

# **The Road to Excess:**

## **A Paper on High Pricing, Collusion and Capture of National Road Construction**

A revision and update of OUTA's previous position paper  
(Titled: GFIP Construction Costs and Sanral's Odious Debt - Feb 2016)  
on the inflated cost of road construction in South Africa,  
more specifically on projects managed by the  
South African National Roads Agency Limited (SANRAL)

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## Executive Summary

This position paper is an update and refinement of OUTA's previous paper released in February 2016 and titled: 'SANRAL's Odious GFIP Debt, Courtesy of SANRAL'.

Within this paper, OUTA looks closely at the costs of the Gauteng Freeway Improvement Project (GFIP), a freeway network upgrade project managed by the South African National Roads Agency Limited (SANRAL), which was conducted between 2008 and 2012 to relieve road congestion in Gauteng, South Africa's economic powerhouse province.

The funding mechanism chosen for the freeway upgrade was a *boomless* electronic tolling (e-toll) system, which was introduced in a 'surreptitious' manner, much to the anger of the Gauteng motorists, leading to the new democracy's biggest civil disobedience campaign.

This paper, however, deals with another matter related to the e-toll scheme, being that of the exorbitant construction costs of the GFIP, one that almost went unnoticed and unchallenged. The significance and seriousness of this issue speaks to the negative impact on society when it comes to collusive and corrupt behaviour within an industry that does business with the state. However, when an industry's collusive conduct is combined with the participation (or lack of corrective action and scrutiny) by the respective State Owned Entity (SOE); the impact has the potential of becoming a massive burden and unnecessary cost to society.

Over the past decade or more, South Africans have been on the receiving end of numerous cases of 'capture', corruption and maladministration of state spending, whereby the SOE's leadership is responsible for excessive capital expenditure due to reasons of ineptitude, participation or turning a blind-eye to matters that enrich companies and individuals, in their dealings and contracts with the government. The extent of the '*state capture*' becomes rife and more easily disguised in large-scale infrastructure projects, whereby price increases, project delays, scope creep and cost escalations are introduced to siphon off excessive project cost increases - ultimately paid for by the public.

This paper provides significant insight into the over-priced cost of the GFIP and thereby raises concerns about the capture of the road construction industry and how SANRAL, along with the Government and Industry oversight bodies, have done little to curb or challenge the substantive and gross overcharging of state-controlled road construction expenditure.

Despite the fact that SANRAL tried (and failed) to discredit OUTA's initial paper in April 2016, OUTA decided to expand its research beyond an international benchmarking exercise, to seek more input and use other methodologies, to test the view that the GFIP was indeed substantively overpriced. In so doing, OUTA was able to obtain input and insights from road construction experts and additional information pertaining to GFIP work package tenders and bill of quantities. This information enabled OUTA's consultants and research team to calculate with reasonable confidence, what they deemed as being a fair value cost of the GFIP and believe this to be the price that SANRAL ought to have paid. In this paper, OUTA has further corroborated their findings with additional benchmarking examples and have concluded with relative certainty, their view on the excessive extent of GFIP costs.

The implications and inferences contained herein, suggest that SANRAL and its leadership has lost its moral compass over the past decade, more specifically w.r.t. the GFIP project and in so doing, have subjected the nation and its people to substantially unnecessary expenditure. The findings also highlight that the high costs imposed on the GFIP became a 'truck' on which the state was able to hitch the expensive e-Toll financing mechanism, which also has questions related to the high costs of administration and operations.

Accordingly, OUTA maintains that had the GFIP construction costs come in at the more acceptable levels indicated by their research, the decision to finance the project through an elaborate and costly e-toll scheme would more than likely not have happened.

From the results reflected in this position paper, OUTA confidently states that the South African public have been grossly overcharged for the GFIP - by more than double the cost that ought to have been paid. In short, SANRAL and its leadership have largely been responsible for an unnecessarily inflated cost of between R9 billion and R10 billion, when it paid R17,9

billion for the GFIP, instead of OUTA’s estimated fair value of the project at around R8,2 billion.

In its conclusions, OUTA finds this situation as unthinkable and unacceptable for an SOE, whose role is to provide the best outcomes for society. By inference, at the very least OUTA believes this situation could not have occurred due to SANRAL's ineptitude or negligence, as this SOE is filled with knowledgeable engineers and advisors (internal and external) who know very well the cost of road construction in South Africa. But whether this situation arrived through negligence, ineptitude, industry collusion or corruption, OUTA's position is that this matter needs to be investigated and any wrongdoing uncovered should be followed through by holding those responsible to account for their conduct.

### **Glossary of terms**

AfDB	African Development Bank
BOQ	Bill of Quantities
CIDB	Construction Industry Development Board
COLTO	Committee of Land Transport Officials
CPA	Contract Price Adjustment
CSIR	Council for Scientific and Industrial Research
FIDIC	International Federation of Consulting Engineers / Fédération Internationale Des Ingénieurs-Conseils
GFIP	Gauteng Freeway Improvement Project
OUTA	Organisation Undoing Tax Abuse
P&G	Preliminaries and General
PAIA	Promotion of Access to Information Act
QS	Quantity Surveyor
SAFCEC	South African Forum of Civil Engineering Contractors
SAICE	South African Institute for Civil Engineering
SANRAL	South African National Roads Agency Limited
SOE	State Owned Entity
UTCRCP	Ultra-Thin Continuously Reinforced Concrete Pavement
UTFC	Ultra-Thin Friction Course
VAT	Value Added Tax
WSDOT	Washington State Department of Transport

## 1. Introduction

This position paper analyses the excessive construction costs of the Gauteng Freeway Improvement Project (GFIP Phase 1), which involved the upgrade and widening of the main freeway network around the three metropolitan districts of Johannesburg, Ekurhuleni and Tshwane between 2008 and 2011.

The freeway upgrade itself was a welcome decision by the motorists of the Gauteng Province, who had become increasingly frustrated with the growing congestion which was having an impact on productivity and living conditions in the country's economic hub.

However, it was when the decision became clear late in 2010 that the financing of the upgrade was to be undertaken by way of an elaborate 45 gantry electronic tolling (e-Toll) system,<sup>1</sup> that questions arose about the tolling decision and as a result, public outrage began to surface. The events that unfolded would lead to South Africa's biggest civil disobedience campaign since democracy, rendering the entire e-toll scheme a failure due to a number of reasons, the most significant being the extremely low compliance levels which, three years into the scheme stands at below 20%.

Amidst the outcry about the e-toll decision, the question of the apparent excessive cost of the freeway upgrade went almost unnoticed and relatively unchallenged. SANRAL had raised more than R20,6 billion in bonds for the GFIP, which was borrowed to cover the road construction cost (R17,9 billion) and the rest to cover the e-toll collection infrastructure as well as other incidentals (R2,7 billion)<sup>2</sup> (As seen in Annexure 1).

The question is; how much should a road construction project of this magnitude and nature cost? If you ask a general member of the public whether R17.9 billion for the Gauteng freeway upgrade is a lot, he/she would probably be unable to tell if this figure represents fair value for a project of this nature. The short answer, which is the culmination of OUTA's first and this

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<sup>1</sup> [http://www.nra.co.za/content/E-TOLL\\_MAP\\_class\\_A2\\_e-tag\\_Rate~1.pdf](http://www.nra.co.za/content/E-TOLL_MAP_class_A2_e-tag_Rate~1.pdf)

<sup>2</sup> [http://www.nra.co.za/live/content.php?Session\\_ID=187de9c76be32d5a266f5060a2fa8d3e&Item\\_ID=407](http://www.nra.co.za/live/content.php?Session_ID=187de9c76be32d5a266f5060a2fa8d3e&Item_ID=407)

<sup>2</sup> [http://www.nra.co.za/live/content.php?Session\\_ID=187de9c76be32d5a266f5060a2fa8d3e&Item\\_ID=407](http://www.nra.co.za/live/content.php?Session_ID=187de9c76be32d5a266f5060a2fa8d3e&Item_ID=407)

subsequent paper, is that R17,9 billion is an extremely high cost and thus a substantive overpayment for this specific project.

Before going further, the question of the size/length of the project needs to be unpacked. The GFIP was initially reported (on numerous occasions) by SANRAL as being 185 kilometres in length<sup>3</sup> but later reported by SANRAL to have increased to 201 kilometres. OUTA's search of SANRAL's references to ascertain the increased length of GFIP, from their earlier references and package lists, revealed two additional unnamed work packages included into Phase 1 of the GFIP<sup>4</sup>. When OUTA calculated the kilometres per work packages reported by SANRAL, it could only get to a maximum of 193 kilometres for the GFIP Phase 1. For the purposes of this paper, OUTA will reference the GFIP as being 193km in length.

When referenced as a cost per kilometre over the 193km attributed to the project, the GFIP comes in at around R92,6 million per kilometre. However, even if SANRAL were to explain and show the additional few "missing" kilometres, this would not detract from the overarching findings and conclusions in this report.

In 2015, the Organisation Undoing Tax Abuse - OUTA (formally known as Opposition to Urban Tolling Alliance) decided to investigate whether the GFIP price tag of R17,9 billion was in fact fair value for the project. This was prompted by the fact that following an expose of construction industry collusion which had an impact on the GFIP, for over two years SANRAL had not been forthcoming with an explanation and sufficient details as to the extent of the collusion on the overall cost of the GFIP and even when it did arrive at a figure, the explanation to broader society will minimal and incomplete.

OUTA decided to benchmark the cost of the GFIP to other road construction projects and references it could find. Their findings were published in a position paper titled "Society's odious GFIP debt, courtesy of SANRAL" in February 2016<sup>5</sup>. Not only was this paper published to provide insight on whether the Gauteng Freeway Improvement Project (GFIP) was

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<sup>3</sup> [http://www.nra.co.za/live/content.php?Session\\_ID=72b9ea1ae055ce5527b46ddcaa4d7c75&Item\\_ID=260](http://www.nra.co.za/live/content.php?Session_ID=72b9ea1ae055ce5527b46ddcaa4d7c75&Item_ID=260)

**Note:** In the majority of SANRAL's communications and presentations to the public, they referenced the GFIP Phase 1 distance as 185km. Please see Annexure 2a and 2b for more detail.

<sup>4</sup> Annexure 1 and Annexure 3

<sup>5</sup> <http://www.ouata.co.za/gauteng-freeway-overpriced-by-321percent/>



overpriced, but in so doing, OUTA raised concerns about the implications and inferences of SANRAL's leadership credibility at the time, as a result of this situation.

OUTA understands that trying to ascertain what the cost of a road construction project should be, can be equivalent to asking "how long is a piece of string?". There is no doubt that a four-lane highway traversing a mountain range would be more expensive to construct than one of the same distance traversing a flat stable landscape. We are also aware that even when comparing projects that traverse similar terrain, other variables such as sub-strata conditions, bridge and other structural work, land acquisition, relocation of other infrastructure (water, electrical, rail lines etc.) and commodity price variances (due to timing differences) along with competitive forces, will all impact on the price of a road construction project.

This, however, does not detract from the need or ability to benchmark road construction projects, especially when some of the complexities are removed and one is able to compare the bulk nature of the basic road construction work with similar projects.

When questioned about the seemingly excessive GFIP construction costs, SANRAL has indicated on several occasions that the cost of the project was acceptable in relation to the work that was done. However, following SANRAL's attempt to denounce OUTA's benchmarking exercise featured in its February 2016 paper, OUTA's additional research and work reflected in this paper, reiterates its position that the cost/payment of R17,9 billion by SANRAL for GFIP was extremely excessive.

To establish its updated claim, OUTA conducted a broader and deeper exercise that not only entails a benchmarking exercise to other projects but also includes input from experienced road construction engineers who have reviewed additional data and information specific to the GFIP. This information obtained by OUTA includes tender documents; bills of quantities; key quantity input from SANRAL and construction company presentations; and satellite imagery. Through the use of this information and the application of various methodologies of calculation and extrapolation, OUTA is able to reiterate with greater certainty its claim that the GFIP construction costs were excessively inflated by between R9 billion and R10 billion.

## 1.1 SANRAL's response to OUTA's initial GFIP costs position paper

Before proceeding with the various calculation exercises, OUTA wishes to highlight a few concerns related to SANRAL's response to its initial position paper released in February 2016.

SANRAL's initial response to OUTA's paper was to send a letter on 23 March 2016 from their lawyers (Werksmans), wherein they posed some 420 questions to OUTA, asserting the claims and inferences therein were unsubstantiated and requested OUTA to respond to their questions within two weeks or face "such action as is appropriate under the circumstances" by SANRAL.

OUTA's response to Werksmans was a request to engage directly with SANRAL in reply to their questions posed, in order to detract from expensive legal costs with taxpayer's money and enable a more efficient process of engagement in this matter. Unfortunately, SANRAL chose to ignore OUTA's request and on Tuesday 12 April 2016, held a media conference to disparage the claims and assertions made in OUTA's position paper. SANRAL's reaction to defend their position was anticipated, after all, the claims and inferences made by OUTA in its paper posed serious allegations and doubt on the entire board and senior management of SANRAL at the time (as does this paper once again).

In SANRAL's attempts to question the integrity of OUTA's position paper at their media conference, they made some erroneous and invalid claims. SANRAL accused OUTA of not being able to tell the "difference between millions and billions" and in so doing, Alex van Niekerk (SANRAL Senior Project Manager) made an absurd claim that "the GFIP freeways are in fact 99.7% cheaper than the comparable European costs". As it turned out, OUTA's references to the cost of road construction in Europe based on this specific report (the Netherlands Impact study by CE Delft) was indeed correct, and it was SANRAL who had got their facts wrong<sup>6 7 8</sup>.

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<sup>6</sup> [http://www.nra.co.za/live/content.php?Session\\_ID=4be2d022e65ca0d07a3893e413cb7ddb&Item\\_ID=4960](http://www.nra.co.za/live/content.php?Session_ID=4be2d022e65ca0d07a3893e413cb7ddb&Item_ID=4960)

<sup>7</sup> <https://businesstech.co.za/news/general/119985/sanral-vs-outa-over-e-toll-report-error/>

<sup>8</sup> <http://www.outa.co.za/outa-stands-road-overcharges-report/>

All in all, OUTA believes an opportunity was lost, whereby SANRAL chose to misinterpret (mistakenly or deliberately) data and references, rather than engaging on the reasonable deductions of the paper or directly denying the conclusions outlined therein. They never once denounced the R17,9 billion paid for the project, or the accuracy of the case studies that were referenced. Instead, they believed that OUTA should not be comparing the GFIP to the case studies selected, due to reasons, which give rise to the differences between road construction projects.

We disagree with SANRAL in that aside from those factors which give rise to higher cost variances (such as design complication and terrain etc.), road construction projects, which conform to specified standards (such as COLTO, FIDIC etc.) are relatively easily comparable between similar type projects, especially when comparing the costs of basic road construction and rehabilitation (resurfacing). Furthermore, when the comparison between the GFIP project to others is consistently and substantively overpriced, a pattern emerges of a significant difference (of overpricing) on the GFIP road construction costs.

