

## EXPERT ANALYSIS

# How infrastructure delivery can find its way again

The National Planning Commission, chaired by the Minister in The Presidency for National Planning, was mandated to take a broad, cross-cutting, independent and critical view of South Africa in order to help define the South Africa its people seek to achieve in 20 years' time and to map out a path to achieve those objectives.



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**I**N 2011, THE National Planning Commission (NPC) published a detailed diagnostic report that set out the key challenges that South Africans confront in fighting poverty and inequality and in achieving constitutional objectives (NPC, 2011). The implicit conclusion of this report was that a business-as-usual approach will result in South Africa failing to meet a great many of its objectives. The National Development Plan 2030, which was published in 2012, seeks to eliminate poverty and reduce inequality by 2030 by drawing on the energies of South Africans, growing an inclusive economy, enhancing the capacity of the state, and promoting leadership and partnerships throughout society (NPC, 2012).

People are surrounded by economic infrastructure (fixed capital investment including construction works), including the homes in which they live, the offices and factories in which they work, schools that are essential for the education of their children, and hospitals and clinics that are fundamental for their health and well-being. They are also surrounded by economic infrastructure that supports the economy in its totality. Road and railway infrastructure not only enable travel between homes and places of work, schools and hospitals, but also distribute goods and services to people. Border posts, harbours and airports are the physical links with neighbouring

countries and the world. Dams provide water not only for human consumption but also for agricultural and industrial purposes. Power stations generate electricity. Networks deliver water and electricity to homes, places of work, schools and hospitals and convey industrial effluent, soil water and wastewater to treatment works. Economic infrastructure is foundational to a better life for all.

Investment in economic infrastructure occurs in expectation of demand or in reaction to demand for capacity. When it happens, it has the following three impacts (Watermeyer, 2011):

- an initial growth in demand for people, equipment and materials on the project, which lasts as long as it takes to create the asset
- a demand on resources over the lifespan of the project to maintain the asset
- a productivity impact in the overall economy, either producing more or producing it better, due to more efficient infrastructure (or simply the availability of capacity like harbour capacity and electricity).

Expenditure on economic infrastructure will not necessarily lead to economic growth. Infrastructure that provides improvements or efficiencies in services, production or export capabilities and is delivered and maintained in a manner that minimises waste of materials, time and effort in order to generate the

maximum possible amount of value, is most likely to contribute to economic growth.

Given the linkage between infrastructure investment and economic growth, it is not surprising that five of the nine priority areas identified in the NPC's diagnostic report have a direct bearing on infrastructure. The tackling of poverty and underdevelopment is, however, being hampered by shortcomings in the delivery and maintenance of infrastructure as evidenced in a recent World Bank report (Foster, V (2008)) that examined infrastructure in 24 countries that together account for 85% of GDP, population and infrastructure aid flows of sub-Saharan Africa. This report found that:

- in some countries infrastructure provision is not focused where it is most needed
- countries typically only manage to spend about two-thirds of the budget allocated to investment in infrastructure
- about 30% of infrastructure assets are in need of rehabilitation.

The inability of many South African municipalities and provincial governments to spend all of their capital budgets each year has for several years been a sore point with National Treasury (Wall et al, 2012).

The McKinsey Global Institute estimates that the world needs to increase its investment in infrastructure by nearly 60% over the next 18 years, from US\$36 trillion (R320.65 trillion) to US\$57 trillion, simply to support projected

economic growth (Dobbs et al, 2013). This institute suggests that boosting infrastructure productivity could save US\$1 trillion dollars a year and cites the following main levers to deliver potential savings:

