Being Popular or Prudent: Making Tough Decisions Backed by State of the Art Technology

Getting Decision Makers to Use New, Big, Different Data Performance Measures Conference, Denver, CO



Creating wealth through infrastructure



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The SANRAL mandate

To manage, maintain, upgrade, finance South Africa's national road network







South Africa has the 10th longest road network and 18th longest paved road network in the world

Roads are among the largest public infrastructure investments in most countries

RSA Road Replacement Cost >ZAR 2 Trillion

Rank		Country	Road length
			(km)
		World	64 285 009
1	222	United States	6 586 610
2	8	India	4 689 842
3	*2	China	4 237 500
4	ø	Brazil	1 751 868
5	•	Japan	1 210 251
6	÷	Canada	1 042 300
7		Russia	982 000
8		France	951 200
9	÷.	Australia	823 217
10	\geq	South Africa	750 000
11		Spain	681 298
12		Germany	644 480
13		Sweden	572 900
14		Italy	487 700
15		Indonesia	437 759
16	C+	Turkey	426 906
		<u></u>	
34	/	Dem Rep of Congo	153 497
45	4	Zimbabwe	97 267
54	Ĭ	Zambia	91 440
55		Tanzania	91 049
70		Madagascar	65 663
80	۵,	Angola	51 429
72	/	Namibia	64 189
98	-	Mozambique	30 331
104		Botswana	25 798
122		Malawi	15 451
148	*	Lesotho	7 438
161	¢.	Swaziland	3 594
173		Mauritius	2 066
193		Seychelles	508
	S۵	DC Total	1 449 720



South African Road Network - 2014

Authority	Paved	Gravel	Total
SANRAL	21,403	0	21,403
Provinces - 9	47,348	226,273	273,621
Metros - 8	51,682	14,461	66,143
Municipalities	37,691	219,223	256,914
Total	158,124	459,957	618,081
Un-Proclaimed (Estimate)		131,919	131,919
Estimated Total	158,124	591,876	750,000

Un-Proclaimed Roads = Public roads not formally gazetted by any Authority





NATIONAL ROAD NETWORK (km)

Description		Non Toll	Agency Toll	BOT	Total
Dual Carriageway		610	520	443	1 573
4-Lane Undivided		11	299	240	550
2-Lane Single		17 662	1013	605	19 280
Total		18 283	1 832	1 288	21 403
% of SANRAL Network		85%	9%	6%	

The 3,120 km Toll network represents 14.58% of SANRAL network, 0.5 % of the total and 2.0 % of the surfaced network of South Africa





Paved – Provincial + SANRAL - 2013

ROADS AGENCYA



Туре	Year	V-Good	Good	Fair	Poor	V-Poor
Length	2013	6,072	21,265	21,515	14,660	4,275
%	2013	8.96%	31.37%	31.74%	21.63%	6.31%

What Is The Price We Pay For Poor Roads <u>– Road User</u>



Please Note: Costs exclude fuel, travel time, cargo damage, etc components

Table 3: Summary of potential increases due to worsening road conditions

Road condition	Average maintenance and repair costs (R/km)	Average percentage increase in the truck maintenance and repair costs	Average percentage increase in company logistics costs	
Good	R0,96	-	-	
Fair	R1,24	30,24%	2,49%	
Bad	R2,11	120,94%	9,97%	







Noooooo....

Potholes are the symptom not the cause... If we strive to become best pothole repairers in the world .. Then we have lost the plot ...

What Is The Solution – Preventative Maintenance !



SANRAL Routine Maintenance Cost

Crack Sealing, Cleaning Drainage Structures, Cutting of Grass
R 6.50 / m² / year SANRAL Reseal Cost
R70 – R130 / m² / 10 year
SANRAL Pothole Repair Cost
R 700 – R1500 / m²
SANRAL In-situ Recycle
R 250 – R500 / m²

Asset Management System Building Blocks/Puzzle Pieces of AMS



- Policy/Procedures Principles/Rules to Guide Decisions and achieve rational outcomes – what, where, when, how.
- Funding Financial resources for operation and results implementation.
- **People** People make decisions, the rest are just to support the process.
- Hardware Road Survey Equipment + IT Infrastructure.
- **Software** Computer based data Analysis and Storage Tools.
- **Data** Knowing what you have, its condition and performance Trend.

AMS Hardware/Condition Data: SANRAL

Various condition parameters collected using SANRAL Road

Survey Vehicles:

- Roughness how bumpy is the road speed, wear, etc
- Rut Depth water pond on surface safety
- Macro Texture assist vehicle tyres to drain water safety, noise
- Cracking how much water will get in deterioration
- Deflection remaining structural life of pavement
- Alignment (DGPS) Speed, Fuel Consumption, etc
- ROW Video Road Signs, Section Measurements, etc
- Surveys at between 75 to 100 km/h







SANRAL AMS Data - Bridges

Visual Assessments (DER)

- Bridge condition is assessed through a standardized procedure to determine the Degree, Extent and Relevance
- Bridge repairs are prioritised according to severity and Relevancy of defects
- 3 to 5 year cycle
- 8000 Bridges & Major Culverts









AMS Data - Traffic

Traffic Event Logger (TEL)

- Inductive Loop Based Technology (1000)
 - >+ Piezo (200)
 - >+ WIM (45)
- Cluster Monitoring
- 1 to 3 year for Secondary Stations











Data Collection Methods Title Deeds

Manual Surveys Spatial Data



- 8 X



AMS Software - Data Management









Roughness **Rut Depth Macro Texture** Cracking **Ravelling** Video



DGPS

Centralised Database



Bridge



Surface Friction

Structural Strength



Challenges

- Aim to get all provinces to use the Asset Management System to enable:
 - Harmonised procedures throughout South Africa
 - Improved network statistics: length, condition of roads
 - Improved asset custodianship
 - Optimised budget allocation with focus on preventative maintenance
 - Better monitoring of the impact of maintenance strategies
 - Ensure transparency
- Through the grant allocation framework, National Treasury has linked the allocation of funds to the provision of asset condition data
- There is some resistance to this:
 - Fear of being held accountable
 - Averse to having 'big brother' link allocation of funds to performance



Note:

The implication of allowing planned Expansions to proceed as Toll Roads or increasing allocation to SANRAL by additional R11.89bn per year over 10 years), will have far reaching positive impact for the national road network and the road users. If Expansions can be funded through toll or increased non toll allocation to SANRAL, the length of non-toll network to be maintained using <u>existing</u> non-toll budget, will immediately decrease by 2,000km, resulting in more budget being available to address maintenance and strengthening requirements.



Note:

The implication of No New Toll Roads and no additional budget (R11.89bn per year additional over 10 years) from national treasury will be far reaching for the national road network and the road users. If the decision is made that all the required Expansion requirements must be constructed over 10 year period, using the existing non-toll budget, since this approach will generate the best economic returns. The impact of this approach will however be disastrous on the condition of the rest of the non toll road network, since remaining budget available can only cover routine maintenance needs.



Freeway Management Systems









Open Road Tolling (ORT) – Central Operations Centre



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

Beautiful!!



Switched on: 3 December 2013



Electronic tag









Operational principles for ORT

- One tag standard
- One account may include any number of vehicles
- One tag irrespective of who owner is of road Central clearing

BUT

There is resistance to paying for use of road: not unique to South Africa

Challenges to persuade citizens to regard roads as any other asset

Thank you!

SANRAL will continue to make prudent decisions and operate backed by appropriate technology

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