

Design experiments in
metropolitan carriage interior
configuration to improve boarding, alighting,
passenger dispersal and dwell time stability

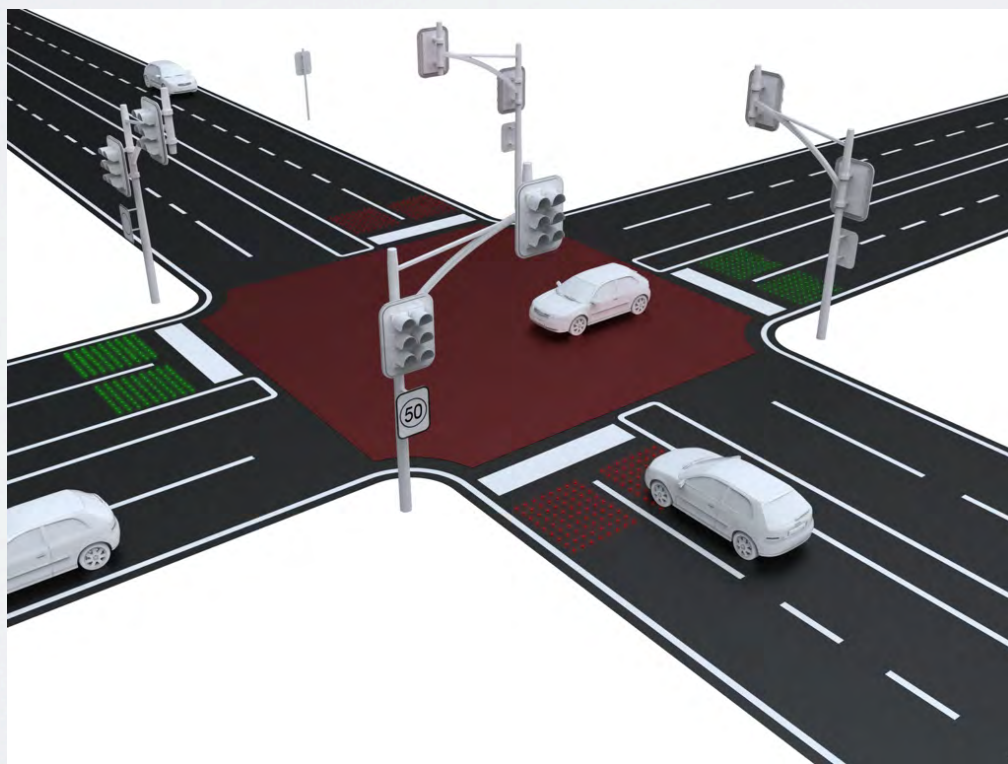
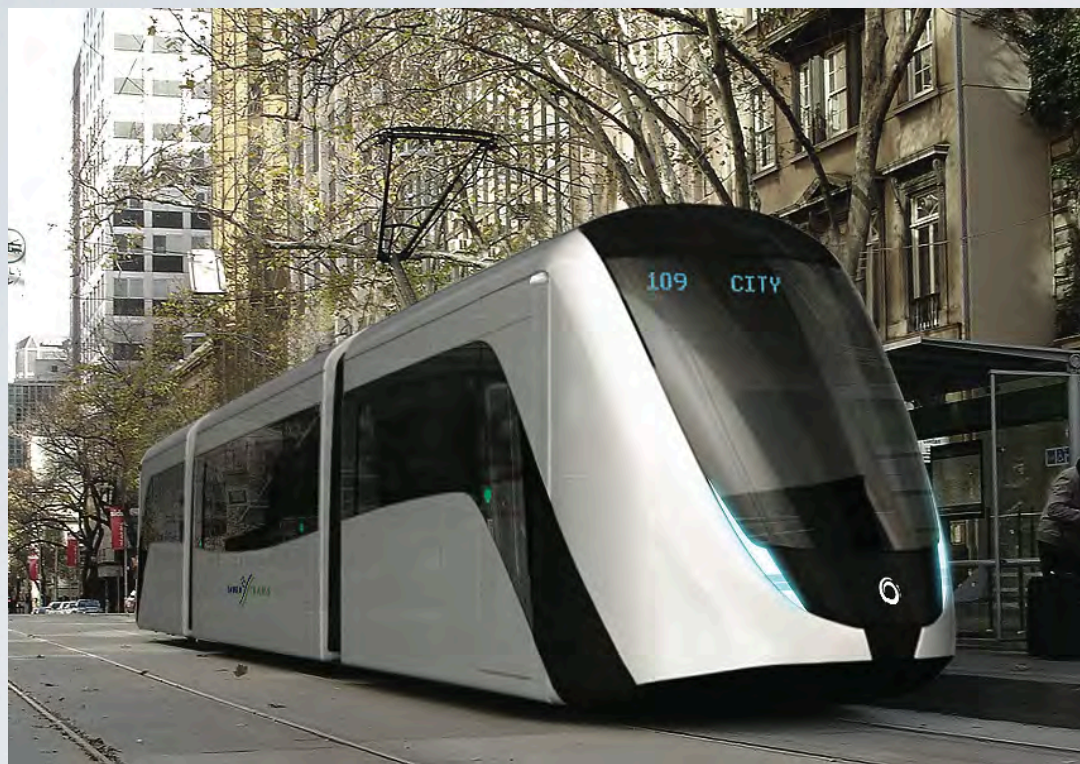


