

GAUTRAIN RAPID RAIL LINK - THE PROJECT CONCEPT

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INTRODUCTION

In February 2000 Gauteng Premier, Mbazima Shilowa, announced the new Gautrain Rapid Rail Link between Johannesburg, Pretoria and Johannesburg International Airport (JIA) as one of the ten Spatial Development Initiatives (SDIs), now called Blue IQ projects. At the end of April 2000 a consortium of consulting companies was appointed to assist the Department of Transport and Public Works with the execution of the project. Since then good progress has been made, as will be described in this paper.

This project is an important project for Gauteng and South Africa, and also unique in the sense that it will be the first of such modern metropolitan or regional rail systems to be provided and operated in Southern Africa. It is however in line with a world-wide trend towards such passenger rail systems. The number of metros globally increased from 25 in 1960 to 54 in 1980 and 100 in 2000. In 1998 there were 62 major airports in the world with passenger rail access and another 116 were being planned. The latter increased to more than 140 in 2001. The above are in developed and developing countries.

This paper is one of four papers at this Conference dealing with the Gautrain project. The paper deals with the process followed, the broad concept of the project and some background motivation for the project. It concludes with the way forward. The other papers deal in more detail with the route and station location determination, the demand and revenue forecast, and the business case.

BACKGROUND

The area between Johannesburg and Pretoria is the fastest growing area in the country with corresponding major transportation needs. In the middle seventies, when the PWV Road Network was planned, provision was made for a more direct rail route between Pretoria and Johannesburg. This was on the western side of the N1 where the topography was more favourable. The major developments since then took place on the eastern side of N1 and therefore made the originally contemplated route impractical.

In the early nineties the Vectura Public Transport Study was conducted and again a public transport corridor between Pretoria and Johannesburg was proposed. Soon after the new dispensation in South Africa in 1994 came about, certain European countries showed great interest in becoming involved in the provision of such new a new rail link. Then the State of Bavaria in Germany, which is a sister province of Gauteng, offered to have a pre-feasibility study conducted by a German

consultancy. This was completed in September 1999. They found that the construction of the new proposed PWV9 toll road would not on its own solve the transportation problem and that it is necessary "to complete the existing transport system by means of a public transport system that would be independent from the existing road network". They further found that their "financial evaluation indicates that in all probability the railway project is feasible in economic terms" and a more comprehensive feasibility study is necessary and justified.

PROCESS

A consortium of consultants consisting of Khuthele Projects, Arcus-Gibb and Lebone Engineering was appointed to assist Gautrans with the project. Gibb-Rail, a leading international railway consultancy based in the UK, provide support, together with a number of sub-consultants, such as APS Plan Africa (spatial planning) and Equinox (communication and public relations).

In June 2000 an Inception Report was completed as part of phase 1. This report focussed the scope of the study, provided an understanding of the project concept, and presented the business plan and study design of the project. For organisational and management purposes, the project was divided in 34 elements, which were grouped into four main categories:

- Project Concept (including e.g. legal and institutional aspects, and consultation and public relations)
- Technical Aspects (including e.g. electricity supply, telecommunication, signalling, rolling stock, operations, environment, and safety and security)
- Route Determination (including e.g. land use, planning integration, route determination, feeder and distribution services, and stations)
- Business Case (including e.g. demand and revenue forecasts, socio-economic analysis, economic evaluation, risk analysis, and PPP/BOT specifications).

The second phase of the project dealt with two major aspects, namely the system planning (including land use, route alignment, station placing, technology and operations) and the needs assessment (including market focus, demand determination, and revenue estimation). The system planning also provided the costs of the project, while the needs assessment eventually provided the income.

In September 2000 a report was presented to the Provincial Cabinet on the route determination. Where as the northern part of the route between Midrand and Pretoria was basically the same for all alternatives, the southern part had a number of alternatives. Some of these were discarded due to environmental and technical reasons. Two alternatives were retained for further investigations. The one was a direct route from Midrand to Marlboro, Sandton, Rosebank and Johannesburg. The other was an indirect route from Midrand and Marlboro down to Eastgate and Bruma and from there into Johannesburg. The first route was more costly but also had more passengers. It was thus necessary to further investigate ridership and life cycle costs.

