

ENHANCING ROADS MANAGEMENT AND ADMINISTRATION THROUGH IMPLEMENTATION OF INTERNATIONAL STANDARDS AND SOUTH AFRICAN NATIONAL STANDARDS

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ABSTRACT

The paper reflects on the Department of Transport's awareness campaign covering the scope, applicability and linkage of existing Government policies to standards published by the International Organisation for Standardisation (ISO) and South African National Standards (SANS), specifically the ISO 55001 Asset Management System and SANS 1393 Construction Management System. The paper also reflects on observations and discussions emanating from stakeholder workshops on the significance of accreditation schemes for conformity assessment or certification bodies by the South African Accreditation Scheme (SANAS) and the relevance of person certification auditor schemes, which are crucial to uniformly implement standards in line with "*conformity assessment technical infrastructure frameworks*". It was observed that the linkage of these and other standards as instruments for work-place skills development, addressing inefficiencies in governance and administration of roads to improve financial performance, service delivery and management of suppliers are not necessarily well-known or understood; most surprisingly, by professional service providers, especially companies contracted for asset management services.

Keywords: Governance, Standards, Management System, Accreditation, Certification.

1. INTRODUCTION

The International Organisation for Standardisation ISO (2021), defines governance as a "human-based system by which an organisation is directed, overseen and held accountable for achieving its defined purpose". According to Kjaer (2004), the government is considered the key actor of governance, and according to the Organisation for Economic Co-operation and Development OECD, (2020), good governance encompasses rules, practices, and interactions by shaping public authority and decision-making in the interest of society.

In this regard, the principles of good governance, accountability, and transparency within the public sector are entrenched in the South African Constitution, as this affects the country's fiscal health, economic competitiveness, quality of life, and environmental sustainability (National Treasury, 2021). The latest King Report, calls for the "apply and explain" principle, independence of directors, transparency, increased involvement of stakeholders and disclosure of information, (IoDSA, 2016).

According to McKinley (2016) and Farazmand (2017), government requires to strengthen public sector institutions, prioritise investing in infrastructure development, remove bureaucratic red tape, ensure good governance, invest in education and skills. The Consolidated General Report by the Auditor General of South Africa, AGSA (2022)

emphasises a need, for national or provincial departments, municipalities and state-owned entities (SOEs) to improve planning, service delivery, oversight, monitoring, evaluation, and preparation of quality reports, in order to achieve better audit outcomes. Since 2019, the Auditor General has reported that 484 national or provincial departments, municipalities and public entities achieved unqualified audits with no findings, 716 achieved unqualified audits with findings, 325 achieved qualified audits with findings, 11 achieved adverse audits with findings, and 64 had disclaimed audits with findings.

It is recognised that road administration, planning, implementation of programmes or projects, monitoring activities and operations are far from routine. These are complex activities that require skilled, experienced and competent specialists, who must use stakeholder input, road user needs, road condition and traffic data to develop plans that are responsive to all relevant policies, legal and technical requirements. In addition, there should be appropriate resources and systems, and modern software applications are required to process road data, so that “evidence-based approaches” are effectively used for the management and administration of roads.

However, a survey by the South African Institution of Civil Engineering, SAICE (2022) indicate that high number of professionals have a low appetite for employment in public sector bodies, due to interference in the work of professionals, limited authority to make decisions, limited career development opportunities, inadequate or no decision-support systems, lack of the understanding and support for processes, resources and structures required for efficient administration.

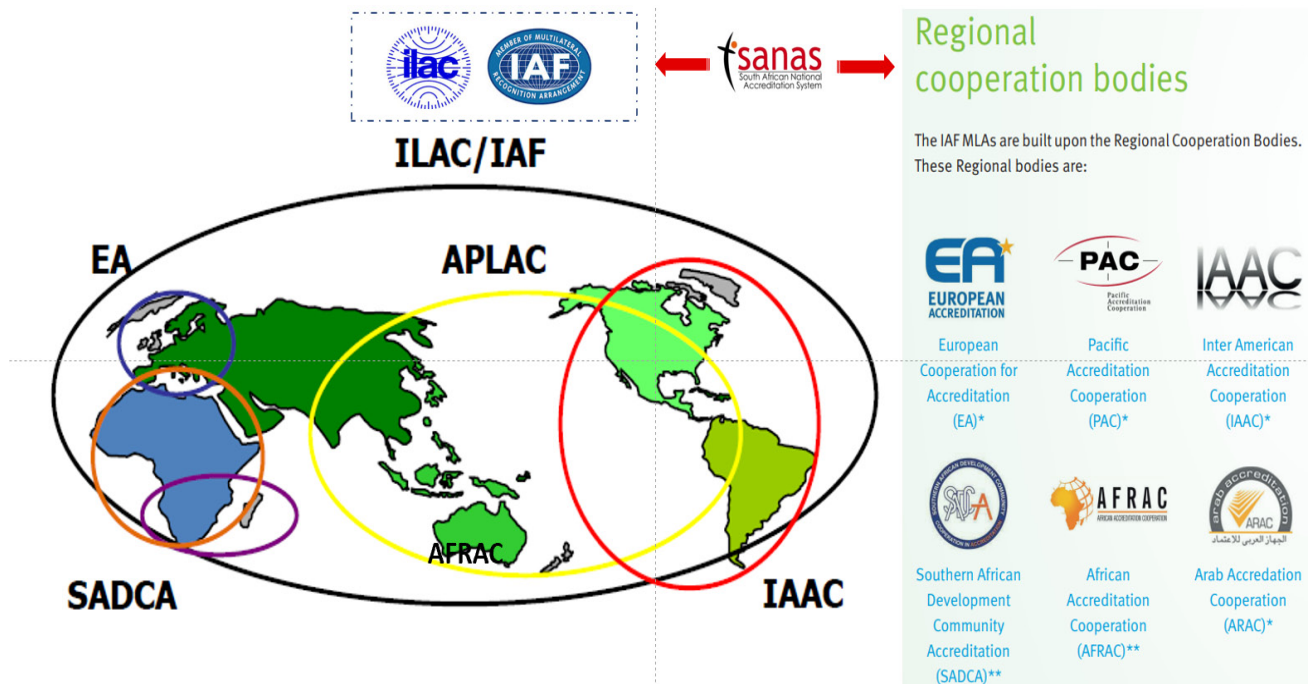
1.1 Conformity Assessment Technical Infrastructure Framework

