

RING RAIL DEVELOPMENT PROJECT: GREATER PRETORIA METROPOLITAN COUNCIL

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1. INTRODUCTION

The Ring Rail Development Project is very unique, from many perspectives. It combines various disciplines with the view of facilitating economic and spatial development. However, the transport system – due to its form-giving characteristics - is the backbone of this spatial structure, using an amended corridor development approach.

The Ring Rail project is, therefore, an urban corridor with a difference. It uses the Moving South Africa Strategy as point of departure, focussing on an area which already shows existing corridor-like characteristics and which is already feasible without substantial investment. As this is one of the strongest existing corridors in the Greater Pretoria area, the Metropolitan Council considers it as a *Flagship Project*.

The basis of the Ring Rail is the commuter rail system running around the Pretoria Inner City Area. However, modes of transport were considered, using the rail as the core of an integrated multi-modal transport system.

One of the unique aspects of the Ring Rail project is that, although public transport is the basis, a holistic and integrated approach was used, where land-use and property development, together with social and economic development, was given as much attention as the transportation component.

The Ring Rail Project was initiated by the Greater Pretoria Metropolitan Council in 1998, after being identified as an important element of the transport system by a number of other transport and land-use planning projects.

One of the main motivators for this study was that local government can no longer afford to serve the continued urban sprawl with all municipal services, and that the Ring Rail provides the opportunity for achievable densification and corridor development.

The project brief of Phase 1 was to assess the existing situation in terms of land-use, transportation and socio-economic indicators, and to identify at least three viable projects to set the development process in action. As part of this phase, a number of strategies and business plans were proposed.

The project has now entered Phase 2 focussing on the implementation plan.

2. BACKGROUND TO THE STUDY

The study area is focused on the Ring Rail Area, which is situated in the **heart** of Pretoria as shown in **Figure 1** but, the wider implications on Greater Pretoria and even Gauteng Province were taken into consideration as the broader secondary study area.

The Ring Rail Development Project not only gave the GPMC the opportunity to undertake a truly integrated study, but it would eventually contribute towards the overall improvement of the quality of life of all the residents in the GPMC area.

3. ADVANTAGES OF THE RING RAIL PROJECT

The optimal utilisation of the Ring Rail Development project will lead to:

- ◆ GPMC growing into a fully-fledged Metropole with a proper metropolitan transport system, not only offering long-distance accessibility, but also internal mobility required for economic development.
- ◆ The Ring Rail fulfilling its role as a significant form-giving element to facilitate land-use and transport integration, particularly with the aim to facilitate densification.

Furthermore the Ring Rail Development project will lead to:

- ◆ Upliftment of the poor in Pretoria
- ◆ Integration (functionally and socially) of the historically disadvantaged communities into the urban fabric
- ◆ Achievement of economic development
- ◆ Promotion of public transport
- ◆ Modal integration
- ◆ Urban regeneration and revitalisation
- ◆ Densification and infilling

