



Energy towards mobile and accessible cities



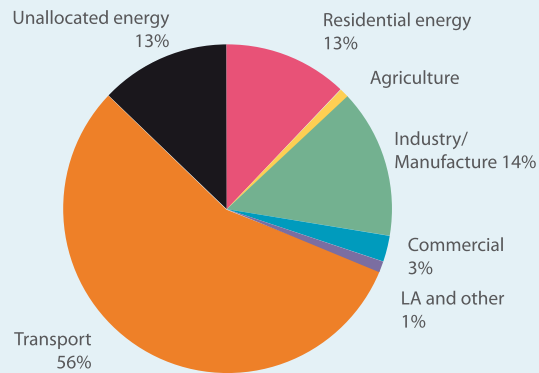
Introduction

Transport is given a section on its own in this report because of the distinctive nature of transport within the overall energy landscape. Firstly it is responsible for as much as 50% of city energy consumption. Secondly, accompanying issues of transport policy tend to overshadow energy issues and so it needs to be highlighted specifically.

The area of transport system planning is vast and out of the scope of the review process and this report. Indeed, a great deal of work is currently being undertaken around urban transport issues and sustainable transport approaches that has not been captured within this report. eThekweni is the first city to have established a Transport Authority and has developed substantial learnings and experience from this. The City of Cape Town is embarking on a 2-year sustainable transport capacity building project, funded by the British High Commission.

This report provides a mere glimpse into some initial energy-related urban transport issues. The focus is predominantly on urban passenger transport issues (rather than freight transport, for example) as this seems to be a strategic priority for local government. As “walking” emerges as the most common commuter mode amongst work and educational trips, notably amongst children going to school, the issue of pedestrian safety emerged as key. Nearly 40% of work and educational trips in the study cities are done on foot. This is not because of healthy lifestyles, or conducive walking environments, but a factor of poverty. Despite the apparent benefits in terms of low-energy intensiveness, walking is a high-risk commuter mode in our cities and pedestrians are twice as likely to die through a motor vehicle accident as the driver of a vehicle.

Figure 3.1 Metro sector energy consumption



Source: Derived from data gathered in City Energy Review, 2006

Mobility amongst urban passengers in South African cities remains highly differentiated by race, although this is being increasingly overlaid by differentiation in terms of income group. Half of urban passengers use public transport to get to work or school. These are mostly poor people, traveling from previously ‘black’ areas in cities. The other half use private transport. These are wealthy people, traveling from previously ‘white’ areas of cities. The travel patterns of the two groups remain effectively discrete.

Transport planning has emphasized the supply side of road transport, rather than focus on transport demand management. As a result, the popular call is to reduce congestion by building bigger and better roads, to provide newly-developed areas with better access to private vehicles and increase the flexibility that private car ownership gives people. However, there is a limit to the capacity of road networks. Rising fuel costs and the impacts of local and global air pollution through increasing private vehicle emissions also place limits on the expansion of private transport systems.



The institutional configuration of the public transport system across the country is fragmented and inefficient. This, alongside the failure to invest over the years in the maintenance and extension of the public transport infrastructure, has resulted in public transport that offers poor levels of services and imposes a high financial burden on both the state (in terms of operational subsidies) and the household. Although car ownership only becomes significant once households reach a R3 000/month income level, the trend is towards a dramatic increase in car ownership in South Africa. Between 1995 – 2003 car ownership increased by 33%. Without a significant improvement in public transport the trend to move into private transport as soon as it can possibly afforded, will continue.

ISSUE: Spatial advantage and participation in urban life

Inequality and the ability to participate in the benefits of urban living are often felt through locational disadvantage. Residents settled far from opportunities and facilities must either travel substantial distances, with associated costs, or opt out from such opportunities, also often at a large opportunity costs to the household welfare and development. If they choose to travel, not only direct travel costs but costs associated with excessive travel times, come into play. The