"International Standards are the foundation for building smarter, more sustainable urban environments. They help systems and products work together, and spread new ideas, technology and efficiency" (McKinley, 2016). Standards provide essential frameworks for organisations to improve their operations, ensure compliance, and manage various aspects of their business effectively. By adopting standards into their business operations. Organisations can establish consistent practices, ensure compliance, enhance customer satisfaction, manage risks, and ultimately drive sustainable growth and continuous improvement.

At a global level, the International Organisation for Standardization (ISO) and the International Electrotechnical Commission (IEC) are worldwide federations of national standards bodies (ISO member bodies) that form the specialised system for worldwide standardisation, by publishing various standards and specifications that cover a wide range of industries and sectors. The South African Bureau of Standards (SABS) is the legislated national standardisation institution in South Africa and a founding member of ISO.

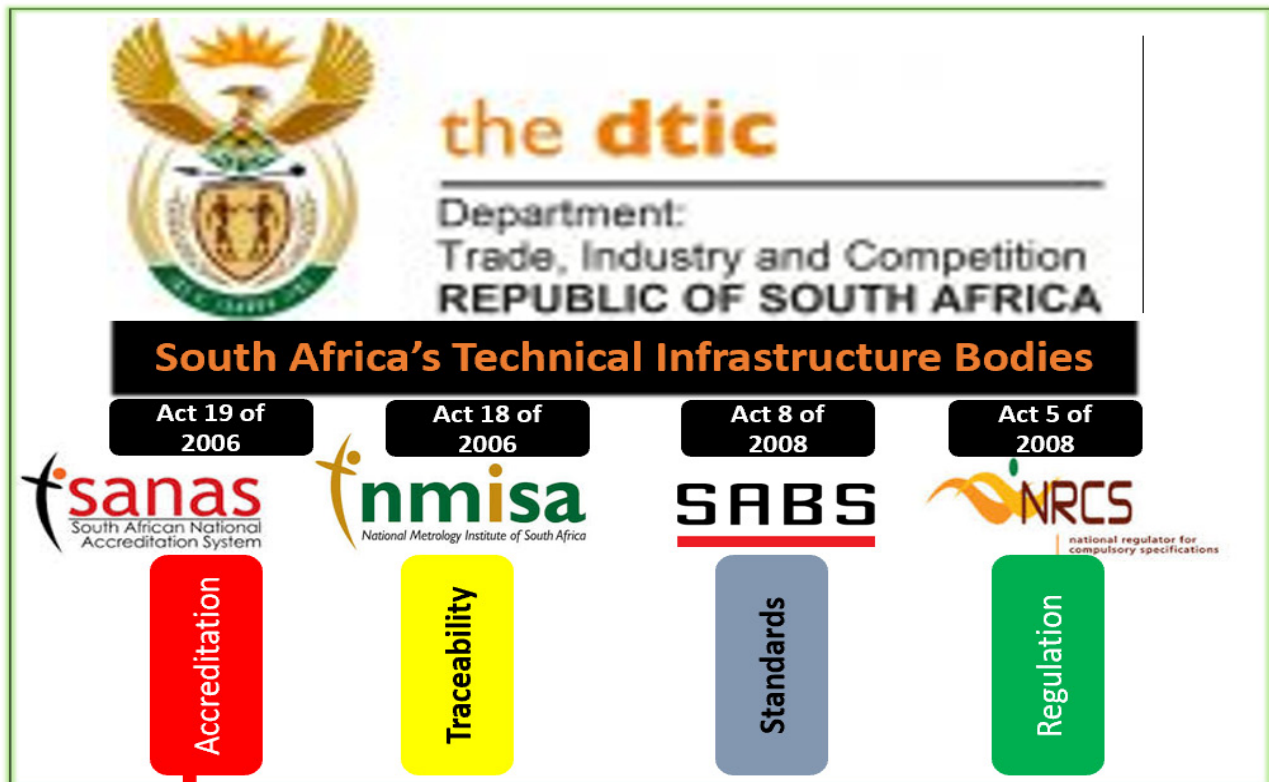
The ISO/IEC 17021 suite of standards specifies conformity assessment requirements for bodies providing audit and certification of management systems. These organisations have to be accredited by a local or international accreditation body, that are generally established in many countries, with the primary purpose of ensuring that conformity assessment bodies are subject to oversight by an authoritative body and operating according to international standards. The South African National Accreditation Scheme (SANAS) is the legislated national body responsible for accrediting organisations that provide certification, testing, inspection, and calibration services. SANAS is a member of various international accreditation organisations such as the International Laboratory Accreditation Cooperation (ILAC), International Accreditation Forum (IAF), African

