

PUBLIC TRANSPORT: A NEW PLANNING PARADIGM IS REQUIRED TO SUCCEED

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ABSTRACT

In the 1950's public transport in South Africa was at its pinnacle. The major cities enjoyed extensive networks of rail, bus and tram systems. Not only did these systems operate without subsidy, but the operator paid the authorities for the rights to operate on routes.

During the 1960's authorities adopted the North American Transportation Planning approach focusing primarily on private cars. Freeways were built, arterials were widened, tramlines were buried under bitumen and footway widths were reduced to accommodate parking. This private car planning philosophy has prevailed for almost half a century.

With the latest policy documents and National Land Transport Transitional Act No.22, 2000 there is a renewed emphasis on putting public transport first. In order to implement this policy a new transport-planning paradigm is required. This paper investigates a new paradigm which truly puts public transport and the people first, as opposed to the existing paradigm which treats public transport and people as a by product to private vehicles.

1. THE RISE OF PUBLIC TRANSPORT

Cape Town, like other South African Cities has a long history of public transport. In 1801 the first public transport system was introduced in the form of a once a week service provided by a horse drawn passenger-carrying wagon between Cape Town and Simon's Town. The first railway line was completed between Cape Town and Wellington in 1863. At the same time work was started on the southern suburbs line by the establishment of the Cape Town and Green Point Tramway Company which by 1865 was carrying 128 630 passengers annually on horse-drawn trams. This was later followed by electric trams the first of which operated from Adderly Street Cape Town in 1896. By the following year there were thirty two electric trams serving the City and it's suburbs over 37km of track (Fraser Gill, p13, 1961).

By 1922 public transport was familiar sight on the roads carrying 30 million passengers annually. The 1920's and early 1930's were a period of intense competition with new comers being referred to as "bus pirates". Thereafter all road carrier permits were withdrawn and later reissued to a much smaller number of operators. A process of mergers and acquisitions eventually saw City Tramways become the sole operator of scheduled passenger services. Trackless trams were introduced and passenger growth continued unabated.

In the 1950's public transport was at its pinnacle. The major cities enjoyed extensive networks of rail, bus and tram systems. Not only did these systems operate without subsidy, but the operator paid the authorities for the rights to operate on the roads (Fraser Gill, p87,1961).

By 1960 in Cape Town, over 200 million bus passengers were carried annually on 600 diesel buses and 139 trackless trams travelling 43 million kilometres. At the same time 100 million rail passengers were carried annually. At that stage public transport was king with private cars carrying a vast minority of passengers (Fraser Gill, p85, 1961).

2. PERIOD OF CHANGE

The 1960's were a time of change which was to have a lasting impact on public transport. Suddenly, everyone aspired to "braai vleis, sunny skies, drive-ins and Chevrolet". In response to the rapidly growing demand for private car travel, the authorities followed the North American transportation approach, focusing primarily on private cars. Freeways were built, arterials were widened, tramlines were buried under bitumen and footway widths were reduced to accommodate parking. This private car planning philosophy has prevailed for over half a century.

Suddenly, after one and half centuries of uninterrupted growth, bus patronage started to decline. This decline was rapid and by the 1970's patronage had dropped to 120 million passengers per annum. Roads were taken over by private cars and buses were relegated to the sidelines. Motorists even wanted buses banned from key routes as they were considered to cause traffic delays. To add to the woes of the bus operators the Group Areas Act came into full force with the relocation of communities and racial segregation of passengers. This all adversely impacted on the viability of the service and for the first time subsidies were introduced.

During the 1980's bus operators were to suffer yet another blow from the deregulation of the minibus taxi industry. Intense competition coupled with slow speeds due to traffic congestion resulted in passengers being attracted in ever increasing numbers from buses to minibus taxis. Bus patronage in Cape Town continued to decline rapidly to its current level of 46 million passengers per annum. At the same time subsidies have rocketed to over R300 million per annum. By contrast minibus taxis currently carry over 80 million passengers per annum. Rail remains the largest carrier of passengers with 200 million passengers per annum.

