

Road Asset Management through Pothole Repairs and Rehabilitation within Municipalities

by

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BACKGROUND

- The biggest asset owned by the government is roads and these are used by everyone, from ordinary people, government, business, etc.;
- Deterioration of the road networks and Backlog of pothole repairs and minor rehabilitations is astonishing in this day and age within all Municipalities, Metros and Provincial Departments;
- What are the causes of this backlogs?
- What are the cost effective solutions available;
- Who should do what within our Municipalities to address the situation?

BACKGROUND

- As per SANRAL Routine Maintenance Cost estimates:
 - Crack Sealing, Cleaning Drainage Structures, Cutting of Grass - R 4.50 m² / per km / year
 - SANRAL Reseal Cost - R70 – R130 m² /10 year
 - SANRAL Pothole Repair Cost -R 700 – R1500 / m²
 - SANRAL In-situ Recycle -R 250 – R500 / m
- Delays in preventative maintenance causes potholes;
- Potholes are mainly caused by the delayed response to timely fixing common pavement distresses;
- Further deterioration which costs 18 times more than the initial cost of repair is incurred for a full rehabilitation if nothing is done over time;
- We have regulations in the country that we do not use for the benefit of the country, why?

● GRAP Compliance of Roads as Key Assets of the State

Municipalities and Provincial Departments need to do the following to comply with General Reporting Accounting Procedures:

- Have an asset management policy & procedures;
- Asset register of Road Infrastructure as a key Assets of the State;
- Physical verification of all roads as key Assets;
- All Assets must be linked to a Geographic Information System (GIS)
- Asset accounting which includes additions, road condition reports, maintenance scheduling and planning, benchmarks on budgeting;
- Application of Road asset valuation methodologies;
- Reporting with supporting documentation of maintenance and new road infrastructure for audit purposes.
- The use of cost effective materials and longer lasting alternative technologies approved by Agre'ment SA or SABS is key to savings in maintenance budgets over time.

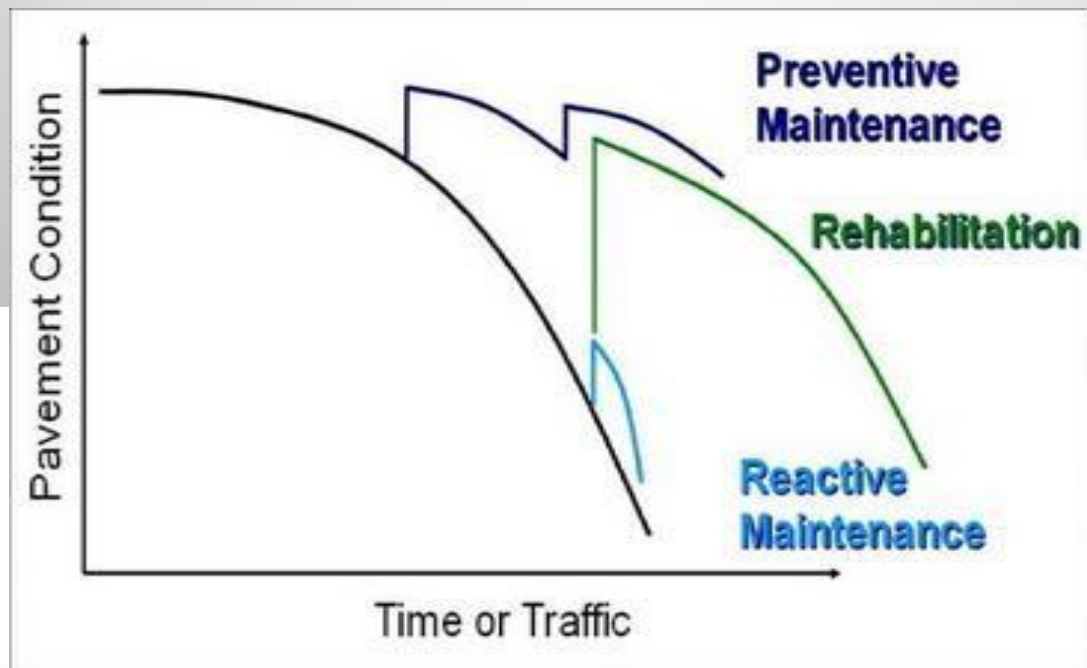
● GRAP Compliance of Roads as Key Assets of the State

