

# IMPACT OF RAPID URBANISATION OF SOUTH AFRICAN CITIES ON THEIR TRANSPORT POLICIES: A THEORETICAL PERSPECTIVE.

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## ABSTRACT

For the past twenty years or so, both the proportion and the number of people living in urban areas have been increasing rapidly in developing countries. This increase is also marked by a concentration of population in large cities. The relationship between urban and transportation is perhaps one of the most important aspects of development in a city. The provision of transportation plays a major role in sustaining development in a city, whilst at the same time, development directly affects transport demand. Without an adequate transportation system there would be a limit to growth. This paper presents an argument that when there are few resources available for the management of growth, the situation often leads to over-populated cities having infrastructure provisions of very low quality. This is most visible when the urban transport network of a city grinds to a halt with traffic congestion. This paper is a study of development of transportation planning and policy dynamics in a rapidly urbanizing cities in South Africa (Johannesburg), to test a number of hypotheses forming a model for the examination of the relationships between urbanisation and transportation, and to look at the development of transportation planning policy making in terms of the actors involved in the process.

## 1. INTRODUCTION

The MSA (1999: 24) document accentuates the following vision for urban public *transport in South Africa* “by 2020, urban customers will be able to participate fully in the various activities of city life by using a public transport network that provide as much city-wide coverage as possible and which is affordable, safe, secure, fast and frequent,” Hence, in this report the term “level of service” collectively refers to the affordability, safety, security, speed and efficiency attributes of the operation. In addition, the MSA forecast has indicated that by 2020 the primary problem in the transport industry will not be road safety but rather congestion (MSA, 1999: 73). If let unchecked, road congestion will be one of the most damaging problems for the urban economy in 20 years from now. Public transport will be instrumental in relieving and preventing congestion.

In South Africa in 2001 the level of urbanisation was 56%, giving a 4.3% increase between 1996 and 2001 (Kok and Collinson, 2006). Circumstances are different in South Africa compared to the pattern characteristic of the rest of sub-Saharan Africa (Potts, 1995). The influx of migrants into cities may in part be a response to the ending of decades of restrictive apartheid legislation which artificially held down the level of urbanisation (Gelderblom, 2003). Because of the increase in motorized transport in South African cities, people walk and cycle less. This has resulted in reduced access to transport for the urban

poor and other vulnerable groups. Increased use of private motor vehicles, especially motorcycles, has reduced the demand for and the overall efficiency of public transport in some cities in South Africa. In many other cities, the rapid increase in population resulted in an increase and often unmet demand for public transport. These cities faced difficulties in meeting this increased demand, resulting to a decrease in the quality of public transport services provided.

The urban transport problem however, should not be thought of only as congestion, but:

- Problems of movements in which difficulties are encountered in satisfying the demand for travel.
- Problems of non- movement, in which difficulties are encountered in making, journeys due to the non existence of facilities.
- Problems of location, in which difficulties are encountered due to the proximity or unavailability of transportation infrastructure provisions and services.
- Problems of change, in which difficulties are created as a result of changing or improving existing facilities.

Most urban transportation problems occur when the demand for transport exceeds the supplied provisions. The demand for transport is a derived demand. That is to say, it depends on where people live and work, and on the location of production, service and leisure activities. Any change in the structure of the society will change the demand for transport. The paper will, however, attempt to draw attention to the fact that many of the “plethora of problems” are the result of (a) shortcomings in transport policy and planning (b) failure on the part of the authorities to apply those policies that do exist.

The aims of the paper are to theoretically see whether urban transportation planning and policy making in these cities developed through the same process of change as that in the developed countries and at the same comparable timescale, to identify the differences, and to provide a better understanding of the needs of such cities for future development purposes. In the course of the study, it is also expected to identify major shifts in political and economic tendencies during the period under consideration, since this often reveals the degree of independence of the transportation phenomenon from external influences.

