

PUBLIC TRANSPORT IN CAPE TOWN: MARKET SEGMENTATION AND POLICY TESTS TO GIVE EFFECT TO MODAL SHIFTS

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1 INTRODUCTION

The passenger transport focus of Moving South Africa (MSA), The Action Agenda: A Twenty Year Strategic Framework for Transport in South Africa was a segmentation of the urban passenger market based on income, travel distance (time) and the existing mode choice. MSA also forecast changes in the market mix over the period 1996 to 2020.

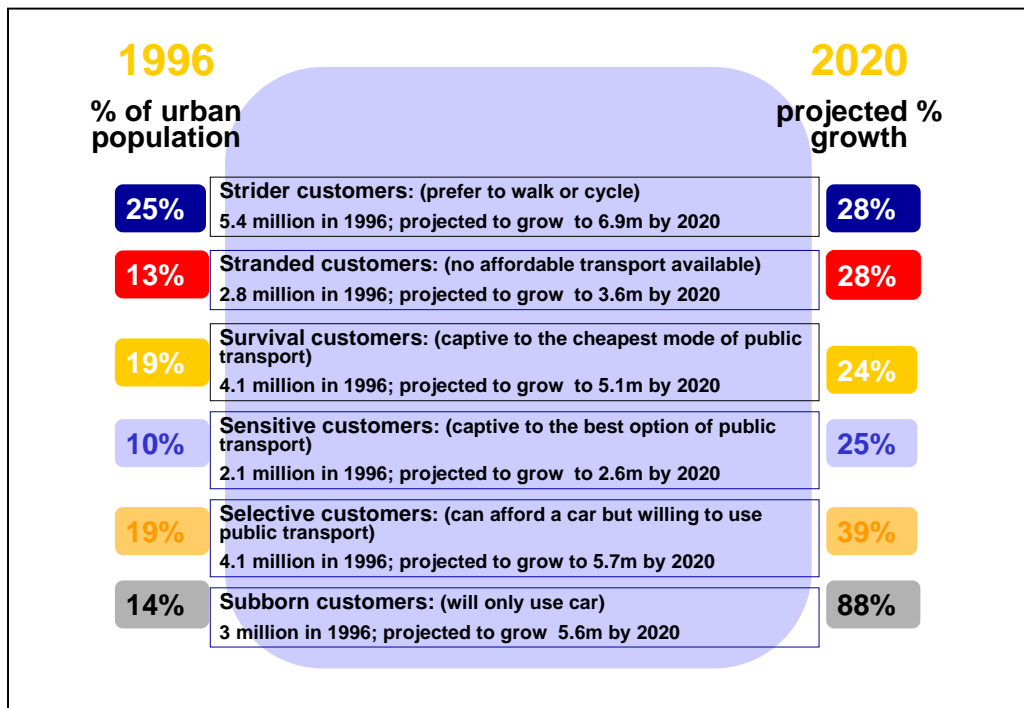
The purpose of the MSA segmentation was to better understand the customer characteristics of urban transport travellers and to more effectively target state expenditure, particularly transport subsidies, through strategic adjustments to urban transport systems.

2 URBAN PASSENGER CUSTOMER MARKET SEGMENTS ACCORDING TO MSA

Figure 1 shows the urban passenger market mix in the RSA in 1996 together with the projected growth of each segment to the year 2020. The current proportion of each of the 6 segments is indicated. The segments were given names to highlight their characteristics. MSA specified that in allocating transport subsidy, priority should be given to the 'stranded' and 'survival' customers. These are the customers that have no affordable transport available, or who are captive to the cheapest mode of public transport. In 1996, these two segments amounted to 6.9 million people and were expected to grow to 8.7 million by 2020: a total growth of some 26 per cent over the period, which is equivalent to about 1 per cent per annum.

From a strategic perspective, MSA was most concerned about the transport implications of the higher rate of growth of the 'selective' customers (those who can afford a car but are willing to use public transport) and the 'stubborn' customers (those who will only use a car). MSA projected that the former would grow by 39 per cent and the latter a staggering 88 per cent between 1996 and 2020. The growth in car ownership and use could impact negatively on the urban environment (through congestion and resulting pollution) and on public transport patronage. This will be particularly serious in Cape Town, where the market share of public transport for work trips hovers around 50 percent.

Figure 1: Moving South Africa – the urban passenger market mix and projected future growth



The recommendations of MSA called for the following strategic actions in urban areas:

- densification of transport corridors;
- optimal deployment of modes to better meet customer service requirements; and
- improved firm level performance, that is, improvement of the productivity of urban transport services through well planned tenders, regulation and enforcement.

