

ADVANCING THE PUBLIC INTEREST: Why you need to maintain surfaced roads

Accelerated and Shared Growth Initiative for South Africa [ASGISA], places maintenance high on the development agenda as a key to sustainable development and economic growth.

The vision is that infrastructure is adequately maintained and operated, resulting in sustained service delivery, growth and employment creation. This will be achieved by improved infrastructure asset management planning, budgeting and implementation.

“Delivery” needs to be understood as embracing not just the construction of infrastructure but the operation and maintenance of that infrastructure throughout its intended life.

The importance of preventative maintenance of infrastructure cannot be over-emphasised, as failure in this regard can result in municipalities incurring significant expenditure in future to replace assets not well maintained”. Report on the analysis of municipal budgets for the 2003/2004 financial year SALGA 2003:5-6

Maintenance needs to be done year after year to ensure that the designed life of the infrastructure is realised. This can sometimes best be done, by labour intensive methods, thus there is substantial scope for maintenance contracts to promote sustainable SMME development.



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1. INTRODUCTION

The main purpose of this publication is to make you more aware of the need and importance of maintaining a surfaced road. The document is targeted at non-technical people, particularly those who are associated with road provision, who have an interest in social and economic development.

2. BACKGROUND TO SABITA

This document has been compiled by the Southern African Bitumen Association in the public interest. Sabita represents the various companies involved in the supply of materials, construction, maintenance and design of bituminous surfaced roads.

Sabita's main goals are to promote the efficient use of bituminous materials through:

- Undertaking research and development to improve our technology
- Education and training of our practitioners
- Creating awareness about worker health and safety during application and the implications thereof on the environment
- Engaging with government

The outcomes of the above activities are published in manuals as best practice guidelines for use by practitioners.

3. WHAT IS THE PURPOSE OF A ROAD?

To provide an all weather surfacing which is safe for vehicles to transport people and goods. Roads are therefore the arteries of the nation. They also provide people with access to amenities such as schools, hospitals, places of work, shops etc. In the urban areas the road also carries storm water and underground services such as electricity, water, sewerage and telephone cables. Roads are also used for recreation by children.



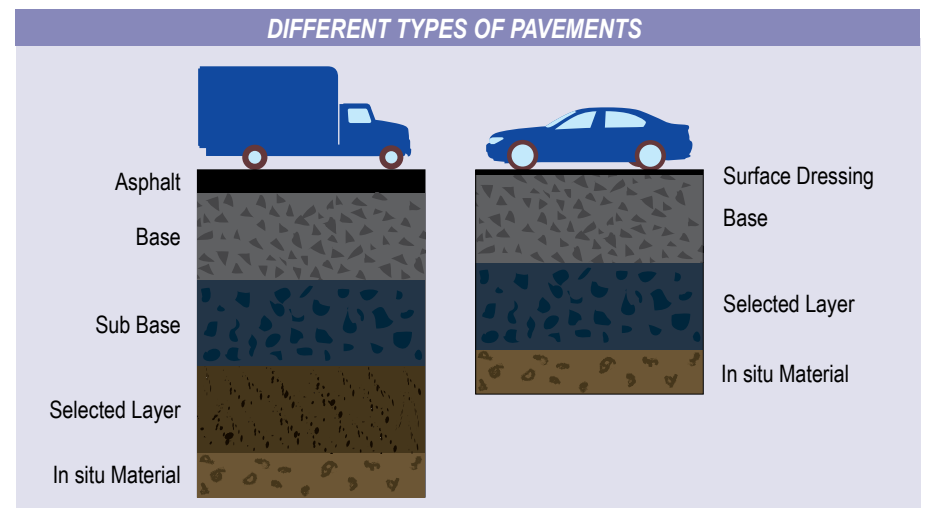
4. WHAT ARE THE DIFFERENT TYPES OF ROADS?

Our public road network consists of 160,000 km of urban and rural surfaced roads of which 95% are surfaced with bitumen. These roads can be characterised according to the purpose they serve, namely:

TYPE OF ROAD	PURPOSE	TYPE OF TRAFFIC
National roads	link cities together	
Provincial roads	link towns and farmers	
Arterial roads	link communities	
Collector roads	link suburbs	
Residential roads	provide access to houses	

5. WHAT MATERIALS ARE USED TO CONSTRUCT A ROAD?

The pavement under the riding surface is made up of layers of compacted stone aggregates and gravel. The number of layers and their thicknesses will depend on the amount and type of traffic using the road. Pavement layers are normally designed to last for 20 years before further strengthening is required.