Municipalities and Provincial Departments need to do the following to comply with General Reporting Accounting Procedures:

- Determine the remaining useful life, residual value and the physical and service condition of every road asset per their number – use of condition assessment technology critical;
- Bench marking on initial construction cost price, rehabilitation;
- Review Road assets fair value by applying a suitable valuation method like market value, adjusted market, replacement cost consistently to a group of road assets according to their categories;
- Annually review policies to ensure you are up to date with developments;
- Training of staff is a continuous process for all staff.
- Standardize the procurement of services such as pothole repairs and minor rehabilitations as the losses here are too huge due to non-uniformity of specification, reporting and quality to ensure asset preservation

Effects of Timeous Maintenance

- Timeous preventative maintenance interventions on road asset will ensure the life of the road asset is preserved and extended.
- Roads deteriorate over time due to: Traffic loading and environment, no preventative maintenance, crack sealing, cleaning of drainage structures and cutting of grass.



● Uniformity in Specifications on Potholes and Minor Rehabilitations

Municipalities and Provincial Departments need to do the following to comply with General Reporting Accounting Procedures:

- Using the GCC contract, there must be uniformity in tendering data;
- For standardization a Transversal Contract should be investigated;
- Consultations with Treasury, the Auditor General and other relevant bodies such as SAICE, IMESA, SABTACO, SARF, etc.
- This will affect provincial departments and municipalities to be coherent in reporting in their books;
- Empowerment legislations should always be part of the assessment of tenders to ensure transfer of skills, socio economic development, sustainability, etc.

Measurement of Work Done in line with Specification and Reporting

Municipalities and Provincial Departments need to do the following to comply with General Reporting Accounting Procedures:

- In line with all the AG requirements, reporting and processing of certificates should be followed;
- Additional requirements should be evidence based instead of signing without supporting evidence;
- This will not delay any process but bolster the officials in processing payments;
- The work of the AG will also be made easier due to evidence.
- Examples are as per the next slides;
- It must be legislated that within three days of a pothole being reported, that pothole must be fixed;
- This will also create empowerment opportunities while extending the life of the road asset.

Daily Report

PROJECT 1 - N2 KWA-ZULU NATAL NORTH COAST - ROAD REPAIR REPORT

Date: 2021/03/16

UserName	Repair No	Van Number	Date Added	GPS	Category	Road Name	M2	Repair Image
Bheki	89a03305-683a-41ad-9312-487ed156759c	Prophat Vehicle 2	2021/03/16	-29.27062487 31.40039243	C1	N2, North Coast, KZN	14,3	
Bheki	7ca91528-ee59-4786-988f-3804d25a1690	Prophat Vehicle 2	2021/03/16	-29.27068418 31.40037035	C1	N2, North Coast, KZN	14,3	
Bheki	e5b1289a-5d88-4945-8052-d9ebb06689a0	Prophat Vehicle 2	2021/03/16	-29.27125929 31.40007127	C1	N2, North Coast, KZN	17,6	
Bheki	bb122067-c8c3-4790-9704-6832304123e5	Prophat Vehicle 2	2021/03/16	-29.27080175 31.40033048	C1	N2, North Coast, KZN	14	
Bheki	7921473b-755f-4753-a0ac-3b80229a49f	Prophat Vehicle 2	2021/03/16	-29.27088768 31.40029329	C1	N2, North Coast, KZN	14	
Bheki	17a25994-b425-4bc8-a72f-Mc5229505a5	Prophat Vehicle 2	2021/03/16	-29.27125396 31.40011368	C1	N2, North Coast, KZN	11,9	
Bheki	115943ec-4754-4d81-8860-37885c961f3a	Prophat Vehicle 2	2021/03/16	-29.27087787 31.40030649	C1	N2, North Coast, KZN	4,5	
Bheki	4886c3cb-5a02-4a08-a8f4-e08ed59c0229	Prophat Vehicle 2	2021/03/16	-29.27072163 31.40039834	C1	N2, North Coast, KZN	3,9	
Bheki	35c70b3a-ec81-4cda-a5e9-877a68b9e403	Prophat Vehicle 2	2021/03/16	-29.27071296 31.40036578	C1	N2, North Coast, KZN	8,2	