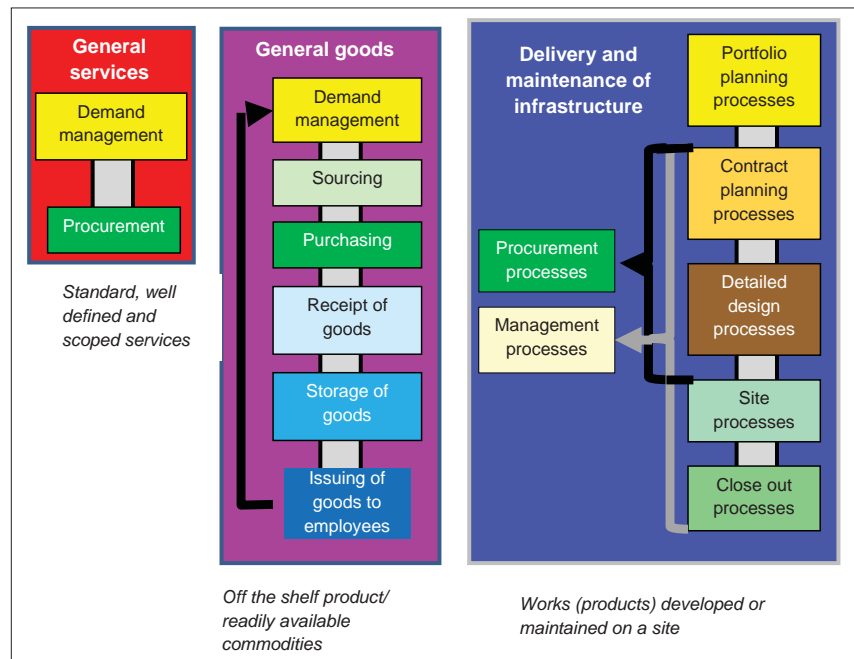
- improving project selection and optimising infrastructure portfolios
- streamlining delivery
- making the most of existing infrastructure assets
- upgrading infrastructure governance systems to capture potential savings.

Government expenditure can account for a significant portion of GDP. A recent study of the 40 countries having the largest GDP in the world found that government expenditure accounted for approximately 29 and 45% of GDP for developing and developed countries, respectively (CUTS, 2013). This study found that government expenditure in South Africa is approximate 31% of GDP. Public procurement forms a significant portion of such expenditure. It is therefore not unexpected that procurement is a recurring topic throughout the National Development Plan.

### The case for a separate supply chain for the delivery and maintenance of infrastructure

Procurement is “the process that creates, manages and fulfils contracts” (ISO 10845, 2010). Procurement deals with activities surrounding contracts, i.e. the development of a procurement strategy and a procurement document, the solicitation of tender offers, the evaluation of submissions, the award of a contract and the administration of a contract. On the other hand, supply chain management (SCM) in the public sector may be regarded as “the design, planning, execution, control and monitoring of supply chain activities in the delivery of goods, services or works, with the objective of creating net value and providing oversight and coordination of information and finances within the supply chain” (Western Cape Provincial Government, 2012). SCM is the management of all activities at a portfolio level that relates to a supply chain i.e. the management of all the interconnected activities from the point of origin to the point of consumption. SCM is accordingly far broader than procurement.

Government procurement that is unrelated to the delivery and maintenance of infrastructure typically relates to goods and services that are standard, well-defined and scoped. Once purchased, goods invariably need to be taken into



storage prior to being issued to employees. Services most often involve routine, repetitive services with well understood interim and final deliverables that do not require officials to provide strategic inputs, or require decisions to be made regarding the fitness for purpose of the service outputs. Accordingly, the supply chain for procurement that is unrelated to the delivery of infrastructure involves one of two basic types, which relates to consumption and operational needs (see Figure 1). They are the procurement of:

- general goods (i.e. manufactured products or materials), which involve demand management, sourcing, purchasing, receipt, storage and issuing of goods to employees (end users)
- general services, which involves demand management, procurement, verification and payment for the services provided.

In contrast, procurement relating to the delivery and maintenance of infrastructure cov-

**FIGURE 1:** Commonly, public sector encountered supply chains (Wall et al, 2012)

service delivery and accommodation needs assessment. Thereafter it involves planning at a contract level and the procurement and management of a network of suppliers, including subcontractors to produce a product on a site (i.e. works) (see Figure 1). There is no need for an organ of state to store and issue materials or equipment unless these are issued to officials responsible for maintenance, or are issued free of charge to contractors for incorporation into construction works.

There are also differences in the approach to the procurement of construction-related goods and services, and general goods and services. Non-construction procurement deals with direct acquisitions, which involve standard, well-defined and scoped services, off-the-shelf items and readily available commodities.