These recommendations suggested the need for the restructuring of public transport in the cities. In the interests of moving the process forward, the National Department of Transport (NDOT) made funds available for demonstration projects in Cape Town and Durban to ‘kick-start’ the process of transport restructuring. In the case of Cape Town, the obvious starting point was research into the market mix.

3 APPLICATION OF THE MSA MARKET SEGMENTATION IN CAPE TOWN

Figure 2 shows the urban passenger market segmentation in the City of Cape Town area (CCT) in accordance with the MSA model. The same database, the October Household Survey of 1995, was used for the segmentation in Cape Town. Subsequently, a more recent OHS of 1998 was used, but the results showed little difference to those of 1995.

Figure 2: Urban passenger market segmentation - Cape Town (after MSA)

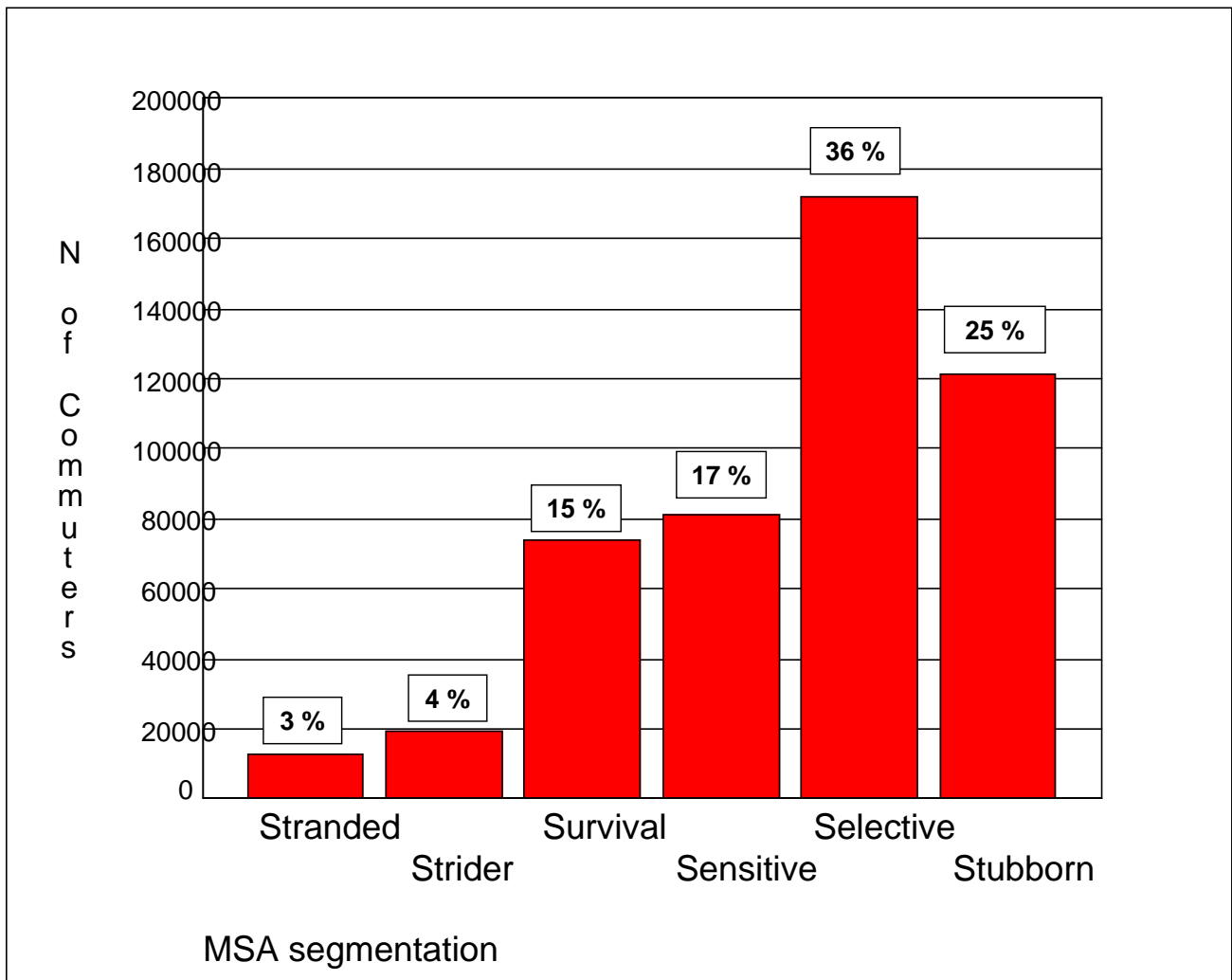


Figure 2 shows that amongst the CCT urban population, there are very few households with commuters classed as ‘stranded’ (3 per cent). The market segments identified by MSA for public transport expenditure priority (the ‘stranded’ and ‘survival’ sectors), form a very small proportion (18 per cent) of the total passenger market in the CCT area, compared with urban areas in the rest of South Africa (32 per cent). Most commuters in Cape Town are either ‘selective’, that is, they can afford a car but are willing to use public transport, or they are ‘stubborn’ and will only use a car.

