Determining Toll Tariffs

Toll fees (User pay principle)

Road toll fees constitute user charges that aim to recover the costs of road infrastructure. Users of toll roads receive the benefit of this road infrastructure in exchange for the payment of toll fees that reflect the value to the individual road user. Unlike a user charge, a tax does not confer a direct benefit for the payment made.

The toll fees or the road user charge is calculated based on the cost of providing, maintaining and refurbishing that specific road. These toll fees should be less than the benefits such as reduced travel times and vehicle operating costs that a user is experiencing when using the toll road. The costs of providing road infrastructure have to be recovered from either specific road user beneficiaries or the general taxpaying public at large. Toll fees promote economic efficiency as well as improving accountability and transparency. In contrast, in the absence of tolls, road costs would have to be borne by all taxpayers, irrespective of the extent to which they derive individual benefits from specific road infrastructure expansion and maintenance projects. Unlike a user charge, a tax does not confer a direct benefit for the payment made.

The costs for the GFIP implementation (Phase 1), inclusive of the tolling system and intelligent transport systems (ITS), will amount to approximately R 19,5 billion (VAT Excl). The GFIP has been funded through borrowings from the capital markets. These loans have to be re-paid by SANRAL through the tolls collected. If the loans are not paid through toll fees, the loans will have to be paid by National Treasury by rising taxes or reducing the allocations to other sectors -- are not prudent for the National Treasury to implement.

Financing of GFIP

The cost of road works and the implementation of Intelligent Transport Systems (ITS) for the implementation of the current phase of the GFIP amounts to approximately R17,4 billion (VAT Excl). The key issue is how to finance the rehabilitation, upgrading, maintenance, operations and new freeways for the GFIP.

The GFIP is funded using capital and money market loans that are being procured to fund the initial capital costs as well as the interest upon the initial capital costs, bearing in mind that the initial capital works took place over several years.

In the case of the GFIP financial model, it is predicted that the loans will be repaid in the year before the major rehabilitation work that has to be undertaken that scheduled after 20 years of operation.

Since the current financial model only makes provision for the repayment of the capital costs associated with the initial capital works and does not make provision for the capital costs of any additional road capacity to be created, either on the existing GFIP routes or in the GFIP corridors, it is reasonable to assume that the toll revenue will, amongst other applications, be applied to provide additional road capacity after the repayment of the loans for the initial capital works.

SANRAL's Domestic Medium Term Note (DMTN) Programme

SANRAL sells (issues) bonds to investors in the capital market at monthly bond auctions. This provides SANRAL with the required funding to build, operate and maintain toll roads. The interest rate that SANRAL has to pay on these bonds is determined in the capital market. Bonds trade in the market similar to shares on the stock exchange, and prices and interest rates fluctuate up and down all the time.

At these bond auctions, investors bid in relation to interest rates of Government bonds and their sentiment towards risks in the market. These investors are mostly anonymous and ownership changes over time as bonds are traded in the secondary market.

Investors are strongly influenced by the opinions of rating agencies. SANRAL has obtained the following ratings from Moody's:

- **Global Scale Issuer Ratings** (Non-guaranteed notes):

Long-Term: A3

Short-Term: P-2

These are equivalent to the sovereign ratings

- **National Scale Issuer Ratings** (Non-guaranteed notes):

Long-Term: Aa2.za

Short-Term: P-1.za

Unlike a home loan, interest is paid every six months and the principal sum is repaid at the maturity of the bond. SANRAL has sold bonds with maturities that vary from two years to 25 years, from 2013 to 2035. When a bond matures, it has to be refinanced by selling new bonds to investors for another fixed period. The average interest rate that SANRAL pays on all its debt is slightly lower than 10%.

SANRAL has a guarantee from National Treasury for a total debt of R37.91 billion, R6 billion for SZ bonds and R31.91 billion for HWAY bonds. A total of R5.5 billion SZ bonds have been issued and R9.7 billion HWAY bonds. In addition to this SANRAL may issue a total of R15 billion unguaranteed bonds, the NRA bonds, of which R10.5 billion have been issued. Both the guaranteed and the unguaranteed bonds are of various tenors (term to maturity) with different coupon interest rates as well as some inflation linked bonds, where the repayment grows with CPI. All details regarding SANRAL bonds are available from the Johannesburg Stock Exchange (JSE).

