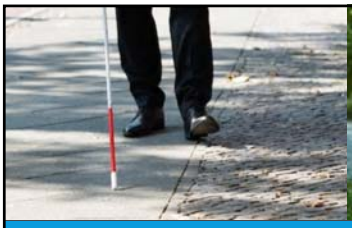

THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

Investigating the needs of public transport users with disabilities

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OVERVIEW OF SEMINAR

Research questions: What are the current barriers people with disability face with the current system and could face with an integrated system?

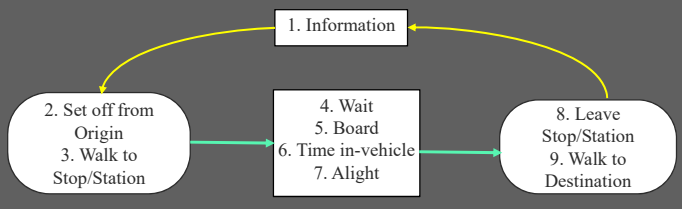
- Barriers using existing PT system
- Gap between policy makers' priorities and users' needs.
- Potential barriers with an integrated PT system

WHAT DO WE KNOW

- Main barriers
  - lack of and poor quality footpaths;
  - poor quality, steep, and lack of curb ramps;
  - poor or lack of lighting;
  - construction works;
  - moving around on-board and disembarking in-vehicle;
  - information (display and availablility);
  - lack of audio announcements at stations;
  - gap between platform and vehicle.

- Gap
  - Past literature focused on either the built environment OR the public transport journey. However, for people with disability, the challenges begin as soon as they leave home.
  - The studies also focused on one type of disability or the elderly.
  - Planning for disability has not been considered as "mainstream".

BARRIERS WITH EXISTING PT SYSTEM



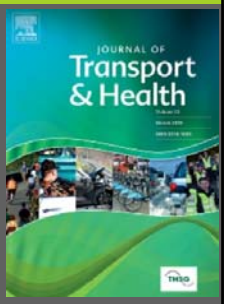


Figure 1: The accessible journey chain

Park, J. & Chowdhury, S. (2018). Investigating the barriers in a typical journey by public transport users with disabilities. Journal of Transport and Health, 10, 361-368.

PART 1: STUDY DESIGN

- Major disability organisations were contacted.
- 32 participants were found using the snowball sampling.
- 15 participants were physically impaired (PI), and 17 participants were visually impaired (VI).

- Questionnaire was semi-structured.
- Received approval from the university's Ethics Committee.
- Duration of interview = 30minutes to 1 hour.
- Transcript was processed using Nvivo for thematic analysis.

QUESTIONNAIRE & PARTICIPANTS

Questionnaire

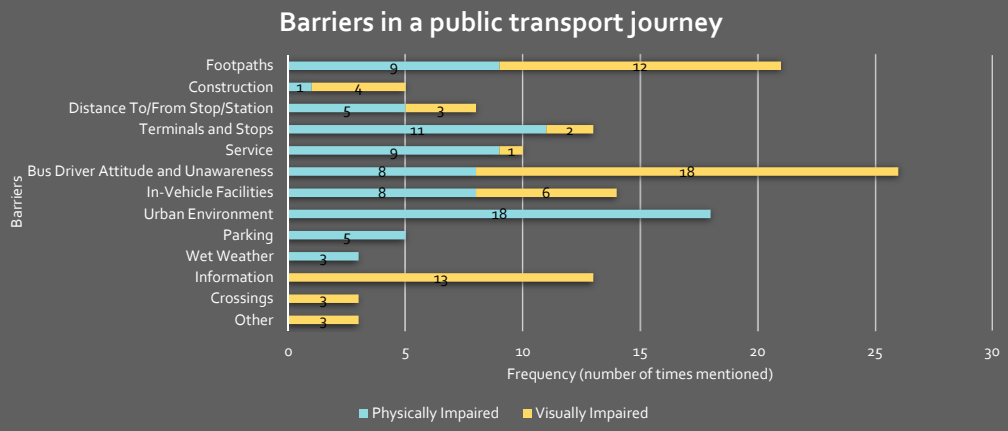
- (a) purpose and frequency of trip
- (b) the barriers they face in a typical public transport journey
- (c) the consequence of the barriers on their perceived well-being, and
- (d) socio-demographic characteristics.

