INTER-CITY TRAVEL BETWEEN CAPE TOWN AND ATLANTIS CAN WE BRIDGE THE GAP?

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Die ontstaan en groei van Atlantis tot op hede, asook die beoogde ontwikkelingstempo tot na die einde van die eeu, word in hierdie artikel in oënskou geneem met verwysing na die beleid van dekonsentrasie en nywerheidsgroei. As gevolg van 'n beraamde ondervoorsiening van sekere tipes werksgeleenthede in Atlantis enersyds, maar andersyds ook vanweë normale interaksie tussen naasliggende stedelike komplekse, kan verwag word dat besondere vervoerbehoeftes tussen Atlantis en die Kaapse Metropolitaanse Gebied sal ontstaan. Afgesien van die vervoer van goedere, waarvoor 'n basiese padstelsel reeds bestaan en waarvoor daar ook 'n goedere spoorlyn in die vooruitsig gestel word, sal die interstedelike passasiersvervoer, en in besonder pendelverkeer, na verwagting besondere drastiese groei ondergaan. Die verwagte groei in interstedelike verkeersaanvraag en eienskappe met betrekking tot ritverspreiding en modusverdeling, word in besonderhede behandel. Die invloed van veral passasiersvervoer op die benodigde infrastruktuur tussen Atlantis en Kaapstad, en op stedelike ontwikkeling noord van die Kaapse Metropolitaanse Gebied word bespreek aan die hand van 'n vergelyking tussen busvervoer en spoorvervoer. 'n Oorsig word gegee van die finansiële implikasies van bus- en spoorvervoer, gebaseer op die voorspelde verkeersaanvraag. Ten slotte word gedagtes gewissel oor metodes om, te midde van 'n tekort aan finansies, die beskikbare infrastruktuur ten beste aan te wend om in die behoeftes te voorsien.

1. DEVELOPMENT OF ATLANTIS

In 1975 building work started at the spot where the future city of Atlantis, about 45 km north of Cape Town, is growing out of the sand dunes. This was a result of an intensive planning process which stretched over many years and was seen as a clear manifestation of the Central Government's policy of decentralisation. Since the creation of decentralised industrial development and job opportunities had high priority, immediate attention was given to the provision of about 578 ha of industrial land of which about 250 ha will have siding facilities. About 45% of the land with future siding facilities and 50% of that without siding facilities is developed at the present time or is in the process of being developed.

At the present time about 6 050 residential units in the first of six planned towns, namely Wesfleur, house about 35 000 people, while approximately 750 units are presently under construction. (*Figures as during January 1983.*)

During 1982 a draft report was completed in which consideration was given to the development of Town II, where the future central business district will be located. The overall development of Atlantis was again given some attention and several studies were undertaken to establish the desirable internal transportation system that has to come about and grow with the city. (*Plan Associates et al, 1981; Transport Research Centre, 1981; Scott and de Waal, 1982.*) Earlier in 1982 a study was also completed regarding the expected travel between Atlantis and the Cape Metropolitan Area and methods to deal with this demand. (*Bruinette et al, 1982.*)

Atlantis is being planned to accommodate a population of about 500 000 by the year 2020. Of this number Wesfleur and Town II will house 60 000 and 150 000 people respectively. Further industrial areas and other places of employment are also included in the planning.

Depending on the rate at which job opportunities can be created it is generally expected that there will be a growing imbalance between the demand and supply of jobs in Atlantis. About 201 000 workers are expected by the year 2020, while jobs will be available for about 122 000 people. Roughly 80 000 people will thus be depending on external job opportunities. Present indications are that the external jobs will primarily have to be found within the Cape Metropolitan Area with the concomitant long commuter distances and particular demands that will be placed on the transportation system between Cape Town and Atlantis.

Much has already been said and written about the desirability of developing Atlantis at such a distance from Cape Town. There are those who believe that the limited industrial potential of the Western Cape should not be divided by luring those industries that would have been advantageous to the Metropolitan Area to Atlantis, while a lot of industrial land is still lying vacant within the metropolis. The counter-argument is of course that it is necessary to stop the concentration of the population in the large metropolitan areas of the Republic and that successful deconcentration can only be brought about if a new growth point is far enough from the existing metropolis. Two conflicting questions are thus asked is this respect, namely

- is Atlantis not too far from Cape Town?
- is Atlantis far enough from Cape Town?

