MOBILITY BARRIERS FOR OLDER PERSONS AND PEOPLE WITH UNIVERSAL DESIGN NEEDS IN SOUTH AFRICA

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Abstract
The Sustainable Development Goals adopted by the United Nations (2012), encourages development that is inclusive, addresses equality concerns and promotes the well-being of all people of all ages, among several other goals, while the National Land Transport (Act 5 of 2009) of South Africa (NLTA), states that public transport must satisfy the user's needs and be safe, convenient and comfortable to use (NDoT, 2000). Based on these objectives, transportation is required to meet the needs of older persons and individuals with varying abilities. However, this is not the current case in South Africa (Lucas, 2011). Applying Universal Design (UD) to transport facilities can help to address the needs of users, to a large degree, while removing the barriers that often prevent older persons and individuals with UD needs from travelling.

Universal Design (UD) is based on the concept of social inclusion, regardless of an individual's ability (Audirac, 2008). This includes, but is not exclusive, to people with disabilities and older persons. In transportation, the application of UD focuses on addressing the physical barriers that hinder people in terms of mobility and accessibility (WHO, 2011).

The need for UD to be applied to transportation in South Africa is investigated in this paper. Through analysing data of the characteristics of South Africans, as well as exploring the mobility challenges of older persons and those with UD requirements within South Africa, the need for UD implementation is determined. The focus of this paper is on quantifying the proportion of individuals in South Africa that fall into the categories of people with UD needs, which includes persons with disabilities and older persons. Therefore, this paper illustrates the critical need for UD principles to be holistically applied to transportation throughout South Africa. Discussions on the various challenges that different types of South African settlements (namely metropolitan, urban, and rural) have, are also presented to contextualise the findings of this paper.

Keywords: South Africa, disability, older persons, Universal Design, mobility, accessibility

Understanding Mobility Challenges in South Africa

Challenges regarding the mobility of people in South Africa are influenced by both historic (Behrens, 2004) and recent factors (Vanderschuren and Galaria, 2003). The majority of the historical influencing factors stem from the agenda of the apartheid government (Behrens, 2004). This will be discussed in the first section of this chapter. The recent developments that have also generated challenges will also be discussed (Vanderschuren and Galaria, 2003) in the

second section of this chapter, therefore, presenting an overview of the transportation challenges that face South Africans.

The Legacy of Apartheid: The Prioritisation of the Minority

During apartheid, settlements were designed to prioritise the mobility of the minority (namely the "White" population), while creating barriers to mobility and access for the majority of society (those classified as "Blacks" and "Coloured") to places of education, work and other activities (Behrens, 2004). This was achieved by various methods and implementations, one of which was building high speed mobility routes and railway-lines to form boundaries and dividers between the different classes of communities. Many of these mobility routes and railway facilities remain unchanged today. Another method that was employed was the creation of dormitory residential settlements, and the trend of low densities that accompany this type of development, which can be seen throughout South Africa (Vanderschuren and Galaria, 2003).

While the policies and laws that enforced the goals of apartheid have since been abolished, the infrastructural, physical and socio-economic barriers remain (Behrens, 2004; Vanderschuren and Galaria, 2003). The democratic government initially took steps to address some of these issues by developing urban areas to become more sustainable, addressing the spatial barriers and improving the socio-economic functioning of South African urban areas through the densification of urban corridors. However, many of these initiatives seem to have fallen away, to a large degree, especially the densification of the urban corridors resulting in densities remaining low in South Africa (Vanderschuren and Galaria, 2003). This has resulted in a high demand for motorised transportation.

Furthermore, hindering factors of transportation, such as the high risk of road collisions, high financial costs of transport and inadequate public transport (NDoT, 2014a; Behrens, 2004), are prevalent throughout South Africa. In the next section, the implication of these challenges will be discussed, as well as an elaboration of the more recent challenges.

The Current Transportation Challenges of South Africans

The current transportation challenges of South Africa can be discussed in terms of objectives, as set out in the Sustainable Development Goals (UN, 2012). Within the Sustainable Development Goals (UN, 2012) there are several goals that rely on sustainable, inclusive and equitable transportation, which needs to serve all ages and capabilities. However, there are two goals that this paper will focus on. These goals have a strong relation to improving the mobility of older persons and those with UD needs.

The two goals, taken from the Sustainable Development Goals (UN, 2012), are:

- Goal 3: Ensuring healthy lives and promoting well-being for all ages, and
- Goal 11: Making cities and human settlements inclusive, resilient and sustainable.

It is with these goals in mind that the current transportation challenges of South Africa will be discussed. This paper aims to show how addressing the needs of older persons and those with UD needs can bring South Africa closer to achieving these Sustainable Development Goals (UN, 2012), as well as addressing the needs of older persons and individuals with UD needs.

Firstly, the challenges that relate to ensuring healthy lives and well-being (UN, 2012: Goal 3), which relate to transportation in South Africa and the mobility of older persons and those with UD needs, will be discussed. Secondly, the challenges that relate to achieving inclusive, resilient and sustainable settlements and the mobility of older persons and individuals with UD needs, will be discussed afterwards.