## **1.2 Further investigation leading to OUTA's revised position**

Following OUTA's initial position paper on the GFIP overpayment matter, and in response to SANRAL's rebuttal of OUTA's claims, OUTA set out to establish whether it had indeed "got its facts wrong" or whether new research and additional information might shed more light on the claim. In doing so, OUTA established a significant amount of information pertaining to the GFIP project itself; such as a full tender of one of the work packages (work package G), additional insights of key quantities from presentations given by SANRAL representatives, as well as participating construction companies. When combining the information obtained with the input and consultation of industry experts, OUTA's benchmarking exercise becomes strengthened with practical applications in order to confirm their position that the GFIP was substantively inflated.

### **1.3 Overarching Claims**

The result of this additional research, investigation, and analysis, contained in this paper, heightens OUTA's call for an independent commission of inquiry to verify OUTA's claims and opinion that the GFIP was excessively overpriced. Until all the data and input is properly and professionally assessed, the concerns, allegations, and inferences relating to the extent of this issue will not disappear.

Furthermore, unless otherwise independently proved, OUTA believes there are far bigger issues linked to the claims of the GFIP overpricing and these stem to one of the potential "capture" of the road construction industry and the impact this is having on the price of road construction in other areas of the country, such as the planned N3 Cedara to Durban freeway upgrade.

In addition, OUTA also points out that had GFIP been conducted at a substantially lower cost, this fact would further heighten the irrationality of the e-toll decision, in that not only would the e-toll tariffs have been substantially lower, but the ratio of e-toll administration costs in relation to servicing the road upgrade bonds would become 'unacceptably' high. The probable outcome of a GFIP being built at between R8 billion and R9 billion (i.e. less than half the price paid by SANRAL), would have more than likely amended or negated the costly e-toll methodology decision to finance the bonds, as the administrative and operating costs of the e-toll scheme (as tendered and contracted by SANRAL) would amount to a similar cost (or more) than that required to finance the bonds.

## 2. Background to the paper

Socio-economic development relies vastly on the integrated expansion of public services and social infrastructure. When considering the growth factor of developing economies and societies, both government and development institutions require extensive planning strategies which consist of amongst other things, ensuring that the costs and quality of infrastructure construction are conducted at levels which are in the best interests of society who ultimately pay for it.

The quality of the construction is generally guided by subscribing to specific standards and in the case of road construction, SANRAL makes reference to the COLTO (Committee of Land Transport Officials) Standard Specifications for Road and Bridge Works for State Authorities<sup>9</sup>, as well the International Federation of Consulting Engineers FIDIC (whose acronym comes from its French name Fédération Internationale Des Ingénieurs-Conseils)<sup>10</sup>, which is an international standards organisation for the consulting engineering and construction industry.

Construction standards are also regulated by organisations such as SAICE (South African Institute for Civil Engineering)<sup>11</sup>, CIDB (Construction Industry Development Board)<sup>12</sup>, and SAFCEC (South African Forum of Civil Engineering Contractors)<sup>13</sup> to name a few.

Some relevant standards include road lane widths used for calculations: According to the 25-Year Integrated Transport Master Plan “the 3,7m lane width was adopted as a South African standard at the time of metrication, rounding up the metric equivalent of the then standard 12 feet lane width. The standard lane width adopted by SANRAL for the Gauteng Freeway Improvement Project (GFIP) is 3,5 m”<sup>14</sup>. However, as seen in Annexure 7, the widths of the lanes in some packages are seen to be narrowed to the minimum value of 3,4m (page 9)<sup>15</sup>.

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<sup>9</sup> <http://www.nra.co.za/content/COLTO.pdf>

<sup>10</sup> [http://www.nra.co.za/live/content.php?Session\\_ID=86366564ad36e6718d11332562656153&Item\\_ID=234](http://www.nra.co.za/live/content.php?Session_ID=86366564ad36e6718d11332562656153&Item_ID=234)

<sup>11</sup> <http://saice.org.za/>

<sup>12</sup> <http://www.cidb.org.za/Pages/Home.aspx>

<sup>13</sup> <http://www.safcec.org.za/>

<sup>14</sup> <http://www.itmp25.gpg.gov.za/documents/Annex-J-Strategic-Road-Network-Nov13.pdf>

<sup>15</sup> <http://www.itmp25.gpg.gov.za/documents/Annex-J-Strategic-Road-Network-Nov13.pdf>

The costs of such construction, however, are determined by not only commodity inputs such as bitumen, steel, and cement but largely by an open and free market that is (a) highly competitive and (b) free from collusion and other anti-competitive behaviour or fraudulent interferences. State organisations need to be very knowledgeable and understanding of the going rate of costs related to specific industries they operate in. In SANRAL's case, the costs related to the various methods, qualities, and quantities of road construction should be second nature to them.

The Bill of Quantities in the tenders relate to Standard Specifications for road and structure (bridge) works as reflected in the COLTO guidelines. These are summarised as follows and each section's breakdown is provided in Annexure 4, as can be seen in the excerpt below.

Series 1000: General

Series 2000: Drainage

Series 3000: Earthworks & pavement layers of gravel or stone

Series 4000: Asphalt pavement and seals

Series 5000: Ancillary road works

Series 6000: Structures

Series 7000: Sundry structures

Series 8000: Sundries

When tenders received display significant variances from the norm, a common practice used by astute organisations dealing with state funds would be to benchmark the project's prices and tender inputs received, to that of industry indices and similar project specifications both local and international.

In the case of the GFIP construction, this paper will show that the price tendered and paid for resurfacing and new road/lane construction are significantly higher than similar local and international projects, which SANRAL should have identified through adequate due diligence, evaluation, and audits.

## **2.1 Construction Industry Collusion**

The 2013 findings of the Competition Commission confirming collusion within the construction industry, serves as a good reason for SANRAL to determine the reasonableness of road construction prices through another objective measure other than local pricing (See Annexure 5). Following the Competition Commission's findings that the price of the GFIP was inflated through collusive practices, it took SANRAL a further two and a half years (Quarter two of 2016), to provide society with the results of their inquiry, whereby they calculated that the construction companies had overcharged them by a total of R750 million due to their collusive behaviour. SANRAL furthermore indicated that not all of this R750 million collusion impact was attributed to GFIP, but SANRAL did not elaborate on what amount thereof was for the GFIP<sup>16 17</sup>.

This position paper will show that even if the total R750m of SANRAL's identified collusion element was assigned to GFIP, this only reduces the cost by 4% from R17,9 billion to R17,15 billion, a price that is still excessively inflated above the cost that OUTA's research depicts the price of GFIP to be.

## **2.2 Gauteng Freeway Improvement Project (GFIP): Addressing growing urban congestion in the province of Gauteng, South Africa.**

The Gauteng Freeway Improvement Project (GFIP) – Phase 1, which is the project name given to the upgrade of the existing main freeway network of approximately 193 kilometres within the province of Gauteng in South Africa. This freeway conveys the bulk of commuter traffic around the metropolitan cities of Johannesburg (the largest economic hub of the country) and Tshwane (the Government administrative capital), some 55 kilometres north of Johannesburg, as well as Ekurhuleni situated in the east of Johannesburg. The GFIP along with the Gautrain (a high-speed commuter train project linking Tshwane to Johannesburg and the OR Tambo

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<sup>16</sup> <http://www.infrastructurene.ws/2016/05/10/sanral-to-sue-construction-firms-found-colluding/#>

<sup>17</sup> <http://www.timeslive.co.za/thetimes/article1401673.ece>

International Airport), were two projects deemed necessary to address the traffic congestion, as a result of a growing economy with more vehicles on the freeway network<sup>18 19 20</sup>.

The GFIP's primary intention was to ease commuter congestion by increasing the main freeway capacity, largely by adding an extra lane to the existing Gauteng Freeway Network of 193 km (initially reported as being an 185km project). In most parts, this meant that the freeway was widened from a three to four lane highway (in each direction). In a few parts, the extra lane took the freeway from four to five lanes (for example the Ben Schoeman section between Midrand and Centurion), and in others such as the R21 between Kempton Park and Pretoria, it was a case of widening from two to four lanes in each direction.

Aside from the additional lane capacity, the project also attended to:<sup>21 22 23</sup>

- Rehabilitation and resurfacing of the existing road surface.
- Upgrading of 34 interchanges.
- 47 new bridges built and 134 existing bridges widened<sup>24</sup>.
- 186 km median lighting (spaced between 34m and 58m apart).
- 127 km median concrete barriers.
- 4 new directional ramps (fly-overs) built.

### **2.3 OUTA's methodology and work conducted to support the opinion that the GFIP was significantly overpriced.**

Following our initial position paper of February 2016, which consisted largely of a benchmark exercise between the costs of the GFIP project and a number of international road construction cost case studies, this revised update broadened the scope of the project by:

<sup>18</sup> [http://researchspace.csir.co.za/dspace/bitstream/10204/1317/1/Chakwizira\\_2007.pdf](http://researchspace.csir.co.za/dspace/bitstream/10204/1317/1/Chakwizira_2007.pdf)

<sup>19</sup> <https://businesstech.co.za/news/general/82981/cities-with-the-worst-traffic-jams-in-sa/>

<sup>20</sup> <http://www.joburg-archive.co.za/2007/pdfs/transport/vol1/statusquo6.pdf>

<sup>21</sup> Figures updated from the February position paper

<sup>22</sup> GFIP Fact Sheet

<http://www.roadsandtransport.gpg.gov.za/media/Category%20Media/GFIP%20fact%20sheet.pdf>

<sup>23</sup> <http://www.gautengonline.gov.za/Documents/E-Toll%20and%20GFIP%20Report.pdf>

<sup>24</sup> OUTA questions the number of new bridges built in this project as claimed by SANRAL in presentations.



- (a) Conducting a “Fair Value” survey and assessment of a full tender pertaining to work package G within the GFIP.
- (b) In addition, other key quantity information pertaining to some work packages as revealed in various presentations were used, in conjunction with input from consulting engineers enabled various costing, extrapolation and other calculations to ascertain fair value costing of the GFIP.
- (c) The establishment of the Square Meter surface area of the project, both pre-GFIP and Post-GFIP (using satellite imagery and aerial photography) enabled OUTA to calculate the relative surface area of the rehabilitation/ resurfacing of the existing freeway, as well as the area apportioned to new road works. OUTA then applied acceptable prices pertaining to each type of road work (rehabilitation and new road), as another methodology to determine the value of the GFIP.
- (d) OUTA’s benchmarking exercise was expanded in this paper to include additional examples of road upgrade and construction projects, both internationally and closer to home (Sub-Saharan Africa and within South Africa).

## **2.4 Inconsistencies in SANRAL’s reporting on GFIP**

OUTA’s report in February 2016, along with this position paper, reflects and references the GFIP Phase 1 project to be 185 kilometres in length. SANRAL, however, maintain the length of the project is 201km (i.e. 16km or 8% longer).

For reasons explained in Annexure 6 titled “Variations in cost and reported distance of the GFIP”, as it is SANRAL who have been inconsistent in their reporting of the GFIP project, both in length and cost, OUTA have had to make do with the most consistent elements provided, as well as their own identification/research processes, to determine these aspects when it comes to the benchmarking exercise.

A summary of the inconsistencies, as presented by SANRAL on various occasions, related to distance and cost of the project is as follows:

Source	Date	Distance	Cost
SANRAL's Declaration of Intent (2005 – 2008) <sup>25</sup>	2005	340km	R4.6 billion
GFIP: Road Design Alternatives and Material Consumption Estimates <sup>26</sup>	2008	180km	Unknown
Gauteng Freeway Improvement Project: Update on Phase 1 Construction <sup>27</sup>	2009	185km	R14,9 billion
Gauteng Freeway Improvement Project GFIP: Current and Future Phases <sup>28</sup>	2011	201km	Unknown
SANRAL Construction Costs	2011	201km	R17,9 billion
Nazir Alli presentation: Bidding Procedures, Monitoring and Management of Public Works in Transportation <sup>29</sup>	2012	184km	R11,4 billion

**Table 1: Inconsistencies in SANRAL reporting**

## 2.5 More confusion on road construction costs

In SANRAL's submission to the Gauteng Premier - David Makhura - GFIP Panel in November 2014 (three years after the GFIP was completed), the following slide can be found in SANRAL's presentation (see **Figure 1** below). SANRAL stated here that a brand new 8-lane highway would cost in the region of R140 million per kilometre in 2014. Given these figures as quoted by SANRAL, one has to question the costs of a number of the GFIP work packages, such as Work Package I (N12 - 19: Gillooly's - Rietfontein) which cost approximately **R140 million per km**, and was not a brand new 8 lane highway, but instead was on average one new lane and three resurfaced lanes in each direction, including structural work and limited and a

<sup>25</sup> <http://www.nra.co.za/content/Declaration.pdf>

<sup>26</sup> Annexure 8

<sup>27</sup> Annexure 9

<sup>28</sup> Annexure 3

<sup>29</sup> Annexure 10

two-lane flyover. Aside from the Gilloolys interchange work, very little upgrade or expansion was done to any of the other interchanges along this route.

<b>FUTURE GFIP PHASES</b>				
				120
<ul style="list-style-type: none"> <li>▪ Future phases, apart from N17 West Rand extension, all provincial routes</li> <li>▪ If current provincial roads budget is applied, the following can be achieved annually:</li> </ul>				
Typical Roadworks and Costs		Kilometre per Roadworks class that can be addressed with Current Budget		
Description	Cost/km	2014/15	2015/16	2016/17
<b>Current Gauteng Province Transport Budget</b>		<b>R 2 099 296 000</b>	<b>R 2 231 262 000</b>	<b>R 2 355 663 000</b>
<b>Routine Maintenance</b> - These include day to day routine activities such as cleaning drains & culverts, vegetation control, litter collection, guard rail repair, road sign repair, crack sealing, patching, edge repair, shoulder regravell.	R 284 165	7 388	7 852	8 290
<b>Periodic Maintenance</b> - These include periodically scheduled activities (8-10 years) such as surface fog sprays/diluted emulsions/rejuvenators, surface seals, functional asphalt overlays < 50 mm in thickness.	R 2 082 000	1 008	1 072	1 131
<b>Rehabilitation/Strengthening</b> - Strengthening increase the structural capacity of the pavement and typical includes insitu reworking of existing layers, addition of new granular basecourse layers or structural asphalt overlays >50mm thick	R 8 498 000	247	263	277
<b>Improvements</b> - Improvements improve the quality of service on a road, and typically including activities such as addition of climbing lanes, passing lanes, additional lanes, intersection/interchange improvements. (Typical GFIP Costs)	R 88 000 000	24	25	27
<b>New Roads</b> - Construction of complete new road where previously no road existed, cost in example related to 8 lane freeways i.e. PWV 9, PWV 5, etc	R 140 000 000	15	16	17
<b>Note: Current Gauteng Province Network: Paved = 3,671km: Gravel = 1,832 km</b>				

**Figure 1: SANRAL presentation on future GFIP Phases<sup>30</sup>**

The fact that SANRAL’s management presented the figure of R140 million per kilometre for a brand new eight-lane highway in 2014 exposes a serious issue around why and how it was possible that six years earlier, SANRAL allowed work package I (also 8 lanes, with only two new lanes, and six lanes resurfaced) to also cost R140 million per kilometre at 2008 prices (despite the inclusion of more expensive UTCRCP<sup>31</sup> Concrete paving included in this package). This contradiction alone is serious enough to warrant a full independent investigation into the GFIP construction costing, as the cost of resurfacing (which was roughly 75% of the work undertaken in work package I) is generally conducted at around 20% of the price of new lane

<sup>30</sup> [http://www.nra.co.za/content/Panel\\_SANRAL\\_presentation\\_6NOV.pdf](http://www.nra.co.za/content/Panel_SANRAL_presentation_6NOV.pdf)

<sup>31</sup> Ultra-Thin Continuously Reinforced Concrete Paving

construction. In addition, similar issues and anomalies on a cost per kilometre basis in the GFIP pertain to other work packages, and not just work package I.