This paper endeavours to quantify the inter-city transportation demand between Atlantis and Cape Town and discusses methods to bridge the gap between the two future urban complexes through the establishment of an effective transportation system.

2. DEMOGRAPHIC INFORMATION

The growth of Atlantis depends on the establishment and development of housing and job opportunities. The supply of housing and the infrastructure associated with it is at the present time a function of the Department of Community Development which provides the finance while the Divisional Council of the Cape administers and executes the programme. As far as the provision of job opportunities is concerned, the private sector can play a very large role and quite a few incentives like the recent deconcentration point incentives have been announced by the Government to stimulate industrial development and the creation of job opportunities.

Notwithstanding these factors that may influence growth, the following figures are given as the official population projections as expected by the various authorities concerned. (*Table 1.*)

Previous studies have indicated that as soon as an inherent growth momentum is established after the end of a century, annual natural population growth of 2,03% – somewhat lower than the present 2,2% per annum – can result in a population by the year 2020 of much in excess of 500 000.

Some other demographic characteristics that have been used in a recent study (*Bruinette, 1982.*) to estimate population, employment etc., are given in Table 2.

Table 3 gives an estimate of the population, number of workers and employment expected to materialise at different stages to the year 2020. (*Bruinette, 1982.*)

The following figures show to what extent reality meets the estimates of Table 3. (*Figures provided by the Divisional Council of the Cape in December 1982.*)

	End of 1982	End of 1983
Housing units completed and occupied	6 042	6 827
Population on the basis of above	35 000	45 000
Local employment	13 000	16 500

Tabel 1 *Demographic Projections*

YEAR	POPULATION	YEAR	POPULATION
1982	25 000	1995	245 000
1983	40 200	2000	353 000
1984	55 100	2005	416 000
1985	68 400	2010	460 000
1990	136 300	2020	500 000

Table 2. *Demographic Characteristics*

Year	Persons per household	Workers per household	Job opportunities within Atlantis
1975	5,32	1,95	
1985	5,02	1,85	
1990			30 000
1995			45 000
2000	4,73	1,79	68 200
2005			86 560
2020			121 960
2025	4,36		

Table 3 *Atlantis population, workers and employment: 1982-2020*

Year	Population	Workers	Employment	
			Internal	External
1982	25 000	9 180	7 127	2 053
1983	40 200	14 848	9 986	4 862
1984	55 100	20 323	12 845	7 478
1985	68 400	25 243	15 704	9 539
1986	78 057	28 823	18 563	10 260
1987	89 602	33 219	21 422	11 797
1988	102 854	38 078	24 281	13 797
1989	118 066	43 737	27 140	16 597
1990	136 300	50 697	30 000	20 679
1991	158 040	58 821	33 000	25 821
1992	179 780	67 187	34 000	31 187
1993	201 520	75 206	39 000	36 206
1994	223 260	83 665	42 000	41 665
1995	245 000	91 684	45 000	46 684
1996	266 600	100 184	49 640	50 544
1997	288 200	100 150	54 280	53 870
1998	309 800	116 746	58 920	57 826
1999	331 400	125 414	63 560	61 854
2000	353 000	133 406	68 200	65 206
2001	370 000	140 426	71 872	68 554
2002	385 010	146 745	75 544	71 201
2003	399 000	152 735	79 216	73 517
2004	409 000	156 356	82 888	73 468
2005	416 000	159 377	86 560	72 817
2010	460 000	108 352	101 250	79 102
2020	500 000	201 136	121 960	79 176

The last column in Table 3 will receive specific attention in this paper, namely the number of workers that will have to find employment outside of Atlantis and particularly in the Cape Metropolitan Area.

3. INTER-CITY TRAVEL DEMAND

Present traffic volumes show a net influx of vehicles to Atlantis during the morning peak period. More work trips therefore occur to Atlantis than from Atlantis at the present time. Present development is still very limited though, and the establishment of a couple of large industries like ADE and others, could have a marked influence on the flow of workers. Table 3 does show that during 1982 approximately 22 percent of the Atlantis residents had to find work outside Atlantis. With an increasing supply of housing, coupled with natural growth and migration to the new city, it is generally expected that a relatively large fraction of the inhabitants of Atlantis will have to find work elsewhere. The recent Cape Metropolitan Transportation Study investigated two scenarios according to which 95 percent and 20 percent of the workers respectively would have to find employment outside of Atlantis. Table 3 shows that, based on the demographic characteristics of Table 2, by 1990 this percentage might be between 40 and 50 percent.

