

SUSTAINABLE DEVELOPMENT AND URBAN TRANSPORTATION

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ABSTRACT

Sustainable Development is the main force in urban planning today. It has developed as the alternative to the modernist philosophy. This modernist paradigm has left us with massive inequalities and inefficiencies in human landscapes and threatening ecological disasters.

Sustainable Development on the other hand focuses on development rather than growth; it places human needs and equality before technology and efficiency. Sustainable Development with Sustainable Urban Transport are key solutions to our urban environmental, social and economic problems.

Sustainable Urban Transport helps to improve our environment, health, quality of life, conserves our natural resources and is inline with the basic principles of Sustainable Development to bring about order, equality and sustainability in our society at all levels, the economy and environment.

This report aims to highlight various challenges to Sustainable Development and Sustainable Transportation, both internationally and South African, and sheds a light on various policies and initiatives, proposed and in implementation, to achieve sustainability and efficiency in the Urban Transport System.

The development of Transport Corridors together with Sustainable Public Transport is one of the many options we can investigate to ensure an efficient and Sustainable Urban Transport System.

INTRODUCTION

Sustainable Development focuses on development of the existing infrastructure, resources public and social systems rather than growth; it places human needs and equality before technology and efficiency. The basic principle is to protect and enhance the physical environment and optimise resource and energy use in order to offer the community a higher standard of living and sustained economic benefits.

The importance of considering a Sustainable Transportation system as set out in the Transport White Paper of 1997 (NDoT, 1998, p.5):

“Provide safe, reliable, effective, efficient and fully integrated transport operations and infrastructure which will best meet the needs of freight and passenger customers at improving levels of service and cost in a fashion which supports government strategies for economic and social development whilst being environmentally and economically sustainable.”

An advantageous option for Sustainable Economic Development is to move from a private to a Public Transport system that will significantly reduce the annual costs of road accidents, congestions and pollution (IAPT, 2004). Social and economic opportunities are generated which in turn can improve the standard of living along the activity and transportation corridors and help to improve on the Public Transport system.

WHAT DOES SUSTAINABLE DEVELOPMENT MEAN TO URBAN TRANSPORTATION?

In order to understand what Sustainable Development means to Urban Transportation we need to briefly determine *why* Sustainable Urban Transportation?

As researched in the European Commission report on Sustainable Urban Transport Plans (2007, p.6) various challenges and problems are raised around urban transportation.

Transportation issues highlighted are air quality impacts, traffic congestion, neglect of the built environment and high levels of ambient noise. Traffic-related emissions contribute to air quality problems and associated health effects in most urban areas. Prolonged exposure to road traffic noise poses a threat to our health and quality of life.

In Europe transport alone currently accounts for 30% of overall energy consumption with half of all road transport fuel combusted in urban areas (European Commission, 2007, p.10). Climate change is happening and the effects will be irreversible should we continue to exploit our environment.

Another issue over Urban Transportation is the number of road accidents, vehicular-vehicular and vehicular-pedestrian, that occur on a daily and annual basis. The effect that road accidents have on our economy and society can be detrimental.

To conclude all of the above issues, Zhi Liu (2006), World Bank Senior Infrastructure Specialist, in his article in the China Urban Development Quarterly, Issue 1, states:

“At the city level, traffic congestion, motor vehicle pollution, and road trauma have become common and serious problems in almost all large cities, and are fast eroding the quality of urban life and the efficiency of urban economic activities.”

Therefore we can see from the points mentioned that it is important for us to develop in a sustainable manner. Through sustainably developing our urban areas and transportation systems, we can improve our movement and simplify transportation, thus reducing congestion, pollution and improving on the safety of pedestrian and passengers, improving on our economy and development and our quality of life.

With the IAPT's (2004) recommendation in mind it can be said that Public Transport is one of the solutions to urban problems in the Community. It consumes less energy, uses less road space and is less damaging to the urban environment.