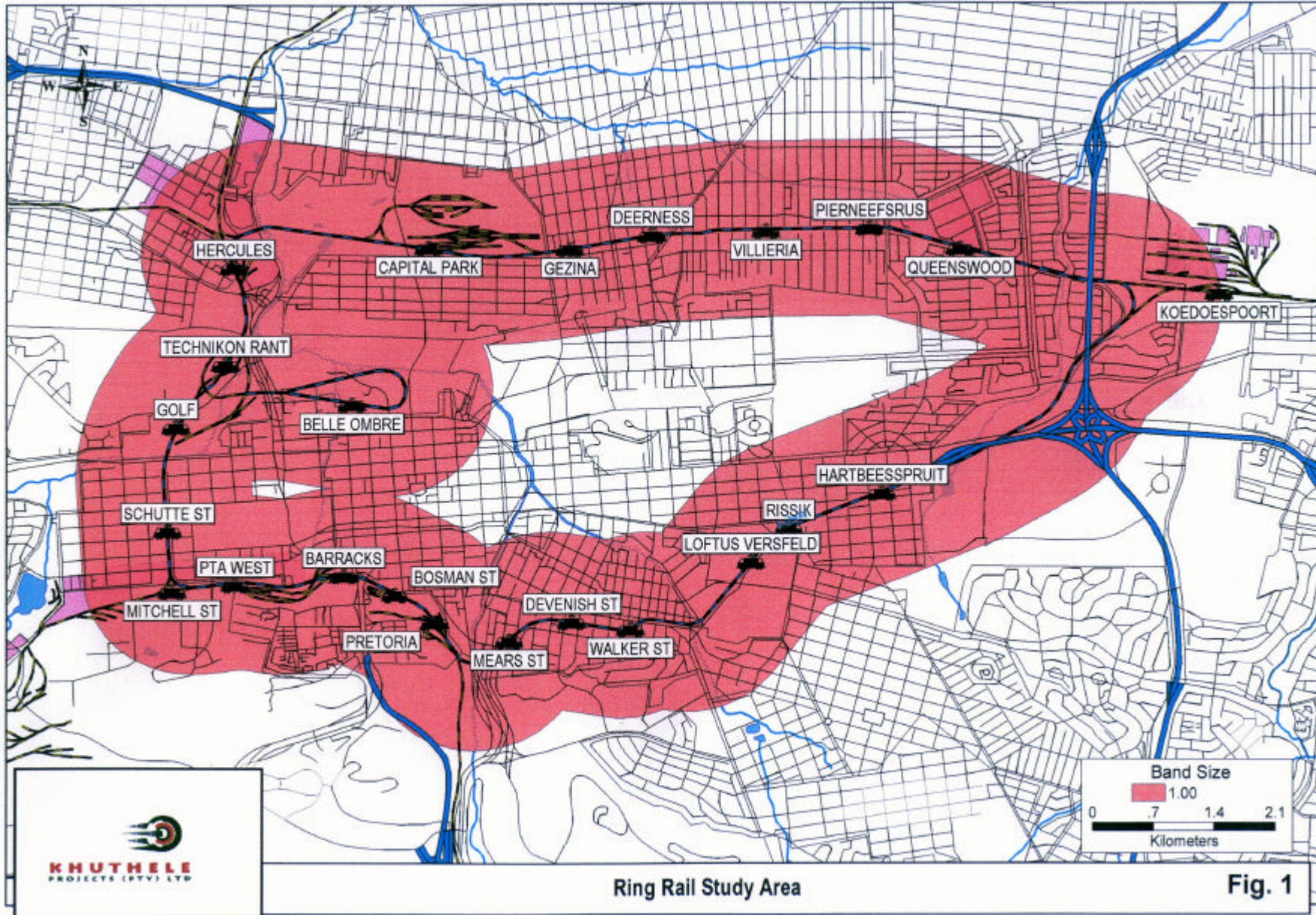
4. DESCRIPTION OF THE RING RAIL CORRIDOR

From the situational assessment it was evident that many elements relating to this strategy are already in place. An estimated 400 000 people (\pm 22% of the total population of the GPMC) live within 1 kilometre of the rail network, and 110 000 live adjacent to the Ring Rail.

About 147 000 job opportunities in Greater Pretoria are directly accessible (within walking distance) from the rail system, of which approximately 110 000 (more than 36%) lie around the Ring Rail.

The following existing social facilities are located in close proximity to the 23 stations:

- ◆ Six hospitals
- ◆ 15 primary schools
- ◆ 15 secondary schools
- ◆ Three universities, the Technikon and a technical college
- ◆ Fresh-produce market
- ◆ Two regional sports stadiums (Loftus and the Pilditch)
- ◆ Several tourist destinations



Ring Rail Study Area

Fig. 1

5. ELEMENTS OF IMPORTANCE IN THIS STUDY

A number of key success factors were identified and considered, including the following:

| KEY SUCCESS FACTORS | |
|----------------------------|--|
| ◆ | An effective institutional structure considerations, with involvement and buy-in of main role players, and clear delimitation of responsibilities. |
| ◆ | Link the Ring Rail System functionally with the regional economy and the social fabric, concentrating on the following: <ul style="list-style-type: none"> ▪ Improved linkage with the existing destinations ▪ Create new destinations along the Ring Rail System ▪ Improve on the rail operational aspects to serve the destination better. ▪ Linkage with major developments, eg Menlyn, Brooklyn, Hatfield and Inner City |
| ◆ | Holistic developmental approach and integration of land-use and transportation |
| ◆ | Modal integration with road transport and private car, as well as cycle and pedestrians |
| ◆ | Acceptable service levels |
| ◆ | Sustainable Public-Private Partnerships and other funding mechanisms |
| ◆ | Develop incentives for appropriate developments in close proximity to the Ring Rail System. |
| ◆ | Identification of catalytic projects |
| ◆ | Address the poor image of the rail system in general. |

The key success factors are therefore geared towards improving the quality of life of the people living in the Greater Pretoria area. Improved quality of life is based on the improvement of the social, economic and the physical environments.

The Situational Analysis of the study identified the following opportunities.