The other major aspect that received attention during this period, was the demand forecasting. Towards the end of 2000 the first results came out and by January 2001 there was a good understanding of the base year passenger forecast. This lead to the second report to Cabinet in February 2001 informing the Cabinet of patronage, income, cost and the proposed route alignment.

The feasibility part of the study, and more specifically the financial feasibility and aspects related to and dependent on it, was delayed with approximately 5 months due to mainly two aspects. The most important was the delay with the appointment of financial consultants to assist the team with inter alia the feasibility study. Kagiso Financial Services was only appointed in April 2001, one

month after the original date for the completion of the study reports, including the feasibility study. Furthermore, since the start of the project, the PPP-Unit of National Treasury was established and developed a whole range of requirements which had to be adhered to. The financial consultants will also assist with meeting these requirements. At the time this paper was written, the intention was to complete the feasibility report in June 2001 so that the authorisation of the PPP-Unit can be obtained during July and Cabinet confirmation during August.

It was also decided to hold an Investors Conference in Sandton on 4 and 5 September 2001 which would not only provide comprehensive information on the project, but would also kick off the tendering process with the request for pre-qualification, which will be issued at the Investors Conference.

COMMUNICATION AND CONSULTATION

In this project the co-operation between all the stakeholders is considered to be essential and very important. This includes the different spheres of government, different modes of transport, and a great variety of interested parties and stakeholders.

A Project Review Committee was established to ensure technical co-ordination, co-operation and consultation. Membership of this Committee includes representatives from

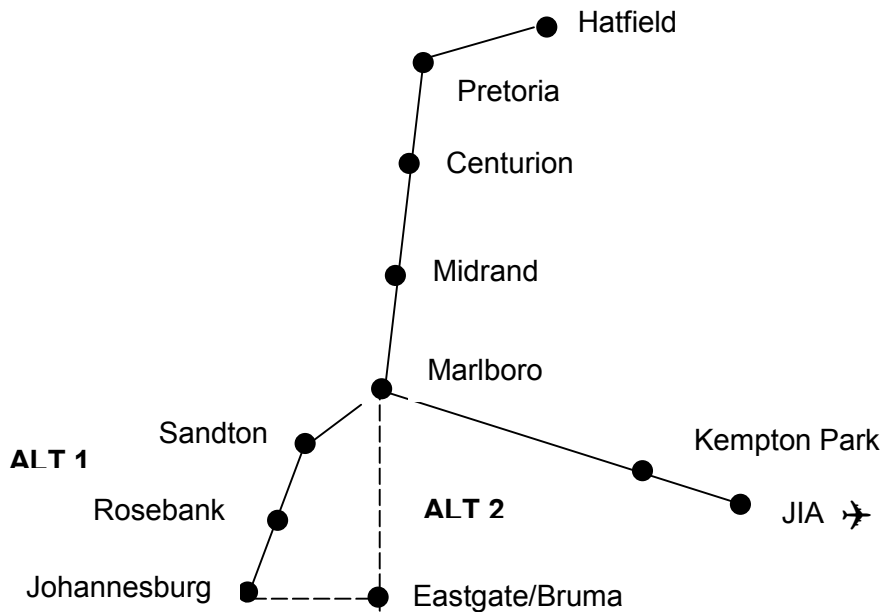
- National Department of Transport
- PPP-Unit of National Treasury
- Provincial Department of Transport and Public Works
- Provincial Department of Finance and Economic Affairs (and Blue IQ)
- Provincial Department of Development Planning and Local Government
- Provincial Department of Housing
- Provincial Department of Agriculture, Conservation, Environment and Land Affairs
- Johannesburg Metropolitan Municipality
- Tshwane Metropolitan Municipality
- Ekurhuleni Metropolitan Municipality
- South African Rail Commuter Corporation
- Spoornet.

A wide variety of consultative and informative meetings also took place, which included

- a Summit between Gautrans and local government
- a Consultative Conference (which also included the different modes)
- Meetings with the councils or standing committees of all the involved local authorities
- Discussions with organisations such as SARCC, ACSA, JIA-Forum, SA Transport and Allied Workers Union, AECl, Eskom,
- Meetings with representatives from international rolling stock manufacturers such as Siemens, Bombardier (Adtranz), Alstom and Mitshibusu, as well as other interested parties such as embassies, construction companies and financial institutions.

