

GOING THE EXTRA MILE:



Transport Equity and Healthcare Access for Seniors in Singapore

Alice S.H. Lee

Co-supervised by Lynette Cheah, Thi Anh Hong Nguyen



Promoting public transport (PT) access is vital for addressing social exclusion and facilitating a just transition towards low-carbon mobility. Research has shown that **increased travel time and costs and physical limitations in using PT can result in lower healthcare utilisation for seniors**. Using a **two-part mixed methods approach**, this study provides insights into **inequities faced by seniors who take PT to healthcare facilities**, thereby offering guidance for improving inclusivity of transport and healthcare systems.

1 Aims

ONE: Using freely available data, identify inequities faced by seniors in the ease of accessing healthcare services by **PT versus private vehicle (PV)** in terms of **relative travel times, costs, and walking distance from transit stops to healthcare facilities** in Singapore.

TWO: Using a walkability assessment, identify environmental barriers that seniors using PT might face when walking **from the nearest transit stop to healthcare facilities** in Singapore.

HOW LONG?
HOW MUCH?
HOW?



PART ONE: SPATIAL ANALYSIS

- Studied healthcare facilities**
 - 8 Restructured Hospitals (RHs)
 - 9 Community Hospitals (CHs)
 - 23 Polyclinics
- Data sources**
 - Google Distance Matrix API, LTA DataMall, physical on-site visits
- Data extraction**
 - PT and PV travel times and costs from each subzone to healthcare facility
 - Walking times from nearest transit stop to each healthcare facility based on seniors' walking speed (58 metres/min)*

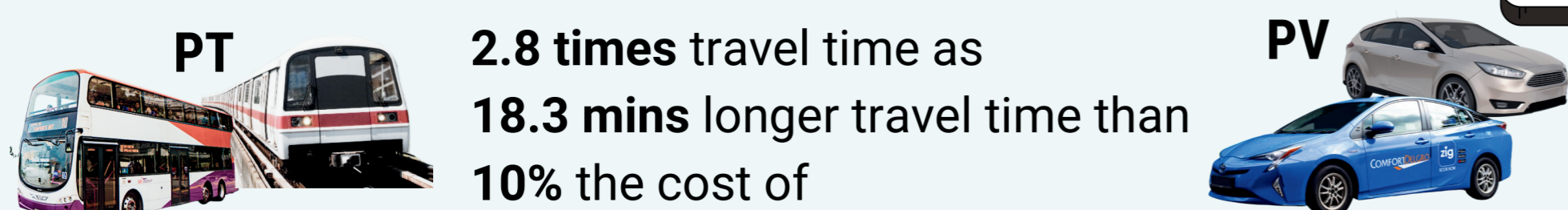
2 Methodology

PART TWO: WALKABILITY ASSESSMENT

Focus on **RHs**, which had the highest travel time and cost inequities in Part One. A **walkability study** of route segments from the **nearest transit stop to each RH's orthopedic clinic** was conducted by 3 researchers, on **3 dimensions** and **11 variables impacting seniors' walkability** based on research:

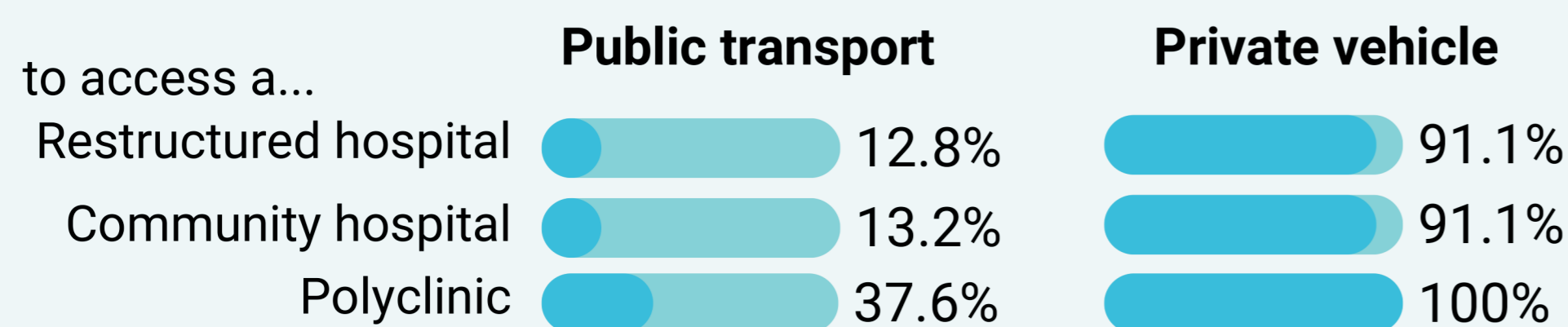
- Direct** Accessibility of bus stop in opposite direction | Obstacles | Level change between pavement and road | Stairs | Slopes | Wayfinding
- Safety** Protection from vehicular traffic | Pedestrian crossing quality
- Comfort** Pavement quality | Pavement width | Shelter/shade