Sustainable Urban Transportation can be defined as:

“...transportation that meets mobility needs while also preserving and enhancing human and ecosystem health, economic progress, and justice now and for the future.” (Elizabeth Deakin, 2001, p.6)

CHALLENGES TO SUSTAINABILITY

Technology

There is a link between the environmental problems we have and the way that we live. Gabriela Schaad (2008, p.1) in her report mentions that in more recent years, climate change has substantiated as a major threat to humanity that can no longer be ignored.

Gabriela Schaad (2008, p.2) further argues that the transition from traditional energy production technologies to environmentally friendly methods are slow due to the fact that the new technologies are capital intensive despite the fact that the new technologies have lower operating costs. Companies are more concerned over immediate profits over the short term than taking on a long term solution.

To support the above, Gabriela Schaad (2008, p.3), mentions that new technologies are not considered because new technologies meet extensive opposition from existing groups with vested interests in the traditional technologies. Established working practices, technologies and perceptions of profitability undermine attempts to integrate sustainability practices into urban development schemes (Donovan et al., 2005, p.2).

Environmental

The specific environmental challenges that an urban development may face depend on its social stature, historical circumstances, geographical and topographical location, political and cultural traditions (context related).

Referring to figure 1, developed by McGranahan et al (cited in Henrik Nolmark, 2007, p.11-12), cities can be placed at different positions in relative to environmental concerns depending on the

level of wealth in the city. McGranahan explains that the primary environmental concerns for low and middle income cities tend to be the provision of basic services i.e. water, sanitation and energy. Environmental effects are local, immediate and health threatening. As cities increase in wealth, they improve their ability to provide basic services, but industrial activity and increasing mobility lead to pollution and increased traffic accidents, and congestion. Wealthier cities may eventually be able to decrease the effects of industrial activity but tend to release more greenhouse gases and consume larger quantities of natural resources. These effects are global and more delayed in nature and threaten life-support systems.

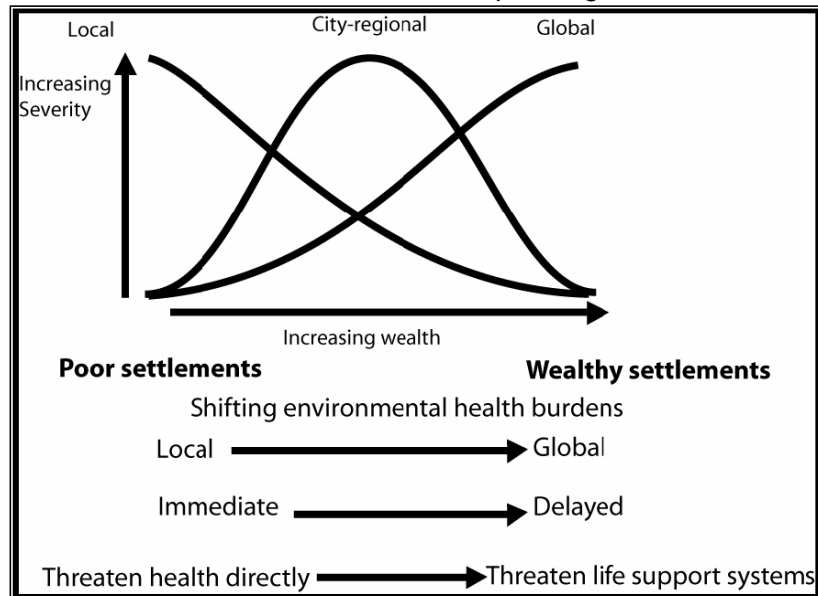


Figure 1. A stylized urban environmental transition (McGranahan et al cited in Henrik Nolmark, 2007)

Challenges in South Africa

Poverty and unemployment in South Africa

is and can be a problem if not attended to. The Office of the Executive Deputy President and the Inter-Ministerial Committee for Poverty and Inequality (internet article entitled "Sustainable Development in South Africa", 2006), puts unemployment at 25.2% and people living below the poverty line at 50%. End results of unemployment and poverty can hamper the efforts of developing in a sustainable manner economically, politically and socially as people don't have the means to sustain and stimulate current and future developments.