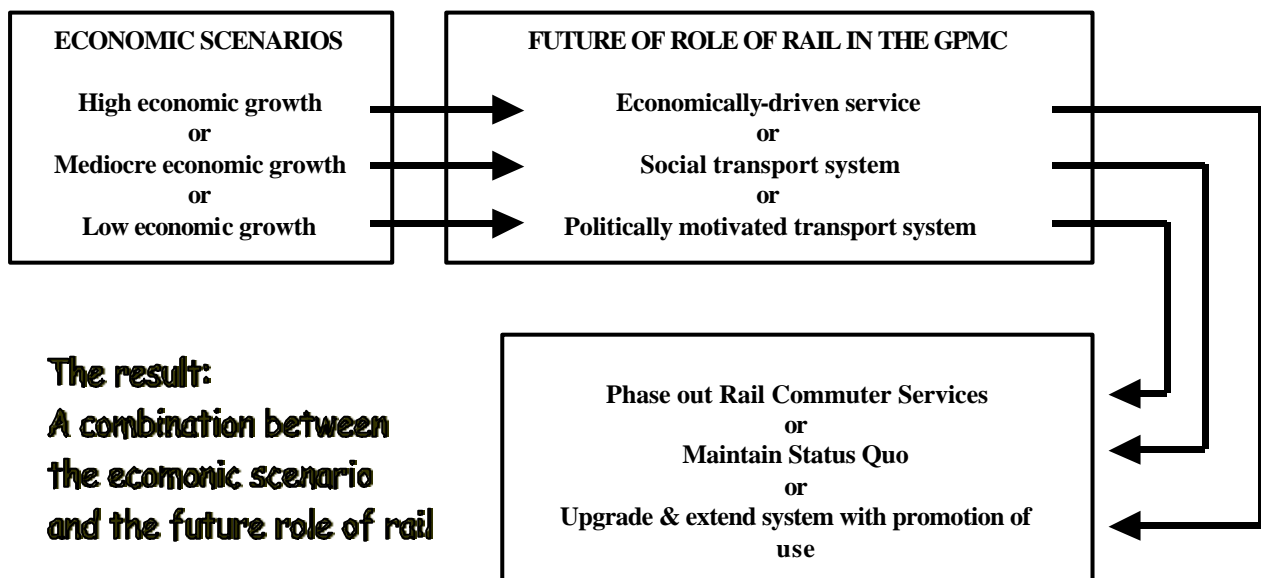
| Functional Area | Strengths | Opportunities |
|-------------------------------|--|--|
| Economic and Financial | <ul style="list-style-type: none"> • Most economic activity nodes accessible to rail system. • Relative low transport cost on rail as compared to road transport. | <ul style="list-style-type: none"> • Possible nodes for development at stations have been identified. • Rail infrastructure already available and can be optimally utilised. |
| Land Use | <ul style="list-style-type: none"> • Multiple origins and destinations (residential areas/activity nodes). • Links with major national facilities (e.g. Loftus Versveld / Pilditch / Universities / Technikon). | <ul style="list-style-type: none"> • Opportunities for densification, redevelopment, infill, rejuvenation. • Opportunity for property development close to some existing stations. • Can achieve concentration for appropriate land-use developments. |
| Institutional | <ul style="list-style-type: none"> • Strong government sector is present in the Pretoria CBD. | <ul style="list-style-type: none"> • Transport policy and proposed legislation promotes the use of public transport. • Vacant government owned land located next to railway line. • Establishment of a Transport Authority. • Mega City can make management easier • IDP/ITP co-ordination and integration. |
| Transport | <ul style="list-style-type: none"> • Excellent transport infrastructure. • Fair road public transportation system. • Reliability is very good (although the cancellation of trains in periods of low frequency has a major impact). • Relative good cost coverage. | <ul style="list-style-type: none"> • Modal integration potential. • Transport / land-use and property development integration. • Spare capacity on the rail system. • Service delivery improvements. • Availability of infrastructure at stations. • Only minor investment needed to achieve certain developments. |
| Socio-political | <ul style="list-style-type: none"> • Serves low-income areas located | <ul style="list-style-type: none"> • High percentage of young people living |

| Functional Area | Strengths | Opportunities |
|-----------------|---|--|
| | outside Ring relatively well. <ul style="list-style-type: none"> • Low-income areas have access to full range of urban functions along the Ring. | along the Ring. <ul style="list-style-type: none"> • Integration corridor can be achieved. • Institutional (subsidised) housing for low-income can be accommodated in vicinity of stations on the Ring Rail. |

6. ARRIVING AT A STRATEGY FOR THE RING RAIL

An extremely difficult but essential aspect of this study was to consider the future role of rail transport as part of the metropolitan transport system. On the one side of the spectrum, even the total phasing out of rail commuter transport was considered. This was done in collaboration with the preparation of the Gauteng Rail Development Strategy. It was found that rail will have to play an important role in the future, as motivated later in this paper.

The following figure (Figure 2) gives an indication of the dynamics of this complex situation:



The study concluded that there is a conflict between the economic needs and the current trend in public transport in the Greater Pretoria area. In order for the Ring Rail Development to reach its full economic potential, development growth should be facilitated by - amongst others - improvement of rail transport services. Furthermore, a method of practical implementation had to be developed through the strategies which were formulated.

