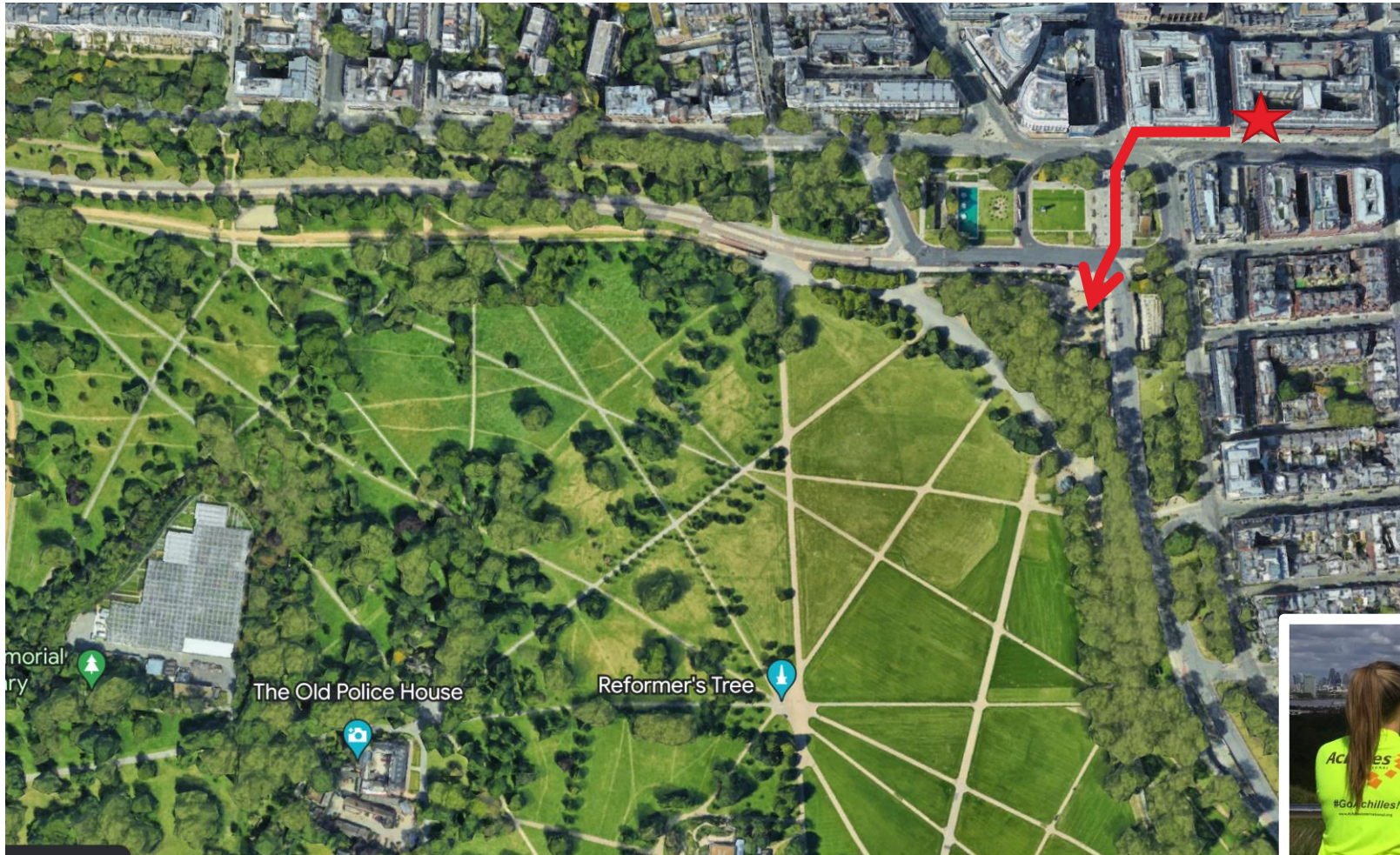


Station Planning: Modelling Wheelchair Accessibility

Christel Hengeveld



Introduction

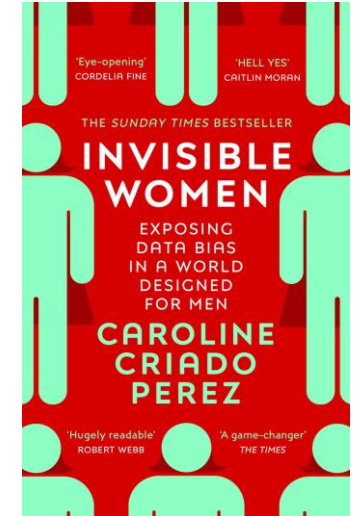


Agenda

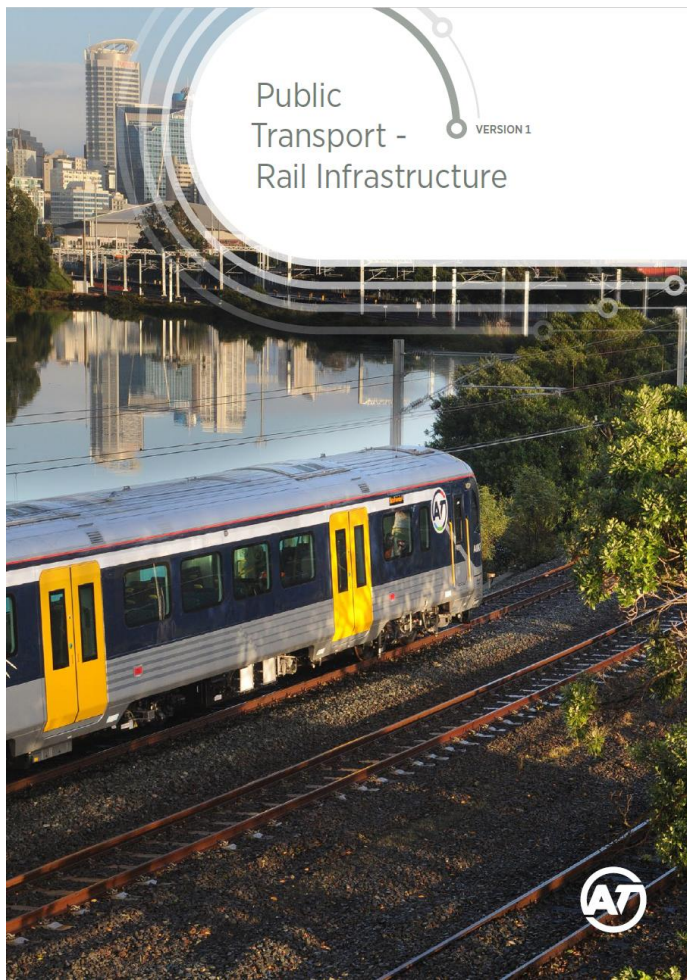
- Historical context
- Current guidance
- Compliant versus accessible
- How can we do better?

Historical Context

- Designing for “default”
 - Call buttons on buses
 - Walking speed measurements from 1960s NYC
 - Planning for the peak
-
- Why does this matter?



Current guidance



Design for impaired customers

Stations and precincts must be designed following NZS 4121, Design for Access and Mobility – Buildings and Associated Facilities, to provide equitable access for all customers, including users with reduced mobility and other disabilities.



Current guidance

TfL Management System

Standard Category 1

S1371 A8 Station Planning

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6.6.10 Lifts should be located to minimise, as far as reasonably practicable, travel distances to the designated wheelchair areas within the trains.