### The inability of many South African municipalities and provincial governments to spend all of their capital budgets each year has for several years been a sore point with National Treasury

ers a wide and diverse range of goods and services, which are required to develop or maintain fixed assets on a site. Accordingly, the supply chain for the delivery and maintenance of infrastructure involves the initial and subsequent recurring updating of planning processes at a portfolio level flowing out of

The business need is commonly achieved through the production of a specification, which then forms a requisition for the procurement of goods or services. An immediate choice can generally be made in terms of the cost of goods or services satisfying specified requirements. Construction contracts differ in

that each contract is unique and there cannot be direct acquisition of infrastructure. Each contract has a supply chain that needs to be managed and programmed to ensure that the project is completed within budget, to the required quality, and in the time available. Many risks relate to the “unforeseen” that may occur during the performance of the contract. This could, for example, include unusual weather conditions, changes in owner/end-user requirements, ground conditions being different to what was expected, and market failure to provide materials or accidental damage to existing infrastructure. Unlike non-construction procurement, there can be significant changes in the contract price from the time awarded to the time of completion. Key persons responsible for managing a contract, particularly in complex services or works, have a major impact on the outcome of these changes. The procurement of supplies and equipment within the construction industry is also different as requirements are frequently established in terms of desired performance. As a result, a range of goods and services (or combinations thereof), with different characteristics, costs, time for delivery, etc., may satisfy such requirements.

The following practices, which are commonly encountered in non-construction procurement, do not sit well with construction procurement:

- awarding tenders on the basis of the lowest price for meeting a minimum standard
- applying generic conditions of contracts that only describe the rights and obligations of the parties and lack agreed procedures for the administration or management of the contract
- negotiation of terms of contract after the evaluation of tenders
- lack of standardised structuring of component procurement documents
- reliance on completing standard schedules that are applied indiscriminately to procurement transactions
- standard, inflexible allocation of risks in contracts that require the drafting of extensive special conditions of contract to amend.

In construction procurement, a procurement strategy (selected packaging, contracting, pricing and targeting strategy, and procurement procedure for a particular procurement) needs to be developed for each transaction and an appropriate form of contract selected to support that strategy. There are far more permutations and options available for

construction-related procurement than there are for non-construction procurement.

The risks that need to be managed, the skills sets that are required and the performance metrics for a supply chain involving the delivery and maintenance of infrastructure are very different to those relating to general goods

## **“It is vital for public servants to have the skills and motivation they need to do their jobs”**

and services. There is an urgent need to have a separate supply chain for the delivery and maintenance of infrastructure.

### **The NPC’s proposals for a new procurement system**

The NPC’s Diagnostic Overview (2011) made the observation that: “It is vital for public servants to have the skills and motivation they need to do their jobs. Yet, there is a shortage of staff and specialist skills in many aspects of the public service.” The report makes specific mention of the shortage of skilled professionals, especially in health, policing, infrastructure planning, engineering, finance and information technology. It furthermore makes the observation that: “Transformation in the post-apartheid state required that the racial monopoly over skill be challenged and dismantled. Policies designed to improve the representation of the public service work best when accompanied by effective management, training and recruitment processes... The result has been a reduction in the number of professionals available to the state, and a looming crisis in the generational reproduction of professional expertise as the ageing cohorts continue to leave the system.”

The NPC’s diagnostic overview also points out that: “Many short-term responses to skills shortages do little to address long-term capacity constraints. Consultants can be brought in to design and build infrastructure, but without in-house technical expertise, provincial and local governments lack the capacity to ensure that the work is done to an adequate standard or to maintain the infrastructure once the work has been completed.”

The National Development Plan 2030 requires the following, among other things (NPC, 2012):

- the state to purchase what it needs on time at the right quality and for the right price
- an improvement in the quality of spending through better planning, sound procurement systems and greater competition in the economy

- greater efficiency in all areas of government expenditure as the overall envelope is likely to grow relatively slowly over the medium-term
- the employment of more effective procurement processes that result in robust contracts and move away from an overly

bureaucratised process with the emphasis on compliance by box-ticking

- the engagement of supply-chain management staff to support technical and other specialists in a manner that does not displace the involvement of the later in procurement processes.