Due to the diversity of economic and social activities of the inhabitants, two neighbouring large cities will experience a great deal of interaction. Inter-city transport and the demand for effective transportation systems between such cities are therefore commonplace. In the case of Atlantis and the Cape Metropolitan Area a couple of special factors are of interest:

- The ethnic composition of the two centres is different. The Cape Metropolitan Area has a heterogeneous composition while Atlantis will be fairly homogeneous. This fact not only influences the type and degree of inter-city social interaction, but also the total inter-city transport.
- Because of the expected distribution of employment opportunities in the region, it is foreseen that just about all the external Atlantis workers will have to travel to the Cape Metropolitan Area. These workers – ethnically homogeneous and economically of the middle to lower income groups will have particular needs in respect of an efficient inter-city transportation system.
- During the next few decades Atlantis will have to undergo almost forced development and will in the process have to compete with the old established Cape Metropolitan Area. The latter is still relatively deprived of industrial development on which progress in Atlantis so desperately depends. The Metropolitan Area will therefore provide strong competition for winning new industries where its own growing population from places like Mitchells Plain could find employment.
- In the light of the above the general statement regarding Cape Town and Atlantis can possibly be made, namely that deconcentration of the particular population group may have been necessary and desirable, but that deconcentration of industries from the Western Cape has not yet become necessary.

The latter is of course one of the reasons why it is generally expected that the supply of employment opportunities in Atlantis will not keep pace with the supply of workers. Based on the findings of a recent investigation of future inter-city travel (*Bruinette et al, 1982.*)

Table 4 *Expected inter-city commuter travel between Atlantis and the Cape Metropolitan Area*

YEAR	PEAK PERIOD		PEAK HOUR	
	Public Transport (Person trips)	Private Transport *(Person trips)*	Public Transport (Person trips)	Private Transport *(Vehicle trips)*
1982	1 930	123	1 381	40
1983	4 507	355	3 223	116
1984	6 910	568	4 941	185
1985	8 680	859	6 206	208
1986	9 357	903	6 690	294
1987	10 570	1 227	7 558	406
1988	12 265	1 532	8 769	499

Table 4 shows estimates of future commuter travel between Atlantis and the Cape Metropolitan Area. The share of public transport is expected to drop from the present 93 percent to about 75 percent in 2020. This conclusion is based on a modal split model which used perceived travel costs to the user as its basis.

The tremendous extent of the Atlantis development within the next few decades and the effect this will have on inter-city travel are shown in Table 5. The influence this might have on the inter-city transportation system is discussed in the next section. It should be borne in mind that these commuter trips will have to be catered for in the Cape Metropolitan transportation system. Based on the figures in the foregoing tables, we are talking of about 44 000 one way person trips per day by 1990 which could grow to about 137 000 in 2000 and 166 000 by the year 2020.

The distribution of these trips within the Metropolitan Area cannot be accurately established at this time. If by way of illustration, it is expected that the Atlantis workers will distribute themselves in the Metropolitan Area in the same manner as was found for all Coloured workers in the Metropolitan Transportation Study (*Van Niekerk et al, 1979.*), then Figures 1 and 2 diagrammatically show the distribution of these workers in 1985 and 2000 respectively. The marked increase in numbers within a period of 15 years can be seen in the figures. (Note: Because of the fact that the vast majority of these trips will probably be by public transport the node in Figures 1 and 2 is shown approximately at Chempet from which distribution of trips can relatively easily take place.)

Table 5 *Inter-city travel*

YEAR	PEAK PERIOD		PEAK HOUR	
	Public Transport (Person trips)	Private Transport *(Person trips)*	Public Transport (Person trips)	Private Transport *(Vehicle trips)*
1989	14 572	2 025	10 419	660
1990	18 048	2 649	12 904	864
1991	22 421	3 400	16 031	1 109
1992	26 758	4 429	19 125	1 444
1993	30 848	5 358	22 056	1 747
1994	35 249	6 416	25 203	2 092
1995	39 215	7 469	28 039	2 435
1996	42 305	8 239	30 247	2 686
1997	44 604	9 266	31 892	3 021
1998	47 706	10 120	34 109	3 299
1999	50 906	10 948	36 398	3 569
2000	53 143	12 063	37 997	3 933
2001	55 803	12 751	39 899	4 157
2002	57 530	13 671	41 135	4 457
2003	59 328	14 189	42 419	4 624
2004	58 774	14 694	42 023	4 791
2005	58 181	14 636	41 600	4 772
2010	61 541	17 561	44 002	5 724
2020	59 936	19 240	42 854	6 273