CITY	AM peak			Inter peak			PM peak			Weekend			Average		
	Entrance	Exit	Av (Int)	Entrance	Exit	Av (Int)	Entrance	Exit	Av (Int)	Entrance	Exit	Av (Int)	Entrance	Exit	Av (Int)
Passengers by PRM Category															
A - Wheelchair	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
B - Physical mobility Impairment	0.21	0.21	0.16	0.58	0.57	0.43	0.29	0.29	0.22	0.37	0.37	0.28	0.37	0.36	0.27
C - Medium encumbrance	2.03	1.46	1.94	5.38	3.87	5.16	8.23	5.92	7.89	9.24	6.64	8.86	6.11	4.39	5.86
D - Large encumbrance	0.77	0.54	0.73	1.59	1.11	1.50	2.09	1.46	1.97	2.37	1.66	2.24	1.68	1.18	1.59
E - Buggy	0.04	0.04	0.08	0.10	0.12	0.23	0.05	0.06	0.12	0.14	0.17	0.31	0.08	0.10	0.18
Total	3.05	2.25	2.91	7.65	5.67	7.32	10.67	7.75	10.20	12.13	8.83	11.68	8.24	6.03	7.90
INNER SUBURB															
Passengers by PRM Category															
A - Wheelchair	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B - Physical mobility Impairment	0.28	0.31	0.16	0.75	0.84	0.43	0.38	0.43	0.22	0.49	0.55	0.28	0.48	0.53	0.27
C - Medium encumbrance	1.65	2.02	1.94	4.38	5.37	5.16	6.71	8.22	7.89	7.52	9.23	8.86	4.98	6.10	5.86
D - Large encumbrance	0.62	0.77	0.73	1.28	1.59	1.50	1.68	2.09	1.97	1.91	2.38	2.24	1.36	1.68	1.59
E - Buggy	0.09	0.09	0.08	0.24	0.24	0.23	0.13	0.13	0.12	0.32	0.32	0.31	0.19	0.19	0.18
Total	2.64	3.19	2.91	6.66	8.05	7.32	8.90	10.87	10.20	10.25	12.47	11.68	7.00	8.51	7.90
OUTER SUBURB															
Passengers by PRM Category															
A - Wheelchair	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B - Physical mobility Impairment	0.49	0.56	0.16	1.32	1.51	0.43	0.67	0.77	0.22	0.86	0.98	0.28	0.84	0.96	0.27
C - Medium encumbrance	1.41	2.46	1.94	3.75	6.54	5.16	5.73	10.00	7.89	6.43	11.22	8.86	4.26	7.42	5.86
D - Large encumbrance	0.52	0.90	0.73	1.08	1.87	1.50	1.42	2.45	1.97	1.62	2.79	2.24	1.15	1.97	1.59
E - Buggy	0.15	0.12	0.08	0.42	0.32	0.23	0.22	0.17	0.12	0.57	0.44	0.31	0.33	0.25	0.18
Total	2.58	4.04	2.91	6.58	10.24	7.32	8.05	13.39	10.20	9.48	15.43	11.68	6.57	10.61	7.90
SHOPPING															
Passengers by PRM Category															
A - Wheelchair	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B - Physical mobility Impairment	0.19	0.18	0.16	0.52	0.48	0.43	0.27	0.24	0.22	0.34	0.31	0.28	0.33	0.30	0.27
C - Medium encumbrance	3.41	1.35	1.94	9.05	3.58	5.16	13.85	5.47	7.89	15.54	6.14	8.86	10.28	4.06	5.86
D - Large encumbrance	1.22	0.50	0.73	2.53	1.03	1.50	3.32	1.35	1.97	3.77	1.53	2.24	2.67	1.08	1.59
E - Buggy	0.04	0.09	0.08	0.12	0.25	0.23	0.06	0.13	0.12	0.16	0.34	0.31	0.09	0.20	0.18
Total	4.87	2.11	2.91	12.22	5.33	7.32	17.49	7.19	10.20	19.81	8.32	11.68	13.37	5.65	7.90
TERMINUS															
Passengers by PRM Category															
A - Wheelchair	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B - Physical mobility Impairment	0.24	0.25	0.16	0.65	0.68	0.43	0.33	0.34	0.22	0.42	0.44	0.28	0.41	0.43	0.27
C - Medium encumbrance	2.38	2.40	1.94	6.32	6.38	5.16	9.67	9.76	7.89	10.85	10.95	8.86	7.18	7.24	5.86
D - Large encumbrance	0.91	0.92	0.73	1.88	1.89	1.50	2.47	2.48	1.97	2.81	2.82	2.24	1.99	2.00	1.59
E - Buggy	0.06	0.08	0.08	0.17	0.23	0.23	0.09	0.12	0.12	0.22	0.31	0.31	0.13	0.18	0.18
Total	3.59	3.65	2.91	9.02	9.18	7.32	12.56	12.70	10.20	14.30	14.52	11.68	9.71	9.85	7.90
TOURIST															
Passengers by PRM Category															
A - Wheelchair	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
B - Physical mobility Impairment	0.35	0.18	0.16	0.96	0.49	0.43	0.49	0.25	0.22	0.62	0.32	0.28	0.61	0.31	0.27
C - Medium encumbrance	1.87	1.45	1.94	4.96	3.85	5.16	7.58	5.88	7.89	8.51	6.60	8.86	5.63	4.37	5.86
D - Large encumbrance	0.69	0.54	0.73	1.43	1.11	1.50	1.88	1.46	1.97	2.13	1.66	2.24	1.51	1.18	1.59
E - Buggy	0.07	0.06	0.08	0.18	0.17	0.23	0.10	0.09	0.12	0.25	0.24	0.31	0.14	0.14	0.18
Total	2.98	2.23	2.91	7.53	5.62	7.32	10.07	7.69	10.20	11.51	8.82	11.68	7.90	5.99	7.90