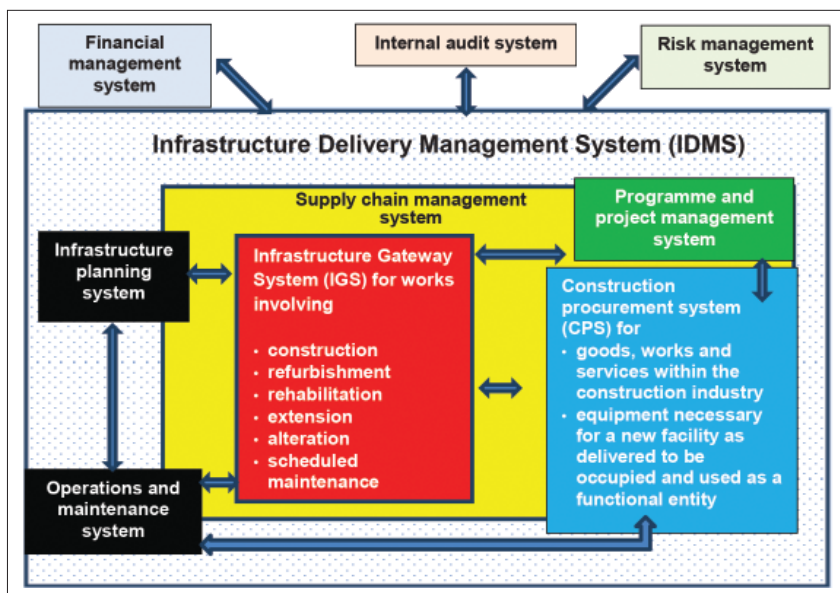
The plan proposes that the following five areas be focused on in designing a procurement system that is better able to deliver value for money while minimising the scope for corruption:

- differentiate between the different types of procurement that pose different challenges and require different skills sets
- adopt a strategic approach to procurement above the project level to balance competing objectives and priorities rather than viewing each project in isolation
- build relationships of trust and understanding with the private sector
- develop professional supply chain management capacity through training and accreditation
- incorporate oversight functions to assess value for money.

The plan, when considering different forms of procurement, recognises that: “Infrastructure procurement involves conceptual design, structuring contracts and ensuring sustainability. As these decisions involve long-term lock-ins, the quality of decision-making is vital.” The plan also makes specific reference to the work being done between National Treasury and the Construction Industry Development Board (CIDB) to establish an infrastructure delivery management system that better accommodates the particular challenges of infrastructure procurement.

### **Government’s Infrastructure Delivery Management System**

The Infrastructure Delivery Management System (IDMS) is a government management system for planning, budgeting, procurement, delivery, maintenance, operation, monitoring



**FIGURE 2:** The linkages between systems and subsystems within an institution (Watermeyer et al, 2012)

and evaluation of infrastructure. It comprises a set of interrelating or interacting elements that establish processes that transform inputs into outputs (see Figures 2 and 3).

The IDMS comprises the following systems (Watermeyer et al, 2012):

- an infrastructure planning system
- an infrastructure gateway system (IGS)
- a construction procurement system (CPS)
- a programme and project management system
- an operations and maintenance system.

Risks are managed within each of these systems.

The IDMS is designed to be linked to the Medium Term Expenditure Framework (MTEF). It has a strong focus on outcomes, value for money and the effective and efficient functioning of the procurement and delivery management system in compliance with relevant legislation. It includes a supply chain management (SCM) system that can be readily integrated into the various systems that accounting officers and accounting authorities are required to implement.