Selby Coxon

Deputy Head, Department of Design



Industrial
design



Industrial
Design

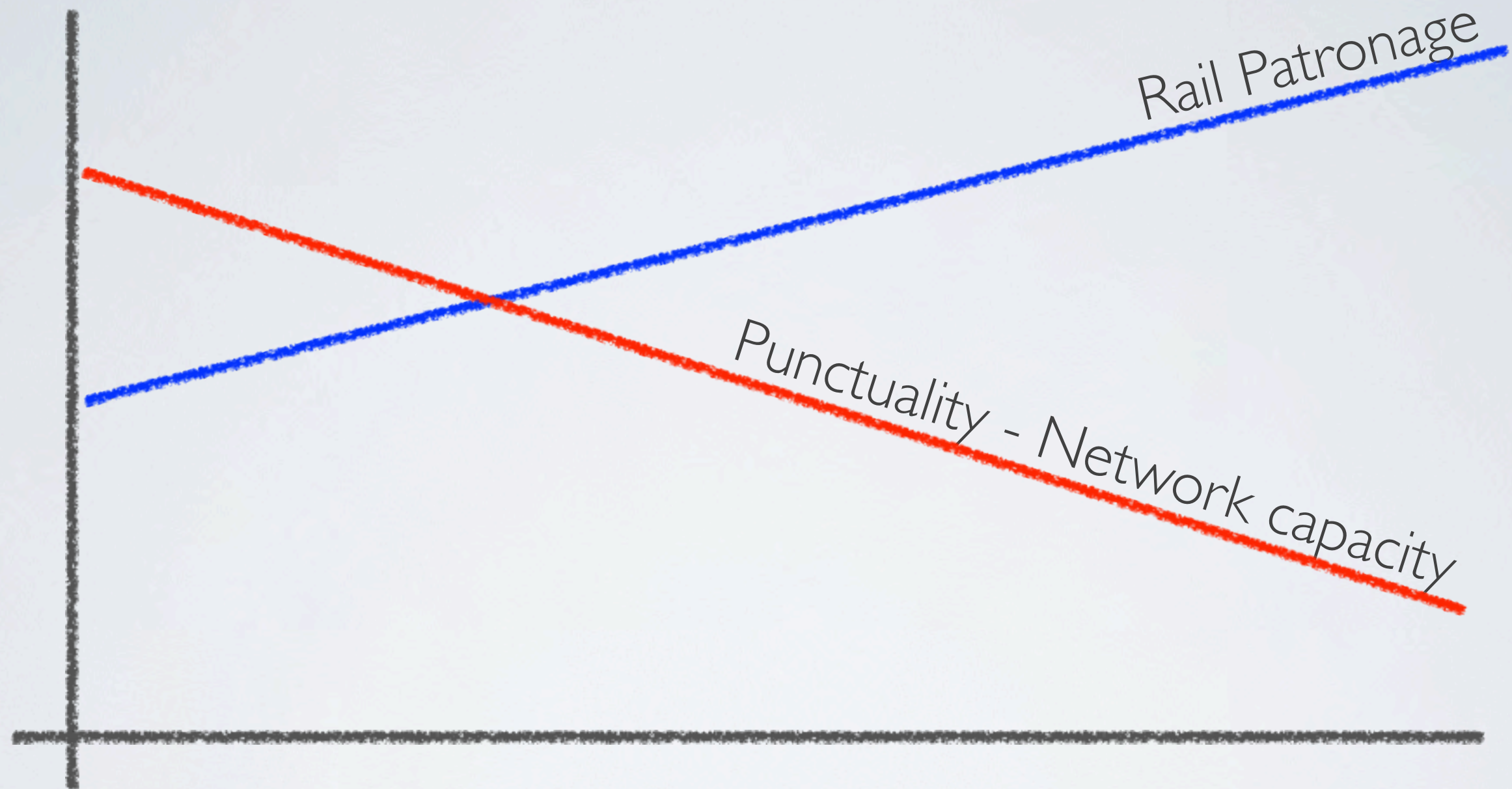
The research
problem

Current state
of the proposed
solution



The research
method

Conclusions



Passengers in excess of capacity



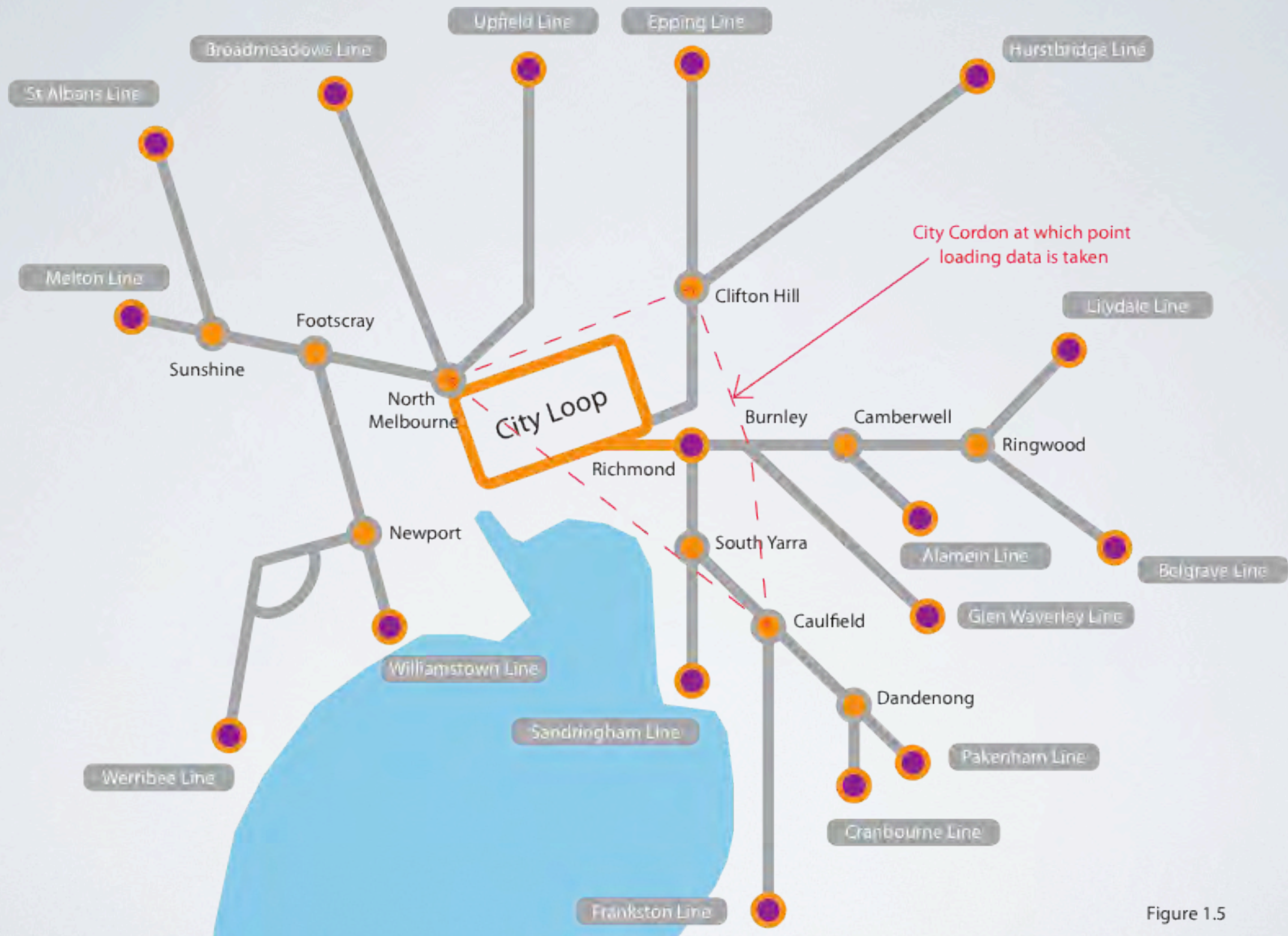
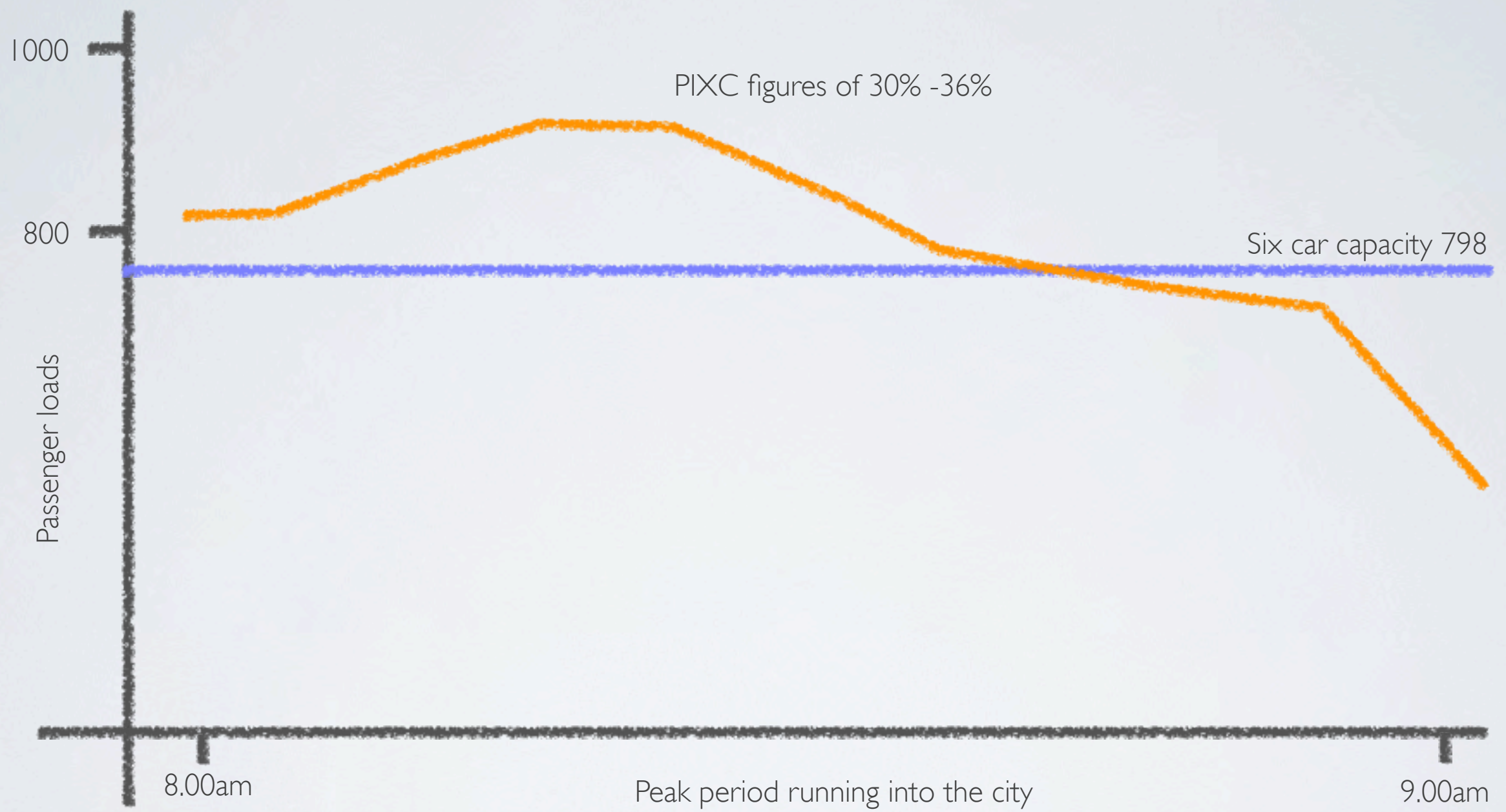


