



Investigations into pedestrian crossing choices on Cape Town freeways



Marion Sinclair^{a,*}, Mark Zuidgeest^{b,1}

^a University of Stellenbosch, South Africa

^b Centre for Transport Studies, Faculty of Engineering and the Built Environment, University of Cape Town, Private Bag X3, Rondebosch 7701, South Africa

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ABSTRACT

South Africa is regularly identified in international literature as one of the countries with the highest number of traffic deaths per capita. Of these, around one third are pedestrians. Freeways constitute one of the highest risk locations for pedestrians – in most developed countries pedestrians are not seen in such locations, but for many South African pedestrians freeways are a regular part of their commute. Walking alongside and crossing of freeways are extremely common – and deaths associated with such activity also tragically so. Over the past four years in the Cape Town area alone there have been 413 pedestrian crashes causing 139 pedestrian deaths on freeways, as well as an unrecorded number of serious injuries.

While pedestrian crossing behaviour has been extensively researched in many parts of the world, almost none has so far been carried out in the context of freeways. Little is known about pedestrian crossing decisions in locations where the stakes are so high.

Following a study using traffic cameras associated with the Freeway Management System to measure the frequency and location of pedestrians crossing freeways, this article reports on surveys into crossing decisions of pedestrians on Cape Town's freeways. Two successive surveys were conducted with pedestrians on or alongside the freeway. These included pedestrians who crossed using footbridges, and pedestrians who crossed at grade.

In the analysis it was clear that while some of the traditional factors such as time saving and convenience were considered, far more important to pedestrians were issues of safety. Safety from fast-moving vehicles was one factor, while safety from criminals was a second and often conflicting factor which affected crossing choices. Crossing at grade was partly described in terms of utility maximisation (time and distance saving) but it was also, for many, one way of avoiding becoming a victim of crime. In terms of their perceptions of being involved in crashes, at-grade crossers reflected an astute awareness of the risks that they face. Many pedestrians articulated the belief that their choice of crossing was constrained by lack of alternatives. Until public transport and safe crossing locations are provided for these pedestrians it is clear that many will continue to cross dangerous roads, in full awareness of the risks they face.

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* Corresponding author at: Department of Civil Engineering, University of Stellenbosch, Private Bag X1, Matieland 7600, Western Province, South Africa. Tel.: +27 21 8083838.

E-mail address: msinclair@sun.ac.za (M. Sinclair).

¹ Tel.: +27 21 650 4756.

1. Introduction

In current transportation research, walking as a modal choice is increasingly presented as desirable from health and ecological perspectives. Walking is seen as a means of combatting obesity, cardiovascular disease and even depression (Murtagh et al., 2015; Poortinga, 2006, Robertson, Robertson, Jepson & Maxwell, 2012) as a way of reducing carbon emissions and thus retarding environmental degradation (Massink, Zuidgeest, Rijnsburger, Sarmiento, & van Maarseveen, 2011; Piatkowski, Krizek, & Handy, 2015), and as a route to improving community amenity (Shamsuddin, Hassan, & Bilyamin, 2012). Yet in many regions of the world walking remains the ‘no other choice’ i.e. captive mode (Diaz Olvera, Plat, & Poche, 2013; Shumi, Zuidgeest, Martinez, Efroymsen, & van Maarseveen, 2014); and with it come associated negative consequences; high crash exposure rates; long hours of effort – sometimes in extreme weather conditions; exposure to crime and even sheer exhaustion. There is a tendency in some quarters to romanticise walking where it is, in fact, one of the burdens of the world’s poorest people.

