

THE **SUSTAINABLE** (ROAD)WAY

Sabita's vision to carbon neutrality, mitigation and adaptation to climate change and the circular economy

Presentation by Mahendren Manicum
to the Road Pavements Forum

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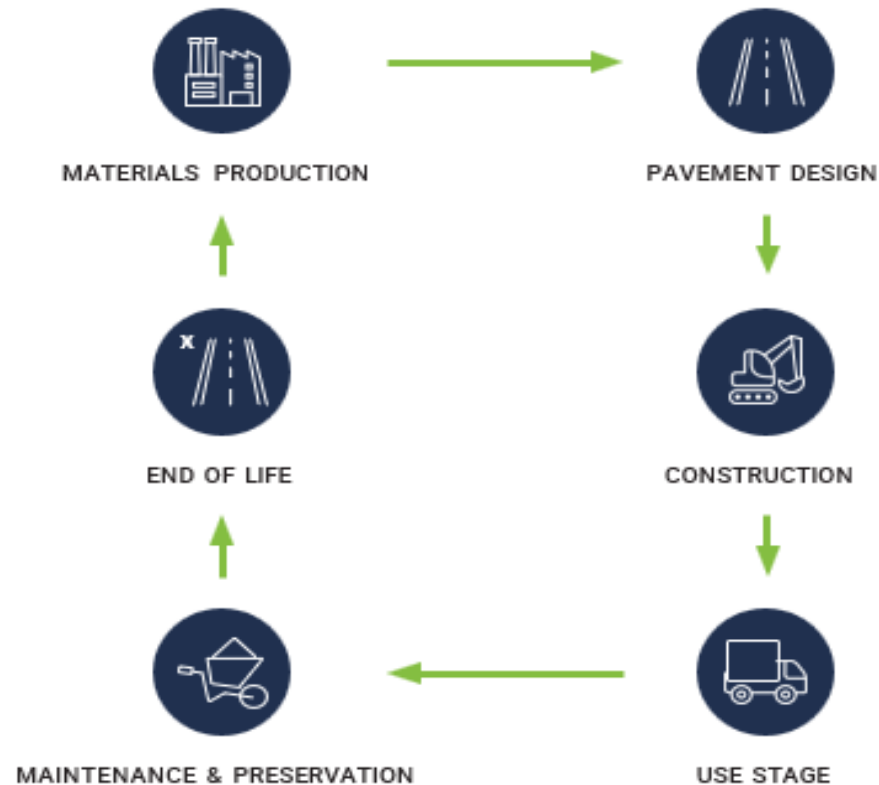


Sustainable development requires properly functioning road infrastructure to promote economic growth and to serve societal needs while preserving natural resources, minimizing its ecological footprint, and mitigating climate change impacts.

- As global warming continues to bring about climate change, the reduction in Green House Gasses (GHG's) is presented as the biggest challenge for all concerned.
- Under the Paris Agreement adopted at the UN Climate Change Conference (COP21) in Paris, South Africa has revised its target Nationally Determined Contribution (NDC) committing South Africa to reducing its GHG emissions to 350-420 MtCO₂e by 2030 and to reaching the goal of net zero emissions by 2050. South Africa's Green Transport Strategy (GTS) provides a supporting vision of a low carbon South African transport sector reducing its GHG emissions by 5% by 2050, while maximising the role of transport in promoting economic growth and social development.
- The bituminous products sector in the roads industry has continuously undertaken initiatives to develop and promote practices which could decrease energy and natural resource consumption, leading to reduced GHG emissions during a road's lifespan.



- Sabita has adopted an inclusive view of sustainability that is not only limited to environmental preservation during road construction and maintenance operations but also broadens to the social, technical, and economic dimensions - the Sustainable (Road)Way.
- Since inception, Sabita has focused on supporting research and development activities to deploy best global practice in a road's overall lifespan which include planning, design, construction, maintenance, and rehabilitation of roads supported by effective asset management practices.
- Sabita is known for its support to the roads industry – as such, sustainability features strongly in its deliverables as detailed in the pavement life cycle diagram below:





MATERIALS PRODUCTION

Objective: Sabita's members to be carbon neutral in the manufacture of road construction materials by 2050.

- Sabita's bituminous product manuals not only deal with performance characteristics but also environmental considerations, be it reduced energy / emissions, its appropriate application and ultimate reuse.
- A GHG calculator for manufacturing plants was developed to assist manufacturing plants in understanding their carbon footprint.
- With the intent of reducing the disposal of used tyres and recyclable plastics to landfill, Sabita has published a technical guide on the utilisation of crumbed rubber and modified binders in the manufacture of asphalt.