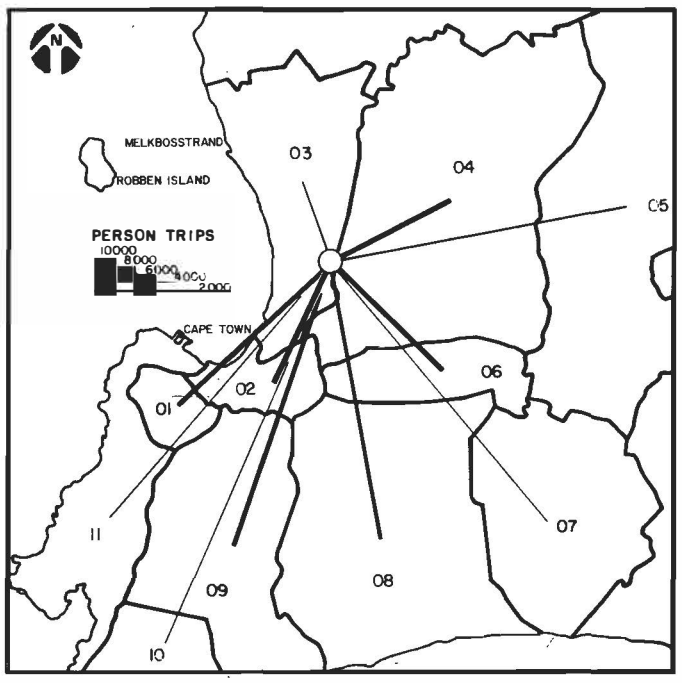

Figure 1 Distribution of Atlantis' external workers – 1985

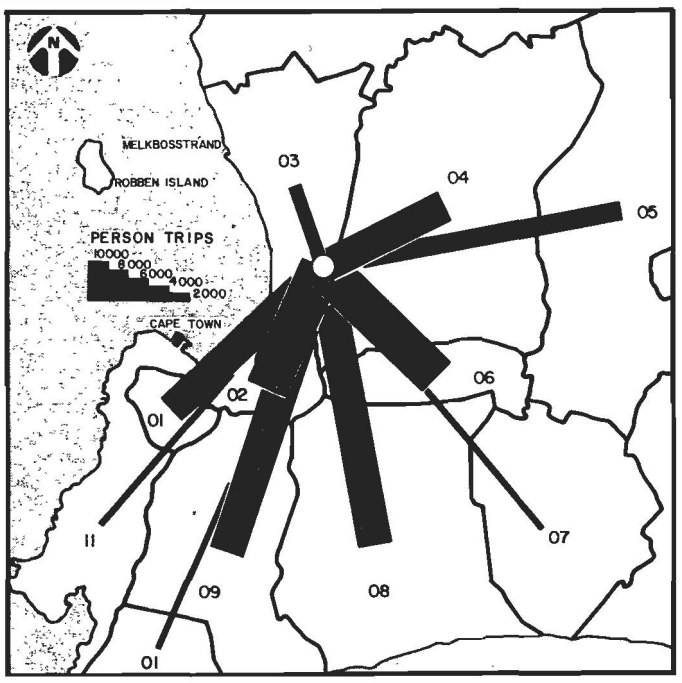

Figure 2 Distribution of Atlantis' external workers – 2000

4. URBAN DEVELOPMENT NORTH OF CAPE TOWN

Following the original framework plan for Atlantis prepared by the Divisional Council of the Cape in October 1975, the ensuing development of the first residential and industrial phases at Atlantis, as well as the establishment of the Nuclear Power Station at Koeberg, a guide plan committee under the auspices of the Office of the Prime Minister prepared a guide plan for Atlantis and environs in 1980 in which proposals are made regarding the future overall land use pattern for the area between Milnerton and Atlantis. (*Office of the Prime Minister, 1981.*) Several physical formative elements, such as wind blown sand, sand dunes, clay deposits, agricultural potential and existing developments, such as the Nuclear Power Station were taken into account in formulating the future land use pattern. Regarding the power station the Atomic Energy Board, in conjuction with the Divisional Council of the Cape, has ruled that:

- The future population within a radius of 20 km from the Power Station should not exceed 650 000.
- It is preferable not to have any further urban development within a radius of 5 km from the Power Station.
- Evacuation safety regulations require specific standards with regard to overall population densities.

