



# Tran:SIT Update

Transformation towards Sustainable and Integrated Transport

## Introduction to Sustainable Transport

Volume 2, July 2007

### Sustainable Transport – An international perspective

Sustainable transport practice looks at supporting those lifestyles and movement patterns which depend the least on non-renewable and polluting energy sources. It encourages walking, cycling and public transport use over private vehicle use and it supports integrated planning approaches which move towards sustainable cities.

Sustainable transport came out of a realisation that the focus on road-based networks to meet private commuter demand was not the solution. Since the 1950s, the use of private vehicles has increased dramatically and although there was investment in public transport, this has not been sustained. Many of the problems experienced in major cities are outcomes of traditional transport planning. These include congestion, urban sprawl, air and noise pollution, loss of green and natural space and an increased demand for fossil fuels. It has become obvious that the way in which we plan for transport needs to change.

A number of international organisations, such as the European Union (EU) and Organisation for Economic

Co-operation and Development (OECD), have looked at long-term scenarios, instruments and strategies that can be put in place to implement sustainable transport. Cities have focussed on aspects of sustainable transport, including upgrading public transport system, promoting non-motorised transport and changing the way in which authorities think about street design.

The following changes need to be taken into consideration when looking at sustainable transport:

- Decrease the demand for motorised transport of goods and people and therefore energy use;
- Shift transport demand from unfavourable modes to those with less negative impact on people and nature;
- Ensure the use of best available technology both for transport vehicles and for the management and communication tools in transport;
- Promotion of cleaner fuels such as biofuels and cleaner technology;

Sustainable Transport promotes a new way of thinking about transport planning. This booklet is part of a series of booklets produced by the Urban Tran:SIT Programme. The Transformation to Sustainable and Integrated Transport for the urban environment (Tran:SIT) Programme focuses on sustainable transport and energy issues related to urban development in South Africa. The programme aims to build capacity of South African cities around sustainable transport.

A partnership project between the City of Cape Town and Sustainable Energy Africa. This Programme is funded by the British High Commission.

- Promote responsible behaviour of individuals and responsible decisions by organisations and authorities; and
- Integrate environmental and social considerations into transport policy.

This Tran:SIT update looks at decreasing the demand for motorised transport of people as well as shifting demand from unfavourable modes of transport. Other sustainable transport considerations are dealt with in future Tran:SIT Updates.



Mini-bus Taxi Rank in Cape Town (Source: CCT)

## State of Transport in South Africa

Transport challenges in South Africa include an increased reliance on private vehicles, an ineffective public transport system and poor co-ordination between stakeholders involved in the sector. Despite the large subsidies of approximately R250 million for the rail industry and R 410 million for the bus services in Cape Town alone, the existing public transport systems are not meeting the growing consumer needs. The taxi industry, which is not scheduled, subsidised or managed by government, is also becoming more dominant, with 25% of all commuters using it as their mode of transport to work. Over half of public transport commuters use mini-bus taxis as their primary mode of transport.

According to the National Household Travel Survey (NTHS, 2003) 40% of South Africans use public transport as their mode of transport to commute to work. Since the 1980's much transport investment has however gone into road development in order to meet the needs of private car users. The need to transform and restructure the current public transport system is clearly understood, but major changes will need to take place.

It is important that any city that is to become a place with equal opportunities should have a high efficient, sustainable transport system, which improves access and mobility in an equitable and sustainable manner.

Sustainable transport has not been a focus in South African cities, although most Transport Departments have acknowledged the problems around congestion and the desperate need to improve the public transport system. Many activities taking place, including TDM projects and the upgrading of public transport (specifically the implementation of Bus Rapid Transit (BRT) systems in many cities) do play a role in achieving sustainable transport, but there is still the need to highlight sustainable transport in their long-term planning activities.

The City of Cape Town has highlighted Sustainable Transport in its Integrated Transport Plan (ITP) and they have identified the following focus areas:

- Promoting alternative and more efficient modes of transport
- Reducing the usage and dependence on private vehicle trips
- Supporting integrated and more efficient utilisation of land
- Promoting improved travel behaviour through marketing and awareness
- Shifting government policy and thinking to support the implementation of efficient transport system
- Promoting the use of alternative and cleaner energy sources.

The relevant changes to budgeting and project planning processes, as well as changes in mindset,

will need to be made to ensure that these focus areas are turned into actions.

Many South African cities are using the impetus around the 2010 Soccer World Cup as an opportunity to make changes to their public transport systems. These upgrades aim to provide a legacy for all South Africans as a public transport service that could be used by all.