## **2. EVOLUTION OF TRANSPORT PLANNING MODELS**

The evolution of transport planning models is briefly traced, through a consideration of the policy developments and socio-economic environments which have influenced transport model changes. In this way it is possible to identify four periods of model development:

- 1950s – 1960s: developments in response to accelerated highway construction and advances in computing;
- 1970s – 1980s: developments in response to criticisms of aggregate methods;
- 1980s – 1990s: developments in response to criticisms of static, trip-based analysis;
- 1990s: developments in response to environmental pollution, and policy shifts towards travel demand management (Behrens, 2002).

Other authors, writing about the developing world specifically, have raised major concerns regarding the appropriateness of the aggregate four-stage model for developing world conditions. Dimitriou (1990:169) suggests that many of the problems with the four-stage model can be traced back to the assumptions underpinning the earliest models, which are largely inappropriate for developing world conditions. For example, the US developers of the 1950s saw the urban transport problem as mainly one of how to overcome motorised

traffic congestion. This is sensible in a country where the majority of residents are vehicle owning. The converse is true in developing countries. In addition, early developed world models were not used to study informal transport and so this essential travel mode is treated in an ad-hoc manner in most models. Aggregate four-stage models assume some long term stability in the variables affecting travel demand. This presumption is especially questionable in a rapidly growing developing country like South Africa.

More recently, Vasconcellos (2001) has been equally critical of the application of aggregate four-stage models in developing countries. He points out that not only is the use of transport models flawed from technical and ideological standpoints, but there are also problems with how the outputs are used in appraisal. Full environmental appraisal (which would include a full safety analysis; disruption and costs to non-motorised transport users) are generally not present. The attribution of monetary costs to accidents and time, which is necessary for economic appraisal, becomes particularly problematic in the developing world where there are large variations in values due to, for example, extreme differences in incomes.

### 2.1 Policy planning

The criterion for the policy study is a simplified approach that looks at policy development on two levels. The first level deals with major policy development and reform that produce leading policies forming the basis for broad based goals such as the development of the highway network and the choice for the type of public transport investment. The second level deals with enactment policy development and reform such as policies to relieve network bottlenecks or enhancement of the existing facilities forming the basis of the executive phase of planning. In view of the already mentioned difficulties that cities in South Africa have in maintaining a balance between transport demand and the level of provision, it is the enactment policies that undergo the most rapid change. The way these policies have evolved, together with the direction the broad based major policies are moving towards, provide a better understanding of the urban transport situation in South African cities.

If transport solutions are to be found to the immense problems of developing cities in South Africa – many growing at alarming speed – the decision makers will have to become more discriminating about what they buy from other countries. South Africa must develop its own approach to transport planning, training experts within the country and feeding back into the global public knowledge base. Essentially three basic questions surface with regard to transport planning in South Africa:

- First, what should be the indispensable level of transport provision for the city to meet the welfare objectives of serving the majority and, therefore, what kind of transport infrastructure would be needed within the limits of resource use?
- Second, how should the city's transport sector be managed to be self-sustainable without undermining the sustainability of other sectors of the economy?
- Finally, how would the organisation of human activities add to the sustainability of the city's transport, impact on human health and its demands on non-renewable resources?

All these issues can be addressed positively if each city's transport planning agenda is strongly committed to a public transport system taking an 'inclusive approach'. Repeated attempts have been made to deal with urban transportation and many reasons have thought of for their failure in South Africa. Reasons such as the inadequacy of the planning efforts, lack of institutions to carry out the task, lack of coordination between the institutions, inappropriateness of policies and failure to meet challenges in time. This paper

is about development of transportation planning and policy dynamics in a rapidly urbanizing cities in South Africa, to test a number of hypotheses forming a model for the examination of the relationships between urbanisation and transportation, and to look at the development of transportation planning policy making in terms of the actors involved in the process.

### **3. URBAN TRANSPORT DYNAMICS**

Most urban transportation problems occur when the demand for transport exceeds the supplied provisions. The demand for transport is a derived demand. That is to say, it depends on where people live and work, and on the location of production, service and leisure activities. Any change in the structure of the society will change the demand for transport.