Pedestrians constitute 22% of all traffic deaths globally (World Health Organization, 2013). In Africa, this figure is 38%, representing more than one third of all fatalities. In fact, the developing world in general carries the burden of much of the world’s traffic problems. The World Report on Traffic Injury Prevention reports that approximately 90% of traffic related deaths occur in low and middle-income countries (Peden et al., 2004). It is in these developing countries that traffic conditions are invariably characterised by low accessibility, poor public transport, congestion and inadequate facilities for non-motorised transport (Diaz Olvera et al., 2013; Vasconcellos, 2001). While poorer countries shoulder this particular burden it is the poorer people within them who are most directly affected, and most at risk of sustaining serious health problems as a result of traffic injuries (Nantulya & Reich, 2003). Transport inequities pose considerable challenges to households. For example, poor families pay significantly higher portions of their monthly income toward transport costs – up to 20% of net income – than wealthier ones (Kranton, 1991; Venter, 2011). Indeed studies have shown a clear link between poverty and transport: the same factors which restrict mobility among the urban poor are the very ones that limit the ability to escape from poverty in general (Diaz Olvera et al., 2013; Lucas, 2011). Transport challenges are in this sense a proxy for wider social, economic and political frustrations of many poor urban households.

Such problems are often compounded by the fact that cities of the developing world take their cues from those in the First World and continue to reflect the dominance of the automobile, in spite of the fact that private car ownership is relatively low (Sietchiping, Permezel, & Ngoms, 2012). Pedestrian facilities are seldom prioritized or even present (Chowdhury, 2014; Romão et al., 2003). In the absence of sidewalks, pedestrians are often forced to share roads with motorised vehicles at great personal risk (Macozoma & Ribbens, 2004).

Interest in the challenges facing the urban, developing world is growing, as is research into the problems faced by vulnerable users, including pedestrians. This interest in pedestrian safety is a global one – pedestrians across the world are more vulnerable to serious injury than other road users and hence more deserving of safe design solutions. To this end, much research has been carried out into pedestrian behaviour on road networks (Lam, Yao, & Loo, 2014; Zhang, Bigham, Ragland, & Chen, 2015); on travel and route choices (Guo, 2009; Guo & Loo, 2013), and on crossing decisions (de Lavalette et al., 2009; Evans & Norman, 1998; Mfinanga, 2014). The body of available literature is large and there is a fairly good understanding of how pedestrians, particularly in urban areas, behave.

Unfortunately much of the current research presupposes that pedestrians confine themselves to the types of roads in which they are welcome, and for which the road design actively anticipates and accommodates them. A search for the twin terms ‘pedestrians’ and ‘freeways’ in any major electronic library-database (e.g. Scopus, Compendix, Web of Science) elicits almost nothing by way of response. Pedestrians and freeways are not expected to coexist in any proximity to each other. Traffic legislation internationally makes it clear that freeways are designed and intended for vehicular traffic only. As such, literature about pedestrian activity on freeways is almost non-existent. The reality, however, is that in many developing countries pedestrians find their way onto high speed freeways as a matter of course: freeways tend to be the shortest, most efficient and most direct routes linking outer suburbs to the inner city. Freeways also represent obstacles to the free movement of pedestrians wanting to access locations beyond them. In many parts of the developing world pedestrians walking along freeways are common, as are pedestrians crossing freeways. The absence of research explaining this phenomenon is a major stumbling block to solving the problem. This research project adds new understanding to the problem by focusing on the pedestrian utilisation of freeways in Cape Town, South Africa.

Pedestrian-vehicle crashes in South Africa constitute approximately 30% of traffic deaths each year – between April 2010 and March 2011, the latest year for which data is available, there were 4612 pedestrians killed of a total of 13,802 recorded traffic deaths (RTMC, 2011). The *National Pedestrian Action Plan* identified 356 hazardous locations for pedestrians across South Africa, of which 12% were on Provincial roads (Ribbens, Everitt, & Noah, 2008). More than half of these particular locations were sited on freeways. Pedestrian injuries on freeways appear to be on the rise despite major investments in freeway infrastructure for the World Cup Football in 2010. Fig. 1, for example, shows an increasing number of freeway pedestrian accidents when looking at the freeways in the Western Cape Province of South Africa (Cable, 2015).

The high number of pedestrians on South African freeways has roots in apartheid policies of city planning, where black South Africans were prohibited from living in the inner cities and forced to the outskirts to reside in formal ‘townships’. The resulting “... accessibility and mobility geographies were disgracefully discriminatory” (Pirie, 2015), and still are to a large extent. Many of the townships and the informal settlements that have sprung up alongside them to deal with urban

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