a wheelchair user

Users should position the rear of
their wheelchair against this wall
and apply their brakes

Please give up this space to a
wheelchair user

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Blind users:

- Gap between Platform and Rail Vehicle

- Entrance area with steps

- Handrails

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Accessibility for Public Transport Systems

Usability of steps (different height and depth)

Legend
very bad
bad
fair
good
very good
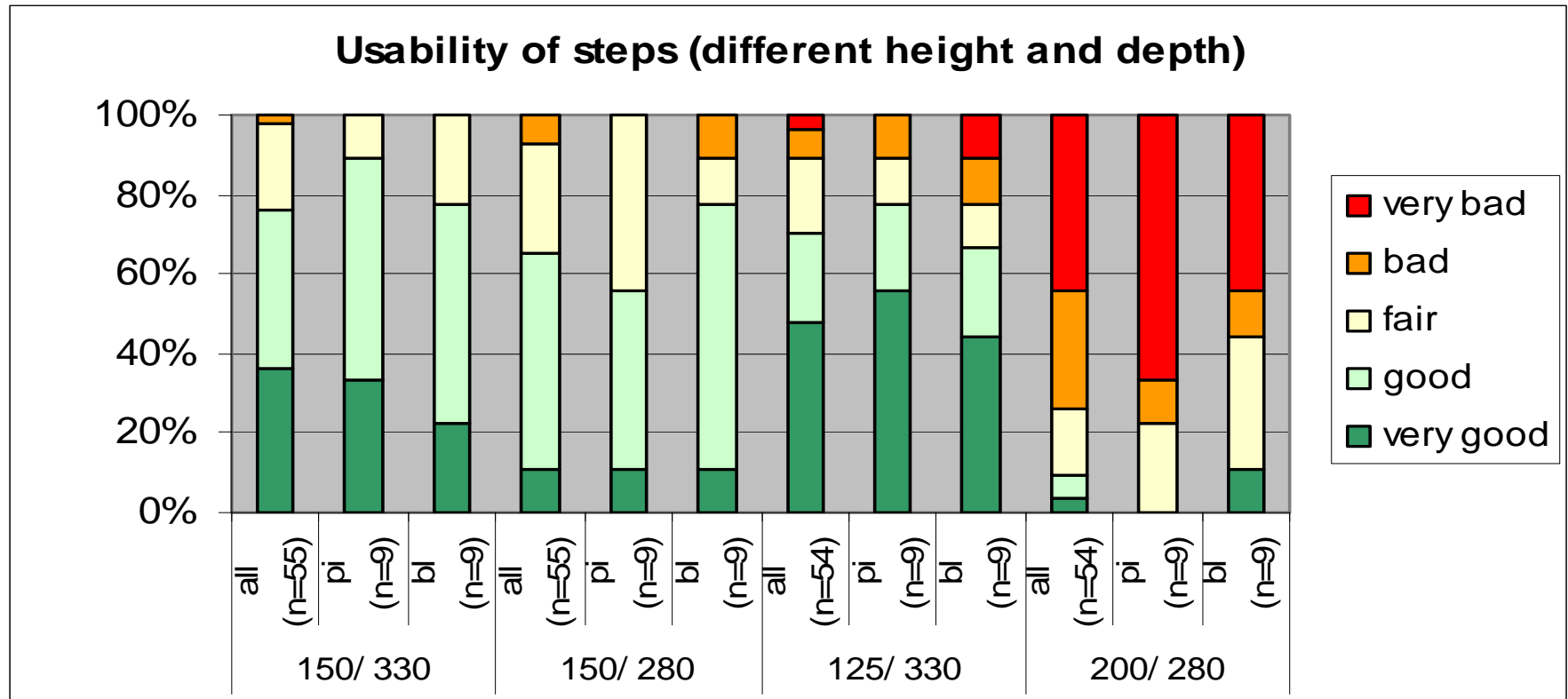
pi...physically impaired

*200/280 = TSI PRM limit

bl...blind users

Source: Boarding Asssstance System Evaluation Matrix, Petutschnig, Ruger, Tauschitz 2010

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Accessibility for Public Transport Systems

Usability

Testing

Source: EU – Project „MODTRAIN"

BITTE WARTEN
Please wait

SPRECHEN
Speak

HILFE KOMMT
Help is coming

SOS

MITRON

SOS Notsprechstelle
Téléphone de secours
Chiamate di soccorso
Emergency call box

easy or comfortable:
reach without much
movement of
the torso vs. maximum or
extended -just possible with
movement abilties
of the upper torso.