Further consultation and communication will take place. The Environmental Impact Assessment also includes a very extensive public participation exercise.

PROJECT CONCEPT



- The project can schematically be illustrated as above. The network in principle consists out of two lines; the one linking Pretoria and Johannesburg and the other linking Sandton and JIA. The stations are shown above. There are three anchor stations (Pretoria, Johannesburg and JIA) and seven other stations with the Rosebank alternative and six with the Eastgate/Bruma alternative. The network length is approximately 80 km. Provision is made for future extension of the network, further stations (e.g. Menlyn) and even new lines.
- The project involves appropriate modern state-of-the-art technology and rolling stock. Three good examples of international city-airport links are the Heathrow Express in London, the Gardemunden Express in Oslo, and the Arlanda Express in Stockholm.
- The travel time for the close to 60 km between Johannesburg and Pretoria will be less than 38 minutes at a maximum speed of between 160 and 180 km/h.
- Frequencies would be as much as 10 minutes.
- There will be extensive feeder and distribution services at each station, of which a part will be dedicated and under the control of the Gautrain operator. There will also be park-and-ride facilities at all stations.
- Reliability, safety and security, comfort and short travel times are important and necessary requirements. A new attractive image is required. It must be able to attract car drivers and users out of their comfortable cars and its freedom, to the train. It must be an attractive and realistic alternative for the car user.
- A very large part of the market focus is existing car users.
- It must also cater for the airline passenger and tourist. Special services to the airport will provide for decentralised check-in- facilities and space for luggage on the trains.

- This project is not a stand-alone project, but part of a total holistic transport system in Gauteng. It therefore does not in principle compete with other public transport services, which provides in a specific need, such as the current Metrorail services. At four stations there will be direct co-ordination with the current commuter rail system and services, namely at Johannesburg Park Station, at Pretoria Main Station, at Hatfield and at Kempton Park.
- As found in the pre-feasibility study, both the Gautrain project and new freeways (PWV9) and/or upgraded freeways (N1) are required. Both have a specific role to play in a total transport system. It is therefore not a question of roads or rail, but rather roads and rail.
- At stations provision will be made for commercial and other development opportunities, to add value and provide additional income. Densification around stations is also very important.

GENERAL EVALUATION

A Comprehensive feasibility study is currently being completed where the feasibility of the project is analysed in detail from technical, economical, environmental, socio-political and financial perspectives.

In the following section the intention is not to report on the feasibility study but rather to provide a few very general considerations which can be taken into account when in general evaluating the project.

A Development Project

- Being one of the ten Gauteng SDI or Blue IQ projects, this project is primarily a project aimed at economic development, growth and job creation. Its secondary aim is to alleviate traffic congestion on the existing roads.
- One of the most important evaluation criteria would thus be whether the project will indeed stimulate and sustain growth and job creation. If this is achieved, the wider population of Gauteng will have a higher income and be in a better position to afford public transport, housing and other aspects for a better quality of life. Such economic growth would therefore also assist to effectively address poverty alleviation and limit the number of people dependent on welfare services.
- Government fully accepts its responsibility to provide welfare and social service, including not only subsidised transport for the poor, but also education, health and welfare services. In fact, more than 85% of the budget of the Gauteng Provincial Government is spent on the latter three services and those spending levels will be maintained.

A Public Transport Project

- It is Government's stated policy to promote public transport and to give it priority above private transport. The new National Land Transport Transition Act places an obligation on Gautrans to actively implement this policy.
- The Gautrain Rapid Rail Project is an illustration of the commitment of Government to promote public transport.

- Current public transport services in Gauteng and South Africa is not always very attractive and convenient. The image of public transport, also that of commuter rail, need to be improved. Otherwise people won't be willing to consider it is a real alternative when they have access to a motor car. More and more South Africans start owning motor cars, but ideally they should not automatically now use it for their home-work-home trips during peak hours when most of the roads are very congested.