A comparison of the key indicators for the bus service in the 1960's and today is shown below.

Table 1. Comparison of key indicators for bus service in Cape Town.

	1960's ¹	2000's ²
Population	1 million	3 million
Bus Passengers per Annum	200 million	46 million
Buses in fleet	739	863
Km traveled	43 million	44 million
Employees	3 429	2 184
Subsidy	0	300 million

¹ Fraser Gill, p85, 1961, Cape Times

² Cape Metropolitan Council, 1998, 1999, 2001, Moving Ahead, Cape Metropolitan Transport Plan

3. KEY INDICATORS

In order to assess the current state of the bus service it is necessary to compare key performance indicators of the 1960's and 2000's and compare these with current international benchmarks. This comparison is shown in table 2 below.

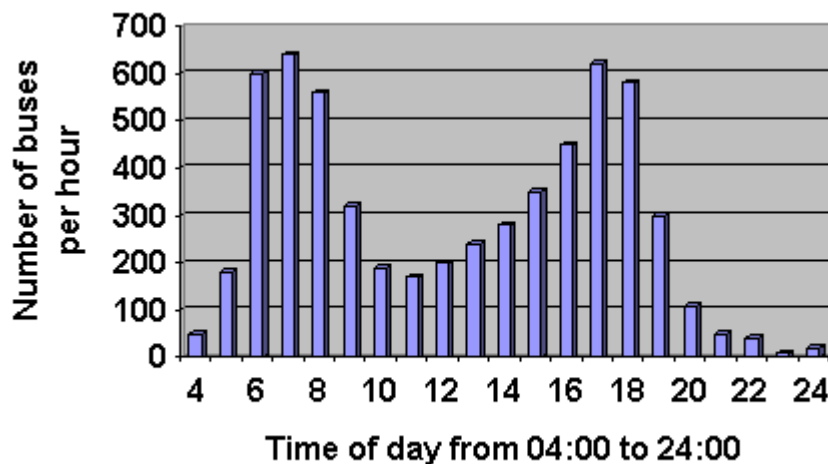
Table 2. Comparison of benchmarks between Cape Town bus service and World Bank.

	1960's	2000's	World Bank ² Benchmark
Passengers per bus per day ¹	1061	209	1000 – 1200
No of daily bus trips based on 50 passengers	21	4,2	20 – 24
Kilometres per bus per day ¹	228	199	230 – 260
Passengers per bus kilometre	4,7	1,1	4,3 – 4,6
Staff per bus	4,64	2,53	3 – 8

¹Based on 255 commuter days per annum.

² Cape Metropolitan Council, p25, 2001, Moving Ahead Cape Metropolitan Transport Plan

The indicators show that the current bus service compares unfavourable with operations in the 1960's and international benchmarks. This does not necessarily indicate inefficiencies by the operator but could well be attributed to inherent inefficiencies in the public transport system. In fact the operator is shown to be efficient with regard to it's number of employees and kilometres traveled per bus per day. The key inefficiency is the number of passengers conveyed per bus per day. This inefficiency is not due to a lack of demand for public transport but rather a skewed distribution of the demand concentrated for short durations during the morning and evening peak periods. This is illustrated on figure 1 showing the hourly bus deployment in Cape Town.



