Footpaths Should Be Improved For Motorised Chairs

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ABSTRACT
This is a personal account of an older person’s experience with the footpath system after relinquishing his drivers licence. It traces a journey via his new motorised chair (shopping scooter) through three kilometres of suburbia. The details of footpath construction are very important such as the smoothness of the invert at kerb crossings. Unfortunately some inadequately detailed features which have been recognised for decades (such as a bullnose at drainage lines) are still being built. The practice of providing for pedestrian needs falls far short of the rhetoric of encouraging walking because it is a healthy sustainable mode. The lack of attention to footway construction details is failing our frail elderly who increasingly rely on motorised chairs.
INTRODUCTION

A personal friend of the author decided to voluntarily relinquish his driver's licence after turning 86. He relied heavily on his car for mobility. After a full life, first in England where he saw military service, and later in Australia where he worked and raised a family he retired to the outer seaside suburb of Mornington. An articulate and compassionate man he wants the best for the more vulnerable in his community. This paper grew out of his concern that engineers should know the impact of their handiwork on the frail elderly.

Suffering from asthma since childhood his condition worsened to the point where even a short walk was a major effort. One hundred metres was far enough before he would need to turn around to return home. A motorised chair was duly delivered. It increased his range enormously. Friends, family, shops and his church were once again within reach. See Figure 2. It seems that motorised chairs are the most rapidly growing mode of transport in Australia. They will continue to be as the ‘baby boomers’ age.

Figure 1. An active life—now mobility depends on the footpath network.
Figure 2. Motorised chairs increase the range of destinations for people with difficulties walking.

The route for the short trip described in this paper was chosen at random but there is no evidence to suggest it was unusual. Motorised wheelchairs have similar problems to those described here for motorised chairs. However they tend to be used by younger people with disabilities—often following accidents using other transport modes!

Note that the motorised chair shown in Figure 3 carries a walking stick for use in ‘side trips’ into buildings.
1.1 THE UNNECESSARY BUT UBIQUITOUS BULLNOSE

The first encounter with the kerb outside his house is one with a bullnose; a vertical lip to guide water. The height is critical. Many are around 40mm high which causes a significant problem for small wheeled vehicles—particularly travelling uphill but travelling downhill as well. The bullnoses shown in Figure 3 and Figure 4 are around 20mm but still cause an unnecessary problem. The hydraulic reasons for this lip seem at best tenuous, at worst ludicrous where there are longitudinal slopes of 3% or more. Why is such a practice continued? Some partially sighted pedestrians value a ridge to feel using a single point stick but their needs can be satisfied by a small ledge of around 5mm high.

Driveways are access points to properties and also form connections between the street network and the footpath network for cyclists. The author and two of his colleagues have come to grief when striking the bullnose at a slight angle on bicycles. Figure 5 shows a recently built driveway with a bullnose around 40mm high. Was the concrete contractor aware of the problem he was creating? Were council officers aware? Unlikely. Although the standard drawings of pram crossings and driveways for most Councils prohibit bullnoses do people ever check? Are these details seen as trivial and not deserving the attention of professionals? How will the concrete contactor ever learn?
Figure 4. Motorised chairs and babies push chairs share similar problems.

Figure 5. Brand new but unsatisfactory concrete driveway with bullnose lip.
Figure 6 shows a well constructed pram ramp. It has a smooth invert, the kerb tray is flush with the road surface and the tray and ramp slopes are gentle. Disability Discrimination legislation has drawn attention to the good design of pram ramps as described in Australian Standards. Hopefully this will provide the impetus for changes in practice.

Figure 6. A well built crossing with gentle slopes.

Figure 7 shows a recently repaired pram ramp where the lighter concrete is the repair. There was no reason why a little extra effort could have been made to reduce the slope of new work by extending the repair job. The maximum permitted slopes should not be taken as the norm; gentler slopes reduce difficulties for pedestrians. The frail elderly already have difficulty crossing roads; judging gaps is more difficult with age. The last thing that they need is to be concerned with a firm foothold as they are about to cross the road or as they are about to leave it.

Figure 7. This relaid ‘pram crossing’ need not have been steep—but it is.
Regrinding irregularities on concrete footpaths has become a common sight. See Figure 8. This assists all users including frail elderly pedestrians, running children and joggers.

Figure 8. Regrinding footpath irregularities assists all users.

1.2 VILLAGE CENTRES

Shopping centres are often cluttered with street furniture, outdoor eating areas and A-frame signs. This clutter is difficult for people who need a wide berth such as those with walking frames. Figure 9 shows the main street of Mornington. It is an excellent example of good pedestrian design. The walkway is smooth and wide through road narrowing. There are zebra crossings at less than 100m spacings.

Figure 9. A wide even surface without obstacles.
Village centres should be lively urban spaces, of action, of cappuccinos and lattes, where people promenade, see and be seen. The elderly often enjoy seeing the world go past. They should not be excluded to the fringe. Figure 10 shows a typical Saturday afternoon scene.