The CCT project team had reservations about the MSA segmentation for two reasons, namely:

- the cut-off of 20 minutes walking time to work between ‘stranded’ and ‘strider’ segments seems unrealistic. A walk of up to 30 minutes to get to work was not considered unreasonable; and
- at the other end of the scale, the differentiation between the ‘stubborn’ and the ‘selective’ also seemed unrealistic. For example, according to the MSA segmentation, in the CCT area, only 24 per cent of commuters travelling to work in the CCT area are ‘stubborn’ and will not use public transport. In view of the fact that the car market share for work trips is considerably higher (about 50 percent), this classification is of dubious value.

Another market segmentation needed to be considered, so that public transport investment and intervention to restructure the public transport system could be more effectively targeted. An alternative was developed based on the following:

- a walk of up to 30 minutes to work was considered acceptable, and any commuter in this category was classified as a 'strider';
- public transport users were differentiated according to income with a "captive" group earning less than R2 500 per month, a "chooser" group earning between R2 500 and R4 000, and a "car aspirant" group earning in excess of R4 000 per month; and
- households owning cars were classified as "mobile" to replace the 'stubborn' group in the MSA segmentation.

The alternative segmentation of the CCT passenger market is depicted in Figure 3. It is evident that it more accurately reflects the modal market shares.

Figure 3: Alternative segmentation of the CCT passenger market

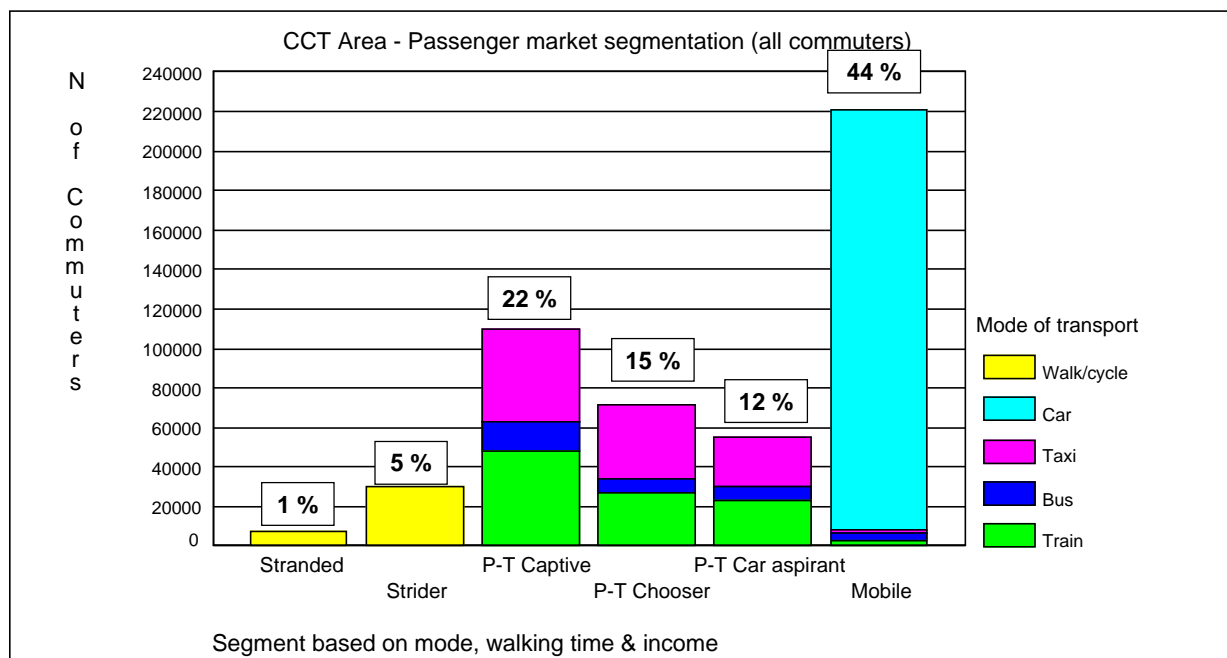


Figure 3 shows the travel modes used for the work journey in each of the market segments. Only a few "mobile" commuters use buses and trains. Of interest is that the public transport market segments show no association between the mode chosen and the income group. For example, it could be expected that public transport captives earning less than R2 500 per month would use the cheaper subsidised modes (bus and train) in preference to minibus taxis. There are, however, many users from all income groups who use taxis for their work trips.