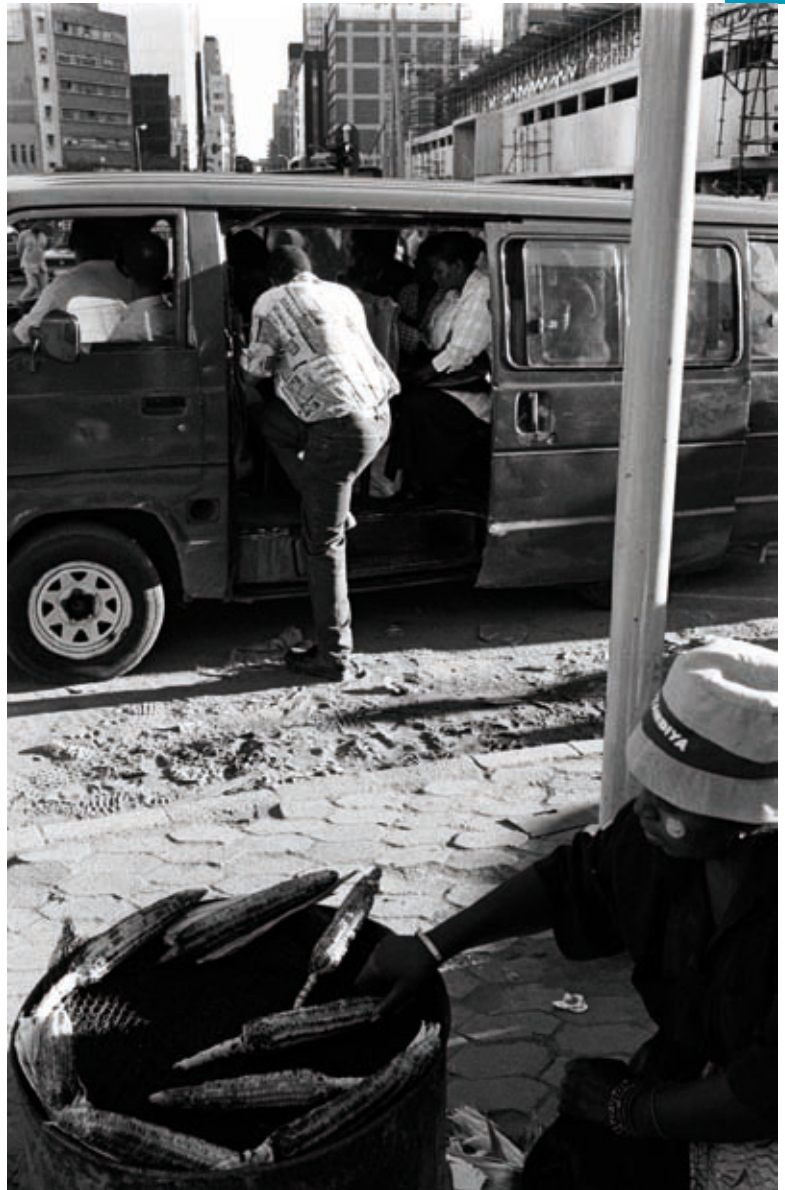
spatial isolation or distancing of communities from sites of economic production and social services centres results in costs to individuals and the city economy: actual costs and opportunity costs.

The spatial division of South African cities by race and income group remains a stark feature of our city landscapes. Apartheid city planning resulted in a legacy of large population centres with very undeveloped local economic bases located at large distances from areas with developed economic bases. Pressure for housing and developer-led housing delivery has resulted in cities utilizing marginal land for housing because land closer to the economic centre is not financially affordable in the short term, although long-term economic costs might be higher.

South African cities are only in the early stages of coming to terms with how to tackle these spatial development problems. These are integrally bound up with transport issues.

Measure: City passenger transport modal split

Nearly 40% of South African city commuters walk to work or school (Table 3.1). Some 30% use private and public transport respectively. More detailed studies done indicate that many of those walking are not walking because of



Energy consumption of different transport modes

Mode	Relative energy consumption per seat km
Motorcar	0.29
Bus; mixed traffic	0.12
Bus: Busway	0.09
Rapid rail transit	0.15

Source: ERI, 2001.