"Code of Practice (BS 8300)

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Visually Impaired users

- Sufficient Contrast to identify the entrance

- Contrast / Steps

- Flooring of the entrance area

Deaf People

- Entrance situation bearing no Problem

- Information in real time

  (train delay, change of platforms)

- Assistance of the staff

17

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Elderly People

- Not only defined by age

- Combination of impairments

- Steps with handrails

18

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Parents with Prams   prefer ramps - no lift !

• Ease of use, as long as not too steep (->TSI PRM, RVAR regulations)

• if there is no other help available, such as PRM service programs by

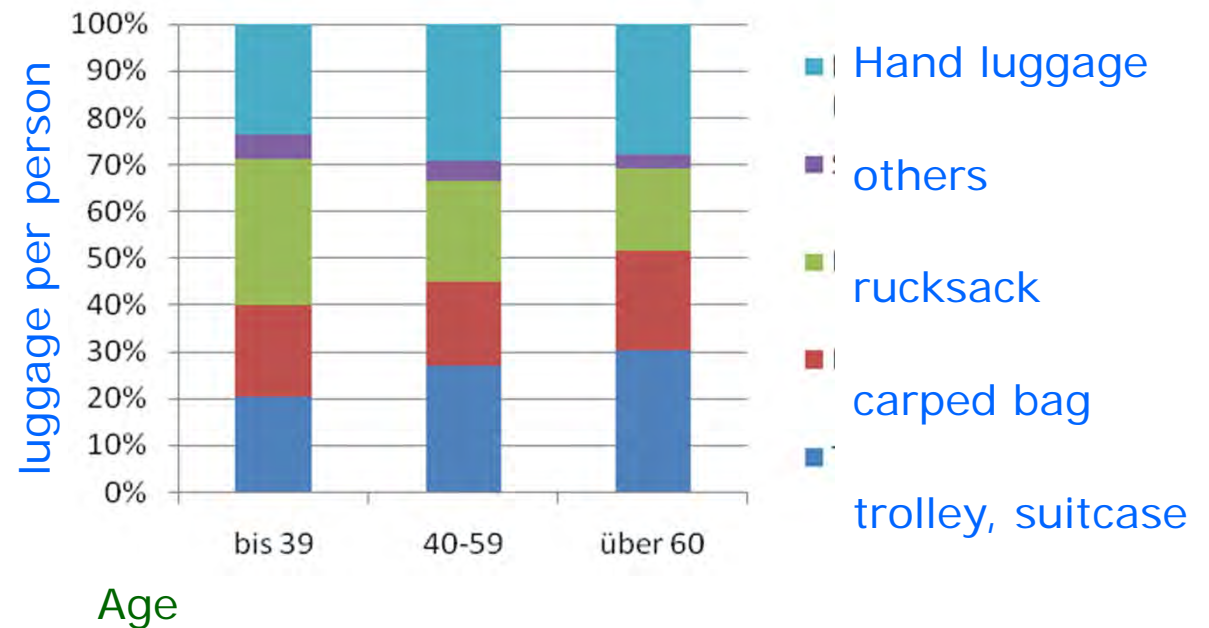• SNCF Accés+, SBB "Mobihelfer", RENFE "Atendo"

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Accessibility for Public Transport Systems

Passengers with luggage

Long distance - every second passenger travels with oversize luggage

luggage per person

- Hand luggage
- others
- rucksack
- carped bag
- trolley, suitcase

bis 39 | 40-59 | über 60

Age

Source: Boarding Asssstance System Evaluation Matrix, Petutschnig, Ruger, Tauschitz 20