**In Summary:** SANRAL themselves have created more confusion from their various reports and presentations about the length and cost of the GFIP Phase 1. The summary of the lengths of the various work packages named on their website and presented in their original tender presentations, amounts to close to 185km. The only reference OUTA can find to any distance close to 201km is the 2011 document that suddenly lists two additional packages not included as part of the original Phase 1 work packages. However, this position paper will reference the GFIP Phase 1 at 193km associated with the final cost of the road construction at R17,9 billion, instead of the commonly referenced 185km by SANRAL.

### **3. Analysis of the GFIP costs, using various methodologies.**

#### **3.1 Overview of the GFIP Work Packages**

In order to obtain sufficient detail to conduct an analysis of each GFIP work package cost breakdown, based on design, tenders and accurate Bills of Quantities (BOQ), OUTA would have preferred to have access to all this information, had SANRAL provided it. This would obviously put out of question the accuracy of the exercise, whereby OUTA would have applied its knowledge of the various indices pricing per unit to each variable, in order to compare its evaluated price per package, to that which SANRAL reflected as what it paid.

Unfortunately, this information has not been immediately forthcoming from requests to SANRAL (OUTA having to resort to the Promotion of Access to Information Act – PAIA, on going at the time of this report's release). Despite this, OUTA pursued its research following significant and relevant information on various aspects of the GFIP project, which enabled various methodologies and extrapolation of calculations to be applied, in its attempt to ascertain a fair value price for GFIP.

It is important to note at this point that OUTA's research was able to find the type of information it sought (i.e. tender documentation, road design drawings, bills of quantities) for many other road construction projects throughout South Africa, including projects commissioned by SANRAL, yet when it came to the GFIP construction, very little relevant and supporting information was obtainable. During OUTA's discussions with people who supply this detail of information to the construction industry, they concurred with the opinion that there appears to be deliberate withholding or obscuring of information by SANRAL on the GFIP Project. One has to ask why this is so? Surely this information is of public interest and a State Owned Entity conducting work on behalf of the public should make this non-commercially sensitive information, easily accessible to society.

The Table below<sup>32</sup> provides a summary of the prices that SANRAL paid for the various work packages.

**SANRAL's COST BREAKDOWN PER PROJECT**

Work Package	Project Description (Including Road, Structure works, Lighting & markings)	Distance (km)	Amount (excl vat)	Contract Price Adjustment	VAT	Total Actual Cost
A1 & A2	N1 - 20 (From Golden Highway to 14th Ave) N12 - 18 (From Uncle Charlies - Diepkloof)	18	1,117,094,584	122,880,404	173,596,498	<b>1,413,571,487</b>
B	N1 - 20 (From 14th Avenue - Buccleuch)	21	1,675,916,119	239,656,005	268,180,097	<b>2,183,752,221</b>
C	N1 - 20&21 (From Buccleuch - Brakfontein)	23	1,492,478,366	213,424,406	238,826,388	<b>1,944,729,160</b>
D1	N1 - 21 (From Brakfontein - Flying Saucer)	10	1,046,331,801	149,625,448	167,434,015	<b>1,363,391,263</b>
D2	N1 - 21 (Atterbury - Scientia)	5	596,218,965	85,259,312	95,406,959	<b>776,885,235</b>
D3	N1 - 21 (Flying Saucer - Atterbury)	6	263,008,100	27,000,000	40,601,134	<b>330,609,234</b>
E1	N3 - 12 (Heidelberg - Geldenhuys)	12	1,823,715,546	300,913,065	297,448,005	<b>2,422,076,616</b>
E2	N12 - 18 (From Reading - Elands)	4				
E3	N12 - 18 (Uncle Charlies - Reading)	12	527,526,704	52,752,671	81,239,112	<b>661,518,487</b>
F	N3 - 12 (Geldenhuys - Buccleuch)	18	1,149,695,508	164,406,458	183,974,275	<b>1,498,076,241</b>
G	R21 - 2 (Olifantsfontein - Hans Strydom)	17.6	631,000,000	69,410,000	98,057,400	<b>798,467,400</b>
H	R21 - 1 (Benoni - Olifantsfontein)	12	535,427,551	58,897,031	83,205,441	<b>677,530,023</b>
I	N12 - 19 (Gillooly's - Rietfontein)	10	1,102,283,849	125,000,000	171,819,739	<b>1,399,103,587</b>
J	R21 - 1 (Rietfontein - Pomona)	5	348,002,527	34,800,000	53,592,354	<b>436,394,880</b>
K	N12 - 19 (Rietfontein - Tom Jones)	9.5	701,669,523	55,000,000	105,933,733	<b>862,603,256</b>
?	Tom Jones - Putfontein (distance est.)	6	511,657,325	49,483,720	78,559,746	<b>639,700,791</b>
?	Pomona to Benoni (distance est.)	4	76,616,543	3,830,827	11,262,632	<b>91,710,002</b>
<b>TOTAL without Barriers (17 Projects)</b>		<b>193</b>	<b>13,598,643,010</b>	<b>1,752,339,346</b>	<b>2,149,137,530</b>	<b>17,500,119,886</b>
Median Barriers	Precast Concrete Barriers (Tender 1)	127	230,076,364	13,804,582	34,143,332	<b>278,024,278</b>
	Precast Concrete Barriers (Tender 2)		86,165,638	6,592,194	12,986,096	<b>105,743,928</b>
<b>TOTAL with Barriers (19 Projects)</b>		<b>193</b>	<b>13,914,885,011</b>	<b>1,772,736,122</b>	<b>2,196,266,959</b>	<b>17,883,888,092</b>

**Table 2: Breakdown of GFIP Work Packages**

See below the map pertaining to the location of the work packages

<sup>32</sup> Work package information extracted from a SANRAL's document obtained in the OUTA vs SANRAL et al court case of 2012/13 and can be viewed in Annexure 1



**Figure 2: Map of the GFIP Scope of Work****3.2 Analysis of the GFIP Costing of Work Package “G”.**

During OUTA’s extended research and investigations, the full tender documentation with the actual Bills of Quantities for work package G was obtained. OUTA’s consulting engineers applied 2008 pricing to the Bills of Quantities, as interested parties at the time would have done. Work package G was part of the R21 construction and was one of the packages that comprised of **mostly new road works**, i.e. expanding the highway from a total of four existing lanes (two in each direction) to eight lanes (four in each direction). Work package G is 17,6 km long. The tender documentation for work package G requested costing on two separate tenders; one including UTCRCP and an alternative tender without UTCRCP. The consulting engineer for OUTA priced both tender requests, but it was confirmed to OUTA that the alternative road-work option (which excluded UTCRCP) was carried out by the successful tenderer. Accordingly, with the input of the consulting engineer, OUTA priced work package G as follows:



**OUTA's WORK PACKAGE "G" COST CALCULATION (ZAR)**

<b>SCHEDULE</b>	<b>Package G</b>
TOTAL SCHEDULE B: Structures	16,508,420
TOTAL SCHEDULE D: Govt requirements for BBBEE	1,040,000
TOTAL SCHEDULE E: Electrical	37,520,883
TOTAL SCHEDULE F: Ultra thin friction course	45,260,000
TOTAL SCHEDULE H: Alternative Road works	486,354,997
<b>TOTAL SCHEDULES</b>	<b>586,684,300</b>
Contract Price Adjustment	29,598,222
TOTAL (Excluding VAT)	616,282,522
ADD 14% VAT	86,279,553
<b>TOTAL WORKPACKAGE COST</b>	<b>702,562,075</b>
Length of the Work Package (km)	17.6
Ave. Cost / km (Including Lighting)	39,918,300
SANRAL's PAID TENDER	798,467,400
SANRAL's Cost per KM for Work Package	45,367,466
COST VARIANCE: Overpriced / (Underpriced)	95,905,325
PERCENTAGE VARIANCE	13.7%

**Table 3: Pricing of Work Package G**

Whilst there is a variance of 14% between OUTA's estimate and that of SANRAL's awarded tender on work package G, this one had the least difference between OUTA's calculation and that of SANRAL. However, as one will see in the remainder of the assessments, the vast variances between OUTA's estimates and the other work packages as paid for by SANRAL are of serious concern. Of even greater concern, is the variance between work packages paid for by SANRAL, which will be explained later in the paper.

**3.3 Positioning Work Package G as a "Base Case" package**

Work package G comprised of work on the R21 for 17,6 km from Olifantsfontein Interchange to Solomon Mahlangu (was Hans Strydom) Interchange.

The extent of the additional (new) surface area for Package G, in order to widen the road to accommodate the extra lanes, (as was obtained from tender documents and drawings), is shown in the table below:

<b>Work Package G - Surface Area</b>	Square Meters	% of Total
Existing Surface Area (Pre GFIP):	402,120	62%
New Surface Area (During GFIP):	242,880	38%
<b>TOTAL Surface Area (Post GFIP)</b>	<b>645,000</b>	<b>100%</b>

One might ask why was the new lane ratio to the existing is only 38%, as opposed to 50% of the upgraded surface area on a route that doubled in lane capacity improvement (2 to 4 lanes each way). The answer to that question is that:

- The lanes were narrowed from 3,7m to 3,5m.
- The width of the existing road pre-GFIP (in each direction) was 11,1m including shoulders accommodating two lanes
- This was increased to 18,0m including shoulders (post-GFIP) in each direction, accommodating 4 lanes.

As one will see later in this position paper (Under Benchmarking), the cost of building new lanes is significantly more expensive than the costs related to top layer rehabilitation. In this paper, we have reflected the costs of these two main categories of the GFIP road work as follows (excluding VAT):

- Rehabilitation / Resurfacing average cost at an average of R325/m<sup>2</sup>, i.e. pertaining to the existing surface area.
- New lane surface area at an average of R1,666/m<sup>2</sup>.
- As can be seen, resurface work is roughly 20% of the cost of new road construction.

### **3.4 Methodology One: Using Work Package G as a ‘Base Case’ per kilometre for all work packages.**

As work package G was one that OUTA had the tender documents and bill of quantities for, and in addition, the fact that this package has the highest ratio of new surface (38%) to existing (62%), we believe it would be ‘reasonable’ to apply the cost per KM of roadworks of this package, to the distances of each other work package, to begin to get a picture of fair value of the total project.

In doing so, we realise that work package G does not have the extent of structural (bridge and other) work that some of the other packages have, however in OUTA’s exercise in Methodology two, where we estimate various schedule costs pertaining to work packages (e.g. work packages A, B, C, D, and E), wherein extensive structural work is contained, the structures in these packages equate to roughly 18% of the total cost. In addition, we believe the higher ‘new road surface’ area ratio (at a higher cost than rehabilitation work) in Package G, compensates substantively for the lower structural costs when applied to all packages.

**METHODOLOGY 1**

Using Work Package G as a "Base Case" / km cost for G: 39,918,300

Work Package	Project Description	Distance (km)	OUTA Indicative Amount (Incl VAT)	SANRAL's Price Paid (Incl VAT)	Value Variance	% Variance
A	N1 - 20 (From Golden Highway to 14th Ave) N12 - 18 (From Uncle Charlies - Diepkloof)	18	718,529,400	1,413,571,487	695,042,087	<b>97%</b>
B	N1 - 20 (From 14th Avenue - Buccleuch)	21	838,284,300	2,183,752,221	1,345,467,921	<b>161%</b>
C	N1 - 20&21 (From Buccleuch - Brakfontein)	23	918,120,900	1,944,729,160	1,026,608,260	<b>112%</b>
D1	N1 - 21 (From Brakfontein - Flying Saucer)	10	399,183,000	1,363,391,263	964,208,263	<b>242%</b>
D2	N1 - 21 (Atterbury - Scientia)	5	199,591,500	776,885,235	577,293,735	<b>289%</b>
D3	N1 - 21 (Flying Saucer - Atterbury)	6	239,509,800	330,609,234	91,099,434	<b>38%</b>
E1	N3 - 12 (Heidelberg - Geldenhuys)	12	479,019,600	2,422,076,616	1,783,383,816	<b>279%</b>
E2	N12 - 18 (From Reading - Elands)	4	159,673,200			
E3	N12 - 18 (Uncle Charlies - Reading)	12	479,019,600	661,518,487	182,498,887	<b>38%</b>
F	N3 - 12 (Geldenhuys - Buccleuch)	18	718,529,400	1,498,076,241	779,546,841	<b>108%</b>
G	R21 - 2 (Olifantsfontein - Hans Strydom)	17.6	702,562,080	798,467,400	95,905,320	<b>14%</b>
H	R21 - 1 (Benoni - Olifantsfontein)	12	479,019,600	677,530,023	198,510,423	<b>41%</b>
I	N12 - 19 (Gillooly's - Rietfontein)	10	399,183,000	1,399,103,587	999,920,587	<b>250%</b>
J	R21 - 1 (Rietfontein - Pomona)	5	199,591,500	436,394,880	236,803,380	<b>119%</b>
K	N12 - 19 (Rietfontein - Tom Jones)	9.5	379,223,850	862,603,256	483,379,406	<b>127%</b>
?	Tom Jones - Putfontein	6	239,509,800	639,700,791	400,190,991	<b>167%</b>
?	Pomona to Benoni	4	159,673,200	91,710,002	- 67,963,198	<b>-43%</b>
<b>TOTAL without median barriers (17 Projects)</b>		<b>193</b>	<b>7,708,223,730</b>	<b>17,500,119,886</b>	<b>9,791,896,156</b>	<b>127%</b>
Median Barriers	Precast Concrete Barriers (Tender 1)	127	278,024,278	278,024,278	-	
	Precast Concrete Barriers (Tender 2)		105,743,928	105,743,928	-	
<b>TOTAL with Barriers (19 Projects)</b>			<b>8,091,991,936</b>	<b>17,883,888,092</b>	<b>9,791,896,156</b>	<b>121%</b>

**Table 4: Methodology 1 for Costing of GFIP**

**The result of Methodology One:**

Using work package G as the base cost per kilometre across all work packages indicates that GFIP, as paid for by SANRAL, was over-priced by R9,8 billion (or 121%) – see table below. Please note that OUTA acknowledges the relative simplicity and limitations of this methodology, thus additional methodologies follow.

### 3.5 Methodology two(a): Estimating the cost of Work Packages A to E, with information of estimated Key Quantities and input from experienced Civil Engineers.

In the presentation “GFIP: Road Design Alternatives and Material Consumption Estimates” by SANRAL representative, Louw Kannemeyer in May 2008, (See **Figure 3** below, as extracted from slide 13 of Annexure 8), the estimated key quantities were provided for work packages A to F.