Apart from income and walking distance, there are other factors that need to be taken into account in differentiating the passenger market. These included the following:

- the population group (race) of the users;
- the proximity of homes to public transport services, particularly trains and train stations; and
- the origins and destinations of trips by public transport.

Figure 4 is a population distribution map of Cape Town differentiated by race group. This information was used to identify the main concentrations of population that, together with existing mode choices and trip origin-destination patterns, was used to identify the target market for user preference surveys. The density of population in the south-east (Mitchell's Plain and Khayelitsha) was and still is a significant factor in public transport restructuring.

Figure 4: Distribution of the population in Cape Town by area and race group

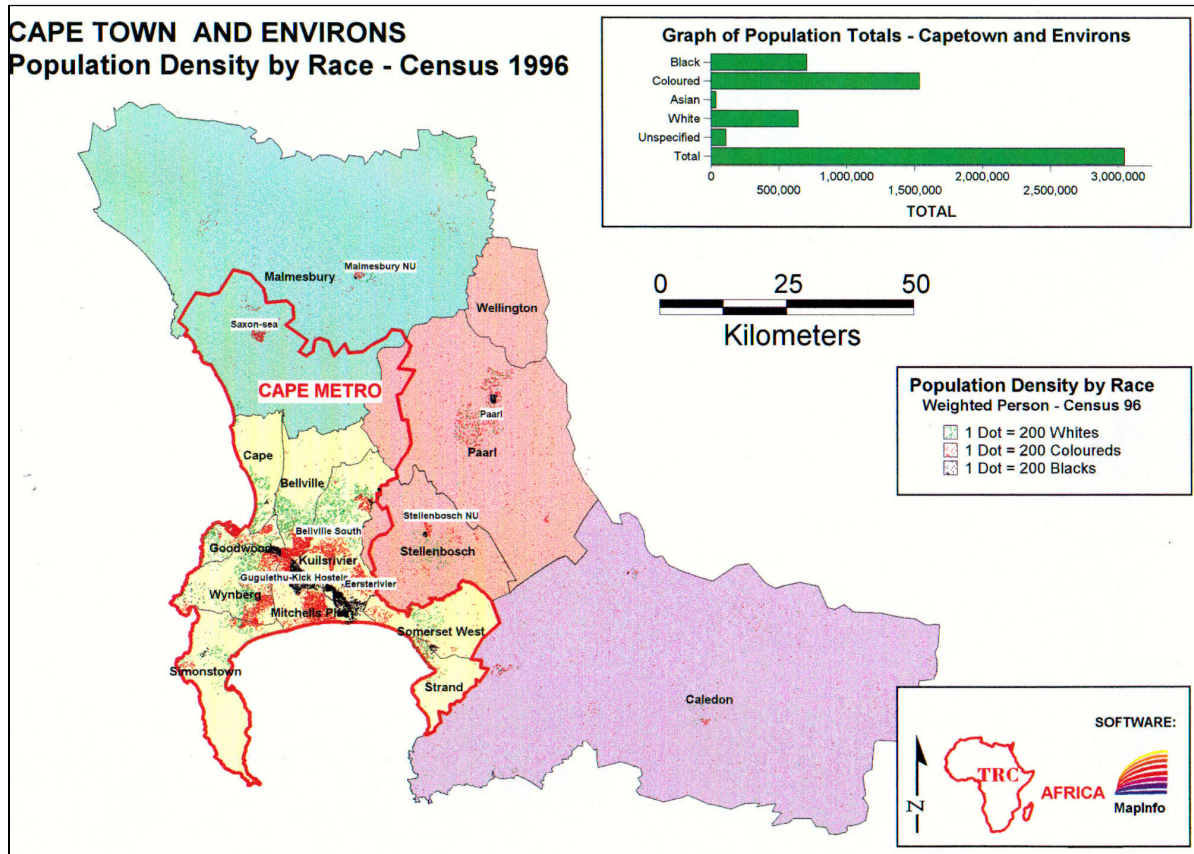


Table 1 indicates that there are some 190 000 Black commuters in CCT, most of whom (140 000) travel from the Khayelitsha/Gugulethu areas. Of these, nearly half (61 000) travel by train.