Compliant versus accessible

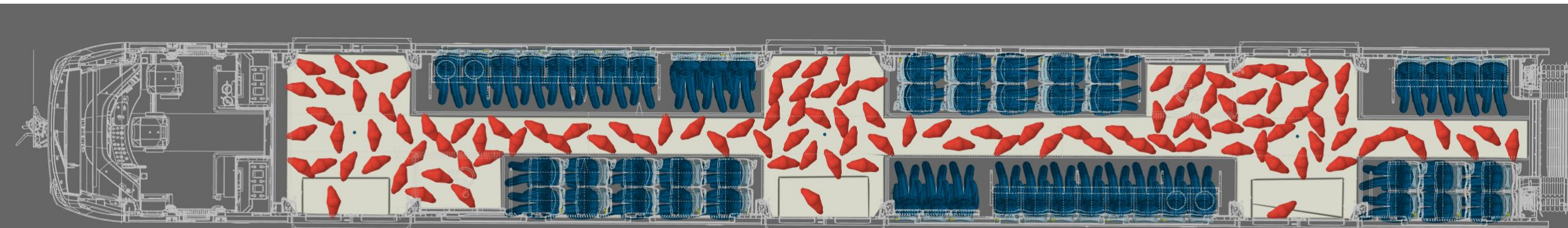


<https://www.pocket-lint.com/gadgets/news/148832-amusing-and-frustrating-design-fails-from-around-the-world/>