In general, as cities grow, the demand for urban transport can be expected to rise. There are various factors present in the growth process of a city that influences the demand for transport. At the same time, there are also differences between cities in developing and developed countries which influence the growth process. Subsequently, the nature of demand for transport and its management would be expected to differ between developing and developed countries. The following is a description of some elements of urban growth and their influence on transport demand. Because of the special characteristics of the cities in developing countries, a general description of the conditions is given:

#### 3.1 Growth of travelling population

Growth in the magnitude of the travelling population is predominantly due to population growth. If the population growth is natural, there is little immediate change in the structure of transport demand. Such changes will be gradual, reflecting the changing demographic characteristics of the society. But when the increase in population is largely due to migration, the implications are quite different, and the impact of growth is felt more immediately. It can be reasonably assumed that the majority of the migrants are active adults and therefore have specific transport requirements. As soon as they arrive, the migrants would need to, and would use the transport facilities, thus presenting an immediate change of demand. The economic circumstances of the new residents are a consideration which will affect the type of transport facility they use. Poorer migrants might be more dependent on public transport though if they become more prosperous, their use of transport means may increase. Moreover, as migrants become established in the city, their activity spaces increase and the number of trips that they make would be expected to rise.

Some changes in the social behaviour of the population can increase the number of travelling population. One such change which has been seen in many countries is the greater participation of women in the workforce. This change would alter the structure of demand in more ways than one. For example, volume of work trips may be altered, or mode choice for travel might be changed as a result of increased household and / or individual income. The immediacy of the impact or the nature of the change would of course depend on the speed of the process and on the extent of the involvement of each individual in the society.

#### 3.2 Spatial form of city growth

Theorists have devised models explaining the way cities grow, but in simple terms, it can be said that growth can take two forms, intensively, by making the city denser, without changing the basic structure of the city; or extensively, by spreading the growth in the city hinterlands creating new suburbs and satellite towns; or by a combination of the two.

When growth is only intensive, volumes of demand increase on the transport network and subsequently, capacity of the existing network becomes the first focus for failure. When there is an element of extensive growth the increase also includes the distances to be travelled, in which case, an extension of the network itself is needed. The relationship between spatial growth and the transport system is interactive. Any change in transport system, be it new routes, changed speeds or costs will influence the spatial growth by altering the urban economic balance. Moreover, the combination of spatial growth and changed land use also leads to complex changes in the nature of transport demand.

### 3.3 Increase in commercial and industrial activities

The increase in commercial and industrial activities affects the transport network in two ways. Firstly as generators of traffic like development they produce trip patterns distinctive to the type and intensity of the activity, hence increasing the demand requirements of the network. Secondly, they have a direct effect on the volume of commercial and goods vehicles, again in a manner distinctive to the type and intensity of the operation. For road – based transport of freight, increased volumes favour the use of larger and heavier commercial vehicles. As axle loads on these vehicles increase, road surface and bridges deteriorate before their time and extra resources have to be found for the maintenance and upkeep of the infrastructure.

### 3.4 Increase in retail and service trade

Retail and service trades are predominantly located in places easily accessible to the intended users, chiefly on main roads and close to transport facilities. Increase in demand for retail and service trade is often portrayed in the increasing number of people using these activities. The implications of this on the transport network are the ever increasing interaction of road users at these sites and the competition for road space.

The requirements of road users are often conflicting. Pedestrian traffic requires adequate space and safe crossing points. Private motor cars require parking spaces. Service vehicles making deliveries require access. More public transport users increase the number of buses and taxis which in turn require space for picking up and setting down passengers. All of the above compete for road space and if any informal activities exist by the roadside, this and the “spillage” of trade from formal retailers onto pavements and roads create further obstruction for pedestrians and vehicle traffic.

### 3.5 Personal mobility, income and the consequences of prosperity

Personal mobility in the context of travel can be defined as the ease with which and individual can transport him between two points at the time of his choosing. A person of high mobility is one who is able to travel at his desired time and to reach his destination with the minimum of time spent on the route. Higher levels of mobility can be obtained by changing to the individual are in general important determinants of the spatial form an unconstrained growing city takes. They are influential factors in the choice of place of residence, influence the activity spaces of the population and ipso facto the level of transport demand and the mode choice of travel.

