

NORTHLINK N1 - IRELAND

Tollinfra was assigned to carry out on-site testing of the new upgraded system software at the N1 Toll plaza near Drogheda.

This included the automatic coin machine process, regular manual lane, and system components such as MIS, LSDU, Frame Grabber and AVC. The toll system was assessed together with operational controls over the selected sample of operational activities, with the focus on the reconciliation between traffic and toll income.

The audit also analysed the requirements of reporting, the system's integrity and the effectiveness of the utilisation of the system by the Operator. The Consultant was required to report on how the Operator could extract more value from the installed system where perhaps certain applications were being disregarded.



SOUTHLINK N25 AND MIDLINK N8 - IRELAND

LIMERICK TOLL TUNNEL AND FERMOY BYPASS

The work involved the mobilisation management of the toll operations and interfacing thereof with the Limerick tunnel operations under the NRA - PPP Co (Direct Route) Contract. This experience culminated in the following:

- Extensive experience was gained in the detailed exposure to the NRA PPP Co and Construction Contract environment and arrangements. Such exposure relates to detailed familiarisation on the PPP Contract structure from Schedules 4 and 7, right through to 5 year management plans, emergency plans, toll by-laws, IEA, IVCS, AVC accuracy verification, certifications and procedures, penalty point regimes, early completion and long stop dates, indexation applications, traffic guarantees, etc.;
- Development of detailed toll operating specifications on behalf of the PPP Co
- (including the commissioning services, the operational services, performance measurement and management, and the asset definitions and registers, all aligned to the PPP Contract obligations and requirements;
- Quality Assurance Plan development;
- Health and Safety Plan development;
- Environmental Management Plan development;
- Toll Operating Plan development; and
- Management of the mobilisation during the recruitment and appointment of human resources, monitoring of the toll system commissioning (factory and site acceptance testing), procurement of movable assets (vehicles, furniture

and loose operational equipment, establishment of sub-supply services (such as cleaning, cash-in-transit, insurance and the like) and co-ordination of various PPP Co website development and 3rd party interfacing activities.

INDEPENDENT ENGINEER FOR THE TOLL EQUIPMENT SUPPLY CONTRACT

Tollinfra was appointed as the Independent Engineer by Messrs Southlink N25 Limited and Midlink N8 Limited to ensure the toll collection system complied with the requirements of the PPP Contract and the specific requirements of the Employer.

THE ROLE ENCOMPASSED:

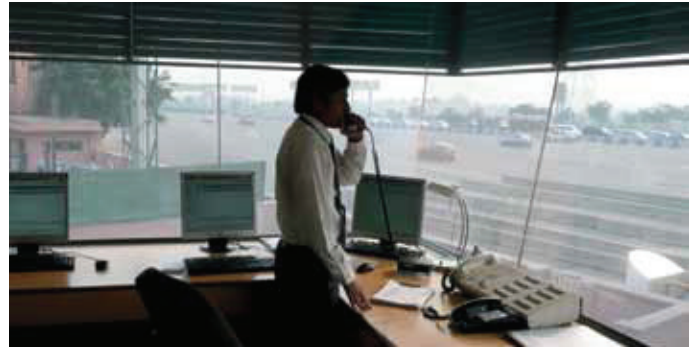
- A review and comment on the tender and contract documentation from a technical, commercial and compliance perspective. This included review and comment sessions in Dublin;
- Carrying out independent tender adjudication, and being present at tenderer's presentation sessions in order to make recommendations to the Client;
- Project implementation including full project management services of programme review and monitoring, processing of claims and variations, contractor's documentation review, FAT and SAT;
- Certification and Take Over, and completion of risk analysis;
- Management of the warranty; and
- Convening monthly management meetings to provide progress reports and certification of progress payments to the Client.

INTERNATIONAL PROJECTS

DND FLYWAY - DELHI - INDIA

An evaluation of the Operational and Training procedures was assigned to Tollinfra by the contracted operator of the DND Flyway in Delhi. The Operator was in turn contracted to the Concessionaire, Messrs NTBCL.

This entailed a comprehensive review of the entire operations documentation suite, including user manuals and internal procedures and operating processes. The findings of this review were presented to the Client, and modifications and enhancements were implemented on the documentation



A1 MOTORWAY - POLAND

The Poland Project entailed the construction of a 95 km green fields closed system, tolled motorway (A1 from Gdansk towards the southern central area of Poland) including various ramp toll plazas, two mainline plazas at either end and two large operations centres.

