Transport and the Urban Poor

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Executive summary

The aim of the paper is to articulate necessary state interventions to improve transport services for the urban poor in South Africa. The paper forms part of a larger study intended to inform a strategic response to the challenges of the "second economy" in the South African urban areas. The definition of the "second economy" is defined more elaborately in other papers in this series of papers. Simply, however, the second economy, in contrast to the first economy, forms part of the South African population whose households are collectively characterised by low skilled labour and high unemployment rates as a result of mismatch between skills they possess and those required by the economy.

Urban areas within the context of the paper refer to both metropolitan and urban areas defined spatially by Statistics South Africa (making up 65% of households and 59% of the population in 2003), and as implemented in the 2003 National Household Travel Survey conducted by the Department of Transport in association with Statistics South Africa. Indications are that South African population is rapidly urbanising and at the same time the household size is declining. From a transport perspective this is basically indicative of the large strain that urban transport systems are increasingly experiencing, where an increase in the number of small sized households implies that per capita travel demand is likely to be on the increase. As a result, transport network congestion is likely to be on the increase, and it can be shown that congestion impacts on poorer households the more severely as a result of increased generalised costs of travel.

With specific reference to the urban areas of South Africa, the paper attempts to address the following terms of reference, in which the author was requested to provide:

▪ A well argued position on transport approaches at local level that will enhance the access of the poor to income generating opportunity.

▪ A well argued position on the financing options available and the proposed way forward on financing/subsiding transportation costs.

▪ A well argued position on the potential impact of transit oriented land use development in South Africa and how this might be achieved (or not).

▪ A set of key state interventions that should be implemented in the transport sector in order to enhance economic opportunities for the urban poor.

▪ A well argued position on governance/responsibilities for the transport sector.

▪ The paper is to be limited to the synthesis of readily available data and information.

The 1996 White Paper on National Transport Policy remains the backbone of transport policy in the country, and therefore provides a good point of departure. Some of the interesting features of the White paper are the explicit policy targets that include: limiting one-way travel distance/time to 40 km or one hour, a ratio of 80:20 between public transport and private car usage, limiting commuter spending on transport to less than about 10 percent of disposable income and limiting walking distances to one kilometre in urban areas. While the White Paper has

these bold policy targets, it does not explicitly deal with the issue of poverty. The White Paper has subsequently been translated in numerous transport legislations, and some researchers have argued that by virtue of making fundamental interventions and improvements in the land-based transport industry, the National Land Transport Transition Act (one of the White Paper derivatives) will ameliorate urban poverty in respect of the following:

- Improved service delivery through the introduction of the transport authority model (where viable), with dedicated transport service delivery function and associated political accountability structures and matching dedicated funding.

- Mandatory transport plans required in terms of the Act would for the first time guide systematic transport service delivery in local government. The formulation of such plans requires public participation prior to adoption.

- The formalisation and legalisation of the minibus taxi industry would improve service levels for the urban poor. Furthermore, the introduction of new vehicle specification would improve safety levels in the industry.

- Competitive tendering process that requires operators to compete for the right to operate a subsidised route would ensure cost-effective services for the urban poor.

- New provisions on integrated public transport law enforcement would improve the levels of safety for public transport.

In the urban areas of South Africa, and in line with the provisions of the National Land Transport Transition Act, local authorities are required to produce Integrated Transport Plans (ITPs). ITPs are to be used as transport-related service delivery instruments and are in turn supposed to be incorporated into the Integrated Development Plan of the authority. Any transport interventions in the area of jurisdiction of the local authority must be informed by the ITP, and conversely, the authority should not allow any transport related intervention if it is not part of its ITP. Therefore, ITPs remain a powerful instrument that should be used by the local authorities for poverty eradication. This includes ensuring that the design and operation of transport facilities allow for effective incorporation of small businesses (trading facilities) and increased employment (for example infrastructure and vehicle maintenance activities). However, in order to achieve this, more innovative contracting regimes, and the generation of more revenue streams, are needed to facilitate more effective business models.

In order to formulate recommendations for transport-related second economy interventions, the paper uses the urban transport solution framework provided by the Department of Transport's Moving South Africa project. Moving South Africa attempted to define urban travel markets for transport service delivery targeting, and also recommended interventions grouped under the following three interdependent solutions:

- Densification of transport corridors.

- Optimisation of modal economics and the service mix.

- Improving firm-level performance.

The paper, however, attempts to expand on the range of potential interventions in each of three generic interventions identified above. Furthermore, the paper provides a detailed account of the state of transport in South Africa in respect of these three strategic interventions (deliberately excluded in this executive summary for simplicity), with particular reference to the "second economy". Recommendations are grouped into short term intervention (which can be practically accomplished within a short period of time) and longer term intervention (which require consistent and focused longer term investments), for each of the three strategic interventions.

Shorter term recommendations for a corridor densification strategy as an intervention to improve access and mobility in the second economy can be summarised as follows:

- A multipurpose definition of a corridor should be formulated. The development objectives of high density corridor should be clearly articulated beyond the area of transport.

- For transport purposes, corridors should be defined in terms of a combination increased access to public transport as well as higher mobility of public transport. In benefit of the second economy, the practice of defining corridors in terms of freeways should be stopped. Where such corridors are defined, increased public investments should be dedicated to improvement of public transport access and mobility. Existing travel patterns should be harnessed as much as possible when defining such corridors.

- Minibus taxis should be formally incorporated as a mode of choice in corridor designs. However, infrastructure design should take into account possible future high capacity modes that may be implemented within the corridors.

- Design standards of these corridors should take into account the special travel needs of disabled people.

Longer term recommendations for a corridor densification strategy as an intervention to improve access and mobility in the second economy can be summarised as follows:

- Increased densities alone are not a sustainable public transport solution. Other social interventions aimed at improving the welfare of the second economy will have more sustainable long term impact. Therefore, strengthening of service delivery institutions to respond to the multi-sectoral nature of the problems of the second economy should receive priority.

- In order to achieve high densities comparable to some larger cities in the world, developments outside defined corridors should be disallowed. A half hearted approach will maintain the status quo.

- Research into the formulation of a roads design framework centred on the mobility of people as opposed to vehicles should receive priority. This would also require supporting physical demonstration projects.

Shorter term recommendations for optimisation of modal economics and the service mix to improve access and mobility in the second economy can be summarised as follows:

- Improve street environments (for example lighting, walking facilities, shading) in order to improve comfort, safety and security of pedestrians.

- Promote the use of non-motorised transport, especially by the youth. This should be supported by a roll-out cycling programmes in the urban areas, as well as proving appropriate non-motorised transport networks around schools.

- Formulate a South African street design architecture guideline that will promote effective and safe use of streets by different users, especially non-motorised transport users. Currently the design of South African roads is biased towards car use. New design framework should take into account income generating opportunities provided by public transport facilities as well as the many societal roles of streets.

Longer term recommendations for optimisation of modal economics and the service mix to improve access and mobility in the second economy can be summarised as follows:

- Increasing subsidies is not always the best option. Transport operations should first be optimised in order to improve operational efficiency. This is actually the historical modus operandi that taxis used i.e. they did not maintain their fleet properly, they lowered the salaries of the drivers or maintained them at low levels and had low overheads as a result of no administrative staff, but as a result the service quality was somewhat lowered.

- Part of programmes such as taxi recapitalisation should be to ensure that operations are better designed in order to be efficient. Currently taxi recapitalisation programme is focused on vehicle replacements.

- Transport subsidies do not always target the right beneficiaries. The use of better targeting schemes, for example, card-based technologies can improve user targeting.

Shorter term recommendations for improving firm level performance in the second economy can be summarised as follows:

- Given the long distance nature of trips of the urban poor, there is an urgent need for improved communication between the neighbouring authorities when formulating transport plans.

- Employers need to evaluate the accessibility of their premises by public transport in consultation with their workers. This should be fed back to authorities for backlog estimation. This will in turn improve the currently ineffective Operating Licensing Strategies.

- Employment contracts to incorporate transport access clauses, especially for vulnerable users such as night shift workers.

Longer term recommendations for improving firm level performance in the second economy can be summarised as follows:

- Improve community access to internet. This will reduce some of the need to travel, especially for routine travel to access social services. This calls for increased government service to be provided online or over the phone.

Furthermore, improved literacy and computer literacy in poorer communities should receive serious attention.

- Intelligent Transport Systems (i.e. utilisation of Information and Communications Technologies in transport operations) should be implemented in a manner that improves the efficiency and effectiveness of transport subsidy targeting as well as the minimisation of corruption.

- Establishment of targeted transport management training institutions across all the transport-related disciplines should improve capacity in Government, transport operator institutions and the private sector.

- Make social facilities and government buildings multi purpose in nature to reduce the need to travel.

- Empower ward based municipal councillors in matters related to effective transport service delivery.

Given that transport is a derived demand, much of the interventions incorporate recommendations that transcend what would be typically be transport functions. It also emerges from the paper that transport solutions need to work for all customers in order to work for the poor.

The paper also identifies a number of research questions. It also clearly emerges that significant amount of research work in the past has focused more on identifying and defining problems as opposed to identifying solutions. Therefore, many of the recommendations are inferred as opposed to be conclusively supported by research findings. However, care was taken to ensure that unintended consequences are identified. The implementation of these recommendations will require political will that has generally been absent in the transport sector.

1. Introduction

The aim of the paper is to articulate necessary state interventions to improve transport services for the urban poor in South Africa. The paper forms part of a larger study intended to inform a strategic response to the challenges of the "second economy" in the South African urban areas. In contrast with the first economy, the second economy forms part of the South African population whose households are collectively characterised by low skilled labour and high unemployment rates as a result of mismatch between skills they possess and those required by the economy (Presidency, 2008). Households that form part of the second economy are generally poor in that they lack the necessary means to acquire some of the basic resources to maintain an acceptable minimum living standard. While solutions to the problems associated with the second economy are nowhere near straightforward, the paper uses research findings in the area of transport studies, conducted locally and internationally, and synthesises what appears to be practical and sustainable interventions in this regard.

Urban areas within the context of the paper refer to both metropolitan and urban areas defined spatially by Statistics South Africa, and as implemented in the 2003 National Household Travel Survey conducted by the Department of Transport in association with Statistics South Africa. In the survey, urban areas comprised 65% of the households (out of a total of 12 432 324) and 59% of the population (out of a total of 46 400 931). Indications are that South African population is rapidly urbanising and at the same time the household size is declining, and from a transport perspective, this is basically indicative of the large strain that urban transport systems are increasingly experiencing (Lombard, Cameron, Mokonyama and Shaw, 2007). An increase in the number of small sized households, in particular, implies that per capita travel demand is likely to be on the increase, in contrast to larger sized households where multipurpose travel by fewer household members has the potential to reduce total household travel demand. Consequently, relatively longer journeys requiring some form of motorised use up more space, in the case of fixed infrastructure capacity, resulting in increased congestion on the roads and in public transport facilities and vehicles.

In fact, the problem of recurrent transport network congestion in South Africa is reported extensively in the Integrated Transport Plans of larger cities, manifesting itself in ever increasing travel times. Transport network congestion in South Africa affects the transport system as a whole, and in the process, it is the poorest people who are severely affected, and the following are some of the illustrative examples:

- Road based public transport in South Africa generally shares road space with private cars, and given the relatively low default speeds of public transport vehicles, the travel times of public transport users become even longer.

- When the prices of goods rise due to increased operating costs of freight vehicles as a result of congestion, it is the poor who become severely affected.

- Poorer people, who use less frequent scheduled transport for commuting, generally have no flexibility in choosing departure times. As a result they usually endure the entire roadway congestion experience on their way to work (in the case of workers). This is also exacerbated by the relatively

longer distance that they travel to work due to the inefficient apartheid spatial planning legacy.