South Africa is well-placed to become a sustainable transport place of excellence. Commuters are already using public transport and non-motorised transport in South Africa, and although this is partly due to poverty, there is still an opportunity to make public transport a viable alternative to the private motor vehicle. Use of private motor vehicles usually comes with increases income. It is therefore necessary to make improvement to public transport and non-motorised transport in South Africa cities, in order to attract new users, and retain those who currently use public transport and non-motorised transport.

## Non-motorised Transport

Non-motorised Transport (NMT) includes all forms of movement that do not rely on an engine or motor for mobility. NMT is recognised as a valuable component of the transportation system and the environment we live in due to the various benefits



Pedestrian street in the CBD that has been closed off to any motorised transport (Source: Gary Meek)

it holds. NMT has however, not been included in traditional transport planning and walkways and cycle paths have generally been implemented as an after thought or not at all.

NMT can address a large range of transportation needs ranging from regional mobility to neighbourhood access. There are various types of trips where NMT may be used as part of or for the entire journey, whether by choice or out of necessity. According to the NHTS approximately 23% of South Africans walk to work, this is generally because they cannot afford to use public transport. In most cases, there are no dedicated walkways for pedestrians and this can become extremely dangerous for the walking commuter. According to accident statistics, nearly 50% of accidents involve pedestrians.

Best practice for improving non-motorised travel conditions and encouraging non-motorised transport include:

- Integrate non-motorised planning into all transport and land use planning activities.
- Educate all transportation professionals in non-motorised transportation planning principles.
- Fund non-motorised planning at a comparable rate as other travel modes.
- Ensure that all roads are suitable for walking and cycling unless these modes are specifically prohibited. In these cases make suitable alternatives available.
- Use current planning practices and design standards, including Universal Access, which promote non-motorised transport.
- Include non-motorised travel in transportation surveys and models.
- Create pedestrian-oriented Commercial Centers (e.g. St Georges Mall in Cape Town CBD) and neighborhoods.
- Perform user surveys to identify problems and barriers to non-motorised travel.
- Use traffic calming and other traffic control measures to make street environments safer and more pleasant for non-motorised transport.

## Traffic Calming

Traffic calming is any design feature or strategy that intends to reduce vehicle speeds and volumes on a particular roadway. Traffic calming changes street design to give greater emphasis to pedestrians, cyclists and residents. It can involve reallocating road space to increase the amount dedicated for bicycle lanes, pavements and green space. Some features, such as wide pavements and improved pedestrian crossing, support the objectives of non-motorised transport projects.

Some traffic calming strategies and devices include

- Mini-circles : small traffic circles at intersections
- Tighter corner radii: the radius of street corners affects the traffic turning speed. It is particularly helpful for intersections with numerous pedestrians.
- Chicanes: curb bulges or planters on alternating sides of the street, forcing motorized to slow down.
- Street closures: closing off streets to through traffic at intersections.

## Travel Demand Management

Travel Demand Management (or TDM) is a general term for strategies that result in more efficient use of transportation resources, as opposed to increasing transportation system supply by expanding roads, parking facilities and other motor vehicle related facilities. It emphasizes the movement of people and goods, not just motor vehicles and so gives priority to public transport, ridesharing and non-motorised modes, particularly in congested urban areas. There are many potential TDM strategies with a variety of impacts. Some improve transportation diversity. Others provide incentives for users to change the frequency, mode, destination, route or timing of their travel. Some reduce the need for physical travel through teleworking and more efficient land use. Some involve policy reforms to correct current distortions in transportation planning practice.

Four TDM strategies are discussed here. The first three, namely the Promotion of High-Occupancy Vehicle (HOV) lanes, Park 'n Ride facilities and Large Employer Programmes are to be implemented by



Chicane planters in suburban street, to slow down vehicles and encourage non-motorised transport (Source: City of Austin)

UK Manual for Streets – A new way of thinking about street design

A new manual for street design in the United Kingdom has been developed by the Department for Transport. It was developed as a new way of thinking and planning for street design. In the manual it is stressed that streets should not just be designed for motor vehicles and that a high priority should be placed on meeting the needs of pedestrians, cyclists and public transport users, so that growth in these modes of travel is encouraged. It encourages a more holistic approach to street design, with greater social interaction, in conjunction with improved access and mobility of all modes.

For more information, visit [www.manualforstreets.org.uk](http://www.manualforstreets.org.uk)

the City of Cape Town, while the fourth, Congestion Charging has internationally, received prominence.

## Promotion of High Occupancy Vehicles

High Occupancy Vehicle (HOV) lanes enable those who share a ride to bypass areas of traffic congestion. They are typically separated from the other traffic by a solid white line and are identified by signs and diamond symbols on the surface. Drivers can use HOV lanes whenever they have two or more people in the car. This rule is sometimes altered to 3 or more people depending on the level of congestion. Public buses, emergency vehicles and motorcycles can use freeway HOV lanes at any time, regardless of how many people are on board.