The surfacing is constructed from a mixture of bitumen and crushed stone aggregate. The bitumen acts as a glue to stick the stones together and to waterproof the underlying layers. The life of a surfacing will vary between 8 and 15 years depending mainly on the type of surfacing used and the traffic conditions. Bitumen is produced locally during the refining of petrol and diesel from crude oil. Bitumen is often mistakenly referred to as tar, which is no longer used in the construction of roads.



Aggregate



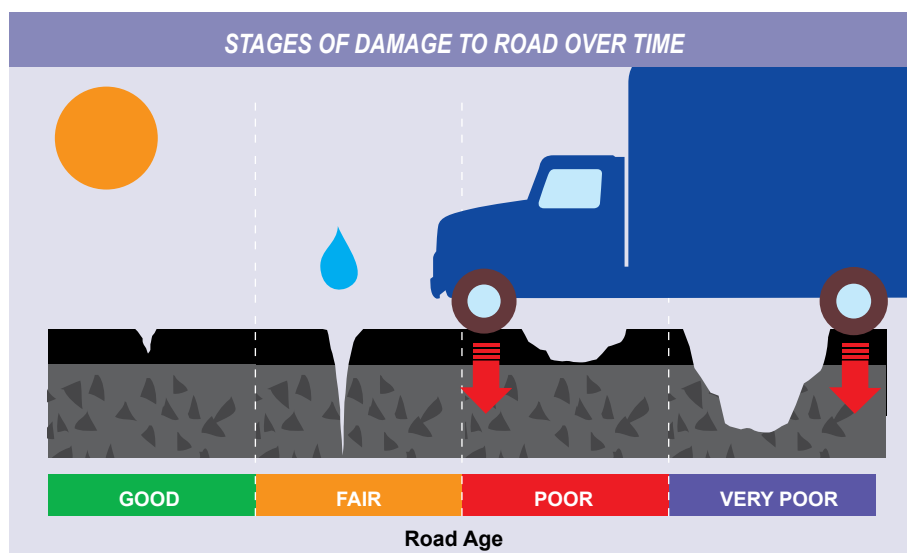
Bitumen

6. WHAT CAUSES A ROAD TO DETERIORATE

A road will deteriorate with time due to the following main factors:

1. The aging of the bitumen, which causes the riding surface to crack.
2. The ingress of water into the underlying layers, causing them to weaken.
3. Overloaded trucks, which accelerate damage to the underlying layers.
4. Lack of timeous maintenance

If the surface cracks are not sealed by filling them or resurfacing the road, potholes will form, causing the lower layers to deteriorate more rapidly with the further ingress of water.



7. WHY MUST A ROAD BE MAINTAINED?

Lack of maintenance will accelerate the deterioration of the road. A good analogy is that of a house – once it has been built it requires ongoing maintenance in the form of painting and waterproofing. This is done mainly to retain its functionality and to preserve its asset value. In the same context the roads of our cities and country are one of our biggest assets and therefore require ongoing maintenance.

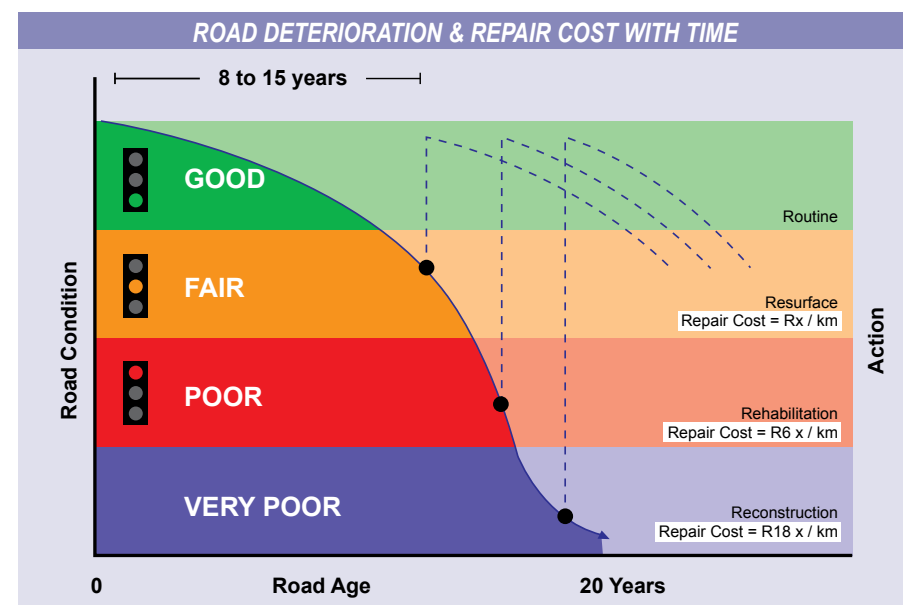
8. WHAT TYPE OF ACTIVITIES ARE NEEDED TO MAINTAIN A SURFACED ROAD?