However, travel time is only one of the few measures of access and mobility. The ability to afford convenient travel, quality of transport infrastructure, walking distances, information availability, frequency of public transport and its availability, safety and security are important design considerations for an accessible public transport system. Apart from non-motorised transport interventions, the second economy would certainly be the primary beneficiary of an efficient and effective public transport system to improve mobility and access in order to enhance participation in social and economic activities. Effective implementation of appropriate public transport solutions, however, remains a research question. With specific reference to the urban areas of South Africa, the paper attempts to contribute to answering this research question by addressing the following terms of reference:

- A well argued position on transport approaches at local level that will enhance the access of the poor to income generating opportunity.

- A well argued position on the financing options available and the proposed way forward on financing/subsiding transportation costs.

- A well argued position on the potential impact of transit oriented land use development in South Africa and how this might be achieved (or not).

- A set of key state interventions that should be implemented in the transport sector in order to enhance economic opportunities for the urban poor.

- A well argued position on governance/responsibilities for the transport sector.

- The paper is to be limited to the synthesis of readily available data and information.

2. South African transport policy

The 1996 White Paper on National Transport Policy (Department of Transport, 1996) remains the backbone of transport policy in the country. The formulation of the White Paper followed an extensive consultation process in sectors of the economy that directly and indirectly interface with transport. In the 12 years of its existence, it has laid the foundation for transport policy across all the three spheres of Government. In order to provide a contextual background to the South African transport policy, it is important to review the five strategic pillars that make up the White Paper and summarised in the White Paper itself as follows:

i. **Funding for transport**

- To ensure sustainable and dedicated funding for passenger transport infrastructure (public transport facilities, networks, non-motorised networks, etc.), operations (administration, modal integration, supporting technologies, etc), and law enforcement.

ii. **Management of space**

- To encourage more efficient urban land use structures, correcting spatial imbalances and reducing travel distances and times for commuting to a limit of about 40 km or one hour in each direction (While this is a policy target, is will probably be difficult to achieve in many parts of the country, especially peripheral areas characterised by longer distance travel).

- To promote the use of public transport over private car travel, with the goal of achieving a ratio of 80:20 between public transport and private car usage (Currently this ratio differs significantly from area to area, by trip purpose and by time of day).

- To promote rural development that will improve access to opportunities by ensuring that rural workers are housed in close proximity to their work locations and services, thereby reducing the need to travel (a rural transport strategy has been formulated in this regard).

iii. **Customer-centric service delivery**

- To ensure that passenger transport services address user needs, including those of commuters, pensioners, the aged, scholars, the disabled, tourists, and long distance passengers (This effectively promotes service delivery based on market segmentation).

- To improve accessibility and mobility, limiting walking distances to less than about one kilometre in urban areas (Urban design norms usually advocate 500m or 5 minutes walking distances).

- To provide an appropriate and affordable standard of accessibility to work, commercial and social services in rural areas (A rural transport strategy has been formulated in this regard).

- To ensure that public transport is affordable, with commuters spending less than about 10 percent of disposable income on transport (The effective implementation of this aspect is strongly dependant on the effectiveness of local integrated transport plans and associated rationalisations plans).

- To promote safe and secure, reliable and sustainable passenger transport (infrastructure, operations and vehicles).

- To provide readily-accessible information for the assistance of passenger transport users (This includes information at transport facilities irrespective of size, effective use of information and communications technology as well as delivery mechanisms sensitive to literacy and language constraints).

iv. Planning and regulatory reform

- To provide appropriate institutional structures, which facilitate the effective and efficient planning, implementation, funding, regulation and law enforcement of the passenger transport system, devolved to the lowest competent level.

- To encourage, promote and plan for the use of non-motorised transport where appropriate (South Africa does not have good track record in this regard).

- To provide for the registration of all public transport operators as formalised commercial entities, bound by the regulations pertaining to their permission to operate (Significant progress has been made in this regard).

- To replace operator permits with permissions issued in terms of approved passenger transport plans (Significant progress has been made in this regard).

- To promote and implement a system of regulated competition for public transport routes or networks based on permissions or tendered contracts (It remains a challenge to implement this aspect in a manner that improves levels of network-based service integration).

v. Sustainable transport operations

- To empower and assist disadvantaged operators to participate meaningfully in the land passenger transport system (Negotiated contracts in terms of national transport legislation are meant to achieve this).

- To ensure that operations become economically viable, requiring the minimum financial support (This is strongly dependant on the effectiveness of the local integrated transport plans. It remains a research question how this is achievable without placing extra financial burden on the end users).

- To foster a stable investment environment in the public transport industry (Public sector has been leading in this regard. Successful and sustainable partnerships between the public and private sectors remain to be seen in public transport).

- To encourage a professional approach to the management and operation of land passenger transport (The impact of Transport Sector Training Authority - SETA and other interventions have not widely been measured).

- To foster manpower and human resources development (An integrated human resource development strategy in this sector has not been formulated).

- To ensure that transport modes are integrated in respect of scheduling, routes and ticketing systems (While there are small pockets of success, this aspect has not been implemented at a large scale).

- To promote acceptable and fair labour practices in the transport industry (The Department of Labour has introduced a number of interventions that include minimum wage, unemployment insurance fund, and sector determination strategy).

- To ensure that land passenger transport operations are more environmentally sensitive and sustainable, and are energy efficient (South Africa lags behind in terms of providing policy targets in this regard).

- To promote strong, diverse, efficient and competitive long-distance passenger transport and charter sectors within the limits of the sustainable transport infrastructure, and to enhance the quality of such services through the provision of safe, secure, reliable and cost-competitive systems (The private sector has provided leadership in this regard).

Some of the interesting features of the White paper in the above strategic pillars are the explicit policy targets that include: limiting one-way travel distance/time to 40 km or one hour, a ratio of 80:20 between public transport and private car usage, limiting commuter spending on transport to less than about 10 percent of disposable income and limiting walking distances to one kilometre in urban areas. Nonetheless, the White Paper does not explicitly deal with the issue of poverty. Subsequent national transport legislation in the form of the National Land Transport Transition Act (RSA, 2000) (soon to be made National Land Transport Act) has also been somewhat silent on the issue of transport as an instrument for eradicating poverty but rather focused explicitly on the transformation of the transport industry (in an era that was admittedly characterised by entrenched disorder in the transport industry, for example: endemic minibus taxi-related violence). Stanway (2001), however, argues that by virtue of making fundamental interventions and improvements in the land-based transport industry, the Act will ameliorate urban poverty in respect of the following:

- Improved service delivery through the introduction of the transport authority model (where viable), with dedicated transport service delivery function and associated political accountability structures and matching dedicated funding.

- Mandatory transport plans required in terms of the Act would for the first time guide systematic transport service delivery in local government. The formulation of such plans requires public participation prior to adoption.

- The formalisation and legalisation of the minibus taxi industry would improve service levels for the urban poor. Furthermore, the introduction of new vehicle specification would improve safety levels in the industry.

- Competitive tendering process that requires operators to compete for the right to operate a subsidised route would ensure cost-effective services for the urban poor.

- New provisions on integrated public transport law enforcement would improve the levels of safety for public transport.

In the urban areas of South Africa, and in line with the provisions of the National Land Transport Transition Act, local authorities are required to produce Integrated Transport Plans (ITPs). ITPs are to be used as transport-related service delivery instruments and are in turn supposed to be incorporated into the Integrated Development Plan of the authority. Any transport interventions in the area of jurisdiction of the local authority must be informed by the ITP, and conversely, the authority should not allow any transport related intervention if it is not part of its ITP. Therefore, ITPs remain a powerful instrument that should be used by the local authorities for poverty eradication. This includes ensuring that the design and operation of transport facilities allow for effective incorporation of small businesses (trading facilities) and increased employment (for example infrastructure and vehicle maintenance activities). However, in order to achieve this, more innovative contracting regimes, and the generation of more revenue streams, are needed to facilitate more effective business models.

3. Analytical framework adopted in the paper

In the interest of continuity, the paper carries over from the seminal Moving South Africa study finalised by the Department of Transport in 1999 (Department of Transport, 1999). The Moving South Africa study pulled together many local and international experts in transport studies, at a scale never replicated in South Africa, to formulate an agenda for transport in South Africa in the form of the year 2020 vision. While the study was never adopted as policy by the Department, the study remains one of the largest investments ever made in the discipline of transport studies and has certainly informed subsequent transport policy positions of all the three spheres of government.

Using the 1996 White Paper on National Transport Policy as a point of departure, which promotes user-centred transport policy, Moving South Africa identified six urban travel markets, described in terms of their travel needs, with the intention of formulating transport policy to address these needs. The six market segments are:

▪ **Strider**: They enjoy good low-cost access to their preferred destinations, and prefer to walk or cycle as the most convenient way to travel. This market segment was estimated at 5.4 million in 1996 and projected to grow to 6.9 million by 2020 (28% growth).

▪ **Stranded**: They lack affordable basic access to motorised transport and therefore have little ability to integrate with the rest of society or participate in the broader economy. The lack of access to transport is driven by low income levels and long travel distances. The longer travel distances result in high travel costs. Even the stranded living closer to work places have access only to higher priced taxis. The population in this market segment was estimated at 2.8 million in 1996 and projected to grow to 3.6 million by 2020 (28% growth).

▪ **Survival**: They can afford to use public transport, but are captive to the least expensive option. Their principal needs are for low cost, higher speed public transport. The population in this market segment was estimated at 4.1 million in 1996 and projected to grow to 5.1 million by 2020 (24% growth).

▪ **Sensitive**: They are captive to public transport but have enough income to select the best transport option. The key dimensions of dissatisfaction for this group centre on speed and choice, with some additional unhappiness with prices. The population in this market segment was estimated at 2.1 million in 1996 and projected to grow to 2.6 million by 2020 (25% growth).

▪ **Selective**: They can afford a car but are willing to use public transport if it meets their primary requirements of higher speed, and greater choice and convenience. They will only stay with public transport if it offers sufficient convenience and choice to make it attractive. The population in this market segment was estimated at 4.1 million in 1996 and projected to grow to 5.7 million by 2020 (39% growth).

▪ **Stubborn**: They will only use cars, and cost is a minor issue for these customers, compared to the much more salient concerns of convenience and speed. The population in this market segment was estimated at 3 million in 1996 and projected to grow to 5.6 million by 2020 (88% growth).

Although the urban poor can be found in many of these market segments, they would mainly be found in the stranded market segment. Since Moving South Africa was never adopted as policy, transport service delivery in the country has not taken explicit account of these market segments.

Moving South Africa went further to define three **interdependent** generic interventions in the urban transport markets, described generally as follows:

i. Densification of transport corridors

- Creation and strengthening of transport corridors. Transport corridors were seen as a natural transition from historical dispersed and segregated land use pattern.

- Promotion of mixed land use within the corridors to reduce generalised travel costs within the corridors.

- Public spending should be focused on these transport corridors. Part of the public spending should facilitate access to housing by poorer households.

ii. Optimisation of modal economics and the service mix

- Choose the best mode of transport for circumstances under consideration.

- Three type of corridors were identified: **High ridership corridors** (typically 40 000 or more passengers/day per direction and likely to support rail or dedicated public transport road infrastructure); **Moderate ridership corridors** (typically 10 000 to 40 000 passengers/day per direction and likely support dedicated bus priority infrastructure and heavy rail is generally not warranted); **Low ridership corridors** (with fewer than 10 000 passengers/day per direction and likely to support small road-based public transport vehicles such as minibus taxis.

- Identification of customer segments and providing services that best serve the needs of these segments.

iii. Improving firm-level performance

- Improve transport law enforcement.

