



GMA CASE STUDY – RISK MANAGEMENT

# **THE ROLE OF RISK MANAGEMENT IN THE GAUTRAIN PROJECT**

The purpose of the case study is to examine the role of risk management in the Gautrain Project. The expected learning outcome is how to identify and manage risk on a large infrastructure project. The study focused on what risk management techniques were used, what worked well, what did not work well and what lessons were learnt as a result of applying risk management in the execution of such a large project.

## LEARNING OUTCOME

How to identify and manage risk on a large infrastructure project.

## BUSINESS OBJECTIVE

To illustrate the techniques of risk management implemented in the Gautrain Project aimed at minimising risk, while at the same time capitalising on collateral benefits arising from the Project.



## 1. BACKGROUND

Risk management was applied throughout the various stages of the Gautrain Rapid Rail Link Project, from the feasibility, through the development, to the operating phase. This implied that various people played a role at different levels of the Project, and the management of risk was also applied differentially.

From an economic perspective, one of the collateral benefits of the Project has been the capital appreciation and development of the properties in close proximity to the stations.

Metaphorically speaking, the Gautrain is beginning to take on the characteristics of a river that is benefiting all the communities that feed off it, whether directly or indirectly.

Risk management is an essential component of

any project, and should be on the daily agenda of any project meeting, in order to attempt to anticipate potential negative events and ensure corrective actions are taken to mitigate the risk. On the flipside, an event can also have a positive consequence, hence the need to ensure that plans are in place to capitalise on such events.

The Gautrain Management Agency (GMA) was established in terms of the GMA Act (Act 5 of 2006) to manage the implementation of the Project and the relationship with the Concessionaire, Bombela Concession Company (Pty) Ltd (BCC).

The Gautrain is primarily aimed at providing and optimising an integrated, innovative public transport system that enables and promotes the long-term sustainable socio-economic

growth of Gauteng. It is also part of a broader vision to industrialise and modernise the region, including a commitment towards creating and sustaining an integrated culture of public transport use.

The strategy of the GMA over the next three years intends to focus on managing, co-ordinating and overseeing both the operation and maintenance of the Gautrain Project and the implementation of the extension of the system to accommodate future demand and new services as identified in the 25-year Integrated Transport Master Plan (ITMP25) for Gauteng.

The GMA Board is committed to oversee the strategy by providing direction and oversight regarding matters related to:

- Concession agreements;
- Project objectives;
- Management of assets;
- Management of finance;
- Corporate governance;
- Cooperation between Government's structures and stakeholders;
- Socio-economic development (including BBBEE objectives); and
- Integration of transport services.

## 2. PROBLEM STATEMENT AND EARLY FINDINGS

### 2.1 The Role of the Risk Model in the Relationship between the GMA and the Concessionaire

The success of risk management will depend on the effectiveness of the management framework providing the foundations and arrangements that will embed it throughout the GMA at all levels. The framework assists

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*David Marx,  
Risk Manager,  
Development Period*



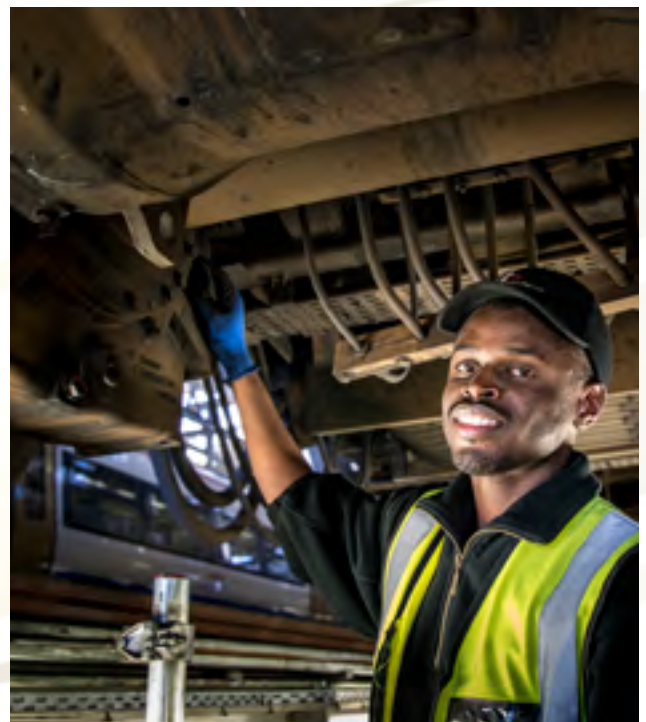
in managing risks effectively through the application of the risk management process at varying levels and within specific contexts of the GMA. The framework ensures that information about risk derived from the risk management process is adequately reported and used as a basis for decision making and accountability at all relevant organisational levels.

