Gauteng Freeway Improvement Project and Open Road Tolling

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## Network Type

<table>
<thead>
<tr>
<th>Description</th>
<th>Non-Toll</th>
<th>State Toll</th>
<th>PPP(BOT)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Carriageway</td>
<td>610</td>
<td>520</td>
<td>443</td>
<td>1,573</td>
</tr>
<tr>
<td>4-Lane Undivided</td>
<td>11</td>
<td>299</td>
<td>240</td>
<td>550</td>
</tr>
<tr>
<td>2-Lane Single</td>
<td>12,429</td>
<td>1,013</td>
<td>605</td>
<td>14,047</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13,050</strong></td>
<td><strong>1,832</strong></td>
<td><strong>1,288</strong></td>
<td><strong>16,170</strong></td>
</tr>
</tbody>
</table>

**% of SANRAL Network**

- Non-Toll: 81%
- State Toll: 11%
- PPP(BOT): 8%
Background

- Gauteng – Economic hub of SA – 38% of GDP
- Congestion as a result of traffic growth linked to economic growth
- When evaluating feasibility, current situation, as well as future situation considered – “what if not?”

William Nicol Interchange 1970

- Potential loss in value added in Gauteng alone could amount to R155 billion over the period 2004 to 2025
- Certain development nodes may not reach their full potential as a result of inadequate road access
- Every Billion spend – R300m backflow

Source: Gautrans Report (Roelof Botha)
Economic Benefit

- The Business School of the UCT performed an macro economic impact study for the GFIP

- GFIP:
  - B/C over 8:1
  - IRR: Over 50%
Approval Processes

- Approached Minister of Transport 2005 – project proposal
- Inter governmental (all spheres) workgroup agreed project principles
- EIA approval was obtained
- Cabinet approval – mid 2007
- Intent to toll process – October 2007
- Declared as a toll road – January 2008
- Procurement of contracts commenced thereafter
**Project Extent:**

**PLANNED LANE ADDITIONS:**
185 km (2010)

**FUTURE UPGRADES:**
(223 KM)

**PLANNED NEW ROUTES:**
158 km

**FINAL SCHEME:**
561 KM
Road Improvements

- In general, freeways are upgraded to 4 lanes per direction

- Some sections, up to 6 lanes per direction

- Interchanges are improved:
  - 7 Systems Interchanges (additional lanes, directional ramps)
  - 27 Access Interchanges (Additional bridges, single points, ramp Additions, lane additions)

- Auxiliary lanes at on- and off-ramps

- Cross road improvements

- Median lighting is provided
N1: Maraisburg Interchange
N1: MALIBONGWE INTERCHANGE
N1: WILLIAM NICOL INTERCHANGE
N1: Allandale Interchange
N1/R21 Interchange
N1: Garstfontein Interchange
N1: Atterbury Interchange
N1: Lynnwood Interchange
N3: Gilloolys Interchange
N3: Linksfield Interchange
N3: Elands Interchange
N3: Grey Ave. Interchange
N12: Reading Interchange
Structures – Package D1
Incremental launch bridge
Allandale Interchange
Beam Placement
Garstfontein

Demolish Atterbury Bridge
Median Works

110 t beam – William Nicol Interchange
Project Progress

- Construction commenced: June 08
- SANRAL awarded road construction tenders to the amount of R15 b (excl)
- ITS for network completed 185 km of network under construction – concludes Phase 1 of GFIP
- Managed to reach almost all milestones for the 2010 World Cup – in some instances, milestones were exceeded
Project Progress

- For World Cup – approximately 80% of road works complete
- Road construction commenced – various completion dates from end 2010 to mid 2011
- Toll infrastructure under construction – completion end 2010
- Toll system under development – toll commencement April/May 2011
Open Road Tolling
Open Road Tolling (ORT)

- In urban environment (space constraint), high traffic volumes (100,000 to 200,000 AADT), conventional tolling not an option

- ORT:
  - All transactions recorded electronically
    - Number plates or tag
  - Vehicle linked to an account
  - No physical toll plazas – free flow tolling
SANRAL principles for ORT

- One tag standard
- One account – may include various vehicles
- Central clearing