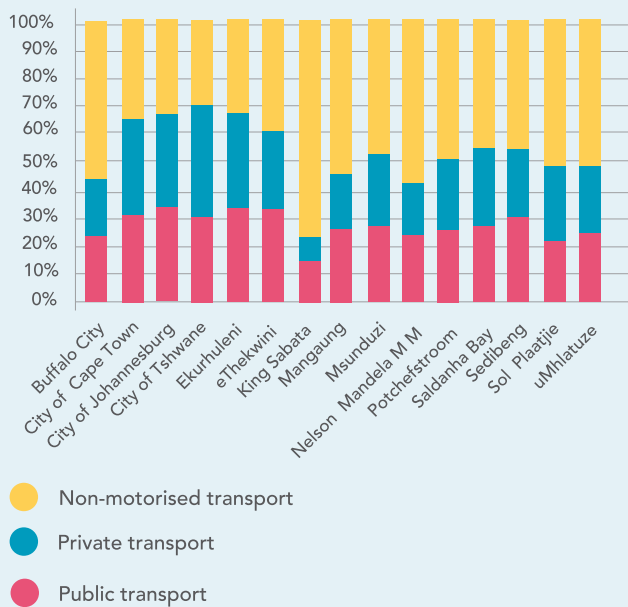
Table 3.1 Average study city transport mode to work and school*, 2001

Non-motorised commuters as % total transport – (i.e. on foot)	39.1
Public transport commuters as % total	30.7
Private transport commuters as % total	30.3

Source: Census 2001

*Note: Transport to work and school is estimated to reflect only some 50 – 60% of all urban passenger trips

Figure 3.2 Mode of travel to work, 2001



Source: census 2001

proximity, but walking well over 30 minutes to save on the cost of public transport¹. A Johannesburg study of travel times and costs reveals that these are lower for high-income areas and that the % income spent on daily commute is far lower for high-income households.

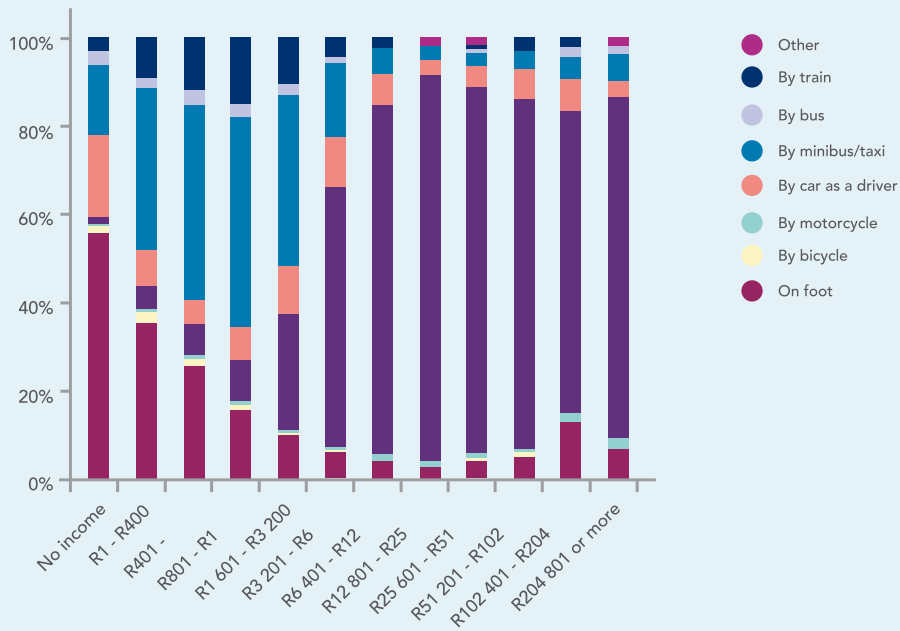
While there are many health benefits associated with regular walking if done in healthy and safe conditions, there are costs associated with walking in unsafe conditions. Studies indicate that walking along busy roads places people, and children, in particular, at risk from harmful vehicle emissions. Data shows starkly that pedestrians are at risk from accidents involving passing motorists. In addition, walking exposes people, in particular women and children, to risk of rape and attack, particularly where lack of alternative transport, or being able to afford transport, means people must walk before sunrise or after dark.

Measure: Mode of transport by income group

There is a strong link between income and mode of transport, making investment in non-motorized conditions and public transport an important aspect of any poverty alleviation and economic development policy in cities. Figure 3.3 on the next page shows mode of transport within Ekurhuleni by income group (tables for other cities are in the City Energy Data at the back of this report). This is typical of the picture across the study cities. Walking as a mode of transport falls rapidly away to be replaced initially by public transport and ultimately by private vehicle, as income increases.