The following salient points are therefore important to note in the context of understanding the relationship between the GMA and the Concessionaire and how the risk model manifests itself:

- a) The Gautrain Rapid Rail Link Project (Gautrain) is undertaken as a Public Private Partnership (PPP) in terms of Treasury Regulation 16. As such it has an approach to risk management that makes it distinctive from other non-PPP infrastructure projects in South Africa.
- b) A PPP consists of the public sector, through a public agent, granting the rights to design, build, finance and operate for a specified period of time some publicly owned infrastructure to a private party. Because this form of contracting was known to impose significant financial obligations and forms of risk on the fiscus, responsibility for approval of projects implemented under such contracts was given to the National Treasury.
- c) The South African framework for PPPs dates back to 1999 when the National Government approved a framework for PPPs in terms of which the Minister of Finance and the Treasury would be responsible for the oversight and fiscal management of PPPs. As a result, Treasury Regulations (TRs) were subsequently made and promulgated in terms of section 76 of the Public Finance Management Act, Act No 1 of 1999 (PFMA). Regulation 16 (TR 16) of the TRs falls under Part 6 thereof – which part is captioned “Frameworks” – and it is pivotal to the regulation of PPPs in the South African context.
- d) TR 16 sets out a formal process by which an institution must obtain various approvals from the relevant treasury for any project that meets the definition of a PPP. TR 16 also provides for the requirements that have to be met for, among other things, a given project to be classified as a PPP and therefore to bring it within the ambit of TR 16 and for the various Treasury approvals

that need to be granted to authorise the implementation thereof.

- e) Best practice in relation to PPP requires that PPPs are clearly differentiated from conventional procurement of infrastructure projects, because in granting and transferring all rights of development, maintenance and operation (and possession) of an infrastructure project to the private party entity under a PPP agreement, a significant amount of risk that is inherent at all stages of the project is also transferred. However, by causing the transference of such risk to the private party entity, the Government could achieve greater value for its money than it would otherwise have done by assuming the risks that arise from conventional procurement methods. Although its first infant steps were taken a while back, the relatively new approach of procuring infrastructure assets for South Africa through PPPs has found a place in the construction and operation of, among other things, correctional service facilities, toll roads, hospitals and government office complexes.



- f) In terms of the definition, a Public Private Partnership (PPP):
- Performs an institutional function on behalf of the institution; and/or
  - Acquires the use of state property for its own commercial purposes;
  - Assumes substantial financial, technical and operational risks in connection with the performance of the institutional function and/or use of State property; and
  - Receives a benefit for performing the institutional function or from utilising the State property, either by way of:
    - consideration to be paid by the institution which derives from a revenue fund or, where the institution is a national government business enterprise or a provincial government business enterprise, from the revenues of such institution; or
    - charges or fees to be collected by the private party from users or customers of a service provided to them; or
    - a combination of such consideration and such charges or fees.