### Testing HOV lanes in South Africa

In South Africa HOV trials have not been successful. According to the Synovate Rush Hour Survey 30% of Gauteng motorists believe that the HOV strategy could work to reduce traffic congestion. Only 22%

of respondents interviewed were positive in their evaluation of the trial in the week of 23 October 2006. In this trial initiated by the Department of Transport, one lane on selected highways was closed to those traveling with only one or two persons in their vehicle. Just over half of those interviewed (55%) deemed this exercise to have been unsuccessful. Many of the respondents believed the failure of the test was in part due to poor communication. The HOV lane was not advertised sufficiently causing it to be underused and creating further congestion on the main part of the freeway as well as on surrounding secondary roads. Poor communication around the Park and Ride facilities in locations around Pretoria and Johannesburg, provided people with limited alternative options.

There are however some sceptics, who argue that used space in HOV lanes make travel inefficient and suggest that a toll system be set up so that single occupant vehicles may use the HOV lanes at a cost. There is also some opposition to this, as some people do not feel that they should pay for the use of a road, which is considered free. There are also a number of environmental impacts around introducing new



HOV lane is designated by the diamond symbol. This lane can only be used by cars with 2 or more passengers (Source: Dallas Area Rapid Transit)

### CASE STUDY: WASHINGTON STATE IMPLEMENTATION OF HOV LANES

Washington state, USA has spent \$1,5 billion on freeway HOV lanes since 1970, with at least 200

miles of HOV lanes being created out of a planned 3000 miles of HOV lanes. The Washington State Department of Transport (WSDOT) is responsible for constructing and operating the HOV lanes and the Washington state patrol is relied upon to enforce HOV lane requirements and policing is aided by encouraging other motorists to report anyone violating the HOV lane rules. Policing the scheme has always been one of the major worries, however, the overall area has experienced a violation rate of only 5%.

Many of the new lanes have seen marked improvements in transport efficient, moving 1/3 of the people on rush hour freeways in approximately 18% of the vehicles. The scheme is also seen as an incentive for public transport, as studies have shown that many people who are currently bussing as a result of the HOV lanes, would switch back to driving alone if they were taken away.

road space for HOV lanes, so these should ideally be developed on already established roads.

## Park-and-Ride

Park-and-Ride systems are an important part of multi modal transport strategies and can be an effective means of reducing the number of private cars in inner city areas. Park-and-Ride systems encourage inner city public transport use by providing large scale parking facilities on the city perimeter. The parking complexes are then usually associated with a rail or bus service.

The position of the Park-and-Ride facility requires considerable thought and investment. It is designed primarily to attract car drivers, who would usually drive into the city centre, but encourages them to use a park and ride system instead. As a result most Park-and-Ride facilities are targeted near main routes feeding the inner city. Park-and-Ride



Park-and-Ride service, where commuters can park their cars and use public transport for rest of their journey (Cornwall County Council)

The CCT will be implementing Park-and-Ride facilities at a number of train stations within the metropolitan areas. The project will focus on the train lines that have available capacity as well as stations that have suitable space for the parking facilities. The Park-and-Ride program for Cape Town should benefit individual commuters and the City in many ways, including less stressful commutes, financial savings to individuals, lower levels of congestion and increased public transport ridership. By identifying the most promising park-and-ride opportunities in the City, these Park-and-Ride facilities should attract new users of the public transport system and should demonstrate the potential of Park-and-Ride as an effective mode of commuting.

facilities require funding, adequate transit service and rideshare programs, and suitable incentives. Security concerns may limit use if Park-and-Ride lots are perceived as being vulnerable to theft, vandalism or assault.

## Best Practices

- Park-and-Ride facilities should be developed as part of an overall transit and rideshare improvement program.
- Park-and-Ride facilities require visual security on site during the hours that the public transport system operates to ensure that vehicles and people using the facility feel safe and secure.
- Park-and-Ride facilities should be located within view of businesses or homes, for the sake of security.
- Park-and-Ride facilities should include bike storage lockers or other secure bike storage if demand exists.
- Provide motorists with convenient information on Park-and-Ride facility location, space availability, train departures and downstream roadway conditions.
- Facilities should have adequate lighting, landscaping, and other amenities (bus shelters, garbage cans, etc.).
- It is usually best to have several smaller Park-and-Ride facilities in different locations, rather than one large one.

