DO ROADS CONNECT OR DIVIDE? THE OTHER SIDE OF THE ROAD

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ABSTRACT

This paper serves to explore the significance of the national road network. The paper examines its importance as key facilitator for progress and growth, to attract much needed direct foreign investment and to create jobs. It also examines how some roads generate barriers for social interaction of people in the communities either side of the road, with serious negative consequences. These include traffic accidents, exclusion from job and work opportunities, and isolation for vulnerable members of society including people with disabilities. The colonial and apartheid engineering standards used to design roads in South Africa, the correlation with the emergence of the use of roads as a tool to divide communities in the Palestine-Israel conflict, and the national promotion of gated communities by municipalities and the private sector are analysed. The paper recommends that roads standards should be redrafted so that the accommodation of pedestrians and public transport users becomes of equal importance to the private motorists. Further, that without doing so, the policy documents of different government departments promoting alternatives to private vehicle transport, become empty rhetoric.

1. INTRODUCTION AND AIM OF THE PAPER

An efficient road network is key enabler for growth and development (Perkins et al, 2005: 213). Generally, African countries struggle to attract foreign direct investment, compete globally and achieve sustainable economic growth, in part due to an underdeveloped road network resulting in high transport costs and multifaceted safety issues (United Nations, 2012: 61).

South Africa is an exception. Well-maintained road infrastructure, resulting in lower road freight haulage costs, stimulates both domestic and foreign investment. The Roads Infrastructure Policy (DoT, 2014:4 13 & 21) identifies the benefits of road construction. However, South Africa is characterised by two economies; one highly developed, (metropolitan) with its efficient, world- class road transport network and lower transport costs. The second (rural/township) by the lack of or poorly maintained roads, and expensive public transport fares (The Presidency, 2003).

This paper will examine if the current road network that maintains the traditional functions of transporting goods and the movement of labour, is on its own, able to support social cohesion in a manner that meets the needs of neighbourhood development. Examples of both divisive and uncontentious roads planning, evident internationally and nationally, will be used to illustrate how societies can be divided or connected by roads. Finally, the paper

will examine the underlying problems for new public transport systems, introduced against traditional roads engineering planning and standards.

2. BACKGROUND

One of the inherent social benefits of road infrastructure is the connection of communities and people. The lack of a road should be the missing link to economic growth and prosperity (DoT, 2014:13).

The South African geographical canvas is not blank. Apartheid planners purposely used physical infrastructure elements as barriers to divide or control neighbourhoods, adding to the effect (intentional or otherwise) that certain people are locked in poverty. This is evident as (Smith, 2001) indicates, in the historic location of townships for non-whites outside town centres (for example Intabazwe, Harrismith; Kwa-Zulu Natal, Soweto, Thembisa and Wintervelt; Gauteng, Seshego; Limpopo), and homelands (Kwa-Mhlanga, Pretoria; KwaMashu and KwaDebeka, Durban). Within cities, roads divided areas allocated for different racial groups, (Figures 1 and 2).

Apartheid planning is still evident in the background of every city, over 20 years later. Colonial spatial planning as (Mablin, 1991) writes, included methods to control indigenous populations through influx and a restriction on purchases.

The relentless application of apartheid settlement planning during the 1950's-1970's, including forced removals, entrenchment of homelands and the development of non-white dormitory-type residential areas on the edge of cities, persistently located non-white blue-collar workers further away from economic activities than their white counterparts (Joscelyne, 2015).

This divisive history of planning has continued by the present government with the placement of RDP housing on the edge of townships (Informal settlements), even further away from job opportunities. The failure to tackle land ownership and urban city centre development, as (Landman, 2004) shows has resulted in segregated security estates on the previous municipally-owned buffer strips, and a continuation of prioritising the private car over other forms of transport. A foreigner would be forgiven for wondering if apartheid had actually ended.