Figure 3.3 Ekurhuleni, mode of travel to work by income level, 2001



Source: census 2001



Table 3.2 Transport deaths by city and category

Transport deaths	2004		2001
	Total deaths	Rate/100,000 pop.	Rate/100,000 commuters, 2001
Joburg: total transport	1,153	36.3	
Road traffic	1,098	33.4	212.1
Pedestrian	556	17.5	
Driver	166	4.8	
railway deaths	55	1.8	75.7
Durban: total transport	1,149	35.8	
Road traffic	1,077		234.6
Pedestrian	582		
Driver	134		
railway deaths	72		118.4
Cape Town: total transport	1,021	33.8	
Road traffic	911	30.1	173.6
Pedestrian	577	19.3	
Driver	119	3.9	
railway deaths	106	3.6	75.0
Tshwane: total transport	779	37.8	
Road traffic	738	35.8	189.7
Pedestrian	250	12.4	
Driver	135	6.6	
railway deaths	41	1.9	47.8

Source: 2004 National Injury Mortality Surveillance System (published by the Medical Research Council (MRC) and the University of South Africa (UNISA))

Level of transport related deaths

The only routinely collected city-level data on transport deaths was found in the 2004 National Injury Mortality Surveillance System (published

by the Medical Research Council (MRC) and the University of South Africa (UNISA), for the four biggest metros: Johannesburg, eThekweni, Cape Town and Tshwane (Table 3.2).

Data points to Gauteng as having the highest rate of transport-related fatalities. All cities have seen a reduction in transport related fatalities, save eThekweni which has remained constant, between 2001 and 2004. Of extreme concern from an equity and poverty perspective is the number of pedestrian fatalities. Given data on income and who walks there is a strong indication that these victims are poorer people.

Measure: Share of biofuel within the transport fuel energy mix

Biofuels are currently a key strategic development area of the government's renewable energy strategy. However, current biofuel consumption within cities remains unrecorded as is at very low levels of consumption. See Productive Cities: local production of biofuel.

Key policy issues

As incomes increase demand for transport is most likely to experience strong growth. Public transport offers many advantages, only one of which is far lower energy consumption, with associated lower impacts on the environment. Even if only from the energy usage perspective, cities need to improve public transport systems to ensure sustainability. Solutions that continue to rely on private vehicles are not sustainable.

People walking to work or school is a substantial portion of the city population, and form the majority of road accident victims, and transport policies, strategies, subsidies and town planning needs to take this into account.

PUSHING PEDAL POWER

Mzi Velaphi, freelance journalist

The National Department of Transport has declared October Public Transport month. The aim of the campaign is to educate the public about the benefits of public transport. Last year, we all heard about (and some of us participated in) the national voluntary car free day. But still Archie Sipoyo from Soweto is disappointed. He is disappointed that not enough has been done to promote the use of bicycles as an alternative mode of transport. Archie has been campaigning for the use of bicycles for a long time.

Born in Central Western Jabavu, Archie started cycling at the age of nine. In the township notorious for gang wars, it was not common to find a young boy passionate about cycling. Central Western Jabavu Township – home to Morris Isaacson High – is also famous for the June 16 uprising. “I developed the passion for cycling very early in my life” says 44-year-old Sipoyo. His first bicycle was a gift from his father’s friend. “It was a three-speed red Chopper,” says Archie without a doubt in his voice.

“I started fixing bicycles at the age of 11 and my parents would always scold me for leaving the backyard in a mess,” says the Jabulani Technical High alumnus. Archie has since worked in many bicycle shops as a repairman and salesman. He has also worked for different projects that aim to support poor communities and promote bicycle use, like Afribike and Axiz.

Together with his friend Bandile Makhalima, they have tried to form a cycling club in Soweto, but because of financial constraints the club no longer exists.

In 2001 the National Department of Transport launched a bicycle transport project called Shova Kalula (Easy Pedalling). According to the Senior Project Manager for Non-Motorised Transport, Whitey Maphakela, the project aims to improve the mobility of South Africans through promoting bicycle transport use, especially amongst the most disadvantaged who currently have to walk long distances to get to school and work. Maphakela says that municipalities have already included

cycling infrastructure and pedestrian tracks in their priority projects.

Bicycle donation from national government is a part of the project. However, the Gauteng Provincial Government has yet to accept the bikes. According to Gauteng Director of Public Transport and Integration, Philip Sobekwa, the province wants to finish the cycling master plan first before they accept bicycles from the national department.