Public Transport has very specific advantages

- In the USA with densities of 18 persons/ha and a 15% public transport modal split, 12,7% of the GDP goes towards the cost of journeys. In Hong Kong and Singapore with 134 persons/ha and a 62% public transport modal split, only 5,4% of the GDP goes towards the cost of the journeys.
- In South Africa and all over the world, billions of rands are lost in traffic congestion, through time lost, transport costs, delivery costs of goods and quality of life. In London the cost of congestion is R25 billion per year. On the N1 between Pretoria and Johannesburg the congestion cost is more than R300 million per year. Unless dedicated rights of way, such as high occupancy vehicle (HOV) lanes or bus lanes are provided, buses and taxis are also subjected to the congestion on the roads. It is not always possible to provide such lanes for the full length of the bus or taxi trip.
- Public Transport is more environmentally friendly. Cars consume three times more energy and produce three times more CO₂ per passenger than public transport. Rail transport is more environmentally friendly than buses.
- Traffic accidents in Gauteng cost R4 billion per year. Modern rail transport have much less accidents than road traffic.
- Roads takes up more space. For example a home-work journey by a single occupancy car consumes 90 times more space than if the same journey was taken by rail.

Gautrain is in the right area

- The corridor between Pretoria and Johannesburg is the fastest developing corridor in the country.
- Gauteng is responsible for 38% of the national GDP
- The population densit in Gauteng is by far the highest in the country.
- Gauteng has 38% of all registered vehicles in South Africa and 41% of all minibus-taxis. More than 50% of all bus and rail subsidies in South Africa is paid in Gauteng.
- The corridor between Pretoria and Johannesburg is therefore, in very general terms, seem to be the best possible place in our country for such new rail link. Negatively put, if it can't work here, it probably can not work anywhere else in South Africa.

It is a good time to consider such a project

- The restructuring of our cities and regions is necessary, moving away from the effects of apartheid where people lived far from employment. With the large scale housing programmes of Government, it is necessary to ensure that they are located in the right place, and that public transport has been considered. These aspects should get attention now.
- More people are affording motor cars and are moving away from public transport. This can only be changed if a reasonable alternative is provided.
- Government has committed itself to public transport and need to illustrate it forcefully.
- Large infrastructure projects are required to stimulate economic growth.
- A rail project like this should not be evaluated over the short to medium term. It has a profound influence on the structuring and growth of a region and will still be there after a hundred years.

Even after all the above arguments have been made, the final decision to go ahead with a project of this nature depends largely on the financial and economical evaluation and feasibility, both from government's and the private sector's perspectives. All indications are that such feasibility is acceptable.

The following figure 1: Financial Input and Evaluation Process provides a schematic presentation of the process that is followed, as well as the expected inputs of the different roleplayers.

It is confirmed that the project will be implemented as a BOT-type project with full involvement of the private sector. This includes the final design of the project, the construction, operation and maintenance over a period of 20 to 30 years.

WAY FORWARD

- The planning and feasibility reports have largely been completed. The technical work still being done, deals with tender specifications and documentation, refinements and due diligence studies, the environmental impact assessment, station planning, geotechnical drilling, and more detailed surveys for the land requirements.
- An Investors Conference is being planned for 4 and 5 September 2001 where potential bidding consortiums and other interested parties will be informed on the project and the tendering process.
- The intention is also to issue the invitation for pre-qualification at the Conference. Interested parties will get 6 weeks to submit their applications whereafter a shortlist will be compiled.
- Draft tender documents will be discussed with the shortlisted bidders at the end of this year (2001) whereafter it will be finalised and approved. The final tender documents will then be issued to the shortlisted bidders towards the end of January 2002.
- Six months will be given for the tender preparation.
- The evaluation of the submitted tenders should take approximately three months, whereafter the preferred bidder will be announced.

- Then the negotiations follows, leading up to financial closure.
- During this time the EIA will also be completed as well as the proclamation and expropriation plans, so that the land acquisition can commence.
- The intention is to start with construction towards the end of the first half of 2003. The construction will take at least three years so that commissioning would not be before 2006.

CLOSURE

Although this is a very important and necessary project, there are also risks involved, the one being whether the patronage projections will be achieved in an environment with virtually no experience of this type of service. The Americans with an even bigger love affair with their motor cars, have proven it can work. And in cities such as San Francisco where they did not originally met their patronage goals, they put a variety of actions into place and eventually met the goals. All over studies have shown the benefits are more than the costs. This is a challenge that should be taken up by all concerned.

REFERENCES

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FINANCIAL INPUT AND EVALUATION PROCESS