- Formalise the minibus taxi industry and encourage appropriate roles for taxis in line with modal economics to create an industry that can reinvest in itself.

- Introduce competition through tendered subsidy contracts to reduce transport costs and improve transport services.

- Control entry growth in the minibus taxi industry.

The paper will attempt to expand the range of potential interventions in each of these three generic interventions identified above. The following sections of the paper provide a detailed account of the proposed additional interventions within the context of recent developments, and taking cognisance of global research findings.

4. Densification of transport corridors

A transport corridor can be simply described as land use designed to allow for high volumes of the flow of movement of people and goods between areas of intense land use, usually with high levels of human activity. There is a tendency in South Africa to define corridors in terms of freeway road networks, a practice that is characteristic of a culture of promoting private car based mobility. More modern definitions of corridors, however, seek to integrate high levels of mobility together with high levels of access in a single facility, which historically have been regarded as mutually exclusive in the design of road infrastructure. This section of the paper attempts to put issues relating to densification of transport corridors in perspective and provides some pointers on how this strategy can be used for intervening in the second economy.

4.1. Development densities alone are not a solution

Similar to many parts of the world, the demand for land in the urban areas of South Africa, by poorer sections of the population, is usually accommodated on relatively cheap land that is often located on the periphery of urban areas. The South African landscape, in particular, has historically been deliberately designed to keep poorer members of the society far from the urban core, and in turn necessitating longer travel distances and times. Exacerbating the situation in South Africa is that the majority of the population in the urban areas tends to be poor and located far from the urban core where most of the economic opportunities tend to be located. Newer housing developments targeted to the poor in the post-apartheid South Africa has not improved the travel long distance travel burden (Gren, 2006; Boraine, Crankshaw, Engelbrecht, Gotz, Mbanga, Nasroo, and Parnell, 2006). Venter, Vokolkova and Michalek (2007) actually show from an empirical study in Durban that when poorer households are located further away from the activity centres, it is the women in such households who bear the largest brunt. Densification of transport corridors is recognised as an intervention that provides an opportunity to bridge poorer parts of the urban areas with the urban core in the form of intensified mixed land use developments within the corridors that includes housing for the poorer households. Theoretically, when properly designed, such developments maximise access by the poorer members of society to economic opportunities at minimum generalised costs of travel. Such a strategy is currently being implemented in Johannesburg (for example the "Rea Vaya" Bus Rapid Transit initiative") and Cape Town (for example "Klipfontein corridor", while other cities are planning to do the same. However, there are no generally agreed national design guidelines in this regard, and this may lead to problems in the long run (for example in the systematic measurement of backlogs across different areas).

There are several problems associated with this corridor strategy as an isolated transport intervention:

▪ It has been shown that improved access leads to higher land values as a result of increased demand. This in the long run becomes an entry barrier for poorer households to access such land.

- Increased development densities lead to increased volumes of travel per unit of space in the corridor. In order to efficiently cater for increased travel demand, large capacity travel modes are required, which are often more expensive to implement that lower capacity modes and in turn requiring state interventions through transport subsidies in order to keep them affordable.

Figure 1 is reproduced from data supplied by Van Den Berg, Krynauw and Cameron (2005). The figure compares development densities in the City of Tshwane with some of the largest Cities around the world. It is evident that typical densities of South African cities, as represented by Tshwane in this case, especially the city centre, are far less than those of other large world cities. In order to reach such high densities in the future, a concerted effort would need to be placed on ensuring that appropriate mixes of development are focused on densifying the corridors, to an extent that very little development, if any, should be allowed to take place outside of the identified corridors. Worth noting also is that even at much higher densities, modal shift to public transport is not guaranteed, even with availability of high capacity public transport system (the case of New York). In fact, the City of Tshwane has relatively more public transport use that many of the cities shown, even at low densities (probably due to relatively low household car ownership rates), again showing that densification as an isolated intervention is not a guaranteed solution for improved public transport ridership by the population. Nonetheless, when such as a densification strategy is adopted, political will is necessary to overcome associated challenges such as increased per capita infrastructure capital and operational costs. Furthermore, a cross-sectoral service delivery approach as promoted by the Integrated Development Planning process would need to be strengthened.

Figure 1: Comparison of development densities and public transport ridership
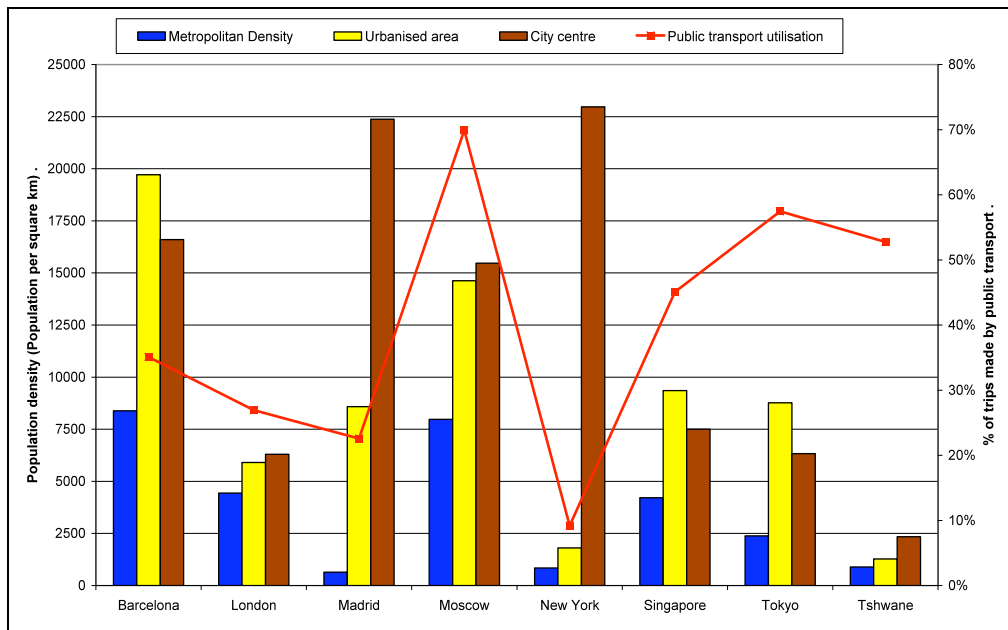
Source: Van Den Berg, Krynauw and Cameron, 2005

Table 1 compared the public transport operational cost recovery regimes in selected cities identified in Figure 1. While the data are admittedly slightly out of date, the table shows that in many of the Cities with high development densities, fares alone are not sufficient to cover the costs of public transport operations. In many of these cities the capacity utilisation (load factors) of public transport infrastructure is relatively high, often evident from congested public transport vehicles and rail infrastructure. Nonetheless, such load factors are still not sufficient to cover operational costs and thus require some form of subsidy. The operational costs of public transport in such cities are relatively high, as a result of increased overhead costs required to operate the modes. Indications are therefore that densification of corridors as an isolated intervention does not guarantee reduced public transport subsidies, especially if higher capacity transport modes are used, for example Gautrain and Bus Rapid Transit. It is, however, also worth noting that worldwide, transport subsidies are not seen as just a solution for the poor members of the society, but also a strategy to achieve specific transport goals, such as reduction in private car use by making public transport more attractive from a cost perspective, and also for providing incentives for numerous agents in the system to work towards specific policy goals.

Table 1: Public transport operational cost recovery comparisons across selected cities

City	Operating cost recovery (bus)			Operating cost recovery (metro/rail)			Comments
	Fares (%)	Subsidy (%)	Other (%)	Fares (%)	Subsidy (%)	Other (%)	
Barcelona	42.2	56.7	1.1	54.5	43	2.5	Rail: Metro
London	71	29	0	103	0	0	Rail: London underground
Madrid	63	35	2	55	41.7	3.3	Rail: Metro de Madrid
Moscow	Not available						
New York	47.2	18.9	33.9	65.6	18.9	15.5	Rail: City subway
Singapore	96	0	4	Not provided			Bus: Singapore bus service,
Tokyo	83.5	3.8	12.7	79.3	8	12.7	Rail: Metro
Tshwane	67.3	31.8	0.9	39	61	0	Bus: Pretoria City bus, Rail: Metrorail
Barcelona	42.2	56.7	1.1	54.5	43	2.5	Rail: Metro

Source Jane's, 1994

4.2. Demand responsive public transport has good track record in South Africa

While corridor development is often associated with higher capacity scheduled public transport services, scheduled services do not have good track record in South Africa. Figure 2 illustrates how market shares for trains, buses and minibus taxis have changed between 1996 and 2003. In all the provinces minibus taxis have significantly increased their market share while the bus market share has significantly declined and the rail market remained essentially constant. Minibus taxis in particular are characterised by the ability to offer an almost door-to-door service as well as to adapt quickly to changes in land use (demand responsive). Furthermore, as shown in Figure 3, access times reported by households are particularly better for minibus taxis and buses than trains (but with more households accessing minibus taxis than buses). Given the relatively low development densities in South African cities, it is conceptually appealing to deliver a corridor solution using minibus taxis until such time that sufficient travel demand has been created and then increasingly implement higher capacity public transport modes. However, the design of the infrastructure in such corridors needs to take into account the future requirements of higher capacity modes.

Figure 2: Public transport modal share changes between 1996 and 2003

Provincial public transport mode shares 1996

Legend: ☐ Train ■ Bus ■ Taxi

Y-axis: % of public transport users (0 to 100)

Taxi values by province: Western Cape 39, Eastern Cape 75, Northern Cape 59, Free State 74, KwaZulu-Natal 59, North West 49, Gauteng 61, Mpumalanga 48, Limpopo 49, RSA 57

Public transport mode shares - 2003

Y-axis: % of public transport users (0 to 100)

Taxi values by province: Western Cape 44, Eastern Cape 79, Northern Cape 77, Free State 83, KwaZulu-Natal 64, North West 62, Gauteng 67, Mpumalanga 54, Limpopo 61, RSA 63