Participants

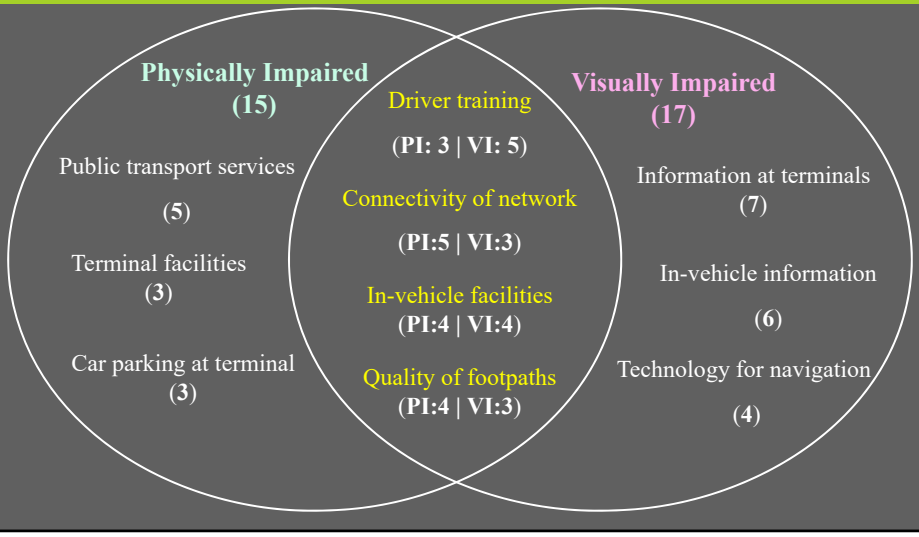
- Majority of the participants were female and European.
- Had a few participants from other parts of NZ.
- 65% from Auckland.
- Low number of participants under 25.

Socio-economic characteristics	Number	
Gender	PI	VI
Male	5 (33%)	5 (29%)
Female	**10 (67%)**	**12 (71%)**
Age-range		
15-24	2 (13%)	1 (6%)
25-44	3 (20%)	2 (12%)
45-64	3 (20%)	8 (47%)
65-74	6 (40%)	2 (12%)
75-84	1 (7%)	3 (18%)
85+	-	1 (6%)
Ethnicity		
European	2 (13%)	4 (23%)
NZ European	11 (73%)	12 (71%)
Mixed European	-	1 (6%)
Chinese European	1 (7%)	-
Australian/Aboriginal	1 (7%)	-
City		
Auckland	13 (87%)	8 (47%)
Dunedin	2 (13%)	6 (35%)
Christchurch	-	1 (6%)
Wellington	-	1 (6%)
Whanganui	-	1 (6%)

BARRIERS BY PHYSICAL AND VISUAL IMPAIRMENT PARTICIPANTS



MAIN FINDINGS



COMMON FINDINGS

- Bus driver's attitude and unawareness of disabled users' needs was a common concern for both groups.

"Bus drivers can be careless, and will not take note of people waiting at the shelters."

"Sometimes they're a bit rude."

"They can make you feel very small."

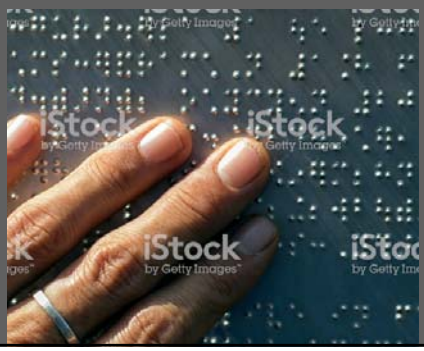
SOCIAL EXCLUSION

The inability to travel independently, because of the barriers they face, has led them to feel as though they are not heard and are not part of the society.