TOTAL SQM REPAIRS FOR 16-03-2021 102,7

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	102,7	0	0	102,7
TOTAL	102,7	0	0	102,7

Weekly Report

PROJECT 1 - N2 KZN NORTH COAST - WEEKLY SUMMARY

Date: 2021/03/15 to 2021/03/21

TOTAL SQM REPAIRS FOR 15-03-2021 88

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	88	0	0	88
TOTAL	88	0	0	88

TOTAL SQM REPAIRS FOR 16-03-2021 102

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	102	0	0	102
TOTAL	102	0	0	102

TOTAL SQM REPAIRS FOR 17-03-2021 0

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	0	0	0	0
TOTAL	0	0	0	0

TOTAL SQM REPAIRS FOR 18-03-2021 0

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	0	0	0	0
TOTAL	0	0	0	0

TOTAL SQM REPAIRS FOR 19-03-2021 0

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	0	0	0	0
TOTAL	0	0	0	0

TOTAL SQM REPAIRS FOR 20-03-2021 - SATURDAY 0

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	0	0	0	0
TOTAL	0	0	0	0

TOTAL SQM REPAIRS FOR 21-03-2021 - SUNDAY 0

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	0	0	0	0
TOTAL	0	0	0	0

TOTAL SQM REPAIRS FOR 15-03-2021 to 21-03-2021 190

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
PV SV Bheki	190	0	0	190
TOTAL	190	0	0	190

Overall Summary Report

TOTAL SQM REPAIRS TO DATE 190,00

TOTAL PER VEHICLE				
Vehicle	Category 1	Category 2	Category 3	Total SQM
Vehicle 1	190	0	0	190
TOTAL CAT	190	0	0	190
P.O. Allowed	190	0	0	190
TOTAL LEFT	0	0	0	0

● Quality Management and Warranty of Pothole Repairs and Minor Rehabilitation Works

Municipalities and Provincial Departments need to do the following to comply with General Reporting Accounting Procedures:

- There must be some form of Quality Management;
- The guarantee period as the report will indicate should be kept for 12 months;
- These allows for the officials to follow up if any work needs to be redone within the warranty period;
- This process of keeping evidence will save government costs of work that can be redone by the contractors who have been contracted;
- Engineers and Technicians to ensure quality adherence and work that needs to be redone at the cost of the contractor due to failures;
- Quality workmanship will be adhered to as contractors will know they will be followed if anything goes wrong within the warranty period.

The Revolutionary PRO-PHALT Infrared

Pothole/Minor Rehab Road Repair System



- PRO-PHALT has brought the next generation system to South Africa which embraces innovative world first (NIT) technology”;
- A typical one or two square metres PRO-PHALT pothole/minor rehab repair can be completed in approximately 15 – 20 minutes;
- The system has been designed to minimise the risk and impact to operators, surrounding environment and the general public;
- The system benefits from an IT tracking device that monitors how many m² repairs are done at any point or time. This system also has many IT functions including various data reporting to track the efficiency of the operator. Road Authorities/ Departments can now track the pothole repairs on a daily/monthly basis.
- Tangible results that can be monitored.

PRO-PHALT (SOUTH AFRICA)

GOVERNMENT AND ROAD AGENCIES CANNOT IGNORE THAT THE BIGGEST ASSET THEY HAVE IS ROADS WHICH PLAY A KEY ROLE IN DEVELOPMENT AND ECONOMIC ACTIVITIES. PRO-PHALT INFRARED ROAD REPAIR SYSTEMS PRESERVE AND REHABILITATE THE ROADS THROUGH A PERMANENT REPAIR OFFER.