The guide plan assumes a Coloured/White population composition of about 73:27 by the year 2020, resulting in population projections as given in Table 6.

Table 6 *Expected ultimate population in guide plan area*

Area	Population projected	Percentage of total
White residential area [a]	180 000	27,7
Coloured residential area [b]	460 000	70,8
Mamre and Pella	10 000	1,5
Total population	650 000	100,0

(a) Including existing development at Melkbosstrand and Bloubergstrand.
(b) Including existing development at Atlantis. (Subsequent projections put the 2020 Coloured population at 500 000)

The planned urban development at Atlantis will cater for the expected Coloured population indicated in Table 6. A future White urban area has been identified comprising about 6 000 ha north of the Milnerton municipal area and east of the planned Chempet-Atlantis railway line. In the short term no rapid White urban development is foreseen in this area, since available residential land in Milnerton has not yet been utilized to capacity. In the medium to long term, however, White urban development is expected to occur northwards from Milnerton and eastwards from Melkbosstrand into the area demarcated for this purpose in the guide plan. Large areas of land within this demarcated area are at present owned by the Divisional Council of the Cape and the Garden Cities Development Company. Garden Cities have indicated that they do not intend undertaking any development in this area for approximately the next 7 years.

Notwithstanding the commuter travel demand between Atlantis and the Cape Metropolitan Area any future urban development north of Milnerton will create a demand for passenger travel to and from main centres of employment within the Metropolitan Area. Road infrastructure and public transport facilities planning for the region should take cognisance of this future travel demand. It is expected that commuter travel peaks for this area will more or less coincide with the passage of peak Atlantis commuter trips, thereby adding in full to the capacity demand placed on the transportation system. High population densities commensurate with the requirements of public mass transit will almost certainly not be allowed within a 20 km radius of the Nuclear Power Station. Serving this area by rail is therefore highly unlikely and reliance should probably be placed on buses as public transport mode. If a passenger railway line to Atlantis is built, a bus feeder system to intermediate stations can be introduced in this area. It should be borne in mind though, that any intermediate stops will detract from the effectiveness and attractiveness of an already long line haul route between Atlantis and the Cape Metropolitan Area.

Too little quantitative information with regard to the phasing of urban development north of Cape Town is available at this time to accurately evaluate its influence on inter-city transport. It is a factor though, that will have to be reckoned with in planning the future infrastructure requirements.

5. INFRASTRUCTURE FOR INTER-CITY TRANSPORT

5.1 Alternative modes

Due to the expected extent and composition of commuter transport as shown in Table 4 it is clear that a high capacity public transport system between Cape Town and Atlantis will be necessary in the medium to long term. This fact already limits the number of alternatives that could be considered. A light rail system for example, while initially having sufficient capacity, will not be able to cope with the expected demand over the long term. Two proven systems that should seriously be considered for this particular service are heavy passenger rail and an integrated line haul bus service.

5.2 Bus service

During the next few years a bus service will no doubt be the most efficient and economical mode for this commuter service. The basic infrastructure already exists and relatively little capital will be needed to extend the service. Furthermore this service is flexible and can adjust to demand while still rendering an effective service outside peak periods.

Over the long term however, a bus service will only be able to reach the capacity needed if special loading facilities and reserved bus lanes are available. These facilities will be capital intensive and will still not be a guarantee that the required capacity will always be available during peak periods.

If only a bus service is provided the extent of the service at different stages to satisfy the demand is given in Table 7.

Table 7 *Required long term bus service* (Without passenger rail)

Year	One-way Peak Hour bus trips	Equivalent vehicle units [a]	Required vehicle fleet Regular [b]	articulated [c]
1982	24	72	25	—
1983	54	162	59	—
1984	83	249	90	—
1985	104	312	113	57
1986	112	336	122	61
1987	126	378	138	69
1988	146	438	160	80
1989	174	522	190	95
1990	216	648	235	118
1991	268	804	292	146
1992	319	957	348	174
1993	368	1 104	402	201
1994	421	1 263	459	230
1995	468	1 404	510	255
1996	505	1 515	551	276
1997	532	1 596	581	291
1998	569	1 707	621	310
1999	607	1 821	663	332
2000	634	1 902	692	346
2001	665	1 995	726	363
2002	686	2 058	749	375
2003	707	2 121	772	386
2004	701	2 103	765	383
2005	694	2 082	757	379
2010	734	2 202	801	401
2020	706	2 118	780	390

(a) Taken as 3 per regular bus for capacity purposes
(b) Regular buses carrying 60 passengers on average
(c) Articulated buses carrying 120 passengers on average

5.3 Passenger rail

A planned goods line between Chempet, north east of Milnerton and the industrial area in Atlantis is at present under construction and the South African Transport Services intend completing the line by December 1984. Figure 3 shows the routes of the line diagrammatically. This facility is being planned as a guaranteed goods line and no facilities other than the basic track work are being provided.