The quality of health and well-being and transport has been shown to have a significant relationship (Whitelegg and Williams, 2000; Litman, 2012). In South Africa, there are several health challenges that could be partially addressed with improved transportation, namely incorporating more Non-Motorised Transport (NMT) trips, as a form of cheap transport that also increases the physical activity levels of individuals, thereby providing health benefits, while also being accessible to all income groups.

Some of the health challenges that could be addressed through improving transport in this manner include:

1. Reducing Non-Communicable Diseases (NCDs), which have a significantly higher impact on older individuals,
2. Increasing levels of physical activity resulting in decreased levels of stress, obesity and poor health (Mayosi et al., 2009),
3. Reducing fatalities and injuries caused by road collisions by improving the safety of vulnerable road users (mostly NMT users, namely pedestrians and cyclists (Mayosi et al., 2009; NDoT, 2014b).

These three health challenges, facing South Africa, will now be discussed in detail with the focus on the implications for older persons and those with UD needs, as they are often affected more by these challenges (WHO, 2002).

Firstly, transport can have a significant impact on reducing NCDs. This is mainly achieved through increased participation in NMT trips, which have several health benefits for those suffering from NCDs. This is especially true for older persons when NMT trips are attractive and feasible (WHO, 2002), as increased levels of physical activity of NMT trips have been shown to reduce or mitigate several NCDs, such as cardiovascular diseases and diabetes, both of which are experienced at relatively high levels in South Africa (Mayosi et al., 2009). However, often NMT trips are not accessible or appropriate for these road users (Oxley, and Whelan, 2008), such as the case in South Africa (NDoT, 2014b). This is unfortunate, due to the positive benefits that NMT can have for all individuals (Litman, 2012), not only those with NCDs.

Ensuring that individuals feel safe and comfortable, while walking or cycling, is an important step in making NMT trips more accessible to older persons and individuals with UD needs (WHO, 2002). Therefore, ensuring that NMT facilities are designed with older persons and individuals with UD needs in mind, is an important aspect of improving the health and well-being of these users. Applying UD to NMT facilities will, consequently, make NMT trips for all users more attractive and, therefore, more frequent (NDoT, 2014a). This would result in improved levels of health of those that incorporate NMT in meeting their mobility needs.

Another way to improve transport which could positively influence the health and well-being of people of all ages is to improve the safety of the South African transport system, by reducing the number of fatalities and injuries caused by road collisions. The injury-related burden in South Africa is high and road collisions are a major contributing factor to this (Mayosi et al., 2009). A result of many of these road collisions is that people are burdened with life-changing disabilities that significantly alter their lives (Venter et al., 2002).

On top of the increased burden of disabilities caused by road collisions, there is also a substantial cost, in terms of lost years of life and financial costs (STATSSA, 2009). It has been estimated that the immediate costs of road collisions in South Africa amounts to an estimated cost of R306 billion per year (€22.95 billion per year), which equates to 8% of the GDP (NDoT, 2014b). Therefore, improving road safety will also have a significant economic benefit for South Africa.

The next goal that will be discussed, relates to making cities and human settlements more inclusive, resilient and sustainable (UN, 2012: Goal 11). This is, once again, discussed with the focus on older persons and people with UD needs. While there are several challenges that relate to this goal, the following were considered to be most relevant to this paper:

1. Urban sprawl and low densities of South African cities and settlements,
2. Increasing levels of private vehicle ownerships and the negative externalities thereof, and
3. Aggressive, risky and problematic road space environment for road users.

In South Africa, the spread of activities and urban sprawl have led to a high demand for motorised transport. For the less affluent urban dwellers, the need for transport is met by a combination of formal and informal public transport. These trips are generally costly; both financially and with regards to the amount of time spent commuting. While public transportation is available, users are more likely to be captive to this mode than selective users of this mode (NDoT, 1999). This is mainly due to poor quality of public transportation services in terms of frequency, reliability, safety and security.

Another issue facing South Africa is the high level of unemployment and poverty in the country. Improving mobility is an important step in alleviating poverty, which can often be exasperated by having disabilities or limited abilities. NMT has been shown to play an important role in vulnerable and low income communities (Whitelegg and Williams, 2000). People with disabilities suffer from a higher incidence of poverty, mainly due to the lack of access and mobility to socio-economic opportunities (Venter et al., 2002). Improving the mobility of individuals with UD needs and older persons can help alleviate the poverty levels and reduce the associated social exclusion thereof.

As the middle income class grows, car ownership increases and the negative transport externalities become more severe (Massink et al., 2011). This is typical of developing countries, which often have high rates of vehicle ownership which increase faster than that of population growth, resulting in high levels of congestion (Gwilliam, 2003). Some of the externalities of this trend include reduced air quality (Whitelegg and Williams, 2000; Massink et al., 2011; Litman, 2012), reduced levels of physical activity (further increasing levels of NCDs)

(Litman, 2012), and increased levels of congestion (NDoT, 2014b; Vanderschuren and Galaria, 2003).