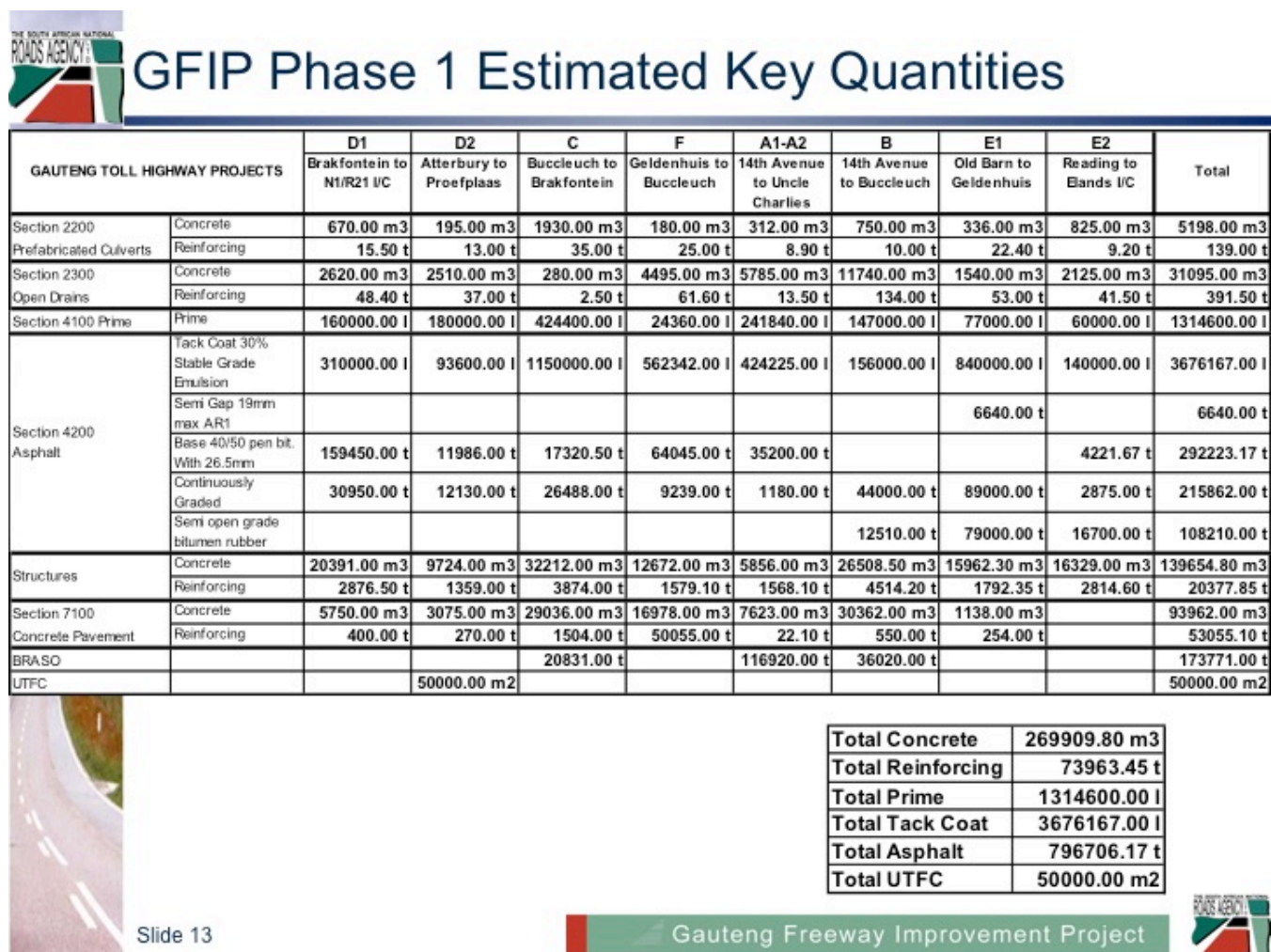


Figure 3: Slide 13 in L. Kannemeyer Presentation

Using input presented from OUTA's civil engineering consultants on the estimated key quantities from SANRAL's presentation, and factoring in costs related to the COLTO series / sections not reflected in the presentation (such as series 3000 costs related to earthworks, pavement layers, gravel and crush stone and others), OUTA has been able to determine fair value of the GFIP cost on these packages. In addition, OUTA was able to garner more specific information related to Package E1 from a presentation given by KAS Joint Venture at the Engineering Excellence Awards in 2012. This provided OUTA with additional information to corroborate costs with the specific work package.

During this assessment, whereby OUTA's Engineering Consultants adopted an approach of affixing competitive and appropriate rates for performance of those activities listed in SANRAL's key quantities, OUTA detected a possible typographical error in the quantity of steel reinforcing (of 50,055 tons) listed in SANRAL's presentation for Package F. When this was compared to Section 7100 Concrete Pavement, it reflected in a volume of 16,978m<sup>3</sup>. The steel volume appeared grossly out of kilter when using the industry standard of roughly 6% of steel by weight of concrete. For this reason, OUTA did not include the Engineer's use of the Key Quantity costing exercise for Package F.

OUTA's civil engineering consultants believe that more than enough leeway has been provided in order to give SANRAL and the construction companies the benefit of doubt on actual pricing at the time of GFIP construction and to make allowances for any difficulties faced by the industry at the time.

With P&G allowances provided for and the costing of key quantities provided above, the total cost of each of these work packages have been calculated to come out as follows:

**OUTA's Calculation of Methodology 2(a) for Cost of GFIP: Work Packages A, B, B, D(1&2), E(1&2) and G**

SCHEDULE	Package G	Package A	Package B	Package C	Package D1&2	Package E1 + E2	Total
Structures	16,508,420	49,428,973	189,003,552	202,648,672	146,498,436	133,485,246	<b>737,573,300</b>
Govt requirements for BBBEE	1,040,000	1,216,108	1,387,070	1,817,169	1,817,169	1,511,532	<b>8,789,047</b>
Electrical and lighting	37,520,883	23,356,721	27,249,508	29,844,699	19,463,934	26,281,529	<b>163,717,273</b>
BRASO/ UTFC/ Other layers	45,260,000	184,161,777	88,446,763	51,150,320	75,248,898	187,955,400	<b>632,223,157</b>
Road works	486,354,997	338,597,160	395,030,020	558,340,722	391,130,053	468,435,544	<b>2,637,888,496</b>
<b>TOTAL SCHEDULES</b>	<b>586,684,300</b>	<b>596,760,739</b>	<b>701,116,912</b>	<b>843,801,582</b>	<b>634,158,490</b>	<b>817,669,251</b>	<b>4,180,191,273</b>
Contract Price Adjustment	29,598,222.93	25,951,632.63	51,220,972.44	39,458,974.62	29,464,315.48	39,229,953.62	<b>214,924,072</b>
<b>TOTAL with CPA</b>	<b>616,282,522.49</b>	<b>622,712,371.47</b>	<b>752,337,884.78</b>	<b>883,260,556.16</b>	<b>663,622,805.03</b>	<b>856,899,204.96</b>	<b>4,395,115,345</b>
ADD 14% VAT	86,279,553	87,179,732	105,327,304	123,656,478	92,907,193	119,965,889	<b>615,316,148</b>
<b>TOTAL WORKPACKAGE COST</b>	<b>702,562,076</b>	<b>709,892,103</b>	<b>857,665,189</b>	<b>1,006,917,034</b>	<b>756,529,998</b>	<b>976,865,094</b>	<b>5,010,431,493</b>
Length of the Work Package (km)	18	18	21	23	15	16	<b>111</b>
Ave. Cost / km (Including Structures & Lighting)	39,918,300	39,438,450	40,841,199	43,779,001	50,435,333	61,054,068	<b>45,302,274</b>
SANRAL's PAID TENDER	798,467,400	1,413,571,487	2,183,752,221	1,944,729,160	2,140,276,499	2,422,076,616	<b>10,902,873,384</b>
SANRAL's Cost per KM for Work Package	45,367,466	78,531,749	103,988,201	84,553,442	142,685,100	151,379,788	<b>98,579,325</b>
COST VARIANCE: Overpriced / (Underpriced)	95,905,324	703,679,384	1,326,087,033	937,812,126	1,383,746,501	1,445,211,522	<b>5,892,441,890</b>
PERCENTAGE VARIANCE	14%	99%	155%	93%	183%	148%	<b>118%</b>

**Figure 4: Methodology 2(a) of Costing of GFIP**

Based on this methodology applied to these work packages, the average cost of road construction calculated by OUTA came in at a cost of R45,3 million per kilometre basis.

It is important to note here that these work packages included more structural work, relative to the others, in that the four flyovers and large bridge-work projects at Allandale, William Nicol, Rivonia and those along work package D were included. The wider than normal width of the roads in Package C (Ben Schoeman) were also included in these calculations, as was the extensive interchange work done at Elands Interchange (work package E). For this reason, the average of these packages at R45,3 million is high on a cost per km, relative to the other packages - such as “G” at R39,9 million which we have calculated relatively accurately.

OUTA is aware that an argument can be made that the costs were calculated using estimated quantities provided at a high-level presentation by SANRAL. OUTA’s response to this would be that it is reasonable to assume the information provided in SANRAL’s presentation and that of the Construction Contractor (both of which were conducted within a period of between a month of the construction starting and within the project period), were relatively accurate. Thus, in the absence of the actual data (which SANRAL has not been forthcoming with), key quantity estimates of the project and accurate costs per quantity as applied by experienced

engineers, the calculations determined in OUTA's work could be construed as a fairly reasonable account of the projects reflected in this methodology.

To further determine the validity of the findings of the cost estimates, OUTA requested comment from a third expert - a Quantity Surveyor (QS) with more than 24 years experience. The QS found that, based on the pre-tender estimates, OUTA's consulting engineers had been more than generous in their findings of the cost of road construction, on a per kilometre basis.

### **3.6 Analysis and Insights of GFIP Costs**

It is OUTA's opinion that the price SANRAL paid for all of the work packages has been excessively exorbitant, especially when considering that the majority of the square meter surface area of the GFIP (approximately 70%), comprised of a rehabilitation / re-surfacing of the existing road, which by OUTA's calculations, would not cost more than R10m / km for a four-lane highway in each direction at the time of the GFIP.

The following exercise compares the costs per kilometre per work package. By reducing the comparisons to a cost per kilometre, takes out the cost variance between packages that were longer than others, which then makes the comparisons more relevant. In doing so, OUTA contends that there are other variables that will affect some packages more than others, such as the extent of bridgework and structures, thus this analysis is split into two parts, one including structural work costs and the second without.

#### **3.6.1 Assessing Total Package Costs per Kilometre**

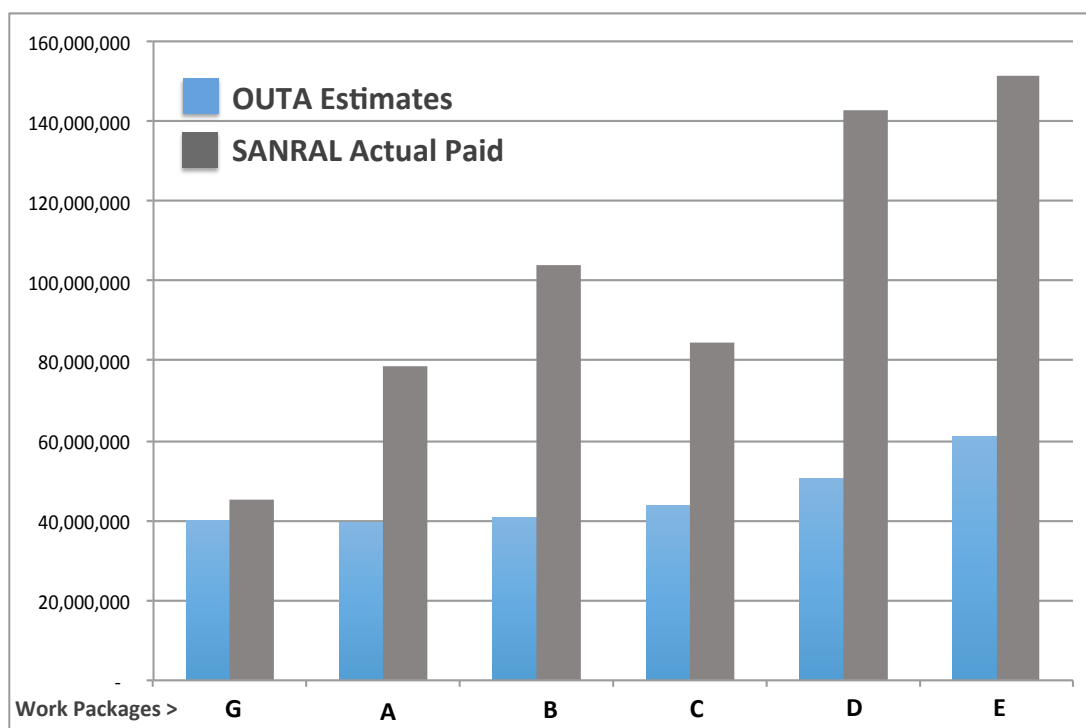
The following Table & Graph depicts the cost per kilometre for the six work packages that OUTA's appointed engineers conducted their assessment on, those being the packages where information on quantities was available.



**TOTAL COST PER KM (Measured Work Packages)**

Work Packages >	G	A	C	V	D (1&2)	E (1&2)	AVERAGE
OUTA's Estimate	39,918,300	39,438,450	40,841,199	43,779,001	50,435,333	61,054,068	<b>45,302,274</b>
SANRAL's Price PAID	45,367,466	78,531,749	103,988,201	84,553,442	142,685,100	151,379,788	<b>98,579,325</b>
% Variance:	14%	99%	155%	93%	183%	148%	118%

**TOTAL COSTS / KM - for Work Package G, A, B, C, D(1&2) and E(1&2)**



**Figure 5: Comparison of OUTA Calculations with SANRAL Payments (Packages A,B,C,D,E & G)**

Firstly, it is important to note that there are variances between work packages, even when looking at OUTA’s figures, as these reflect where more work was done with bridge structures, fly-overs, retaining walls etc.

The variances between OUTA’s estimates for these work packages range between 14% (package G) and 183% (Package D 1&2). While OUTA’s conclusion to this paper claims gross wrongdoing (i.e. manipulation, interference and / or corruption) in the pricing of the GFIP, the above information enables OUTA to go further in its conjecture that there was more wrongdoing on some packages than others.

### 3.6.2 Assessing and Comparing Road Work Costs (excluding Structures):

The following Table and Graph is one that looks deeper into the costs of the road construction only, i.e. removing costs related to Structures (bridgework, retaining walls etc.), and also excludes CPA and VAT.

In calculating SANRAL’s Road Work costs, OUTA took SANRAL’s own figures, excluding CPA, and VAT, and then reduced these by OUTA’s estimate of the structural costs on these packages (as calculated by its Engineers using the key quantity indicated in SANRAL’s presentation and using price indices for these key quantities applied for 2008).