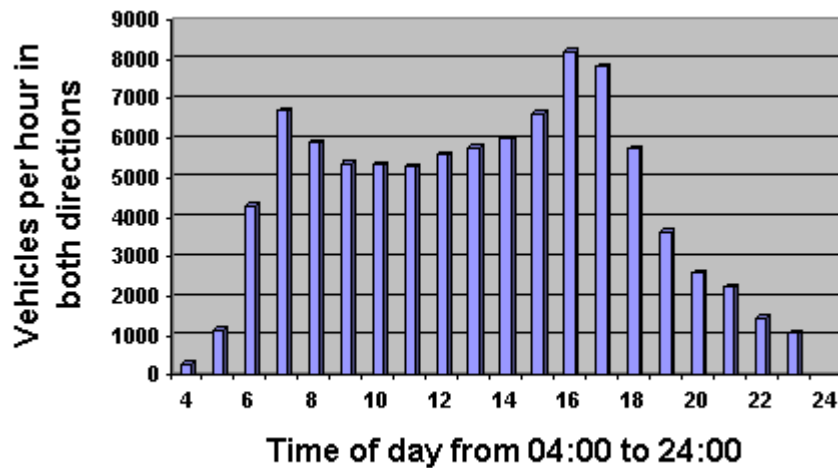
(Source: Cape Metropolitan Council, p49, 1999, moving ahead, Cape Metropolitan transport plan)

Figure 1. Hourly bus deployment for weekdays (1998).

A further inefficiency is introduced due to traffic congestion causing buses to travel at their slowest during peak periods thus further increasing the size of the bus fleet required to serve the peak demand.

By comparison private car travel has a far more even distribution with a much smaller percentage difference between the peak and off peak utilisation as shown on figure 2.

By comparing the utilisation during the evening peak hour (17:00 to 18:00) with that of the mid morning off peak (11:00 to 12:00), the percentage utilisation for buses of the off peak is just under 30% of that of the peak while the same utilisation for private vehicles is about 65%.



(Source: City of Cape Town traffic surveys, 2003)

Figure 2. Hourly distribution of vehicles for weekdays on N2 between Black River Parkway and Jan Smuts Drive on Wednesday 7 May, 2003.

Thus the fleet of public transport vehicles which is an efficient carrier of people is being ineffectively utilized while private motor vehicles which is an efficient carrier of people is more effectively utilized. One of the reasons for this is that congestion has forced private car users to adopt a flexible approach to their working hours which they have been successful in negotiating due to their seniority in organizations and ability to influence decision making. By comparison, public transport users are generally lower level workers and they generally do not enjoy the benefits of flexible working hours. This lack of flexibility is largely responsible for the large demand for vehicles in the peak period.

4. RISE OF CAR TRAVEL

Since the 1960's there has been a rapid growth in vehicle ownership and car travel as shown on table 3.

Table 3. Vehicle, population and vehicle ownership growth from 1960 to 2000.

Year	1960	1970	1980	1990	2000
Vehicles	100 000	250 000	450 000	550 000	720 000
Population	1 000 000	1 400 000	1 900 000	2 400 000	3 000 000
% vehicle ownership	10 %	18 %	24 %	23 %	24 %

(Source: Cape Metropolitan Council, p27 & 45, 1998, Moving Ahead, Cape Metropolitan Transport Plan)

The large investments in building freeways during the 1960's and 1970's was associated with an extremely high growth in vehicle ownership far outstripping the population growth during the same period. Since the 1980's vehicle ownership has remained static. This has largely been due to the influx of poor people from rural areas in search of economic opportunities. These poor people are unable to afford cars and are reliant on a deteriorating and inefficient public transport system for their travel needs.

Recently, attempts have been made to give priority to public transport. However these have largely failed due to these priority measures being undertaken in a planning environment supporting private car travel. The philosophy has been to accommodate public transport but not at the expense of the private car.

5. CHANGING THE PLANNING PARADIGM

With the coming into being of the National Land Transport Transition Act there is now a clear policy directive to give public transport priority over private transport. Implementation of this policy has not been successful largely due to the current planning philosophies developed during a pro-private car era. Recently, attempts have been made to accommodate public transport, but there has been no fundamental change to the pro-car philosophy.