## 2.2 The Nature of Risk Management in Public Private Partnerships (PPPs)

It is well understood by the Treasury, and the various public sector departments and agencies implementing PPPs, that the private party entity would include in its “price” – broadly defined to include all costs and revenues that it expected to incur or receive so as to make a return on investment – an amount that was “appropriate”, given the risks that were allocated to it. This might mean that a PPP envisaged for a specific project might appear to have a higher price than the same project undertaken as a conventional procurement by Government (i.e. not as a PPP). This differentiation between PPPs and conventional projects is no small matter and the Treasury devoted considerable time and effort to explain how PPPs must be procured in order to ensure that the benefits of the PPP expected to rebound to the State will exceed the cost of procurement under a PPP regime.

This is precisely why the Treasury ensured that TR 16 stipulates three prerequisites for the granting of a Treasury Approval (TA) for a PPP. These prerequisites are:

- **Affordability:** Can the institution meet the financial commitments to be incurred by it in terms of a PPP agreement from existing and future budget allocations?
- **Value for money:** Does the provision of the institutional function or the use of State property by a private party entity in terms of the PPP agreement result in a net benefit to the institution defined in terms of cost, price, quality, quantity, risk transfer or a combination thereof?
- **Substantial technical, operational and financial risk transfer:** Does the envisaged PPP evidence a substantial transfer of risk to the private party entity in terms of the PPP agreement?

There are various references to the type or qualitative value of “risk” in the developing versions of TR 16 that are required to be transferred from the institution to the private party entity in a PPP.

There is also reference to “appropriate” risk transfer in versions of TR 16 versions. For example, in May 2002, TR 16.3.2 provided as follows:

- The relevant treasury may grant such approval only if it is satisfied that the proposed PPP will –
  - a) provide value for money;
  - b) be affordable for the institution; and
  - c) transfer appropriate technical, operational and financial risk to the private party.

The term “appropriate” in this last subparagraph (c) is taken to mean that the basis for the allocation of risks in PPPs ought to be to the party “... best able to manage them”.

The objective of carrying out the process set out in TR16 is to ensure that (i) risks are properly identified; (ii) the processes, in terms of which such risks are transferred or shared, are consistently applied; and (iii) the occurrence of risks and/or disputes associated with them are clearly dealt with in a way that either avoids the occurrence thereof or, if that cannot be done, at least then minimises the impact of any such occurrence and of the potential termination of the agreement as a result thereof.

Paragraph 6.2 of Standardisation clearly provides:

“The approach prescribed in this Standardisation is that the Private Party shall bear all the risks associated with the performance of the Project Deliverables which the Institution does not expressly assume. This must be reflected in the PPP Agreement as an express undertaking by the Private Party to exercise its rights and perform its obligations included in the Project Deliverables at its own risk save as otherwise expressly provided in the PPP Agreement.”



Paragraph 6.3 then further provides as follows: “Although the risks associated with the performance of the Project Deliverables reside with the Private Party and not the Institution (save to the extent expressly assumed by the Institution), the successful implementation of this risk allocation depends largely on the clarity of the output specifications and the Parties’ co-operation in the implementation of the Project Deliverables. Accordingly, the Institution should ensure that the output specifications included in the RFP are clearly drafted and that the PPP Agreement makes provision for co-operation.”

The Gautrain Concession Agreement is a PPP Agreement in accordance with TR 16. It has the characteristics of risk transfer to the Concessionaire as the Private Party. It also sets out the performance requirements as well as the rights and obligations of the Parties.

Section 4(b) of the GMA Act enjoins the GMA “to act on behalf of the Province in managing the relationship between the Province and concessionaires in terms of concession agreements and ensure that the interests of the Province are protected”.

Section 5(c) similarly requires the GMA to “manage and oversee concession agreements on behalf of the Province”.

It is important to note that the framework, although it recognises the external environment in which the GMA operates, does not intend to replicate the risk management activities of the Concessionaire, which is tasked with specific responsibilities in relation to the operation of the Gautrain.