Different maintenance actions will be required during the life of a road depending on the condition and age of the road.

		TYPE OF MAINTENANCE	ACTION
Road Condition	GOOD	Routine	Seal surface cracks Repair surface failures Clean / repair drainage
	FAIR	Periodic	Resurface: • slurry seal • chip & spray • asphalt
	POOR	Reactive	Rehabilitation: • fill potholes • patching • in situ recycling

9. WHAT IS THE BEST WAY TO ENSURE THAT OUR ROADS ARE WELL MAINTAINED?

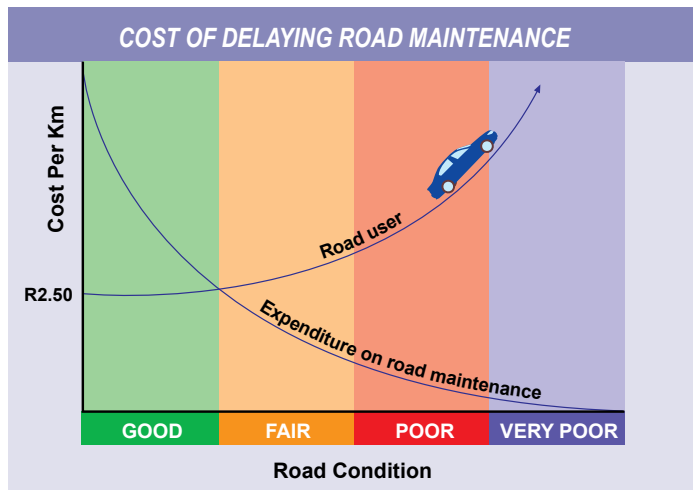
To ensure that we have a well maintained road network, which is in the national interest, we need to regularly monitor the condition of all the roads and make funds available to carry out the required maintenance timeously. This can save tax payers' money by not having to reconstruct roads which could have been saved through proactive maintenance.



Therefore, deferring expenditure on road maintenance – which retards social and economic development - is a false economy as it will cost exponentially more in the longer term. This can clearly be seen in the above graph where the cost of rehabilitation is 6 times and that to reconstruct is 18 times more expensive compared to periodic maintenance.

10. HOW DOES A POORLY MAINTAINED ROAD AFFECT US?

Roads that are not well maintained will result in more vehicle accidents and higher vehicle operating costs. This will result in higher transport costs which will add to the costs of goods and will ultimately be passed on to you - the consumer. The effect of a deteriorating road on the cost of operating a vehicle is shown in the graph below.







As can be seen the vehicle operating costs increase exponentially as the condition of the road deteriorates.

11. WHO IS RESPONSIBLE FOR MAINTAINING THE ROAD NETWORK?

Officials employed by the local, provincial and national road authorities are responsible for identifying the maintenance needs of the road network. Councillors are responsible for approving the officials' requests for sufficient funds to maintain the urban roads under their jurisdiction, using funds which are sourced from the rate payers. At provincial and national level funds sourced from taxes are made available from the treasury for maintaining roads. Consulting engineers are appointed to assist with investigation and design the type of maintenance treatment required. Contractors are appointed through a standardised supply chain management system to carry out the selected remedial works in accordance with the designs.

For these activities to work effectively on an ongoing basis, a well managed road maintenance system, known as a Pavement Management System, must be in place to help identify which roads require maintenance.

The new Government Immovable Asset Management Bill (GIAMA) will be binding on state authorities and guide municipalities to improve management of their road network. It will become obligatory for public sector institutions to draw up sound multi-year infrastructure asset management plans.

ACTIVITY	TOOL		RESPONSIBILITY
Identify Maintenance Needs	Pavement Management System		Officials/ Consulting Engineers
Approve Funds	Budget		Councillors
Investigate & Design	Tender Document		Consulting Engineers/ Officials
Conduct Maintenance	Contract		Contractor/ Officials

12. HOW DOES A WELL MAINTAINED ROAD NETWORK BENEFIT US?

A well maintained road network has the following benefits to the community and the country as a whole:

- Preserves one of the largest national assets;
- Provides all-weather access to social services and places of work;
- Minimises the cost of transportation and thus goods and services;
- Makes the roads safer and thus reduces accidents;
- Underpins quality of life and economic development;
- Allows us to build and sustain capacity in the Industry through the development and training of people to conduct road maintenance.
- Creates jobs and sustainable enterprise development

In order to realise the above benefits we need to assist road authorities to implement a Pavement Management System and provide capacity (human and financial) to maintain our roads timeously.