A unique challenge faced in South Africa with the implementation of Sustainable Development policies is the balance between our first world / third world situation, for example, the dilemma as to whether housing or economic considerations should come before environmental protection (NMBM, 2007a, p.30)

Too many private vehicles cause traffic congestion and are not an economic option as congestion effects the efficiency of the urban economy due to the reduced urban productivity caused by congestion (NMBM, 2007b, p.80; Zhi Liu, 2006). This can be seen both locally and internationally.

A recent challenge experienced is the strong resistance from mini bus operators to the government's proposed Bus Rapid Transport (BRT) routes. There have been local and national strikes by minibus operators, some of which have had violent outbreaks. Disgruntled operators claimed that they were not consulted with, regarding the proposed developments. They further highlighted income loss concerns. From this we can understand that there are difficulties involved and to be experienced in implementing policies and strategies to existing habits.

INITIATIVES AND POLICIES THAT ENCOURAGE SUSTAINABLE DEVELOPMENT AND URBAN TRANSPORTATION

The World Summit on Sustainable Development, Johannesburg 2002

The outcomes of the Johannesburg World Summit 2002 (United Nations, 2002) outline good governance within each country and at all levels from international to local levels of government, that encompass sound economic, social and environmental policies, anti-corruption measures, gender equality and the rule of law. This should all create an environment for investment into sustainable development and meet the needs of the community at large.

Steps and actions were put into place by the leaders of the world at the World Summit on Sustainable Development to address Sustainable Development. Some of the topics covered were:

Sustainable Development Implementation – Encourage relevant authorities at all levels to take Sustainable Development considerations into account in decision-making. Provide support for the development of Sustainable Development strategies and programmes. Promote public procurement policies that encourage development and diffusion of environmentally sound goods and services. Provide capacity-building and training to assist relevant authorities with regard to the implementation of the Sustainable Development policies and strategies. Use environmental impact assessment procedures.

Transport Services and Systems – Implement transport strategies for sustainable development, reflecting specific regional, national and local conditions, to improve the affordability, efficiency and convenience of transportation as well as urban air quality and health and reduce greenhouse gas emissions, including through the development of better vehicle technologies that are more environmentally sound, affordable and socially acceptable. Promote investment and partnerships for the development of sustainable, energy efficient multi-modal transportation systems, including public mass transportation systems and better transportation systems in rural areas, with technical and financial assistance for developing countries and countries with economies in transition.

Institutional development and management

In his article in the China Urban Development Quarterly, Issue 1, Zhi Liu, (2006), mentions the development of a new infrastructure framework for sustainable urban transport that identifies the following priorities for institutional development and management:

- Redefine the role of the national government in urban transport to enhance coordination and risk management
- Develop accountability mechanisms and a strengthened local governance structure for urban transport;
- Build institutional capacity for strategic planning, as a basis for effective coordination;
- Establish the linkage between urban transport planning and financing, to enhance coordination and accountability;
- Develop a sustainable and transparent financing mechanism, as a foundation for financial risk management;
- Develop a viable public transport industry as a center piece of urban transport services for inclusive development

Initiatives in Canada

Bruce Duncan and John Hartman's (1996) report to the APEC Forum on Urban Transportation Seoul, Korea, November 20-22, 1996, mentions that the Canadian vision on Sustainable Urban Transportation calls for major change from past practice in terms of land use and urban structure, the role of private autos relative to other modes, and transportation funding. The emphasis is placed on reducing the need for travel through land use change, designing for the movement of people and goods rather than vehicles, offering real alternatives to single occupant auto use.