Compliant versus Accessible



Compliant versus Accessible



4 passengers per m²

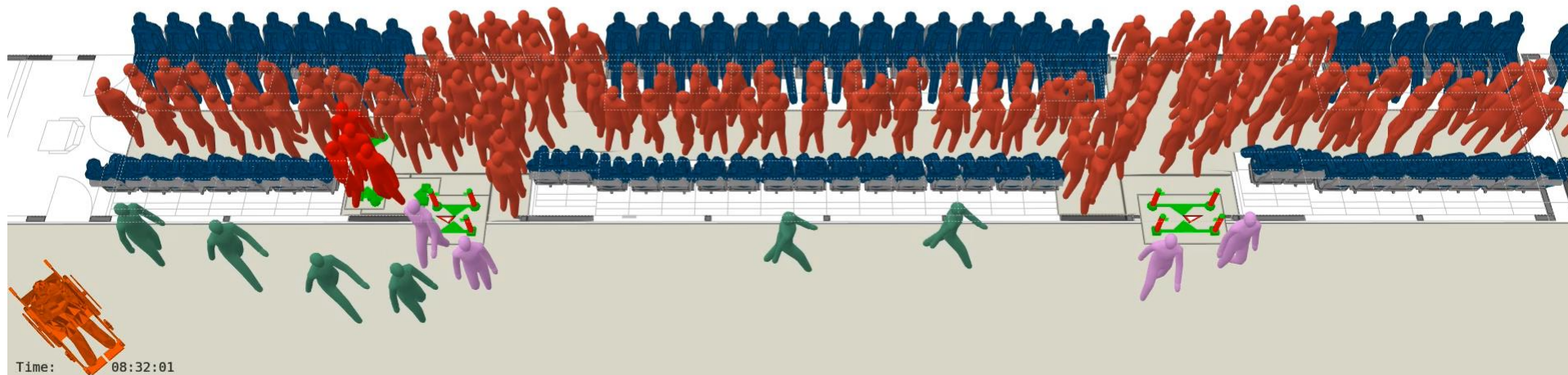


Compliant versus Accessible

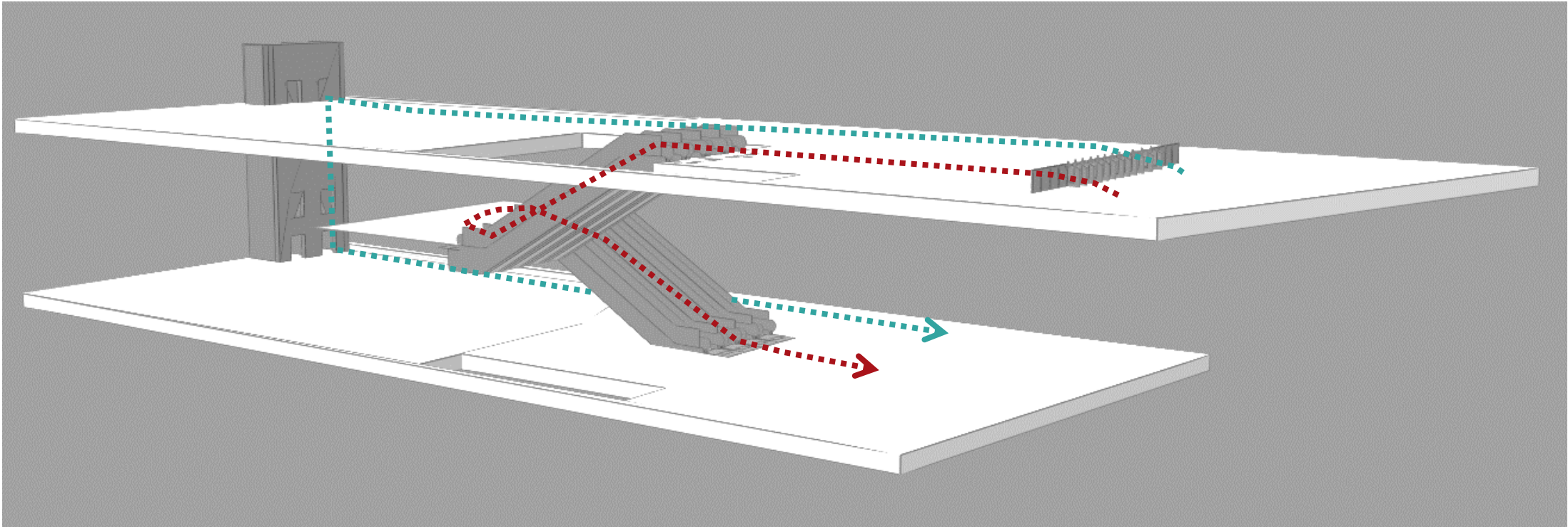
Wheelchair access onto a train

Design for impaired customers

Stations and precincts must be designed following NZS 4121, Design for Access and Mobility – Buildings and Associated Facilities, to provide equitable access for all customers, including users with reduced mobility and other disabilities.



Compliant versus Accessible



- 6.6.10 Lifts should be located to minimise, as far as reasonably practicable, travel distances to the designated wheelchair areas within the trains.