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boarding with luggage

Difficulties for 30-50% of all travellers with luggage

■ large difficulties

■ difficulties

■ little difficulties

■ no difficulties

large luggage

more

hand luggage/rucksack   others

Source: Boarding Asssstance System Evaluation

Matrix, Petutschnig, Ruger, Tauschitz, July 2010

21

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Boarding with luggage

Approx. 15% of female and

Approx. 4% of male passengers

need assistance
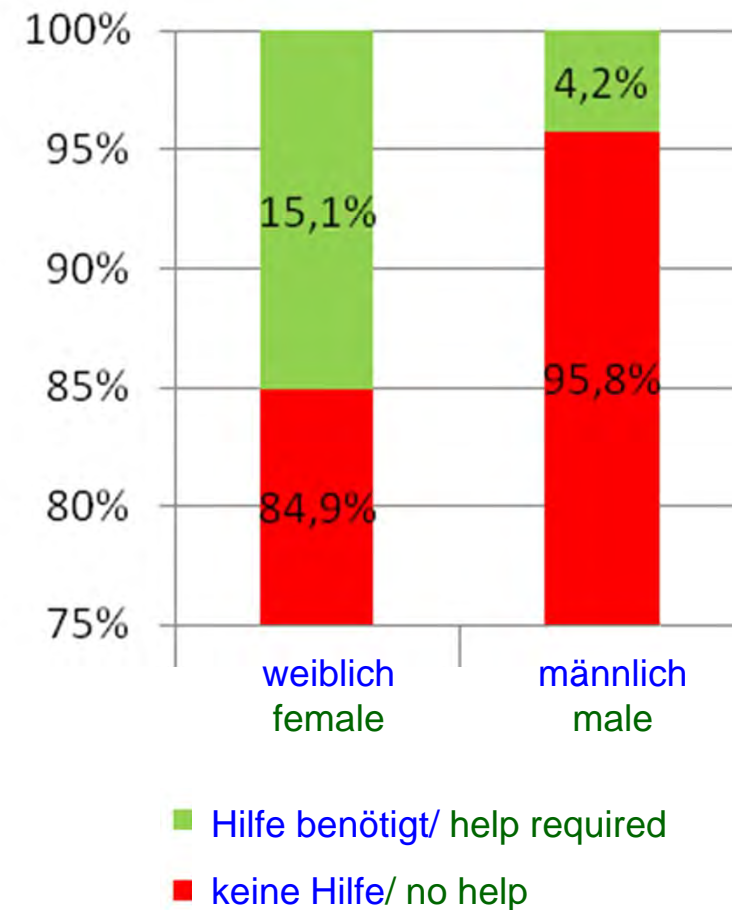
weiblich female — männlich male

■ Hilfe benötigt/ help required

■ keine Hilfe/ no help

Source: Boarding Asssstance System Evaluation Matrix, Petutschnig, Ruger, Tauschitz 2010

22

Accessibility for Public Transport Systems

The U.K. Railway System &

Accessibility Strategies –

A Case Study

(courtesy DfT London)

- Facts

- History

- Progress

- Challenges

...

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FACTS

- 11 million disabled people in UK

- Disabled people have annual purchasing power of €93 billion

- By 2020, half the UK population will be 50 or older

- Obese older adults are more likely to develop conditions that limit daily living

History

- Disability Discrimination Act 1995

- Rail Vehicle Accessibility Regulations 1998

- Disability Discrimination Act 2005

Progress so far: Vehicles

- All older vehicles feature improved accessibility

- 2020 End Date – use of "targeted compliance" on older vehicles to focus effort on significant improvements

- Technical Specification for

  Interoperability – Persons with

  Reduced Mobility 2008 "TSI-PRM"

- Rail Vehicle Accessibility Regulations

  2010

- 5604 vehicles built to access standards -> 45% of heavy rail fleet

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Progress so far – Stations

- In 2005, just 57% of journeys started or ended at a step-free station

- "Access for All" – 10 year, €425m programme

- Step-free access at 148 stations

- Smaller schemes at 1300 other stations

- Intention to achieve 81% by 2015

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Challenges United Kingdom Railway System