One of the most convenient modes of transport is the motor car. The acquisition of a motor car and the skill necessary to drive one, the high mobility offered by it is beyond the reach of many individuals. Moreover, a motor car which is collectively owned by a household is available only to those who are using it at any one time, and others must still rely on other transport modes for their travel needs. As income levels increase in relation to the cost of motoring, many more people acquire motor cars, and as the number of motor cars on the roads increase, they become less beneficial to the society as a whole. Roads become congested and the speed of travel drops for all road users thus making public transport a

less attractive alternative to motor car. Increase in the number of private cars result in reduced use of public transport. The reduced patronage makes public transport operation less economical, and as a result, services are reduced and cur. Those who will be particularly put at a disadvantage by this are the people who rely on public transport, who originally had less mobility than car users, but now are even less mobile than they were before.

#### **4. TRANSPORT POLICY IN CONTEXT**

In its introduction, the White Paper on Transport states: "Transport plays a significant role in the social and economic development of any country, and the Government has recognised transport as one of its five main priority areas for socio-economic development. The effectiveness of the role played by transport is to a large extent dictated by the soundness of transport policy and the strategies utilised in implementing the policy".

It goes on to say that public policy cannot be static but must be dynamic in nature. It must at all times be perceptive to the environment within which it operates. Policy therefore needs to be reconsidered and if necessary revised on a continuing basis. Transport is a necessary input to urban life, providing the means of access from home to activity. It plays a key role in people's lives, providing them with access to opportunities. A new turn in the globalisation of capital occurred in the last quarter of the twentieth century. As a result, international policies increased their emphasis on foreign investment (facilitated by international aid agencies) to enhance 'development' in poor countries. Stiglitz (2002, 67) observes: "Foreign investment is not one of the three pillars of the Washington Consensus, but it is part of the new globalization ... Privatization, liberalization, and macrostability are supposed to create a climate to attract investment, including from abroad. This investment creates growth. Foreign business brings with it technical expertise and access to foreign markets, creating new employment opportunities." There is value in comparing the transport policies of cities in different parts of the world for two reasons that one can term 'global effect' and 'mutual influence'. First, because of its impact on the atmosphere and thus on the global climate, urban transport policy pursued in one city has an impact on cities worldwide.

Second, transport policy is disseminated from place to place. City planners learn about 'best practice' in their field, and the 'best practice' is mostly defined in terms of the practice of the cities of the economically developed world. Much of the transport policy which is today being implemented in cities around the world has come out of the USA of the 1950s, premised on the assumption that the most advanced and best mode of transport is the private vehicle. European transport policy is today creating a new model based partly on the discourse of sustainability, but also very strongly on intercity movement via rapid transit. Neither of these models is particularly suited to the actual conditions of cities in other parts of the world. Neither model is ecologically sustainable (OECD, 1995; Whitelegg, 2003). Both ultimately create a distance intensive world in which the costs of individual mobility are borne by society and the environment, and both benefits and costs are very unevenly distributed among local populations.

Such mutual influence is enhanced by economic globalisation. The euphoria of an integrated globalised world has made universal concepts of sustainability – promoted by the international multilateral agencies, such as, the World Bank, IMF or World Trade Organisation – a reality; no matter how different is the development process of the developed countries from that of the less developed ones. Although the field of debate on globalisation is large, complex and rapidly changing, it has become quite clear by now that

a market ideology of competition, efficiency and free trade has been able to influence the framework of policy making worldwide to a great extent.

It is also true that the increasing numbers of multinational corporations that operate across the globe facilitate not only an intercountry, interlinked financial system but increasingly interfere in the political system and governance of such countries. In Goodwin's words the 'new realism' in Europe is: 'an environmentally friendly package, sometimes justified in economic terms, and sometimes by environmental arguments, consisting of [*inter alia*] containment or reduction of the total volume of traffic' (Goodwin, 1997: 8). But this 'new realism' is coupled with the infrastructure policies of the Trans-African Network extending the scope of both road and rail systems to connect cities and regions.