The home district of Coloured workers using the different modes is shown in Table 2. In all, there are some 460 000 Coloured commuters in Cape Town. Nearly a third (157 000) currently get to work by car. Amongst Coloureds, the mode share of trains and taxis was roughly equal, 86 000 travel by train and 89 000 by minibus taxi.

Table 1: Modes used by Black commuters to travel to work

Home District	Train	Bus	Taxi	Car	Walk/ Cycle	Other	Total
Bellville					1 600		1 600
Goodwood	8 513	1 209	1 646	2 144	2 504	593	16 610
Cape			2 376	2 182	1 091		5 649
Simonstown	366				523		889
Wynberg	468	1 645			2 275		4 389
Khayelitsha	60 700	19 737	25 655	13 621	8 668	11 217	139 597
Kuilsrivier	6 092	202	5 661	939	4 806	928	18 628
Somerset West					878		878
Atlantis			278		1 302	491	2 071
TOTAL	76 140	22 793	35 616	18 887	23 647	13 229	190 310
Percentage	40	12	19	10	12	7	100

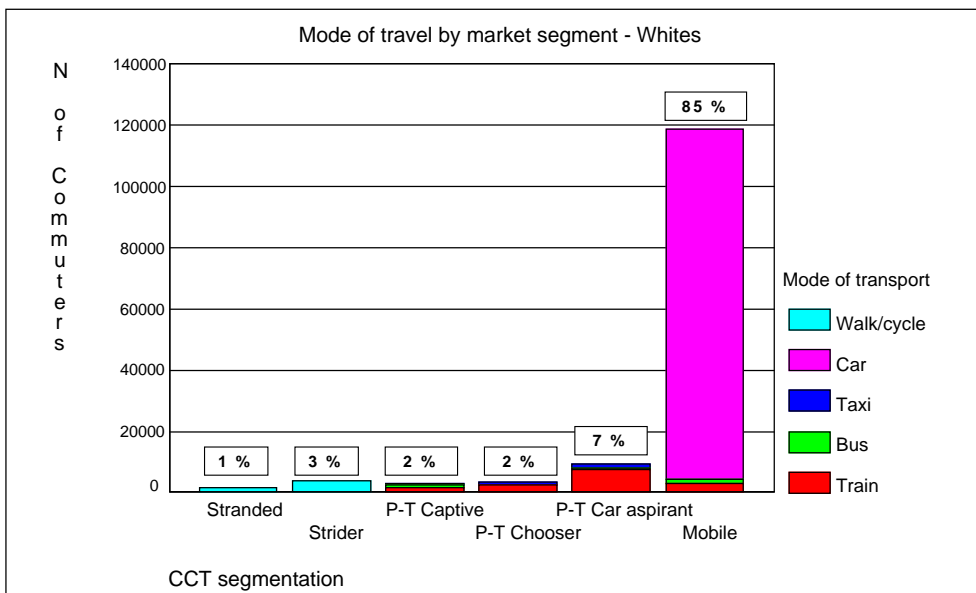
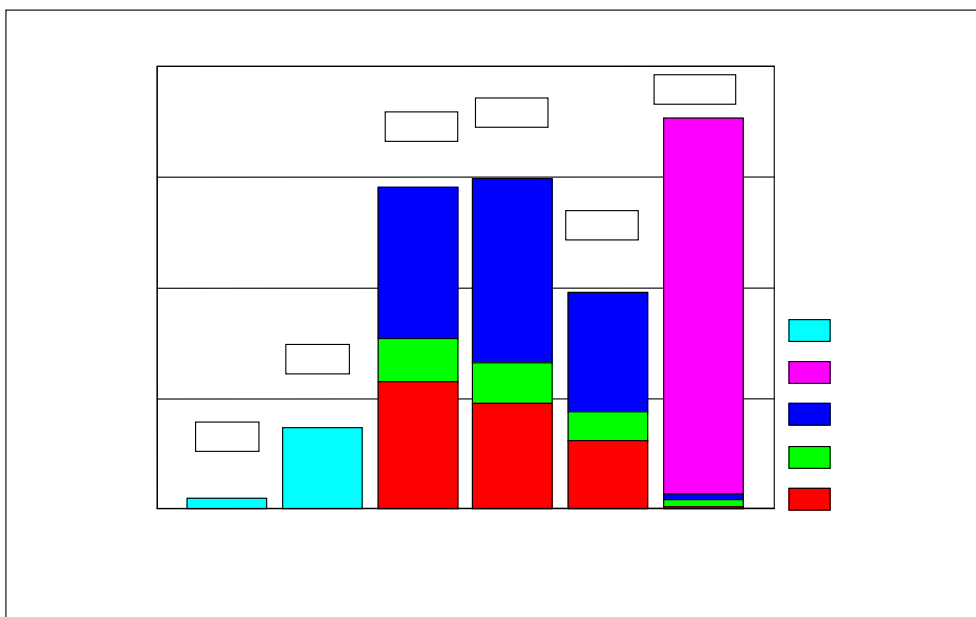
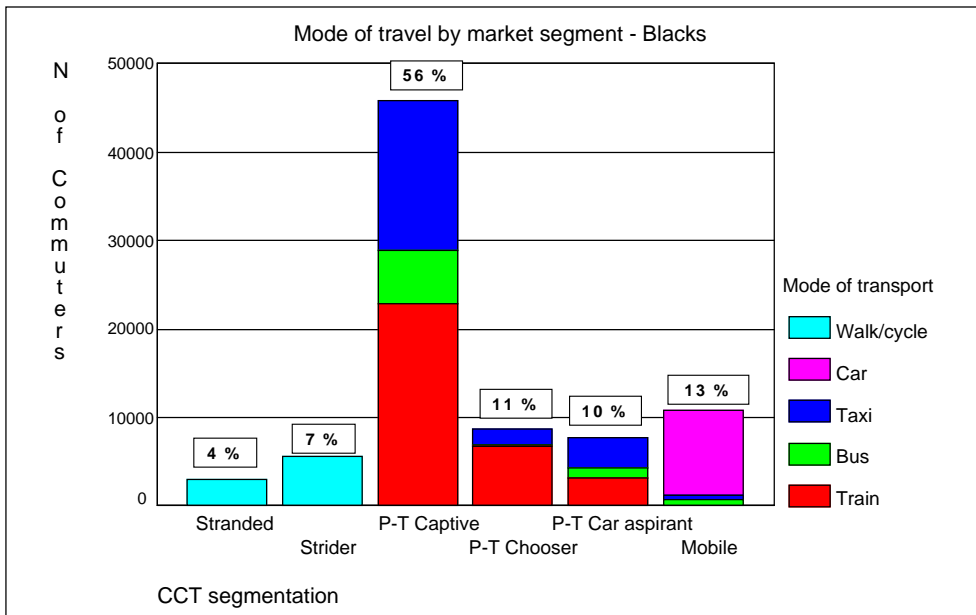
Source: OHS 1998