If the commuter traffic between Cape Town and Atlantis is to be carried by a passenger rail service, four possible operating alternatives should be considered. These alternatives have been investigated in detail in a recent study of inter-city travel between Cape Town and Atlantis (*Bruinette et al, 1982.*) with regard to travel time, capacity, infrastructure requirements, etc. Ultimately the alternatives boil down to the following:

- Alternative 1: Diesel traction over single line with three well placed loops. Train control through semaphores.
- Alternative 2: Diesel traction over single line with three loops. Train control through di-directional axle counters allowing 7 minute headways.
- Alternative 3: As previous alternative but with di-directional colour light signalling and track circuitry allowing three minute headways.
- Alternative 4: Electrified line with three loops which could later be upgraded to a double electrified line. Colour light signalling and track circuitry allowing three minute headways.

The estimated maximum capacity of these four alternatives together with the expected traffic demand are shown in Table 8.

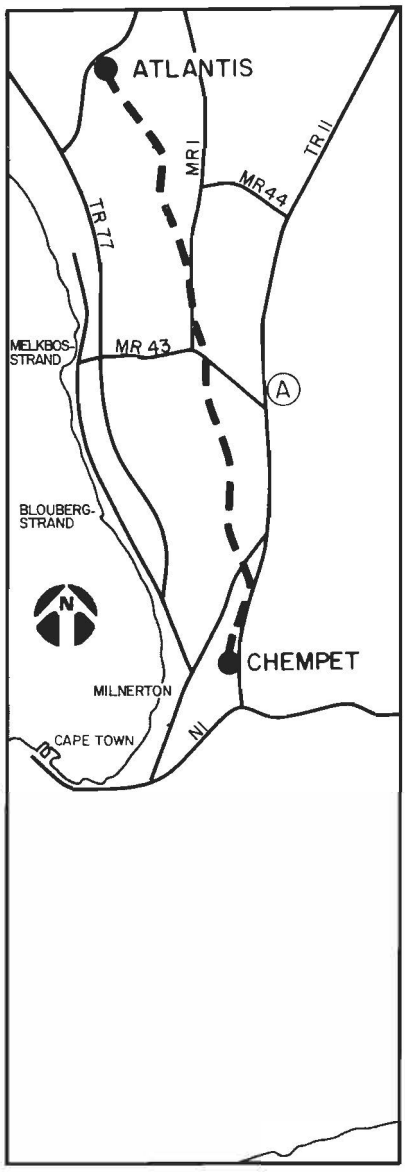

Figure 3 Present road system and rail route

Table 8 *Practical capacity of passenger rail alternatives*

Year	Expected passengers		Ultimate peak hour capacity			
	Peak Period	Peak Hour	Alt 1	Alt 2	Alt 3	Alt 4
1985	8 680	6 206	(5 960)[a]	(5 960)[a]	10 728	11 000[b]
1990	18 048	12 904			(10 728)[a]	15 400[c]
1995	39 215	28 039				41 800[d]
2000	53 143	37 997				41 800
2005	58 181	41 600				41 800
2010	61 541	44 002				41 800[e]
2020	59 936	42 854				41 800

(a) Inadequate capacity
(b) One loop only
(c) With three loops
(d) After doubling of line
(e) Possibly inadequate, but passenger demand estimate over long term very speculative.

6. ROAD SYSTEM

6.1 Present planning

Apart from the specific requirements of Atlantis workers, as discussed in the previous sections, it is clear that two neighbouring large urban complexes should have effective connecting routes to handle the large diversity of inter-city trips. The present road system is shown in Figure 3 and primarily consists of three north south routes, namely

- The high standard West Coast Road (TR 77) – single carriageway, two lanes with paved shoulders.
- The low standard Mamre Road (MR 1) – single carriageway, two lanes with gravel shoulders.
- The good standard Malmesbury Road (TR 11) – recently reconstructed to single carriageway, two lanes with paved shoulders north of point A (Fig 3) and double carriageway south of point A.