It is thus the responsibility of the Concessionaire to take and manage the risks associated with the design, construction, financing, operation and maintenance of the Gautrain in accordance with the Concessionaire Agreement (CA).

It is the responsibility of the GMA to ensure that this is indeed the case and to identify and manage those risks associated with the Project that are not allocated to the Concessionaire in terms of the CA.

The GMA carries out its assurance functions through the overall oversight of the Concessionaire's obligations. It carries out its own risk management responsibilities in accordance with its Risk Management Framework.



## 3. ANALYSIS OF ISSUES

### 3.1 The Sustainability of Risk Management Mechanisms

#### 3.1.1 Losing valuable institutional knowledge

There is a real possibility of losing valuable institutional knowledge as a result of skilled and experienced staff exiting from the GMA, and being replaced by staff who do not have sufficient appreciation and/or understanding of the Project dynamics as these relate to risk management practices. The GMA, priding itself as a high-performance learning organisation, wants to ensure that it preserves its successful project management track record for the benefit of the country. The underlying problem here is that the team that was instrumental in the success of the Project during the development phase, will not be available ad infinitum.

#### 3.1.2 Aging cohort of skilled and experienced professionals

The GMA, now during the operating phase, has an aging workforce with 76% of the staff being over 35 years of age. It is imperative therefore that the GMA finds an effective mechanism to transfer skills and knowledge to successive generations to ensure the preservation of its successful project management culture. One of the major factors that contributed to the success of the development phase was the fact that comprehensive risk management was an essential component of the entire Project.

#### 3.1.3 Disjointed risk management between project phases

There was no continuation of the same risk management processes and infrastructure between the development and operational phases.

### 3.2 Risk Management during Development Phase

Risks were managed during the development phase by TKC, the turnkey contractor, whose obligations from a risk perspective included:

- Production of the TKC risk management plan in order to describe the implementation of Bombela's risk management procedure and integration into the TKC project management processes;
- The project risk management coordination and risk integration of all parties, including the Province, following the agreement with all entities through regular monthly meetings and reporting;
- Ensuring compliance of O&M, BCC, CJV and E&M with Bombela's risk management procedure through regular audits;
- Identification, assessment and control of the risks within TKC responsibility and ownership, including all parties' interface risks; and
- Quantitative risk assessment based on the integrated schedule.

TKC appointed a Risk Coordinator, who reported directly to the CEO, in order to:

- Implement and maintain the risk management system in terms of the TKC project management processes;

- Implement and maintain the risk management system into the TKC Project Management processes;
- Maintain the TKC specific risk inventory;
- Ensure compliance of O&M, BCC, CJV and E&M with Bombela's risk management procedure through regular audits or reviews; and
- Perform specialised tasks such as quantitative analysis and general audit/support as requested.

Various risk owners, who were members of the project team, were appointed by their respective department heads who had the responsibility to review, check and approve the risks on a regular basis.

As shown in Figure 1, risks were examined from the viewpoint of the TKC during the Development Period and Defects Liability Period for TKC, CJV and E&M risks – in terms of Quality, Time, and Cost objectives. All interface risks between the Province, Bombela Concessionaire Company, O&M, CJV, E&M and TKC were handled in this manner. This philosophy ensured that risks were integrated for maximum control of the Project. All parties worked together to share information and manage the risks.