Table 2: Modes used by Coloured commuters to travel to work

Home District	Train	Bus	Taxi	Car	Walk/ Cycle	Other	Total
Bellville	11 206	3 582	12 882	17 944	11 093	6 146	62 854
Goodwood	12 058	4 069	8 921	16 818	8 986	6 534	57 386
Cape	3 110	2 962	7 580	13 890	8 579	2 524	38 695
Simonstown	4 904	946	2 556	3 407	1 201	1 393	14 407
Wynberg	16 915	8 571	22 996	53 018	8 238	2 148	111 886
Mitchells Plain	21 032	8 067	12 239	18 202	2 369	-	59 910
Kuilsrivier	14 903	3 454	5 204	13 929	12 984	-	53 545
Somerset West	2 144	375	7 294	6 759	2 539	2 613	21 723
Strand		2 059	9 551	6 852	12 129	865	31 052
Atlantis		2 059	9 551	6 852	12 129	460	31 052
TOTAL	86 272	34 085	88 636	157 003	68 119	22 683	459 917
Percentage	19	7	19	34	15	5	100

Source: OHS 1998

Figure 5: Modes of travel used by Black, Coloured and White market segments in Cape Town



The market segments for Coloured and Black commuters (Figure 5) provide an interesting contrast. Most Black commuters are in the 'public transport' captive segment and most Coloured commuters the 'mobile market' segment, indicating the differences in household income between the two groups. As a further contrast, and point of interest, the mode of travel to work and market segmentation of White commuters is also indicated in Figure 5.

4 TARGETING OF POLICY TESTS

In view of the objectives of public transport restructuring, attention was given to those most in need of public transport subsidisation. Accordingly, priority was given to the most populous low-income area of the city, namely Khayelitsha. Black commuters in the Khayelitsha/Gugulethu area number about 140 000 and in terms of the market segmentation, mostly fall into the 'public transport captive' group (equivalent to the MSA's 'survival' category). Most are captive to the cheapest public transport, namely train services. Many Khayelitsha commuters are, however, unable to use trains because their work destinations are not served by commuter rail

Second priority was accorded to the large group of Coloured commuters travelling the greatest distance to work, namely the residents of Mitchell's Plain, numbering some 60 000 daily commuters.