Besides increasing levels of congestion, South African motorists are characterised by aggressive driving behaviours (Sukhai, 2006) and a general disregard for the rules of the road (Arrive Alive, 2010). This makes South African roads dangerous for vulnerable road users, such as older persons and people with UD. These vulnerable road users are often reliant on public transport and NMT trips to fulfil their transportation needs, due to inaccessibility of private motorised transport.

Pedestrians are especially vulnerable and make up a significant proportion (36% in 2008; 34% in 2009) of fatalities on South African roads (Arrive Alive, 2010). Moreover, pedestrians are also a road user group that has a high percentage of members that have mobility challenges and are, therefore, sensitive to physical barriers and limitations (Litman, 2012). The high percentage of pedestrian fatalities and injuries may be due to the lack of adequate road space allocated to vulnerable road users. The current situation has resulted in an exceptionally high number of road fatalities and injuries (Peden et al., 2013).

Another significant contributing characteristic of South African road collisions is the high percentage of road users who were under the influence of alcohol or drugs at the time of their death (Arrive Alive, 2010). This wide spread abuse of substances by South African road users, combined with increasing levels of congestion and aggressive driving, are likely to result in an even higher number of road collisions and, therefore, costs, fatalities and injuries. Moreover, this hinders inclusive communities in cities and human settlements.

In summary, transportation in South Africa is seen as unsafe, negatively affecting the health and well-being of South Africans, as well as being unsustainable, with many sections of the population experiencing inadequate levels of service. In the next section, the role that UD could have in addressing these challenges is explored. The need for UD in South Africa will be quantified, therefore, showing the need for UD to be more holistically included in South African planning and implementation, thus, brings South Africa closer to achieving the Sustainable Development Goals mentioned in this paper (UN, 2012).

The Need for Universal Design in South Africa

"*The challenge is not one of cost; a good urban project does not cost more if it includes universal design concepts. The challenge is changing notions of what our urban environment should look like and whom it should accommodate*"

- IDB president, Enrique V. Iglesias (2001)

Universal Design could be described as the design of environments and services that are usable by all people without the need for adaptation (WHO, 2011). UD has several guiding principles, which include: equitable use, flexibility in use, simple and intuitive use, perceptible information, tolerance for error, low physical effort, as well as size and space for approach and use (Story et al., 1998). In order for the need for UD to be comprehensively understood, the various types of UD dependent users first need to be identified.

The primary goal of UD is to design and implement facilities and services, so that individuals, who would have been hindered by mobility constraints, are able to use the facility or service, due to the improved design and implementation thereof. It is important to acknowledge that within the concept of UD, it is the responsibility of the design of the facility to fulfill the needs of the users. Therefore, it is not on the individual to adjust to the built environment but rather that the environment (in this case the facilities and services) to adjust to the needs of the users. UD intends to create environments that provide easier mobility and higher levels of accessibility for individuals that would normally experience social or physical barriers. UD results in better designs that are more efficient and less likely to present dangerous situations (WHO, 2011).

In the South African context, the following types are proposed to be included within the UD dependent road users:

1. Children younger than 12 years old
2. Persons with difficulties seeing
3. Persons with difficulties hearing
4. Persons with difficulties walking
5. Persons with difficulties with self-care
6. Persons with difficulties with communications
7. Individuals wearing glasses (or contacts)
8. Individuals using hearing aids
9. Individuals using a walking stick or walking frame
10. Individuals using crutches
11. Persons using wheelchairs
12. Individuals on chronic medication
13. Individuals accompanied by a guide-dog
14. Individuals requiring personal assistance
15. Other (individual with other equipment to assist their functioning)
16. Those on grants that pertain to old age, disability or care dependent
17. Individuals who are not well enough to travel or cannot travel due to disability
18. Individuals travelling to medical or welfare destinations.

While this list may not be completely comprehensive, regarding the various groups of individuals that fall into persons with UD needs, the data drawn from the National Household Travel Survey (STATSSA, 2013) was collected on a national level and was not collected with UD needs in mind. Therefore, based on the current available data, these classifications have been used in this analysis. Certain classification groups, namely the classifications listed as numbers 15, 16, 17 and 18 were included to help account for individuals with UD needs that may have been omitted from the previous classes.

Venter et al., (2002) estimates that while physical and visual disabilities dominate, at any one time a far greater percentage of the population is likely to be "mobility impaired" by environmental barriers. This can account for between 20% and 30% of the population (Venter et al., 2002). People who are part of this particular classification include: people with temporary health conditions, children, pregnant women and people carrying goods. Many of these individuals' needs would not have been fully accounted for in data collections, such as the National Household Travel Survey (STATSSA, 2013), which typically only occurs

every decade or so. In the analysis of this survey, care was taken to ensure that the most comprehensive spectrum of UD dependent individuals were taken into account and that no double counting occurred, in order to determine the percentage of individuals within South Africa that would fall under the classification of "mobility impaired" or individuals that depend on UD for mobility.