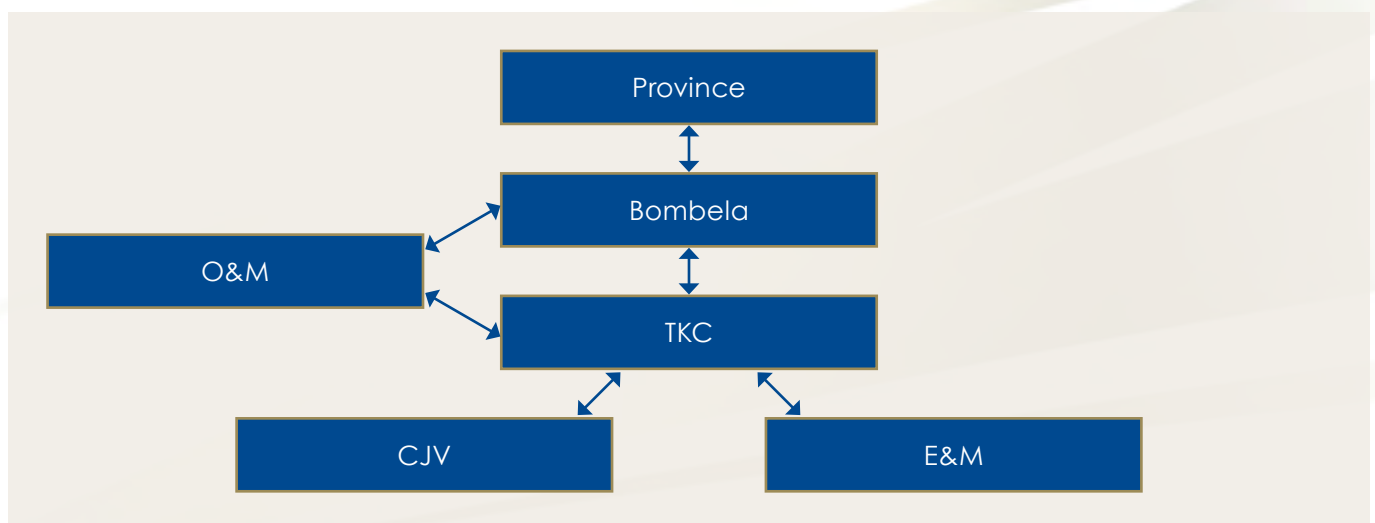


Figure 1: Role of TKC in integrating risk among the partners



The risk assessment phase identified the impact on quality, time and money of risk events and the process was robust enough to especially quantify the impact on money. The risk score

or risk rating was ultimately calculated by multiplying probability x maximum impact.

Risks were rated and reported on by using the risk score table below.

**Risk Score Table**

Risk Score 1		Impact (Time, Cost, Quality)				
		1	2	3	4	5
Probability	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

Table 1: Risk Score Table

- Top Ten risks are, by default, all risks with a score ≥ 20.
- Major risks are those with a score ≥ 10.
- Calamities are risks where the probability is very low (1) but the impact is high (5). Although these risks are unlikely to occur, they are to be treated as major risks as a result of their high impact should they occur.

Monitoring involved verifying that mitigation was implemented as planned and, where possible, that this was effective in preventing the risk occurring (or increasing the identified opportunity). It also included maintaining a general check on the risk register integrity. Monitoring was done on a regular basis:

- By updating the risk register;
- By monitoring the action plans; and
- By the Risk Coordinator checking the risk register contents, and especially the integrity between the various generic risks.

Review consisted of specific review (through meetings or not), feedback of past experience and quantitative analysis of "Time" and "Cost".

Risk was an agenda point of TKC project management meeting in order to discuss the overall risk management system and specific risks related to TKC or other parties, and the agenda was as follows:

- New and changed risks (inform on changes made over the previous period, define changes for the next period);
- Top 10 risks (identify which risks are considered most important for this period in terms of implementation of mitigations measures);
- Actions (general);
- Actions that relate to the risk management; and
- Integrity of the risk register.

TKC carried out risk management audits, on a 6-months basis, to assess that the risk

management system within CJV and E&M JV was compliant with the risk management procedure (BOM-ALL-PRD 0000 0011) and TKC risk management plan (TKC-ALL-MPL-0002 0014).

Regular reports were produced. The Executive Project Risk Management Report was prepared by TKC during the Development Period and Defects Liability Period. The report gave a qualitative indication of the direction in which the risk profile for various packages and the Project as a whole was developing.