Source: Lombard, Cameron, Mokonyama and Shaw, 2007

Figure 3: Reported access to public transport modes in South African urban areas
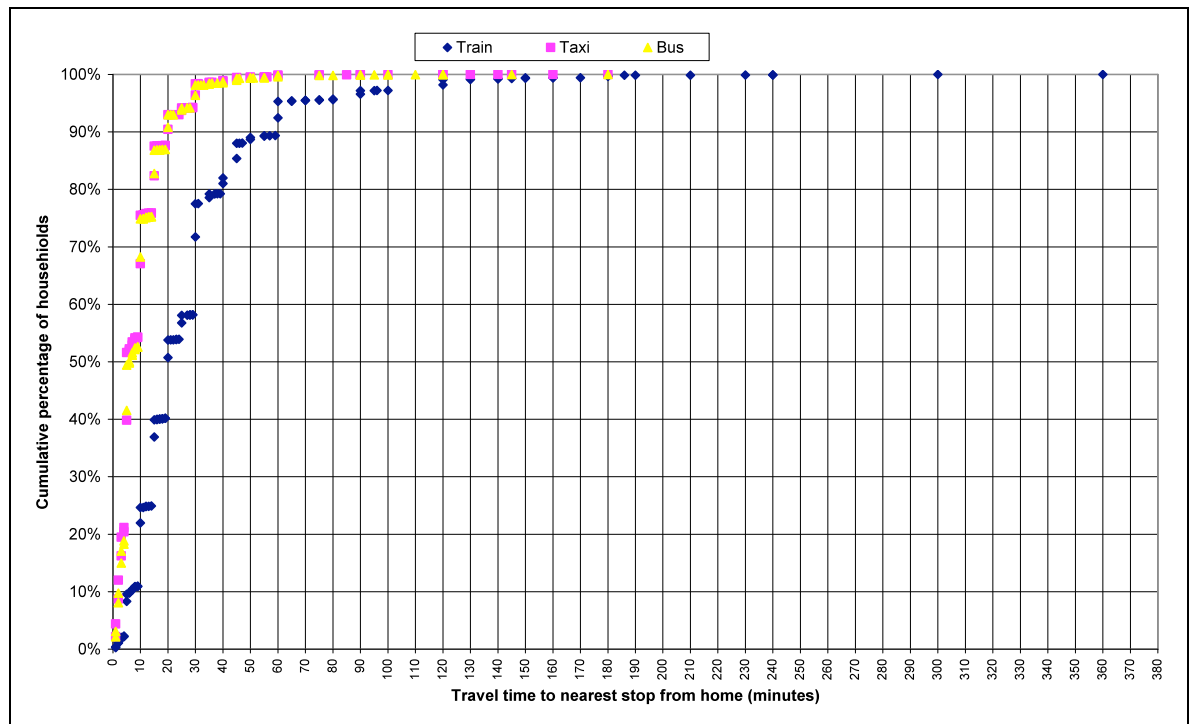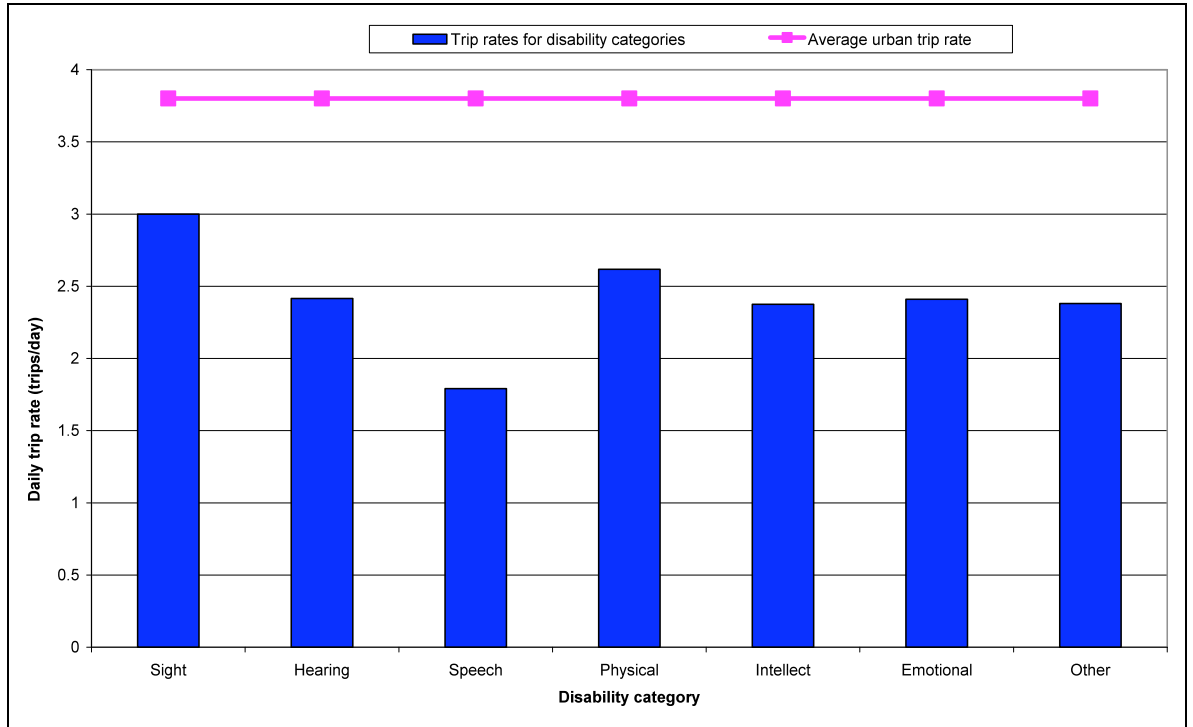

Source: Department of Transport, 2003

4.3. Travel demand issues related to special users

It is generally agreed that a public transport system that caters adequately for the most vulnerable users such as the disabled members of society, is likely to meet expectations of most members of the population. In designing transport corridors, therefore, it is important to ensure that their needs are catered for. Figure 4 contrast the urban trip generation rates (in terms of the average number of trip undertaken in a day) of disabled members against the average rate of the entire urban population. Generally, disabled people undertake lesser number of trips than the population average. This is particularly extreme for disabled people with speech impediments. A further illustration of the trip making behaviour of the disabled people is shown in Figure 5, where reasons for not travelling were disclosed. Reasons that relate to unsuitable transport infrastructure and their well being are particularly cited as the main reasons for not travelling. Where travelling does take place, as shown in Figure 6, visiting tends to be the main travel purpose, in fact, trip purposes that are not commuter based tend to dominate. This implies that a public transport system designed for commuter-based travel (mainly work and education) currently does not necessarily meet the travel needs of disabled people. For the disabled poorer members of society, indications therefore are that the public transport system is likely to be grossly mismatched with travel needs. The design of concessionary fare systems in public transport corridors, if implemented, should therefore take into account the multiple purpose nature of the travel needs of disabled people.

Figure 4: Comparison of disabled trip rates with population average in urban areas

Source: Department of Transport, 2003

Figure 5: Reasons for not travelling

	Did not need to travel	Not well enough to travel	Family responsibilities	Usual car not available	Public transport too expensive for me	No available public transport	I had no money	No suitable transport for disabled	Other
No disability	4 078 732	279 790	368 564	9 336	23 995	17 929	327 803	3 916	77 893
Possesses some form of disability	139 805	134 305	8 548	282	1 134	908	6 247	29 438	1 951
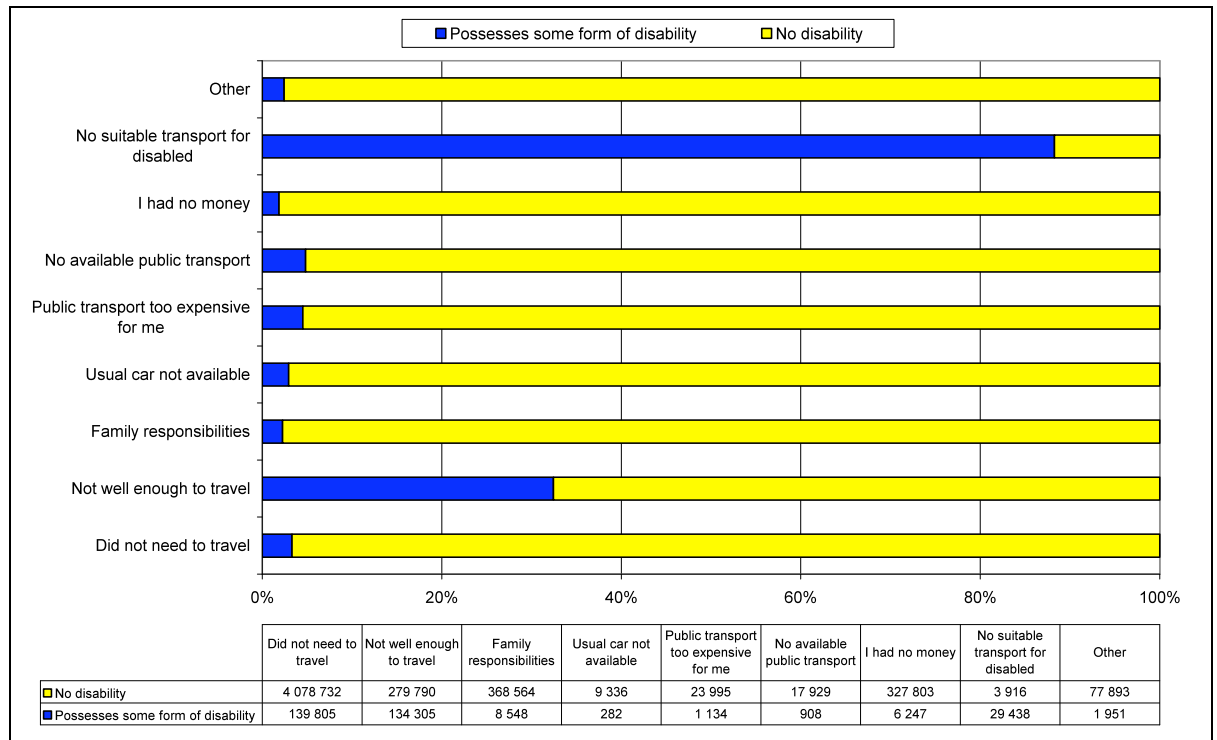
Source: Department of Transport, 2003

Figure 6: Trips undertaken by disabled persons in urban areas of South Africa

|	Sight	Hearing	Speech	Physical	Intellect	Emotional	Other
Other	1 153	557	222	2 621	478	1 144	1 855
Church	10 021	5 464	1 577	11 809	5 732	6 774	4 735
Sport	2 826	1 050	488	4 516	2 119	1 936	3 236
Visit	23 685	11 015	4 037	41 274	17 502	13 240	12 981
Welfare	5 892	1 329	1 495	8 436	5 392	3 452	3 299
Medical	14 257	6 037	2 695	25 982	10 904	8 409	7 189
Look for work	1 858	849	842	3 298	873	1 537	1 312
Shops	23 247	11 925	1 649	31 075	12 365	10 288	14 615
Education	10 072	6 726	2 654	13 991	20 484	5 935	5 544
Work	14 196	7 479	1 418	12 989	1 124	4 829	4 703

(Source: Department of Transport, 2003)

4.4. The need for improved road classification and design standards

Figure 7 presents a design framework that has historically been used in the design of roads in South Africa (and many part of the world). Basically, the framework defines levels of mobility and access appropriate for different classes of roads. For example class 1 roads (freeways) are defined in terms of high mobility and low or no access (i.e. access gained in terms of widely spaced interchanges). Class 5 roads, usually residential streets, are defined in terms of high levels of access and low mobility (low speeds and no through roads). The combination of access and mobility is varied accordingly for different road classes. The main problem with this framework is that both mobility and access are defined in terms of access and mobility of motorised vehicles. Furthermore, the role of other forms of vehicles that are present in South Africa, such as non-motorised modes and motorcycles, as well as activities other than travel, for example trade and social activities, are ignored. A shift of paradigm is required where both mobility and access are defined in terms of the mobility of large volumes of people and access also by large volumes of people. For Class 1 roads for example, public transport stations can be made part of the road reserve (similar to fuel filling stations), to allow safe access by abutting land uses and high levels of mobility traditionally offered by freeway facilities. The users of such facilities will be able to enjoy improved service levels in terms of increased speed of travel. Similar approaches can be adopted for different

road classes such as arterials, within the context of corridor design. However, such approaches require more in-depth research.