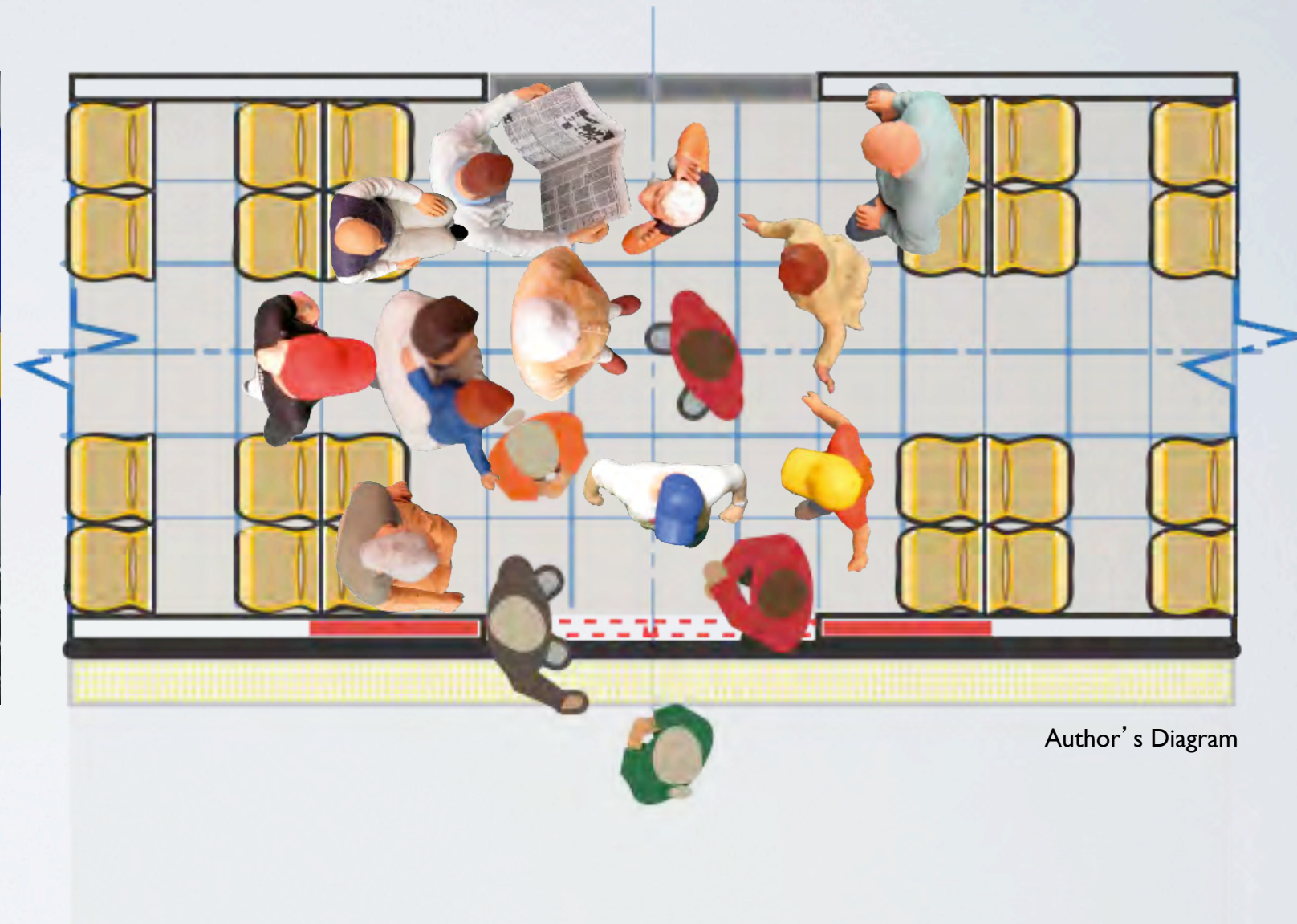
Figure 1.5



Doorway occlusion

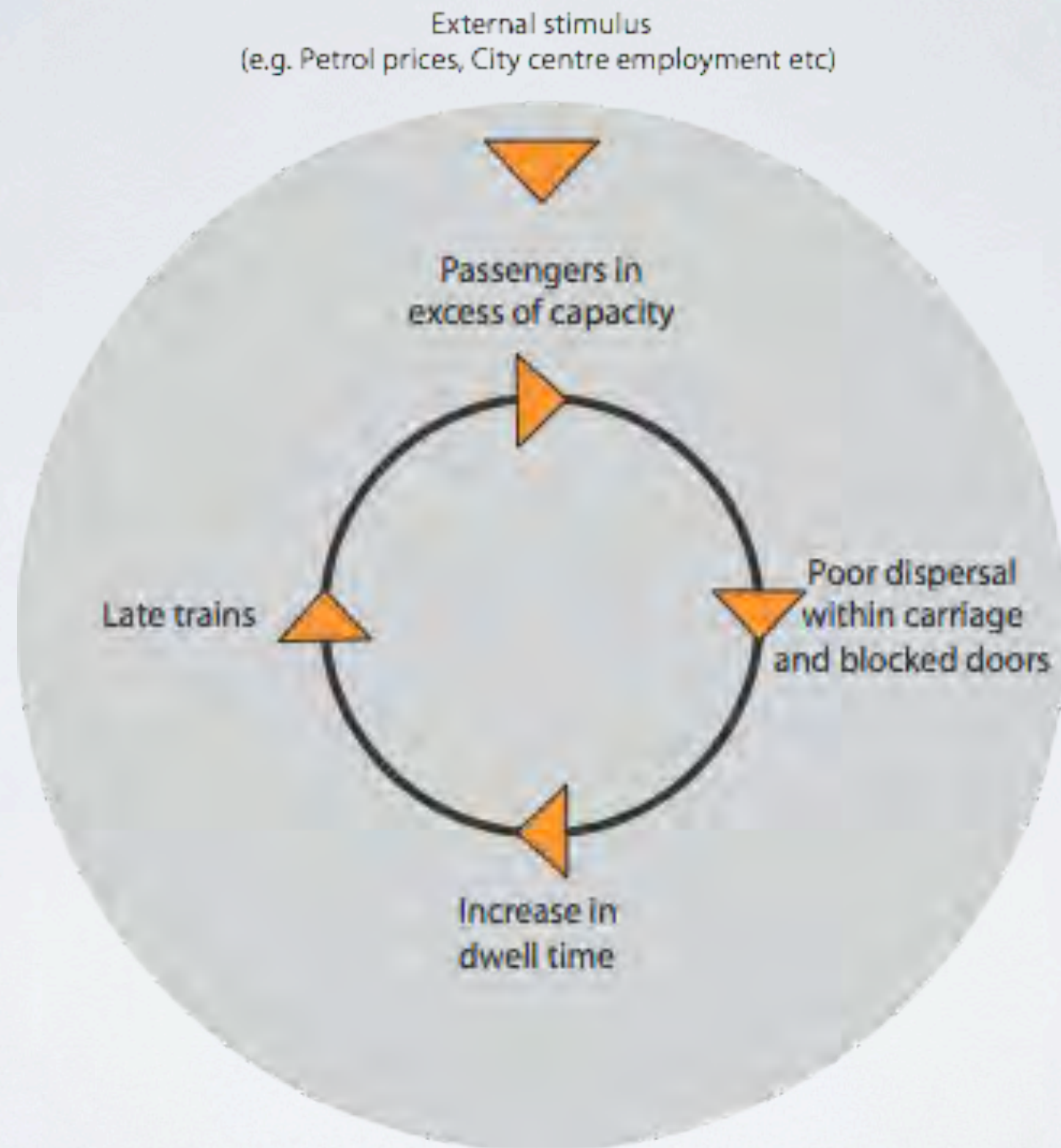


Image: Age Newspaper Online Archive



Author's Diagram

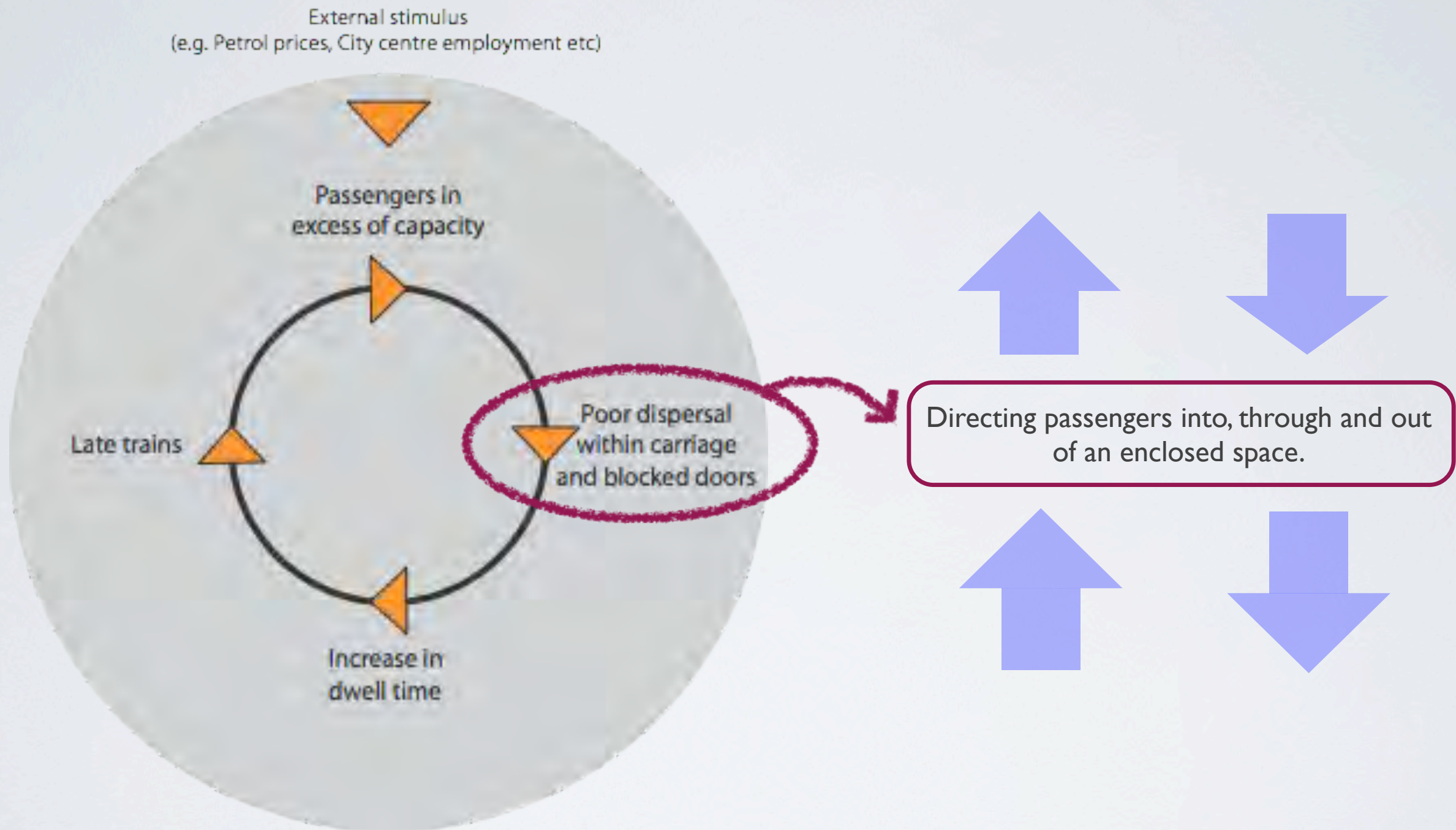
The Problem Space



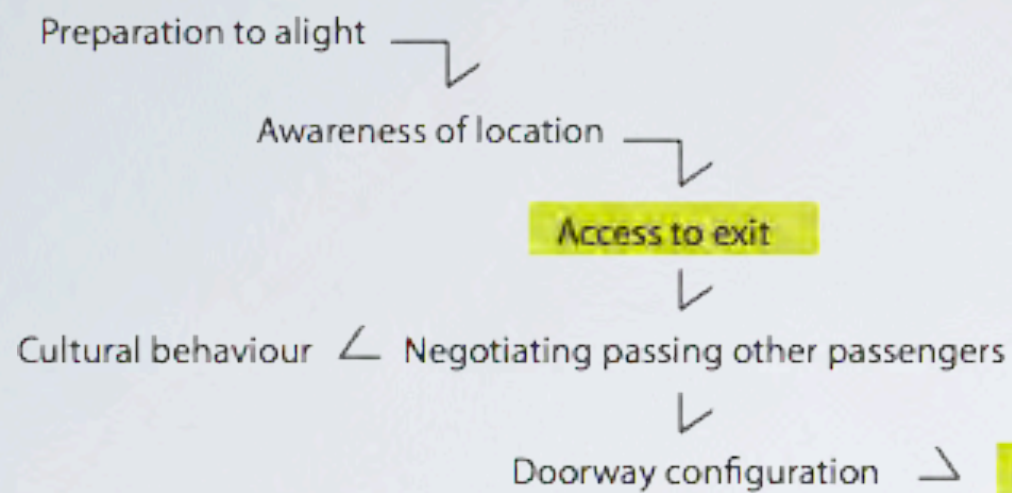
Current methods to ameliorate the problem

- Add more carriages
- Increase service frequency
- Fewer seats
- Wider doors / More doors
- Signpost desired behaviors
- Seat configuration
- Double deck carriages
- Track amplification