The table below lists the unguaranteed NRA bonds with amounts in issue. Note the NRA013 and the NRA023 are inflation linked bonds.

BOND	COUPON	MATURITY	COUPON DATES	ISSUE AMT (R million)	TYPE
NRA013	4.25 %	31 October 2013	30 April 31 October	1473	CPI
NRA014	11.25 %	30 April 2014	30 April 31 October	132	Fixed
NRA018	12.25 %	30 November 2018	31 May 30 November	2553	Fixed
NRA022	12.25 %	31 October 2022	30 April 31 October	2470	Fixed
NRA023	5.00 %	31 May 2023	31 May 30 November	643	CPI
NRA028	12.25 %	31 November 2028	31 May 30 November	3246	Fixed

The SZ bonds are issued under the original guarantee dating from 1998 and has a limit of R6 billion.

BOND	COUPON	MATURITY	COUPON DATES	ISSUE AMOUNT (R million	TYPE
SZ18	12.5%	30 September 2015	31 March 30 September	1 648	Fixed
SZ25	9%	30 September 2025	31 March	3 823	Fixed

			30 September		

The HWAY bonds are issued under the R31.91 billion guarantee. The HWAY23 is an inflation linked bond.

BOND	COUPON	MATURITY	COUPON DATES	ISSUE AMT (R million)	TYPE
HWAY20	9.75 %	31 July 2020	31 January 31 July	6 660	Fixed
HWAY23	5.50 %	7 December 2023	7 June 7 December	781	CPI
HWAY34	9.25 %	31 July 2034	31 January 31 July	2270	Fixed

Tariff Determination and Tolling Strategy

The objectives in developing the tolling strategy were:

Equitability - users paying a level of toll that commensurate with the distance they travel on the freeway system.

Affordability - the traffic using the freeway system is commuter and/or daily business related.

Traffic Attraction – optimise traffic attraction to the toll roads, thereby limiting additional traffic being loaded onto the secondary road network.

Efficiency from a cost/toll revenue income point of view.

The approach for tariff determination that was adopted for the GFIP, was to determine the tariff levels at which there would not be traffic diversion to alternative roads in respect of those freeway sections to which capacity would be added. It was found that, if the above-mentioned approach is adopted, traffic attraction to most of the upgraded freeway sections

would still be achieved at light vehicle discounted tariff levels of 50c/km (non discounted in March 2007 values).

The nature of this road network is such that a conventional toll collection system (toll gates) is not appropriate to install. Therefore, an electronic toll collection (ETC) system is installed which will not impact on traffic flow. Gauteng's e-toll will be operating as an Open Road Tolling (ORT) system comprising a fully electronic toll collection system that does not require vehicles to slow down or stop to conclude a toll transaction. As there are no physical toll booths, overhead gantries are fitted with the toll collection equipment that will recognise the vehicle identifier (electronic transponder (e-tag) in a vehicle and /or the vehicle number plate), toll will be deducted from a user's registered e-toll account associated with the vehicle identifier and the user will be able to travel without any disruption.

The toll system will enable fully integrated electronic toll collection on all toll roads in South Africa, and will be able to do central clearing of toll transactions, thereby enabling a road user to set up a single toll account with the central clearing house, that will allow the account holder of a specific vehicle to make payment at any toll plaza where electronic toll collection is offered, through a single account. In other countries where electronic toll collection has been implemented, road users are required to set up toll accounts with each toll authority or concessionaire that offers electronic toll collection.

Various toll systems were investigated during the development phase of the project. A closed toll system, would have resulted in the construction of gantries (toll points) at every on- and off ramp, at every interchange which would have resulted in an increase in construction and operational costs, thereby increasing the toll tariff to such an extent that the cost to implement a closed toll system would have outweighed the benefit, resulting in an increase of the required toll tariff. The type of toll system, introduced in GFIP, is referred to as a directional toll system, where only one direction of the route is tolled and the toll points are situated approximately 10km apart. The directional toll system, in this instance, is the most equitable for the road user.

Tolls are raised per gantry. Each time a vehicle pass underneath a gantry, toll is charged. The cost per gantry is determined by the kilometer distance which the toll point/gantry represents. However, since this is not a closed system, in some instance road users might travel on the tolled route, but exit the system, before passing a gantry (toll point), which would mean a 'free ride'. But, on the return trip, road user might pass a gantry (toll point) for which they will be charged, thus balancing the cost. Some road users might enter the system just a short distance, before a gantry (toll point) and the full gantry (toll point) cost would apply, even though he/she did not travel the whole section of road. Road users may also enter the road network and exiting it, without going through a tolling point at all.