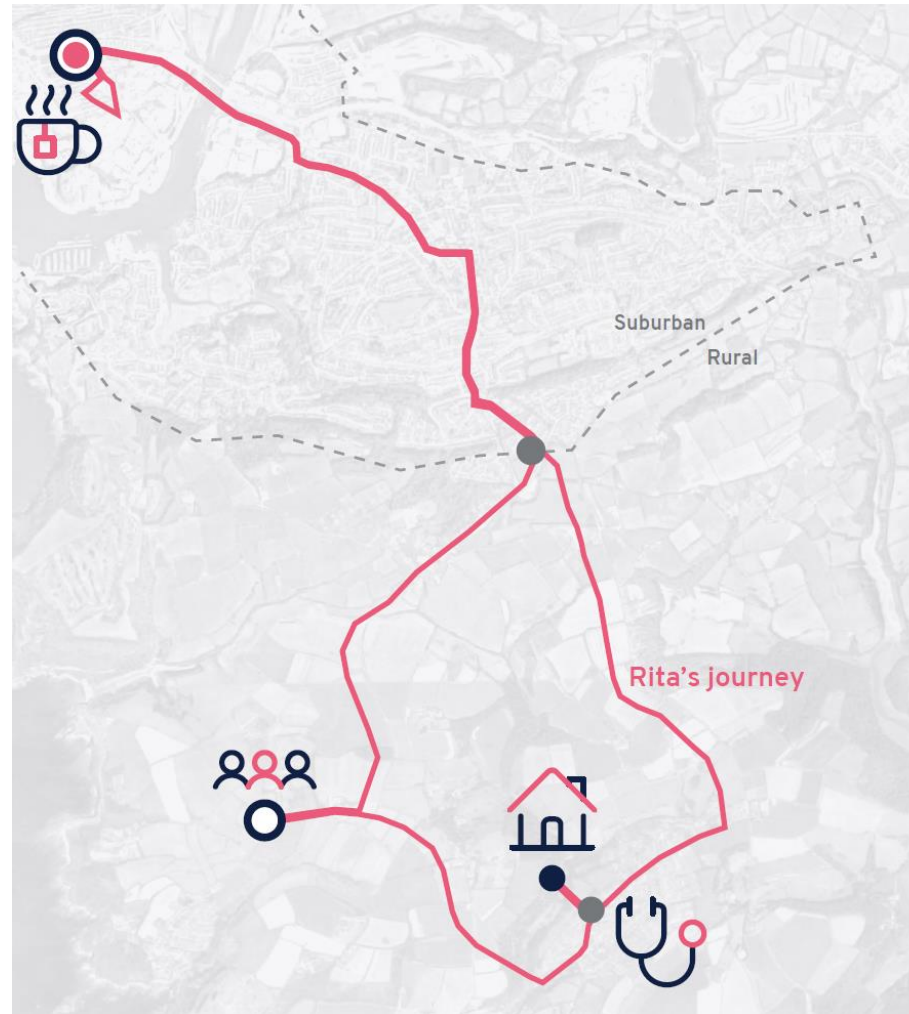
How can we do better?

User Journeys

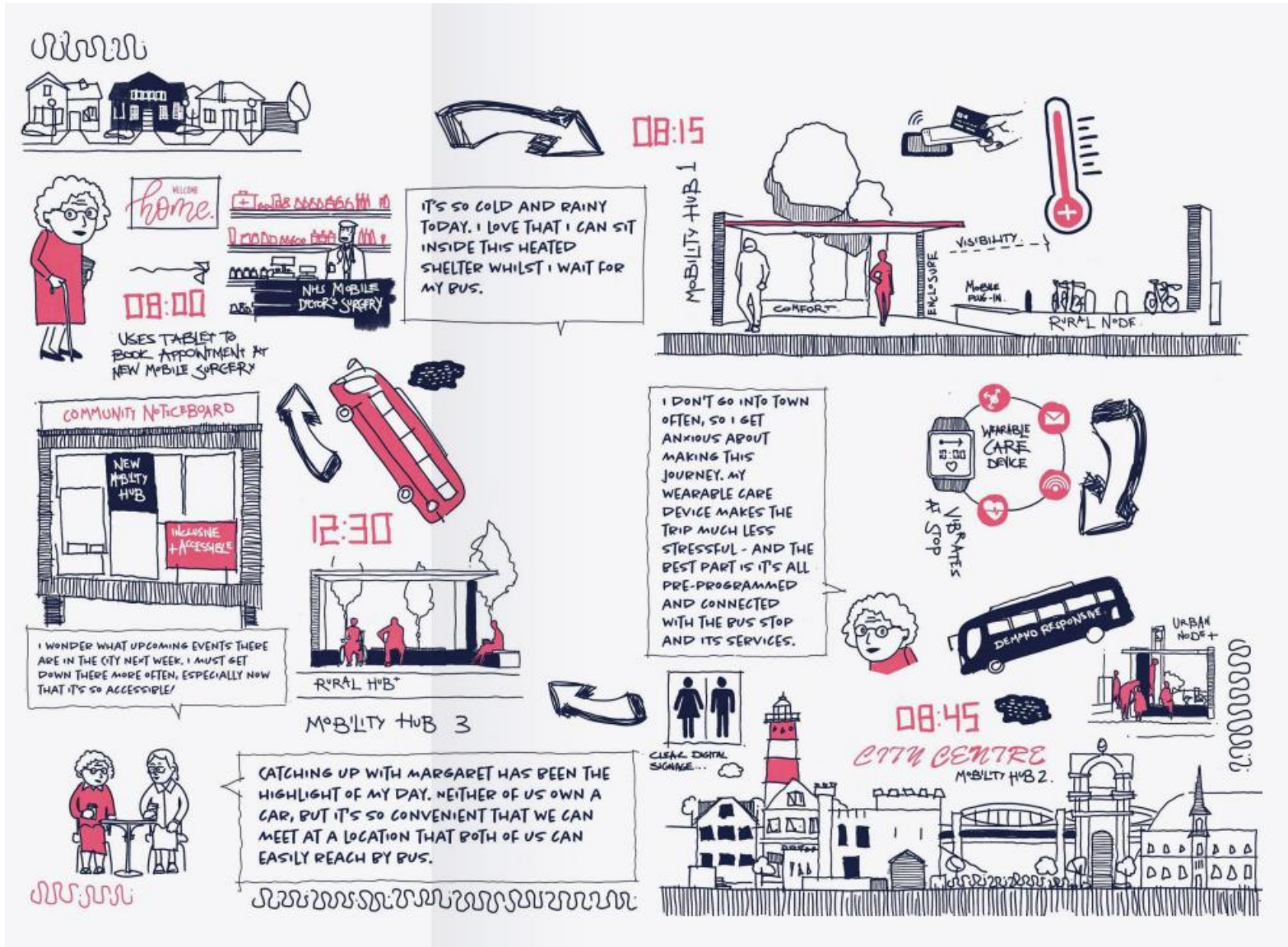
We have developed three characters and their user journeys to show how people will interact with the Future Mobility Hub Framework. These begin to explore the users' specific requirements and how each mobility hub needs to respond to context, scale and opportunity.