The vision statement for the Ring Rail Development reads as follows:

A SAFE, SECURE, SUSTAINABLE AND USER FRIENDLY ENVIRONMENT THAT IMPROVES THE QUALITY OF LIFE OF THE RESIDENTS OF GREATER PRETORIA BY OPTIMISING THE ECONOMIC POTENTIAL AND GIVING THEM ACCESS TO A FULL COMPLEMENT OF URBAN FUNCTIONS IN THE HEART OF PRETORIA.

The gap between the economic and operational reality, and the future vision for the Ring Rail Development Project had to be managed very carefully.

A **Turn Strategy** is required to move from the trend, towards developments aimed at the Future Vision. The proposed process is based on the following strategies, as shown in **Figure 2**:

- (1) Strategies to satisfy the needs of existing rail passenger transport users and to discourage them from choosing other modes of transport.
- (2) Strategies to attract choice users, and users who under improved circumstances, would make use of public transport, but who – due to various distortions – do not do so at present.
- (3) Attract property developments (such as residential, retail, office) to the station precincts.

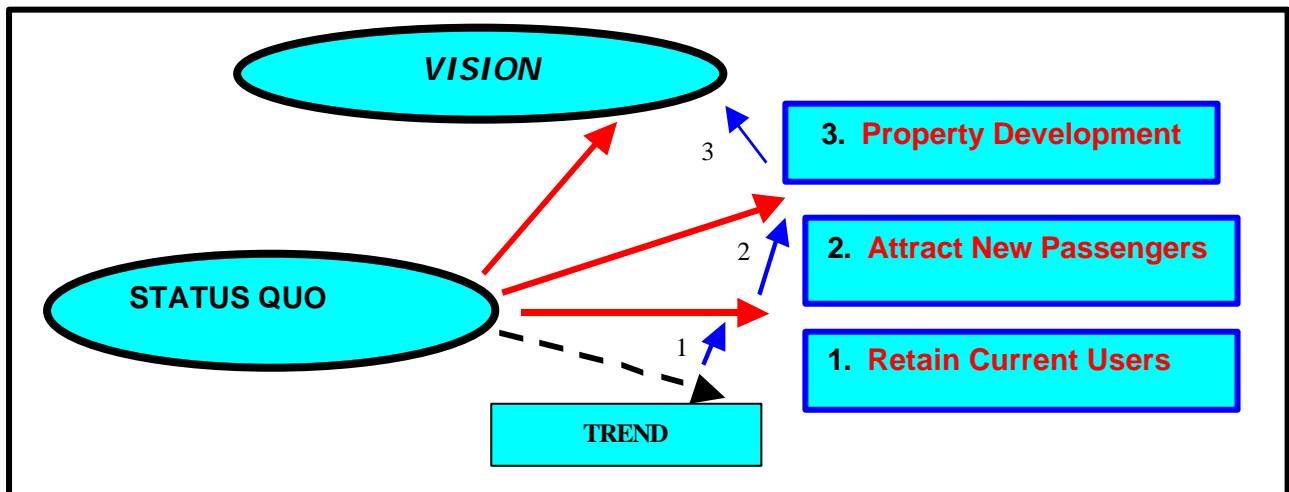


FIGURE 2: TURN STRATEGY

Although these three groups of strategies should be addressed simultaneously, note should be taken of the relative importance of these, as the one builds onto the other. (For example, it does not really make sense to attract passengers to the rail system's vicinity if the services are not sufficiently acceptable to even address the needs of the existing captive users.)

Strategic objective focus areas were identified to ensure that one of the key success factors, namely to make use of a holistic approach, was taken into consideration. The Strategic Focus Areas for the project are as follows:

- ◆ **Marketing** of the Ring Rail area, the rail services and the Ring Rail Projects;
- ◆ Improved **Safety and Security**;
- ◆ **Modal Integration**, for public transport and related services;

- ◆ **Property and Land-use Development** in the Station Precincts;
- ◆ **Economic Development;**
- ◆ **Development Funding and Transport Funding;**
- ◆ **Social Development** (including social integration or improved tolerance);
- ◆ **Institutional Development** (the establishment and maintenance of an institutional structure that will facilitate and promote development);
- ◆ **Operational Development**, focussing on improving the rail services to acceptable service levels; and
- ◆ **People Friendly Environment.**

7. THE STRATEGIES

The strategic focus areas were grouped under four strategies, thereby giving focus to the study and working towards the original brief of the project, namely to formulate business plans for implementation projects. The four strategies are:

- Strategy 1: Maximising trip productions and attractions around stations
- Strategy 2: Improve the image of the rail system and its environment
- Strategy 3: Transport Operations Strategy
- Strategy 4: Institutional organisation and co-ordination of the project

7.1 Strategy 1: Maximising trip productions and attractions

This strategy deals with two aspects that are dealt with simultaneously, namely:

- (a) **maximising the potential number of trip productions (user origins) along the system, and**
- (b) **maximising trip attractions (destinations) along the system and providing access to the maximum number of destinations.**

The strategy entails mainly that as many as possible residential, economic and social activities be provided in the direct vicinity of the railway line, and/or functionally linking the railway line to as many as possible of these opportunities.