Figure 10. Smooth even surface (except for the driveway).

The very young and the very old rely on small wheels for mobility. See Figure 4. Often it is not until footpath designers push their own children in pushchairs that they become aware of the importance of construction details. Pressures on curricular in formal training courses for professionals and para-professionals has led to this situation. Only recently has an established body of documented good practice been created—Australian Standards and AustRoads Design Guidelines.

1.3 PEDESTRIAN NETWORKS THROUGH THE SUBURBS

Our journey takes us across Tanti Avenue; a street carrying around 3,000 vehicles per day at speeds of 60km/hr. The pedestrian refuge reduces the task of crossing the street by reducing the task to a single direction at a time. See Figure 11.

Figure 11: Well placed refuge on local pedestrian route.
Why is it that traffic planners no longer consider the ‘crossability’ of a road or busy street as a performance variable? Two decades ago attempts were made to quantify the barrier that traffic represented to pedestrian travel. The WITS scale (Width, Intermittency, Traffic volume and traffic Speed) and average pedestrian delay were introduced as valid traffic engineering performance parameters. They remain undeveloped as the traffic planning profession seems to have retreated to the variables that simply relate to motorised traffic.

There is a great deal of scope to build fine grained pedestrian networks into new sub-divisions. The author has long held the belief that it should not be possible to draw a line longer than 300m which does not have at least one crossing point. Too often designers associate limited (vehicle) access road layouts with limited access pedestrian layouts.

Often structures are build to prevent trail bikes and cars from entering recreational paths. Unfortunately they sometimes prevent access by legitimate users such as people in motorised chairs. The structure shown in Figure 12 allows motorised chairs through. Tanti Creek is a local barrier to pedestrian and bike movement. This is the only crossing for 400m either side.

![Figure 12. Design details to stop trail bikes and cars often impede motorised chairs](image)

Although the banks of the Tanti Creek slope steeply the designer of this crossing wisely decided on a design that did not require motorised chairs to negotiate steps—an impossible task.

### 1.4 UNEVEN GROUND

Because of the necessity of motorised chairs to negotiate doorways within buildings they are narrow with a high centre of gravity. Uneven ground aggravated by tree roots can form a real barrier. See Figure 13. Unlike a child cyclist, a fall by an elderly person at low speed from a motorised chair can easily result in a broken hip or hospitalisation for many months. It’s no wonder elderly motorised chair users are very cautious—particularly those on three wheel chairs; rather than the more stable but less manoeuvrable four wheeled chairs.
Uneven ground can threaten to overturn a motorised chair. This explains why it is not unusual to see motorised chairs on a roadway itself. Footpaths need not be constructed along every local street. However, Shandon Street, photographed in Figure 13, carries around 6,000 vehicles per day and does not have a footpath on either side. It is a main pedestrian access route to a secondary school and leads to the only signalised crossing of Nepean Highway for 500m.

Motorised chair users and child pedestrians have low eye heights. Compare the view in Figure 14 with that in Figure 15. The situation is compounded when the parked vehicle is a 4WD or a van without windows. The ‘safe’ speed to pass a parked car is close to ‘jogging speed’—not the 40 or 50km/hr speed limit for residential areas.
1.5 PUSH BUTTON LOCATIONS

It is not possible to press the pedestrian button in Figure 16, without the motorised chair intruding onto the actual roadway. On the return trip it is accessible. See Figure 17. Did the designer or contractor check for this? Could the offending pole have been located a metre further back with no cost penalty? Probably. Quality design is not always obvious. A side effect of the ‘lowest cost’ and ‘more for less’ doctrines that have dominated the design and construction of public infrastructure recently is that ‘quality’ is lost. Quality is more difficult to quantify and to recognise by an increasingly deskill public workforce where technical skills are less valued.
1.6 FOOTPATH DESIGNERS AS OCCUPATIONAL THERAPISTS

When a person suffers trauma through an accident, stroke or simply grows old, their house is often modified to enable them to manage day-to-day life. See Figure 18. We need our footpath designers and builders to have a similar awareness of the limitations of frail elderly pedestrians, child pedestrians motorised chairs (shopping scooters), and motorised wheel chairs. The old adage that ‘the world was designed by a 35 year old male’ all too often rings true.
2 SUMMARY

Any walk through any part of suburbia will show examples of good and bad practice. So what! Unfortunately many examples of bad practice are the most recent. They pass unrecognised both at the pedestrian network planning level and detailed design level. We need professionals who recognise the importance of pedestrians who are more skilled at meeting their needs. We need better processes to ensure that the quality of new pedestrian infrastructure is improved. The losers are often the community’s most vulnerable and powerless—the frail aged and those without access to cars. Hopefully our current planning rhetoric on the sustainable green modes—walking and cycling will lead to better design at the detailed level.