A COMPLETE SOLUTION TO THE BIGGEST ROAD DEFECT.....'POTHOLE'S' AND MINOR REHABILITATIONS

Pothole and Minor Rehabilitation Challenges

- Road defects like potholes, pavement failures, etc. are a 'hot button' issue for the public.
- There are more than 15 million potholes on South Africa's roads.

The spin-off affect of poor roads is becoming insurmountable:

- Public safety a real and major concern;
- Incidents are increasing some fatal due to neglect of road maintenance;
- Continuous destruction / deterioration of transport routes;
- Major damage to all transport vehicles - the end consumer always pays;
- Impacts on negatively on tourism, a major contributor to job creation;
- Resulting devaluation of the road assets and to surrounding properties;
- Major civil claims - actual abuse / misuse of actual Road Fund;
- Inaccessibility to outlying and rural regions which hinders economic growth;
- Unnecessary time delays which cost all industries fortunes;
- Public perception of use of tax payers' money is poor and mistrusting.

Typical Failures

- Wearing course repair
- Suitable for all asphalt surfaces
- Typical failures would be:
 - Potholes
 - Pavement Failure
 - Around metal work
 - Utility trenches
 - Pathways
 - Single and Double seal
 - Crocodile cracks, etc.



South African authorities are currently paying substantial claims in compensation due to incidents on the roads

The Revolutionary PRO-PHALT Infrared Pothole/Minor Rehab Road Repair System



The patented Pro-Phalt Road Repair Maintenance Solution is the next generation of road repair that the department of roads and transport require to overcome their challenges of repairing over 15 million potholes reported on South Africa's roads – as per 2015 statistics it is definitely worse now.

Surfacing defects are repaired by recycling the existing road surface using the latest standard infrared technology to create a seamless and longer-lasting repair.



Preparation of the surface

Step 1

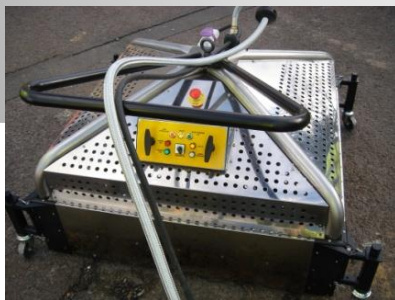
- Sweep and remove all loose debris from pothole
- Lower the Infrared Road repair system from the vehicle ready for operation.



Heating

Step 2

- Portable infra-red heater is positioned over the defect area
- The system heats the surface area by a controlled temperature of approx. 200 °C within 8 to 10 min cycle period
- Pulsed heat delivers consistent heat temperatures to repair area in 1 minute cycles
- Maximum penetration without damaging surface
- Heat penetrates to depths of 100mm
- Returns asphalt seal to semi fluid state to work with



“Pro-Phalt’s” unique NIT (heat medium) can operate at 650°C and can be physically touched 10 sec from switch off ”

Scarifying

Step 3

- Existing surface is then re-worked
- Stone is freed from mechanical bond
- The heat generated from the Infrared heater creates a thermal bond between new material and the existing surface , reducing potential weak points
- Existing material scarified in preparation



“No waste, no landfill everything RECYCLED on site”

Adding material

Step 4

- Add Specially formulated ISO9000 warm asphalt mix with advanced rejuvenator properties.
- Homogenously mix with recycled repair area material
- New material used is significantly reduced due to the existing material being recycled.



“Pro-Phalt’s unique on board hot box’s delivers
a single vehicle solution”

Rejuvenation & Compaction

Step 5

- Measured volumes maintain levels to ensure consistent repair
- Spread equally to deliver an even coverage
- Equipment specified in line with repair area requirements
- Edges rolled first to recreate mechanic interlock with surrounding surface
- Skilled operator to judge levels needed to complete the repair and create a seamless joint.



SA Agrément Certification

Pro-Phalt Infrared Pothole Road repair system has all relevant Agrément Board Certificates in place in the UK and in South Africa.