Feeling	Key supporting statements
Angry	"Outraged. Outraged. Absolutely outraged, the injustice of it"; "If it was because of poorly designed infrastructure … I would be angry".
Frustrated	"I would feel frustrated, obviously"; "It is very frustrating and disempowering"; "I get a wee bit cross"; "At times, pretty annoyed".
Resentful	"I mean you feel resentment that you're being mucked around this much"; "Resentful, you get resentful".
Isolated	"You feel isolated, you feel kind of trapped"; "It's not nice being left out"; "Completely, utterly, isolated"; "I'm in this cage"; "It limits my contact with friends"; "I feel a bit isolated and a bit lonely sometimes because I can't go places by myself independently".
Stressed	"Having to change buses and go to use unfamiliar bus routes to get to places is stressful"; "I'm having a really stressful time because of my vision impairment, I need good lighting".

PART 2: STUDY QUESTION

Is there a gap between what is prioritised by practitioners and the needs of public transport users with disabilities?



RESEARCH METHOD

- Using barriers identified in the study by Park and Chowdhury (2018), a questionnaire for practitioners was designed.
- Questionnaire was designed using the Analytic Hierarchy Process (AHP).
- AHP: Humans have the natural tendency to arrange their ideas or their perceptions in a hierarchical manner against a common goal.
- Output: Is relative weights for a criteria.

QUESTIONNAIRE

- The questionnaire had 36 exclusive pairs.
- Rank importance of one attribute over the other from 1 to 9.

Attributes	Importance
Stops and Station Facilities	
Crossing Facilities	
Information at Stops	1 – Of Equal Importance
Vegetation	3 – Somewhat Important
Bus Driver Attitude	5 – Important
Access to Stops and Stations	7 – Very Important
Quality of Footpaths	9 – Extremely Important
On-Vehicle Facilities	
Construction Works	

INVITATION TO PRACTITIONERS

- Invitation to participate was sent out to 35 transportation experts identified in the field. They were identified from word of mouth, LinkedIn, and personal contacts.
- The 16 practitioners participated in the study, consisting of 9 females and 7 males.
- 10 from the public sector, 3 from private sector and 3 disability advocates.

MORE ABOUT PARTICIPANTS

- Participants were predominantly from the Auckland Region (12), followed by Christchurch (2), Hawkes Bay (1) and Waikato (1).
- Expert had around 10 years of experience or more in their respective fields with many in the position of managers, team-leaders, or held senior roles.
- All these experts have experience in designing or planning (or both) accessible features for people with disabilities

RESULTS: POLICY MAKERS AND ADVOCATES

- **Practitioners (13) prioritized:**
  (a) crossing facilities the most (AHP weighting: 19.0%);
  (b) access to stops/stations (17.1%),and;
  (c) quality of footpaths (13.1%).
- **Disability advocates (3) prioritized:**
  (a) quality of footpaths the most (AHP weighting: 19.5%);
  (b) crossing facilities (17.3%), and;
  (c) access to stops/stations (14.7%).

Comment from practitioner about driver attitude: *"Bus driver attitude is a subjective issue that cannot be controlled easily, and therefore, we do not place a high weighting on it."*