These two factors, global effect and mutual influence, taken together suggest that cities and planning worldwide are becoming increasingly interdependent. This being so, there is a need for a higher degree of critical international consciousness and mutual awareness among planners in both the developed and developing world. Planners in the economically developed world ought to consider what sort of model and precedent their policies set for planning in the developing world. Under the present circumstances, urban transport contains a concrete example of Kant's categorical imperative: act in such a way that the maxim of your actions can become a universal law. In other words when you make plans for your urban transport system consider what would happen to the global climate if all cities everywhere in the world were to plan their transport systems on the same principles. If we take a long term view of the consequences of policy, this is also not just a matter of duty along Kantian lines but also of prudence, for the decisions of one city, if applied worldwide, eventually come back to affect the welfare of future populations of that same city.

## **5. REVISED MOBILITY POLICY FRAMEWORK IN SOUTH AFRICAN CITIES**

South Africa is running out of options and sustainable transport solutions are the way forward. In many instances, policies focused on the construction of additional roads infrastructure and capital intensive, high-cost public transport systems such as rail-based metros including Gautrain. This has strongly affected the urban quality of life and has gone on at the expense of more environmentally sustainable transport systems like non-motorized transport and low-cost bus rapid transit (BRT) systems. South African cities urgently need a policy framework which prioritizes the movement of goods and persons instead of vehicles. Such an effective and sustainable transport system for people and goods, which can deal with the expected rapid growth in demand, is a prerequisite for sustainable economic growth. Improved access for all sectors of society especially those living below the poverty line, to places of work, educational, and health services, can help these groups to better their lives.

Such a major policy reorientation will require the building of new institutional capacities and regulatory frameworks, a land-use planning concept which integrates affordable, environment friendly public transport and which respects non-motorized transport. Changes of this magnitude do not come easily. Sustained political will is required to see such changes through. Divided and conflicting institutional responsibilities for transport policy between the national and the city levels will need to be tackled. Revised and improved institutional mandates need to be followed by a comprehensive capacity building program for all organizations involved. South African cities desperately need expanded investments in mass transit, roads and other transport-related infrastructure and services for 2010 and beyond purposes. The ability of cities to meet the increasing demand for movement and the fiscal requirements for the maintenance of related transport assets are

major challenges that need to be addressed. In many South African cities, public transport is insufficiently subsidized, thereby contributing to the deterioration of public transport in general and limiting the possibilities for government to spend for the transport needs of the poor.

## **6. CONCLUSION**

Changes are occurring very rapidly in South Africa and policy makers need to get ready to satisfy the demand for mobility while keeping the negative impacts in check. They will be confronted with the need to make decision on the environmental, social and economic dimensions. The outcome of such decisions will be influenced by local circumstances and will be different from location to location. Notwithstanding the differences between cities, 5 key measures are suggested that all cities could take and if implemented, would be significant steps towards making transport more sustainable in South African cities.

First, cities should make an active attempt to calculate the economic costs of air pollution, road accidents, and congestion. This will help to raise awareness and provide the economic rationale for comprehensive action. Second, cities need to develop pro-public transport policies. As part of this, they need to ensure that road user taxes, charges and other fees are not subsidizing private car users at the expense of public transport and non-motorized transport. This needs to be part of an overall financing plan for sustainable urban transport. Third, cities need to emphasize the importance of non-motorized (NMT) transport, formulate an NMT action plan and set an example by creating high profile pedestrianized areas. Fourth, cities need to ensure that there are roadmaps in place for the introduction of cleaner vehicles and fuels and take advantage of the emerging new technologies. Fifth, and this is probably a more long-term action, cities need to develop sustainable land-use plans which prioritizes the movement of goods and persons and not of vehicles. In so doing, cities need to develop the required regulatory frameworks, the institutional and organizational capacity, to implement such sustainable land-use plans.

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