Accreditation Cooperation (AFRAC) and Southern African Development Community Accreditation Service (SADCAS).



Source: Department of Transport

Figure 1: International Technical Infrastructure Bodies



Source: Department of Transport

Figure 2: South African Technical Infrastructure Bodies

The ISO/IEC 17021 suite of standards specifies conformity assessment requirements for bodies providing audit and certification of management systems as follows:

- Part 1: general competence requirements;
- Part 2: environmental management systems;
- Part 3: quality management systems;
- Part 4: event sustainability management systems;
- Part 5: asset management systems;
- Part 6: business continuity management systems; and
- Part 7: road traffic safety management systems.

Certification of a management system is one means of providing assurance that an organisation has effectively implemented a system to manage its activities, products, and services in alignment with its policies and in compliance with relevant standards. The ISO/IEC 17024 standard sets requirements for certification bodies that certify individuals and management systems auditors. The standard focuses on ensuring that professionals and workers are assessed and certified based on their competencies and qualifications in a specific field or occupation. This standard helps maintain the integrity and reliability of certification schemes by ensuring that individuals are evaluated fairly and consistently (ISO/IEC, 2015). Currently, there is only one locally based accredited personnel certification body in South Africa that has been accredited by SANAS against ISO/IEC 17024.

Third-Party Certification Audits, where applicable, shall be required to be carried out by an independent, SANAS accredited, external organisation (the third party), who evaluate and certify that a system, product, service, or management system meets the relevant norms, guidelines, standards and regulations. This process enhances credibility and trust since the Certification Body is not involved in the development or operation of the system, product or service being certified. Internal Audits (First-Party Audits) are conducted by the implementing Authorities, who are directly involved in implementation of a management system standard. Regulatory / Second-Party Audits are conducted by “Policy Maker and Regulator”. Unlike third-party certifications, second-party audits focus on internal or contractual relationships and are typically less formal but still essential for ensuring compliance and maintaining the norms, guidelines standards and regulations.

In summary, the role of the *Conformity Assessment Technical Infrastructure Framework* is paramount in ensuring that organisations operate efficiently, ethically, and sustainably. By adhering to international standards such as those established by ISO and IEC, organisations can foster consistency, compliance, and continuous improvement in their operations. It must be noted that the Engineering Council of South Africa (ECSA) published a gazette for the Identification of Engineering Work (IDoEW), which outlines engineering tasks to be carried out by ECSA registered individuals. The IDoEW places emphasis on “engineering aspects”, whilst the use of ISO and South African National Standards in alignment with the *conformity assessment technical infrastructure framework* focuses on the “systems and process aspects”. These approaches are complementary to each other.

2. BACKGROUND

A review committee on South African State-Owned Enterprises (SOEs) identified a need for improvements in governance at SOEs, as essential for better performance, financial sustainability, and attracting private sector investment. As part of efforts to support the

Road Authorities' plan, finance, maintain and sustain the road network, the Department of Transport is providing "Conditional Grant Funding" to provinces and municipalities, one of which is to implement and maintain road asset management systems. These grants also make provision to fund the collection of traffic data, road inventory data and visual conditional assessment of roads, bridges and structures.

After assessing road condition and traffic data received from road authorities, it was found that some data were not available, missing or being provided in the incorrect format and therefore not usable. In addition, during the spatial overlay verification exercise, it was found that the Road Classification Guidelines was not being applied in a consistent manner and in some cases, the digitised road map files did not correspond to the Google map aerial photos. In addition, evidence of implementing ISO 55001 and prescribing the SANS 1393 was lacking at provinces and municipalities.