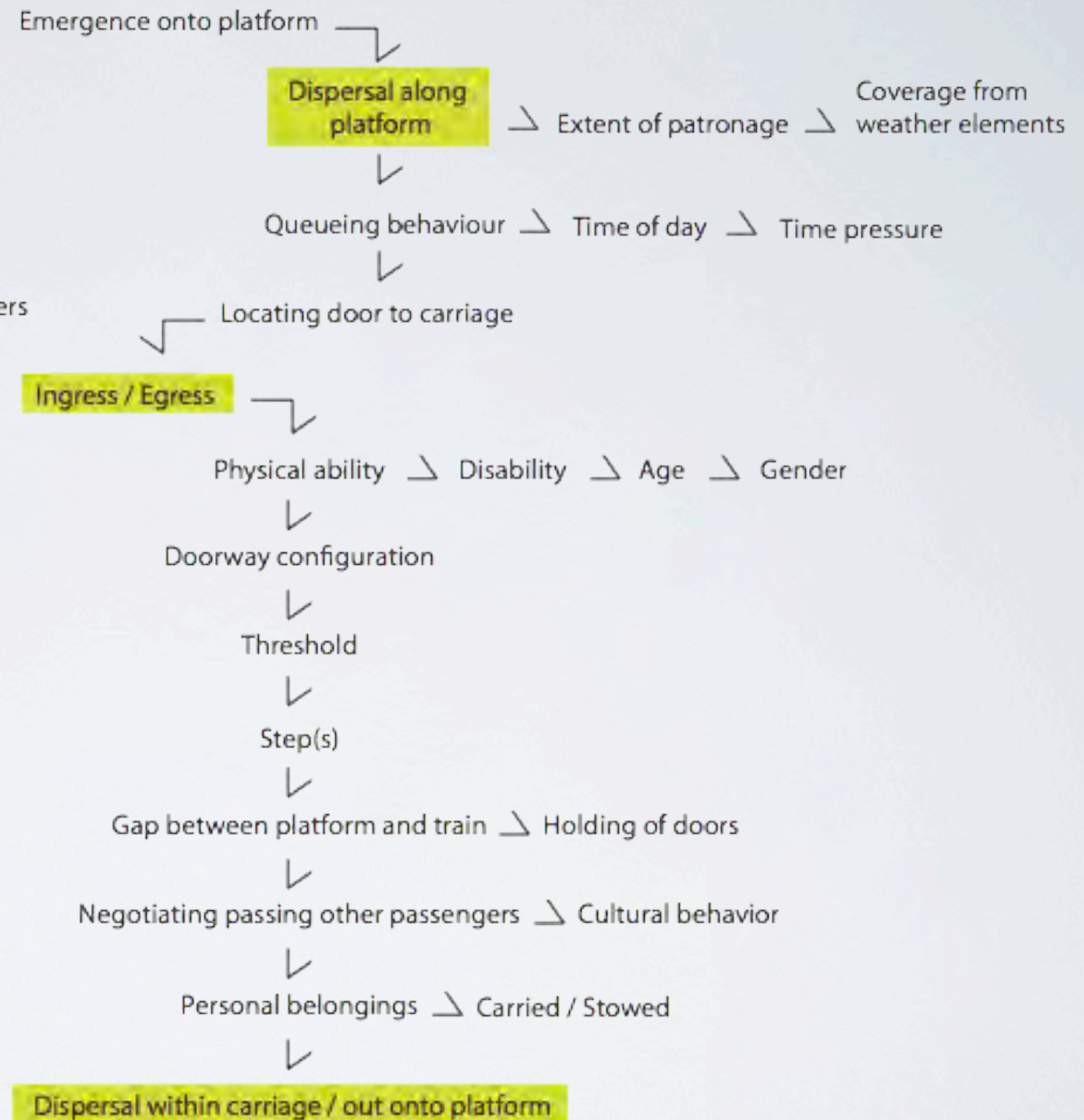
The Design Intervention



Alighting

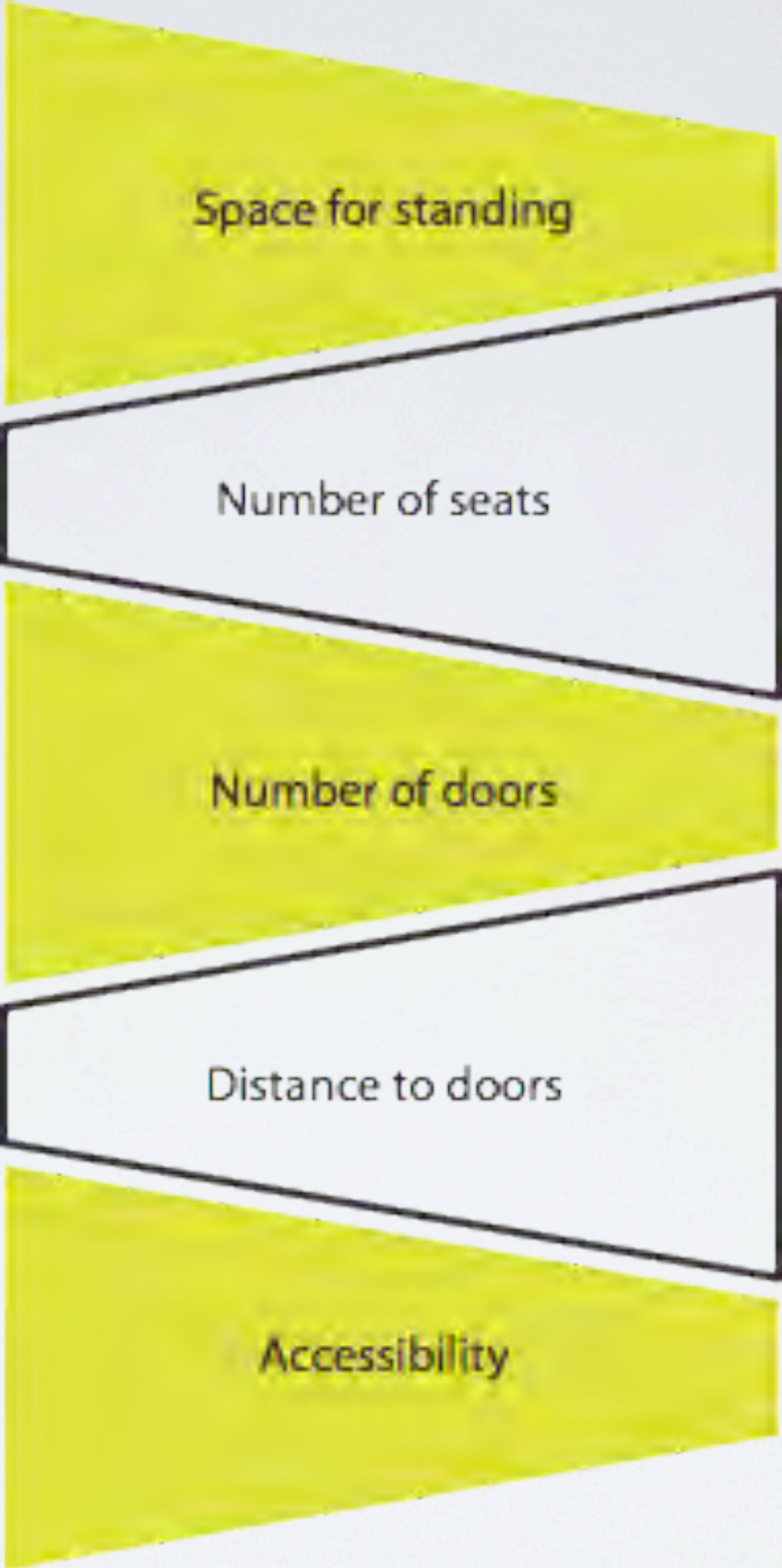


Boarding









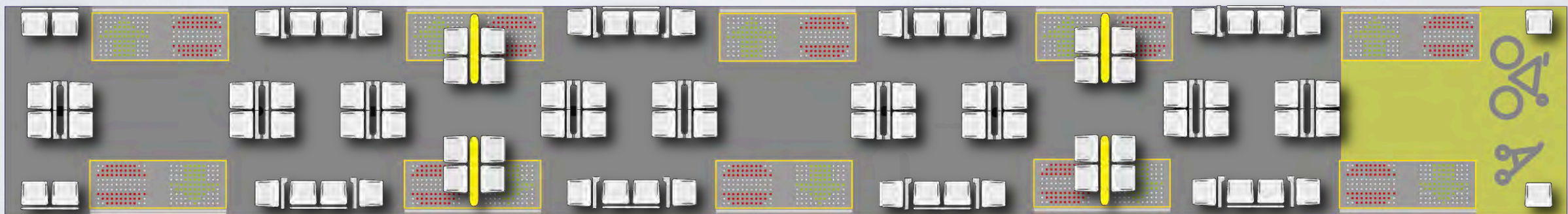
Space for standing

Number of seats

Number of doors

Distance to doors

Accessibility