## Large Employer Programmes

Large Employer Programmes are general TDM measures that are focused on large employers. These programmes typically provide financial incentives to employees, particularly in terms of a parking cash out and public transport allowances. They also promote alternative working hours, including flexi-time and compressed work weeks. They promote the use of non-motorised transport by providing safe storage for bicycles and changing facilities for those who cycle, walk or run to work.

## CASE STUDY: METROPOLITAN STAFF TRANSPORTATION SERVICE

Metropolitan is a larger employer in the northern suburbs of Cape Town. They have a feeder bus system to and from the Bellville train station for their staff during the morning and afternoon peak. The service also travels to the nearby shopping mall during lunch times. Two 60-seater buses operate and between them, four trips are made during the morning and afternoon peak.

Metropolitan work on flexible work hours, which add to the buses operating at maximum efficiency, as not all staff have to be at the office at the same time. Employees can only board the bus after showing their personnel cards and this is operated as a free service to the staff. (Source: CCT TDM Strategy, 2006)

They provide company vehicles to eliminate the need for employees to drive to work in order to have their cars available for business travel. They also provide private bus services from public transport interchanges for staff to get to the office.

A key aspect of any Large Employer Programme is the education and awareness raising around alternatives as well as the change in mindset of both the employees about alternatives and employers around changing the way in which things have always been done.

## Congestion Charging

Congestion charging means that motorists pay a direct cost for driving on a particular roadway or area. This is usually in the CBD and in most cases the income generated is used to upgrade the public transport system in order to further reduce congestion.

The main barrier to implementing a congestion charge is the opposition from user groups, who consider themselves worse off if they are forced to pay to use roads they currently perceive as free.

There is also opposition to government implementing these charges, as people fear that the charge has been implemented primarily to increase government revenue and that it will be used inefficiently.

Best practice for using congestion charging to achieve TDM objectives include:

- Choose pricing methods that are cost effective to implement, convenient to users and accurately reflect the costs imposed by each trip;
- Encourage the development of travel alternatives, including flexi-time, ridesharing, public transport improvements and bicycle facilities.
- Integrate the charge with other TDM strategies that increase traveler choice and provide additional incentives to use alternative modes in the same area.

Currently London and Stockholm have implemented congestion charges and a number of other European and North American cities are investigating the possible implementation of similar charges in their CBDs.



Sign demarcating the congestion charging zone in London, including hours of operation (Source: [www.web.pxb.edu](http://www.web.pxb.edu))

## CASE STUDY: LONDON CONGESTION CHARGE

In February 2003, the Mayor of London, (Ken Livingston) introduced the Central London Congestion Charge to deal with the congestion experienced in inner London. The congestion charge covers an area of 22km<sup>2</sup>, but there are plans to expand the system for further areas in London. The Congestion Charge operates from 7am to 6pm on weekdays. Drivers entering the congestion charge zone must pay £8, with failure to do so resulting in a heavy fine. Payment can be made by post, telephone, internet, SMS, at self-service machines, retail outlets and some petrol stations. The System is policed by approximately 230 CCTV cameras equipped with automatic license plate recognition systems, which monitor the 200 entrances / exists to the congestion zone. Certain categories of vehicle are exempt, including

licensed taxis, motorcycles and buses and some alternative fuel vehicles. Residents of the congestion charge zone can register for a 90% discount, while disabled "Blue Badge" holders are eligible for a 100% discount.

When the congestion charge was implemented, 14 500 extra bus seats were provided as well as bus priority measure and extensive traffic management schemes to manage the priority public transport system.

Just over a million people enter central London during a typical weekday morning peak (7-10am). Over 85% of these trips are by public transport. Prior to the congestion pricing program about 12% of peak-period trips were by private vehicle. During the programmes first few months automobile traffic declined about 20% (a reduction of about 20,000 vehicles per day), resulting in a 10% private car mode share.

### Useful web resources

- Victoria Transport Policy Institute – TDM Encyclopedia: [www.vtpi.org/tdm/index](http://www.vtpi.org/tdm/index)
- Sustrans – UK Sustainable Transport NGO: [www.sustrans.org.uk](http://www.sustrans.org.uk)
- Institute for Transportation and Development Policy: [www.itdp.org](http://www.itdp.org)
- Transport 2000: [www.transport2000.org.uk](http://www.transport2000.org.uk)
- European Federation for Transport and Environment: [www.transportenvironment.org](http://www.transportenvironment.org)
- Sustainable Urban Transport Project: [www.sutp.org](http://www.sutp.org)
- Bicycle Empowerment Network (BEN): [www.benbikes.org.za](http://www.benbikes.org.za)
- City of Cape Town: [www.capetown.gov.za](http://www.capetown.gov.za)
- National Department of Transport: [www.dot.gov.za](http://www.dot.gov.za)

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