Using the raw data from the National Household Travel Survey (STATSSA, 2013), the first selection made was of all the children under the age of 12 years. These data points were then excluded from further selections to prevent double counting from happening. The next selection was individuals that had self-reported that they had difficulties with seeing, which was then removed from further selections to prevent double counting. This process was continued until all the categories of individuals with UD needs were accounted for.

Based on this analysis, the need for UD in South Africa was determined based on the percentages of potential users that would benefit from UD implementations. From this base analysis, several sub-analyses were conducted in order to fully understand where and who these potential individuals with UD needs are.

The first analysis was to determine the different proportions of the various individuals that depend on UD for mobility per settlement type. From Figure 1, the greatest contributing group to the demand of UD was found to be young children (<12 years old) in all three types of South African settlements. Individuals in metropolitan and urban areas had a greater percentage of individuals using aids, which may be due to better identification of impairments, better access to aids, as well as increased affordability of aids.

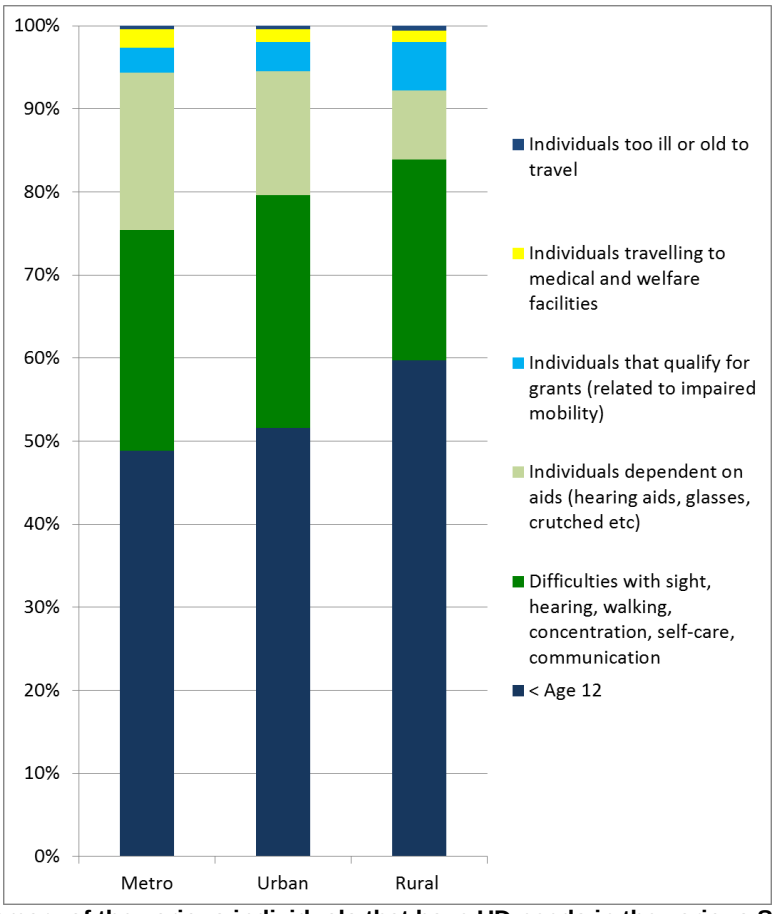


Figure 1: Summary of the various individuals that have UD needs in the various SA settlements

Source: Calculations using the NHTS, 2013

Young children were, by far, the dominant group that falls under the UD needs in South Africa, indicating that these vulnerable road users are likely to benefit greatly from UD being applied throughout the built environment. The second most dominant group across all three types of settlements was individuals with difficulties with sight, hearing, walking, concentration, self-care and communication. The third largest group consisted of those that are reliant on aids to assist their mobility. These top three groups indicate that facilities need to take into consideration that walking, understanding signs, using steps/ramps could be challenging and not accessible if designed poorly, with no inclusion of UD principles.

Understanding the mobility barriers of the individuals in the different types of settlements is important in terms of prioritising UD retrofits and UD elements in transportation projects. In Figure 2, the detailed breakdown of these mobility impairments and UD needs are given for the various settlement types.