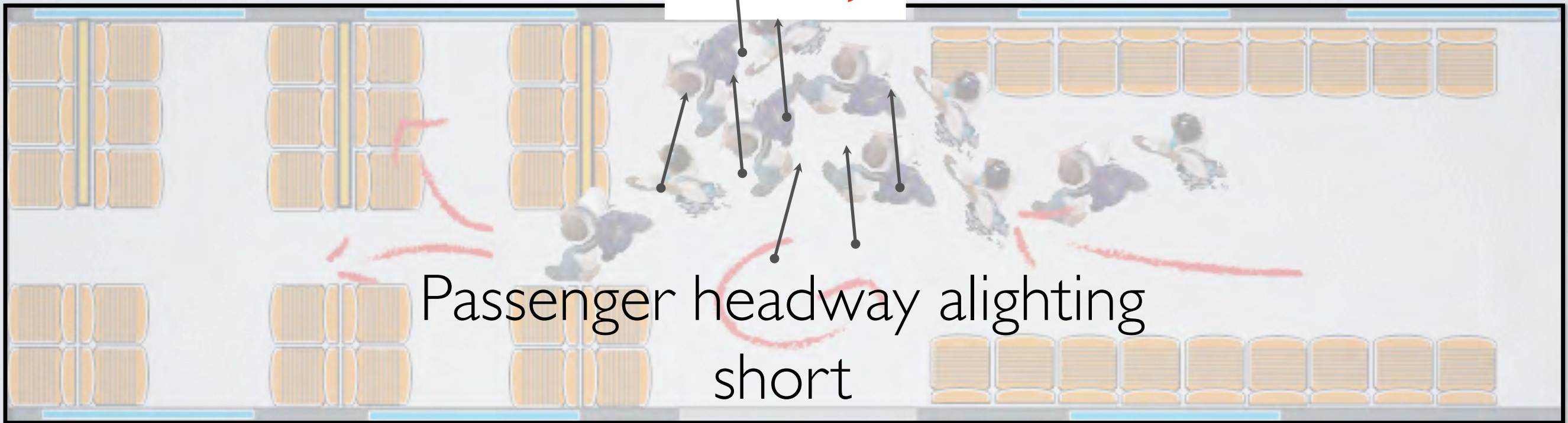
Passenger dispersal
quick

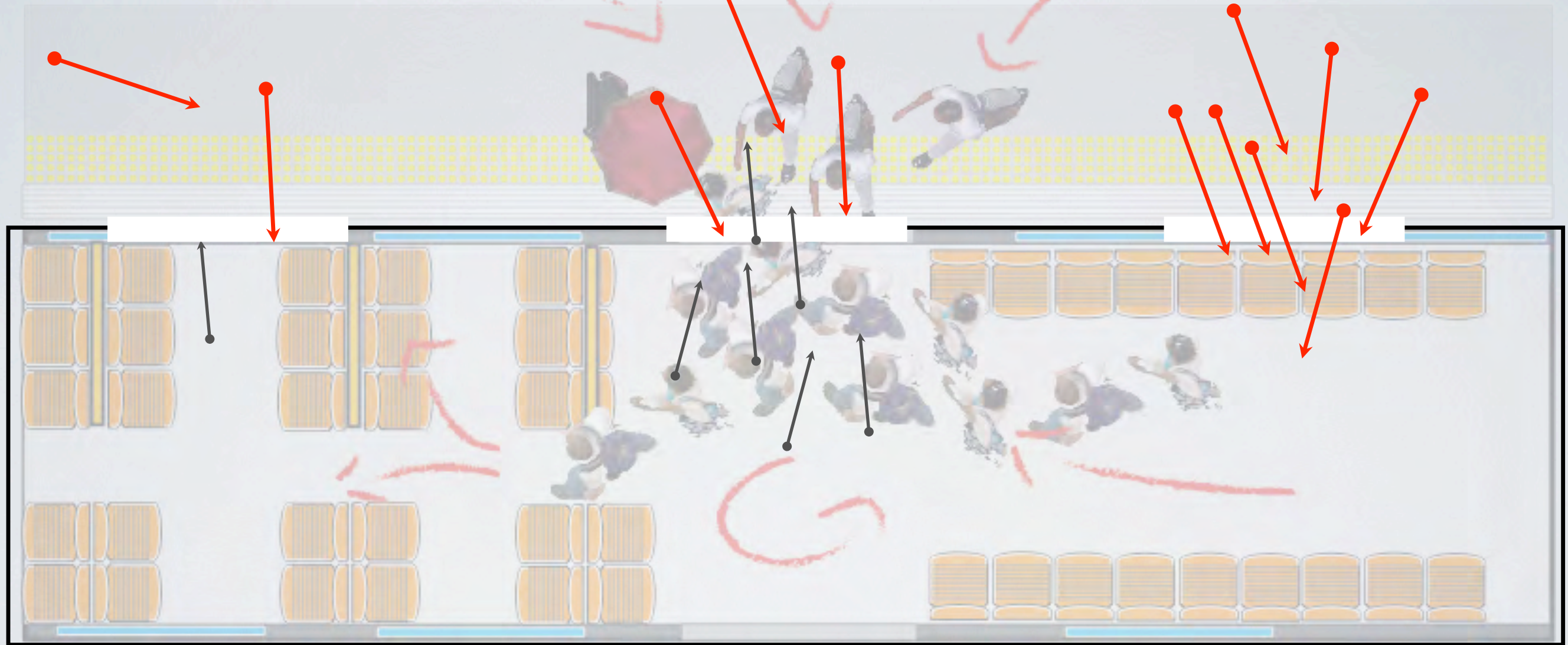


Passenger dispersal slow



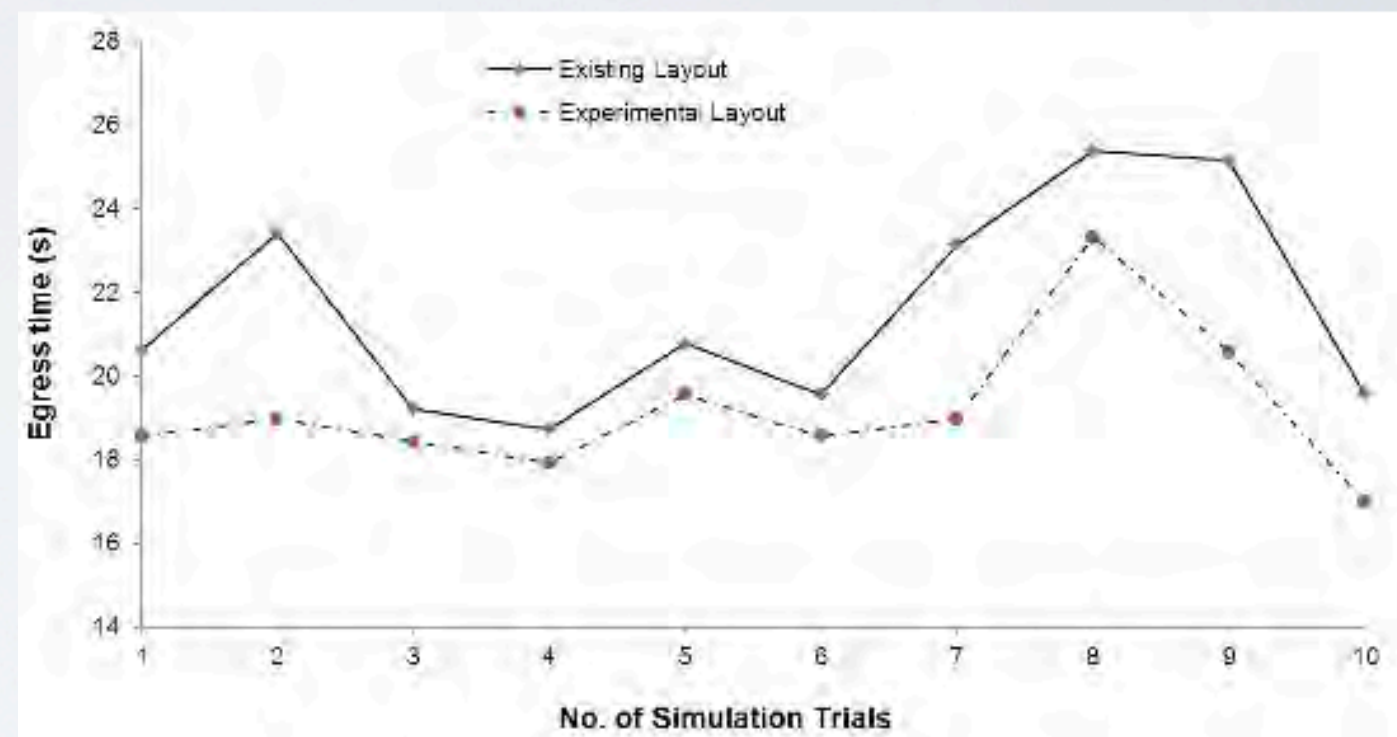
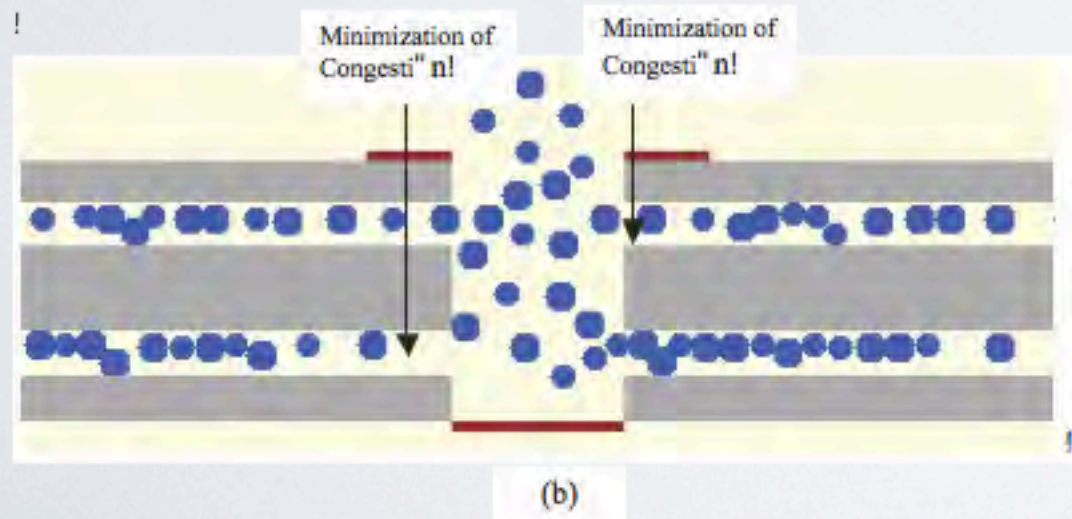
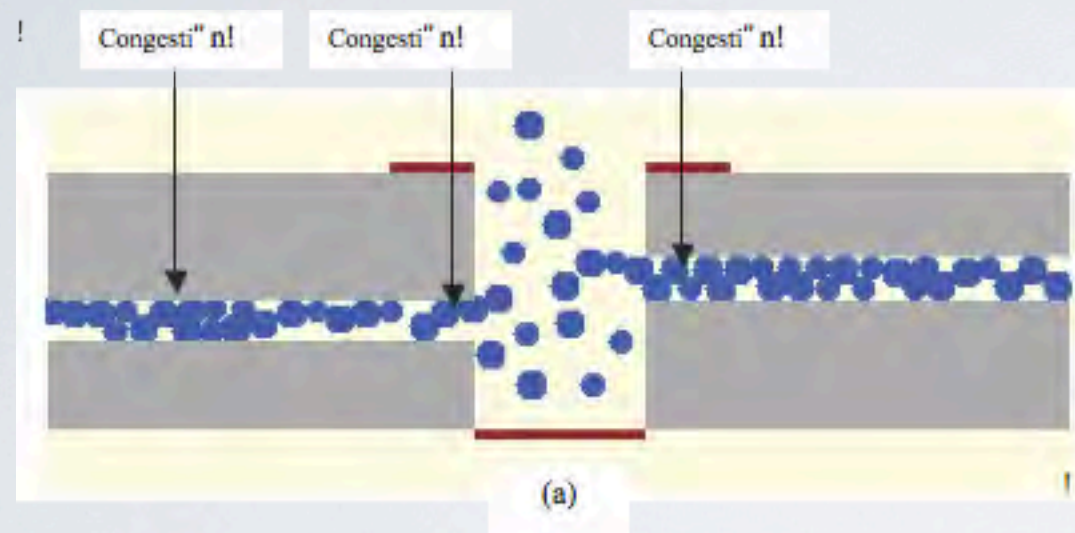
Passenger headway
boarding long