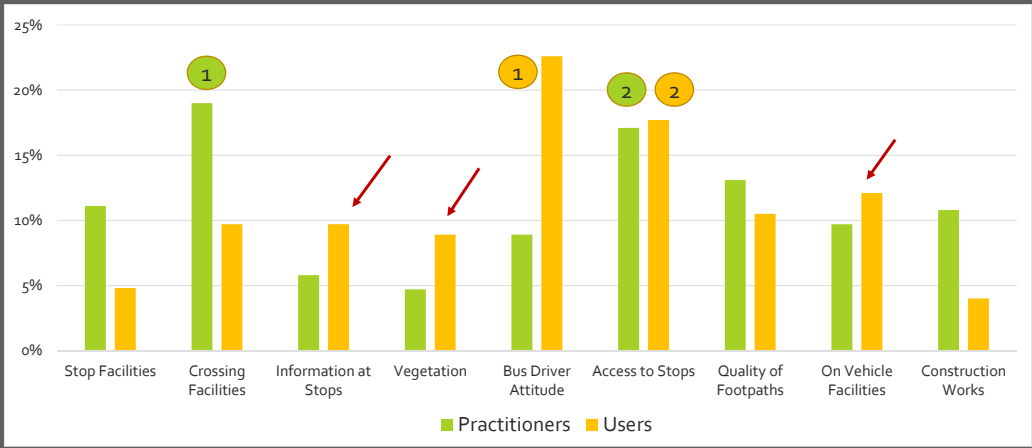
QUESTION FOR AUDIENCE

Pick your top three accessibility features for improvement:

https://auckland.au1.qualtrics.com/jfe/form/SV_9tY5MzwlHqRKCTb

Attributes
Stops and Station Facilities
Crossing Facilities
Information at Stops
Vegetation
Bus Driver Attitude
Access to Stops and Stations
Quality of Footpaths
In-Vehicle Facilities
Construction Works

RESULTS: PRACTITIONERS AND USERS

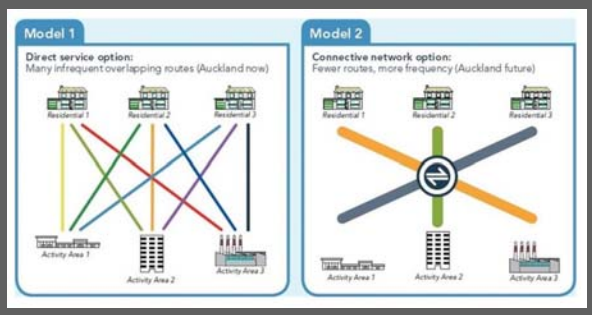


QUESTION FOR AUDIENCE

- How do you consider needs of people with disability when:
  - Designing;
  - Implementing;
  - Discussing policy changes.

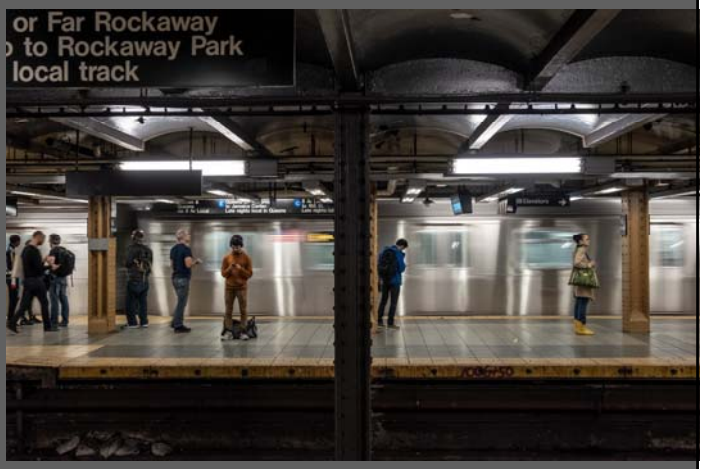
PART 3: INTEGRATED PT SYSTEMS

- Aim: to provide a transport system that performs as 'one unit' from the support of multi-modal networks.
- These systems are reliant on transfers.
- Globally, more cities are moving towards an integrated system. For example, Auckland.



TRANSFERS

- Operators: (a) reduced cost
  (b) higher ridership
- Users: (a) more time outside vehicles
  (b) more destination choices



TRANSFERS

- Transfer time = transfers waiting time + walking time.
- Perceived inconvenience are influenced by:
  - Information
  - Coverage
  - Perceived personal safety
  - Missed connections
  - Additional cost

Reading:

1) Chowdhury, S., Y. Hadas, V. Gonzalez, B. Schot. (2018). Public transport users' and policy makers' perceptions of integrated public transport systems. *Transport Policy*, 61, 75-83.

