



3.6 Transport

OVERVIEW

In South African cities transport accounts in some cases for up to 50% of the total energy used, reflecting the legacy of inadequate spatial planning, urban sprawl, and dependency on private vehicle use³². Vehicle exhaust emissions in South African cities are reported to be increasing, with various pollutants predicted to increase by up to 44% by 2011 (from 2002 levels) if emission controls are not in place³³. The resulting decline in air quality would affect many outdoor sports events such as running and cycling, and would impact on general visibility in host cities.

On top of that, the activity that produces the most carbon emissions and consumes significant amounts of energy at major events – including sports events – is typically transport. Air travel

related to the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg for example, accounted for 95% of summit-related carbon emissions. Further impacts include massive traffic congestion and disruption in cities, and associated air pollution.

Coordinated planning of transport for an event is essential to establishing an efficient system which avoids these problems. Such co-ordination requires a single decision-making authority and a well-developed Operational Plan well in advance of the event. At the WSSD, efforts by the City of Johannesburg's Transportation Planning section to develop a WSSD transportation plan were thwarted by the absence of a clear decision-making authority, with the result that no final transportation management plan was ever established for WSSD.

The 2010 FIFA World Cup™ should be

used as a catalyst for the faster development of an efficient, sustainable and affordable public transport system that will benefit commuters and the economy in the years following the event. A national Transport Action Plan for 2010 has been developed and Transport Plans are being developed by municipalities of the 2010 host cities. The Transport Action Plan for 2010 has the following implementation strategies:

- Major public transport improvements including road, rail and aviation infrastructure, building and upgrading of railway stations and airline terminals, and redesign of fare collection systems
- Adopting economic incentives / disincentives:
 - Differential parking rates for High Occupancy Vehicles (HOV)
 - Dedicated lanes for HOVs or buses
 - Secure, weather protected bicycle storage facilities
 - Pedestrian links between venues

- A weekly transport card for all modes
- Park and ride areas
- Establishment of a World Cup (Joint) Operations Centre and sub-centres (closed circuit television monitoring, area traffic control, etc.)

As discussed in Section 3.1, impacts of transport on climate change can be reduced through carbon offset projects, after implementing emission reduction strategies, as a final step in compensating for unavoidable emissions.

“Transport is either the clear impediment to a major event’s success, or the fundamental, “invisible” enabling factor.”

DoT, 'Transport Action Plan for 2010
- International Best Practice Lessons', 2006

³² DEAT 2005, National Strategy for Sustainable Development

³³ DEAT 2006, South African Environment Outlook

OBJECTIVES

The key objectives with respect to transport are:

1. Minimisation of transport needs
2. Promotion of public transport
3. Reduction of pollution from transport

The **London 2012 Sustainability Plan** has adopted the strategic approach of using the Games' inspirational power to influence behaviour change. The 'Healthy Living' theme of the Sustainability Plan, proposes an **'Active Spectator Programme'** to encourage and facilitate walking and cycling.

LOCOG, 2007

Objective 1:

Minimisation of transport needs

Minimising transport needs is achieved by reducing reliance on mechanised transport by locating venues close to accommodation, and increasing the use of non-motorised transport such as walking and cycling. For the 2006 World Cup in Germany, attractive routes from main stations to stadiums for fans on foot, called 'World Cup Miles' were set up by host cities during games time.

Objective 2:

Promotion of public transport

The building or upgrading of public transport infrastructure to meet event needs is undertaken by government and may be out of the control of event organisers; however promoting use of the public transport system can be addressed through a range of strategies outlined below. Event-related infrastructure that would be provided by event organisers includes directional signage and travel orientation displays

and venues and transport hubs.

Long-distance domestic and continental visitors should be encouraged to use rail rather than air transport by providing special offers. Special charter services should be provided for teams and fan groups, especially for travel between host cities (Germany, 2006).

Promoting the use of public transport can be addressed by a range of broad strategies:

- The selection of venues close to transport hubs
- Providing incentives and/or disincentives
- Matching transport provided to the needs of the event
- Raising awareness of the merits of public transport and promoting behavioural change towards increased use of public transport; and
- Providing good information about public transport.



