

The road to a more sustainable future needs a rethink

By [John Rammulla](#)

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As we stand on the precipice of a climate catastrophe, our planet is heating up at an unprecedented rate. The need to safeguard a world that can nurture life for both present and future generations has never been more urgent. It necessitates a global, united front in addressing the pressing challenge of climate change.



Africa, home to approximately 1.5 billion people – constituting around 17% of the global population – is responsible for a mere 4% of the world's total greenhouse-gas emissions. Yet, it finds itself enduring the most of climate change's impact.

The continent is already grappling with an increased frequency of climate-related disasters, soaring temperatures, unpredictable rainfall patterns, and rising sea levels. These climatic shifts bring with them a wave of human suffering, economic disruption, and social unrest. The imperative to reduce greenhouse gas (GHG) emissions calls for comprehensive decarbonisation efforts across all sectors, not least the transportation sector.



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The transportation sector is a significant contributor to global CO₂ emissions, accounting for between 10-15% of all global emissions (and 25% of global fuel combustion emissions). This makes it the second highest sector contributor to climate change.

South Africa, along with the rest of Africa, faces a daunting journey towards achieving net zero emissions by 2050, much like most parts of the world. One potential solution that could aid in reaching these goals is the adoption of Intelligent Transport Systems (ITS). These systems have the potential to revolutionise road networks, making them more resilient to climate change and inherently decarbonised.

An advanced application

Think of ITS as an advanced application that provides users with access to innovative services that relates to transport and

traffic management. Fundamentally, ITS is not about ripping and replacing what has already been put in place. Rather, it is gaining the ability to adapt existing networks to either facilitate less movement or to enable more efficient movement of people and goods.

Accomplishing this will require a shift towards public and active transportation modes while moving away from individual and personal road transportation. In South Africa, where people still insist on using their own transportation to get from Point A to Point B, this is definitely a tricky proposition although not an impossible one to achieve.

Roads will always be an integral cog in the transportation chain here and other countries. To move on the path of net zero emissions, entails thinking differently when it comes to how roads are used. This is where the concept of ITS comes in.

ITS has evolved into a sophisticated systems approach, providing numerous opportunities to revolutionise road networks, delivering transformation that influences travel patterns and demand. Furthermore, an ITS can help reduce congestion, facilitate more efficient planning, and pave the way for greener mobility – all key aspects when it comes to moving closer to reaching the global net zero target.

Construction innovation

Adapting to ITS begins by focusing on road infrastructure construction. This encompasses many historically high energy activities including everything from mining borrow material to the manufacturing of cement for road infrastructure structures. South Africa's historic isolation, when combined with the need for an advanced road infrastructure to support the economy, resulted in local engineers developing customised road design and construction technologies that are viewed as innovative globally.

This created an environment where naturally available materials, of which South Africa has an abundance of, have been used to develop road infrastructure. Additionally, recycling existing road materials, and the use of so-called deeply balanced pavement structures, have contributed to the development of an extensive road network at a fraction of what it would cost in most developed countries.

Unfortunately, road funding faces significant competition from other social requirements such as health and welfare. Invariably, this has seen a relative slow uptake of technology innovation by road authorities. Despite this, mass-transit systems, electric vehicles, and asset management systems, when combined with ITS, can alleviate some of the poor road conditions that all road users experience. By alleviating congestion, improving safety, and optimising maintenance needs and planning, a more environmentally friendly road infrastructure can be developed.

Carbon reduction focus

Currently, road transportation activities and operations account for approximately 10% of the greenhouse gas emissions in the country. It makes sense that evolving this sector to leverage ITS more effectively can result in a significant contribution towards South Africa's net zero drive.

It is specifically in road design and construction where emphasis has been placed on the recycling and re-using of materials in addition to adopting non-carbon intensive materials. Furthermore, the concept of multi-purpose road usage will bring significant benefits. This sees roads used as communication corridors, social and recreation facilities, overhead mass-transit systems, underground pipeline and services, and the like.

Partnership approach

Government cannot accomplish this on its own. It is critical for engineering and construction service providers to work closely with municipalities and regional partners to develop strategies for how transport needs can be met. In this way, existing infrastructure can be used smarter as opposed to continually building new roads.

Part of this entails evaluating existing infrastructure and identifying opportunities to upgrade and refurbish. A basic principle is that assets should be optimised from a whole life service perspective, promoting renovation, and be retrofitted. The drive towards net zero emissions is one where decarbonisation becomes a focal point.

With roads continuing to play a vital role for South African society, more attention must be placed on how to harness its positive contributions towards mobility. Roads contribute to the economy and societal development. By adapting existing road networks for a more sustainable future, ITS can unlock significant growth while also contributing towards reducing the carbon footprint of transportation.

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