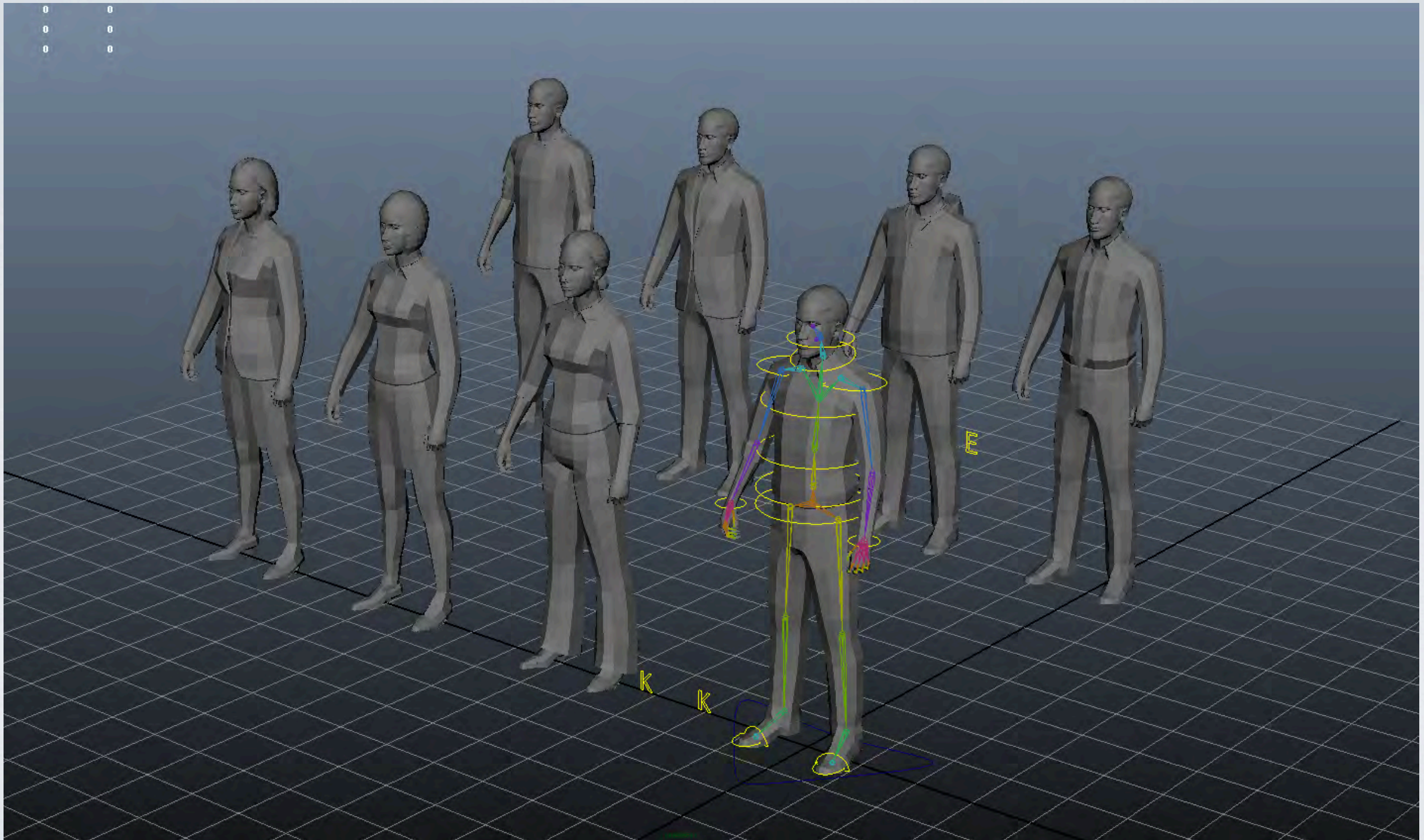


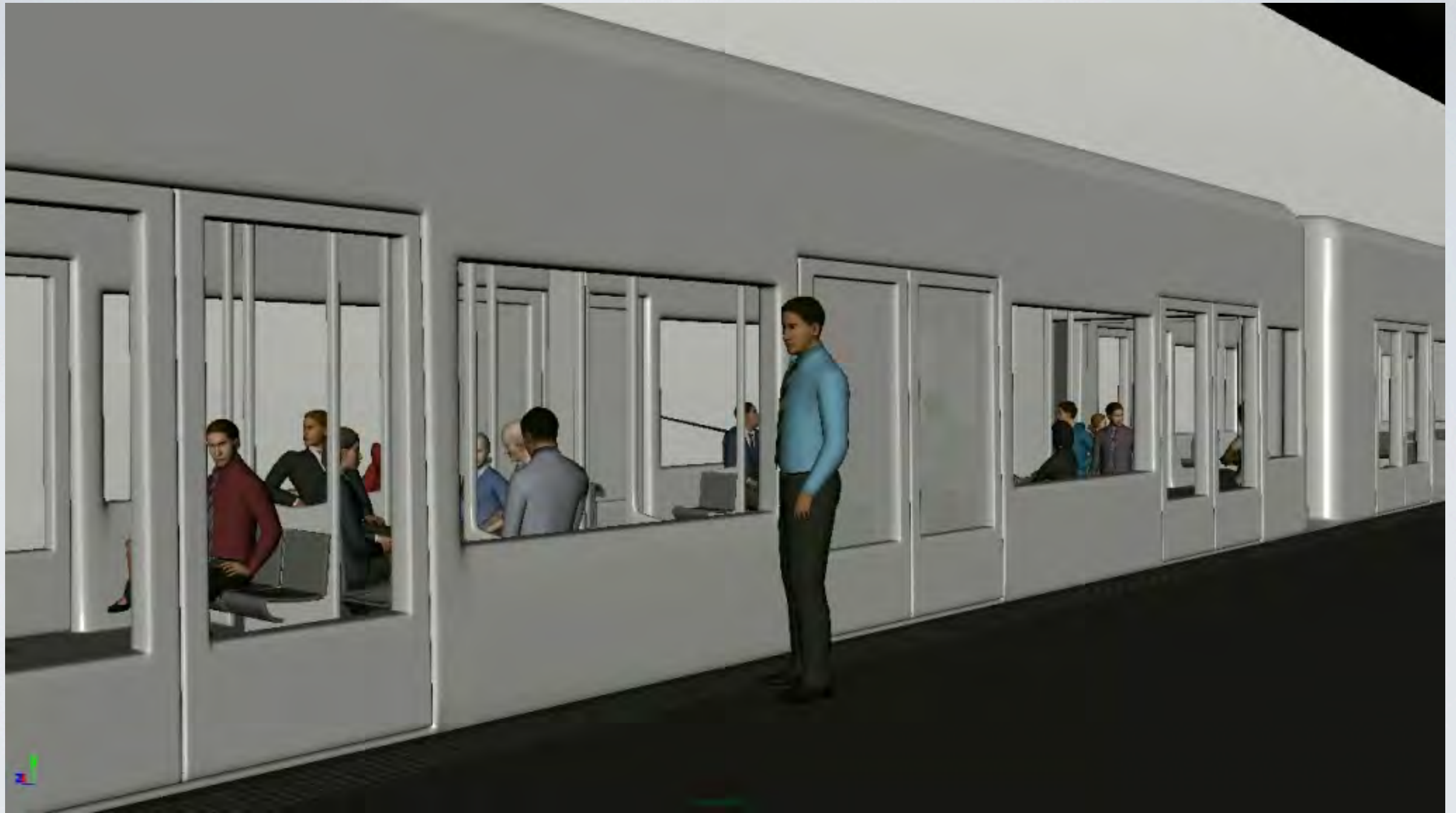
Variable loading on doors
Door with the highest load controls the dwell