2) Chowdhury, S. and A. Ceder (2016). Users' willingness to ride an integrated public-transport service: A literature review. *Transport Policy, 48*, 183-195.

RESEARCH MOTIVATION

What are the needs of people with disabilities when making a transfer in an integrated system?

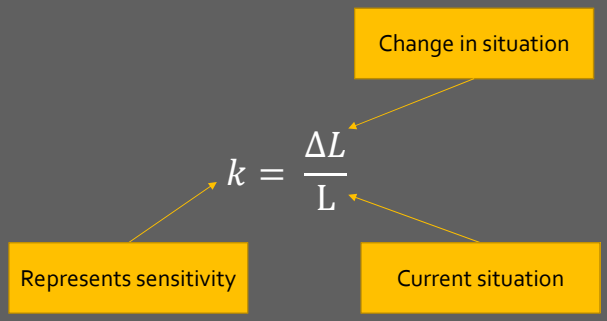
STUDY DESIGN

- Online questionnaire design;
- Ethics approval;
- Snowball sampling.

- Data collection duration: 3 months
- Number of responses: 102
- Data usable: 57 participants

WEBER'S LAW

- Just Noticeable Difference (JND)

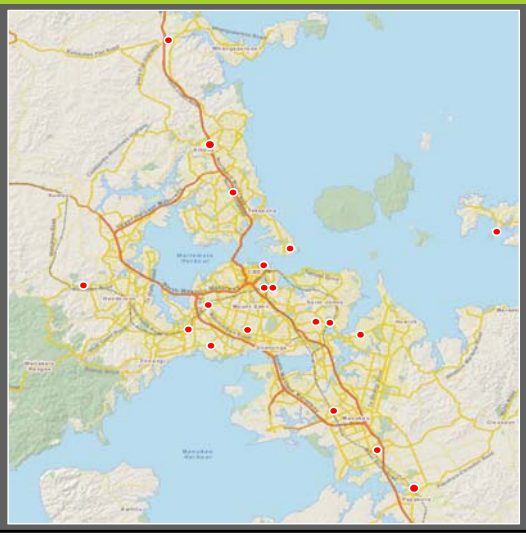


QUESTIONNAIRE DESIGN

Questions for direct route riders	Questions for riders who currently make a transfer
What is your main form of public transport?	
On a weekly basis, how often do you use public transport when you are traveling?	
Approximately how long is your current public transport journey?	
Do you have any card concessions or discount fares?	
Do you have access to other modes of transport?	
Please select all the applicable accessibility features and rate on a scale of 1-5, how well they meet your needs.	
-	How many transfers do you make?
-	On average, how long do you wait to catch the second vehicle?
-	How long do you have to walk to make the transfer?
-	What station/stop do you normally start your public transport ride from?
-	Rate your current satisfaction of the transfer route on a scale of 1-5.
Hypothetical scenario questions	
From the following, please select the minimum travel time savings needed for you to consider taking the new route.	
Please select the maximum time that you are waiting to wait for another vehicle	
Please select the maximum time that you are willing to walk to make a transfer	
What is the maximum time that you are willing to wait to make a transfer if the transfer-making station has better facilities such as: Real-time audio announcements, amenities including accessible toilets, sheltered seating and waiting areas, etc.?	
What is the maximum time that you are willing to walk to make a transfer if there are better facilities such as: Informative signage, quality walking paths, and crossing facilities, sheltered walkways, etc.?	
What additional facilities/features would improve the ease of making transfers?	