The report consisted of several parts: Executive summary, providing a brief overview of the current situation, recent events and actions;

- Monthly Top 10 risks;
- Graphs, showing the development and evolution of the risk profile and distribution;
- Risk list (major and minor); and
- Major risk register.

### 3.3 Risk Management during Operational Phase

Initially, no structured risk management practices existed and the GMA started taking the necessary steps to improve its risk management maturity levels. It created a position for a Risk Manager, reporting directly to the CEO, but initially incubated in the COO office, and co-opted a resource from the Technical Unit to manage the function, after the Finance Unit managed it briefly. External consultants were also appointed to assess the status of risk management in the GMA, and made many recommendations on how to improve the GMA risk management maturity level.

The following enhancements to the GMA risk management practices were made:

- A risk register template was developed which focused mainly on strategic risks.



- Risk management was shifted to the business units by the appointment of risk coordinators in each unit.
- New risk management policies and procedures were written.
- Risk management review meetings were held once a quarter with executives prior to board meetings.
- Internal Audit did quarterly audits of the status of risk management in the GMA.

These initiatives resulted in a culture of risk management to become embedded in the GMA which helped to reduce silo mentalities in the organisation.

Subsequent to this arrangement, it became apparent that the growth of the GMA required

more dedicated focus on the risk management function, and an external resource was recruited to manage the function on a fulltime basis. The following issues were immediately addressed:

- Revision of the risk management policies and procedures to separate conflicting clauses in them;
- Writing a new risk management framework;
- Clearing all audit queries relating to risk management in the GMA;
- Embedding a new risk register format;
- Embedding the risk tolerance levels in the new risk register;
- Ensuring that the GMA risk appetite is clearly defined in its risk management framework;
- Ensuring that the risk management architecture is compliant with both ISO 31000 (International Standard) and SANS 31000 (SA Standard);
- Commencing with risk management awareness sessions to all staff; and
- Writing a business continuity plan for the GMA.



## 4. LESSONS LEARNT

### 4.1 What Worked Well

Risk management was well structured during the development phase and was appropriately embedded. Although no formal risk appetite and risk tolerance levels were set, appropriate cut-off points were identified where risks, which fell into those categories, got dealt with effectively.

Whenever issues arose, they were dealt with immediately due to the fact that risk management has always been a topical issue.

Certain risks, such as pricing, were accepted by the Concessionaire, which resulted in a huge saving for the Province when this risk materialised.

During the early phase of the Operating Period, the quarterly sessions with the CEO, COO and SEMs assisted with the building of a risk management culture.

Resources responsible for risk management were kept to a minimum and the risk coordinators in the business units provided useful support to the Risk Management Unit.

A performance management system was put in place to manage the Concessionaire's obligations in terms of the agreement and this function is well managed.

### 4.2 What Did Not Work Well

Risk management became somewhat disjointed in the transition from the Development Period to the Operating Period. This resulted in the unintended consequence of the operator becoming very risk averse during this period and refusing to accept risks which it should assume. Risk management became an ad-hoc responsibility instead of being fully integrated into the business of the GMA.

### 4.3 Recommendations

Risk management should not be a discrete activity and broken up into the various components of a PPP. The risk management framework should be developed for the life cycle of the Project, taking into account that some risks will be more prominent during certain phases of the Project and vice versa.

Risk management obligations of the Concessionaire should be developed upfront for the full duration of the Project. Do not assume that the other party will mitigate a risk that they have not accepted. Define these issues upfront in the concession agreement.

Continue with quarterly risk management meetings, but make it a standing item on the MANCO agenda, instead of forming another committee in the GMA. Agenda items can also be matched to items on the risk registers, which will assist management to focus more on risks and less on administrative items.

Do a risk maturity evaluation at least once a year, and use the outputs to guide how risk management in the GMA should evolve.