As explained earlier, there are already many developments (residential, educational business, retail, office and others), within walking distance of the Ring Rail stations. The main component lacking is, however, the fact that few of these developments adjacent to the railway line functionally incorporated the railway line into the development when they were planned and constructed. This is clearly illustrated by the number of buildings orientated backwards towards the railway line (e.g. in Hatfield), or the lack of provision for students using the railway line to enter any of the campuses of the Universities of South Africa or Pretoria.

The result is that very few potential users of the system are actually motivated or enticed to do so. The aim is that all development in the vicinity of the railway line should be done to the concept of ***Transit Orientated Development (TOD)***, where the land-use development in the vicinity of a public transport node should be totally suitable to public transport.

In total 17 TODs were identified on the Ring Rail and nine on the feeders to the Ring, both at the origin and the destination side of commuter trips on the rail. **Figure 3** shows the location of the TODs. Apart from these, there are several portions of land around the rail system available for either redevelopment, or infill development.

7.2 Strategy 2: Improve the image of the rail system

Indications from this study are that the image of the Ring Rail system plays a major role in modal choice, and also the decisions by developers whether or not to develop close to railway stations. The study showed that significant opportunities existed to attract passengers and developers, on the condition that the image be addressed. At present many people perceive the rail system as unsafe, unattractive, unreliable and only to be used by people with limited choice. The current image of the rail system (as indicated by recent attitudinal surveys) is determined mainly by perceptions on safety and security, urban design of station precincts, cleanliness of stations and trains, obsolete / outdated technology, development management around stations, and hawkers and general control measures.

Aspects to deal with in this regard include:

- ◆ Improvement of the marketing of the system,
- ◆ Improvement of safety and security around the system,
- ◆ Provision of proper infrastructure, and facilities and amenities in the station precincts (e.g. public toilets, rest rooms, benches, etc., and giving attention to urban design elements in order to make the rail system a human/user friendly environment).
- ◆ Improvement of rail services through effective and integrated transport services.

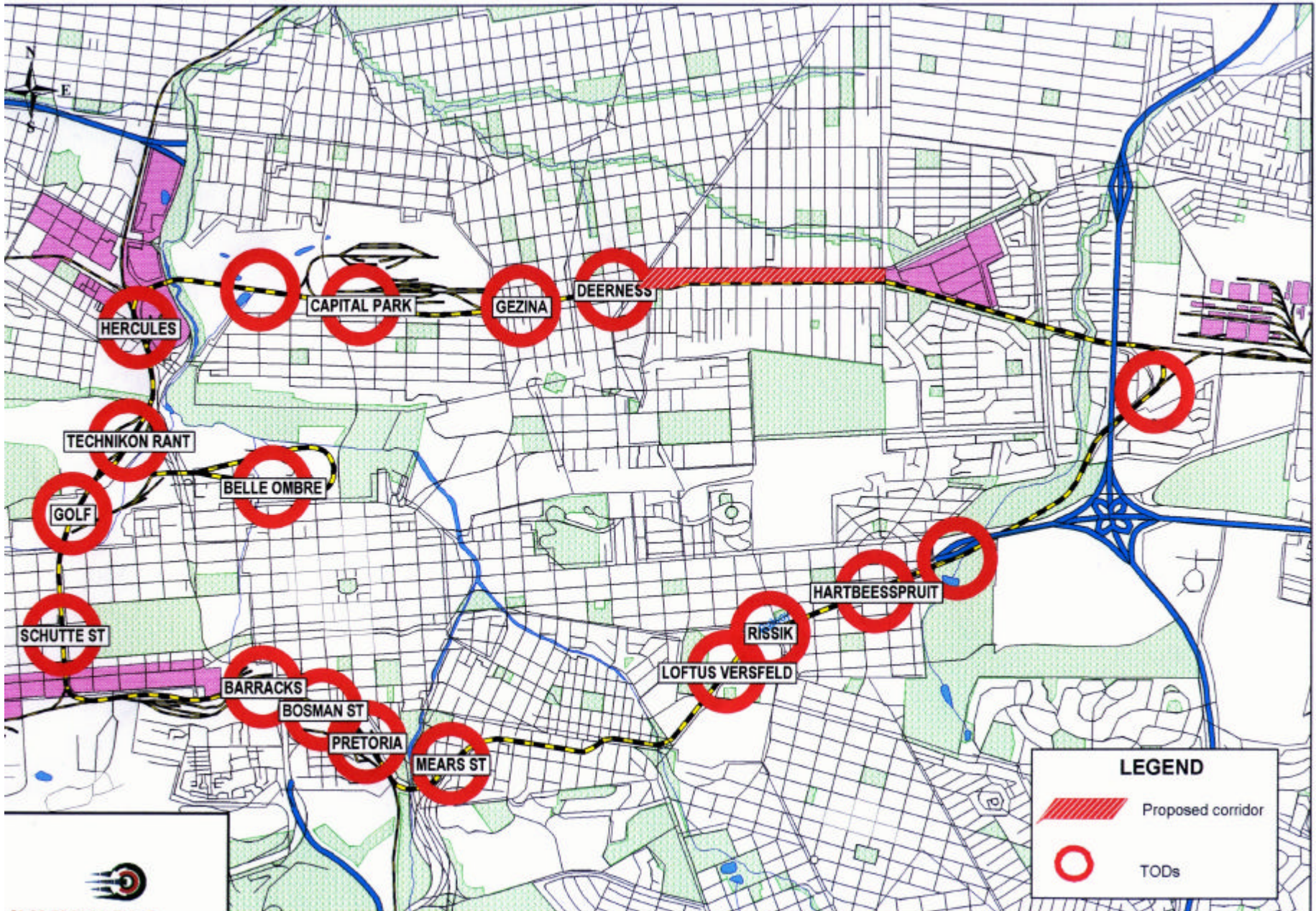
The success of the rail system will, to a very large degree, depend on the level to which the residents of Greater Pretoria will use it. In order for people to be attracted to the system, it will have to be able to improve their quality of life in some or other way. The project business plans included elements directed at an improved image.