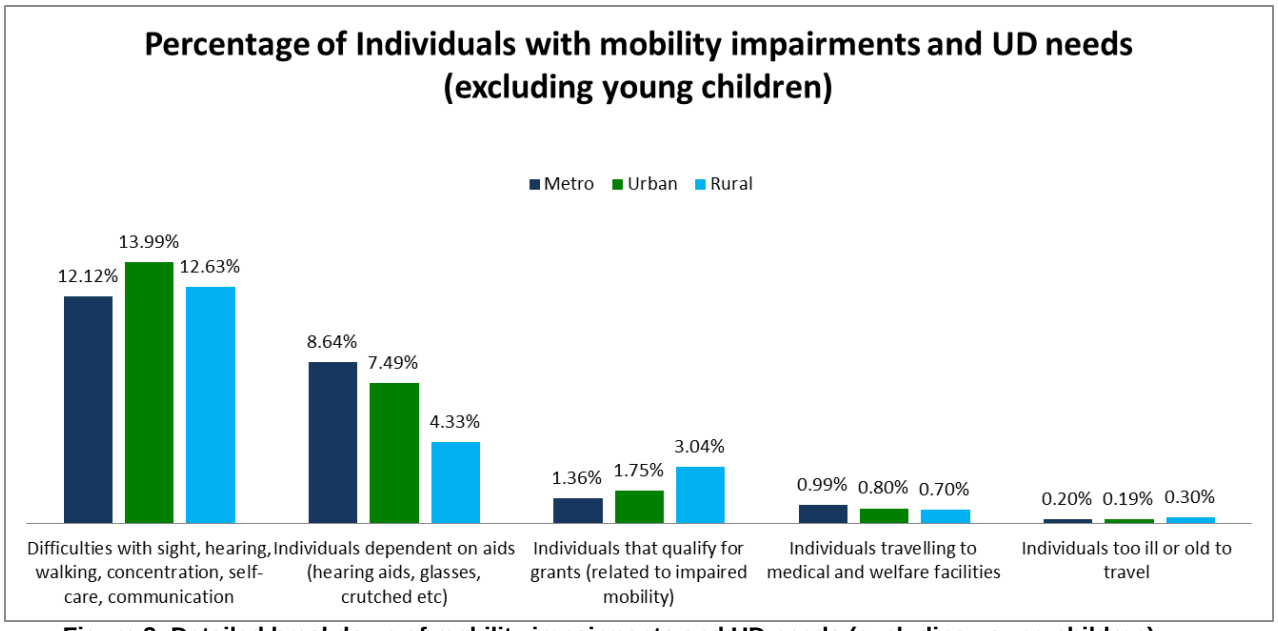


Figure 2: Detailed breakdown of mobility impairments and UD needs (excluding young children)

Source: Calculations using the NHTS, 2013

What can be seen in Figure 2 is that prioritizing resources is important in the developing context. For example, priority seating is one UD concept that can be applied (which would speak to the needs of those who are too ill or too old to travel), however allocating resources to ensure UD elements that address sight, hearing, concentration and communication difficulties may have a larger impact.

Overall, based on the analysis from the raw data of the National Household Travel Survey (STATSSA, 2013), as mentioned earlier in this paper, the total of individuals that are dependent on UD is 45.6% of metropolitan population, 50% of urban population and 52.2% of rural populations. Nationally, the total of UD needs is found in 49.6% of the population. This is a significant proportion of the South African population. In the following section mobility challenges, that are characteristic for the different settlements in South Africa, are discussed. As shown in Figure 2, urban and metropolitan areas had similar percentages of individuals with mobility impairments and UD needs. Therefore, these two types of settlements were combined in the discussion which is presented in the following section.

Universal Design in Metropolitan and Urban Areas: Focus on Cape Town

In metropolitan and urban areas, UD is important to ensure that employment opportunity, education and other activities and services are not withheld from individuals with disabilities or older persons. A South African example of such an area is Cape Town. While Cape Town has one of the better public transportation services in the country (STATSSA, 2013), mainly due to an extensive railway network, UD is often missing from these transport facilities. Thus, mobility and accessibility of individuals with disabilities and older persons remains relatively low.

The low and middle income groups in South Africa are reliant on walking and public transport trips to fulfil their travel needs. This is illustrated by Figure 3,

with 61% of individuals in the low-income group depending on walking as their main type of transport, followed by 30% dependent on public transport as the second main type of transport mode. These figures drop considerably in the high income group with only 9% using walking as a main mode type and only 3% using public transport as their main mode of transport.