Source: Department of Transport

Figure 3: Missing road data and inconsistent road classification



Source: Department of Transport

Figure 4: Digital mapping data not corresponding with the Google aerial photos (street maps)

The Department pioneered initiatives to create person certification auditor schemes for ISO 39001 and ISO 55001. These initiatives included integrated skill transfer programmes for departmental officials and provincial stakeholder workshops to raise awareness and understanding of implementing ISO 39001 within the transport logistics value chain. The workshops also emphasised the need for implementing ISO 55001 by Road Authorities, in alignment with the TMH22 Road Asset Management Technical Manual and SANS 1393 within the construction sector, as outlined in Government Gazette 39101, published by the Construction Industry Development Board (CIDB). The SANS 1393 was identified as a tool for developing and building capacity amongst construction companies, to sustain their business operations and provide quality services and offer “value for money” to government.

Feedback on the analysis of road data, as indicated in Figure 3 and 4 above, was provided during the stakeholder workshops, wherein questions were asked by the attendees directly to any service providers who were also present at these workshops on the quality and level of their services. Because, this was not the primary intention of these workshops, a separate presentation was made at the Road Maintenance Forum, to have a broader discussion on these matters with industry representatives and service providers.

At the time of conceptualising these initiatives, a number of barriers were evident such as the lack of ISO 55001 and SANS 1393 accredited schemes for SANAS to accredit any qualifying Certification Bodies (CBs) and Engineering Council of South Africa (ECSA) Continuing Professional Development (CPD) accredited training. Emanating from the stakeholder workshops, it was observed that there is a lack of understating governance structures, roles and responsibilities of key institutions within the “*conformity assessment technical infrastructure framework*”.

The following was achieved:

- SANAS successfully accredited an ISO 55001 certification scheme and is in the process of assessing and accrediting certification bodies.
- the ISO 55001 training / skills transfer sessions completed within the Department is now accredited by SAAMA, with ECSA CPD points.
- Lead Auditors for ISO 55001 and SANS 1393 scheme registered with a SANAS accredited certification body.
- The CIDB has is conducting capacity building for SANS 1393 for contractors and over 170 organizations have completed this training, many of which are in process of obtaining certification against SANS 1393,
- ISO 55001 training (CPD) has also been accredited by SAAMA for ECSA CPD points.

3. SCOPE AND APPLICABILITY OF POLICIES AND STANDARDS TO THE TRANSPORT SECTOR

3.1 Aviation, Maritime and Rail

The aviation and maritime industries are highly “*regulated and standardised*”, and these apply globally to all United Nations member countries. The International Maritime Organisation (IMO) is the United Nations specialised agency tasked with the responsibility of evaluating the safety and security of shipping and the prevention of marine pollution by ships. The IMO Member State Audit Scheme (IMSAS) provides an audited Member State with a comprehensive and objective assessment of how effectively it administers and implements those mandatory IMO instruments that are covered by the Scheme. The

mandatory IMO instruments included in the scope of IMSAS cover safety of life at sea (SOLAS Protocol); prevention of pollution from ships (MARPOL); standards for training, certification and watchkeeping for seafarers (STCW); load lines (LL 66 and its 1988 Protocol); tonnage measurement of ships (Tonnage, 1969); and regulations for preventing collisions at sea (COLREG, 1972).

The International Civil Aviation Organisation (ICAO) is the specialised agency of the United Nations that issues standard and required practices for air navigation, its infrastructure, flight inspection, prevention of unlawful interference, and facilitation of border-crossing procedures for the international civil aviation sector. Within the rail sector, the SANS 3000 suite of standards, was introduced with an aim to improve safety, quality, and risk management practices across Railway Operators and associated industries in South Africa. The Railway Safety Regulator is the legislated body responsible for certification of Railway Operators and suppliers.

3.2 Road Regulations, Infrastructure and Operations

The National Road Traffic Regulations, as amended, prescribes various South African National Standards and/or compulsory specifications for road, traffic, transportation, operations, vehicle testing stations (VTS), including requirements for manufacturers, importers and builders (MIBs) of motor vehicles and parts, (South Africa, 2000). In addition, the government's intention is that the "Road Transport Quality System (RTQS) will be revisited and extended in order to ensure full and proper implementation of the system, as contemplated in the 1996 White Paper on Transport Policy" (NDoT, 2021).

The SANS 1395 standard, Road Transport Management Systems (RTMS) was introduced in South Africa as a voluntary, self-regulation scheme that encourages consignees, consignors, and road transport operators to implement a management system that demonstrates compliance with road traffic regulations and improves safety and productivity. Key aspects include ensuring compliance with legal load limits and minimising overloading; monitoring medical fitness, managing chronic health conditions, and ensuring adequate rest periods; emphasis on driver behaviour, fatigue management, regular training of drivers; and emphasis on vehicle maintenance through implementing preventive maintenance processes and daily vehicle roadworthy checks. The implementation of RTMS has been successfully driven by the private sector throughout South Africa and has been implemented by several transport operators in neighbouring States.

The Road Traffic Safety Management System ISO 39001 was developed to provide organisations with a framework for improving road traffic safety, by reducing the risk of road traffic incidents, injuries, and fatalities. It provides a systematic approach to managing road traffic safety risks and performance, applicable to all organisations that influence or are influenced by road safety, such as road and traffic authorities, businesses, public and private sector stakeholders. ISO 39001 was identified as the key instrument to support implementation of the Decade of Action Global Road Safety Plan and address a growing concern over the global impact of road traffic crashes, that emerged as a significant cause of deaths and injury across the world.

