

Essential accessibility information of travel chains for everyone

Merja Saarela, Häme University of Applied Sciences (HAMK)

Introduction

- This case study examines the importance of considering Universal Design (UD) in public transport and travel chain planning, emphasizing the need for inclusive solutions that benefit as many passengers as possible without requiring specialized adaptations.
- While physical barriers have been extensively studied, there is limited research on the accessibility information available to persons with disabilities (PwDs).
- This study addresses the gap by examining the essential accessibility information provided and its alignment with the needs of PwDs.
- I will present two travel chains to illustrate our research findings

Driving Forces for Accessibility and Mobility for All

I According to Eurostat 2023, approximately 87 million (19,4%) Europeans have some form of disability.

II EU's Sustainable and Smart Mobility Strategy 2020 aims to create a sustainable, inclusive, and resilient transport system.

III UN's Convention on the Rights of PwD (CRPD)

Article 4 (General obligation): to ensure and to promote UD in the development of standards and guidelines, to undertake research and development of universally designed goods, services, equipment and facilities.

Article 5 (Equality and Non-Discrimination)

Article 9 (Accessibility): to ensure that PwDs have equal access to the physical environment, transportation, information, and communications including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas.

Article 20 (Personal Mobility): the greatest possible independence for PwDs in the manner and at the time of their choice, to quality mobility aids, devices, assistive technologies and forms of live assistance and intermediaries, including by making them available at affordable cost, providing training in mobility skills.



EU Regulations for Advancing Accessible Travel Chains and Travel Information for All



Intelligent Transport Systems (ITS) Directive & Regulation (EU) 2017/1926 – Ensures interoperability and accessibility of multimodal travel information services.



Regulation (EU) 2024/490 – Updates previous rules and strengthens real-time data accessibility for smart mobility.



Accessibility Act – Requires transport-related services (websites, mobile apps) to be accessible to all users.



NAP (National Access Point) – Gathers transport and travel data to ensure accessibility information is easily available.

Mobility for all in Riihimäki and region



- Riihimäki offers UD transportation services:
 - standard local bus lines,
 - door-to-door services: the “R-kyyti” (DRT) and two fixed-route small bus lines
 - standard taxi services and specialized taxi services for PwDs (SOTE).
- All local and on-demand buses have low floors.
- The most important hubs are the railway station, the bus station, and the expressway connection to regional buses. There is interconnectivity between the hubs and regions.
- Regional and local buses, including on-demand buses, feed regional, long-distance, and international trains.

Disease/condition	Number of PwDs	Assistive devices/services	Information and communication technology
Physical or motor disability	6	Wheelchair (x1), occasional electric wheelchair (x1), electric wheelchair (x4)	Computer, smartphone
Visual impairment, blindness	3	White cane (x3), guide dog (x1)	Computer, smartphone
Visual impairment, low vision	1	None	Computer, smartphone
Aging with temporary physical difficulties	3	Assistant	Computer, smartphone