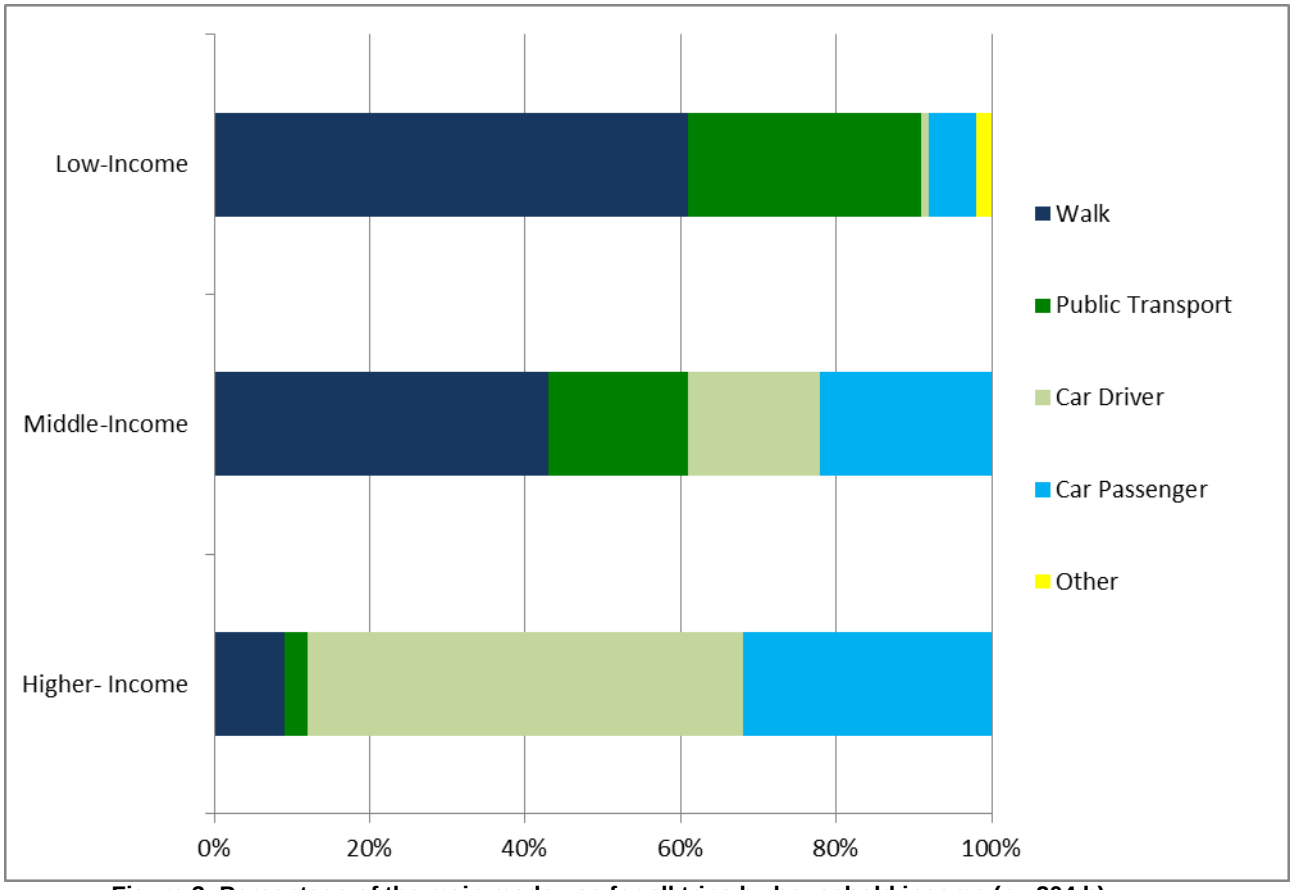


Figure 3: Percentage of the main mode use for all trips by household income (n= 204 h)

Source: Behrens, 2004

These figures indicate that income has a significant impact on the mobility and accessibility of South Africans. For older persons and individuals with disabilities in the middle and low income groups, their personal mobility and accessibility is often dependent on the quality of the urban environment and the implementation of UD in an integrated manner. Therefore, improvements and retro-fitting public transport facilities are likely to be most effective in addressing the mobility and accessibility barriers.

Depending on the facility and the community, the following facilities/elements of facilities could add significant benefits to older persons and those with UD needs:

- Well-designed pavements:
  - sufficient widths,
  - even surfaces with sufficient friction,
  - appropriate placing of street furniture, to not impede the mobility of users, and
  - sufficient street lighting.
- Well-designed pedestrian crossings:
  - dropped kerbs on all connecting sides,

    - clear signage of pedestrian crossings, indicating priority to pedestrians,
    - clear road markings of road crossings, and
    - sufficient lighting.
- Improved access to Public Transport facilities:
    - ramps, doors and stairs appropriately implemented,
    - safe, convenient and comfortable routes guiding users to PT facilities.
- Physical separation between NMT facilities and motorised traffic when the speed difference is significant and pedestrians are at risk of being involved in a collision with motorised traffic.

While there are many other facilities and interventions that could (and should) be considered, most of the common issues experienced in South Africa could be addressed through considering the suggested items above (NDoT, 2014b).

Universal Design in Rural Areas of South Africa

Mobility and accessibility challenges in rural areas are, in principle, difficult to resolve, due to the spatial distances, low population densities and low levels of transport facilities and services (Gray et al., 2006). Considering the low car ownership in rural parts of South Africa, the mobility and accessibility needs of the communities should be fulfilled by public transport or NMT (Vanderschuren et al., 2015). In Figure 4 shown below, the modal split was determined in an investigation of rural districts.