5.1 Road Hierarchy

The current road classification allows for Primary Distributors, District Distributors, Local Distributors and Residential Access Roads. The current planning guidelines advocate accommodating public transport by adding lanes, signal priority or providing bus stops. These measures invariably don't work for the following reasons:

Additional lanes invariably experience enforcement problems, run out at intersections where public transport is forced to mix with general traffic, terminate at key bottlenecks due to cost or practical problems in continuing the lane and make the road wider to cross and thus unfriendly to pedestrians accessing public transport. In fact the key benefactor is private transport which has additional capacity due to public transport being removed from general traffic lanes. Also private transport makes use of the public transport lanes due to the difficulty in achieving effective enforcement.

Although there are successful examples of signal priority for public transport, these are largely limited to situations where traffic is operating under free flow conditions. Under congested conditions signal priority has to be provided along with dedicated approach lanes, which fail due to the enforcement problems mentioned above.

Bus stops merely serve to remove public transport from the traveled lane making it difficult for public transport to re-enter and really just benefits private car travel.

5.2 Public Transport Corridors

Cities which have been successful with public transport have not followed the approach of trying to accommodate public transport on the general traffic system. Rather they have adopted the approach of removing or diverting private transport (especially through traffic) from the identified public transport corridor and turning the corridor into a people friendly environment. Successful examples are Curitiba, Bogota and European cities such as Grenoble.

Removing cars and handing the roads over to public transport and people may sound like a radical approach. However, it is no more radical than the approach adopted in the 1950's of burying tramlines under bitumen and handing roads over to private cars. Given the current state of public transport it is only through measures like this that public transport can truly achieve priority over private transport and be restored to its former glory.

By making public transport corridors as a specific category in the road hierarchy and removing or diverting private transport (especially through traffic) from these corridors, it becomes a lot easier to implement government's public transport first policy.

There are numerous benefits, e.g.:

- Government will be sending a clear message that it is sincere about implementing its public transport first policy.
- Investments can be directed at creating a people friendly environment as opposed to expensive road widening.
- Public transport will be able to travel in a congestion free environment with a significant savings in travel time and reliable scheduling.
- Quicker turnaround times will reduce the peak fleet requirement resulting in significant capital and operating savings. It has been estimated that with a fully implemented system of public transport corridors the peak fleet in Cape Town requirement could be significantly reduced. This saving can be redirected at recapitalising the existing fleet.
- Enforcement is easier because physically separated lanes are dedicated to public transport and access to the corridor is designed to not encourage through traffic.
- By using existing roads a network of key corridors can be implemented relatively quickly.
- If public transport corridors are selected so that alternate routes are available for through traffic, the adverse impact on private car travel will be kept to a minimum. With the success of the corridors commuters will be attracted to public transport thus compensating for the loss in capacity on the private vehicle road system.
- With the removal of fast moving through traffic, a pedestrian and cycle friendly environment can be created.

The objective behind the public transport corridors is not to remove cars from the transport system but rather to support public transport so that it becomes a viable alternative to cars for most trip purposes. The corridor philosophy is to concentrate public transport services on as few routes as possible to achieve high frequency services throughout the day. As these corridors comprise a relatively small percentage of the overall road system, the impact of removing through traffic from these corridors is relatively small at a system level. A relatively small modal shift towards public transport, due to its increased attractiveness, would reduce overall traffic congestion.

5.3 Travel Demand Management

The current planning philosophy is directed at satisfying transport demand by providing additional vehicle capacity. This worked during the 1960's, 70's and 80's, when funds and land were in abundance. Currently, funds and land are the two biggest constraints in providing additional capacity. This renders the current planning philosophy ineffective in dealing with the increasing demand for travel. Despite the apparent need to increase transport capacity in the peak periods, there is a vast surplus of capacity in the off peak periods. In effect the available transport capacity is inefficiently utilized. Providing more peak public transport capacity will just increase this inefficiency. In order to address the inefficiency, a new planning paradigm is required of managing public transport demand rather than satisfying demand.