The Concessionaire consists of SKANSK from Sweden, NDI from Poland and Group 5 from South Africa. At the start of the Project, toll infrastructure development expertise was limited in Poland.

Tollinfra was appointed for the compilation of the User Requirements (from an operational perspective) for the plaza and operations facilities, as well as to execute the co-ordination of the detail design of these facilities by Polish designers. During this process, Tollinfra was required to transfer a huge amount of expertise to the designers such that they could continue with the next phase of the Project.

Tollinfra was also responsible for the detail design auditing from a technical point of view.

LEKKI EXPRESSWAY - LAGOS - NIGERIA

Tollinfra was appointed to oversee certain critical components of the management and implementation of a major toll concession project in Lagos, in Nigeria. This entailed the provision of the full scope of Operational Management Services for a Toll Concession Company. The project consisted of the rehabilitation of an existing road and the development of a green fields parallel route which will be used to service a rapidly growing area of Lagos, and placing these under toll.

The project consists of 80 km of tolled road, with 5 mainline toll plazas.

THE SERVICES PROVIDED INCLUDED:

- Strategic development of the tolling policies and strategies to optimise revenue with capital and operational costs;
- Facility planning in line with the operational and routine road maintenance philosophies;
- Basic planning, preliminary design and detailed design of all toll and road operations infrastructure;
- Basic planning, preliminary design and detailed design of all systems infrastructure, including the toll system, communication systems, and ITS systems;
- Compilation of tender documentation and management of various tender processes for the procurement of toll and other operational electronic systems;



- Supervision and monitoring of construction works of toll plazas, and system implementation including project management;
- Managing the facility Take Over on behalf of the Concessionaire;
- Monitoring and commissioning management of systems installations (factory and site acceptance testing);
- Enabling the Concessionaire to establish an operating entity and training, mentoring and facilitating that entity;
- Mobilisation management and provision of key specialist staff to handle documentation and procedural development, movable asset procurement, recruitment and appointment of staff, training of staff, interfacing with 3rd parties, asset take-over, and management for operational purposes; and
- Continuing for a period of 5 years to provide toll audit and forensic services to the Concessionaire.

DALPARK OPERATIONS CENTRE REFURBISHMENT

Tollinfra was appointed as the Supervising Consultant by the South African National Roads Agency Limited (SANRAL) to refurbish three existing buildings at the Dalpark Toll Plaza on the N17 which were to be used as the back-up operations centre for the Open Road Tolling project (ORT).

THE SCOPE OF WORK INCLUDED:

- Various repairs, replacements and installations pertaining to the general building facility (interior and exterior);
- Electrical and mechanical work (including air-conditioning, UPS and generators);
- Plumbing;
- Electronic access and security system;
- Landscape and gardening; and
- Call center



Tollinfra was required to supervise the primary contractor and sub-contractors for the duration of the contract.

In addition to the on-site supervision, Tollinfra was required to measure the contractors' progress, performance and quality of work.

GAUTENG OPEN ROAD TOLLING (G-ORT) STRATEGIC PLANNING: SYSTEMS AND OPERATIONS

This was the first phase of the initial development of the Gauteng ORT project, following the successful conclusion of the feasibility, financial and traffic modeling done by others.

Tollinfra was part of the team assisting SANRAL to develop a framework for ETC interoperability, including technical, operational and contractual interoperability.

This process also involved the interaction with other Toll Concessionaires in South Africa as well as the definition of the detail design process to follow this conceptual stage.

At this stage, the legal framework aspects have been addressed, as well as the definition and clarification of 16 principles on which future interoperability will be based in South Africa.

ITS - REHABILITATION



The South African National Roads Agency Limited (SANRAL) implemented an Intelligent Transportation System (ITS) project where ITS technologies are used to manage traffic, and to provide road users with traffic conditions on a real-time basis. The ITS backbone connects the Network Management Centre (NMC) to 27 Outstations where the video-streams and data-streams from approximately 240 field devices (the majority of which are cameras, but also including Variable Message Signs (VMS)) are collected for transfer to the NMC.

This project has been operational for several years, and the duct infrastructure for the fibre optic cables have significantly

deteriorated over the years due to ongoing construction and repair of other services.

This situation was further aggravated by the significant reconstruction and expansion work SANRAL commissioned on the Gauteng Freeway Improvement Project (GFIP), where several highways were significantly widened and almost all the major interchanges were optimised and rebuilt.

Due to the damage on the duct infrastructure, a significant portion of the backbone had to be rehabilitated, and in certain cases, completely replaced.