A widely-used incentive for the use of public transport is the issuing of event tickets that are also valid for use on public transport (see Text Box below). Raising awareness around transport impacts and reducing car dependency through promoting behavioural change can also be achieved by using the inspirational power of the sports event and sports heroes.

A public transport system needs to be effective and efficient in order to attract users so it is important to match transport with the needs of the event.

Objective 3: Reduction of pollution from transport

New technologies and fuels can dramatically reduce emissions from vehicles. These new technologies are exciting to the public and can be showcased at events to raise awareness. For example, the Vancouver 2010 Games will use a fleet of hydrogen-fuelled buses that will leave a legacy after the games; the FIFA World Cup 2006 in Germany used two hydrogen powered buses for airport shuttle service in Berlin that were pollutant free and carbon neutral, since the hydrogen for the fuel cells was produced using renewable sources. Where existing

vehicles are to be used, they can be retrofitted with particulate filters, catalytic converters or LPG tanks.

Emissions standards can be set for vehicle fleets, with maximum CO₂ levels depending on vehicle type. As is planned for London 2012, competition venues can be operated as 'low emission venues' at games time with penalty arrangements for non-compliance.

³⁴ FIFA (2006) Green Goal Legacy Report

PROMOTING THE USE OF PUBLIC TRANSPORT

The 2006 FIFA World Cup™, provided special offer railway tickets to event ticketholders called a 'World Champion Ticket', while those without tickets attending side-events were also offered rebated tickets for rail, tram and bus travel around Germany. As a disincentive to private car use, both the Vancouver 2010 and London 2012 Olympic Games Transport Plans will provide no spectator parking at event venues (except for disabled parking). Similarly, spectators at the Sydney Olympic Games could only access events at major Olympic sites via public transport.



STRATEGIES

Recommended strategies for each of the objectives outlined earlier are as follows:

1. Minimisation of transport needs

- Where airline travel is unavoidable, suggest airlines with good environmental policies for participants and provide opportunities for participants to offset their travel related carbon emissions (see section on Climate Change and Energy for information on carbon offset projects).
- Select event venues and accommodation facilities that are near each other.
- Set up attractive pedestrian and cycle routes between stations and stadium (e.g. 'Fan Miles' as provided at the World Cup 2006).
- Time events during off-peak hours to avoid congestion.

2. Promotion of public transport

- Raise awareness about the merits of

public transport amongst staff, participants and public. Provide information about available routes.

- Promote behavioural change towards the use of public transport through choosing facilities that are accessible to each other and to airports and train stations, via public transport.
- Create 'park and ride' facilities at transport hubs.
- Create incentives for using mass transportation (e.g. make event tickets valid on local public transport and use special offers to encourage people to use public transport).
- Use volunteers or trained staff in key stations/areas to assist people in finding their way to the games and related events/services.
- Optimise the efficiency of transport system to attract users:
 - Ensure the frequency of transport matches demand.
 - Match vehicle size to demand so that vehicles do not travel empty.

- Train vehicle drivers and maintenance staff in environmental best practice.

- Create incentives for car-pooling by reducing parking costs for multi-passenger vehicles.
- Provide adequate signage and information:
 - Provide extensive directional signage (at transport hubs, event venues), published information brochures and dedicated information assistants (often volunteers), using a common, recognisable signage theme.
 - Mount comprehensive travel orientation displays at stadium precincts and fan parks.
 - Locate venues for sports fans e.g. (Fan festivals and Fan Parks) in central areas close to public transport.

3. Reduction of pollution from transport

- Use energy efficient and low emission technologies and fuels:
 - Use vehicles that utilise alternative fuel sources such as ethanol, biodiesel, LPG,

electric or hydrogen (particularly for high profile vehicles what are these?) where available. Use fuel blends, unleaded petrol, low-sulphur diesel for regular vehicles.

