











Inclusive Cycling – Other Considerations and Notes

	Tandem wheelchair bike		Bike with trailer		Wheelchair with hand-cycle attachment		Recumbent rider		Trike	
	Manual	Power-assist	Manual	Power-assist	Power-assist	Power	Hand-cyclist	Pedal-cyclist	Manual	Power-assist
										
Other considerations										
Turning circulation limiting effort (m)	5m		5m		3m	Can reverse, max 2m	5m		3m	
Adapted cycle width	635mm		850mm		800mm		800 – 850mm		780mm	
Adapted cycle length	2700mm		3900mm		1500mm		2500 – 2800mm		1800mm	
Commuter / recreation / both	Both	Both	Both	Both	Both	Both	Recreation	Both	Both	Both
Notes – Cycling infrastructure barriers to inclusive cycling										
Barrier interactions (ie people and parked cars)	>1m apart - buffer		>1m apart - buffer		>1m apart - buffer		>1m apart - buffer		>1m apart - buffer	
Posts, bollards, gates (width clearance)	>1.5m		>1.5m		>1.5m		>1.5m		>1.5m	
Cyclist safety (against motorcars)	Essential		Essential		Essential		Essential		Essential	
Camber	The wheelchair component can easily tip on certain cambers, especially when cornering. We see rough cambers along footpath cycleways in particular.		Not a problem unless excessive (pushchairs would tip too) where bike can go buggy can too.		Can tip on cambers that exceed minimum gradients, particularly if made to do a sharp turn.	Steep cross slope provides challenges. Only encountered on Pakuranga Rotary Path.	Tippy on rough camber.		Tippy on rough camber.	
< 1m width for cycle lane	Minimum width 1.5mm for single lane (ideally 2m). 4m for two-way.		1.5m for single lane (double our buggy width) – 3m for two-way – Ōrākei Path is great size example.		Ideally 4m for a two-way cycle path.		Prefer 2m single lane and 4m for two-way. Riding closer to ground with wider wheels means being vigilant not to hit them.		Prefer 2m single lane and 4m for two-way.	
Lack of turn around space (circulation width 3-5m)	Wheelchair disconnects from bike if needed. Rides with an assistant (captain) to manoeuvre and pedal.		Trailer disconnects from bike if needed. Can do a multi-point turn, but will block pathway.		Cycleways providing 4m in width score highly.	Wheelchair can disconnect with apparatus.			Need a good turning circle.	
Rest spots	We often block cycleways if insufficient space is available to pull into.		Need a large area to pull length of trailer into, otherwise we block cycleway. Ōrākei Cycleway good example of this.			Rest spots not required.	Required on long inclines.		More space to pull off cycleways needed.	
Public transport access (for cyclists) – NB: buses are presently not accessible	Trains and ferries (unreliable, access & capacity) – if a lift used at a station we would need to detach bike from wheelchair.		Trains and ferries are possible, but buggy will block entranceway and access for other passenger.		Needs 1.8m space on modes and larger lifts 1.8m		Easier in off-peak. Space limitations, train station lifts are not wide enough.		Train station lifts make using the train difficult. The Newmarket lift does not fit a trike. Otahuhu a bit wider. It would be great to know which stations have lifts that are more amenable to trikes.	
Mobility parking	We need longer mobility parks and safe rear entry via hoist.		Need long mobility parks with min of 3m clearance at rear access for rear hoist and buggy to come out back – can come out back onto footpath.		Safe transfer space from driver side needed. Often transferring onto road.	We need longer safe entry	Longer mobility parking for bike trailer on the rear of vehicle.		N/A	
Secure bike parking	We would disconnect bike from wheelchair / buggy, could lock up against present systems.		We would disconnect bike from wheelchair / buggy, could lock up against present systems.		Don't need as cycle is used as a mobility device.	Don't need as cycle is used as a mobility device.	If rider is able to transfer out of a recumbent tricycle there are no secure bike parks wide enough to lock up to.		Trikes are wider needing wider points to lock up to: eg sheffield bike racks; can only use the double decker parking if there are outside spaces; too heavy to hoist on top rack.	
Recreation (ie playgrounds, beaches, picnic benches)	Limited – little inclusion.		Need wheelchair flat / level hard surface access, trailer disconnects if needed, very limiting not a lot is suitable.						N/A	
Public amenities (ie accessible toilets)	Standard accessible toilets do not work for us. We need carer assistant toilets like Changing Places.		Cannot use standard accessible toilets – need “Change Places” – with hoise and height adjustable bed.		Can use standard disability bathrooms as apparatus can disconnect.		Can't use bathrooms mid-route, only start / finish.		N/A	
Gutters (cycleways)	Gutters will tip up tandem wheelchair bike, we have to avoid them. They need to be clearly painted as they are a health and safety issue. There needs to be enough safe space to get around them.		Need yellow highlight or paint to indicate the change in surface level. Extra available width given to get around them or have them covered.		Troublesome, need to avoid. Sometimes space is not given when using concrete barriers against traffic to avoid them.	Drains are an issue on main arterials. Have to ride around them.	Drains and gutters are natural hazards. Health and safety issue for other cyclists and traffic due to width.		Drains and gutters are natural hazards. Health and safety issue for other cyclists and traffic due to width.	
Kerb separators (for protected cycleways)	Placement needs to have >1m clearance between them to enable wheelchairs / adaptive cyclists / pushchairs to access or exit.		Access between separators need to be 1.5m wide. Paint them bright colours, eg: orange. - Nelson Street a good example. Driveway access was indicated differently.		Gutters need to have coverings if using kerb separators along cycleways.		Preferably used with >2m width cycle-lanes in both directions. Riding closer to ground with wider wheels means being vigilant to not hit them.		Gutters need to have coverings if using kerb separators along cycleways.	
Maintenance (imperfections)	Doesn't cope well with roots or pot holes. We also find detour signage doesn't consider disabled cyclists.		Greenery – like grasses, need to be pruned back to prevent getting caught in wheels.				Gravel and potholes can cause punctures.		Gravel and potholes can cause punctures. Roots will cause tipping.	
Steep gradients	Depends greatly on the fitness of the captain & the weight of the wheelchair user. Less than 3% with rest areas is more inclusive.	Gradients >10% for prolonged periods would run down battery and become challenging.	Gradients are a challenge without power assist. (Nelson Street, Glen Innes) – needs to be a concrete path or smooth / good traction surface, preferably with flat sections like the path Glen Innes to Ōrākei. Gravel paths will cause us to skid and lose traction. Walking up is difficult as pulling / towing weight.		Gradients steeper than 1:10 for prolonged periods are challenging. Over >10%	Steep gradients are fine as long as a path is paved and speed can be maintained. Alternative is reversing. Requiring unobstructed path in full view.	Riders can not get off and walk up if gradients are too steep. This is where signage is crucial for adaptive riders to judge effort for gradients. Paved trail essential for all weather cycling. Drainage on steep slopes prevent run off across path. They also are unable to stand up to put more effort into climb.		Not great on gradients more than 1 – 2%	Gradients over >10% for prolonged periods would run down battery and become challenging.
Signage and wayfinding	Prefer following route painted on cycleway itself. As a Captain we are constantly looking at the ground to avoid terrain imperfections, so signage on the ground is helpful.		Signage painted on ground is good. We like good size fonts used with good contrasting colour. People with low-vision will find this essential. Signs could be at both low level standard height. Try and keep directional signs clean of clutter – eg logos, advertising, Bike Auckland, heritage trail, Lion or Rotary Club, etc – should have own signage.				Preferably set lower so riders don't need to strain neck and painted wayfinding on road is helpful.			