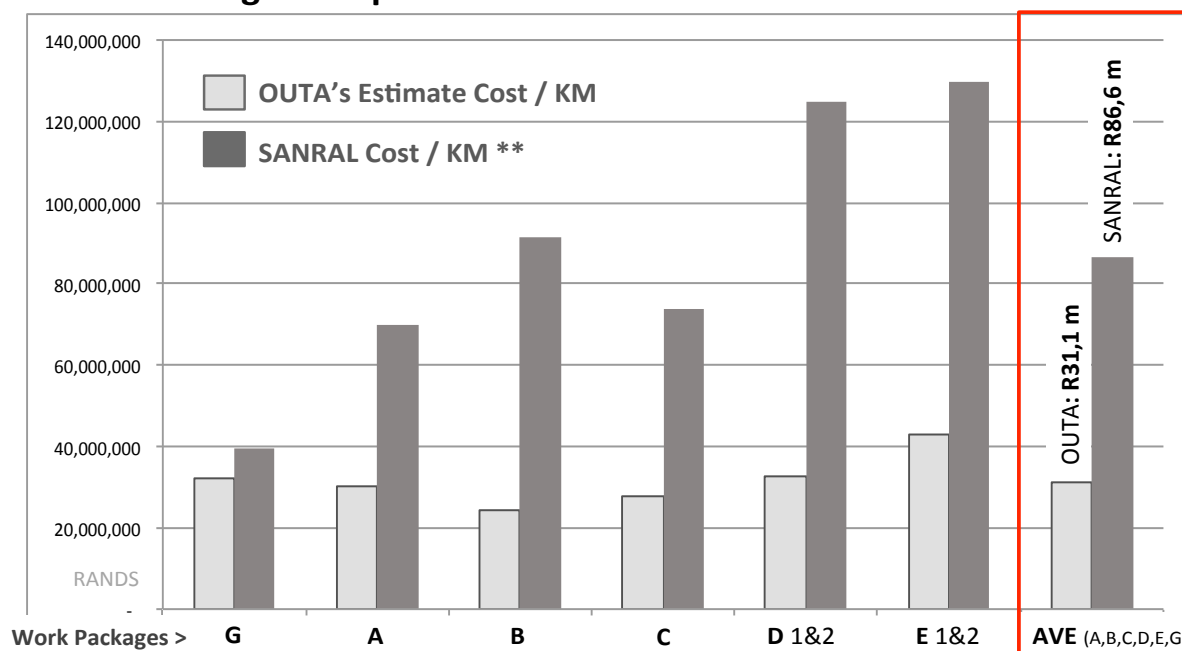
**Work Package Cost per KM for Road works \***

Work Packages >	G	A	B	C	D (1&2)	E (1&2)	AVERAGE
<b>OUTA</b>	32,396,357	30,407,320	24,386,350	27,876,213	32,510,670	42,761,500	31,126,745
<b>** SANRAL</b>	39,583,014	70,015,765	91,414,756	74,062,110	124,858,738	129,900,128	86,603,243
% Variance:	22%	130%	275%	166%	284%	204%	178%

\* ROAD WORKS Costs are those attributed to all work, less structures, CPA and VAT

\*\* Note: Sanral’s figures are their own, pre CPA and less OUTA’s estimate of Structure costs. All excl. VAT

**Work Package Cost per KM for Road works \***



\* ROAD WORKS Costs are those attributed to all work, less structures, CPA and VAT

\*\* Note: Sanral’s figures are their own, pre CPA and less OUTA’s estimate of Structure costs. All excl. VAT

**Figure 6: OUTA vs SANRAL Road Works Costs**

OUTA makes the following observations from the assessment of the roadwork costs:

- The variances between OUTA's average costs for roadworks only, (pertaining to these packages) is R31,1 million per kilometre. When compared to SANRAL's figure of R86,6 million, a serious concern is raised with reference to the variance of 178%.
- On some work packages, OUTA claims that SANRAL paid as much as 284% more than they ought to have, see work package D (1&2), were OUTA calculates the Road Work costs at R125 million per kilometre. A similarly high value of R130 million per kilometre was paid on work package E (1&2), however, in this package, there was more costs related to Asphalt, BRASSO and Ultra-Thin Friction Course applied.
- Nonetheless, the costs attributed to SANRAL's expenditure of road work is extremely high. OUTA believes the only explanation for the costs of road construction (excluding structures, VAT and CPA) to be as high as R87 million/kilometre on average within 111 kilometres of a four to five lane highway in each direction, (of which approximately 70% was resurfacing of an existing well-maintained road surface), can only be attributed to gross ineptitude, maladministration and / or corruption, or both. Additionally, the discrepancy is far too large for SANRAL's leadership not to know or become suspicious about this

### **3.7 Methodology two (b): Using methodology two (a) for estimates of work packages: A to E & G, and largely applying methodology one for work package G calculations to the remainder of GFIP packages (82 km).**

In this Methodology 2(b) OUTA has arrived at an estimate for the full cost of GFIP of R8,7 Billion (or R45 million per kilometre). OUTA arrived at this figure as follows:

1. Applying the costs pertaining to Packages A, B, C, D(1&2), E(1&2) and G from Methodology 2(a), which totalled R5,01 Billion (at R45,3 million per kilometre), for 111 Km.
2. Then OUTA applied the cost of work package G (as was applied in Methodology 1) for the remainder of the packages that make up the outstanding 82 km (being F, G, H,

I, J, K, D3, E3 and the two other ‘unnamed’ work packages). OUTA recognised that the structure work applied to G would be lower than that applied to the average of the remainder of the projects and therefore adjusted the structure work higher in these “other” work packages. The cost of the work packages that made of the 82 “other” kilometres, came in at R3,2 billion at R39,9 million per Kilometre.

- The TOTAL Cost of GFIP using this methodology (2b), came in at R8,7 Billion (or R45 million per kilometre), including all costs (median barriers, lighting/electrical, contract price adjustments, structures, and roads).

**OUTA's Calculation of Methodolgy 2(b): TOTAL Cost of GFIP**

	SCHEDULE	Using Calculations for Methodology 2(a)	Using Methodology 1	GFIP TOTAL
		Work Packages A, B, C, D(1&2), E(1&2), G	Ave G Costs* Applied to Remainder Packages	
<b>OUTA's ESTIMATES</b>	Structures	737,573,300	277,289,421	1,014,862,721
	Govt requirements for BBBEE	8,789,047	4,869,091	13,658,138
	Electrical and lighting	163,717,273	175,665,950	339,383,223
	BRASO/ UTFC/ Other layers	632,223,157	211,899,091	844,122,248
	Road works	2,637,888,496	2,077,025,668	4,714,914,164
	<b>TOTAL SCHEDULES</b>	4,180,191,273	2,746,749,221	6,926,940,494
	<b>Contract Price Adjustment</b>	214,924,072	138,573,498	353,497,570
	<b>TOTAL with CPA</b>	4,395,115,345	2,885,322,719	7,280,438,064
	ADD 14% VAT	615,316,148	403,945,181	1,019,261,329
	<b>WORKPACKAGE COST (Excl Barriers)</b>	5,010,431,493	3,289,267,900	8,299,699,393
	Median Barriers (as per Sanral Tender)			383,768,206
	<b>TOTAL COSTS (Inclu Median Barriers)</b>			8,683,467,599
	Length of the Work Package (km)	111	82	193
Ave. Cost / km (Including Structures & Lighting)	45,302,274	39,918,300	44,992,060	
<b>SANRAL's COSTS</b>	SANRAL's PAID TENDER (Excl Barriers)	10,902,873,384	6,597,246,503	17,500,119,886
	Median Barriers (as per Sanral Tender)			383,768,206
	<b>SANRAL'S TOTAL GFIP COSTS (Incl Barriers)</b>			17,883,888,092
	SANRAL's Cost per KM for Work Package	98,579,325	80,063,671	92,662,633
<b>VARIANCE</b>	COST VARIANCE: Overpriced / (Underpriced)	5,892,441,890	3,307,978,603	9,200,420,494
	PERCENTAGE VARIANCE	118%	101%	106%

\* Package G costs adjusted to increase allowance for Structures and Road Works

**Table 5: Methodology 2(b) GFIP Costs**

Using this methodology (two b), OUTA’s Estimate for the total cost of GFIP (at R8,7 Billion) is around R9,2 Billion **lower** than the price that SANRAL paid for GFIP (of R17,9 Billion).

### **3.8 Methodology 3: Using Square Meter road surface area to calculate rehabilitation and new road construction costs of GFIP**

#### **3.8.1 Arriving at the Road Construction Price Calculations, on a Per Sq Meter basis.**

##### **Resurfacing and Rehabilitation:**

Following the costing on a recent tender for road rehabilitation of another Gauteng Highway, we took the average cost of road rehabilitation which pertained to skimming and/or milling the existing road surface and resurfacing the road as per the specifications provided in the information obtained from SANRAL's presentation of key quantities and tenders.

For this exercise in OUTA's costing of the GFIP, a figure of R325/m<sup>2</sup> (Excluding VAT) was applied to the existing road surface as calculated by OUTA. The figure of R325/m<sup>2</sup> is one that was obtained by OUTA from tenders and information on similar road construction work during the period of 2014-2016 (a few years post-GFIP). According to the standards of Contract Price Adjustment indices, this figure of R325/m<sup>2</sup> would have been lower in 2008, when the GFIP construction began. OUTA have also seen tenders and road construction work allocated by SANRAL to other contracts, for road rehabilitation and resurfacing, being done at R250/m<sup>2</sup> around this period. However, as OUTA has done in all aspects of this paper, SANRAL and the construction companies have been given the benefit of doubt by using the higher costs and estimates where these have been attained.

#### **3.8.2 Work Package G: Cost Breakdown for Resurfacing and New Lane construction**

As mentioned earlier in this paper, OUTA was able to access the full tender documentation for work package G, a section of construction on the R21. From this information, the following could be deduced from the drawings regarding the existing road:

- The distance covered by work package G was 17,6 kilometres, and the total average width across the upgraded highway road surface was 36 metres.
- According to the cross sections, the existing road was 11.1 metres wide on either side of the road, totalling 22.2 metres in road width.

- Therefore, the total **existing surface area for work package G was 402,120/m<sup>2</sup>.**
- The width of the road increased to 18 metres on either side (an additional 6,9 metre width on each side of the new road), therefore the **total area AFTER construction of the road, equates to 645,000 m<sup>2</sup>.**
- OUTA calculated the **new road construction area is 242,880 m<sup>2</sup>.**

Based on the calculations of the tender done on work package G by OUTA's experienced road engineer, the total cost of road works for work package G should have been in the region of R 531,614,997 (including road works and Ultra-Thin Friction Course, but Excluding Structures, Lighting and VAT) in 2008.

Another indication that OUTA's rehabilitation cost of R325/m<sup>2</sup> is relatively generous to use, is gathered from the cost of rehabilitation reflected in Benchmark Project # 3 (reflected later in this paper). This project pertained to the significant rehabilitation of an existing main road at R325/m<sup>2</sup> (at 2014 prices). By using the higher value (as opposed to de-escalating for inflation by six years to 2008), OUTA believes that more than enough allowance has been made for variations in material use and challenges faced by the construction industry during the Soccer World Cup preparation period.

In using this figure for the resurfacing of the existing surface area, and applying this to OUTA's calculations for work package G, OUTA was able to extrapolate the cost of New Lane surface to be R1,666/m<sup>2</sup>. On checking with experts in the road construction industry, the figure of R1,666/m<sup>2</sup> is regarded as a very reasonable price for new road construction projects in 2014 and thus ample for the GFIP project period.

In this methodology, OUTA conducted an analysis of satellite imagery and aerial photography to determine the extent of the GFIP road surface area, both prior to (i.e. 2007) and post (i.e. 2012) the GFIP. This was broken down into a square metre calculation for both rehabilitation and new lane construction. Based on this analysis, OUTA was able to conduct the following costing exercise to the GFIP:

- There is a very different cost apportioned to the resurfacing of an existing road surface, when compared to the costs attributed to the building of a new road/lanes, which requires sub-base layering and compaction, in addition to other work, before applying the final surface.
- OUTA has accounted for an acceptable deviation in the measurement of the surface area of the roads.
- Using the above cost estimates based on the areas pertaining to the existing road surface (for rehabilitation) at R325/m<sup>2</sup> and then applying R1666/m<sup>2</sup> for the additional surface area added to the freeway network from the GFIP, we have been able to estimate the costs of the road construction element of the GFIP project, before adding in the extra costs apportioned to bridge work, median barriers, lighting etc. (see table below).

**Methodology 3: Applying Cost / Sq M for Roadworks**

ITEMS COSTED	Cost / Sq M Applied	AREA of A, B, C, D(1&2), E(1&2), & G		Remaining 82 km of GFIP		TOTAL GFIP	
		AREA (Sq M)	COST (ZAR)	AREA (Sq M)	COST (ZAR)	AREA (Sq M)	COST (ZAR)
New Road Surface Area	R 1,666	1,182,720	1,970,411,520	761,223.84	1,268,198,919	1,943,944	3,238,610,439
Existing Road Surface Area	R 325	3,193,440	1,037,868,000	2,055,366.16	667,994,002	5,248,806	1,705,862,002
<b>TOTAL</b>		<b>4,376,160</b>	<b>3,008,279,520</b>	<b>2,816,590</b>	<b>1,936,192,921</b>	<b>7,192,750</b>	<b>4,944,472,441</b>
Total per Sq M	R 687						
Lighting			163,717,273		175,665,950.24		339383223
Structures			737,573,300		277,289,421		1,014,862,721
<b>TOTAL</b>			<b>3,909,570,093</b>		<b>2,389,148,292</b>		<b>6,298,718,385</b>
CSI & BBBEE			8,789,047		4,869,090.91		13,658,138.11
Contract Price Adj			214,924,072		138,573,498.26		353,497,569.98
Median Barriers							383,768,205.78
<b>TOTAL</b>			<b>4,133,283,212</b>		<b>2,532,590,881</b>		<b>7,049,642,299</b>
VAT (@ 14%)			578,659,650		354,562,723		986,949,922
<b>TOTAL Including VAT</b>	R 1,117		<b>4,711,942,862</b>	-	<b>2,887,153,605</b>		<b>8,036,592,221</b>
<b>SANRAL PAID &gt;</b>							<b>17,880,000,000</b>
SANRAL's COST / Sq M:	R 2,486						2,485.84

**Table 6: Methodology three table - cost/m<sup>2</sup>**

### 3.9 Summary of OUTA’s Three Methodologies used to calculate the estimated cost of GFIP.

The table below provides an overview and summary of the total cost of GFIP, as per OUTA’s three methodologies of calculation.

#### SUMMARY AND COMPARISONS OF OUTA'S THREE CALCULATION METHODOLOGIES

METHOD	COST OF GFIP	METHOD DESCRIPTION
<b>Method 1</b>	8,091,991,936	Using Engineers calculation Package G tender documents as (base case) per KM for all packages
<b>Method 2(b)</b>	8,683,467,599	Using Engineers calculation of Key Quantities obtained for Several Work Packages (A, B, C, D, E, G) and applying Package G (base case cost / KM) to remainder of packages (82km)
<b>Method 3</b>	8,036,592,221	Applying the figure of R325/m <sup>2</sup> for rehabilitation work(5,248,806 m <sup>2</sup> ) and R1666/m <sup>2</sup> for added surface area (1,943,944 m <sup>2</sup> ) and adding costs pertaining to structures, lighting and median barriers.
<b>AVERAGE</b>	8,270,683,918	Taking an average of the above three methodologies
<b>SANRAL</b>	17,883,888,092	The actual figure paid by SANRAL for the GFIP
<b>DIFFERENCE</b> % Variance	9,613,204,174 116%	The amount OUTA believe that SANRAL overpaid for the GFIP

When assessing the costs of GFIP through the application of three different methodologies, OUTA firmly believes that it is far from wrong when estimating a realistic price that SANRAL (and therefore the people of South Africa) ought to have paid for the GFIP.