Figure 7: Traditional road classification framework
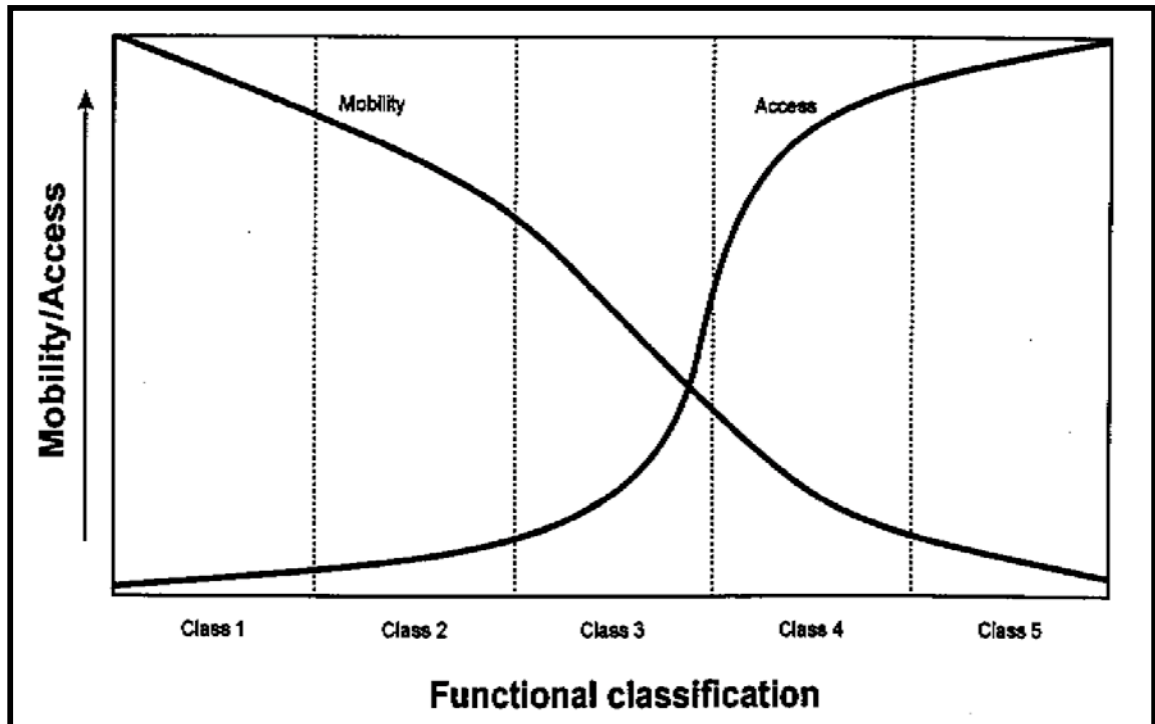
4.5. Some recommendations on densification of transport corridors in relation to the second economy

Shorter term recommendations for a corridor densification strategy as an intervention to improve access and mobility in the second economy can be summarised as follows:

- A multipurpose definition of a corridor should be formulated. The development objectives of high density corridor should be clearly articulated beyond the area of transport.

- For transport purposes, corridors should be defined in terms of a combination increased access to public transport as well as higher mobility of public transport. In benefit of the second economy, the practice of defining corridors in terms of freeways should be stopped. Where such corridors are defined, increased public investments should be dedicated to improvement of public transport access and mobility. Existing travel patterns should be harnessed as much as possible when defining such corridors.

- Minibus taxis should be formally incorporated as a mode of choice in corridor designs. However, infrastructure design should take into account possible future high capacity modes that may be implemented within the corridors.

- Design standards of these corridors should take into account the special travel needs of disabled people.

Longer term recommendations for a corridor densification strategy as an intervention to improve access and mobility in the second economy can be summarised as follows:

- Increased densities alone are not a sustainable public transport solution. Other social interventions aimed at improving the welfare of the second economy will have more sustainable long term impact. Therefore, strengthening of service delivery institutions to respond to the multi-sectoral nature of the problems of the second economy should receive priority.

- In order to achieve high densities comparable to some larger cities in the world, developments outside defined corridors should be disallowed. A half hearted approach will maintain the status quo.

- Research into the formulation of a roads design framework centred on the mobility of people as opposed to vehicles should receive priority. This would also require supporting physical demonstration projects.

5. Optimisation of modal economics and the service mix

In 1989 Alan Armstrong-Wright and Sebastien Thiriez (Armstrong-Wright and Thiriez, 1989) made a remark that "In developing countries, a reasonable level of household expenditure on bus travel should not exceed 10% of household income". The household expenditure limit of 10% of income on public transport is now treated as a norm but was not necessarily meant to be the norm when originally formulated (Mitric and Carruthers, 2005). In fact, such formulations have no basis and should be discarded (World Bank, 2002), and the approach to follow is to analyze affordability data together with other measures of household economics and the transport system performance, including further interviews, to get a better sense of what is affordable (Mitric and Carruthers, 2005).This section of the paper puts in perspective issues of transport affordability and sustainable interventions in the second economy. The focus is once again on transport solutions for the urban poor.

5.1. Modes of transport

From a transport economics perspective, the costs of a public transport service can be optimised if the right mode of transport is used for a given set of travel circumstances. For a public transport corridor, a combination of travel demand, route length and right of way can be used to determine the best mode to use. This is illustrated in Figure 7, where the costs per passenger kilometre for a 20km route are shown for different modes of transport at different peak hour passenger volumes. For example, the unit costs of heavy rail are substantially lower that all the other modes at higher passenger volumes, but increase rapidly with decreased volumes. Figure 7 is further elaborated in Figure 8, in which the performance of public transport modes and associated investment costs are compared in the context of the right of way provided. Public transport modes with the Right of Way A (e.g. heavy rail) have virtually unimpeded flows and therefore tend to perform the best (e.g. reduced travel time, increased overall carrying capacity) compared to all the other modes. In South Africa public transport modes operate mainly in Right of Way C in which the right of way is shared with other modes and as a result their performance tends to be inferior. Currently, some of the cities of South Africa, for example the City of Johannesburg, are attempting to implement public transport modes in Right of Way B (e.g. BRT), which perform better than Right of Way C but at reduced unit costs than Right of Way A.

Figure 8: Economic of modes
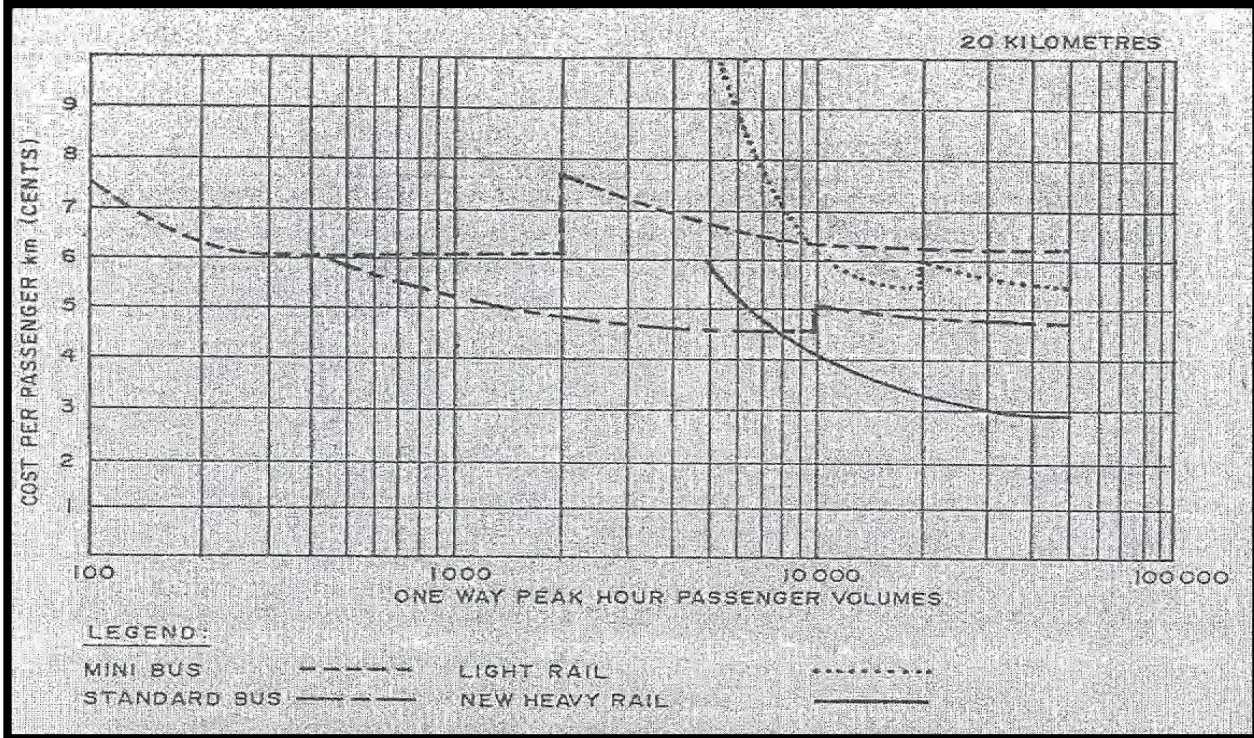
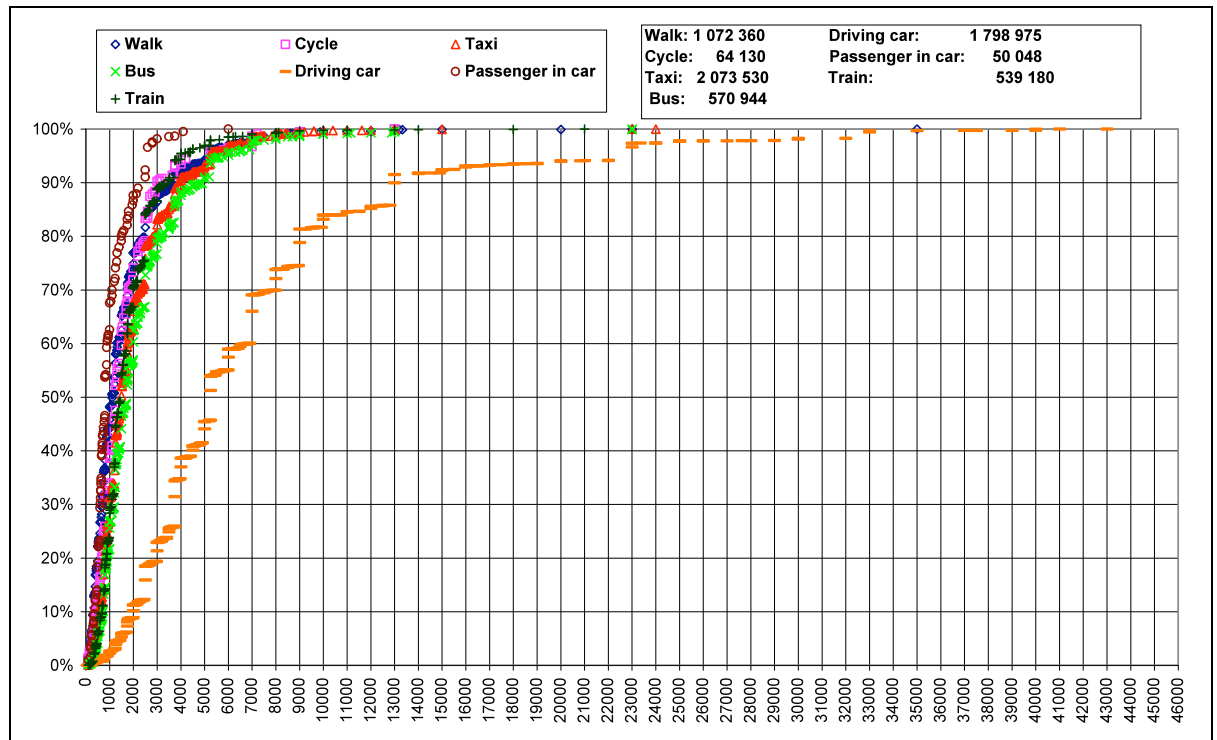*Source: Department of Transport, 1987*