Full interoperability
ORT - General

- **SANRAL model:**
  - TCH & VPC – National SANRAL initiative:
    - Central clearing with all current and future concessions
    - Clearing with CTROM
    - Integration of Natis and AARTO
    - Utilising special enforcement unit to do violation processing & enforcement
ORT Building Blocks

- Consist of following:
  - Toll tag
  - Kiosks/Mobile Kiosks
  - Satellite Centres
  - Technical Shelters and Gantries (Toll Point)
  - Communications Backbone
  - Central Operations Centre (ORT Back Office, TCH, VPC, ITS)
  - Disaster Recovery Centre
  - Toll Signage
  - User Services
Electronic tag

- **Tag:**
  - Standard: 5.8 GHz
  - Also known as transponder or On Board Unit (OBU)
  - SANRAL pre-qualified 3 suppliers
Kiosks

- At shopping centres:
  - Account registration
  - Tag problems
  - Account queries
ORT – Customer Service Centres
Assumptions

12 mins at ave of 80km/h = 16km

Turnaround only possible at next interchange
Technical Shelters & Gantries
TOLLING POINT GANTRIES
Communications Backbone

- SANRAL Provides:
  - Fibre Optic Backbone
  - Combination of existing ITS fibre and fibre to be installed in median

- Coms DBO tender:
  - Two tender options:
    - Provide infrastructure and services – normal payment
    - DBO contractor allowed to use it commercially – SANRAL should share in benefit

- Contractor:
  - Backup/emergency coms
ORT – Central Operations Centre

- ORT Back Office
- Transaction Clearing House (TCH)
- Violations Processing Centre (VPC)
- New ITS ops centre
ORT – Back Office

- Receives Transactions from RSS
- Apply discounts
- Do manual NPR if ANPR failed for non-e-Tag transactions
- Optimise completeness and compliancy of transaction, before forwarding to the TCH
ORT - TCH

- Receive transactions from the ORT operator
- TCH links transaction to an account
- Does financial clearing
- If not successful – forward to VPC
- Do account management – call centre
- Manage tag logistics – issues the tag to all ETC projects/Retail outlets
Setting Up an Account

- Users required to register or set up account:
  - Do it at point of presence (kiosk/customer centre)
  - Through the internet
  - Contacting a call centre
  - Tag in a bag
Account Types

- Register a:
  - Pre paid account (similar to cell prepaid)
    - Low balance warning
    - Automatic top up
  - Guaranteed post paid
    - Linked to credit card
    - Transactions rolled up on daily basis – single transaction on credit card
Account Types (cont.)

- Top up of pre-paid account:
  - EFT (internet)
  - At POP
  - At ATM
  - By means of debit order
  - Etcetera
ORT – Violation Processing

- Potential violator identified if:
  - No tag or account
  - Insufficient funds in account
  - Vehicle not identifiable

- Transaction forwarded to VPC:
  - Send invoice
  - Not successful – Infringement notice – note, must be peace officers and should be appointed by SANRAL
  - Not paid – Courtesy letter (RTMC)
  - Not paid – Enforcement order
Violation Enforcement

- Enforcement Unit (traffic officers together with ORT contractor) to be set up to do violation enforcement
- Not only toll enforcement but also traffic violations & incident response
A dedicated Enforcement Unit of ±260 Traffic Officers undergoing training (appointed in conjunction with the RTMC)

Two specialised units are envisaged:

- Patrolling Unit (toll enforcement / incident response)
- “Road Block” Unit

Patrol vehicles (MPV) and Mobile Payment Stations (MPS) are in prototype phase

MPS Midi’s – 3 workstations, MPS Maxi’s – 4 workstations
Enforcement Unit

- Create a safe environment for Road Users
- Secure the infrastructure
- Assist with incidents on the freeway
- Create an awareness and deterrent effect for non-payment of tolls
- Enforcing all Traffic Infringements and Offences
- Tracking Vehicles of Special Interest (VOSI)
The Enforcement Unit will patrol the route 24 hours per day.

24 MPV are being procured.

MPV’s will patrol +/- 20 km stretches of road with 2 vehicles per shift.
Patrol Vehicles
Road Block Unit Strategy

- The Enforcement Unit will perform road blocks for 2 shifts per day
- Road Blocks at on-ramps, X-roads & technical shelters
- 20 MPS to be procured
Mobile Pay Stations (Midis)
Mobile Pay Stations (Maxis)
Thank You

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