The IDMS contains a number of systems each comprising a set of processes that need to be managed. These systems are interrelated and contain interacting elements as shown in Figure 3. The planning of an institution's infrastructure projects at a portfolio level is not only influenced by the strategy and planning processes conducted at a national, provincial and local level, but also by the asset management plans developed by custodians

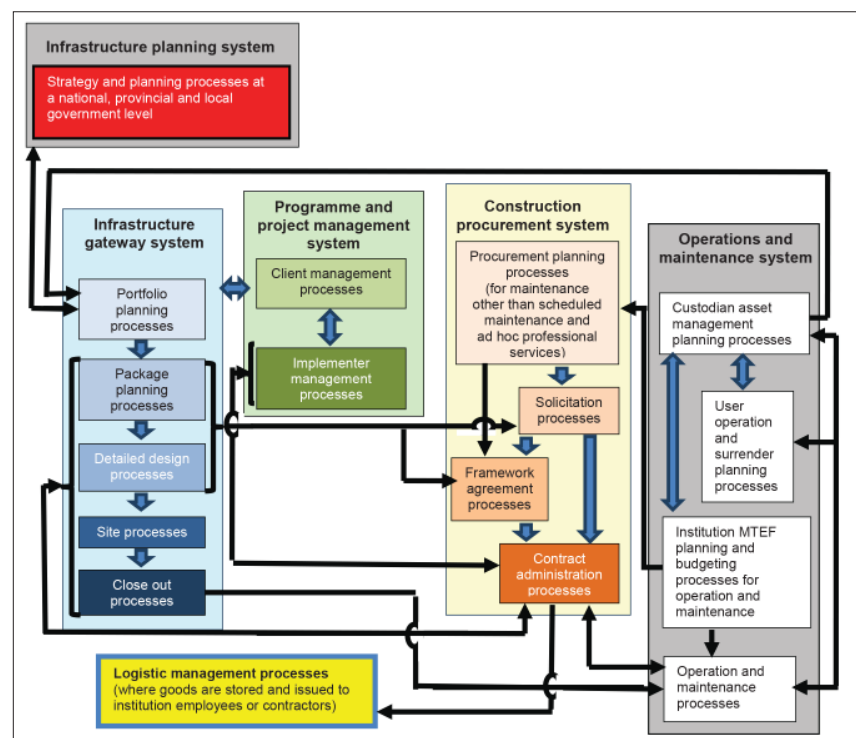
(caretakers of infrastructure throughout its life cycle) and users (those who operate allocated infrastructure) in the operation and maintenance of infrastructure. The infrastructure gateway system, which provides the workflow for the delivery of projects involving the construction, refurbishment, rehabilitation, extension, alteration or scheduled maintenance of infrastructure, cannot be implemented in isolation from the construction procurement and programme and project management systems. Likewise, the operations and maintenance system cannot be implemented in isolation from the procurement system

and certain outputs (e.g. record information and user manuals) of the infrastructure gateway system.

The construction procurement system included in the IDMS comprises not only procurement processes but also:

- rules and guidelines governing procedures and methods as embodied in the CIDB Standard for Uniformity in Construction Procurement and the ISO 10845 Standards for Construction Procurement
- procurement documents, which include terms and conditions, procedures and requirements embodied in the CIDB, FIDIC, JBCC and NEC3 families of contracts and SAICE's GCC standard form of contract
- risk/quality oversight (governance and performance) controls
- organisational policies, which deal with issues such as:
  - the usage and application of particular procurement procedures
  - requirements for recording, reporting and risk management
  - procedures for dealing with specific procurement issues
  - the usage of procurement to promote social and developmental objectives
  - the assignment of responsibilities for the performance of activities.

**FIGURE 3:** Interacting systems and processes embedded within the IDMS



**TABLE 1:** Scope of the draft National Treasury standards for the delivery and maintenance of infrastructure

National Treasury standard	Scope
<b>Infrastructure Delivery Management System</b>	This standard establishes an IDMS comprising processes, procedures and methods within an institution for the delivery or maintenance of infrastructure in a staged, systematic, disciplined, uniform integrated and auditable manner. It covers the manner in which projects involving the construction, refurbishment, rehabilitation, extension, alteration or day-to-day, routine, scheduled and emergency maintenance of infrastructure are conceived, budgeted for and delivered.
<b>Construction procurement system</b>	This standard establishes a CPS within an institution for the procurement of: a) goods, services, engineering and construction works, and disposals relating to the construction industry b) goods or services necessary for a new facility as delivered to be occupied and used as a functional entity and c) temporary facilities. The standard does not apply to: a) the storage of goods and equipment following their delivery to an institution, which are stored and issued to contractors or to officials b) the procurement of non-construction industry related goods and services or land, except as specifically provided c) the sale, exchange, donation or letting of land d) public-private partnerships contemplated in Regulation 16 of the Treasury Regulations for Departments, Trading Entities, Constitutional Institutions and Public Entities, issued in terms of the PFMA, 1999 e) the conclusion of any form of land availability agreement f) leasing and rental of assets.