Figure 9: Right of way categories for public transport modes
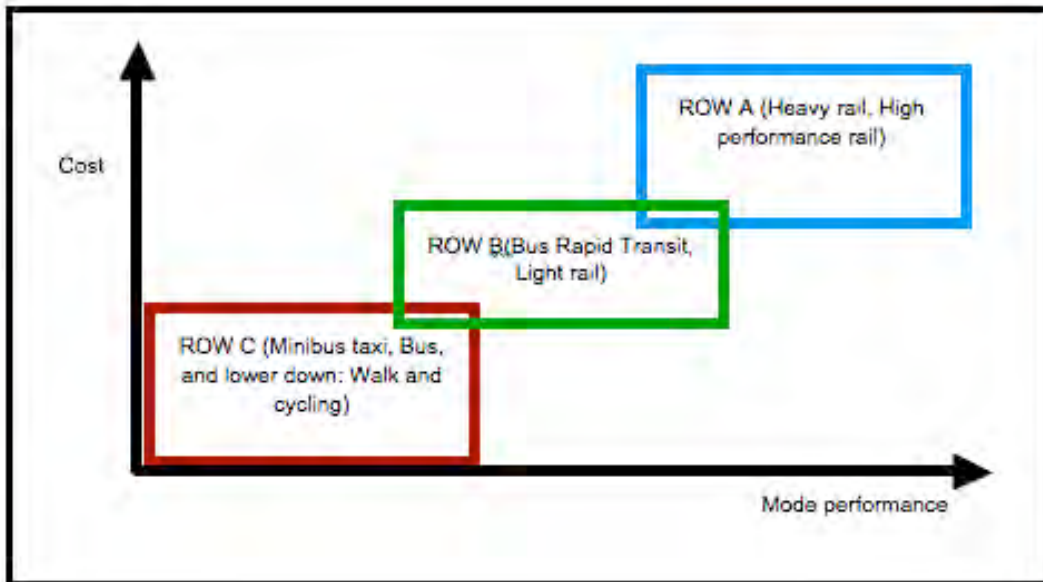
Source: Simplified version from: Vuchic, 2005

Figure 9 uses the case of work trips in South African urban areas to illustrate how the choice of travel modes is currently taking place. Walking, minibus taxi and driving are the most utilised modes of transport. Walking appears to be especially the mode of choice by lower income workers and evidently avoided by higher income workers. It is also evident from Figure 9 that public transport is particularly a mobility solution for low income workers, in contrast to a car whose use increases with increased income. Experience around the world shows that while most travel takes place on foot, this tends to be overlooked in the design of infrastructure (World Bank, 2002), and this is the case for South Africa. A longer term modal economics intervention proposed by the Department of Transport entails two thrusts. The first one comprises accelerating existing interventions such as taxi recaptilisation, transforming subsidised contracts and consolidating passenger rail. Secondly, the strategy promotes the implementation of "integrated mass rapid public transport networks" (Department of Transport, 2007).

Figure 10: Modal split for urban work trips

◇ Walk	□ Cycle	△ Taxi
× Bus	— Driving car	○ Passenger in car
+ Train		

Walk: 1 072 360	Driving car:	1 798 975
Cycle: 64 130	Passenger in car:	50 048
Taxi: 2 073 530	Train:	539 180
Bus: 570 944		

Source: Department of Transport, 2003

Research has previously explored some alternative modes of transport in South Africa. For example, Mahapa (2000) shows how non-motorised modes such as carting (animal drawn) are used in some urban areas of South Africa by poorer households as an effective freight delivery solution. De Vries and Jenman (2006) show that electric bicycles (with a 2005 estimated purchase price of about R3 500) could provide an emission free travel in urban areas of South Africa. However, transport policy has seemingly ignored the role such alternative transport modes. Also important is the transport solutions needed to support small-scale businesses in which transport costs are a significant input cost. However, very little research has been conducted in this regard.

## 5.2. Travel expenditure in South African urban areas

Notwithstanding remarks about affordability indices mentioned above, Figure 10 shows the profile of urban household expenditure on public transport. On average, about 30% of urban households in South Africa spend more than 10% of their gross household income on public transport. However, of the households that spend some proportion of income on transport, approximately half of them spend more that 10% of the gross household income on public transport. Figure 11, drawn for households up to a gross income of R6 000, confirms that low income households spend relatively more on public transport than higher income ones. In South Africa the use of a transport affordability index has been marked with inconsistencies in definitions and accurate measurement, where some authorities use percentage of expenditure across all modes and others use only public

transport modes; others use expenditure as a percentage of household incomes and others use personal incomes (Venter and Behrens, 2005). Moreover, even when income is used, some use disposable income and others gross income. The failure to agree on one benchmark hampers the ability to effectively monitor the single most important travel attribute in the second economy.

The 2005/2006 income and expenditure survey (Statistics South Africa, 2008) found that transport is the single household expenditure item that increased substantially over the recent past, mostly as a result of private car purchases. Even for 20% of households with the lowest income, transport expenditure as a proportion of total household expenditure increased from 4% in 1995 to 10.6% in 2005/2006. However, the situation could be worse given that generally household expenditure surveys tend to underestimate travel costs (World Bank, 2002). It appears therefore that transport costs could easily be the most serious threat to the survival of the second economy in the future. The causes of increased household transport costs, especially in the lower income households, are not well documented. However, contributory factors would include the following (based mainly on anecdotal evidence):

- A trend in lower income households in which poorer households prefer sending their school attending children to schools located further away from their primary areas of residence in pursuit of what is perceived as better quality education.

- A trend of settlement locations further away from work places and other areas of opportunity. Often travel from such settlements would require transfers between different public transport routes and separate payments for each.

- Global trend of increased fuel costs, which serve as input costs to public transport fares.

- Salaries that do not keep pace with real costs of living, especially in elementary jobs.

Figure 11: Profile of urban household expenditure on public transport
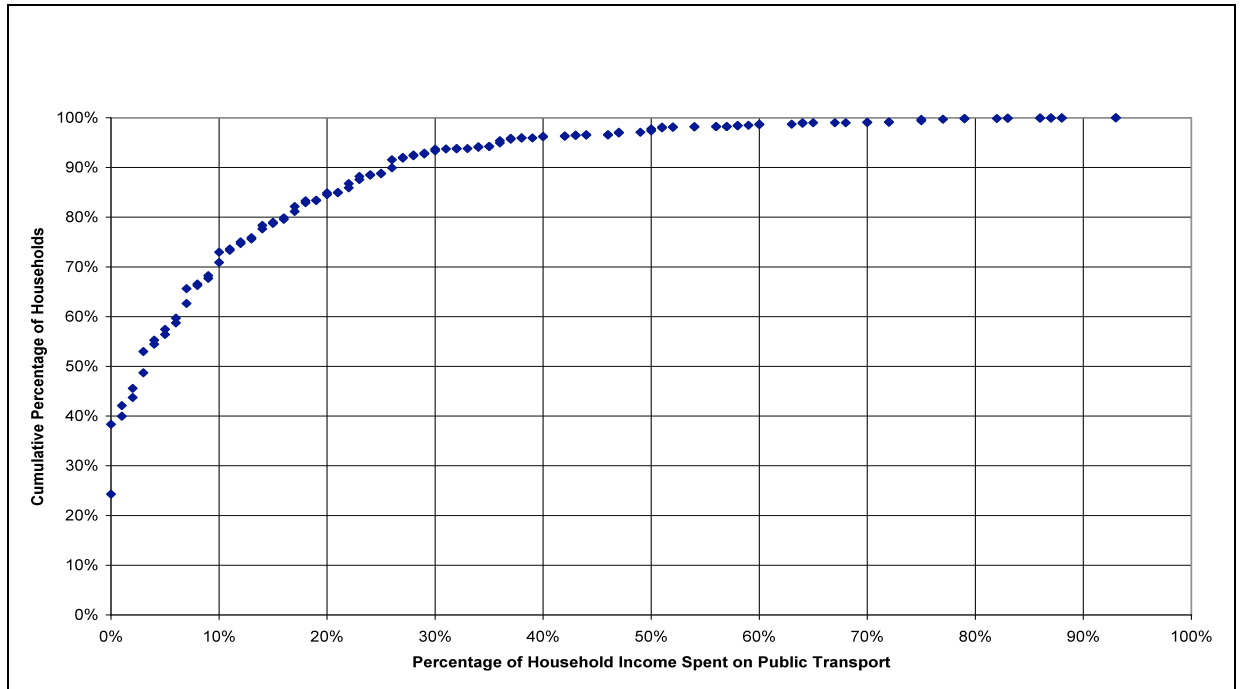
Source: Department of Transport, 2003

Figure 12: Household income and expenditure on public transport in urban areas
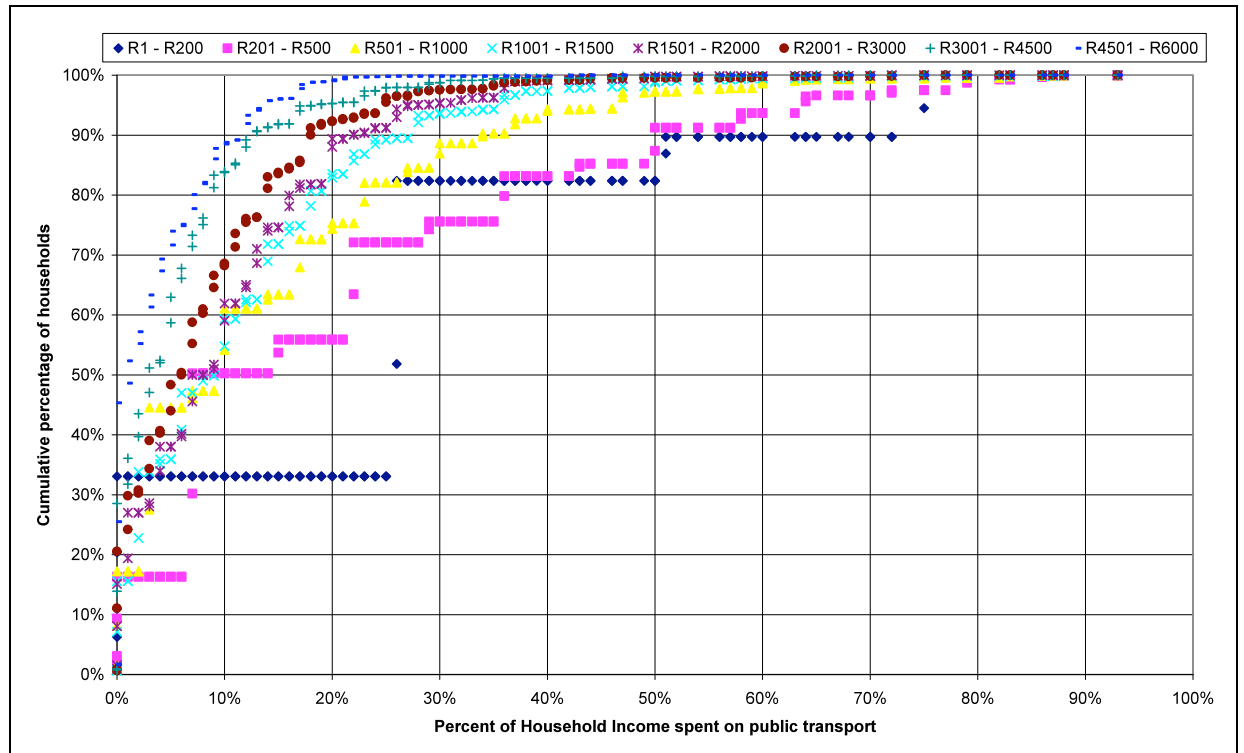

Table 2 compares cash fare charges across three public transport modes in different urban areas of South Africa. It is evident from the table that minibus taxis tend to be more expensive than all the other modes of transport. The popularity of the minibus taxi is therefore likely to be related to its availability and accessibility, and indications are that poorer people are willing to pay some premium for these attributes. For the specific cases illustrated (and for the period March 2008), average fares in Rand per kilometre of route are 0.47, 0.41 and 0.28 for taxis, buses and trains respectively. In contrast to this, the use of a typical private car is about R1.00/km (March 2008), which is two times more expensive than a taxi fare (on the basis of out of pocket expenses only). All these costs are not reflective of the true costs of travel. For example, buses and trains receive direct subsidies and car users generally do not pay the costs of the infrastructure they use as well associated environmental impact. Taxis receive some indirect subsidies in the form of infrastructure used, unregulated fleet maintenance and employee salaries, as well as in the form of delayed passenger travel, especially in the off-peak periods, where operators wait for the vehicles to fill-up before departure. In future, the formalisation of the taxi industry is likely to increase the service costs, as a result of increased capital costs and investments in potential service quality specifications. Within the spirit of the White Paper on National Transport Policy, however, public transport modes should not be compared against one another. Instead, authorities should seek solutions that functionally integrate these services in a manner that provides the best customer service. Public transport subsidies, where required, should be implemented within this context.