Apart from the further upgrading of these routes (except for MR 1) to double carriageway or freeway standards, a further north south freeway is anticipated in the long term. This route will be more or less parallel to the railway line up to a point opposite Melkbosstrand, where it will link with the present Malmesbury Road from where it will follow the latter route as a freeway. Several east west routes are also anticipated for the area between Milnerton and Atlantis while the internal road and street system of Atlantis has been the subject of various recent studies and is as yet not finalised.

6.2 Influence of rail transport on road system

If a bus system is to handle the long term commuter traffic between Atlantis and Cape Town the figures in Table 7 show the potential peak hour demand that will have to be carried by the road system. Under this assumption a detailed analysis has recently been made of future north south capacity requirements of a road system between Cape Town and Atlantis. (*Bruinette et al, 1982.*) The results are summarized in Table 9. The analysis was repeated with the assumption that the present bus service will only expand up to 1985 and will then be replaced by a passenger rail service. The requisite road capacity in this case is shown in Table 10.

Figure 4 qualitatively shows the influence a rail passenger service might have on road traffic volumes. The influence on the road system may be summarized as follows:

- Much lower heavy vehicle volumes (about 3 to 5 percent as against 13 to 18 percent during peak hours) will influence the design lifetime and maintenance required for existing and new road facilities.
- The new north south freeway mentioned above, may be required quite a few years later.

Both these aspects will have far-reaching financial implications which will have to be taken into account in evaluating the capital cost associated with the passenger rail line.

Table 9 *Requisite road capacity without rail transport*

Year	Equivalent		Possible composition [a]	
	freeway lanes	arterial lanes	freeways	arterials
1990	0,8	1,2	—	1
1995	1,9	2,8	—	2
2000	2,9	4,4	1	2
2005	3,6	5,3	1	2
2010	4,3	6,5	1	2
2020	5,5	8,3	1	3

(a) Both road types assumed as 4-lane double carriageway with access control. One freeway for every 2 arterials operating at capacity.

Table 10 *Requisite road capacity with rail transport*

Year	Equivalent		Possible composition [a]	
	freeway lanes	arterial lanes	freeways	arterials
1990	0,7	1.0	—	1
1995	1,6	2,4	—	2
2000	2,5	3,8	—	2
2005	3,1	4,7	1	2
2010	3,9	5,8	1	2
2020	5,0	7,5	1	3

(a) Both road types assumed as 4-lane double carriageway with access control. One freeway for every 2 arterials operating at capacity.

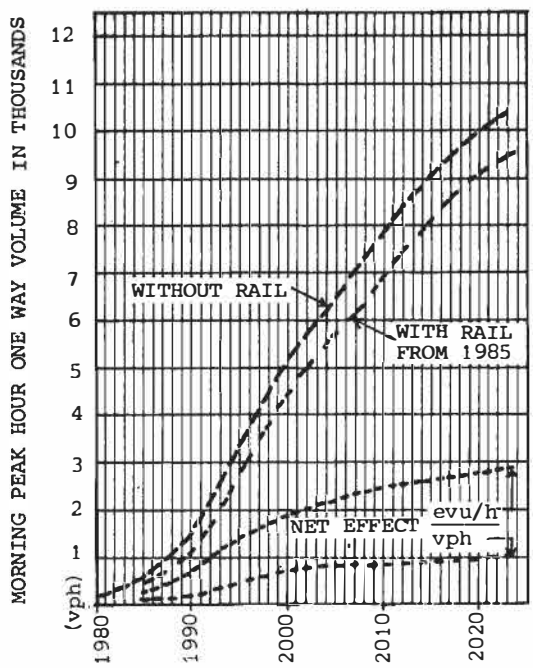

Figure 4 Influence of passenger rail line on road traffic

7. ECONOMIC AND FINANCIAL ASPECTS

The economic and financial analysis of alternative transport modes for handling the inter-city travel between Cape Town and Atlantis is a complex process. Apart from direct capital and maintenance costs, aspects like congestion costs, accident costs, travel time, sources of energy and the financing and subsidizing policy of the authorities involved have to be considered. In this paper no detail attention can be given to these aspects.