N17 TOLL PLAZA DESIGN AND CONSTRUCTION SUPERVISION



Tollinfra was appointed to the management of the preliminary design and implementation of the N17 Toll Project, running eastwards out of Johannesburg between Leandra and Ermelo.

The project consisted of the development and implementation of 3 mainline toll plazas with ramp plazas.

THE SERVICES PROVIDED INCLUDED:

- Strategic analysis of toll plaza positioning to optimise the cost of infrastructure versus toll revenue benefit;
- Traffic analysis in order to determine toll plaza sizing and toll lane configurations for a 10 year design period, as well as future predicted expansions;
- Method of payment analysis to coincide with the plaza sizing and expansion requirements within the context of the migration to Open Road tolling;
- Basic planning and preliminary designs of the toll plazas and control centres, including the civil and structural

- works, the building works, the electrical & mechanical works, and toll system and communication interfaces;
- Development of tender documents and managing of a tender process for the plaza construction;
- Development of tender documents and managing of tender processes for nominated sub-contract or similar arrangements for the supply of the electrical and mechanical systems;
- Co-ordination of 3rd parties in relation to adjacent road construction, operations and authority activities;
- Monitoring of health and safety, environmental, and quality assurance activities.
- Obtaining of authority permits; and
- Construction and hand-over supervision of the toll facilities.

This project was also undertaken as Specialist Consultant to Goba under the appointment of the South African National Roads Agency.

BEITBRIDGE TRAFFIC CONTROL PROJECT



Tollinfra was appointed as Design Consultant for an integrated traffic control and tolling facility.

The project included the planning, design, implementation and supervision of the construction of a toll plaza facility (buildings and toll lane area), including communications, security and toll systems to collect tolls, integrated with the overload fee collection systems and operations.

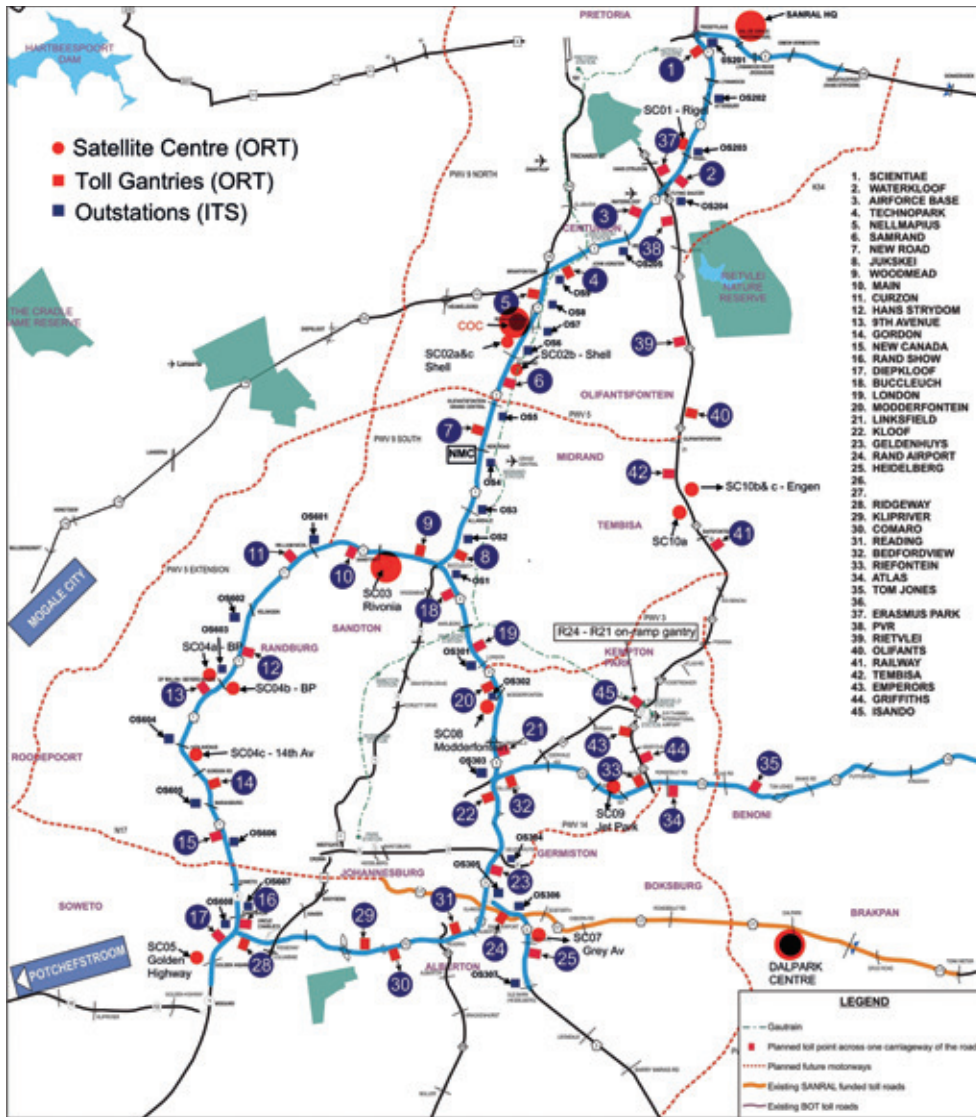
THE SERVICES PROVIDED INCLUDED:

- Traffic analysis;
- Micro positioning of facility;
- Co-ordination and interfacing with authorities;
- Basic planning;
- Preliminary design;
- Detail design, (only the electronic component);
- Tender process management, (only the electronic component);
- Construction and installation supervision, and electronic and multi disciplinary interfacing aspects; and
- Development and management of hand-over processes and interfacing with toll operations and maintenance.

COMMUNICATIONS FIBRE OPTIC BACKBONE

The South African National Roads Agency Limited (SANRAL) had a requirement to establish a high bandwidth and high availability fibre optic communications backbone for two major projects implemented along their main national routes in the Gauteng province. The combined lengths of the two networks are approximately 370km.

The first is an existing Intelligent Transportation System (ITS) project where ITS technologies are used to manage traffic, and to provide road users with traffic conditions on a real-time basis. This project required a significant upgrade in bandwidth and the rehabilitation - and in some cases the replacement of - existing fibre optic infrastructure. The communications backbone must connect the Network Management Centre (NMC) to 27 Outstations where the video streams and data streams from approximately 240 field devices (the majority of which are cameras, but also including Variable Message Signs (VMS)) is collected for transfer to the NMC.



OVERVIEW OF ENTIRE NETWORK (TOLL GANTRIES, SATELLITE CENTRES & ITS)

The second project is the Open Road Tolling (ORT) project implemented as part of the Gauteng Freeway Improvement Project (GFIP). The ORT project is an Electronic Toll Collection scheme designed to recover the investment on the GFIP infrastructure. It consists of 42 gantries with their associated Technical shelters, 10 Satellite Centres (SC) for Customer Service, a separate redundant Operations Centre located at Dalpark, the Central Operations Centre (COC) located off Samrand Road in Midrand, and a Disaster Recovery Centre located at Rivonia.

SANRAL's Head Office and Northern Region Office situated in Pretoria also had to link into this backbone in order to provide for their Corporate and Operational requirements, which includes:

- Real-time voice (VOIP) ;
- Real-time video (Streaming video-conferencing);
- Business data (Office applications, database connectivity and SAP);
- Best Effort data (Internet, File Transfer, E-mail);
- Data exchange with the ORT system;
- Data exchange and live video feeds from the ITS Management Systems; and
- Traffic data uploading on to the SANRAL system from traffic data loggers, which are located next to various motorways in the country.

The network has been designed to facilitate later expansion and to provide communications to SANRAL facilities from other provinces and third parties such as concessionaires.

LOCAL PROJECTS

BAPONG CORRIDOR CONTROL STATION PROJECT



Tollinfra was appointed as Design Consultant for a centralised weighing and vehicle checking facility, incorporating the data collated from remote weighing stations on other roads on the corridor.

The Project included the planning, design and implementation supervision of a weigh station facility (buildings and control area), including communications, as well as the inspection station for the enforcement of the South African Road Transport Quality System (RTQS). The latter is responsible for the monitoring of vehicle permits, driver checking, compliance with

the load distribution and security regulations, vehicle fitness requirements, and public safety commitments.

In addition to this, the full ambit of weigh in motion and static weigh bridges, as well as related traffic tracking and management systems were incorporated into the station. Tollinfra's primary responsibility was all basic operational and facilities planning, as well as all phases of the systems and electronic related components of the Project. In this Project, Tollinfra acted as Specialist Consultant to the Principal Consultant, Goba Pty Ltd.

N2 DUBE TOLL PLAZA

Dube Toll Plaza is located in Kwa-Zulu Natal and is part of the Dube Trade Port initiative close to the new King Shaka Airport.

Along with the Principal Consultant (Goba), Tollinfra was responsible for the preliminary design of the N2 Dube Toll Plaza, and also had to develop the detail design brief from an operational point of view. With its partner in architecture, LCM Architects, Tollinfra was also involved in co-ordinating the detail architectural designs.