### Recent developments in the SCM regulatory environment

Draft Public Finance Management Act (PFMA) regulations issued for public comment in Government Gazette 35939 of 30 November 2012 separate the supply chain management system for the delivery and maintenance of infrastructure from that for general goods and services. Reference is made in these draft regulations to a National Treasury standard for an IDMS and a National Treasury standard for a Construction Procurement System, which draws extensively on the work of the CIDB. The scope of these standards is indicated in Table 1.

Government's IDMS, which is embedded in the two standards referenced in Chapter 30 of the draft PFMA regulations, addresses four of the five focus areas identified in the National Development Plan around which future procurement systems need to be designed. The NPC envisaged that the focus area "build enabling support structures" would result in a professional supply-chain management capacity, which would be developed through

training and accreditation, and supported by a database of registered supply-chain managers and a central list of those who have been barred from working in supply chain management roles in the public sector. This has yet to be established.

#### **The relationship between the various built environment professions and the IDMS**

ISO 9000 defines quality as the “degree to which a set of inherent characteristics fulfils requirements”, and a quality management system as a “management system to direct and control an organisation with regard to quality”. ISO 9001 establishes the requirements for a quality management system relating to the establishment, documentation, implementation and maintenance of a quality management system and continually improving its effectiveness.

The starting point is to determine the processes needed for the quality management system and their application throughout

the organisation. Thereafter, the sequence and interaction of these processes need to be determined, as well as the criteria and methods needed to ensure that both the operation and control of these processes are effective. Once this is in place, resources and information need to be made available to support the operation and monitoring of

established in ISO 9001 for a quality management system. It also establishes the compliance framework. What it does not address is the availability of resources to support the operation and monitoring of processes. ISO 9001 in this regard requires that “personnel performing work affecting conformity to product requirements shall be competent on

### **The IDMS is designed to be linked to the MTEF. It has a strong focus on outcomes, value for money and the effective and efficient functioning of the procurement and delivery management system**

these processes. This enables actions necessary to achieve planned results to be implemented and continual improvement of these processes.

The IDMS as contained in the draft standards identified in Table 1 documents the essence of a quality management system as it addresses most of the requirements

the basis of appropriate education, training, skills and experience”.

Packages (works that have been grouped together for delivery under a single contract or a package order issued in terms of a framework agreement) can in terms of the IDMS be delivered as a programme of projects or an independent project. The draft National



Treasury standard for an IDMS identifies the roles associated with the implementation of a package and assigns responsibilities for such roles. Roles are identified for a principal programme/project manager, project leader, lead designer, designer, cost consultant,

in assigning functional responsibilities to particular persons (officials, professional service provider or contractor). This ensures flexibility. For example, in some programmes of projects different individuals will be assigned functional responsibilities for each of the identified

- the setting of standards of professional qualifications and practice
- the keeping of a register of qualified persons and the awarding of titles
- determining the conduct of registrants
- the investigation of complaints and disciplinary sanctions for professional misconduct.

### **Persons registered with the statutory body governing a profession have the necessary generic skills that are required to implement the IDMS**

procurement leader, contract manager, supervising agent and health and safety agent. The draft National Treasury standard for a CPS also assigns technical responsibilities to a documentation review team and an evaluation panel, and governance responsibilities to a construction procurement committee and delegated authority.

