# Modelling wheelchair accessibility in crowded train cars

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| Accessibility for people with disabilities to public transport is critical to ensure social participation and inclusion. Universal accessibility is legislated by the NZ Human Rights Act (1993) and is applied through public transport policies implemented by regional councils and Auckland Transport. This has resulted in accessible standards of station and carriage construction with widespread adoption of step-free access and designated spaces for wheelchair and mobility scooter users.As congestion on public transport vehicles increases, it becomes more difficult for persons with restricted mobility (PRMs) to reach accessible spaces. Passengers on a train frequently stand in wheelchair spaces when it’s busy, and crowding on board makes it difficult for those passenger to move out of the way so that wheelchair users can access the space. In some cases, this means that PRMs cannot board and miss the train. Although the infrastructure is designed to offer universal accessibility, in reality some operational scenarios make it impossible to provide access for all.Our study used modelling software to visualise boarding movements for wheelchair users, in different crowding scenarios on a commuter train. The investigation used the MassMotion 3D modelling tool to visualise people’s interaction while boarding and alighting in high density scenarios, that were identified by the train operator. The investigation concluded that in high density scenarios in train carriages, it can be very difficult for wheelchair users to board. In addition, those on the train struggle to move out of the way due to the high number of people already on board. The use of the modelling tool allowed us to develop strong visualisations of the problem. Subsequently, these visualisations have been used to support the business case for phasing out lower capacity rolling stock, and to ensure new rolling stock is able to meet expected demand growth in the future.  |