Their vision on Sustainable Urban Development is supported by 13 decision making principles which point the way to more sustainable urban transportation systems in the future. Principles put forward are:

- Plan for increased densities and more mixed land use.
- Promote walking as the preferred mode for person trips.
- Increase opportunities for cycling as an optional mode of travel.
- Provide higher quality transit service to increase its attractiveness relative to the private auto.
- Create an environment in which automobiles can play a more balanced role.
- Plan parking supply and price to be in balance with walking, cycling and transit priorities.
- Improve the efficiency of the urban goods distribution systems.
- Promote inter-modal and inter-line connections.
- Promote new technologies which improve urban mobility and help protect the environment.
- Optimize the use of existing transportation systems to move people and goods.
- Design and operate transportation systems which can be used by the physically challenged.
- Ensure that urban transportation decisions protect and enhance the environment.
- Create better ways to pay for future urban transportation systems.

THE SOUTH AFRICAN PERSPECTIVE AND INITIATIVE FOR ACHIEVING SUSTAINABLE TRANSPORT

An internet article entitled “Sustainable Development in South Africa” (2006), lists some of the South African Government’s methods and tools to promote Sustainable Development and Transportation to overcome political, economic and social hurdles. Some of the methods and tools listed are:

Taxes – The government can levy taxes on industries or practices that are unsustainable. For example, the government can tax gasoline to encourage people to drive less or use public transportation more because using gasoline creates pollution.

Subsidies – The government can create an incentive for sustainable behavior by providing the funds to start up sustainable projects, create or update infrastructure to make industries more sustainable, etc. For example, the government can subsidize Public Transport and make it affordable and appealing compared to using private transport.

Laws and regulations that control environmental pollution and regulate development – These would include laws and regulations that limit the amount of water or air pollution caused by factories; those that prevent development on environmentally sensitive land; those that protect the constitutional right to a healthy environment; those that encourage communities to become involved in decisions that affect them, such as what type of development should take place.

Environmental education and awareness – Government can do much to educate the public about environmental issues that affect the country as a whole and their communities in particular and inform on the benefits of public transport.

Urban forms and Structures can also be used to Sustain Development and Transportation by conducting in-depth studies of the local environment. For example should we consider implementing a transport corridor? Studies may include (NMBM, 2007a, p.76):

- The identification of transport corridors that have the potential to be developed into integrated development corridors and can be supported by a suitable public transport system.
- The identification of public transport infrastructure requirements to ensure that effective and efficient public transport operations are put in place to support the developments in each corridor.

- The formulation of a broad strategy, covering all public transport modes, for more detailed planning in those corridors that can be used to achieve route and mode optimisation and public transport integration.

Upon conclusion of the above studies, the development of policies, strategies and Spatial/Integrated Development Frameworks will follow.

These policies can be applied through enforcement. As mentioned in the Draft Metropolitan Spatial Development Framework for the NMBM (2007a, p.32), critical to the efficient and sustainable management of any city is the enforcement of its by-laws and land use schemes. It is important though that such laws and regulations be formulated in a manner that encourages public support. The reason for planning a city in the first place is to guide growth in a manner that will ensure that efficient development takes place in the interests of the community as a whole. Without enforcement, none of the planning programmes or initiatives that are instituted will come to fruition.

Long-term and short term public transportation strategies can be conducted to ascertain which mode or combination of modes would best suit Sustainable Transportation. Modes used for Sustainable Transportation may include rail lines, bus trunk routes, local bus routes and minibus feeders.

The long-term transport development strategy should include a modern and attractive public transport system offering seamless traveling and an integrated and scheduled service. This should include contracted operators and through ticketing to promote efficiency. High-density development along the public transport corridors will be served with a high-frequency public transport service, which will convince more people to use the public transport system (NMBM, 2007a, p.78).

Transportation Corridors

Sustainable Urban Transport can be achieved by developing Transportation Corridors along major routes with potential for integrated mixed land use development supported by improved public transport services.

As mentioned in the Draft Metropolitan Spatial Development Framework for the NMBM (2007a, pg. 31), city structures need to be developed in a manner that uses infrastructure more efficiently and minimises the need to extend infrastructure networks unnecessarily.