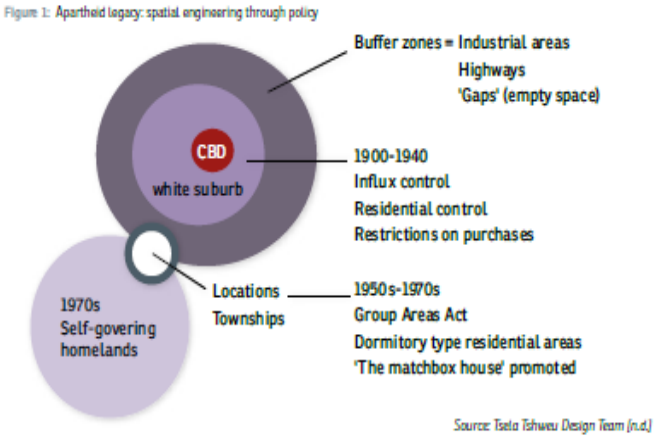


Figure 1: Source: South African Cities Network, (2014:14)

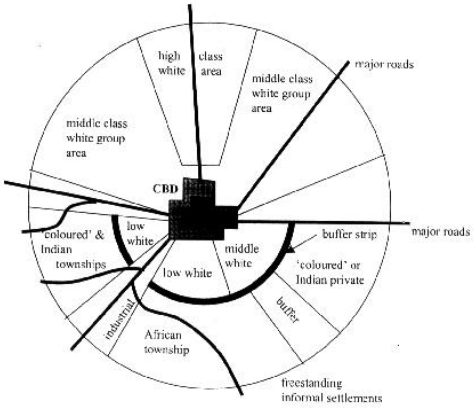


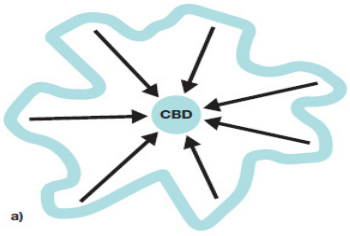
Figure 2: Source: CSIR Red book, (2000)

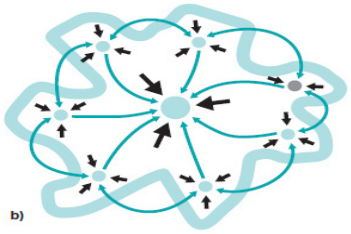
For a variety of reasons (social mobility, concerns over crime), South Africans who can afford their own homes, regardless of race, have concurrently opted for security estates, often built on re-zoned farm land with limited road access (Landman, 2004).

3. PROBLEM STATEMENT

A restricted roads network creates hardship for passengers using public transport and it discourages investment. This leads to lower economic growth, unemployment, poverty and entrenched income inequalities (DoT, 2015). In mono-centric urban settings (including South African cities), travel produces radial trips (Figure 1). The inflow of traffic between traditional working hours (9-5) aggravates the convergence of private vehicles with radial public transport, leading to rampant congestion (United Nation Habitat, 2013:82).

The segregation of neighbourhoods creates a poverty trap affecting an increasing proportion of society as (Savill et al, 2003:150), point out and results in a lack of easy access to opportunities for anyone who does not own a car or cannot drive.





Source: United Nation Habitat (2013:82)

Figure 3: Urban form **Figure 4: Spatial pattern of travel flows**

In South African Cities, due to the additional issues outlined, it seems to be becoming increasingly clear that there is an underlying dysfunctional situation. The new development (RDP houses, Gated communities) has introduced additional barrier to mobility of many people particularly those rely heavily on public transport. It has outgrown on the unaltered apartheid city structure, leading to more divided communities characterised by increased private car usage.

The solution in Figure 1(b), with smaller satellite work opportunities aligned to settlements, is proving difficult to achieve, especially with a fragile economy. With the underlying national historical spatial planning problem, this proves that in retrospect, apartheid planning is unaffordable and that the solution lies in dealing with the settlement and transport environment in tandem.

4. THE ECONOMIC AND SOCIAL IMPACT OF ROADS

The purpose of road infrastructure is not to serve itself but to act as an enabler for other economic activities (Perkins et al 2005:213). Improved road infrastructure is a key facilitator of the economic growth and development as (Perkins, 2005:211) argues. The following benefits should be inherent in a road network;

1. Reduced transport costs
2. Improved safety of both perishable products and commuters
3. Reduced delivery/journey time of both goods and commuters

4.1 The positive effects

One of the greatest advantages of roads to communities is that they engender the "quality of the residential neighbourhood'' (SANRAL, 2012:7). In the aftermath of the war in Afghanistan, the construction or reconstruction of roads by the United States government, led to the following social benefits (Islam et al, 2008:01):

- School attendance rates appear to be up over all within the ZOI
- Frequency for having a clinic or a hospital within the village increased, and
- Travel times to a clinic or hospital declined

4.2 Equity of the use of roads, national and international barriers

There is a general assumption amongst transport professionals that because pedestrians and cyclists pay no roadway infrastructure costs in the form of fuel costs, motor vehicle registration and traffic fines; they do not deserve the same level of access to the roadway as private motorists (Litman, 2013: 11).