**The fair value price tag as per OUTA’s calculations ranges between R8 billion and R8,7 billion, the average of the three methodologies coming in at R8,3 billion. OUTA further adds that it has been generous in the figures and calculations used when arriving at their cost estimates. In so doing, OUTA firmly maintains that SANRAL has grossly overpaid for the GFIP, by approximately 116%, or R9,6 billion.**

As regards this excessively inflated cost of GFIP, OUTA provides its overarching opinions, conclusions, and recommendations in the relevant section at the end of the paper.



### 3.10 Other Assessments & Observations:

#### Excessive Cost on Work Package I (Gillooly’s to Rietfontein)

This work package was 10 km long, on the R21 from Gillooly's to Rietfontein. Other than the bridge and structure work around the Gillooly's interchange, which included the two-lane flyover, there was very little other structural work conducted on this package. Neither was there significant expansion done to any of the interchanges along this route. It was a relatively easy package which largely saw the expansion of the three lanes (exiting) highway, to four lanes (in each direction).

However, it works out to be one of the most expensive Packages when it comes to evaluating the costs of road construction only – i.e. removing the estimated cost of the Structural work estimated to be around R150 million.

#### OUTA's ASSESSMENT OF WORK PACKAGE "I"

SCHEDULE	Package I
SANRAL's Cost of Work Package I (before CPA & VAT)	1,102,283,849
Estimate Structure Costs by OUTA (Maximum)	150,000,000
OUTA's Est of SANRAL's Cost of Road works: (excluding Structures, CPA, VAT)	952,283,849
Length of Package:	10
Roadwork cost per KM (Excluding VAT & CPA):	95,228,385
OUTA's Estimate of Road Work per KM: (Adjusted for higher cost of Ultra Thin Continuously Concrete Technology applied)	32,500,000
Overpricing of Work Package I:	62,728,385
% Variance:	193%

The excessive costs attributed to the road works on package “I”, raised serious concerns of overpricing, at around R95 million per kilometre (excluding structure work, CPA and VAT). This is some three times higher than the cost arrived at by OUTA (R32.5 million per

kilometre). OUTA has priced Package G at R32 million per kilometre and this section has a far greater “new surface area” ratio to that of Package “I”.

The authorities and oversight bodies, plus SANRAL’s Board and others cannot ignore the vast discrepancies between projects and points to some projects making far more money, or profits than others, for whatever reason exists. The Oversight bodies and the Minister of Transport simply cannot ignore the problems of corruption or gross maladministration inferred in this matter.

## **4 Benchmarking of GFIP costs with other road construction projects.**

### **4.1 Benchmarking**

Following OUTA's initial Position Paper in February 2016, SANRAL questioned OUTA's assertion whether international pricing should be used as a benchmark. As mentioned earlier, when dealing with state funds, a State Owned Organisation (SOE) are well advised to make use of benchmarking practices to identify maladministration and/or corruption such as price collusion practices and to detect whether they are receiving fair value from their suppliers. SANRAL's own mandate and legislation promote the use of local and international benchmarking, and thus OUTA finds it inexplicable that SANRAL should question the need to benchmark.

### **4.2 SANRAL's Mandate**

According to SANRAL annual reports, SANRAL's mandate is described as follows:

“SANRAL has a distinct mandate – to finance, improve, manage, maintain and upgrade the national road network. We are committed to carrying out our mandate in a manner that protects and preserves the environment through context-sensitive solutions.”<sup>33 34</sup> How is SANRAL able to fulfill their mandate if they do not benchmark their projects against other national and international projects? It is illogical for SANRAL's management to imply that the costs tendered by local construction companies are the ones they must simply accept, without evaluation to detect excessive pricing variances from the norm.

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<sup>33</sup> [http://www.nra.co.za/content/3845\\_SANRAL\\_annual\\_report\\_2015.pdf](http://www.nra.co.za/content/3845_SANRAL_annual_report_2015.pdf)

<sup>34</sup> <http://www.etenders.gov.za/sites/default/files/tenders/SANRAL%20Volume%201%20Marketing%20and%20Advertising%20RFP%202016.docx.pdf>

Furthermore, OUTA's grounds for the use of international benchmarking are supported by the SANRAL Act, Chapter 3 (Functions, powers, and responsibilities of Agency), Section 26 (m) and (s), amongst others states the following:

“In addition to the Agency's main powers and functions under section 25, the Agency<sup>35</sup> is competent-

(m) to undertake or conduct any research, investigations or inquiries and collect any information in connection with roads, whether in the Republic or elsewhere;

(s) to liaise and exchange information, knowledge and expertise with the official bodies or authorities entrusted with control over roads of a national or international character in other countries, and to participate in the conferences, seminars and workshops of those bodies or authorities and in the activities of any multinational or international association of those bodies or authorities;”

This section clearly signifies the importance of consulting, referencing and benchmarking international sources and organisations with SANRAL's related projects. Such international organisations, as mentioned in OUTA's initial position paper, are the World Bank, African Development Bank, and the CSIR, that provide benchmark prices for road construction in developing nations.

### **4.3 South African projects and research used to Benchmark GFIP**

In this section, local road construction projects have been references, against which GFIP can be compared/benchmarked in terms of cost. According to civil engineering experts who consulted with OUTA, *“it is a known and acknowledged fact within the civil engineering construction industry that price escalation, year upon year, has been between 5% to 10% annually compounded, since the collapse, globally, of the economic markets in late 2008.”* For the purposes of this position paper, OUTA used an average inflation rate of 6% each year to calculate what the estimated price would have been for these benchmarked projects in 2008 – to the year in which the GFIP construction started.

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<sup>35</sup> <http://www.nra.co.za/content/act7~1.pdf>

#### 4.3.1 Benchmark Ref #1: University of Johannesburg Study<sup>36</sup>

In a study conducted by Backeberg (2009) from the University of Johannesburg, the cost of an upgrade to the Ben Schoeman Freeway (work package C) is evaluated against the cost of the Gautrain (high-speed commuter train) project. The research examines what could have been done to improve the Ben Schoeman Highway, as an alternative to the introduction of the Gautrain, which was built at a cost of R100 million/km (and was being built prior to the announcement of the GFIP), in order to address the freeway congestion. According to Backeberg (2009), with the money used to build the Gautrain, “one intersection per kilometre plus five additional new lanes on each side can be built” on the Ben Schoeman highway. This once again brings into question the costs incurred on the upgrading of that section of road.

The implication is that one new lane of the highway would cost around R5 million per kilometre. Considering the standard lane width of 3,7 metres, this equates to **R 1 351 per square metre**. As will be demonstrated later, this is in line with international pricing and comes in lower than the OUTA estimate of R1,666/m<sup>2</sup>, based on work package G.

#### 4.3.2 Benchmark Ref #2: CSIR Report<sup>37</sup>

Maina (2006) reported in the article “Multi-million Rand Research to Design Better, Durable Roads” that the cost to build 1 km of the freeway can cost **as much as R25 million per kilometre**. This equates to R28,1 million per kilometre at 6% inflation rate in the year 2008. This report is an informed estimation from within the Republic which is indicative of the reasonable costs to construct freeways in South Africa.

It is not unreasonable to assume that the cost given in this report of R25 million per kilometre is referring to a larger main road or highway. For the sake of being conservative, OUTA

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<sup>36</sup> <http://www.jtscm.co.za/index.php/jtscm/article/download/53/49>

<sup>37</sup> [http://journals.co.za/docserver/fulltext/csir\\_sci/5/1/csir\\_sci\\_v5\\_n1\\_a3.pdf?expires=1486357777&id=id&accname=guest&checksum=2B69440F903CAC86FEED8069C35F5385](http://journals.co.za/docserver/fulltext/csir_sci/5/1/csir_sci_v5_n1_a3.pdf?expires=1486357777&id=id&accname=guest&checksum=2B69440F903CAC86FEED8069C35F5385)

reference a 2-lane highway in each direction, such as the R21 (work package G) prior to the upgrades.

The R21 prior to GFIP had a width of 11.1 metres in each direction (two lanes @ 3,7 metres wide, shoulders of 2,8 and 0,8 metres). This means the total width of the highway was 22.2 metres.

An R28,1 million per km cost attributed to 22,200 square meters, equates to **R1,266 per square metre**. This calculation is significantly lower than the R1,666/m<sup>2</sup> attributed to the new lane area applied earlier for new lanes built in the GFIP. However, OUTA has acknowledged that their calculations have been on the generous side, and have taken into consideration the construction challenges of the time.

#### **4.3.3 Benchmark Ref #3: N1 Upgrade from Platteklouf to Old Oak Interchange (Cape Town)**

This part of the N1 is exposed to severe levels of congestion at peak periods during the mornings and the afternoons. The project will take place in four phases (from February 2016 – February 2019). It includes not only the construction of additional lanes, but also intersection and bridge upgrades and repairs, and extension of the concrete median barrier.

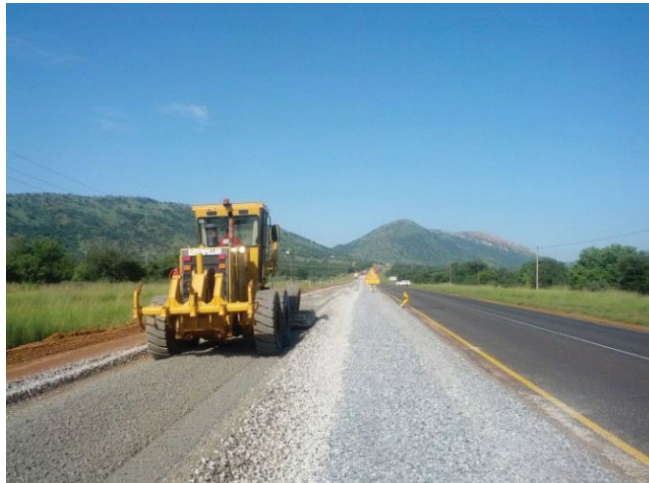
The project cost is estimated at R487 million<sup>38</sup> (including all related costs such as community investment) and is only 9km in length, resulting in lower economies of scale. The project will cost around R54 million per km or R1 680/m<sup>2</sup> for the estimated 289 800m<sup>2</sup> area covered (based on COLTO standards). When one de-escalates this price to 2008 (when GFIP construction started), at an average of 6% per annum, the project rate comes in at around R1,054/m<sup>2</sup>. This cost includes both new works and rehabilitation, and still comes out more than 50% cheaper than the average cost of GFIP.

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<sup>38</sup> <https://www.westerncape.gov.za/news/major-r487-million-n1-upgrade-project-ease-congestion-city>

#### **4.3.4 Benchmark Ref #4: N4 – Phase 2 rehabilitation and re-alignment through Swartruggens<sup>39</sup>**

Phase two of the N4 project (May 2014 – December 2015) between Rustenburg and Swartruggens consists of realignment and rehabilitation of 25km of the highway, at a cost of R160 million, or R6,4 million/km. Using COLTO standards of road width, OUTA estimates the area of the road rehabilitation and construction project to be 495 000m<sup>2</sup>. Should this surface area be correct, the cost of the project is around R323/m<sup>2</sup>, at 2014/2015 prices.



If one de-escalates the cost at 6% per annum, in 2008 the same project would have cost R228/m<sup>2</sup>, well below the R325/m<sup>2</sup> applied for the GFIP resurfacing element.

#### **4.3.5 Benchmark Ref #5: N7 Upgrades (2012-2016) from Citrusdal to Cederberg**

The N7 project is a 27km upgrade and will include the widening of the road (from 7,4m to 12,4m), as well as additional climbing lanes. A challenge in this project is the hilly landscape, traffic allowances and adherence to environmental regulations to protect endangered plant species along the route<sup>40</sup>.

<sup>39</sup> <http://www.wbho.co.za/wp-content/plugins/category-grid-view-gallery/includes/CatGridPost.php?ID=2551>

<sup>40</sup> By the way – July August 2016

The project will cost R450 million, for an estimated area of 334 800 m<sup>2</sup> (by COLTO standards). The average cost **is calculated at R1 344/m<sup>2</sup> in the 2012-2016 period**, lower than GFIP's actual average cost of R2,486/m<sup>2</sup>. This once again brings the GFIP cost into question.

#### **4.4 Sub-Saharan African projects and research used to Benchmark GFIP**

##### **Important considerations:**

- Costs given in Dollars (\$) are converted to Rands (ZAR) at an average rate of R8,20 to the Dollar for 2008, the time of tenders for GFIP.
- Costs are also adjusted to account for a 6% pa inflation rate in order to adjust the cost for 2008 standards.

##### **4.4.1 Benchmark Ref # 6: African Development Bank (AfDB) Study 2010/2011<sup>41</sup>**

The African Development Bank (AfDB) conducted a study in 2010/2011 to analyse the road infrastructure and construction unit costs in Africa. The study looked at creating a database of road projects in Africa, which offer a baseline for construction costs in Africa, assisting in identifying the prevalence and extent of cost overruns in African based projects. The unit costs were determined by analysing the Project Completion Reports of 172 projects around Africa. Unit rates are expressed in US\$, but converted to ZAR, taking into account the exchange rate of the time, as well as inflation.

The study found that:

- The smaller the project, (particularly projects that are shorter than 50 kilometres) were more expensive than contracts larger than 50 kilometres. This also meant that smaller projects were more susceptible to cost overruns.
- Upgrading or new construction of roads are more susceptible to cost overruns.
- The location of the project did not significantly influence the unit rate distribution.
- The origin of the contractor does not influence the unit rate distribution.
- There is a difference between landlocked and seaboard countries but without major influence.

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<sup>41</sup> [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Study\\_on\\_Road\\_Infrastructure\\_Costs\\_-\\_Analysis\\_of\\_Unit\\_Costs\\_and\\_Cost\\_Overruns\\_of\\_Road\\_Infrastructure\\_Projects\\_in\\_Africa.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Study_on_Road_Infrastructure_Costs_-_Analysis_of_Unit_Costs_and_Cost_Overruns_of_Road_Infrastructure_Projects_in_Africa.pdf)



Bearing in mind the effect of design details and specific circumstances such as geographical location, as well as issues related to economy of scale, the following table indicates the unit rate statistics for road infrastructure across 24 African countries and 172 projects.

Type of Road Infrastructure Investment	Rehabilitation of Paved Road (US\$ - 2006)	Construction & Upgrading of Paved Roads (US\$ - 2006)
<b>&lt; 100 lane km</b>		
Quartile 3	290 000	425 400
Median	180 300	227 800
Quartile 1	109 800	166 300
<b>≥ 100 lane km</b>		
Quartile 3	130 500	162 000
Median	84 400	147 100
Quartile 1	47 400	115 900

**Table 7: Summary of Unit Rate (USD/lane-km)**

Type of Road Infrastructure Investment	Rehabilitation of Paved Road (ZAR - 2008) <sup>42</sup>	Construction & Upgrading of Paved Roads (ZAR - 2008)**
<b>&lt; 100 lane km</b>		
Quartile 3	2 671 921	3 919 431
Median	1 661 198	2 098 840
Quartile 1	1 011 644	1 532 208
<b>≥ 100 lane km</b>		
Quartile 3	1 202 364	1 492 590
Median	777 621	1 355 309
Quartile 1	436 721	1 067 847

**Table 8: Summary of Unit Costs in 2008 (ZAR/lane km)**

At R2,1 million per lane kilometre, the average cost of construction and upgrading of paved roads around Africa is R567/m<sup>2</sup>. This cost is lower than other benchmarks used in this paper,

<sup>42</sup> The results were taken from 2006, and adjusted for 6% per annum inflation for 2006. Exchange rate of R8,20 to the dollar used for 2008.

but this can be attributed to the variances in the type of road included in the study, as well as the exclusion of structures. However, it does raise the issue once more of how GFIP could have reasonably cost almost five times this amount on average, considering the confirmed high rate of cost overruns in the rest of Africa.