The Public Finance Management Act (PFMA) and Municipal Finance Management Act (MFMA), requires mandatory compliance with relevant legislation and standards, including the Government Immovable Asset Management Act (GIAMA) and also requires regular reporting on the status and performance of immovable assets. GIAMA provides for the management of an immovable asset that is held or used by a national or provincial

department. In addition, GIAMA requires co-ordination of the use of an immovable asset with the service delivery objectives of a national or provincial department, (South Africa, 2007).

Government should facilitate a consistent approach across public institutions to asset management certification (SANAS, 2025), support specific industries (SARF, 2022), create a unified framework for managing public assets effectively by integrating and aligning ISO55001 with local policy, legislation, including national standards such as SANS 1393, to ensure a comprehensive approach to asset management, (SABITA, 2024). Proper planning and training are crucial during the implementation to deal with challenges related to cultural alignment, resource management, and integration of existing practices (Smith, 2021). Asset management maturity can be enhanced by implementing structured management frameworks and models to improve the life cycle of public sector assets (Singh, 2016). Asset management decisions should be compliant with applicable statutory requirements, the organisation’s business objectives and stakeholder needs, including sustainability principles, i.e. “reduce, reuse, and recycle” (Amadi-Echendu, 2017).

Section 13(1)(d) of GIAMA requires that *“the accounting officer of a custodian must, for all immovable assets for which that custodian is responsible, ensure that all activities that are associated with common law ownership are executed, including managing an immovable asset throughout its life cycle; assessing the performance of the immovable asset; assessing the condition of the immovable asset at least every fifth year; identifying the effect of the condition of the immovable asset on service delivery ability; determining the maintenance required to return the immovable asset to the state in which it would provide the most effective service; and estimating the cost of the maintenance activities identified”*.

Government departments and SOES are required to adopt a whole-of-life approach to asset management, which involves planning, controlling, and monitoring throughout the asset lifecycle to minimise risks and maximise opportunities. It requires balancing risks, costs, and performance through informed decision-making across different timeframes and asset levels. Table 1 below lists stakeholders that require financial and/or non-financial information on public sector assets (National Treasury, 2021).

Table 1: Stakeholders requiring asset management information

Regulatory Community	Investment Community	Supplier Community
Parliament / provincial legislatures	National government/fiscus	General goods
Elected officials	Donor agencies	Specialised goods
Auditor General	Development banks	Capital equipment importers
Sector regulatory bodies	Commercial banks	General services
Standards setting bodies	Investors	Specialist services
	Developers	
	Fund managers	
Professional Community	Broader Community	Customers
Professional associations	Media	Residential customers
Academic institutions	Special interest groups	Business customers
Research institutions	Taxpayers	Institutional customers
Statisticians	General public	
Economists	Other governments	

National Treasury has put in place the Infrastructure Delivery Management System (IDMS), a framework to guide the management of the delivery of infrastructure projects, aiming to ensure that infrastructure projects are delivered efficiently, effectively, and sustainably. The National Infrastructure Maintenance Strategy (NIMS) was developed by the Construction Industry Development Board (CIDB) in collaboration with the Department of Public Works and the Council for Scientific and Industrial Research (CSIR), and aims at improving the maintenance of the government's infrastructure. The standard specifications for road and bridge works in South Africa were approved by the Committee of Transport Officials (COTO) and were introduced with an aim to ensure consistency and quality in road construction projects. COTO standards cover various aspects, such as general requirements, services, drainage, earthworks, concrete, asphalt, and quality assurance.

The ISO 55000 Asset Management Systems series of standards was designed to guide organisations, including public sector bodies, in managing their assets effectively, with a focus on increasing value, reducing risks, and achieving sustainability. ISO 55000 provides an overview of asset management, explaining its principles and terminology. This standard serves as the foundation for understanding the entire ISO 55000 series. ISO 55001 specifies the requirements for an asset management system, assisting organisations to establish, implement, maintain, and improve their asset management practices within the context of their organisation. ISO 55002 offers guidelines for applying ISO 55001 effectively. It gives detailed advice on how to implement the requirements of ISO 55001 in a practical manner. ISO/TS 55010 provides guidance on aligning asset management with acceptable financial and accounting practices. This ensures that asset management practices are integrated with an organisation's financial strategies. ISO 55011 focuses on guidance for dealing with government asset management policies that promote effective asset management and is applicable to national, provincial and local governments or their agencies.

The TMH22 Road Asset Management Manual was customised and fully aligned with the ISO 55001 standard, and issued as a guide for road authorities. The manual covers:

- the benefits to the Road's Authority relating to asset management;
- a brief description of the policies and requirements of a road authority in terms of current legislation;
- the various levels of asset management and the minimum levels required;
- processes and methodologies for higher levels or more advanced asset management;
- guidance for the implementation of the Road Asset Management System;
- guidance for the development of inventory data and asset valuations;
- requirements for the collection of usage and condition data and time intervals thereof;
- methodologies for the reporting on the condition of assets;
- methodologies for the determination of the maintenance and rehabilitation requirements of the road network; and identification of the ongoing improvement of a road authority's Asset Management System.