Table 2: Public transport fares estimates (Source: Own enquiries March 2008)

Province	One way trip from	One way trip destined at	Distance (km)	Taxi		Bus		Train	
				Cash fare (R)	Fare/km (R/km)	Cash fare (R)	Fare/km (R/km)	Cash fare (R)	Fare/km (R/km)
Gauteng	Soweto	Johannesburg CBD	18	8.00	0.44	6.00	0.33	4.50	0.25
	Mamelodi	Pretoria CBD	18	9.00	0.50	7.50	0.42	4.00	0.22
	Atteridgeville	Pretoria CBD	12	8.00	0.67	7.00	0.58	4.00	0.33
	Pretoria CBD	Johannesburg CBD	50	20.00	0.40	not available	N/A	8.00	0.16
	Alexandra	Johannesburg CBD	12	7.00	0.58	6.00	0.50	no train	N/A
	Orange Farm	Johannesburg CBD	40	12.00	0.30	not available	N/A	7.00	0.18
	Krugersdorp	Johannesburg CBD	30	9.00	0.30	no bus	N/A	7.00	0.23
Kwazulu Natal	KwaMashu	Durban CBD	15	7.00	0.47	5.50	0.37	8.00	0.53
	Westville	Durban CBD	15	6.00	0.40	5.50	0.37	no train	N/A
	Umlazi	Durban CBD	20	7.00	0.35	11.50	0.58	8.00	0.40
	Cato Ridge	Durban CBD	45	12.00	0.27	5.50	0.12	no train	N/A
Western Cape	Khayelitsha	Cape Town CBD	25	10.50	0.42	10.00	0.40	7.00	0.28
	Bellville	Cape Town CBD	18	8.00	0.44	not available	N/A	4.20	0.23
Eastern Cape	Motherwell	Port Elizabeth CBD	20	7.50	0.38	6.00	0.30	no train	N/A
	Mdantsane	East London CBD	20	7.00	0.35	no bus	N/A	5.00	0.25

Province	One way trip from	One way trip destined at	Distance (km)	Taxi		Bus		Train	
				Cash fare (R)	Fare/km (R/km)	Cash fare (R)	Fare/km (R/km)	Cash fare (R)	Fare/km (R/km)
Limpopo	Seshego	Polokwane CBD	10	6.00	0.60	6.50	0.65	no train	N/A
	Thohoyandou	Makhado/Louis Trichard	60	20.00	0.33	not available	N/A	no train	N/A
Northwest	Lichtenburg	Mafikeng CBD	60	20.00	0.33	no bus	N/A	no train	N/A
	Itsoseng	Mafikeng CDB	35	11.00	0.31	9.00	0.26	no train	N/A
Northern Cape	Galeshewe	Kimberly CBD	10	6.00	0.60	no bus	N/A	no train	N/A
	Prieska	Kimberly CBD	220	100.00	0.45	no bus	N/A	no train	N/A
Free State	Virginia	Bloemfontein CBD	130	70.00	0.54	90.00	0.69	30.00	0.23
	Botshabelo	Bloemfontein CBD	50	11.00	0.22	12.00	0.24	no train	N/A
Mpumalanga	Nelspruit	Barberton	35	70.00	2.00	not available	N/A	no train	N/A
	Bethal	Middleburg	80	15.00	0.19	no bus	N/A	no train	N/A

5.3. Transport subsidies

Public transport subsidies are applied in cases where public transport is deemed a social service when the costs of operations exceed fare revenue charged the passengers. There is nothing in particular that stops the operator from fully recovering operating costs from the passenger. However, charges are usually set in terms of a transport policy aimed to achieve specific purposes, and not limited to improving the affordability of low income users. In South Africa the subsidisation of public transport services has historically been aimed at compensating operators for the difference between ticket prices and the economic fare (what is deemed affordable to the commuter). This was particularly the case for commuters working in the urban areas and whose homes were displaced by the apartheid government to distant settlements away from the urban core.

Transport subsidies in South Africa are currently made available in order to achieve the following (Department of Transport, 2004):

- To financially relieve the distance burden and improve job opportunity access for people historically displaced by apartheid policies, and

- To improve efficiency of consumption and investment allocation between private and public transport, and among different public transport services.

Currently, only contracted buses and trains receive direct operating subsidy from the state. However, the minibus taxis are subsidised directly only as far as they provide agreed contracted scheduled services that support tendered subsidised bus contracts. Historically, the non-subsidised minibus taxis have historically set fares that are in direct competition with subsidised bus fares, and the effect of this are partly reflected in Figure 2 (increased market share).

Figure 13 illustrates how the bus subsidy allocations have been changing from 2001/2002 to 2005/2006. Generally, bus subsidies have been on the increase (mainly inflationary) and Gauteng Province receives the highest proportion.

Figure 13: Changes in provincial bus subsidy allocations
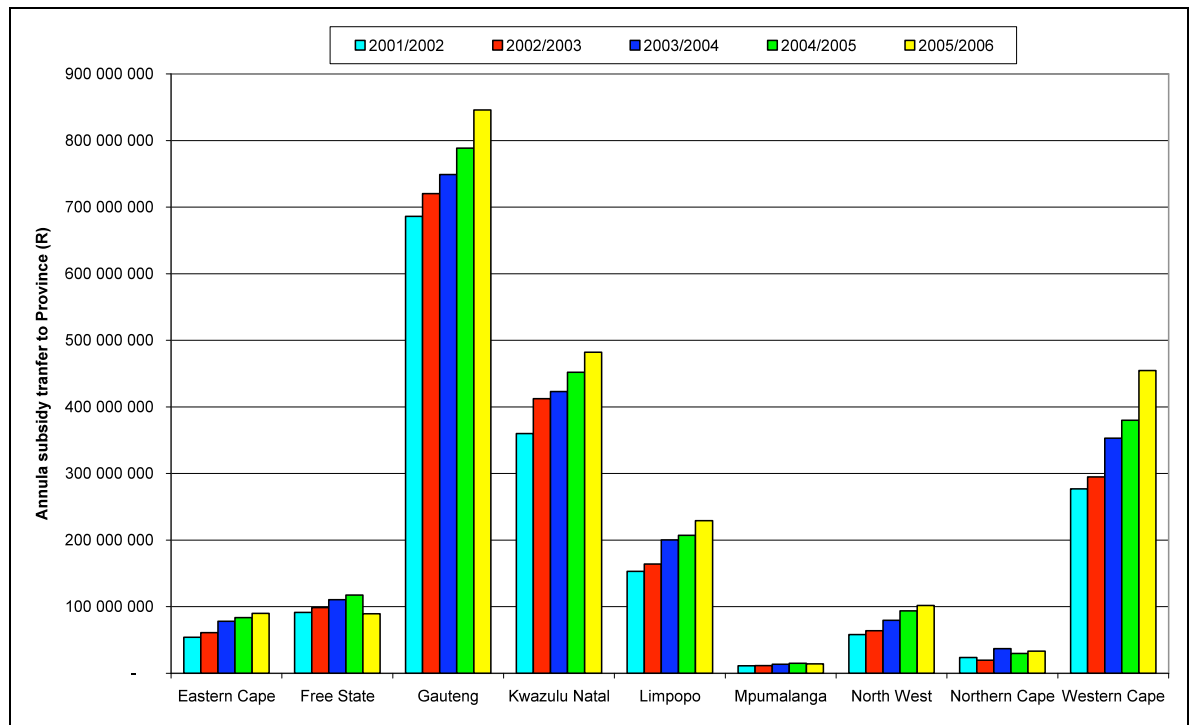
In order to put subsidy transfers in perspective, Table 3 provides some notable summary statistics (excludes municipal bus services). The average subsidy per bus passenger trip was highest in Gauteng and lowest in Limpopo. If subsidies were distributed equally to private car owners, North West owners would get the most and Northern Cape the least. These amounts, for example, can be likened to an equivalent amount that would be paid as an incentive to car drivers to leave their cars for work trips and use public transport. When the whole human population is considered, indications are that wealthier provinces such as Gauteng receive more subsidies per capita than poorer provinces such as Limpopo, suggesting that the goal of targeting the poor is not entirely practised.

Table 3:Statistics related to bus subsidies for 2001/2002

Province	Annual Bus passenger trips	Subsidy transfers (R)	Number of registered light passenger vehicles	Human population	Average subsidy per bus passenger trip (R/trip)	Average subsidy per registered car in population (R/car)	Average subsidy per person in population (R/person)
Eastern Cape	22 751 696	103 000 000	251 836	6 436 763	4.53	409	16
Free State	15 158 104	91 500 000	206 432	2 706 775	6.04	443	34
Gauteng	55 520 629	819 001 187	1 628 123	8 837 178	14.75	503	93
Kwazulu-Natal	46 958 983	360 000 000	556 761	9 426 017	7.67	647	38
Limpopo	27 019 843	69 879 530	117 975	5 273 642	2.59	592	13
Mpumalanga	20 131 579	153 000 000	186 546	3 122 990	7.60	820	49
North West	60 917 532	300 887 815	180 310	3 669 349	4.94	1669	82
Northern Cape	3 070 606	16 671 420	66 231	822 727	5.43	252	20
Western Cape	44 000 000	277 000 000	734 425	4 524 335	6.30	377	61

(Source: Department of Transport, 2002)

In order to conform to the provisions of the White Paper on National Transport Policy, the Department of Transport developed a new subsidy policy that aims at reforming public transport contracts in South Africa. Much of the policy amounts to what is referred to as subsidy based on net cost contracts, in contrast to gross cost contracts. Basically, while in net cost contracts the operator carries both revenue and cost risks, in gross cost contracts the revenue risk is carried by the authority. The proposed new public transport subsidy policy can be summarised as follows (Department of Transport, 2004):

- Public transport subsidy is provided on the basis of a shortfall that exists between the affordable fare and the marginal total cost of provision for the service.

- Support should only be provided for services, whether existing or planned, that are approved in terms of approved transport plans. Subsidies allocated under the rationale of relief of distance burden should be continued, but gradually reduced and eventually be limited to commuting trips of 40 kilometres or less.

- The primary beneficiaries of subsidies should remain disadvantaged commuters with the aim of targeting household expenditure on public transport to below 10% of disposable household income.

- Conditions specified in municipal transport plans should be used as subsidy qualification criteria, and should be the only barriers to market entry for subsidised services and contracts.

- Operators should compete for the provision of subsidised rail and road-based public transport services, through competitive tendering processes. Tendering processes should make provision for the participation of Historically Disadvantaged Enterprises and Historically Disadvantaged Individuals.

- In the medium to longer term, provincial and/or local funding should directly supplement transport subsidy levels through appropriate means to partially replace national funding.

- In the longer term public transport subsidy management should take place at the lowest competent level of government.