7.3 Strategy 3: Transport Operations Strategy

This strategy is aimed at improving the transportation experience and the quality of the public transport services in the Ring Rail vicinity. A three-pronged strategy was used dealing with modal integration, transport planning and improvement of the rail operations.

Essential feeder services in the outskirts of Greater Pretoria and in close proximity to the Ring Rail were considered. A number of transport network options were investigated, and both the operating cost and the quality of services were evaluated as part of a parallel exercise. The total operating costs of providing the required services in the am peak hour were obtained from the model. The cost implications for the above-mentioned two network alternatives, as well as two network alternatives with no passenger rail services in operation are shown in **Figure 4**.

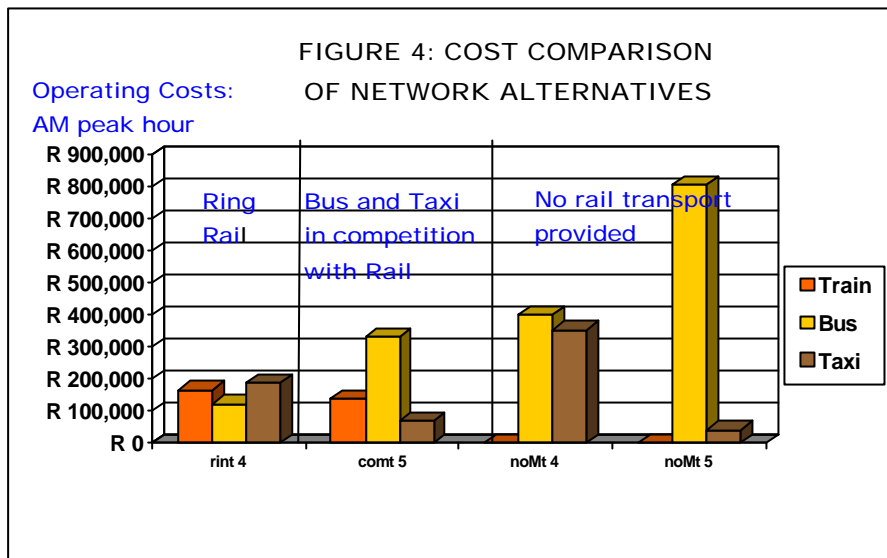
The rail service levels in Greater Pretoria – particularly with regard to frequencies and hence to door-to-door travel speeds – have been lowered a number of times during the past two decades. The decrease in the number of First Class passengers on the Pretoria Rail system indicates that those passengers who can afford alternative means of travel perceive the current service levels as too low for selecting rail transport as the preferred mode of transport.



Location of TODs on Ring System

Fig. 3

This is particularly true for the off-peak *ad hoc* trips (i.e. the trips not made for commuting purposes).



Based on the information obtained from the modeling process, the following became clear:

- All three modes of public transport should be sustained, but their specific roles/functions should be more clearly defined.
- **Termination of rail services** in the Greater Pretoria area will have a **major cost implication** with regard to cost of providing public transport services to the inhabitants of the region.
- If no rail services were available to the people of the Greater Pretoria area, the general **quality of public transport** services available to them would **decline substantially**.
- It can be concluded from the worst case network scenario (Radt4), where the rail, bus and combi-taxi modes continue to operate in direct competition with one-another, that the rail system will be adversely affected if such a network is allowed to develop further.
- By having bus services complementing the rail system (i.e. bus services operated from areas not served by the rail system and no bus services in direct competition with rail), the following benefits can be obtained:
 - increased rail patronage,
 - decreased operating costs (total public transport system),
 - increased service quality.