> *"The fuel levy is not ring fenced or dedicated to roads and the concerns around how much of the fuel levy actually is spent on roads and transportation. While the long term sustainability of the current fuel levy is not "future proof" given that there is a move to more fuel-efficient vehicles (hybrids) and the pressing green agenda concerns calling for the reduction in fossil fuel usage due to the negative environmental impacts associated with it" (Litman, 2013).*

Geometric engineering standards in general use, favour vehicles, continue to isolate pedestrians, people with disabilities, elderly people, children and people dependent on walking as their main means of transport (UN Habitat, 2013: 18). Pedestrians, cyclists and public transport users pay for their lack of access with their health and their lives. Their loss becomes a family tax, as the person travelling is often the bread winner (RTMC, 2016). This is despite the fact that, as (Litman 2013:15) argues, the cyclist and pedestrian cannot be denied the opportunity to use the roads as they have moral, legal and practical rights to use public roads.

The West Bank in Palestine demonstrates one of the most extreme form of the use of roads as barriers. The motorways linking Israeli settlements create barriers through Palestinian settlements. Israeli settlements are frequently designed as security complexes, similar to those seen sandwiched between the township and the city centre in South African cities, and are connected solely by motorways. The motorways effectively create a barrier for Palestinians who are not allowed to use them, nor to enter Israeli settlements, although they are built in Palestinian Territory (Palestinian Ministry of National Economy, 2011).

4.3 Road engineering standards and road accidents

Problems with engineering standards for pedestrians in the roads environment are not unique to South Africa, as (Campbell et al, 2012) indicates:

1. Road guidelines do not reflect the special needs of some road users, such as older drivers, visually impaired pedestrians with mobility limitations, and users of lower-speed alternative transportation devices;

2. They do not adequately address trade-off between conflicting demands that are related to important road user characteristics;
3. They may not address specific combinations of roadway design features that can have an impact on road user behaviour and subsequent safety.

Use of exclusionary planning leads to practical problems on in the road reserve, which are expensive and complicated to address. There is a need for Municipalities, Provinces, Private sector to address conceptual neighbourhood issues. If engineering standards on high order roads are not changed within new or existing city centres, the resulting problems can be seen in Nelspruit, Mbombela on the R40 to White River:

Table 1: DoT universal access report for Mbombela IRPN

Scenario	Engineering standard	Unintended consequence
Public transport kerbside stops may not be placed near robots, where it is safe to cross the road.	Sight lines of vehicle users must be protected. (DOT 2000 Table 20:10)	It is too far to walk from the bus stop to the safe crossing point at the intersection, leading to people running over the road midblock to get to the bus stop on the opposite side of the road
Roads are too wide to cross	A universal design standard for pedestrian speed is 1m/second maximum, for at least 7 seconds (DoT, 2016). This is given as the exception in Road Signs Manual 2012, (SADC 2012: 4.3) not the norm	Engineering standards promote unacceptable conditions for pedestrians as roads that are too wide to cross in safety for all pedestrians.
Vehicle speeds generally are too fast approaching intersections. Vehicles also speed up when travelling towards pedestrian crossings. Reduced speed limits are either not in place or are widely ignored.	Engineering standards promote high vehicle speeds to promote smooth flowing traffic (COTO: 2012: 66)	Measures to slow vehicles down to ensure that they are travelling at a reasonable speed to be able to stop in an emergency are not put in place. The number of pedestrians killed on South African roads is one of the highest in the world, and is increasing.

Source: Gibberd, 2017

4.4 Gated communities and current utilisation of roads engineering standards

Urban planning in addition to the use of roads engineering that promote social exclusion in post-apartheid South Africa, have developed in tandem, as an unintended consequence of lack of foresight in development planning .