Setting of Toll Tariffs

The legal process is as follows:

- Based on the aspects raised above, SANRAL presents the proposed toll tariffs to Minister of Transport for approval
- If approved by the Minister of Transport, the tariffs are published in the Government Gazette.

The toll financial model is used to determine the required toll tariffs in terms of sound financial principles. This financial model is audited by the Auditor General. As part of the toll tariff review process, two auditing firms namely Deloitte's and PWC were appointed to review the SANRAL financial model. Deloitte reviewed the inputs to the SANRAL Cost Model and the overall results presented. PWC reviewed the formulae and outputs of SANRAL Cost Model, and the inputs, formulae and outputs of the SANRAL Revenue Model.

The conclusions reached by Deloitte's are quoted below:

"In concluding, we underline our key results:

- All SANRAL Cost Model parameters were reviewed. Those with a large effect on maximum debt level and payback period were checked for sensitivity to the SANRAL Cost Model.
    - Income for 2011 is the parameter to which the SANRAL Cost Model is most sensitive toward followed by the income adjustment for 2011. This may pose a problem as if income is fractionally less or the adjustment is inaccurate, maximum debt levels and payback period may reach uncontrollable levels.
    - The September 2009 inflation indices for plant and material are the third and fifth most sensitive parameters. These values are only used in the calculation of construction inflation for 2009/2010 which has a value of 0.7%. Using a calculated inflation rate is more appropriate than the flat line inflation rate of 6% applied to all other inflation rates.
    - The fourth most sensitive parameter is inflation rate per annum 2009/2010.
- The SANRAL Cost Model is highly sensitive to economic assumptions such as the inflation rate and interest on debt payable, i.e. real rate. These assumptions have been carefully considered and are appropriate at the time of model's construction. Due to the long time period involved in the projection and the expanding funnel of doubt in projecting forward to longer time periods, it can be considered acceptable to use a flat interest rate in the long term.
    - An inflation rate that varies with term could be considered more appropriate, however, this would likely result in spurious accuracy when projecting 30 years into the future.
    - The interest on debt payable is an important consideration in the model. The rate used in the model has been confirmed by SANRAL Treasury and is considered appropriate at the time of the model's construction. This rate will vary as bonds mature or are repurchased before maturity and new bonds issued. As such, the 11.30% is considered appropriate.
- Other inputs such as traffic growth and income from revenue require all models to be collectively reviewed to ascertain the full impact of these parameters. Other than the Traffic Model, the remainder of the models will be reviewed by PWC. PWC's results will then be reviewed again by Deloitte in order to ensure that the models, inputs and assumptions are consistent with one another as well as between models.
- It is important to note that no contribution to overheads, profits or further expansion costs are included in the determination of the tariff. As such, the income generated from the tolls is not intended to cover these items. Other than the possible contribution in terms of processing fees from other toll authorities or toll roads adopting the technology developed, no cross-subsidies or other interactions with other toll roads have been allowed for in the

calculation of the tariffs. As such, the GFIP will not be cross-subsidising other toll roads or authorities.

- Some subjectivity is included in the model, but where subjective inputs have been incorporated , these have been substantiated and confirmed by Deloitte where possible. It should be noted that the model projects into the future and it is therefore impossible to predict the future with absolute certainty. Where predictions have been made, these were based on inputs that have been reviewed by Deloitte and are considered appropriate.
- SANRAL is exposed to many risks, these include lack of law enforcement, expense risk, inflation risk and interest rate risk to mention a few. Therefore it would be considered appropriate to include a measure of prudence in the model to allow for these risks."

The conclusions reached by PWC are quoted below:

"Conclusion of key findings:

- In its current form, we could not find any major errors in the Income Model. None of the findings above had an overall impact of more that 1% on the overall results.
- In its current form, we could not find any major errors in the LSR Model. The concerns we have highlighted are around change control – i.e. if the model is passed on to someone unfamiliar with how it works, then that may expose the user of the model to operational risk.
- The scenario analysis was performed correctly by Tolplan across both models under review."

From the conclusions reached above, it is clear that no profits, sharing of toll revenue or too conservative risk assumptions were made, that could be used to revise the toll tariff.