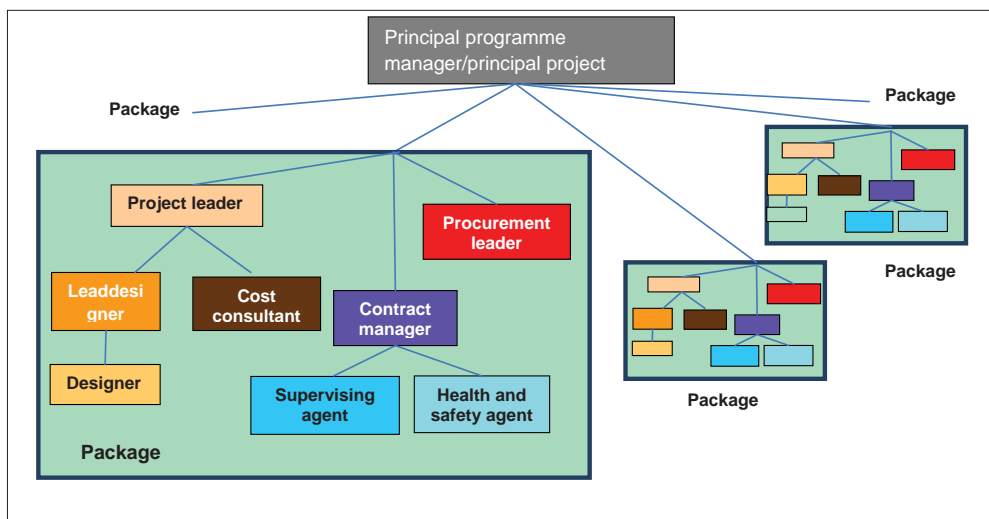
The basic lines of reporting for each package within a programme of projects or an independent project are set out in Figure 4. There are many options available to an implementer

roles. In other programmes it may be desirable to combine functional roles and responsibilities, e.g. the project leader can also be the procurement leader and the same person can be appointed to function as project leader, lead designer, designer and cost consultant or the contract manager and supervising agent.

There are a number of Acts which establish statutory councils to regulate the architectural, project and construction management, engineering, landscape architectural and quantity surveying professions through:

Persons registered with the statutory body governing a profession have the necessary generic skills that are required to implement the IDMS. Categories of registration within a profession can easily be linked to some of roles and responsibilities in Figure 4. There are, however, overlaps in the services offered by different professions when it comes to the roles relating to principal programme/project manager, project leader, procurement leader and contract manager.

Registration in a relevant and appropriate category of registration with a relevant council is a good starting point in meeting the ISO 9001 requirement for “personnel performing work affecting conformity to product requirements shall be competent on



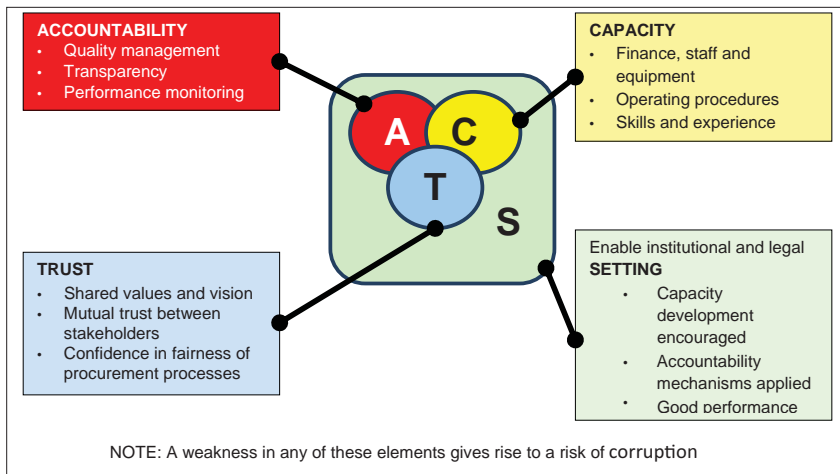
**FIGURE 4:** Basic lines of reporting for assigned functional responsibilities for each package

the basis of appropriate education, training, skills and experience". There is, however, a need to establish a system that recognises demonstrated ability to perform specific

outcomes relating to the IDMS in order to ensure that those who perform key tasks associated with the IDMS not only have appropriate education, training, skills and experience, but also the necessary contextual knowledge to do so. What is required is for categories of registration to be established, for example:

- IDMS practitioners to apply the draft National Treasury standard for an IDMS
- construction procurement practitioners to undertake a range of activities in accordance with the draft National Treasury standard for an IDMS and the National Treasury standard for a CPS
- construction procurement evaluators to serve as members of a documentation review team or an evaluation panel
- contract managers to undertake the administration of a contract strictly in accordance with the provisions of the form of contract selected by the client, i.e. FIDIC, JBCC, NEC3 or SAICE's GCC, and any targeted procurement procedures included in the contract. The categories of professional registration provided by the South African Council for Project