- Install particulate filters on bus exhausts.
- Purchase, or retrofit, vehicles with catalytic converters.
- Showcase alternative vehicular technologies at events.
- Use non – motorized transport, e.g. rickshaws, bicycles.
- Provide walking and cycling routes and supply maps of these. Provide secure bicycle parking at venues.
- Provide clear and reliable information on alternative transport methods in various media, particularly the internet.
- Vehicles should be made subject to national emission standards.

transport at WSSD

A mass transport system was introduced to supplement Johannesburg's public transportation during the WSSD. This comprised of 200 new buses with emission reduction technologies to convey delegates from hotels to Summit venues and key tourist destinations. Roads were upgraded to reduce congestion and bus drivers were trained in responsible driving techniques and vehicle maintenance. The transport tenders required that companies comply with environmental standards by testing vehicle emissions regularly; using biodegradable products for cleaning; and recycling waste. Monitoring data from the initiative indicated that the environmental requirements were fulfilled and driver training was successful. Approximately 25 000 bus passes were sold during the event. The effectiveness of the system would have been improved if routes had been more widely advertised, accreditation badges acted as passes and if the system had been integrated into the Johannesburg regular transport system.



MONITORING

Project-specific Indicators to evaluate the success of each objective will need to be identified. Examples of indicators that relate to Transport as well as suggestions for targets that could be set, are provided in the Table below:

TABLE 3.71.: Sample Transport Monitoring and Evaluation Indicators

OBJECTIVE	INDICATOR	TARGET	RESULT	COMMENT RE SUCCESS
Minimising transport needs	% of spectators that used non-motorised transport	20%	12%	Moderately successful: Challenges included steep terrain and distances
Promoting public transport	% of spectators that used public transport to reach stadium	50%	45%	Very successful due to good information displays
Reducing pollution from transport	% reduction in measured particulates during games	25%	10%	Not successful due to failure to establish emissions standards in time

3.7 Design and Construction

OVERVIEW

Responses to global environmental crises such as global warming, energy security and the depletion of natural resources have driven an increasing move towards sustainable design, architecture and construction. The built environment is responsible for a major proportion of global resource use and environmental degradation, especially climate change. The design of buildings has a broad range of environmental impacts including those associated with:

- the use of energy and water,
- the loss of biodiversity from raw material extraction,
- the clearing of vegetation under the footprint of new infrastructure and,
- waste streams that emanate from construction activities and the operation of facilities.

These and related issues have been dealt with in earlier chapters in the guideline.

Many terms are used internationally to describe efforts by built environmental professionals to minimize these impacts, such as green building, eco-design, and environmental design; with the term sustainable design becoming more acceptable globally. Sustainable design encompasses the three pillars of sustainable development, namely environmental, social and economic sustainability, rather than being limited to 'green' environmental resource issues. It is not merely substituting 'greener' alternatives for resource use, materials or technologies, but represents an integrated process within architectural design.

The broad aim of sustainable design is to reduce the environmental impacts of buildings and increase the social and

economic benefits during the production of building components, during the construction process, as well as during the lifecycle of the building, as follows:

- **Environmental sustainability** considers the limits of natural resources by maintaining ecological integrity, limiting the use of natural resources (including land) to a level that allows nature to regenerate, thus minimizing the use of non-renewable resources.
- **Social sustainability** is principally about ensuring stakeholder participation, user comfort and health, designing inclusive environments with broad access and providing a range of facilities, amenities and services. It also incorporates the education of labour and building users to raise awareness of environmental issues.
- **Economic sustainability** focuses on development that is viable, fair and

efficient, and which occurs at a rate which does not exceed the ability of the natural and social systems to support this growth. It also supports the local economy and promotes design for adaptability and flexibility over time. A lifecycle costing approach is necessary, which takes into account not merely the capital cost of a component or technology, but the ongoing costs of operation and maintenance over a longer term period.

Why build green?

The built environment is responsible for:

- 20–30% of greenhouse gas emissions,
- 30–40% of global energy use, and
- 40% of materials entering the global economy each year are turned into building components.