An accessible travel chain

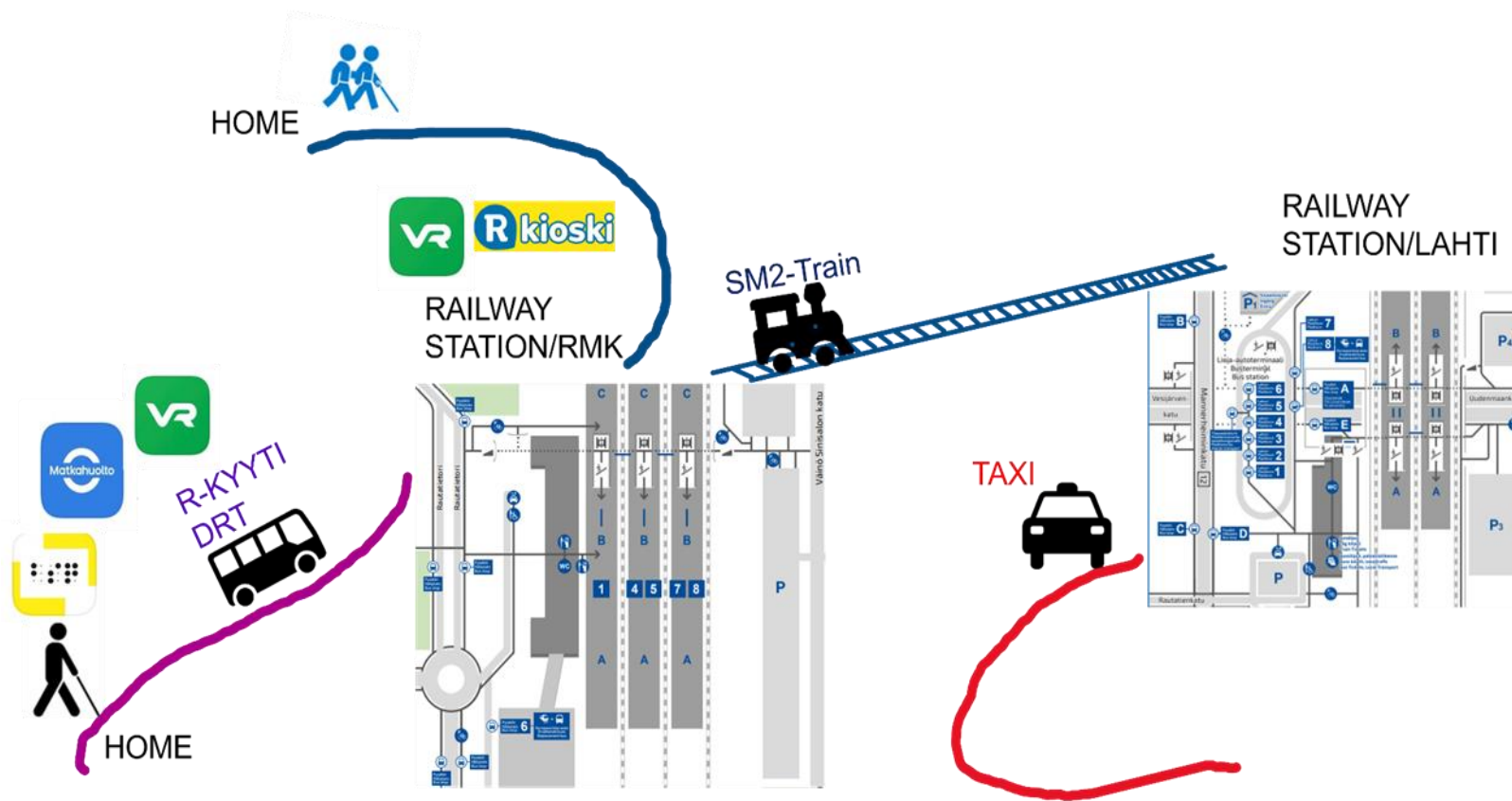
It is a continuum that consists of accessible travel information and sales services, physically accessible pathways, stops, vehicles, station facilities, multi-sensory route guidance, and accessibility information of the infrastructure included in the travel chain, as well as assistance services.

Together, these enable the most independent, smooth, and accessible travel possible for all people.

Ways to plan and implement a Travel Chain

Disability	The digital applications/websites used (Travel chain planning phase)	Travel booking strategies (Travel chain planning phase)	Searching for accessibility information at transfer stations (Travel chain implementation phase)
Physical or motor disability	- Ticket options were researched using a computer - The web version of VR Matkalla was used for booking and purchasing tickets using - The Reitit ja Liput app was used for DRT booking - In-person assistance at an R kiosk was relied upon	- Using online platforms to research and book tickets - Initially planning to buy tickets at an R kiosk - Using DRT and a SOTE taxi for transportation to the station - Preferring to buy tickets at an R kiosk to get personal service	- Checking for maps multiple times to understand the stop locations - Receiving helpful notifications from DRT - Facing issues with non-automatic doors at the station - Having no clear services or feedback channel for door and elevator issues - Requiring assistance from other passengers to enter the station - Using an accessible entrance when available - Not needing a ramp service due to using a rollator
Visual impairment, blindness, independent	- The VR Matkalla application was used for booking a ticket - The Junat.net app was used to check a station node - The Lahitaxi application was used to order taxi - E-mails were used for communication and assistance	- Using a cell phone to buy a ticket for a taxi service - Buying train tickets with the VR Matkalla application - Buying tickets from an R kiosk	- Using the BlindSquare application to simulate the pathway to the transfer station - The Junat.net app was used to check a station node and arrival time - Relying on previous trips and navigation at stations
Visual impairment, blindness, assistant	- Digital applications were not used for booking - In-person service was relied upon - The assistant helps with tickets and uses applications	- Walking to the station - Buying tickets at an R kiosk	- Navigating the station on foot - No specific accessibility issues mentioned; the information consists of information on old trips