This means Archie has to wait for the cycling master plan to be finished before the Soweto roads become less of a stress for him. Archie has been involved in three accidents while training because there are no cycle lanes. “I have tried to persuade him to quit but he kept on, saying that he would quit the following year,” says Archie’s wife Thembi. Archie and Thembi have three children, two girls and a boy.



Other cities are making strides in terms of promoting bicycle use. Bicycle Empowerment

Network Managing Director Andrew Wheeldon says the use of bicycles has grown from 14 to 17% in Cape Town over the past year. “Cape Town is doing well and it seems as if the sponsors are only concentrating on that part of the country,” laments Bandile.

In a country where a whopping 74% of households have no access to a car and are wholly dependent on walking and public transport, there is a serious need to look for good transport alternatives. The development of a good public transport system requires dedicated road space for buses, bicycles and taxis. Bicycles are the most environmentally friendly modes of transport: they give off no pollution and stimulate health and fitness. Once the bike is paid off, cycling is free. Cycling also stimulates local economic opportunities. Archie now has his own bicycle shop in Jabulani where he employs two assistants.

BLOOD LEAD LEVELS AMONGST URBAN SOUTH AFRICAN CHILDREN

Angela Mathee, South African Medical Research Council

There is little doubt that the use of lead in petrol in South Africa, and around the world, has had a significant impact on the blood lead levels of young children. Even at low levels, exposure to lead has been associated with reductions in IQ scores, behaviour problems (hyperactivity and difficulty in concentrating), learning difficulties and poor performance at school. International experts have described lead exposure and poisoning as a “public health catastrophe”.

Until the mid-1980s, the level of lead in petrol in South Africa (0.836 g/litre) was amongst the highest used anywhere in the world, and a study conducted in Cape Town showed that nearly 100% of children in the Cape Peninsula had blood lead levels that equalled or exceeded the international “action” level of 10 µg/dl, the level endorsed by the World Health Organization. The blood lead levels of children who lived or attended schools in close proximity to busy Cape Town roads were significantly elevated relative to those further away.

Between 1986 and 1989 lead levels were incrementally reduced, and in 1996 unleaded petrol was introduced in South Africa for the first time. A survey undertaken in 2002 showed that following the introduction of unleaded petrol, the blood lead levels of Cape Town children declined substantially (see Figure 1). These findings mirror what has been observed in countries around the world following discontinuation of the use of leaded petrol.

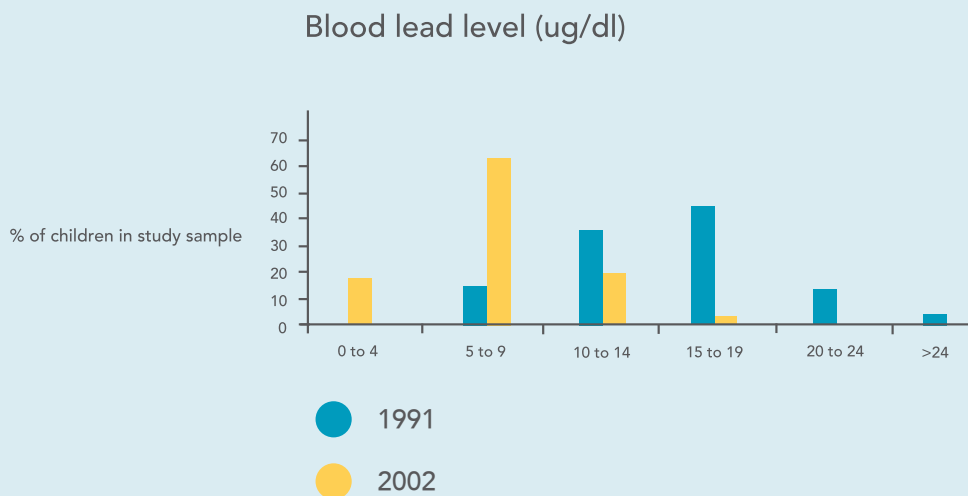


Figure of blood lead levels among Woodstock children before and after introduction of unleaded petrol. From 1 January 2006, the target date for the phase-out of leaded petrol in South Africa, the blood lead levels of South African children are expected to decline further.