Transportation infrastructure is the most expensive infrastructure in urban development and extensions to road and rail networks need to be kept to a minimum. One means is to increase both residential and commercial densities along transportation routes and to transform these routes into activity or development corridors. This concept is supported by directives from the National Department of Transport that call for investigations into the development of transportation corridors in order to make public transport a viable alternative to the private motor vehicle. The implementation of the Transportation Corridors can further be achieved by linking major centres and industrial areas with the residential areas and economic poles within the greater area.

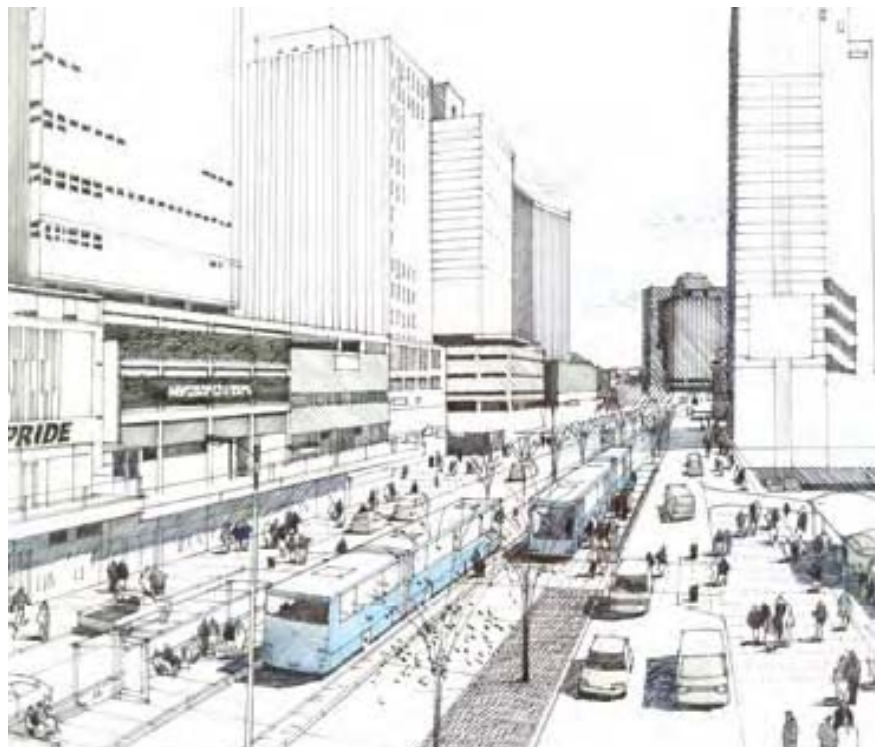
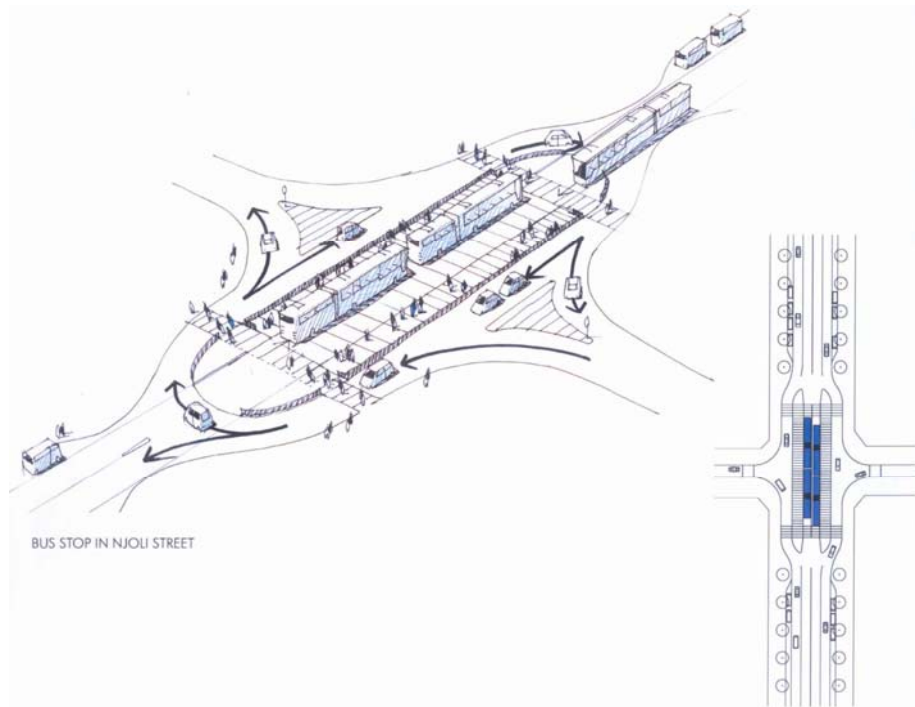