Evaluation through computer simulation

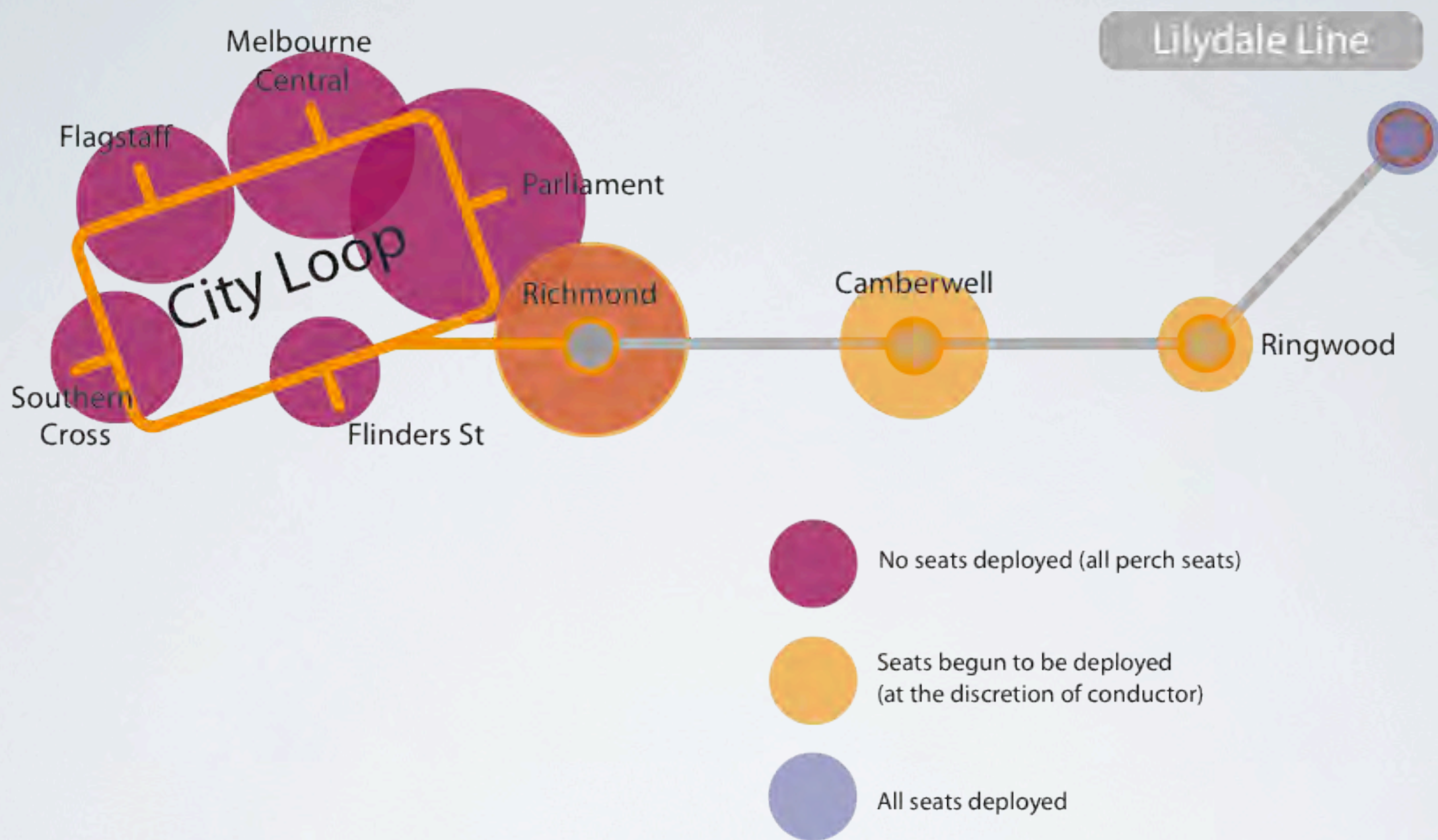


Creating passenger archetypes

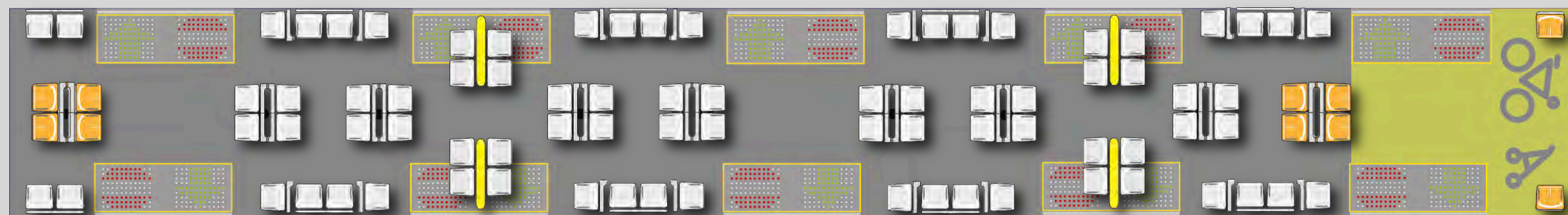
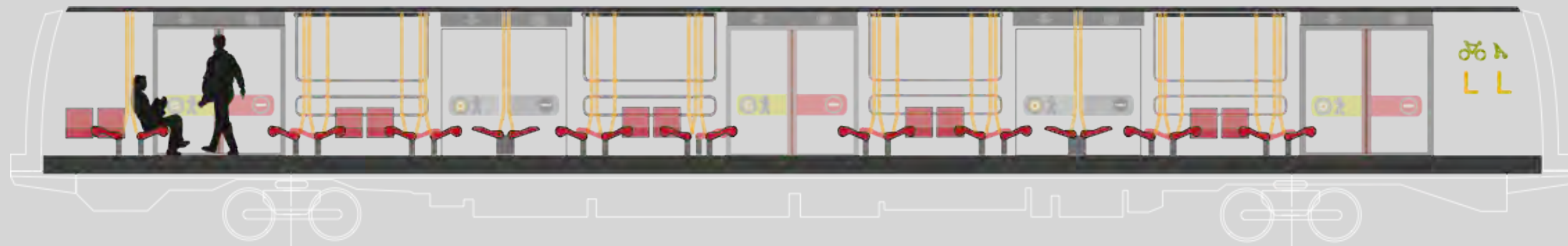




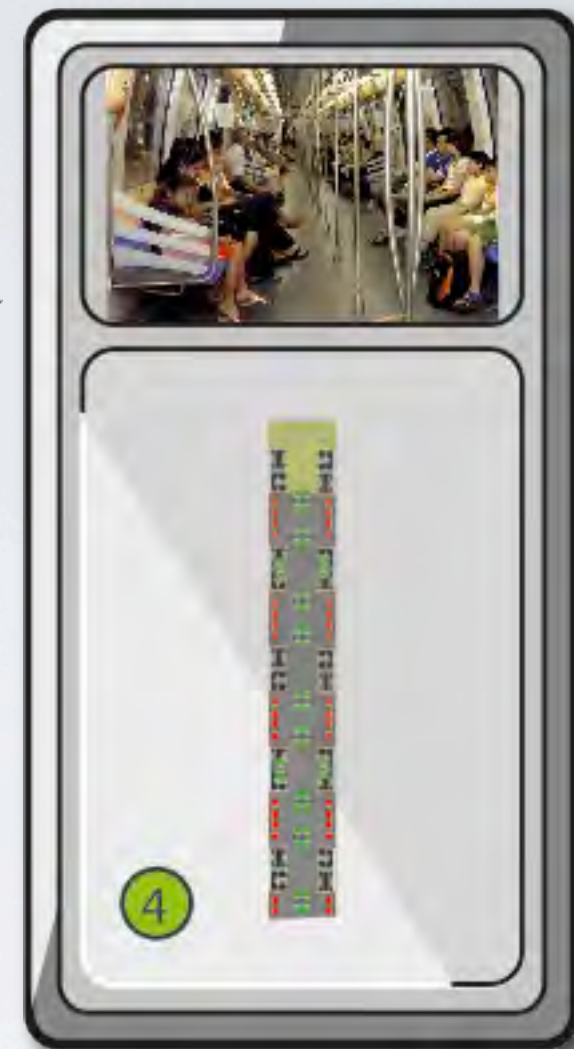




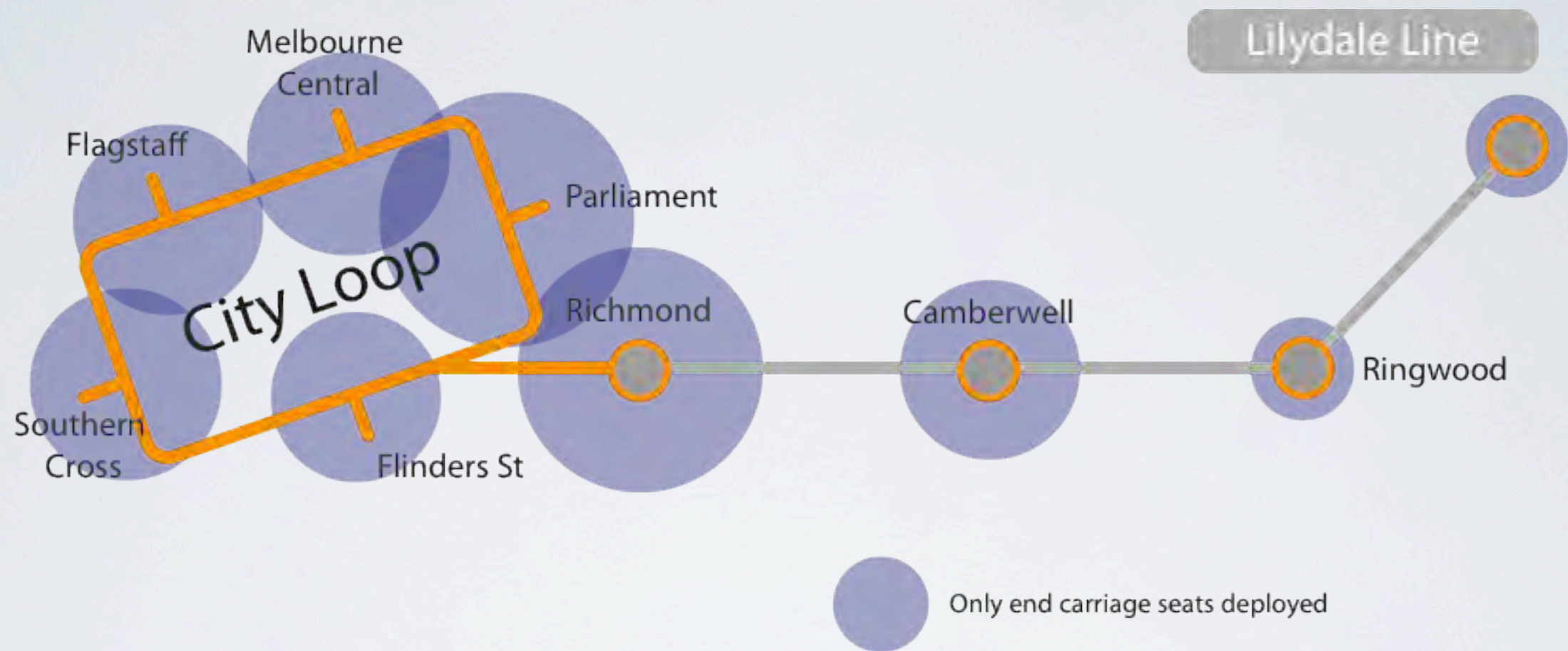
Seat deployment during afternoon peak
(defined as being at the point where patronage is within 5% of desired maximum load i.e 798 people per 6 car train at 4.30pm - 6.30pm.)



Perch seat to full seat deployment







Seat deployment during morning peak
(defined as being at the point where patronage is within 5% of desired maximum load i.e 798 people per 6 car train at 7.30am - 9.30am.)