**FIGURE 5** The ACTS framework for the drivers of performance (After Goldie-Scot, 2013)

and Construction Management Professions (SACPCMP) have the sharpest focus of all the built environment councils on supply chain management and contract management. It is also the council with the most dual

registrations as many of its members are also registered with other councils governing other professions. The SACPCMP is empowered in terms of its governing legislation to create specified categories of registration in terms of its governing legislation to support the effective implementation of government's IDMS and CPS. The SACPCMP is currently exploring the establishment of additional categories of

registration to support the implementation of government's proposed IDMS.

#### Extending the IDMS to municipalities

The principles for the procurement and delivery of infrastructure expressed in the National Development Plan 2030 need to be extended to the relevant municipalities. There is no reason why the draft National Treasury standards for an IDMS and a CPS cannot be implemented within municipalities. There are many benefits in doing so, particularly if accreditation is linked to standards. It makes no sense in having separate standards for different spheres of government involved in the delivery and maintenance of infrastructure. Any specifics, for example, that relate to portfolio planning processes, can be accommodated by making minor variations to some of the activities within these standards.

The draft PFMA regulations embed the standards in the regulations and in so doing link the standards to the PFMA. These standards also need to be linked to the Local Government:

Municipal Finance Management Act (MFMA) of 2003. Section 111 of the MFMA requires that “each municipality and each municipal entity must have and implement a supply chain management policy that gives effect to the provisions of this part.” Section 112 requires that the supply chain management policy of a municipality or municipal entity comply with a regulatory framework for municipal supply chain management, which, as a minimum, must cover a number of areas identified in the MFMA. Regulation 3 of the Supply Chain Management Regulations issued in terms of this Act requires that the accounting officer prepare and submit a draft supply chain management policy to the council for adoption, review the policy annually and, where necessary, submit proposals to the council for adoption. The accounting officer may make use of any National Treasury guidelines determining standards for such policy and submit such policy or any modified version as a draft for adoption. Where the policy deviates from the guideline standard issued by the National Treasury, the accounting officer is required to develop such a policy so that it complies with the constitution, the MFMA, the Regulatory Framework contained in the regulations and other legislation, and does not undermine the objective for uniformity in supply chain management systems between organs of

state in all spheres. The accounting officer is also required to report any deviations from the guideline standard to National Treasury and the relevant provincial treasury.

National Treasury in 2005 issued a Municipal Supply Chain Management Model Policy in

2013). The National Treasury standards, read together with the draft PFMA regulations, not only establish the “setting”, but also the “accountability” and part of the “capacity” and feed into “trust”. The SACPCMP has the opportunity to complete “capacity” in a meaningful

## In terms of this framework, “accountability” makes it happen. “Capacity” makes it possible. “Trust” makes it flourish

terms of the MFMA. National Treasury needs to issue a Municipal Supply Chain Management Model Policy for the Delivery and Maintenance of Infrastructure to enable the National Treasury standards to be adopted within municipalities. Consideration may also have to be given to making some minor amendments to the MFMA SCM regulations.

### Conclusions

Strengthening the drivers of performance can reduce corruption as indicated in the Accountability Capacity Trust Setting (ACTS) framework presented in Figure 5. In terms of this framework, “accountability” makes it happen. “Capacity” makes it possible. “Trust” makes it flourish. Enabling institutional and legal “setting” allow it to continue (Goldie-Scot,

way should it accredit practitioners through its governing legislation.

The National Development Plan sets a clear agenda for the redesigning of the current procurement and SCM systems to deliver value for money, while minimising the scope for corruption so that the needs of South Africans are better met. National Treasury has aligned the revised Public Finance Management Act regulations for the delivery and maintenance of infrastructure with this agenda, but still needs to extend this to municipalities through the Municipal Finance Management Act. In order to effectively implement the agenda, set by the NPC, statutory councils for built environment professionals need to focus on providing government with the right skills set to effectively implement the new system. **35**

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