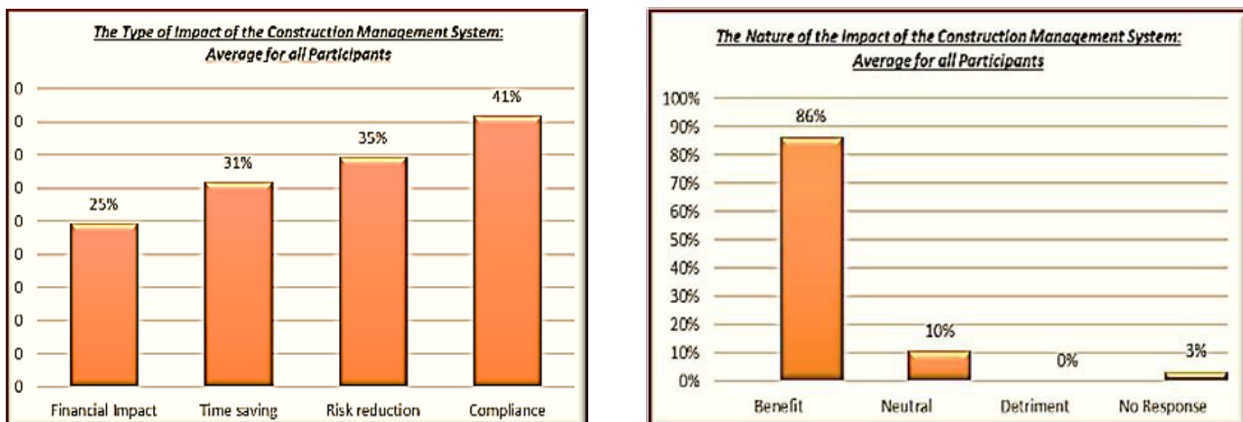
Implementation of ISO 55001 by Road Authorities provides a structured framework to effectively and sustainably manage road infrastructure assets, improve performance, enhanced risk management, and serves to empower Road Authorities optimise their asset lifecycle, enhance stakeholder satisfaction, and demonstrate commitment to service delivery. ISO 55001 provides significant benefits (Smith, 2021) and can be integrated with maintenance systems to ensure better asset reliability and management (Gupta and Sharma, 2020), improve service delivery and achieve greater efficiency, (Torres, 2022).

Government can leverage ISO 55001 as a strategic tool to support the transition to a circular economy, by focusing on sustainable management of public assets, promoting efficiency, and maximizing resource usage, (McKinley, 2016).

3.3 Construction Sector

The development and publication of the SANS 1393 in South Africa, was initiated by the CIDB, who envisaged that it should be used as a “best practice industry scheme” for construction companies to deliver improved value to Government and ensure that projects meet quality, safety, and environmental standards. The implementation of the SANS 1393 will assist a contractor in:

- demonstrating their ability to consistently deliver construction works that meet customer and applicable statutory and regulatory requirements.
- enhancing customer satisfaction through the effective application of the standard, including the assurance of conformity to customer and applicable statutory and regulatory requirements.
- providing safe and healthy workplaces by preventing work-related injury and ill health.
- managing environmental responsibilities in a systematic manner that minimises environmental impacts.



Source: www.cidb.org.za

Figure 5: Monitoring and evaluation data of SANS 1393 Certified Contractors

The intent of the CIDB (2015) was for Grade Nine contractors to obtain certification against the Anti-Bribery Management System (ABMS) standard, to participate in Government tenders and for Grade Five contractors and above to obtain certification against the Construction Management System standard. However, the CIDB has not pronounced an implementation date, which has resulted in a poor appetite by the targeted organisations, to adopt and implement these standards. The data above, extracted from the CIDB website, confirms that construction companies are achieving tangible results, such as financial sustainability, improvements in productivity and compliance.

4. REFLECTIONS ON THE INITIATIVES BY THE DEPARTMENT

The NDOT engaged with the relevant stakeholders through workshops held across the nine provinces to provide the necessary information and provided a platform for information gathering. Secondly engagements were held with SANAS the regulator of conformity assessments in South Africa, mandated by the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act," is Act No. 19 of 2006 and the

CIDB as mandated by the Construction Industry Development Board Act No. 38 of 2000. Lastly a SANAS accredited ISO 17024 certification body in personnel certification was identified and engaged to develop auditor schemes for ISO 55001 and SANS 1393.