In order to ensure that modal integration takes place successfully and in co-ordination with the Ring Rail development project, the following proposals were made.

- (a) The implications of the Ring Rail Development Project should be included in the Integrated Transport Plan (ITP).
- (b) The hierarchy of modal transfer facilities should be in co-ordination with spatial development initiatives regarding development nodes and corridors.
- (c) Pedestrian access and private vehicle parking should be important design criteria for intermodal facilities in order to promote ease of transfer between modes.
- (d) The design of transfer facilities should incorporate all modes to ensure modal choice and transfer options.

For the Ring Rail development to be successful, it is important that rail passengers must be able to travel efficiently with a seamless service to all destinations on the Ring. This implies that transport services that are capable to move passengers around the Ring is required.

The current inability to maneuver around the Ring Rail (even though 10% of passengers make rail-rail transfers) result in only approximately 1% of the Greater Pretoria rail passengers currently travelling from an origin on the Ring to a destination on the Ring. The fact that many of the passengers who live and work next to the Ring Rail are “choice users” together with the relative short trips involved, plays a major role leading to these low numbers.

However, **more than 55% of all rail passengers** in Greater Pretoria travel to destinations on the Ring Rail. The need for one of the following is evident from the study results:

- Either integrated intra-modal rail services, with seamless transfers at convenient stations (e.g. Koedoespoort Station), or
- A service that travels around the Ring, to supplement the commuter services from Mamelodi, Soshanguve, Johannesburg and Atteridgeville.

Considering the fact that rail transport currently is a National Competency (to be devolved at a later stage, possibly after concessioning) the rail operational aspects should be handled with great circumspection.

One of the results from the course assessment of operational improvements was that sufficient evidence exists to indicate a more focussed investigation of this matter. The fact that any increase in passengers on the Ring, particularly the short-distance passengers, will be beneficial from a subsidy point of view, underlines this conclusion. The reason for this finding is mainly due to the fact that rail transport has a major fixed cost component on any line, independent of the actual number of trains being operated over the line. Short-distance passengers can only be attracted if the image of the system is acceptable, if it is safe, convenient and – compared to other modes of transport – relatively time efficient.

The conclusion is that serious consideration is required to increase frequencies to levels acceptable for metropolitan transport systems (not only catering for commuters). This implies that a different yardstick need to be used for off-peak services as compared to the peak-hour services. Any use of capacity utilisation rates and norms based on the long trainsets being used locally may lead to incorrect decision-making. The **Diminishing Service Level Spiral** (where cuts in service levels lead to decreases in patronage and hence lower income levels, resulting in the need to cut service levels more) is well known. This would eventually lead to a total curtailment of services, which would be contra-productive in the external aims of facilitating development, promoting infill and densification, in order to make Greater Pretoria functioning more effectively and efficiently.

The need for increased service levels is in contrast of the events during the past decade where every rationalisation (read balancing / optimisation) exercise resulted in the curtailment of trains outside the peak period.

The conclusion is, that no matter how difficult it is, it would be essential to go against the current stream with the aim of improving service levels to attract passengers. This implies a dedicated effort, focussing also on the financial implications. The operational assessment indicated that the latter would most likely not result in the medium to longer term in any increase in subsidy requirement. The reason for this conclusion is the following:

- Statement above that due to major fixed cost component, increases in number of trains would not imply a similar increase in operational cost.
- Additional off-peak passengers will help in lowering peak patronage intensities with improved capacity utilisation rates.
- Short-distance passengers pay relatively higher fares if measured on passenger-kilometer basis, which will allow for subsidising the long-distance passengers.
- Indications from current passenger profiles are that the off-peak passengers would be more inclined to accept higher fares than the present, on the condition that service levels are adequate.
- There is currently no real effort to apply market segmentation to the best advantage to the rail operator / subsidising authority.
- It will help to have two-directional traffic with subsequent major improvement in cost-recovery.

More specifically, with modal integration and integration of intra-modal rail services, much can be gained without a commensurate increase in costs.

7.4 Strategy 4: Institutional organisation and co-ordination of the project.

Strategy Four relates to the institutional component that deals with the roles and responsibilities of different authorities involved with the rail system or areas adjacent, and the co-ordination of these roles and responsibilities among them.

The following were some of the main considerations in formulating the Institutional Strategy:

- ◆ The need for improved co-ordination between the roleplayers involved,
- ◆ The fragmented management of the public transport system (see below for more detail),
- ◆ The difficulty to lead developers to develop in suitable or preferred areas.
- ◆ The policy statement accepted by National, Provincial and Metropolitan Government, which states that public transport, has to be promoted.
- ◆ The need for job-creation and economic development.