Keep the resources responsible for risk management in the GMA to a minimum, and invest in risk management software once the GMA has reached an appropriate risk maturity level. Ensure that resources are aligned with the risk management strategy.

Ensure that the Risk Manager is a senior person who can guide and influence mitigation strategies.

Ensure that new staff understand the CA and the risk allocation inherent in it, so that they can apply this knowledge within their functional domains.

Ensure that the GMA does not assume responsibility for the Concessionaire's risks and continue to manage its own risks only.

Understand what will happen in future with the CA and how it needs to be managed. For example, in the year 2017, Government can renegotiate the PG, so consideration should be given as to what risks will materialise from that event.

Ensure that risk management keeps abreast of opportunities that may be presented by risk events and capitalise on them when they arise.

Ensure that the GMA retains a healthy age distribution of staff of around one third under 35 years of age, and two thirds above 35 years of age, in order to ensure that the GMA has abundant institutional memory with a good pipeline of young talent for succession planning.



## 4.4 Conclusions

The Gautrain Project is one of the most successful PPPs in South Africa. It is currently managed very successfully by a highly skilled and experienced team who was involved with the Project from inception. It is essential that these skills are retained and that the next cohort of leadership is carefully groomed to ensure a seamless transition to them.

Effective risk management can contribute to this transition by ensuring that effective mitigation strategies are in place to manage the risk of losing scarce skills. An ancillary consideration is that the project team must understand what skills will be required in future and ensure that it is able to attract them as is required.



The Gautrain Project had a number of benefits such as:

- The station parking bays contributed R47 million to the Gauteng Province's GDP during 2013.
- The parking bays sustained about 618 jobs in Gauteng in 2013, 83% of the jobs created was in the semi-skilled and unskilled category.
- In addition to generating concrete economic benefits, the Gautrain also delivers on social dimensions such as lower carbon emissions, fewer accidents and casualties due to fewer cars on the road.
- The Gautrain airport service plays an important role in the economy by connecting local business travellers to Gauteng, supporting Gauteng's access to international markets, connecting employees of the ORTIA precinct to their place of work and by changing the overall perception of the public transport system by providing a safe and convenient service that delivers an enjoyable and stress-free transition between air and rail travel.
- The economic value-add derived from the Gautrain airport service stems from the cost savings and value for money of the service, as well as the average time saving and reliability of the service.
- With the Aerotropolis development gaining momentum and receiving support from a wide range of national, provincial and municipal policy documents and strategic objectives, it is important to emphasise the enormous potential for synergy between the Gautrain and the OR Tambo International Airport.
- Due to increased connectivity provided by the Gautrain in combination with high rates of economic growth in Gauteng in the past few years, the areas surrounding the Gautrain stations have developed and are continuing to develop into high-density mixed-use areas, changing the urban

landscape notably. Property values continue to rise in areas surrounding Gautrain stations and several new developments have been rolled out in their vicinity, including high rise office towers, hotel developments, residential apartment blocks and various other forms of retail and commercial properties.

- Residential property value surrounding the Gautrain station allows us to gain a better understanding of the impact the Gautrain development has on the attractiveness of surrounding areas, relative to further outlying property. By showing the impact of additional demand on property prices surrounding the Gautrain, it is possible to see the value

that residents attach to being close to high-quality public transport that connects them to industrial and economic business hubs. Specifically, the analysis takes account of the effect of Gautrain stations on residential properties within a 0km - 2km radius of all the stations in terms of their value inflation since 2008.

These economic benefits are likely to continue as long as the Gautrain remains an attractive alternative to other transport modalities. It is essential that the GMA team understands the factors which contribute to this trend and ensures that they remain in place.

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44 Grand Central Boulevard Grand Central ext. 1 Midrand | PO Box 1266, Kelvin, 2054  
Telephone: +27 (0) 11 086 3500 | Email: [info@gautrain.co.za](mailto:info@gautrain.co.za) | [www.gautrain.co.za](http://www.gautrain.co.za)