- Gaps / Steps - Staff intensive

- Old platforms used for mixed traffic

- Manual boarding ramps used at all heavy rail stations - Prevents independent access

Challenges

- "Harrington Hump" – prefabricated hump to raise low platforms at low use stations
- Does not give level access - Does not deal with horizontal gap
- Being fitted elsewhere

-> Anticipation in the Planning-Process of new infrastructure

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Staff assistance

- 24 hours notice requested

- Discourages infrequent travellers

- GB reluctant to move to automated devices

- 50% failure rate

- Funding for improved IT system

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The ideal situation for enabling effectively working railway environment interfaces

- gap bridging systems for level-boarding

- Automatic bridge plates as used in

  -> closed interoperable* systems =

  Same vehicle type (rolling stock*)

  Same station-platform height throughout the infrastructure*

-> improved passenger flow

-> Avoid Missing Links

-> increase number of irregular travellers

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The ideal Situation enabling effectively working Railway Environment Interfaces – speed up increase passenger turnover

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Best practice example ->

- E.g. Suisse Federal Railways

  Program "Mobihelfer"

  1 hour notice time only

Best Practice

Examples for

Specialised Services:

SNCF Accés+,

RENFE Atendo,

Barrierfreies Reisen

Austrian Federal

Railway ÖBB
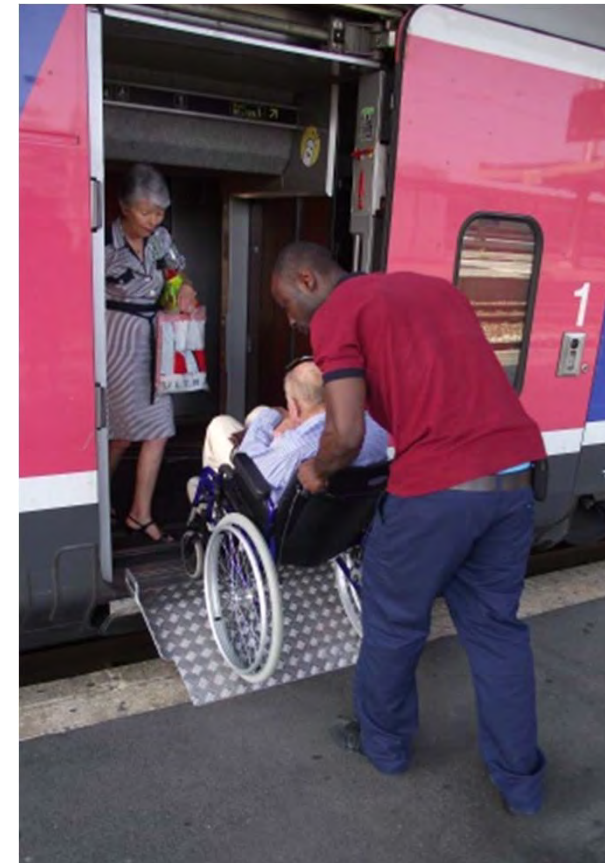
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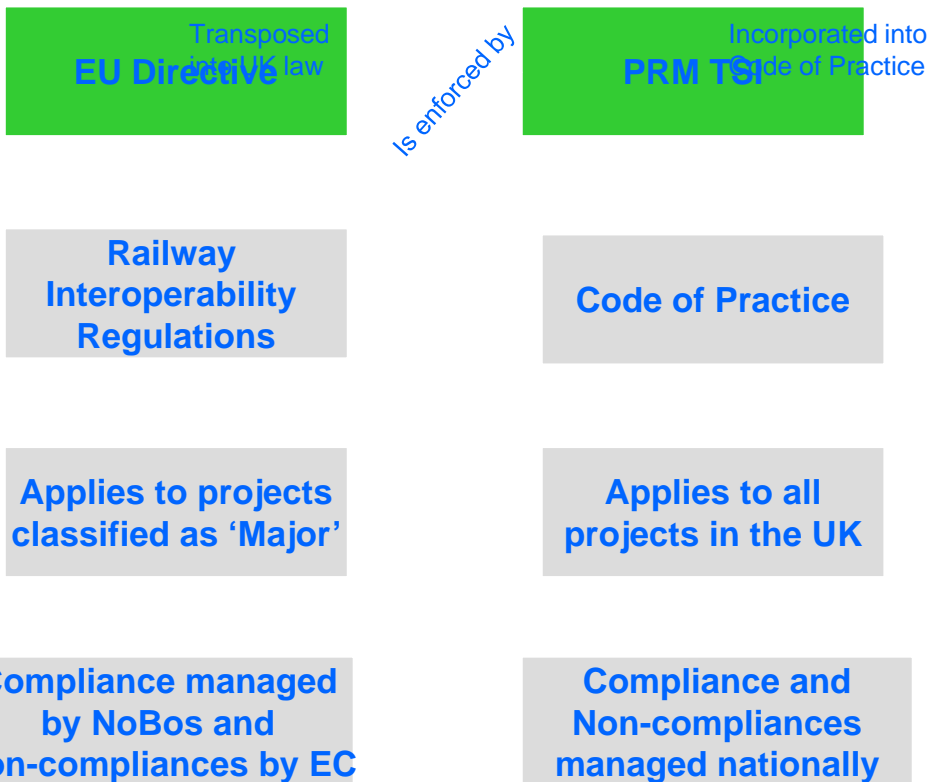
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PRM TSI and National Rules
UK Example