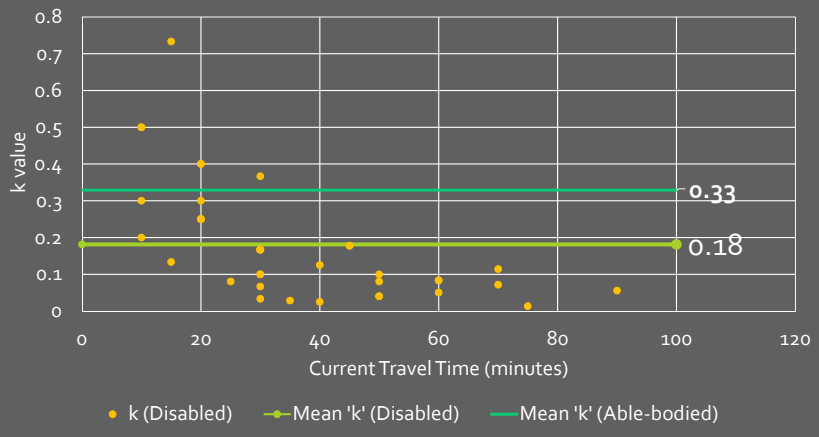
PARTICIPANTS DESCRIPTION

- Mostly female (61%);
- Age range: 24-65;
- 53% are from Auckland;
- Mostly visual and physical impairment.
- 26% had multiple impairment.

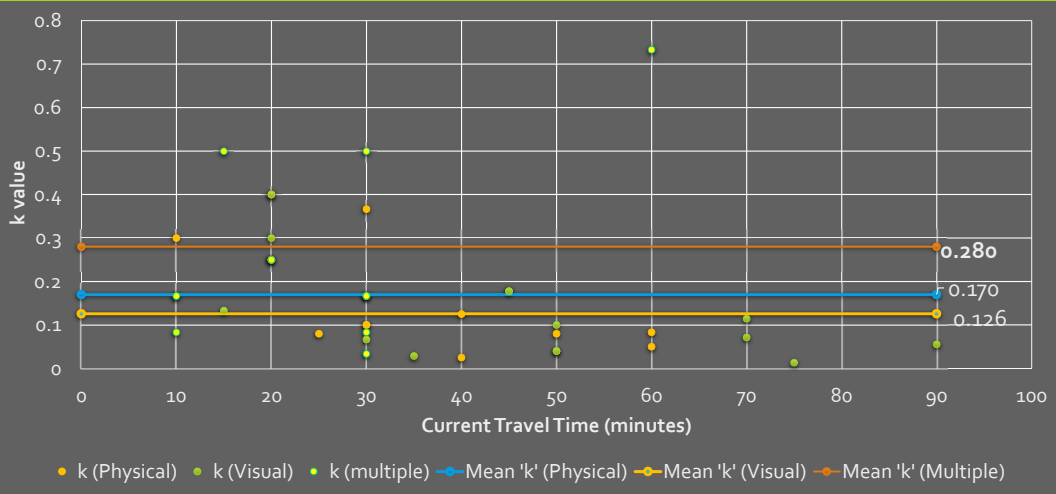


DIFFERENCE BETWEEN ABLE AND DISABLED RIDERS

- Travel time savings



DIFFERENCES AMONG DISABLED RIDERS



TRANSFER WAITING AND WALKING TIME

- 50% of the participants made a transfer;
- Rated currently accessibility features poorly, 1 or 2.

Trip attribute		Basic interchange	Good accessibility interchange
Waiting time	$\bar{x}$	.479±.076	.641±.142
	s_w^2	.116	.405
Walking time	$\bar{x}$	1.051±.192	1.362±.472
	s_w^2	.627	3.788

SUMMARY & FUTURE RESEARCH NEEDS

- People with disability have different needs within the disability type.
- Research Need A: More in-depth research is required to understand the needs of people with different disability.
- Very small sample is evidence - Trust in the government is missing for people with disability.
- Research Need B: Research in collaboration with the government is required to re-build this trust.
- Research Need C: Integrated Public Transport systems – more research required in this topic to completely understand the design standards and requirement by people with different disabilities.

THANK YOU

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