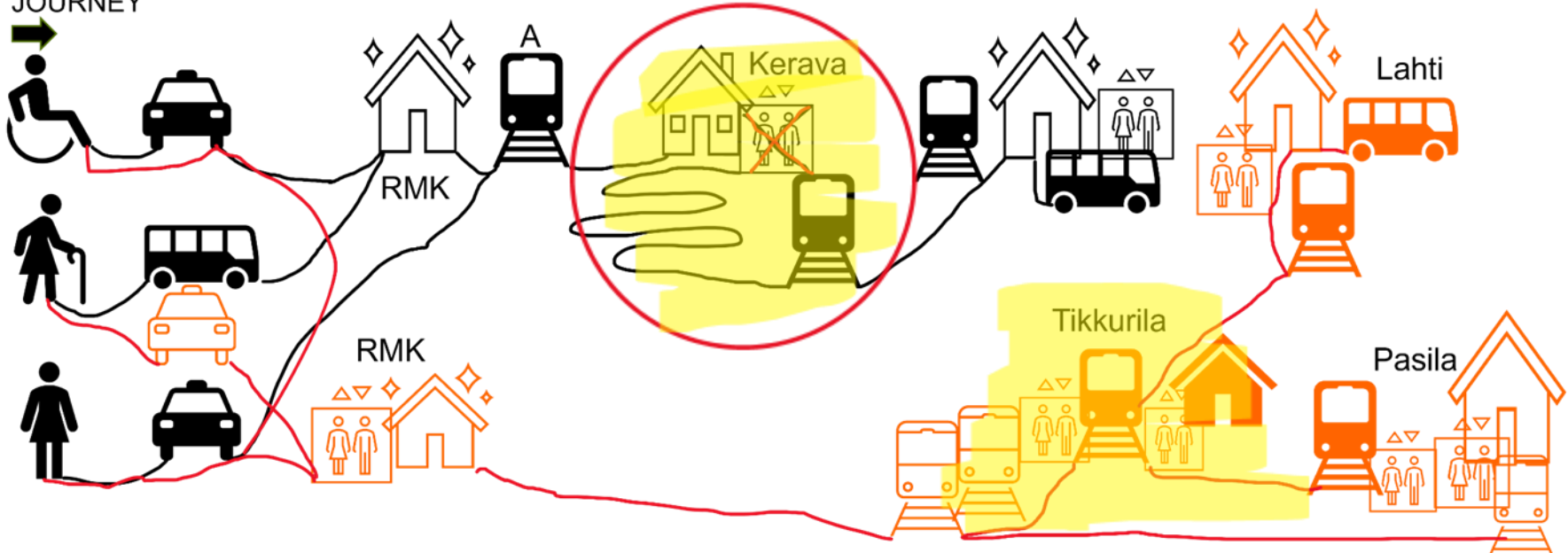
An example of successful travel chain experience of PwDs



An example of unsuccessful travel chain of PwDs



Home.... STARTING JOURNEY....Station, RMK... MAIN JOURNEY 1..Kerava... MAIN JOURNEY 2...Station, Lahti.... END JOURNEY