One of the most compelling reasons for targeting the policy tests in these groups was the evident ineffectiveness of the current targeting of bus subsidies. Figure 5 reveals that less than 20 000 low-income commuters in the 'public transport captive' group are currently benefiting from bus subsidies. In all segments, there are fewer than about 57 000 daily bus commuters, while bus subsidy amounts to about R270 million per annum. This amounts to a subsidy that averages about R395/commuter/month.

Accordingly, the Mitchell's Plain and Khayelitsha commuters were selected for the Phase 1 consumer surveys and the associated policy tests on alternative transport networks and service delivery standards.

In Phase 2 of the study, it was decided to target the policy tests on different market segments. These were low-income commuters living in the Cape Flats and travelling intermediate distances to work in the CBD or along the main transport corridors to Bellville, Epping, Wynberg, and Claremont. The reason for this choice was to understand the impact of shorter travel distances on mode selection. Amongst this group, the policy tests were designed to assess the impact of minibus-taxi recapitalisation and the introduction of 35 and 18-seater vehicles on the demand for short-haul services.

The most interesting aspect of the Phase 2 target for policy tests was the decision to test the reaction of middle-income car-using ('mobile') commuters to possible improvements in rail services. In this case the targets (Figure 5) were Coloured and White car commuters (the 'mobile') living in the northern and southern suburbs. Figure 5 indicates that there are some 290 000 White and Coloured commuters in Cape Town who travel to work by car. In view of the MSA prediction that this group of "stubborn" commuters will grow by 88 per cent between 1996 and 2020 (a rate of roughly 3 per cent per annum), it is obvious that this policy test was necessary, to assess what it will take to shift car users to public transport, particularly trains.

5 THE POLICY ISSUES FORMING THE BASIS OF THE PHASE 1 POLICY TESTS

From the focus group discussions, the impression was gained that as long as there are major improvements in travel time and comfort as a result of the new bus contract system, a high frequency line-haul bus service will be supported. This led to the idea of testing a direct “core” bus service to complement the “core” train service. Such a service would not compete with train services but serve high demand destinations not served by rail. The “core” bus service would intersect with train services at ‘strategic public transport interchanges’. Because of the differences between current bus and taxi fares, there could even be scope for higher fares on the improved “core” bus services.

In Mitchell’s Plain, it is apparent that commuters are currently ‘spoilt for choice’ of public transport modes. In competing for custom, both bus and minibus-taxi operators make special concessions to customers, such as free feeder services to the town centre, in the case of buses, and door-to-door services in the case of taxis. The policies and service level changes that were recommended for policy tests in the Phase 1 surveys envisaged a significant reduction of the number of bus routes in Mitchell’s plain in order to reduce subsidy and “rationalise” services. Other specific policy tests were:

- more extensive and visible security on train services, the provision of express trains, reducing travel times, but most notably providing trains which cater for the needs of particular ethnic groups, even if it means reducing the capacity of some trains;
- significant improvements in security and hygiene factors, to stamp out crime and vandalism on public transport;
- simulation of the removal of parallel subsidies, by significantly increasing prices of bus tickets where buses compete with train services in the same corridors;.
- in the case of Khayelitsha, one of the policy tests was the improvement of capacity and train frequency to give effect to a reduction of crowding; and
- fares are a source of customer concern, particularly where fare evasion is rampant. Fare structure adjustments and ticket control policies were tested where fare evasions compromises the effectiveness of differentiation between METROPLUS and METRO services and contributes to customer perceptions of poor train security.

The study team recommended that, in view of the importance of fares and fare structures, the service level and supply changes proposed by METRORAIL for January 2001 and for the 12 bus contracts which were to be advertised in late 2000, should be delayed. This was to ensure that fares could be influenced by the results of the survey. This recommendation was not observed in the case of METRORAIL, and the failure to press ahead with new bus contracts made the recommendation redundant in the case of bus fares.

At the time of the recommendations on policy tests for the Phase 1 customer surveys, it was noted that:

*“Unrealistic fare control is at the heart of the **failure** of (‘state’) public transport companies, and even of private sector franchising arrangements. The central problem is one of over-specified regulation. Put very simply, the combination of “fare-box” and subsidy must generate enough revenue to finance the quality and quantity of service provided: attempting simultaneously to determine:- fare levels, subsidy levels, frequency and vehicle quality – will almost certainly lead to one of*

the objectives being missed. Usually the effect of such over-specification is that with a shortage of revenue, first provision for vehicle replacement and then maintenance is cut. Initially, this leads to the loss of service quality and ultimately to the loss of quantity, as vehicles become unserviceable or un-roadworthy.