What this study highlighted is that while there is no specific unit cost that can be determined, unit costs can be estimated by comparing broadly similar projects, whilst taking into account differing designs details and circumstances. In addition, the size of the project has a large impact on the unit rate – the larger the economies of scale, the cheaper the unit costs. For comparison sake, major physical and location factors such as bridges and taxes are excluded from the comparison in the study.

According to AfDB, cost overruns in road infrastructure are increasingly common, ranging between at least 35% and 100%. These cost overruns can be caused by a lack of competition in the bidding process, technology practices, fuel price fluctuations and availability and quality of road materials. However, understanding these cost overruns in Africa is difficult due to limited data availability. However, it is not unreasonable to assume that South Africa should have a competitive construction environment, and access to all the necessary technology and high-quality road material. Therefore, it is reasonable to expect that in South Africa, under SANRAL's watch, the cost overruns should remain minimal. However, it appears that with GFIP, this was not the case.

#### **4.4.2 Benchmark Ref # 7: Project Name: Addis Ababa–Adama Expressway<sup>43</sup>**

The Addis Ababa - Adama Expressway is a new six-lane highway (three lanes in either direction), and shoulders on both sides. The project was built to reduce congestion and travel time between the two cities of Addis Ababa and Adama, over a distance of 84,7km. The project includes:

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<sup>43</sup> <http://www.globalconstructionreview.com/news/700m-ethiopian-high8w8a8y-gets-started-after-four/>

- 18km of link road and 7.2km of frontage road on either side in Adama
- Construction of 6 interchanges and 3 intersections
- Construction of 77 slab culverts, 36 underpasses and 43 over-passes.
- The 5.4m high overpasses are supported by 73t girders, reinforced concrete piers and stone structures.
- Construction of two main toll gates, 13 ramp toll gates, and ITS facilities.

The total **actual cost** of the project was \$700 million (\$612 million excl. VAT), including engineer design and supervision costs. It was built between 2010 and 2014, so the above costs are taken at 2014 pricing. The width of the road was a total of 31 metres, resulting in 2,625,700m<sup>2</sup> of brand new (green fields) road construction.

Benchmark Ref # 7: Project Name: Addis Ababa–Adama Expressway							
Year	KM	m <sup>2</sup>	Value (\$) (2014)	Value (\$) (2008)	Value (ZAR)**	Cost ZAR/km	Cost ZAR/m <sup>2</sup>
2014	85	2 625 700	700 000 000	493 472 378	4 046 473 500	47 774 185	1 541

**Table 9: Cost per Square Metre for Addis-Ababa-Adama Expressway**



**Summary:** While OUTA places the GFIP new road construction element at around R1666/m<sup>2</sup>, the price paid for the Addis Ababa-Adama Expressway Toll Road at R1541/m<sup>2</sup> is estimated below OUTA’s value of R1666/m<sup>2</sup>. When compared to SANRAL’s value of R2,486/m<sup>2</sup> for GFIP and noting this difference in the scope of works, the cost of GFIP is once again excessive.

#### 4.4.3 Benchmark Ref #8: Project Name: Nairobi-Thika Superhighway Upgrade<sup>44</sup>

The Nairobi-Thika Superhighway connects Nairobi and Thika, and was initially constructed in pre-independence and later upgraded to bitumen standards in the early 1970's. The initial designs for improvement to the superhighway were done between 2006 and 2008, and construction took place between 2009 and 2012. The reason for the upgrades was<sup>45</sup> due to “Severe traffic congestion and frequent road accidents were common on the Nairobi-Thika roadway, which necessitated a new, wider and safer highway. The urban zones along the stretch have rapidly increased, and so has the number of automobiles. Excess fuel consumption and high level of vehicular pollution followed as the inevitable consequences of the heavy traffic.”

The project covered 50km of a road, approximately 34 metres wide (using industry standards to calculate 8 lanes at 3.65m each and 4 shoulders at minimum 1.2m each). Surface area is, therefore, 1,700,000m<sup>2</sup> (est.) and the contract for its improvement was divided into three sections to enable its implementation



<sup>44</sup> [http://www.kenha.co.ke/index.php?option=com\\_content&view=article&id=75:nairobi-thika-superhighway-a-dream-realised&catid=20:2014news&Itemid=8](http://www.kenha.co.ke/index.php?option=com_content&view=article&id=75:nairobi-thika-superhighway-a-dream-realised&catid=20:2014news&Itemid=8)

<sup>45</sup> <http://www.roadtraffic-technology.com/projects/nairobi-thika-superhighway/>

The actual cost of the contract was \$360 million, and this is taken at 2012 pricing. The scope of the works included both rehabilitation of road and new road construction.

<b>Benchmark Ref #8: Project Name: Nairobi-Thika Superhighway Upgrade</b>							
<b>Year</b>	<b>KM</b>	<b>m<sup>2</sup></b>	<b>Value (\$) (2012)</b>	<b>Value (\$) (2008)</b>	<b>Value (ZAR)**</b>	<b>Cost ZAR/km</b>	<b>Cost ZAR/m<sup>2</sup></b>
2012	50	1 700 000	360 000 000	285 153 719	2 338 260 496	46 765 210	1 375

**Table 10: Cost per Square Metre for Nairobi-Thika Superhighway**

The extent of this project, which comprised of significantly more new lane construction, came in well below GFIP on a cost per kilometre basis, again highlighting the exorbitant price of the GFIP.

#### **4.4.4 Benchmark Ref # 9: Project Name: Tonota to Francistown<sup>46</sup>**

This project consisted of the upgrading of a road section (Tonota – Francistown) “from single carriageway to dual carriageway standard including construction of new dual lane bridge structures across Tati, Shashe and Tholodi Rivers as well as the construction of access roads to the adjacent Kgotla. The construction includes relocation of services such as Water Utilities Corporation waterlines, Botswana Power Corporation services, Botswana Telecommunications Services and Sewerage lines. The design of this project was done in conjunction with Keeve Steyn (Pty) Ltd of South Africa”<sup>47</sup>

This project took about 36 months to complete by 2015, covering a distance of approx. 30 km, and costing \$113 Million (approx. Pula 1.1 Billion). Based on industry standards, the road width is estimated at 24.8 metres (four lanes, four shoulders), resulting in an area of 744,000m<sup>2</sup>.

<sup>46</sup> <http://www.pulaconsultants.co.bw/tonota-francistown-road>

<sup>47</sup> <http://www.infrastructurene.ws/2014/02/21/tonota-to-francistown-via-dual-carriageway/>

<b>Benchmark Ref # 9: Project Name: Tonata to Francistown</b>							
<b>Year</b>	<b>KM</b>	<b>m<sup>2</sup></b>	<b>Value (\$) (2014)</b>	<b>Value (\$) (2008)</b>	<b>Value (ZAR)**</b>	<b>Cost ZAR/km</b>	<b>Cost ZAR/m<sup>2</sup></b>
2015	30	744 000	113 000 000	89 506 584	733 953 989	24 465 133	986

**Table 11: Cost per Square Metre for Tonata Highway**

Using an exchange rate of R8,20 to the dollar in 2008, this brings the cost to **R986/m<sup>2</sup> for the construction of this road**, which is well below SANRAL's GFIP cost of R2485/m<sup>2</sup>, with a higher ratio of new lane construction and lower economies of scale on this project.

## **4.5 International projects and research used to Benchmark GFIP**

### **4.5.1 Benchmark Ref #10: Study on Highway Construction Costs done by the Washington State Department of Transport (WSDOT) (2004)**

#### **North America**

In the previous report, a number of North American studies were used to indicate the average cost of road construction in North America. Important considerations include:

- North American studies are all offered in Miles as the distance measurement. For the purposes of this research, all distances have been converted to kilometres to understand in a South African context.
- Costs given in Dollars (\$) are converted to Rands (ZAR) at an average rate of R8,20 to the Dollar for 2008.
- Costs are also adjusted to account for a 6% pa inflation rate in order to adjust the cost for 2008 standards.

The WSDOT compiles a report on road construction around the USA to determine if they had the most expensive road construction in the country. They reviewed 15 cases across 12 states and outlined the determining factors in variation in cost. As an addition to the study, they added the Arkansas State Department level estimates, as posted on their website.



**Arkansas State Department Estimates<sup>48</sup>**

Type of Project	Cost in \$/mile (in 2004)	Cost in ZAR/km (2008) (R/\$ = 8,20)
<b>Widening 2-4 Lanes Urban (i.e. two extra lanes in each direction)</b>	<b>2 600 000</b>	<b>16 718 018</b>
New Rural, 2- Lane Mountain Terrain	2 300 000	14 789 016
Rural Interstate Reconstruction	3 600 000	23 148 025
New Interstate Construction	6 500 000 - 8 500 000	41 795 045 - 54 655 058

\*\* (R/\$ in 2008 = 8,2; adjusted at 6% pa inflation rate for ZAR rates in 2008.

**Table 12: Typical Road Construction Costs as reported in the Arkansas study during 2004.**

In the spirit of comparing similar projects, OUTA reviewed the WSDOT report for road construction projects that had similar characteristics to the GFIP:

**4.5.2 Benchmark Ref # 11: Project: The Katy Freeway (IH-10)<sup>49 50 51</sup>**

The “Katy Freeway” is a major East-West Freeway that connects Houston and Katy. It included two frontage road lanes in each direction, and three general purpose lanes in each direction (totalling 10 lanes).

Between 2003 and 2008<sup>52</sup>, the Texas Department of Transport embarked on a freeway widening project (adding lanes and a managed toll lane), aimed at alleviating congestion. Labelled the “world’s widest highway”, it now includes about 22 lanes. In some sections such as Beltway 8, the freeway increases to as much as 26 lanes (12 main lanes, 8 feeder lanes, and

<sup>48</sup> <http://americandreamcoalition.org/highways/HighwayCosts.pdf>

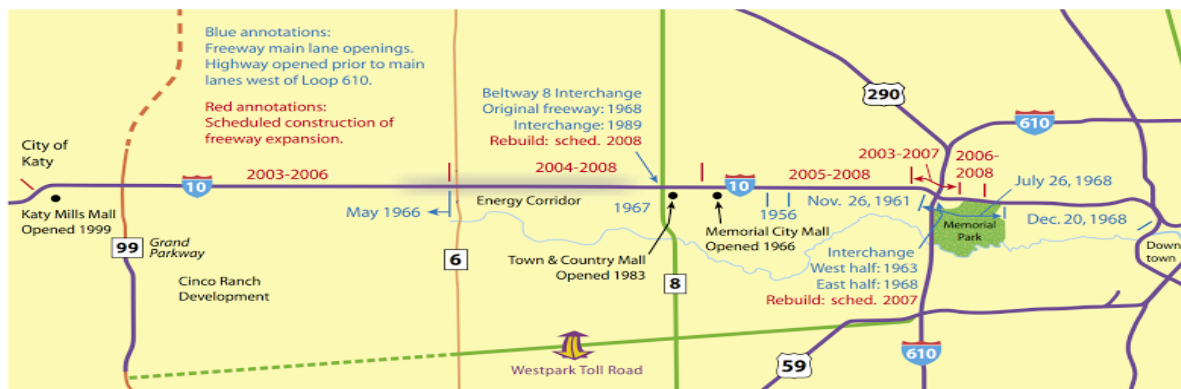
<sup>49</sup> <http://mobility.tamu.edu/mip/strategies-pdfs/added-capacity/technical-summary/adding-new-lanes-or-roads-4-pg.pdf>

<sup>50</sup> <http://www.texasfreeway.com/houston/schematics/i10/i10.shtml>

<sup>51</sup> [http://www.fhwa.dot.gov/ipd/project\\_profiles/tx\\_katyfreeway.aspx](http://www.fhwa.dot.gov/ipd/project_profiles/tx_katyfreeway.aspx)

<sup>52</sup> <http://www.wsp-pb.com/en/WSP-USA/What-we-do-USA/Projects/I-10-Katy-Freeway/>

six managed lanes), but is 22 lanes at a minimum. The project also included two freeway-freeway interchanges, 27 grade-separated intersections, as well as sidewalks to serve pedestrians in each direction<sup>53</sup>.



**Figure 7: Katy Freeway (IH-10) widening project**

The distance covered in the upgrade was a total of 23 miles (37 kilometres). The average width of the freeway, however, is 145m (475 feet)<sup>54</sup>. The total cost of the project was \$2.8 billion, including external infrastructure development and changes. For the purposes of this evaluation, OUTA will focus on one work package in the Katy project that closest resembles a GFIP type construction.

This work package was the **I-10 East of Grand Parkway to West of SH6<sup>55</sup>** - Reconstruction of **6.91 miles (11.1km)** of Interstate Freeway while under traffic. According to the WSDOT report, the project included construction in order to “widen the main lanes to four or five lanes in each direction and add a third continuous lane to the frontage roads. The diamond lane will be maintained and shoulders will be added on each side of it, although its beginning and ending points will be moved about one mile to the East. A continuous auxiliary lane will be added on each side of the freeway. The existing access roads will be converted to 2-way local access roads. Both frontage roads will be widened at their approaches to the three major crossroads (Barker Cypress Rd, Fry Rd, and Mason Rd) to allow for turning lanes. U-turn lanes will be built on both sides of all six crossings.”

<sup>53</sup> <http://www.wsp-pb.com/en/WSP-USA/What-we-do-USA/Projects/I-10-Katy-Freeway/>

<sup>54</sup> [http://www.fhwa.dot.gov/ipd/project\\_profiles/tx\\_katyfreeway.aspx](http://www.fhwa.dot.gov/ipd/project_profiles/tx_katyfreeway.aspx)

<sup>55</sup> [http://www.vtpi.org/WSDOT\\_HighwayCosts\\_2004.pdf](http://www.vtpi.org/WSDOT_HighwayCosts_2004.pdf)



Construction of this package ran from 2003 until 2006, and cost \$208 million.

### Katy Freeway – Houston, Texas



Katy Freeway at Fry Road before



Katy Freeway at Fry Road after

To calculate the width of the freeway, OUTA analysed the descriptions. The average width of the Freeway is 145m (475 ft)<sup>56</sup> for approximately 25 lanes. This package contained 22 lanes, so the estimated width of the road is 127m. This will include all shoulders etc... Therefore the area of this project is 1,409,700m<sup>2</sup>.

Benchmark Ref # 11: Project: The Katy Freeway (IH-10)							
Year	KM	m <sup>2</sup>	Value (\$) (2006)	Value (\$) (2008)	Value (ZAR)**	Cost ZAR/km	Cost ZAR/m <sup>2</sup>
2006	11	1 409 700	208 000 000	233 708 800	1 916 412 160	172 649 744	1 359

**Table 13: Cost of Katy Freeway**

**Additional Information:**

“Katy Freeway was named one of the Top 10 North American infrastructure projects by the International Right of Way Association in 2009. Other recognition included the 2009 Texas Public Works Association Project of the Year Award and the 2009 American Association of State Highway and Transportation Officials President’s Award for the Katy Freeway Reconstruction Team.”