EU Directive
Transposed into UK law

Is enforced by

PRM TSI
Incorporated into Code of Practice

Railway Interoperability Regulations

Code of Practice

Applies to projects classified as 'Major'

Applies to all projects in the UK

Compliance managed by NoBos and Non-compliances by EC

Compliance and Non-compliances managed nationally

SOURCE: ERA Interim Report review May 2011

Member states are able to classify projects in such a manner so as to locally manage the time and cost impact or requirements...
Mechanism Project for Classification:

Directive 2008/57/EC [..]
 enforces that a project that is Major must be assessed against the requirements of the PRM TSI by a Notified Body
Neither the UK or the Netherlands have yet used a Notified Body to assess the compliance of an infrastructure asset against the requirements of the PRM TSI.

But "Large Scale" projects have been classified as non-Major suggesting the need for certification of compliance by a NoBo is not necessary

A number of reasons [..]
managing the requirements at a local level
To limit the cost and process impact associated with involving a NoBo
To remove the need to apply to the EC for a deviation against requirements

The impact of the PRM TSI within the UK and Netherlands is limited due to existing national legislation and strategies

Rolling Stock

Netherlands

- No new Rolling Stock has been introduced since the PRM TSI has been in force

- Existing Rolling Stock is being upgraded in-line with mid-life refurbishment programmes. However the level of compliance is restricted by structural design, hence targeted application of requirements is being

Infrastructure

- Parliamentary Act passed which is designed to make railways accessible by 2030

- PRM TSI used to provide design requirements

UK

- Only two new fleets have been introduced since the PRM TSI has been in force

- RVAR Regulations have been in existence since 2008, ensuring Rolling Stock design already has accessible elements

- Existing rolling stock is being upgraded using 'targeted compliance', which focus on a

- Access for All and Stations for All regulations are used to drive accessibility

- Both member states are using the requirements of the PRM TSI to drive the infrastructure projects

Rolling Stock

- New Rolling Stock

  – Manufacturers are standardising the incorporation of the PRM TSI and other requirements in their new modular designs