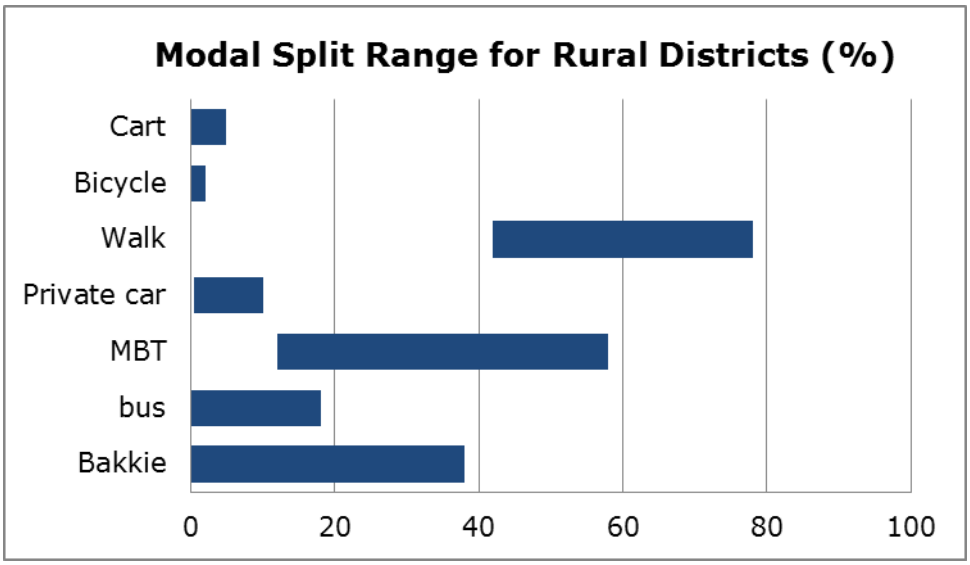


Figure 4: Modal split for the District Municipalities Surveyed (n= 15578)

From Figure 4 it can be seen that the two dominant forms of transport are walking trips and MBT (Mini-Bus Taxi's) trips. In some districts, such as the Alfred Nzo, Amathole and O.R. Tambo, bakkies (pickup trucks) provide a significant proportion of the trips (Vanderschuren et al., 2015). However, transportation in bakkies is often associated with a high risk of injuries and fatalities, if involved in a collision, as well as dangerous behaviour of users (for example standing while in transit). Despite the fundamental challenges of rural transportation, there are measures that can be put into place to improve the mobility and accessibility of individuals in these areas.

The Cape Winelands District is an example of a district which is mainly rural, that has outlined various possible implementations that could help increase the mobility and accessibility of rural individuals. These implementations also improve the mobility and accessibility of individuals with UD needs, if UD principles are applied to the facilities. In the *Non-Motorised Transport Framework Plan towards Master Planning: version 1.1* (Cape Winelands District Municipality, 2009), a number of NMT facilities, including routes, connections and links, are identified as key facilities that would improve the ease, comfort and convenience of individuals travelling in and through these areas. Considering the high dominance of walking trips, this would improve the quality of many trips taken by people with UD needs and older persons.

Increasing ease, comfort and convenience are important aspects, especially when considering the total travel times that are typical in rural areas of South Africa, shown in Figure 5. Long total travel times can lead to many negative externalities and consequences for people with UD needs and for older persons.

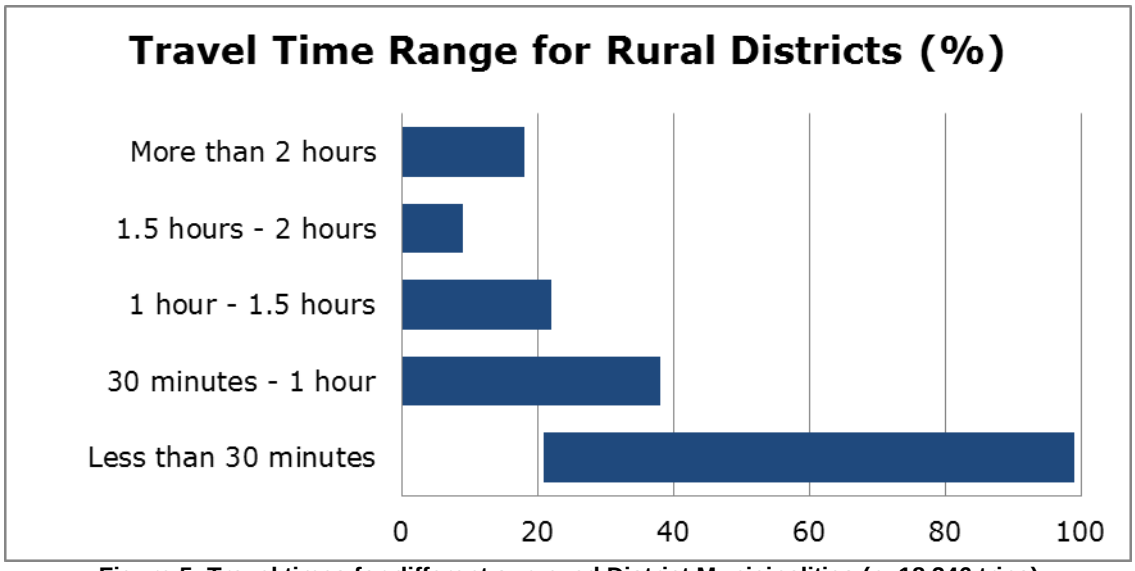


Figure 5: Travel times for different surveyed District Municipalities (n=18 246 trips)

From Figure 5, it can be seen that at least 21% of the surveyed trips take longer than half an hour. In one area (John Taolo Gaetsewe) almost 20% of surveyed trip makers travel for more than two hours. With total travel times being of considerable length, the cost of productivity and monetary costs are high. Social and safety concerns can also limit trips being made if individuals are concerned about the time that is required in order to complete the trip. Individuals may be sensitive to avoiding trips that result in having to leave or arrive back in the dark, for safety concerns, or having social obligations that require that they are not away for extended periods of time (this may include taking care of children, preparing food and other domestic chores)(Vanderschuren et al., 2015).