<sup>56</sup> [http://www.fhwa.dot.gov/ipd/project\\_profiles/tx\\_katyfreeway.aspx](http://www.fhwa.dot.gov/ipd/project_profiles/tx_katyfreeway.aspx)

### 4.5.3 Benchmark Ref #12: Western Europe - Western China International Transit

#### Corridor (CAREC - 1b)

CAREC Corridor 1b is the main road corridor crossing Kazakhstan from the border with the People's Republic of China (PRC) in the southeast, through Almaty, Taraz, Shymkent, Kyzyl-Orda, and Aktobe, to the border with the Russian Federation, and consists of a total of 2,787 kilometres (km). This project covers the Almaty–Shilik, Shilik–Tashkarasu, and Tashkarasu–PRC border road sections of CAREC Corridor 1b. “The first component of the project includes the upgrade and construction of the road section within Almaty Oblast. This component will finance: civil works to support the upgrade and construction of the Almaty- Khorgos road section of the Western Europe-Western China road corridor within Almaty Oblast, including associated bypasses, bridges, interchanges, and ancillary facilities; and the provision of consulting services for management and supervision of civil works under the project”.

This project is, therefore, an upgrade project, increasing the road from 2 to 4 lanes (a width of 27,5m)<sup>57</sup> over a distance of 305 km. The area of the road is therefore approx. **8 387 500 m<sup>2</sup>**. About 65% of the works will involve new alignment. It is still in progress, running from May 2012 to June 2017. As it is not complete, the pricing will be taken at tender pricing in 2012. The cost of the project stands at \$1,256 million.

<b>Benchmark Ref #12: Western Europe - Western China International Transit Corridor (CAREC - 1b)</b>							
<b>Year</b>	<b>KM</b>	<b>m<sup>2</sup></b>	<b>Value (\$) (2006)</b>	<b>Value (\$) (2008)</b>	<b>Value (ZAR)**</b>	<b>Cost ZAR/km</b>	<b>Cost ZAR/m<sup>2</sup></b>
2012	305	8 387 500	1 256 000 000	994 869 641	8 157 931 056	26 747 315	973

**Table 14: Costing of CAREC - 1b**

<sup>57</sup> <http://www.gulsanholding.com.tr/en/kazakhstan-almaty-khorgos-motorway-construction-project.asp>

#### 4.5.4 Benchmark Ref #13: PATHE - Section Maliakos - Kleidi Motorway PPP, Greece

The PATHE motorway is a 230 km section (the construction of the new 25km motorway section, with the upgrades of a 205 km existing road and toll route) of the most influential Greek commercial road, between Athens and Thessalonica, which forms a part of the Trans-European Network (TEN). Construction of 36 bridges, 3 twin tunnels, 15 retaining walls, 80 culverts, 8 interchanges, rehabilitation or new construction of 11 toll stations, construction of 4 operation/maintenance building centres, 3 police buildings, 5 road services areas and 2 fire brigade buildings will be included. Construction ran from 2008 – 2012<sup>58</sup>.

The cost for this project is estimated to be approximately €1 billion, of which over two-thirds of the total Capex will be earned in the form of long-term bank loans and equity from all the active partners, which will be regained from toll charges and service station concessions.

<b>Benchmark Ref #13: PATHE - Section Maliakos - Kleidi Motorway PPP, Greece</b>						
<b>Year</b>	<b>KM</b>	<b>m<sup>2</sup></b>	<b>Value (€) (2012)</b>	<b>Value (€) (2008)</b>	<b>Value (ZAR)**</b>	<b>Cost ZAR/km</b>
2012	230	8 387 500	1 256 000 000	994 869 641	11 938 435 692	51 906 242

**Table 15: Costing of Pathe Road in Greece**

Due to the extent of the work and the variations in width, including mass tunnel works, it was difficult to determine the m<sup>2</sup> cost. However, at R52 million/km, this project, which had far more complex structural work, was 57% of the cost of GFIP.

<sup>58</sup> [http://www.aegek.gr/new/eng/uc\\_profile.html](http://www.aegek.gr/new/eng/uc_profile.html)

## 5 Closing, Conclusions and Recommendations

### 5.1 Contract Price Adjustment

One of the major questions around the inflated costs, is where did the money go? Following the engagement with OUTA's consulting engineers regarding the prices for each of the work packages, serious questions arise around the Contract Price Adjustment (CPA) on each package.

According to the engineers, CPA on construction work is a standard adjustment, based on escalation indices provided by StatsSA on a monthly basis. Having obtained these indices, we calculated what the CPA amounts should have been, and noticed that the CPA across the eight work packages analysed by OUTA was inflated by 450% in the final GFIP payments. If this is the standard across all the work packages, then the total amount of R1,7 billion paid for contract price adjustment was overcharged by almost R1,4 billion.

OUTA believes that a thorough investigation into the Contract Price Adjustments must be done.

<b>Contract Price Adjustment on GFIP (limited packages)</b>			
<b>Work Package</b>	<b>SANRAL Paid</b>	<b>OUTA Calculations</b>	<b>% Variance</b>
<b>A</b>	122,880,404	25,951,632	373%
<b>B</b>	239,656,005	51,220,972	368%
<b>C</b>	213,424,406	39,458,975	441%
<b>D1</b>	234,884,760	29,464,316	697%
<b>D2</b>			
<b>E1</b>	300,913,065	39,229,954	667%
<b>E2</b>			
<b>G</b>	69,410,000	29,598,222	135%
<b>TOTAL</b>	<b>1,181,168,640</b>	<b>214,924,071</b>	<b>450%</b>

## 5.2 Breakdown of Trust

### Competition Commission and the Construction Industry Collusion

The Competition Tribunal on the 21<sup>st</sup> and 22<sup>nd</sup> July 2013 established that virtually all Road Packages under the GFIP implemented and administered by SANRAL were the subject of collusion amongst the major Contractors who took part in a meeting entitled the “2006 Contractor’s meeting”. That meeting was convened with the express intention to carve up the contracts pertaining to the 2010 World Cup stadiums and various national roads or toll road contracts amongst the attending contractors at fixed or pre-determined prices.

Price collusion in both the local and international contracting environment is deemed to be an act of corruption and subject to criminal prosecution. It would, therefore, be a common cause to assume that the relevant “competing” contractors, in this case, inflated all prices for the GFIP packages. Having established that the prices for the GFIP packages were inflated, it becomes necessary to establish the quantum - by how much the colluded prices exceeded normal pricing under normal circumstances.

Until the exposure of the construction industry collusion in early 2013, SANRAL’s leadership had on numerous occasions dispelled the view that the cost of the road construction was excessively high. Naturally, this had the potential to become embarrassing for SANRAL, as it appeared that the industry had been able to tender pricing above the norm. But how much above the norm, was the impact of the collusion?

When the GFIP collusion was exposed in the first quarter of 2013, OUTA imagined this might possibly be the explanation for the seemingly excessive costs of GFIP and if indeed the collusive prices were responsible for the bulk of the overpricing applied to GFIP, the obvious follow-up question would be to establish “how could a collusive industry jack up the known road construction costs to such an extent, without being challenged by SANRAL?”.

However, the timeline of events and actions by SANRAL began to indicate the behaviour of an SOE that was reluctant to take hard action against the construction industry for their collusive conduct:

- On 8<sup>th</sup> February 2013, Construction industry collusion<sup>59</sup> is exposed and the competition commission reveals its findings and fines attributed to the collusive conduct in June of 2013.
- On 5<sup>th</sup> August 2013, an article titled “SANRAL probes Avenues to sue for damages” in the Business Report (iol.co.za)<sup>60</sup>, Twenty-four road rehabilitation and upgrading tenders issued by SANRAL, including the GFIP were included in these settlement agreements.
- On 10<sup>th</sup> May 2016, SANRAL announces that it had “suffered damages and overcharges as a result of the companies’ collusive conduct and has put in for claims totalling between R600 and R760 million” and that seven construction firms and joint ventures had been served papers accordingly<sup>61</sup>.
- On 20<sup>th</sup> October 2016, an announcement is made whereby Government reached an agreement with the seven collusive construction companies (Group Five, WBHO, Basil Read, Stefanutti Stocks, Aveng, Murray & Roberts and Raubex), on the basis that these companies will undergo a transformation process and contribute R1,5 billion to a fund for “social investment initiatives.” They also committed to refrain from collusive actions and conduct going forward. It would appear that SANRAL was party to and in agreement to this arrangement and as such, have withdrawn their civil claims against the collusive companies.<sup>62</sup>

Following this announcement of an agreement between Government and the Construction industry, of concern to OUTA was the following:

- Why did it take SANRAL more than 2½ years to establish the value it had attributed to the construction collusion?

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<sup>59</sup> <http://mg.co.za/article/2013-02-08-00-construction-collusion-may-be-industrys-fatal-flaw>

<sup>60</sup> [http://www.iol.co.za/business-report/economy/sanral-probes-avenues-to-sue-for-damages-1557368#\\_VX3UgWBWtv1](http://www.iol.co.za/business-report/economy/sanral-probes-avenues-to-sue-for-damages-1557368#_VX3UgWBWtv1)

<sup>61</sup> <http://www.infrastructurene.ws/2016/05/10/sanral-to-sue-construction-firms-found-colluding/>

<sup>62</sup> <https://www.businesslive.co.za/companies/2016-10-20-seven-listed-construction-groups-agree-to-cough-up-for-collusion/>

- Whilst SANRAL did not say how much of this was attributed to the GFIP and how much to the other 23 projects, even if one attributed the full value to the GFIP, this would reduce the price from R17,9 billion to R17,15 and this was in effect a reduction in the GFIP cost of around 4%.
- OUTA finds it difficult to believe this figure as being the extent of the overpricing for the GFIP, for the following reasons:
  - a. Why would the construction industry take the risk of collusive behaviour to only attract a maximum benefit of 4%?
  - b. OUTA's estimates of the overpricing are in excess of 116%, which means that the collusive industry conduct revelation by SANRAL offered little explanation for the bulk of the GFIP overpricing. SANRAL's explanation of the GFIP collusion impact had not covered the full extent of the problem.

Naturally, an in-depth and independent investigation into the entire GFIP matter, will provide answers to the many unanswered questions, however until then, OUTA makes the following deductions:

- SANRAL's estimate of the industry collusion inflation impact on GFIP (at R760m or 4%), does not explain the excessive overcharges on the GFIP, by over R9 billion, allowed and paid by SANRAL.
- With SANRAL's expert understanding and knowledge of road construction costs, it would not be possible for SANRAL's management and processes to overlook, or ignore this extent (over 116%) of overcharging by the industry unless their systems and expertise were compromised.
- OUTA believes there is an "unhealthily close relationship between SANRAL and the main construction industry players", due to many dealings, appointments that have taken place over time. This statement has also been made by the Deputy Minister of Transport, Mr Jeremy Cronin, on or around 2011. Additionally, SANRAL's seemingly reluctance or unwillingness to pursue the necessary claims and actions against the collusive industry players leaves civil society concerned as to whose side in SANRAL on, the construction companies or the people?

- OUTA believes that SANRAL's systems and ability or desire to fetch the best prices for the GFIP, on behalf of the people, was compromised. OUTA further maintains that ineptitude or negligence by SANRAL's management does not explain this situation. OUTA believe instead, that SANRAL's Management must have been able to detect and note the exorbitant GFIP construction costs, either at the time of tender and during construction, if these arose due to overcharges, excessive payment claims and, cost overruns throughout the project.
- By implication, OUTA believes SANRAL's leadership at the time was largely to blame for the overpriced problem of GFIP and need to explain themselves accordingly, more so the CEO (Mr. Nazir Alli), their CFO (Ms. Inge Mulder), their Audit Committees and the Senior Project Manager of GFIP (Mr. Alex van Niekerk).

SANRAL has no excuse to say they do not have local and international road construction projects to benchmark to. Nor can they say that benchmarking is not a requirement. It is clearly stated in their own mandate, as referenced earlier in this paper.

SANRAL also have numerous bodies such as the SA Institute for Civil Engineers (SAICE) and the Construction Industry Development Board (CIDB) through whom they were able to request pricing and cost comparison investigations if there was any doubt as to the high costs of the GFIP.

OUTA believes that SANRAL has many good Engineers and Quantity Surveyor experts within the organisation, to ensure that their suppliers and contractors would not be able to overcome their checks and balances for the best possible prices.

### **5.3 Conclusion**

- a. The cost of the GFIP was grossly inflated.
  - In OUTA's position paper of February 2016, using only a benchmarking exercise and conducting high-level road construction assessments, OUTA



estimated then that the cost of GFIP should have been around R7,1 Billion and thus was overcharged by around R10,8 Billion.

- Having now conducted a review of these claims, and more through and deeper research, combined with more information and project detail, and combined with input from construction industry experts, OUTA confirms with some adjustment, that SANRAL has unnecessarily overpaid for the GFIP by between R9bn and R10 billion.
  - OUTA also maintains that its costing estimates applied in this paper (and that of the engineers who provided advice and input) was done so a higher rate than estimated for the period of the construction. Thus, when making this claim that the GFIP should have only cost between R8,0 and R8,7 Billion, compared to the actual cost paid by SANRAL, of R17,9 Billion, it does so with the belief and comfort that these numbers are at the upper limit and that the costs could have even come in somewhat lower.
- b. That SANRAL's Management must have been aware of the overpricing.
- OUTA maintains its original position that the cost of project has been grossly inflated and that SANRAL could not or should not have been able to overlook this fact. By inference, we maintain that SANRAL's management must have known about this. It is inconceivable that SANRAL is able to justify the costs of the GFIP project at around R92 million per kilometre, or that some work packages were able to be charged as high as R140 million per kilometre.
- c. The E-Tolls decision is now grossly unjustified.
- The cost of collection of e-tolls, is over R1 billion per annum (or around R 80 Million per month). In the 2012 OUTA vs SANRAL court documents, SANRAL had indicated the E-Toll collection costs to amount to R1,7bn per annum, had the scheme gone according to their initial plans and compliance levels of 90% plus.
  - OUTA maintains that despite the irrational decision to proceed with e-tolling, if indeed the GFIP construction costs had come in at a more realistic price tag of R8 to R9 billion, the repayment costs on the bonds would have amounted well

under R1 billion per annum, over 20 years, at an (achievable) interest rate of 10%. This means that the servicing of the capital debt of the road upgrade would have cost less than the e-Toll collection costs, which would have been extremely difficult to substantiate or motivate. In this case, the e-Toll scheme would more than likely never been approved.

## **5.4 Recommendations**

OUTA requests that the Ministers of both the Departments of Transport and Public Enterprise intervene by way of establishing an independent commission of enquiry to conduct a full investigation as to the costs and all other elements pertaining to the GFIP.

- The recent agreement between Government and Construction Industry players be revisited - as the “punishment” imposed is deemed to be punitive.
- That civil claims are re-opened against construction industry for collusion and adequate penalties are applied.
- That oversight bodies (CIDB) and industry Associations (SAFCEC and SAICE) explain why they have been relatively silent on this issue.
- That the N3 Cedara – Durban project (and others) tenders are fully investigated for this multi-billion project that has all the hallmarks of another overpriced project R15bn for a 78km upgrade project.
- That a Transport Regulator is introduced to monitor the problems and concerns experienced by the public on road and transport matters.
- That an oversight body with links and input from Civil Society road construction pricing and tenders is introduced.
- The e-toll scheme is scrapped.

**END**