After a thorough analysis of feedback and deliberations with stakeholders, who attended and participated at the workshops, it was observed that various relevant standards are not necessarily being adopted and used (implemented) in the intended way or in line with the requirements of the “*conformity assessment technical infrastructure framework*”. This is due to the lack of awareness and understanding of:

- various types of standards, their differences and the purpose of adopting standards, the value of implementing or using standards, including the linkages of standards to legislation and/or policies;
- the legal status and differences between an ISO/SANS Standard in relation to Guidelines or Technical Manuals developed and published by a Government Department or SOE or by the industry/private sector;
- linkages of standards to governance and oversight by Government departments and industry;
- the process of implementation of standards;
- conformity assessments and the key role players;
- internal audits (1st party audits) and external audits (2nd party audits and 3rd party audits), customer audits and regulatory audits in line with the ISO 19011 Guidelines for Auditing Management Systems and the ISO/IEC17021 Conformity Assessment Requirements for bodies providing audit and certification of management systems.
- industry / private sector initiatives in relation to the conformity assessment technical infrastructure framework / requirements;
- the need for initiatives to promote the value of using and adoption of standards, including the linkages of standards to legislation and/or policies;
- policies directives and KPI's to regulate and hold Road Authorities and Agencies accountable;
- resources needed, skills requirements and capacity for effective governance and oversight;
- the need of collaboration between Government and/or SOEs with SABS, SANAS and Conformity Assessment Bodies;
- how to conduct needs (Gap) assessments and putting a plan in place to address any gaps, including the allocation of budgets; and
- the need for adequate government and SOEs participation at SABS, NRCS and SANAS Technical Committees.
- the need for capacitation of officials employed at Government and SOEs to pursue registration as Standards Auditors/Inspectors at relevant SANAS accredited Certification Bodies.

Many service providers, who are providing either programme and project management, or asset management or technical support or monitoring and evaluation services, attended the workshops. Some of their representatives expressed appreciation and expressed concerns that the linkage of TMH22 to the ISO 55001 standard was never so well explained or understood prior to these workshops. Some suggested that the PRMG and RRMSG Conditional Grants Frameworks should be more clearly written to specify how these grants can be tapped into by Road Authorities and used to achieve the strategic goal of “implementing and maintaining road asset management systems”. Some suggested that, in the long term, there is a need for Road Authorities to specify ISO 55001 certification requirements for Service Providers interested in bidding (tendering) for project

management, asset management, technical support, monitoring and evaluation services. In summary, the discussions and questions raised, includes and was not limited to:

- will Road Authorities specify certification as a pre-tender requirement?
- which service providers should be certified?
- how long does the certification process take?
- are there 55001 implementation support toolkits?
- where can their staff be trained and which training bodies are recognised?
- are there SANAS accredited certification bodies?
- Besides the CIDB capacity building for SANS 1393, what other support will be offered to SMME construction companies?
- what other support will be offered to emerging asset management service providers?

During discussions with SANRAL, it was confirmed that a tender was awarded for ISO 55001 certification, beginning with a GAP Analysis, capacity building and assisting SANRAL to achieve certification. The tender also required an independent company to perform the Certification Audit. During that time there was an absence of SANAS 55001 accredited certification bodies, and the SANRAL tender was packaged in “generic” way, so that any qualifying international company could tender and be used. SANRAL recommended that the Department of Transport lead a capacity building initiative to assist all provincial and municipal road authorities. SANRAL would await the SANAS processes to be finalized and certification bodies accredited.

In discussions with the Road Transport Regulation unit on SANS and ISO standards, it was noted that although the National Road Traffic Regulations (as amended) requires compliance with standards for the transportation of dangerous goods by road and vehicle testing stations, there are no SANAS accreditation schemes for Certification Bodies and auditor inspection schemes for these standards. South Africa adheres to the United Nations Model Regulations for the classification, packaging, marking, and labelling of dangerous goods, ensuring their safe transport across various modes of transport, including road, rail, sea, and air. SANS 10231 defines the operational requirements for road vehicles transporting dangerous goods, covering aspects such as vehicle registration, inspection, and load constraints, as well as the roles of consignors, operators, drivers, and consignees. SANS 10216 specifies the requirements for vehicle testing stations, outlining the necessary infrastructure, equipment, and procedures for conducting inspections. SANS 10047 details the methods for testing vehicle roadworthiness, focusing on components such as brakes, lights, and emissions to meet safety and performance standards. Certified auditor schemes are essential for officials, who are responsible for ensuring compliance inspections, and employed at national or provincial departments, municipalities, and public entities

In the broader freight logistics industry, it was also observed that, in addition to the SANAS accredited SANS 1395 and SANS/ISO 39001 schemes, which are applicable to the road transport industry, there are other private sector industry schemes used by industry associations, with a requirement for certification of companies against these schemes to qualify to be awarded contracts (tenders). However, there is no certainty if the organisations performing the certification audits are accredited by SANAS, and if the auditors or inspectors used within this industry, although knowledgeable and experienced, are “lead auditors” and certified by a SANAS accredited certification body. Government should play an oversight role of industry practices, especially if these fall under regulatory related matters, and put in place a monitoring mechanism to ensure the playing fields are fair.