The proliferation of gated neighbourhoods and communities has been coupled with the introduction of roads engineering standards suitable for high order roads, in classes of roads which are supposed to accommodate pedestrians. The intended goal was to increase road capacity for the growing population, however the unintended consequence has made the roads environment more dangerous (Landman,2004).

Gated communities refer to security villages and enclosed neighbourhoods (Landman, 2004 & Roitman, 2009).

Gated communities perpetuate the legacy of apartheid by enclosing and segregating office parks, housing, markets and malls outside the Central Business District or on the edge of the cities (Sandton, Midrand, Centurion, Pretoria East) maintaining residential township separation. The implication of this type of development as (Landman, 2004 & Roitman, 2009) points out are the following:

1. Gated communities exclude poorer people who are then employed as domestic labour; cleaners, security guards, gardeners and domestic workers.
2. They allow labour in during certain times, mainly during the day. At night non-residents are excluded or restricted. Gated communities exclude through-traffic forcing more cars onto surrounding roads and making them more dangerous for the pedestrians who have to use them, at an uncalculated cost to life and convenience. If residents or non-residents walk after dark, the risk of road accidents on the faster access roads are far higher, given the lack of sidewalk provision, as are the chances of being mugged or raped.
3. The lack of comprehensive sidewalk provision that prioritises pedestrians forces them into the roads in certain locations, making them more vulnerable to uncontrolled driver behaviour, accidents and death.
4. These developments are contrary to the cities Integrated Development Plans (IDP's), and do not support Comprehensive Integrated Transport Plans (CITPs). They are interventions that perpetuate exclusion, whilst IDP's and CITPs promote integrated development.

Figure 4: Main entrance gate to Woodhill estate, Gauteng. People (security guards, cleaners and other domestic workers) arriving by public transport (to work) have to walk further to their final destination as the plan of the estate, approved by the municipality, enabled the entrance to be placed far away from the main road. The estate reduces the number of public roads available by banning through traffic, resulting in higher number of vehicles on fewer roads, travelling at high speed. There is no sidewalk on any road.

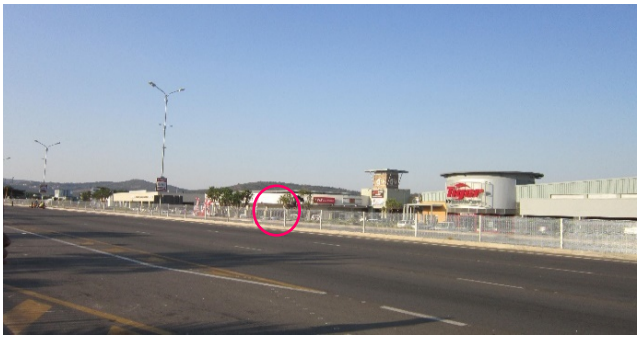


Figure 5: R40, Nelspruit, Mbombela. A pedestrian jumping over the barrier recently erected to prevent pedestrians crossing the road, which is an anathema of universal access. This environment was supposed to be made safer for pedestrians, not more dangerous. No measures have been introduced to make it safer or easier to cross the road, nor to control the speed of vehicles, which generally travel at at least twice, if not three or more times the legal speed limit.

5. CONCLUSION AND RECOMMENDATIONS

The 2010 FIFA World Cup created an opportunity for the South African government to invest in construction, and to redesign the road network to support public transport. The increased investment during the FIFA World Cup allowed the country to weather the

2008-2009 economic recession. Roads are well developed and of a world-class standard across all metropolitan municipalities.

Apartheid spatial planning is recognised as a national problem, but has yet to be resolved, Measure are required to reverse it. However, if roads network planning continues with the current disintegrated approach at different levels of government and lax partnership with the private sector; major catalytic government projects will continue to bypass isolated or poorer communities with the same negative consequences; or if public transport focused, become impossible to implement.

A paradigm shift from the apartheid-colonial engineering approach with associated standards, which prioritise the needs of the private motorists, middle class and the rich at the expense of pedestrians, public transport users, is urgent and imperative.

By not promoting integrated development in its true sense, and by allowing private developers or residents themselves continue to segregate residential areas or neighbourhoods, municipalities are failing to implement national government policies. By indirectly promoting private motor car use, and neglecting public transport, walking, and cycling through unforgiving roads standards, the result is untold social costs, rampant congestion and traffic accidents.

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