Planned action:

- Promote the development and use of PG bitumen specifications thereby contributing to sustainability by enhancing pavement design, construction, and maintenance.
- Encourage the use of environmentally beneficial energy sources for all operations.
- Promote the use of asphalt mixes which hold environmental benefits such as but not limited to Cold Laid Asphalt, Warm Mix Asphalts (WMA), Bitumen Rubber Asphalts (BRA) and High Modulus Asphalts (HiMA).
- To assist in assessing South Africa's unique priorities in the development of road infrastructure, a sustainability tool is in the making with trials being conducted on selected projects.
- To actively promote carbon neutral projects in design and construction.





PAVEMENT DESIGN

Objective: Bituminous products enable designs that mitigate climate change phenomena and assist in adaption to the new norm.

- The Performance Grading (PG) specification for binders consider performance and environmental factors. Functional requirements, be it stormwater management, durability or ease of maintenance can respectively be met with, open graded, cold laid asphalt or HiMA.
- The assessment of climate vulnerabilities of infrastructure and enhanced adaptive capacity of the road sector for addressing the potential for adverse consequences of climate related hazards.

Planned action:

- Refine PG grading based on historical data for South Africa to projected data given the change in weather patterns and the need to source imported material.
- Promote the use of HiMA for heavy and heavily trafficked routes given its durability properties.
- Encourage the use of sustainable materials in asphalt mixtures using Life Cycle Assessments (LCA) and Life Cycle Cost Assessments (LCCA) based tools coupled with Balanced Mix Design (BMD) and performance metrics.
- The promotion of adaptation techniques in the design of resilient pavements.





CONSTRUCTION

Objective: Minimise HSE incidents by providing supporting mechanisms to the road construction industry and include aspects of Smart Technology to reduce the carbon footprint in road construction projects.

- Sabita's Bitsafe course, HSE seminars / awards and HSE publications support this aspect. In addition, an extensive work zone safety tool kit is available which includes best practice for traffic accommodation as per SA regulations.
- Sabita Manual 40, Design and Construction of Surface Treatments, deals with the provision of temporary surfacing to accommodate traffic safely on temporary deviations.

Planned action:

- Adapt the work zone safety tool kit to cater for emergency response plans including repair strategies.
- Promote these tools on a regular basis through the Road Pavements Forum (RPF) and Road Maintenance Forum (RMF).
- Promote the use of Smart Technology Tools to help reduce the carbon footprint during road construction.
- Promote the use of a deconstruction plan i.e. recycling, reusing, upcycling and material utilisation charts to ensure a holistic view of the impact in a circular economy.





ROAD USE PHASE

Objective: With this phase being the most carbon intensive due to vehicle emissions - research improvements to the vehicle road interface and areas of extracting economic benefits.

Planned action:

- Refine the PG specifications with updated field data.
- Support research on reducing road noise and alleviating surface runoff whilst optimising tyre / surface friction.
- Actively support the user pay principle as a source for road funding.





MAINTENANCE & PRESERVATION

Objective: provide access to best practice in road maintenance to preserve and extend the life of a road as this would have significant environmental, societal, and cost benefits.

- The Road Maintenance Forum (RMF) initiated by Sabita, which is open to all parties to share best practices on the subject.
- Sabita's bituminous product manuals, details the various product applications.

Planned action:

- Promote the sourcing of Cold Laid Asphalt, with known performance characteristics which has been enabled by Sabita guideline document and an ISO registered authority.
- Use technology development to provide longer-life roads requiring less maintenance. Examples of such technology includes HiMA and Nano Modified Emulsions (NME).
- Encourage municipalities to present their challenges at the RMF.





END OF LIFE

Objective: With bituminous materials being 100% reusable, research greater use in new mixes.

Planned action:

- Promote the increased use of RA and other recycled materials in asphalt mixture.
- Initiate research on high RA mixes and update the appropriate Sabita manuals.

Many of the planned actions for the different phases of the pavement life cycle deal with mitigation measures and adaptation strategies. They assist in reducing the contribution to global warming and adjust infrastructure to cope with the changing climate.

Adaptation measures that include but are not limited to aspects such as enhanced drainage systems, raised road elevations and improved flood resistant design, will be promoted by Sabita.





LOOKING AHEAD

For South Africa to achieve its climate change goals it is imperative that the existing procurement and regulatory framework be amended to promote the assessment of optimal and sustainable solutions in the provision of infrastructure. Sabita aims to promote dialogue on this matter within the road sector and with road administrations. Sabita will also provide training for the various aspects highlighted.

The **Sustainable (Road)Way** aims to challenge Industry to continuously improve on its past performance in this sphere and is guided by a *Sustainability Plan*. An annual survey intends to track the measurement of these initiatives to share progress and identify shortcomings.

Sabita will continue to provide support to its members and the broader industry for the provision of optimal and sustainable solutions in the provision of infrastructure. Collaboration with allied industries on identifying opportunities for improvement on this aspect is important to instil an ethos of sustainability throughout the supply chain.



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