An interesting aspect of the Plaza design was the necessity to allow for a design that could also cater for free flow ORT traffic in future. The design also had to allow for easy development into a hybrid plaza. Tollinfra was also responsible for the final toll lane determination documentation which was used as input to the preliminary designs.



GAUTENG ORT DESIGN AND TENDER DOCUMENTATION: SYSTEMS AND OPERATIONS

Toll Infrastructure Services was appointed by the South African National Road Agency, to be part of the team including South African and International consultants to do the design and compilation of the tender documentation for the "Procurement of an open road tolling system in the Gauteng Province, South Africa and a National Transaction Clearing House".

The tender documentation included the general contractual documents and was based on FIDIC. The user requirement documents included system and operational requirement specifications, and the regime for the performance management. The Project documentation included the following main operational areas:

- Tolling gantries;
- Toll Back Office system;
- Transaction Clearing House; and
- Violation Processing Centre.

The system included interfaces to third parties such as the banking system, e-NATIS and Toll Agencies. The Project also included a variety of electronic payment options such as credit card, debit card, debit order, e-commerce and electronic file transfer.

The operations include the Central Operations Centre, Customer Services Centres (including satellite centres and permanent and temporary kiosks), Mobile Payment Stations, Law Enforcement, and two Call Centres.

G-ORT CUSTOMER SERVICE CENTRE DESIGN AND CONSTRUCTION SUPERVISION



Tollinfra was appointed by the South African National Roads Agency Limited (SANRAL) to project manage the design and implementation of G-ORT Project A, Project B and Project C of the Customer Service Centre Buildings.

The Project consists of the construction of 14 Customer Service Centre Buildings with access roads, parking, provision of water and sanitation, as well as electrical and mechanical services (including power supply).

TOLLINFRA'S DELIVERABLES WERE THE FOLLOWING:

- Basic planning, land requisition, preliminary design and detail design co-ordination;
- Development of tender documents and managing of tender process (tender adjudication) including nominated sub-contractors;
- Development of project specification (producing project documentation);
- Co-ordination of health and safety-, environmental- and quality assurance activities monitoring; and
- Construction supervision and hand-over of the G-ORT Project A (Rigel, Rivonia, Modderfontein and Grey Customer Service Centre Buildings).

G-ORT INFRASTRUCTURE: CENTRAL OPERATIONS CENTRE DESIGN AND SUPERVISION



Tollinfra was appointed jointly with another firm under a consortium structure for the design, development and construction supervision of the ORT Central Operations Centre in Midrand adjacent to the ORT project. This Centre is conceived and designed to house the entire operational administration and process all customer interfaces and future ORT and ETC transactions on a National basis. The Centre accommodates diverse aspects such as data centres, call centres, a Violation Processing centre, management offices, briefing rooms etc.

The main entrance to the buildings is designed to take the form of an African drum, flush glazed with traditional African motif. Special diamond-shaped glass pyramids symbolise the diamonds of Gauteng, while gold coloured curved steel beams symbolise the gold of Gauteng.

The effect of using the symbol of the horn of an African Oryx gazelle as the supporting columns, symbolises power and protection and as used in the structural elements.

The Project implemented green architecture through sun shading panels. These elements are used both visually, and to protect the building from the harsh rays of the Gauteng sun.

The Ant theme which forms part of the landscaping, depicts ants as extremely busy creatures, always contributing to building and constructing their environment. This is compared to the daily commuter who is always busy travelling and contributing to the economy.

G-ORT DESIGN BUILD AND OPERATIONS SUPERVISION

Tollinfra was appointed by the South African National Roads Agency to fulfill certain key aspects of the supervision of the Contract between the Contractor (Operator) and the Agency. This Contract is based on international Best Practices utilising the FIDIC conditions of contract, where the supervision role includes the application of the conditions, and ensuring that the extensive requirements are being fulfilled.

Tollinfra fulfilled the specific role of the nominated Employers Representative for the Design and Build phase of the project. This project was developed almost entirely using local South African expertise, as SANRAL had determined that the cost and value obtained in the local market matched and bettered services available from broad based international sources.

The Project included the supervision of all the electronic and IT systems as well as the operations related to the G-ORT Back Office, National Transaction Clearing House and the National Violations Center, the latter two, as the name implies, being developed and applied across the entire South African roads network.

Under the Contract, the Operator has had to established a new organisation, which would create approximately 2 000 permanent job opportunities, with newly acquired skills, new philosophies, new disciplines all of which were designed and overseen for implementation by the supervisory team.