Figure 2: Govan Mbeki Avenue New Public Transport (SWECO International, 2005)

High-density corridors that contribute to sustainable public transport services are receiving high priority in the major cities of Cape Town, Johannesburg, Durban and Port Elizabeth. These corridors focus on principles such as high density, captive public transport populations, integration opportunities and mixed land use development that maximise the use of services and reduce the need to travel through the provision of work opportunities in close proximity to residential trip origins (NMBM, 2007a, p.76).



The above initiative of implementing Transportation Corridors is in the process of implementation in the Nelson Mandela Bay Municipality through the form of dedicated bus lanes for public transportation (see figures 2 & 3 for an artistic view of the proposed public transport service). Studies were based on investigations of the public transportation systems in South America where similar dedicated bus lanes are in place and operating successfully. The feasibility of this system for the Nelson Mandela Bay Municipality was conducted by SWECO International with support from the Swedish International Development Cooperation Agency.

Strategic Actions for Sustainable Urban Transportation

Figure 3: Bus Stop in Njoli Street (SWECO International, 2005)

In their 14 month research and as concluded in their report “Moving

South Africa”, the NDoT (1998, pp. 135-136) has put forward the following strategic actions for Sustainable Urban Transportation that is applicable to the South African environment:

- **Densification of transport corridors to achieve economies of scope through increased use of controls and incentives and provision of public transport investments to support corridor densification. This action is the linchpin of the urban strategy, creating a ‘corridor vision’ for urban areas across the country.**
- **Optimising modal economics (through economies of scale) and service mix to meet customer needs. In particular:**
 - Focusing infrastructure investment on supporting corridor development, especially to improve roads and dedicated road-based public transport infrastructure like busways
 - Reorienting planning and operation of public transport services to promote the mode that offers the best cost/service trade-off for a given corridor, and encourage differentiated public transport services, to meet higher level customer needs without subsidies or cross-subsidies
 - Implementing tough road space management and car restrictions to improve the performance of public transport
 - Targeting subsidies towards the poorer segments while encouraging use of the optimal mode and incentivising modal integration.
- **Improving firm-level performance and productivity, by creating:**
 - Competition within and between modes through tendering/concessions of services to private sector operators
 - Effective regulation of all modes, especially taxis, to meet customer needs, reduce system costs and create sustainability

- Improved funding for infrastructure and upgrading to ensure sustainability

CONCLUSION

Our current development and habits are effecting our environment and the effectiveness of our transportation systems. New technologies are the future, however there are strong oppositions to new technologies by established industries. Poverty, traffic congestion and change to new urban developments are evident South African challenges which need to be addressed via effective government policies and strategies.

Transportation corridors with adjacent mix-use Sustainable Developments are one of the many ways forward for Sustainable Urban Transportation providing the community with a safe and efficient Public Transport Network.

Sustainable Urban Transport helps to improve our environment, health, quality of life, conserves our natural resources and is inline with the basic principles of Sustainable Development to bring about order, equality and sustainability in our society at all levels, the economy and environment.

"... public transport is a catalyst for economic and social opportunities that contribute to efficiency and productivity in urban areas where most of the wealth is created." (IAPT, 2004).

The development of Transport Corridors together with Sustainable Public Transport is one of the many options we have to ensure an efficient and Sustainable Urban Transport System with improved regulation, performance and productivity of service to the community.

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