Rita's Profile

Rita is a retiree and lives on her own in a small, rural village. She doesn't have a car and relies heavily on the public transport network to get around. She is an anxious traveller and has a mobility impairment which limits her to walking short distances and avoiding stepped routes.

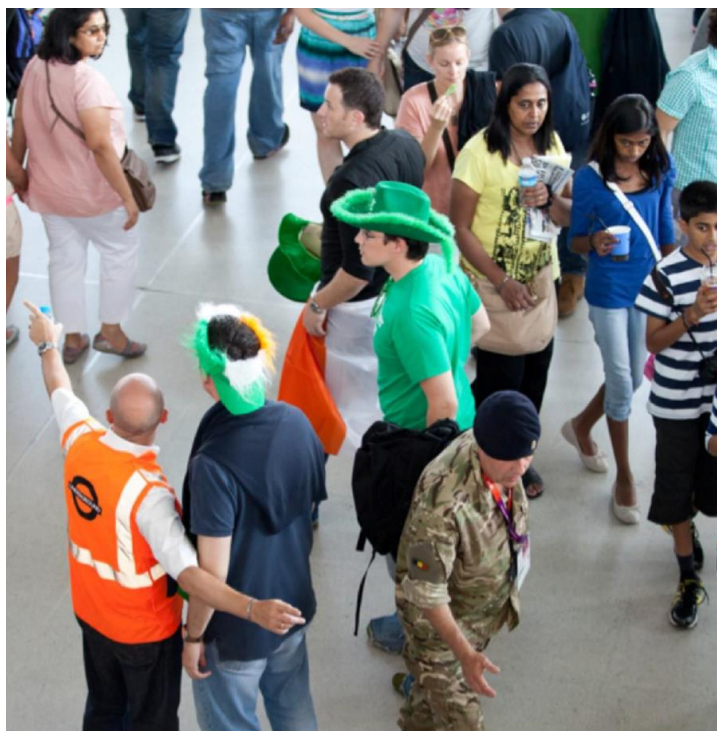


How can we do better?



How can we do better?

Research



Travel in London: Understanding our diverse communities 2019

A summary of existing research

The 'all customer' gain points often have a more severe impact for disabled customers. There are also additional gain points for disabled people:



The barriers to greater public transport use that are most commonly mentioned by disabled Londoners are:

- Overcrowding and cramped conditions (51 per cent compared with 47 per cent non-disabled customers)
- Cost (36 per cent compared with 43 per cent non-disabled customers)
- Passengers pushing and shoving each other (33 per cent compared with 24 per cent non-disabled customers) [13]

How can we do better?

- Let's not stop at compliance
- Drive for innovation and user centric design
- Reconsider what value engineering does to all PT users

ARUP