Unwillingness to consider fare increases stems from the feeling that there is a maximum fare that is affordable and that fare control is necessary to maintain “affordability” levels. This view has been encouraged by the World Bank’s infamous proposition that for the journey to work, transport costing more than 15 per cent of disposable income is unacceptable. The effects of that prescription may have contributed to the financial failure of public company basic services.

The concept of affordability is dubious. Where housing is effectively free, and water and power are also supplied at very low prices, 15 per cent of disposable income may not be poverty causing. World Bank research in central Asia has shown that people are far more concerned about the availability and quality of public transport, than its price.” (Gwilliam, 2000. edited to accord with the tense and context of the paper)

In Phase 1, the main policy strategy for Mitchell’s Plain was to eliminate parallel train and bus subsidised services and to make improvements to train frequency, travel time and comfort by introducing express services and improving security.

For Khayelitsha, the policy objectives were similar to those in Mitchell’s Plain, with a focus on reducing crowding, by increasing the number of peak hour train sets and reducing travel time by introducing express services.

The main service attributes to be tested in these policy tests were as follows:

- total travel time to work (door-to-door time);
- access time to main line-haul modes;
- waiting times for the line-haul travel modes;
- transfer times between feeder and distributor modes and the main modes;
- in-vehicle times;
- fares and fare increases;
- some comfort features such as crowding, standing and/or seating; and
- security improvements including, but not restricted to, enhanced and visible policing, electronic surveillance and panic buttons on trains.

6 THE POLICY ISSUES FORMING THE BASIS OF THE PHASE 2 POLICY TESTS

As indicated previously, the focus groups amongst “White and Coloured” car users posed some serious challenges for the Phase 2 policy tests. In the light of focus group results and given that it was difficult to recruit respondents for the survey because of ‘entrenched’ anti-train and pro-car attitudes, it was decided to test the ‘limits’ of possible policy changes

which might give effect to a modal shift from cars to trains. Accordingly, the following policy changes were tested both explicitly and implicitly:

- congestion pricing (implicit) through severe time penalties on car use, that is, no further road-building, resulting in major congestion, (tested through large increases in car travel times) or possible road toll charges (tested through large increases in travel costs);
- CBD parking price increases (explicit) addressing the high subsidies enjoyed by car users, in order to highlight the cost advantages of train services (together with the cost penalties implicit in the above policy);
- major improvements to train and station security (explicit) including guards, conductors and railway police to address the concerns of 'Metroplus' market segments, as well as train and station access control and electronic surveillance; and
- general improvements, including station access, transfer times and trains service improvements.

For the policy tests associated with the surveys in the central Cape Flats, the main emphasis was on the travel characteristics of policies associated with:

- bus rationalisation, namely a 'sparse' bus network, with attendant increases in access time but improved frequencies and in-vehicle times; and
- improved short-haul and feeder services associated with the minibus taxi recapitalisation ideal, resulting in improved safety, vehicle quality and comfort resulting from new vehicles and 'better' regulation.

7 CONCLUSION

The market segmentation in Cape Town differs significantly from the market segmentation determined in Moving South Africa. The key differences are as follows:

TYPE	MSA	MSA segmentation in CCT	CCT segments
• Stranded & Strider	38%	7%	6%
• Survival & Sensitive (Captive)	29%	29%	37%
• Selective	19%	34%	12%
• Stubborn	14%	24%	44%

This major difference in market segmentation implies that significantly different policies will have to be applied in Cape Town to those advocated in Moving South Africa. The MSA policy of targeting subsidy at 'stranded' and 'survival' customers cannot be directly applied to Cape Town as there will be a huge risk of losing the 'selective' market segment to private transport.

The appropriate policy for Cape Town will be to primarily direct subsidies at improving services to retain the 'sensitive' and 'selective' market segments. The CCT segmentation model indicates that these markets comprise 27 percent of commuters in Cape Town. (In the MSA model applied to Cape Town the figure is 53 percent and is much higher because the 'selective' group includes many car users.) Service improvements to be targeted should be those of safety, security reliability and availability. At this stage it is not advisable to target the 'stubborn' segment because the service improvements necessary to attract this group to public transport will require significant investments and are likely to be ineffectual.

Incorporation of the findings of the "Market Segmentation" in a statutory Integrated Transport Plan, may be the best way to ensure that the resources expended on the project are justified and that sensible policies are implemented. Such a plan needs to be delivered rapidly, that is, before vested interests can challenge the information base of the plan.

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