Recent detailed analysis resulted in the following figures (Table 11) for the requisite fare per journey to cover the full financial cost of the service. (*Bruinette et al, 1982.*)

At the present time fares for equivalent journeys per train and bus respectively would be about R0,24 and R0,52. The balance of the cost would have to be made up by subsidies. Recent changes in attitude regarding the subsidizing of public transportatin services render predictions of the requisite subsidies speculative. The above figures are shown graphically in Figure 5. The long term tendency, namely that, for this particular case, rail transport could be more economical than bus transport from about 1994, is obvious.

Table 11 *Fare per journey*

Year	Fare per journey (September 1981 Rand)	
	Rail transport	Bus transport
1985	R0-95	R0-81
1990	R0-87	R0-73
2000	R0-63	R0-69
2005	R0-61	R0-67

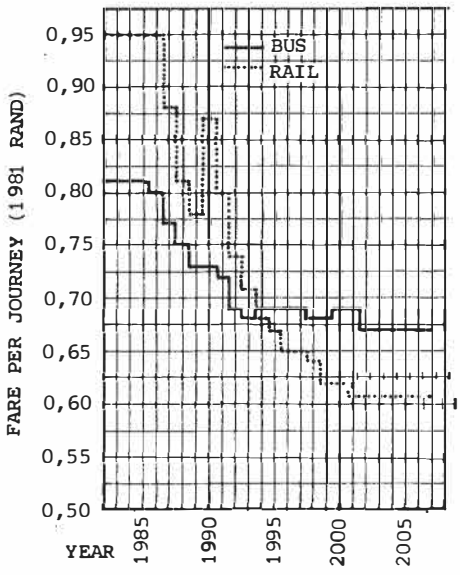

Figure 5 Fare per journey to cover full financial cost

8. CONCLUDING REMARKS

The development of Atlantis and the expected shortage of adequate local job opportunities will have a large influence on inter-city travel between Cape Town and Atlantis. Due to the nature of this demand and the capacity requirements over the long term, it is desirable that the planned goods line to Atlantis should be converted to a passenger line as soon as possible. The minimum infrastructure that would initially be required is a single electrified line with colour light signalling enabling trains to run at three minute headways during peak periods.

Notwithstanding the need and possible implementation of a passenger rail line several road improvements will be necessary in this area before 1990. In particular the doubling of the West Coast Road (TR 77) will have to receive serious attention. The possibility of future urbanisation north of Milnerton underlines the urgency of improved transportation facilities north of the Metropolitan Area. The introduction of a passenger rail line may have a marked influence on the programming of certain road facilities as well as on traffic conditions and road pavement requirements in general.

From the foregoing it is clear that the infrastructure between Atlantis and the Cape Metropolitan Area will have to receive a lot of attention and capital during the coming years. Capital for road and other transportation infrastructure facilities has been in short supply during the past few years. Recent announcements with regard to additional funds from income on petroleum products may bring some relief in certain problem areas but it will not be sufficient to end the general shortage of funds.

Under these conditions methods will have to be found to make the best use of the existing infrastructure and also to be innovative with regard to the provision of new transport facilities. Some thoughts in this respect are the following:

- There are indications that the West Coast Road (TR 77) will come under early pressure. This route has high geometric standards with two traffic lanes and paved shoulders. From a capacity viewpoint though, it is re-

garded as a two lane road while the shoulders are frequently used by moving traffic. At the moment no method exists to adequately determine the theoretical capacity of a facility used in this way. Furthermore several legal aspects are involved in allowing the use of the shoulder by moving traffic. In the near future it may be necessary to use the West Coast Road as a four lane facility. Accomplishing this in a safe and effective manner instead of earlier doubling of the facility poses several interesting challenges to the profession.

- The handling of increasing traffic volumes from the north at key points in the metropolitan transportation system will require effective measures at transfer stations, junctions and intersections, interchanges, etc. to facilitate optimum use of the facilities. An action programme similar to TOPICS (Traffic Operation Program to Increase Capacity and Safety) which received a lot of attention in the USA about ten years ago, could well be introduced in this case.

- Ways and means to control transportation demand in terms of time, place and mode should be investigated through the strategies developed during the past few years for different types of corridors and road systems as part of the transportation system management programs (TSM). Control strategies will have to receive early attention to ensure a balance between traffic demand and capacity at all times.

- It is imperative that the necessary funds will have to be found to introduce the passenger rail service as soon as possible. Innovative ways and means of financing as well as economic but efficient implementation will be necessary. Leaving the bus service in a state of uncertainty and allowing expansion of the service (or lack of expansion), will introduce inefficiencies in the transport system which cannot be afforded in the light of present political and economic realities.

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