Agrément Certification includes:

- factors relating to compliance set by the SA Agrément Board
- factors relating to compliance with regulations where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal five yearly review

Agre'ment Certification is the equivalent of an SABS Certificate for alternative solutions

Benefits to the Environment

- **No** jack hammering or saw cutting
- **No** dust
- **No** excavation or waste
- **No** excessive noise especially in residential areas
- **No** multiple vehicles
- **No** landfill, recycled in situ
- **No** edges, seamless joint with existing material
- **Cost savings of up to 40% - as per average prices announced by the Minister of Transport in May 2021**
- **Faster repair time**
- **Less traffic disruption**
- **Reduces your carbon footprint**

Permanent pothole repair with equivalent life to adjacent surface

“...better for roads, better for planet...”



PRO-PHALT'S - Carbon Footprint For A Sustainable Technology

A Mature Tree absorbs 4.75Kgs of CO₂ Per Annum

Traditional Methods produce
51.62Kgs of CO₂ /Square Metre Repaired

Pro-Phalt Infrared repair produce
4.28Kgs CO₂ /Metre Square Repaired



Socio-economic Benefits

- **Major Sustainable job creation**
- **Typical project requires 3 busses which employ on average 20 locals**
- **Advanced skills development through proper, certified training academy**
- **Addressing key government policy and objectives in infrastructure**
- **Integrate Private and Public sector initiatives and partnerships**
- **Creating teams that contribute to long term economic development**
- **Optimising human and innovative resources**
- **Reduction in the supply of machinery and equipment for road and pothole maintenance**
- **Supply of latest specially formulated materials and technology available**
- **World class back up service and training**
- **Significant reduction of carbon footprint**
- **Pro-Phalt IRRS has proven international certifications and Green awards**

Health & Safety in line with COVID 19

Pro-Phalt is committed totally to the effective management of all health, safety, environmental and quality standards, and has established and implemented dedicated systems to this effect.

A systematic approach to health and safety management which identifies priorities and sets objectives.

Effective procedures and facilities for the reporting and treatment of injuries which occur at work

Adequate instruction, information, training and supervision

Safe systems of work

Control of all situations likely to cause damage to property and equipment

A safe working environment by the operation and maintenance of all plant, equipment and facilities.

Effective fire prevention and fire control procedure

Why Pro-Phalt Summary

- **IRRS System** - There is no other Infra Red pothole road repair system that compete on all levels for the Government Roads Department
- **Environmental** - 90% savings in carbon footprint over traditional methods
- **Cost Effective** - Permanent repair solution – we can extend our warranty up to two years
- **Repair Life** - Permanent repair with equivalent life to adjacent surface, HRA and surface dressing. Pothole repair complete in 15-20 minutes.
- **Health & Safety** - Gastec certification, no vibration white finger, no manual handling
- **Single vehicle solution** - Fast and effective with little congestion
- **Pro-Phalt** - Has as brought a solution which drives cost, quality and productivity, and meets job creation and socio development government objectives
- **Vehicle supply** - The complete Pro-phalt solution is housed in an Iveco van or trailer type depending of what the Government requires.



Why Pro-Phalt Summary

- **Pro-Phalt is a black empowerment company**
- **New technology to address critical national needs in civil infrastructure**
- **Pro-Phalt IRRS system will restore safety and drivability to roadways**
- **Less vehicle damages, accidents and traffic congestion**
- **Cooperation with Local Authorities and other Private Businesses**
- **Radically different approach put in place**
- **Prophalt specialised personnel to assist existing Road Maintenance teams to carry out the pothole repairs using this new technology.**
- **Management Structure in place to support the Government Road Departments**
- **Procurement of supply of the Pro-Phalt system with specially formulated IS9000 asphalt material mix**
- **Creation of socio-economic development opportunities**
- **Full skill training**

**“ WORKING WITH GOVERNMENT ROAD
DEPARTMENTS, PRO-PHALT IS A MODEL THAT WILL
ADDRESS THE NEEDS OF OUR ROAD ASSET
MAINTENANCE, OUR PEOPLE, OUR ECONOMY AND
OUR FUTURE “**