Proposed Ring Rail Management Body

It was proposed that a specific body be established to achieve implementation of the Ring Rail business plans.

This Management Body should not substitute any of the existing entities, but should be a vehicle to focus effort on the specific interventions required to achieve the strategic objectives for the Ring Rail system. The following specific aspects need to be addressed in this regard:

- Ongoing identification of the needs for upliftment in the Station Precincts and proposals to address these.
- Identification of property development and business potential in the Station vicinities.

- Interaction with the relative Planning Zone Forums to address the need for integration.
- Further development of the Transit Orientated Development (TOD) concept.
- Proactive interaction with developers, and development facilitation (on condition that these follow the principle of TODs).
- Acting as a Corridor Development Agency.
- Acting as a Modal Integration Agency.
- Facilitate the ongoing need for marketing as discussed in the marketing proposals.
- Integrate the action plans for a pro-active strategy aimed at the security situation on the Ring Rail and its environment.
- Facilitate the distribution of travel information (service information).
- Assist with the specific developments at the nodal points.
- Focus on the areas between the operational station areas and the streets accessing the stations. Ensure an integrated approach to address these areas.

Both the Municipal legislation and the transport legislation enables the GPMC, the SA Rail Commuter Corporation and other role players to form a joint venture to act as Ring Rail management authority.

This Structure will make use and will influence the (existing) planning mechanisms, namely:

- the Metropolitan Integrated Development Plan (IDP);
- the appropriate planning zonal IDPs, the GPMC Integrated Transport Plan; and
- the Pretoria Town Planning Scheme.

8. THE IMPLEMENTATION PLAN

During the strategy development process, more than 70 related projects were identified by the project team which have direct bearing on the aims and objectives of the project. The projects were divided into short, medium and long-term projects, focusing either on area-wide projects or node specific projects (planning and implementation).

These projects were used to identify project themes to focus on the end deliverable, namely business plans for implementation. The following themes were identified:

- ◆ Nodal developments
- ◆ Short-term projects around the stations
- ◆ Accessibility
- ◆ External access to the stations
- ◆ Sports academy
- ◆ Social development
- ◆ Modal integration
- ◆ Service information
- ◆ New services
- ◆ Other projects

From these project themes, seven Business Plans were formulated, as follows:

- BP1** Economic development and investment plan
- BP2** The Ring Rail as catalyst for modal integration in the Greater Pretoria
- BP3** Strategic upgrading and improvements at existing stations
- BP4** Development of Transit Orientated Development nodes
- BP5** Development of an institutional structure for the Ring Rail Development project
- BP6** Marketing the Ring Rail in the Greater Pretoria Area
- BP7** Rail operational improvements

9. RING RAIL DEVELOPMENT PROJECTS – PHASE II

Phase II of the project commenced recently, focussing on the following elements:

- ◆ Marketing of the project to the relevant stakeholders to obtain their support for the planning process.
- ◆ Establishment of an Implementation Management Team, which will form the basis of the focused effort to implement the project (i.e. institutional structure).
- ◆ Implementation of small, catalytic projects, which will make a visible difference.

These actions will be undertaken through the establishment of focused Sectoral Task Teams (i.e. marketing, safety and security, land-use, transport, station precincts), which will have a predetermined scope and program to achieve project orientated milestones.

10. SOURCES

A wide range of sources were consulted, all of which are listed in the documentation of Khuthele Consortium: Ring Rail Development Project Phase I, Greater Pretoria Metropolitan Council, Jan. 2000.

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ABBREVIATED CURRICULUM VITAE

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| Date of appointment | September 1989 |
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| Years of Experience | 22 |

KEY QUALIFICATIONS

Mr Venter started his professional career with the South African Transport Services (now Transnet Ltd and South African Rail Commuter Corporation) where he did transport planning, design, construction and maintenance work. As District Engineer he spent some time in the Contract Disputes and Arbitration Division.

Mr Venter was co-creator of the Spoorplan Consortium which assisted with the commercialisation of the SA Transport Services and the establishment of the SA Rail Commuter Corporation in 1989. In charge of all technical and rail planning aspects for the national Department of Transport. Strategy and policy formulation. Devolution of functions to the RSCs, Metropolitan Councils and Services Councils. Preparation of provincial, metropolitan and local passenger transport plans. Mainly public transport analysis, economics, policy and strategy formulation and planning. Supported the Gauteng Strategic Management Team on Public Transport and Roads. Project Manager for community upliftment projects. In charge of team who formulated the National Airport and Airspace Policy for the Department of Transport.

During the last 18 months he has been involved in three important projects where transport planning played an important role, namely: Ring Rail Development Project for the Greater Pretoria Metropolitan Council, Coega Deep Sea Harbour for the Coega Development Corporation and at present the Gauteng SDI Rail Link.