The time taken to access public transportation for various rural communities was also surveyed, as seen in Figure 6. It was found that many rural districts have the majority of their walking trips to public transportation under 30 minutes. Some districts, such as Central Karoo, Xhariep and Joe Gqabi were able to access public transport for a vast majority of their trip needs, in less than 30 minutes. Other rural districts had significantly longer walking trip types. These included, for example: Ugu District, Umkhanyakude District and the Uthukela District

(Vanderschuren et al., 2015). For many individuals with UD needs, walking such long distances without proper facilities, such as paved walkways, may prove challenging and would limit their mobility and accessibility.

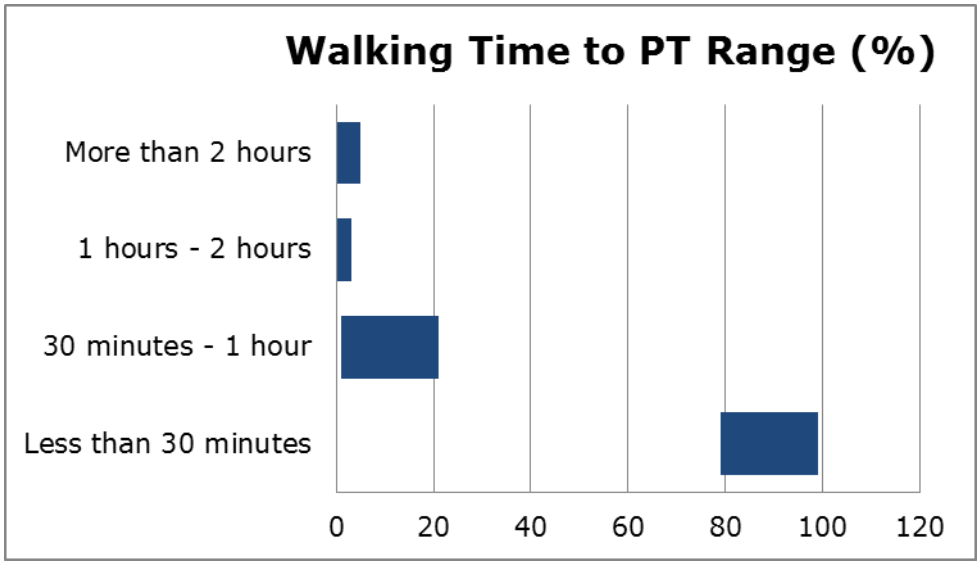


Figure 6: Walking Time to Public Transport for Rural South African Municipalities (n=6 982 trips)

In order to address the mobility challenges that rural districts face, key routes should be focused on. This approach of prioritising projects and upgrades to facilities is to generate the greatest improvement for the mobility for as many people as possible for the allocated resources. A range of possible solutions to meet the mobility of older persons and those with UD needs should be considered for each context. Some of these potential strategies could consider:

- Increased access to PT,
- Providing shelter, sufficient resting benches and lighting at PT stations and stops,
- Tailored transport services for those with unique mobility needs,
- Program that reimburses neighbours and community members that assist others in meeting their mobility needs, especially those with severe UD needs or older persons, and
- Improving NMT, especially cycling as a means of transportation (this may be increasing the bike supply to providing safe, comfortable and convenient cycling routes and facilities).

It is important, especially in rural areas where resources are limited compared to the areas that are considered, that the most beneficial projects and initiatives are undertaken. Therefore, a holistic understanding of the users' needs is important to be established before the undertaking of any proposed project or initiative.

Conclusion

With an increasing proportion of South Africans becoming older (Joubert and Bradshaw, 2006), as well as developing NCD and other ailments, it is imperative to ensure that mobility and accessibility is improved across the various rural districts. This is an important step in ensuring that the quality of life for individuals does not decline in later years of life. It is important that older individuals are able to access the necessary activities and services that can

improve or maintain their quality of life. This includes having the mobility and accessibility to collect grants (example old age grants) and medical services.

South Africans that are dependent on UD have not been appropriately accounted for and, therefore, have not been considered in an adequate manner in transportation provision. While metropolitan and urban areas do, generally, have a higher demand for UD, due to higher volumes of individuals, as well as increased levels of activities, rural areas should not be excluded. UD should be implemented, where possible, in rural areas in order to improve the mobility in these areas.

People with disabilities and older persons have been, to some degree, accounted for in the National Household Survey (STATSSA, 2013). However, this could be greatly improved so that the current UD demand can be accurately and comprehensively understood. The limited view, regarding the people who would benefit from UD in South Africa, could be a contributing factor to the slow uptake of UD in the various transportation projects, services and facilities in South Africa. By demonstrating the wider demand of UD in South Africa, a more comprehensive approach to implementing UD in transportation is justified and should be considered.

Further research should be conducted to fully understand the mobility barriers that have the most significant impact on the mobility of people with disabilities and older persons in South Africa.

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