  – Few new projects introduced, hence minimal impact

- Existing Rolling Stock
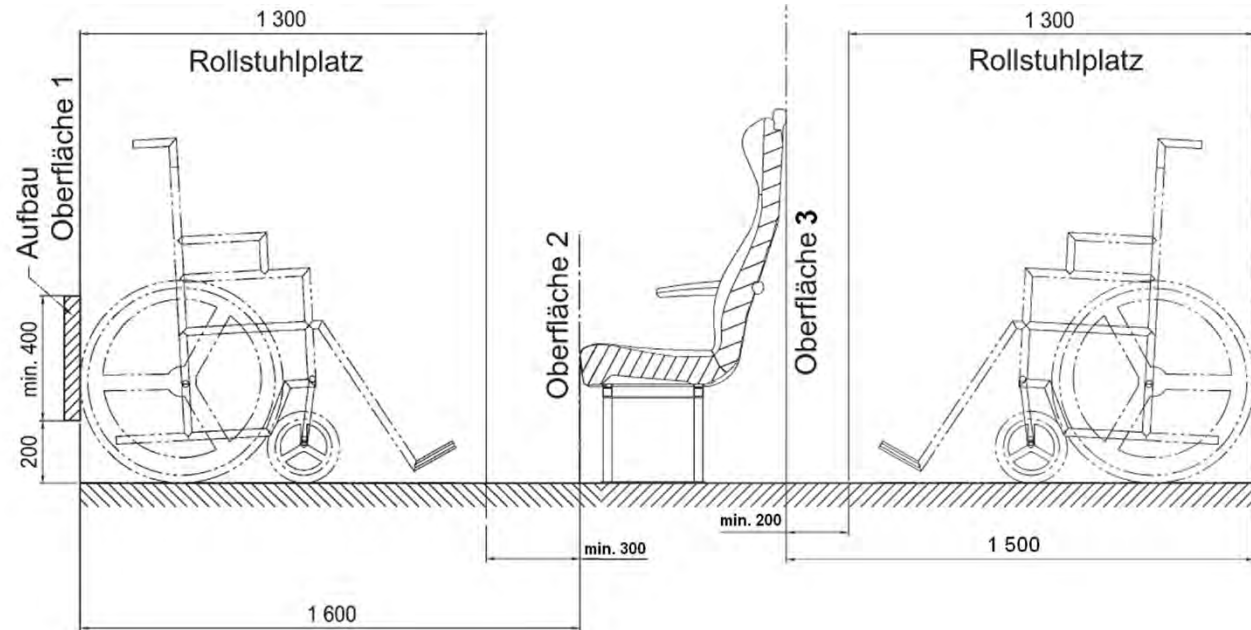
  – Always going to be restricted by it's

Infrastructure

- Member states have strong policy and standards

  – UK has RVAR which has long promoted accessibility

  – UK and Netherlands both have national accessibility policy to develop their network

- Use of 'Major' classification is limiting the effect of the legislation [..]

SOURCE:
ERA Interim

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TSI – PRM - Annex M

- Basis= ISO 7193:1985.
- Dimensions for wheelchair intended for indoor use.
- Mass limit of 200kg for combined mass of wheelchair and occupant and luggage.

-> prime example for non-harmonised Standards

Role of a wheelchair in transport

Interoperability of Norms?

- EN 12183 - Manual wheelchairs

- EN12184 – Power Wheelchairs

- Class A – Indoor, Class B - Indoor with outdoor capabilities Class C – Outdoor, with climbing ability Classified by operating environment – not by mass – Wheelchair selection/prescription according to user requirements   vs. ->

- TSI – PRM. Annex M gives engineering limits for a transportable wheelchair & restricts access to Infrastructure & Stock for powered wheelchair users. proposed by European Disability CEN / TC256 WG 44 (Austria)

Picture: Pinzgauer Lokalbahn (Salzburger Landesbahn SLB), Austria

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Wheelchairs – as seats in transport

- Primary function –
  to compensate for mobility impairment

- Transport Enables
  – Access to leisure, work & other facilities

- =Social Inclusion
  – Access to education
  – Design Priorities?
  – Toileting, - Comfort
  – Posture Management
  – Pressure Management
  – Tissue integrity

Source: B. Appleyard, British standard Institute, Chair Wheelchair Committee),
ternational Consultant with BP[i]nternational CONSULT[i]ng

38

Thank You for your attention !

WILL & SKILL

Member
World Conference on Transport Research Studies – SIG Public Transport
CEN /TC 256 Working Group [TSI PRM – Accessible Rail Vehicles]

Assoc. Member
European Disability Form, Brussels
European Expert – European Certified Experts Associations