The following outcomes were agreed, in principle, after engagements with stakeholders:

- Roads Authorities need to put in mechanisms in place and specify certification as a pre-tender requirement for their asset management service providers.
- ISO 55001 certification must be obtained by Roads Authorities by a SANAS accredited or an equivalent certification body.
- SANAS accredited certification bodies should provide guidance and the necessary toolkits (ISO 17021) to Roads Authorities.
- ISO 55001 training must be conducted with accredited service providers by SAAMA with ECSA CPD.
- Lead Auditors for ISO 55001 and SANS 1393 should be registered with a SANAS-accredited certification body.
- Government and SOCs responsible for managing infrastructure assets, Authorities should collaborate on capacity building initiatives on SANS 1393 for contractors and in the medium to long-term, stipulate certification to SANS 1393.

Possible interventions proposed by stakeholders are the need for clear policy directives on what standards should be implemented, by whom and the target dates to achieve compliance. In parallel, Government, various SOEs and stakeholders should engage with each other to form strategic collaborative partnerships, with an objective to implement the identified standards in the intended way and in line with the requirements of the *“conformity assessment technical infrastructure framework”*.

Engagements with SANAS can take place to facilitate plans for the SANS 1393 accreditation scheme. Road authorities and the infrastructure agencies, such as SANRAL, PRASA, TRANSNET, ACSA should specify requirements for construction companies to be certified against SANS1395. Similar conditions should be specific for Consulting Service Providers, especially organisations providing programme and technical support, including asset management services, against the ISO 55001 standard.

South African Asset Management Association (SAAMA) was identified as a potential partner for implementing asset management capacitation programmes for officials at national or provincial departments, municipalities and public entities. SAAMA is promoting the interests of asset management and maintenance as a whole, as well as to uplift asset management and maintenance practitioners in Southern Africa. SAAMA is affiliated to the Global Forum on Maintenance and Asset Management (GFMAM). The South African Qualifications Authority (SAQA) has recognised SAAMA as a professional body and approved for SAAMA to award the designation of “Certified Senior Principal in Asset Management (CSAM™) to persons who meet these requirements.

Discussions with the Railway Safety Regulator (RSR) and SANAS can take place to facilitate the development and launch of accreditation schemes for the Railway Safety Standards, for marketing and promoting these accreditation schemes. It must be noted that although certification is a legislated function of the RSR, the Government has pronounced on plans, which are at an advanced stage, to allow more rail operators to use the rail network. To deal with the additional volume of certifications, within the context of the RSR's economic sustainability, the Government can consider using a pool of certification bodies and industry experts. However, to ensure the integrity of the work by any 3rd party organisations performing certification audits, these organisations should be accredited by SANAS, and the auditors or inspectors used within this industry, although knowledgeable and experienced, should be trained as “lead auditors” and certified by a

SANAS-accredited certification body. A capacity programme may be required for these auditors or inspectors.

The Road Traffic Management Corporation and SAATCA can be engaged to initiate discussions on developing and launching audit inspection schemes for SANS 10231, SANS 10216 and SANS 10047, including the facilitating of capacity building programmes, marketing and promoting these schemes for registration by officials employed within the relevant inspectorate divisions at national or provincial departments, municipalities and public entities.

Engagements with the Construction Industry Development Board and SANRAL, ACSA, RSR, Transnet and PRASA to implement and roll out a sustainable capacitation programme for Certification of Contractors against SANS 1393. Although Government Gazette 39101 was published in 2015, the industry is not ready to meet this requirement.

In the absence of policy directives, there was a view that ACSA, PRASA and Transnet should be encouraged to pursue and obtain certification against ISO 55001 by a SANAS Certification Body, similar to SANRAL. In addition, all SOES are to pursue Certification against SANS 1734 or ISO 37001 by a SANAS-accredited Certification Body.

5. CONCLUSION

National and International Standards are the foundation for building smarter and more sustainable urban environments. They help systems and products work together, and spread new ideas, technology and efficiency. Certification of a management system is one means of providing assurance that an organisation has implemented a system for the management of the relevant aspects of its activities, products and services, in line with the organisation's policy, and conforms to requirements of a standard. The nationwide implementation of standards can contribute significantly to building skills, improving governance and administration. However, clear policy directives by national sectorial infrastructure departments, implementation support, capacitating officials through training and certification programmes are essential.

The National School of Government (NSG), including SANAS accredited certification bodies, QCTO and ECSA accredited training providers were identified to play a pivotal role to ensure public servants are offered education, work-place skills, training, certification and development initiatives, so that road authorities are equipped to comply with legislation, regulations, systems, so that they can and apply discretion and innovation in addressing service delivery challenges.

It is envisaged that Government officials, including professionals from the private sector, can pursue further training and development to become ambassadors of these standards. The development and provision of the centralised web-enabled Road Asset Management System shall be fast-tracked, and the system shall be made available to all road authorities. The unique feature of the centralised web-enabled Road Asset Management System will be its ability to serve as an "intra-authority and inter-authority system", with a secure Web-based and GIS-enabled remote access upload road data and to access technical reports to guide road infrastructure planning, budgeting and resource allocation.

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