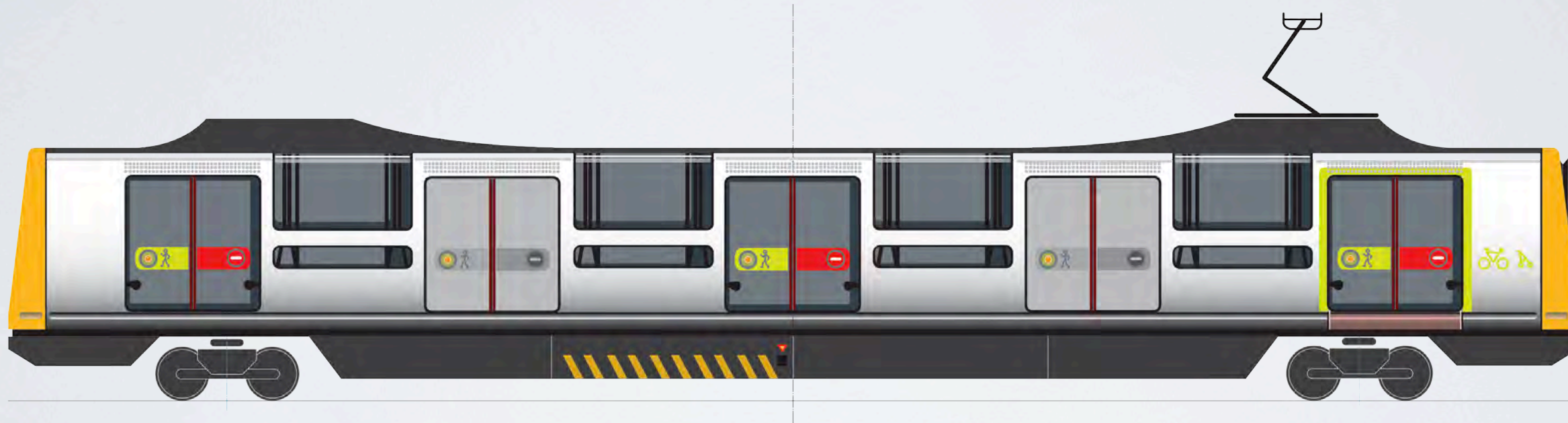
The research
problem

Current state
of the proposed
solution

The research
method

Conclusions



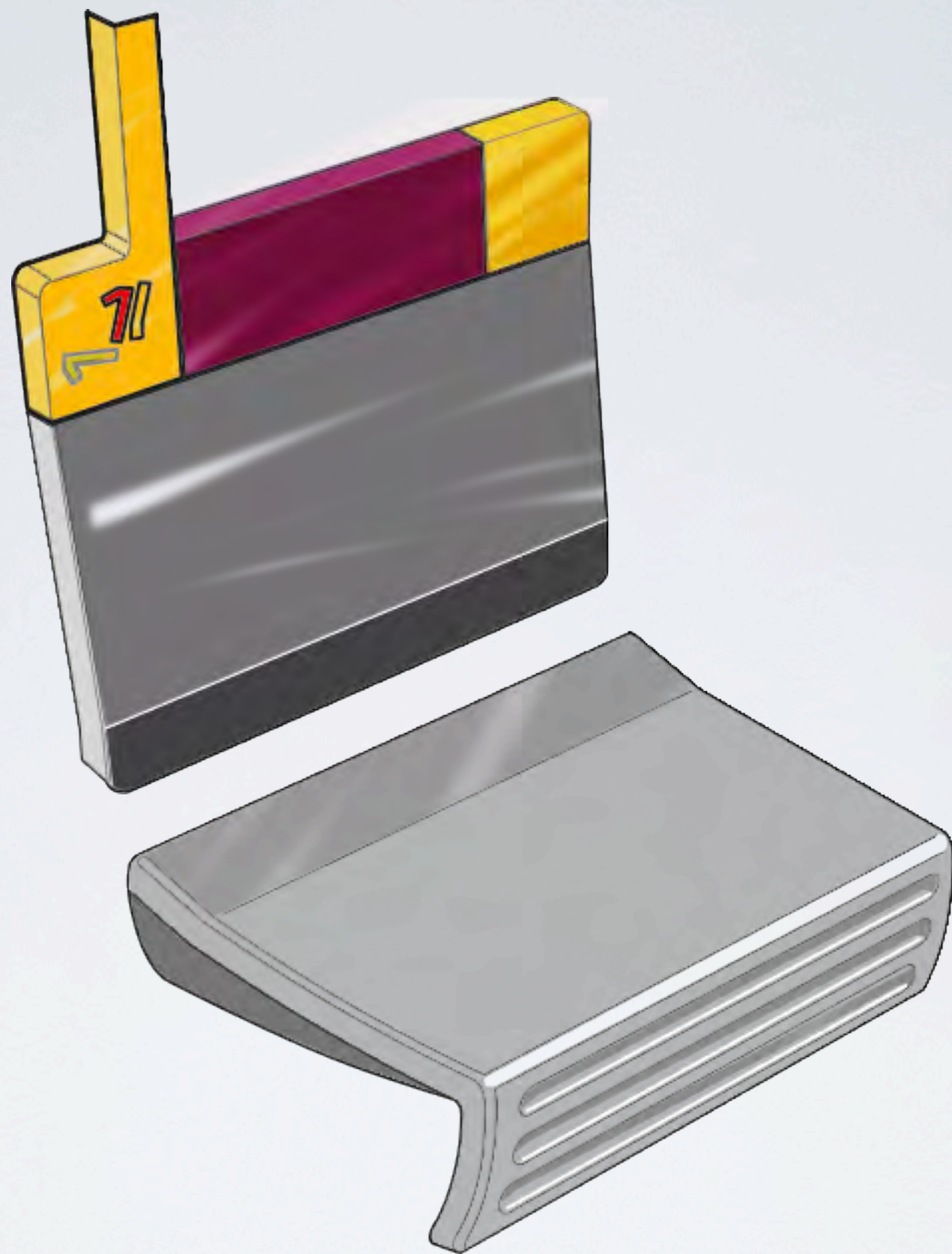


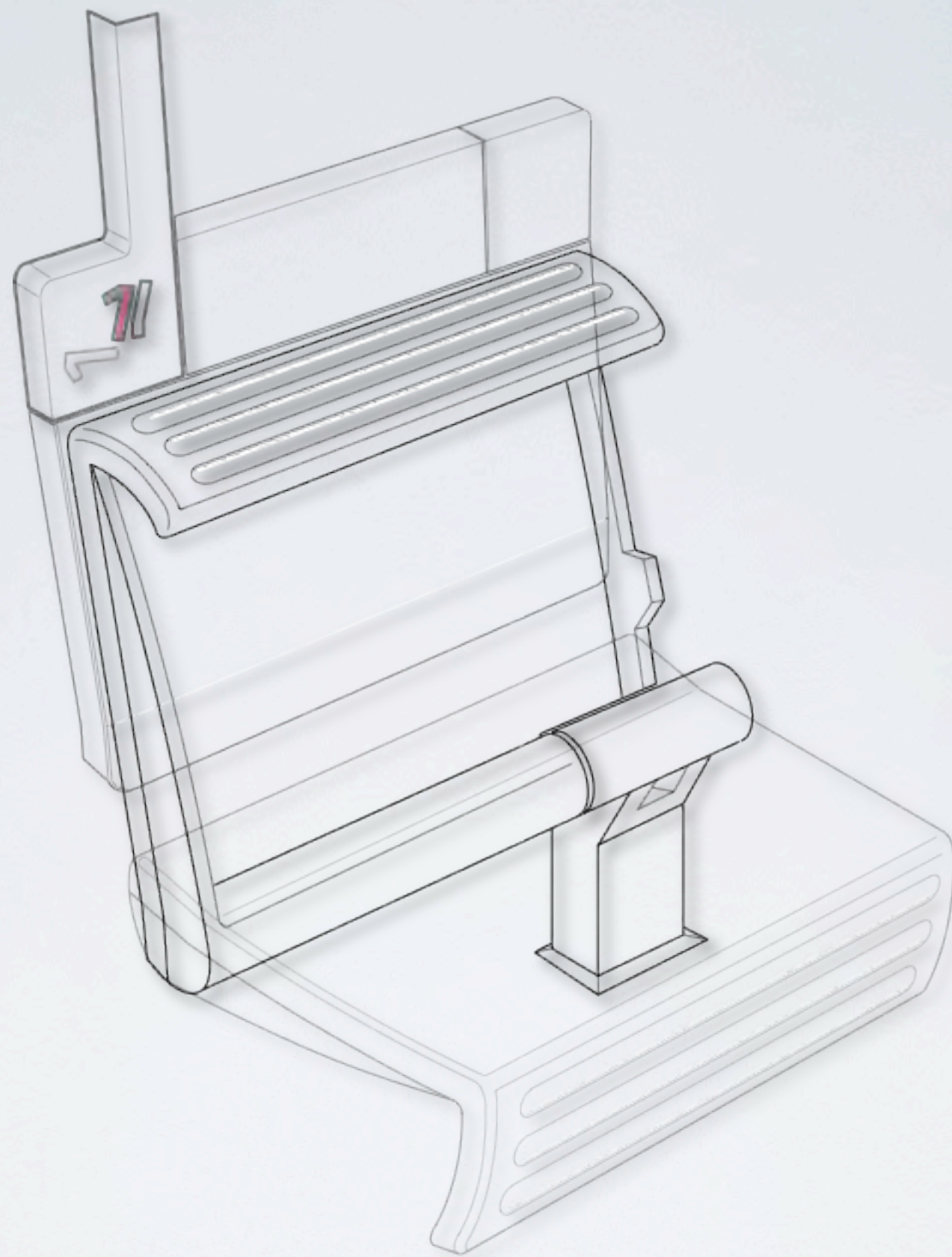












The research
problem

Current state
of the proposed
solution



The research
method

Conclusions

Conclusions to the study

- ABM modelling of the design concept suggests that for peak periods;- multiple doors, dual corridor and a two way split boarding reduces dwell time.
- But.....this has come at the cost of fewer seats overall and considerable culture change amongst patrons and operators alike.

Contact details: -

Mr Selby Coxon

selby.coxon@monash.edu

www.artdes.monash.edu.au/