The subject of public transport reform has received worldwide attention and the intention of such reforms is usually to improve equitable distribution of welfare benefits across the population. The effectiveness of such reforms, however, is limited by what Gwilliam (2005), through comprehensive investigation of reforms in developing and transitional economies, summarises as follows (all of which are taking place in South Africa):

- **The uncommitted reformer**: The adoption of new approaches is as a result of the failure of traditional systems as opposed to the authorities believing in the merits of subsidy reforms. This is evidenced by dual systems were the private sector operators are subjected to more stringent market based rules as opposed to the public sector operators (for example, municipal owned buses) with more lenient rules and regulations.

- **Protection of vested interests**: In this instance, countries make commitment to reform but still find it politically convenient to protect vested

interests of incumbent operators (for example, operators who have been in service for extended periods). Governance systems where transport operations and policy functions are combined especially aggravate the situation. There are further reports in some countries were operators enjoy political support and are therefore able to influence the awarding of contracts.

- **Unrealistic expectation of market processes**: In this instance governments have completely unrealistic or inappropriate expectation of what the market can achieve and how it can be exploited. The prominent example is illustrated in countries were reform is accompanied by unrealistic risk burden placed on the operators e.g. stringent fare restrictions and short term contracts restricting the vehicle types to non-versatile vehicles and in turn compelling the operator to make large investments in an uncertain environment.

Indications are that the three subsidy reform problems are impeding speedy transformation of the public transport system in South Africa. A solution in this regard can only come from strong recommitments by the authorities. Moreover, the transition from old to new subsidy policy regime has been dragged for a considerably lengthy period and as a result the benefits of the new system are not readily evident. At the core of these delays is provisions of the agreement signed between labour unions representatives, operator representatives and government, referred to as the Heads of Agreement, in which vested interests (as discussed above) are overshadowing the interests of the public transport users. Under these circumstances, public transport service delivery progress for the urban poor suffers.

Some of the unintended consequences of subsidy reforms have also been documented. For example, Hensher and Hauge (2002) indicate that in the long run tendered contracts generally have the effect of reducing the number of future competitors and the subsidy generally rises, and over time tends to monopolistic practices. Furthermore, when fares are capped the spatial coverage and capacity of the public transport system tends to decrease (Wegelin and Borgman, 1995). The tendering system has also been known to introduce certain behavioural responses from the operators such as undercutting themselves in order to get the subsidy contracts with the result that service quality suffers in the long run (World Bank, 2002).

Recent lobbying by minibus taxi operators to be included in the public transport subsidy scheme of government is gaining momentum. Regardless of this, there has not been a clear policy response from the Department of Transport in this regard. Indications are that if subsidy is extended to minibus taxis the subsidy budget will have to be increased substantially, given that there are 20 times more taxis operating than buses, and the situation would be exacerbated by lack of proper accounting practices (Walters, 2006).

5.4. Some recommendations on optimisation of modal economics and the service mix

Shorter term recommendations for optimisation of modal economics and the service mix to improve access and mobility in the second economy can be summarised as follows:

- Improve street environments (for example lighting, walking facilities, shading) in order to improve comfort, safety and security of pedestrians.

- Promote the use of non-motorised transport, especially by the youth. This should be supported by a roll-out cycling programmes in the urban areas, as well as proving appropriate non-motorised transport networks around schools.

- Formulate a South African street design architecture guideline that will promote effective and safe use of streets by different users, especially non-motorised transport users. Currently the design of South African roads is biased towards car use. New design framework should take into account income generating opportunities provided by public transport facilities as well as the many societal roles of streets.

Longer term recommendations for optimisation of modal economics and the service mix to improve access and mobility in the second economy can be summarised as follows:

- Increasing subsidies is not always the best option. Transport operations should first be optimised in order to improve operational efficiency. This is actually the historical modus operandi that taxis used i.e. they did not maintain their fleet properly, they lowered the salaries of the drivers or maintained them at low levels and had low overheads as a result of no administrative staff, but as a result the service quality was somewhat lowered.

- Part of programmes such as taxi recapitalisation should be to ensure that operations are better designed in order to be efficient. Currently taxi recapitalisation programme is focused on vehicle replacements.

- Transport subsidies do not always target the right beneficiaries. The use of better targeting schemes, for example, card-based technologies can improve user targeting.

6. Improving firm-level performance

The improvement of firm level performance is perhaps the most important intervention in the public transport system that will have a lasting legacy. This includes aspects related to transport law enforcement, transport funding, institutional arrangement and transformation. This in many respects forms the foundation of many of the interventions that could have a positive lasting legacy in the second economy.

6.1. Transport law enforcement

Transport laws contained in Acts such as the National Land Transport Transition Act (Act 22 of 2000), the National Road Traffic Act (Act 93 of 1996), Administrative Adjudication of Road Traffic Offences (Act 46 of 1998) as well as in some Municipal by-laws, tend to be comprehensive in how they address transport law enforcement. However, the general lack of effective enforcement of these statutory provisions remains a problem. For public transport services, this results in poor service characterised by unsafe operations as well as poor security. Enforcement requires resources such as trained enforcement officers, a resourced judiciary system and appropriate enabling technologies. Such resources are often not functionally integrated across the three spheres of government. The violence that often characterises minibus taxi operations is partly as a result of lack of effective law enforcement. Research on safety and security on public transport revealed that passengers using trains tend to be the likely victims of crime in public transport (Page, Moeketsi, Schurink, Molefe, and Bruce, 2001). Key findings of the study can be summarised as follows:

- The commuter rail and minibus taxi systems were singled out as fraught with personal security problems, often rendering the 1,900 respondents interviewed hopeless in minimising their potential of becoming the next victims.

- On-board crime happens anywhere and everywhere. The physical environment has little impact. It is the potential victim and their vulnerability that determines where the criminal strikes.

- There is a direct relationship between the extent of overloading and opportunity for criminal activity. Also, as the number of standing passengers increased, so too did the commuter's fear of crime. Actually, the respondents in the same study, felt relatively safe when everyone was seated.

Proper training and equipping of law enforcement officials and institutions in matters of transport law enforcement, that is beyond just road traffic offences or focused on one mode of transport, is needed. This would include enforcement of laws that relate to driver behaviour, vehicle safety standards, driving in somebody's designated public transport route and powers to arrest criminals operating within public transport facilities across all modes of transport.

However, in areas riddled with institutional corruption, for example, acceptance of bribes, regulatory interventions alone do not work. Therefore parallel to the

formulation of a law enforcement strategy, a strategy on rooting out corruption needs to be implemented. The solution is to ensure that corruption is rooted out of the institutions. This would not apply only to the transport operators but to all cases where regulation is seen as an entry barrier to a more prosperous life.

6.2. Transport funding

Around the world, the responsibility for urban transport management is increasingly being devolved to local governments but without matching financial resources (World Bank, 2002). This is also the case in South Africa, to the extent that the proposed amendments to the National Land Transport Transition Act include the following recommendations (Department of Transport, 2007):

- Municipalities, especially Metropolitan Municipalities should be given powers to raise levies and charges in order to effectively perform their transport functions.

- Establishment of a dedicated transport fund such as the Urban Transport Fund created in terms of the Urban Transport Act (Act 78 of 1977).

The first recommendation is in line with the observation of the World Bank (World Bank, 2002) that without efficient pricing of private transport use, government expenditure on transport tends to favour the wealthy at the expense of the poor. However, National Treasury has historically been principally opposed the concept of a dedicated fund for transport in South Africa or any other function (Department of Transport, 2007). Moreover, without empowered communities, which is often the case with many public transport users, the interests of public transport users are often overshadowed by the stronger voice of the more organised wealthier people who tend to be in favour of inefficient land use patterns to advance their own interest. The absence of a "National Public Transport Agency", the equivalent of a "National Roads Agency", bears testimony to the skewed nature of public expenditure in transport on private-based road travel.

6.3. Institutional arrangements, capacity and transformation

The National Land Transport Transition Act recommends the formation of Transport Authorities in areas where transport functions are more complex, for example Metropolitan Municipalities. Transport Authorities can be described as more autonomous, voluntarily established bodies that have full jurisdictional powers on all matters relating to transport in the designated transport area. The only Transport Authority in South Africa has been established in eThekwini Metropiltan Municipality. However, indications are it functions as a normal transport department of a municipality without a Transport Authority. This is partly due to the limited powers that the eThekwini Transport Authority possesses, for example ability to regulate all modes of transport and ability to raise funds. This in turn limits the impact that the Transport Authority can have on the livelihoods of people in the second economy.

One of the serious problems with the National Land Transport Act is the fundamental assumption in the Act of the availability and abundance of transport management skills in the three spheres of Government. Experience is proving that the lack of transport management skills in these institutions is hampering transport service delivery. For example, the Operating Licensing Boards established in each

Province, whose primary function is to receive, assess and issue public transport operating licenses, often lack necessary analytical skills to balance the demand and supply aspects of public transport. Increased disputes over minibus taxi routes emanates largely from this problem. Poor coordination between Provincial Public Transport Registrars and Law enforcement agencies also exacerbates the problem.

Self regulation of the minibus taxi industry often yields positive results. Experience around the world shows that by organising themselves into route associations, they can lower their per-seat operating costs and become more competitive (Cervero and Golub, 2007). However, because their income is solely dependant on passenger ridership, their competition for the market often results in unsafe driver behaviour, especially in the peak periods. Furthermore, while peak period operations are relatively profitable, off-peak travel demand is usually low resulting in poor servicing of low demand routes and long passenger waiting times when drivers insist on filing up the taxis before making a journey. Public transport services for people dependant on public transport therefore tend to be extremely poor in the off-peak periods. These off-peak periods can be associated with higher activity levels of women with larger responsibilities on household duties (Venter, Vokolkova and Michalek, 2007).

Urban sprawl in South Africa has created the need for the urban poor to travel over longer distances in order to access work opportunities. When businesses relocate to new premises away from the urban core employees who use public transport suffer the most. The situation is worsened in the case of workers working night shifts. Therefore apart from transformation of the public sector operations, the private sector (mainly) also has a significant role. In order to ensure minimum impact on poorer workers, all work place establishments and location changes should be subject to a comprehensive public transport impact assessment. A partnership between the public and private sectors in this regard should be explored.

6.4. Some recommendations on improving firm-level performance

Shorter term recommendations for improving firm level performance in the second economy can be summarised as follows:

▪ Given the long distance nature of trips of the urban poor, there is an urgent need for improved communication between the neighbouring authorities when formulating transport plans.

▪ Employers need to evaluate the accessibility of their premises by public transport in consultation with their workers. This should be fed back to authorities for backlog estimation. This will in turn improve the currently ineffective Operating Licensing Strategies.

▪ Employment contracts to incorporate transport access clauses, especially for vulnerable users such as night shift workers.

Longer term recommendations for improving firm level performance in the second economy can be summarised as follows:

- Improve community access to internet. This will reduce some of the need to travel, especially for routine travel to access social services. This calls for increased government service to be provided online or over the phone. Furthermore, improved literacy and computer literacy in poorer communities should receive serious attention.

- Intelligent Transport Systems (i.e. utilisation of Information and Communications Technologies in transport operations) should be implemented in a manner that improves the efficiency and effectiveness of transport subsidy targeting as well as the minimisation of corruption.

- Establishment of targeted transport management training institutions across all the transport-related disciplines should improve capacity in Government, transport operator institutions and the private sector.

- Make social facilities and government buildings multi purpose in nature to reduce the need to travel.

- Empower ward based municipal councillors in matters related to effective transport service delivery.

7. Conclusions

The paper attempted to systematically identify possible transport interventions to improve transport service delivery for the second economy. Given that transport is a derived demand, much of the interventions incorporate recommendations that transcend what would be typically be transport functions. The paper used the seminal Moving South Africa Action Agenda (Department of Transport, 1999) as a point of departure for framing of problem statements. However, the Moving South Africa analytical framework was expanded in order to allow for the formulation of relevant potential solutions. The recommendations are identified explicitly in the text of the paper.

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