To an extent, car users have been forced to adapt to the new paradigm as increasing congestion forces them to adapt their time of travel. This is evident in figure 2, which shows the spreading of peak period and a high demand for off peak travel on the N2. By contrast the deployment of buses is very much focused on the peak periods with over 50% of the fleet lying idle outside of the peak periods. The dilemma for public transport is that although we want to increase its modal share, there are already too many people using it in the peak period: Thus trying to pursue government's policy of shifting people to public transport will merely increase the current inefficiency in the public transport system and increase the subsidy required to sustain the service. In order to address these inefficiencies serious attention must be given to travel demand management and increasing off peak utilization. As was shown in Tables 1 and 2 by improving the efficiency, operating subsidies can be significantly reduced. These can be redirected at capital investment in improving the public transport fleet and information. If the current bus system could attain the efficiencies achieved in

the 1960's, the current 46 million bus passengers per annum could be carried on a fleet of 170 buses opposed to the current peak fleet of over 600 buses.

Car users have been able to adjust their time of travel due to flexi times being introduced in the office environment, whereas factory workers, who are reliant on public transport, have not enjoyed this privilege and their standard 07:30 to 16:30 work day continues across the industry. Even within the peak there are vast fluctuations in demand with the public transport service that gets workers to their place of work at 07:30 being overcrowded while the following service, which would make them late being underutilized.

In order to implement travel demand management measures, it is necessary to firstly develop a thorough plan, which addresses the current mindsets and constraints. The second step is to consult with key stakeholders and based on their input, refine the plan. The third step is to introduce incentives to encourage spreading of the peak travel period. The fourth step is to introduce dissuatives and legislation to manage peak period travel demand. The final step is to monitor and review the situation and achievements.

5.4 Land-Use

Until the 1960's the land use development in Cape Town was very supportive of public transport with service largely concentrated on the relatively high density Main Road, Voortrekker Road and Sea Point corridors. This all changed with the implementation of the Group Areas Act which relocated communities to the periphery. With the introduction of freeways and the growth of car ownership, many communities and developments located themselves remote to the established public transport corridors. Even today the government's housing policy encourages single residential development on the periphery. This unsupportive land use has significantly increased the travel distance and the number of public transport routes required. The impact of this is best illustrated by comparing Cape Town with other city's which are successful with public transport. By comparison the length of the Klipfontein Corridor from Khayelitsha to Cape Town is in excess of 35km compared with the average corridor length in Curitiba of 12km. In order to serve its dispersed land use, Cape Town has over 700 bus routes with over 400 having only one bus trip during the peak period. In other words, *if you miss the bus you have to wait till the following day to catch the next bus.*

Although adjusting the road hierarchy, implementing public transport corridors and travel demand management can improve the efficiency of the public transport system, without a supportive land use the system will remain ineffective and financially unsustainable. It is essential that land use policies force development to take place in public transport corridors and that densification takes place to reduce travel distances.

6. CONCLUSION

The current transport planning philosophies come from an era of promoting private car travel. Where these planning philosophies made provision for public transport it was invariably within a private car dominated environment. This has contributed to the demise of public transport.

History has shown that South African cities once had efficient and effective public transport systems. In order to return to this situation, it is necessary to fundamentally rethink the current transport planning philosophies to truly embrace government's public transport first policy.

The following fundamental changes need to be undertaken:

- The road hierarchy needs to incorporate public transport corridors as a specific category.
- Public transport corridors need to be people friendly and include a wide range of activities and uses, which support the use and operation of public transport.

- Travel and demand management needs to be an integral component of all transport planning and taken seriously by all role players.
- Land use policies, especially the housing policies need to be changed to support public transport.

Perhaps the most difficult change required is that of people's mindsets, that the car is King.

7. REFERENCES

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BIOGRAPHY

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He has twenty five years post graduate experience in roads, transport planning and public transport. He has traveled extensively, experiencing public transport systems throughout the world.

He has authored numerous papers which have been presented both locally and internationally.

He is married, has three children and enjoys red wine and surfing.