1. Transport mode choice affects accessibility to healthcare facilities in terms of travel time and costs.



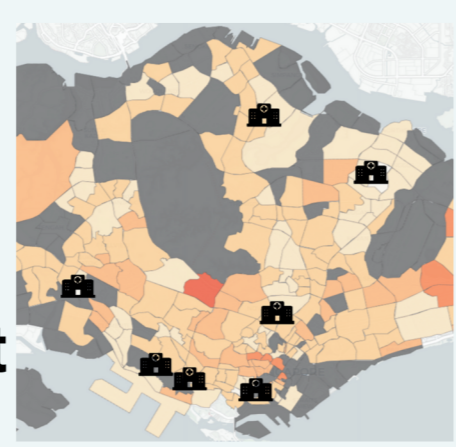
2. Extent of transport inequity depends on where seniors stay.

% of subzones within 20 minutes of travel time by:



Trips with highest travel time inequities, or PT/PV ratios, tend to be:

- In Central region (e.g., Outram, Bukit Timah, River Valley, Museum planning areas)
- Originate 1 - 2 subzones away from healthcare facility (see right figure)

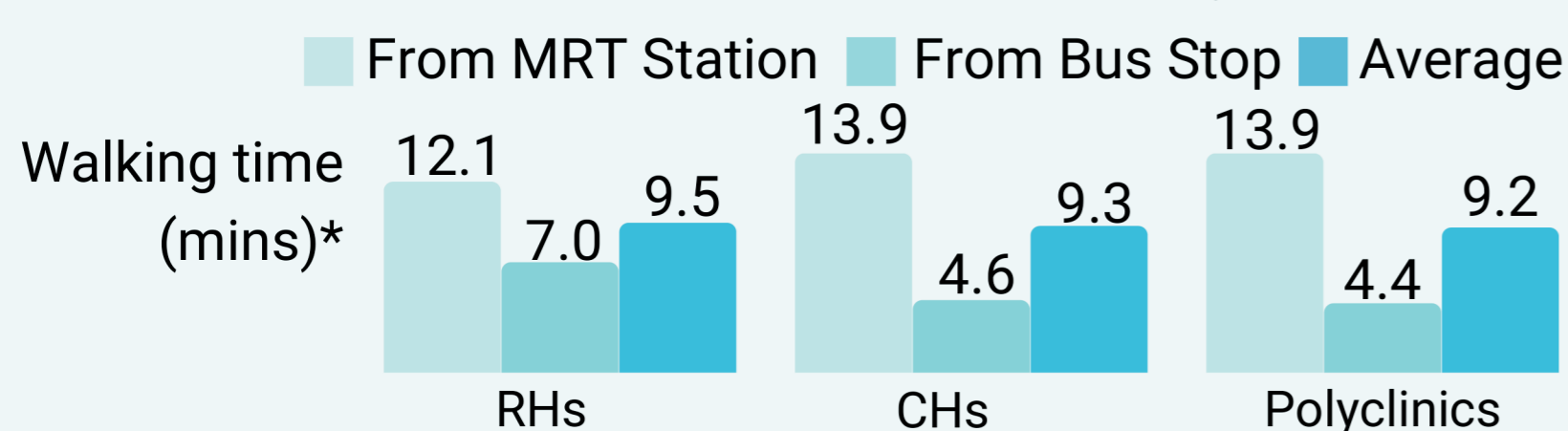


Trips with highest travel cost inequities, or PT/PV ratios, tend to:

- Have longer PT travel time[^]
- Originate 1 - 2 subzones away from healthcare facility

[^] attributable to cap of PT concessionary fares for seniors, at SG\$0.94 beyond 7.2km travelled, which is already lower than flag-down for taxis.

3. Seniors using PT walk significantly long distances from the nearest transit stop to a healthcare facility.



3 Findings

4. Key walkability barriers along routes from nearest MRT station/bus stop to RHs based on Walkability Assessment:

Lack of pictograms or staff to help illiterate seniors; low diversity of wayfinding locations causing signage to be easily missed (especially outdoor)

a) Wayfinding difficulties for seniors



Exposure to traffic along footpaths, posing risk to seniors who have decreased ability to detect and respond to traffic hazards

b) Safety risks for seniors



- Narrow paths; level changes between pavement and road; uneven pavements; lack of shelter/shade from weather elements
- Shuttle bus services available from MRT station for AH, CGH, KTPH were not always wheelchair-friendly or available from nearest bus stop

c) Accessibility issues for wheelchair users

Overall, the **FIRST** segment of the route from bus stop to every RH tends to score the **lowest** across walkability variables.

4 Conclusion

- Inequities exist between seniors with financial means** to take private vehicles, and **cost-sensitive seniors** who face more accessibility barriers due to taking public transport to access healthcare services.
- Future healthcare facilities** should consider proximity to transit stations or availability of disabled-friendly shuttle services, and eliminate walkability barriers for public transport users like insufficient wayfinding and shelter/shade.
- Study limitations** include potentially out-of-date data, unrepresentative healthcare trips and walking routes, differing perceptions with actual seniors for walkability assessment - attitudinal surveys of seniors might offer better insight.