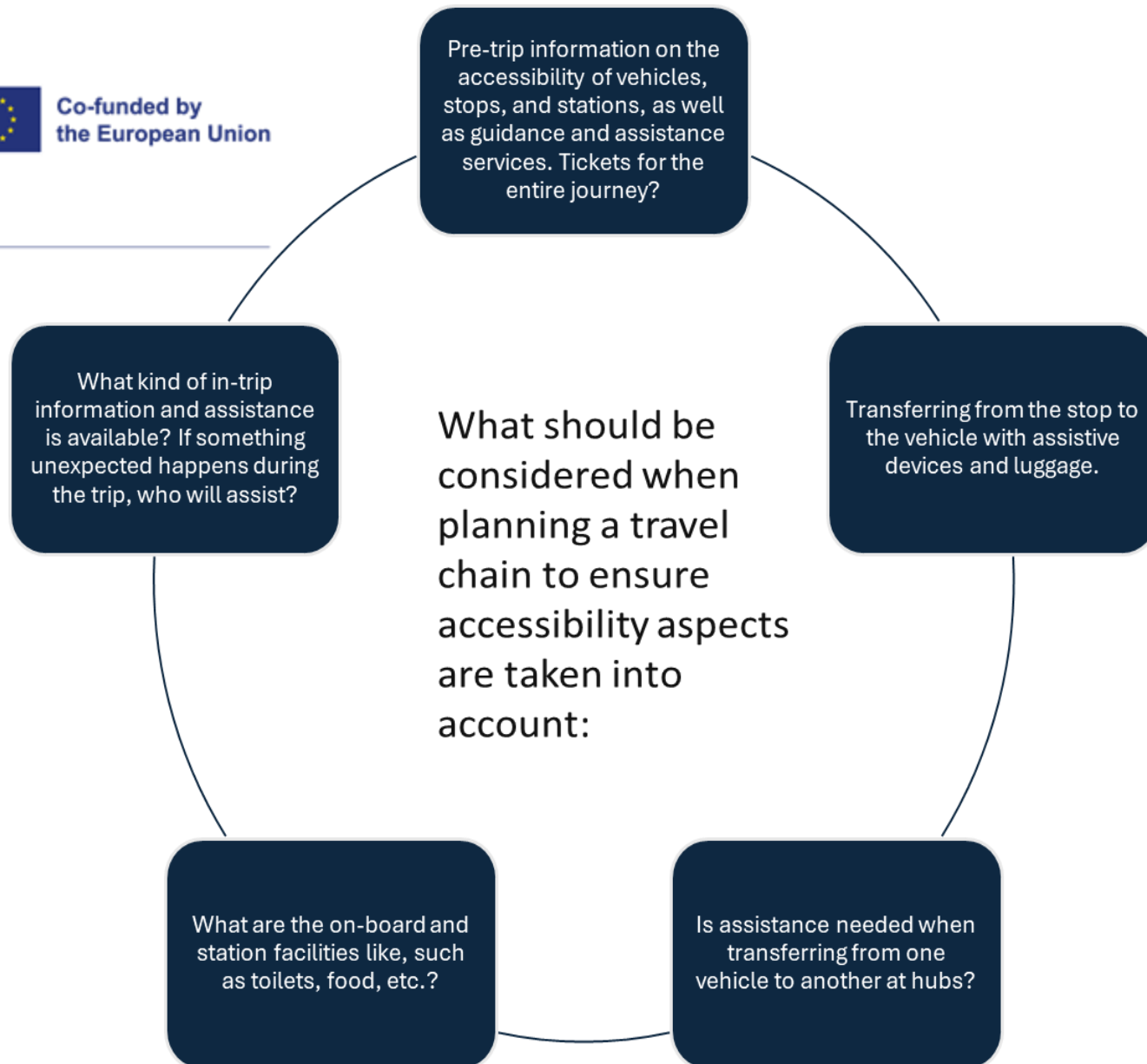


Home.... END JOURNEY.... Station, RMK...MAIN JOURNEY2...Tikkurila...MAIN JOURNEY1...Lahti...START JOURNEY Pasila



- Various **obstacles during the travel planning phase**, including fragmented travel information and insufficient details about physical barriers along their travel chain.
- **Challenges realized during the implementation phase, especially at transport hubs**, where PwDs may encounter malfunctioning elevators, inadequate multi-sensory guidance, and concerns regarding transfers and connections.
- **UD of public transport is not fully realized**, leading to fragmented travel chains or disrupted travel chain. The fragmentation of digital and physical accessibility information complicates trip planning and execution.
- **The built environment is lacking** real-time information on the functionality of infrastructure, e.g., elevators.
- **User profiling and adaptability of MaaS solutions need improvement.** As digital services become more widespread, their accessibility and accessibility information for all user groups must be ensured.

Towards an accessible travel chain experience



Contact information:

Merja Saarela, EdD, Principal scientist,
HAMK Tech Research Unit, Häme University of Applied
Sciences merja.saarela@hamk.fi.

Articles: Saarela, M. & Partanen, A. 2024. Challenge of Producing Accessibility Data for Public Transport and Travel Chains. SMART ACCESSIBILITY 2024: The Ninth International Conference on Universal Accessibility in the Internet of Things and Smart Environments. Pages 7-14. ThinkMind(TM) Digital Library.

Saarela, M. & Partanen, A. 2024. Essential Accessibility Information About Travel Chains for Everyone. Studies in Health Technology and Informatics. Volume 320: Universal Design 2024: Shaping a Sustainable, Equitable and Resilient Future for All. Pp. 323 – 330.
<https://ebooks.iospress.nl/volumearticle/70436>.

Saarela, M. & Partanen, A. 2024. The Challenges of Producing and Integrating Accessibility Data as Stumbling Blocks for Seamless Travel Chains in Public Transportation and MaaS for All. Pages: 189 - 201. ThinkMind // International Journal On Advances in Intelligent Systems, volume 17, numbers 3 and 4, 2024.
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