



## Wit's Infrastructure Delivery Management System

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### 1 Introduction

Infrastructure comprises fixed assets that are constructed or result from construction operations. An Infrastructure Delivery Management System comprises the following systems which interact with other systems within an organisation (see Figure 1):

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

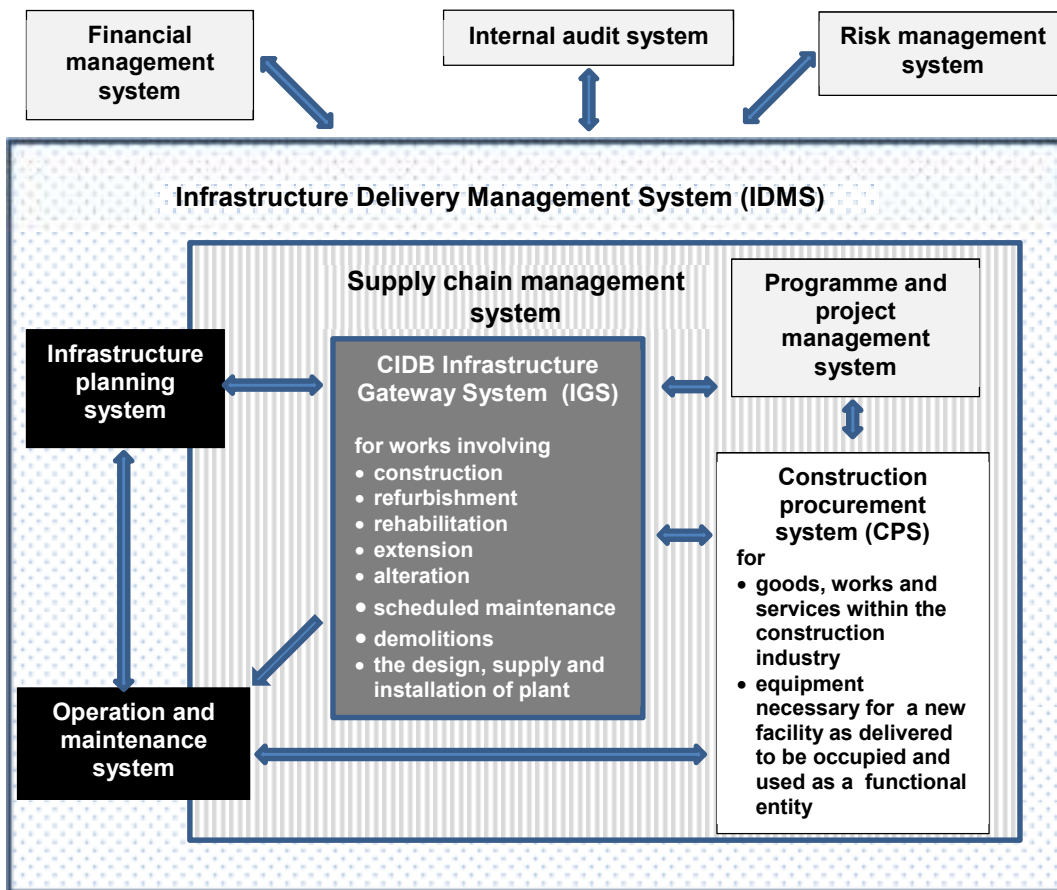


Figure 1: The linkages between systems and systems within an IDMS

### 2 Supply chain management systems

Supply chain management involves the design, planning, execution, control, and monitoring of supply chain activities in the delivery of products and services with the objective of creating net value. It provides oversight and co-ordination of information and finances within the supply chain. The supply chain management function as such links into all the other organisational systems as illustrated in Figure 1.

There are a number of distinctly different supply chains. For example, the supply chain for the supply of general goods (i.e. manufactured products or materials) involves demand management, the sourcing, purchasing, receipt, storage and issuing of goods to employees (end users), while the supply chain for services simply involves demand management and procurement. On the other hand, the supply chain for the delivery of infrastructure involves planning processes at both a portfolio and package<sup>1</sup> level and the procurement and management of a network of suppliers, including subcontractors to produce a product on a site (i.e. works). The risks that need to be managed and the performance metrics between a supply chain involving the delivery of infrastructure is very different to one involving the purchasing, storing and issuing of goods.

### 3 The supply chain management system for infrastructure

#### 3.1 Overview

The supply chain management system (i.e. set of interrelating elements comprising processes which transform inputs into outputs) which is embedded in the IDMS comprises the following three elements (see Figure 2):

- the CIDB Infrastructure Gateway System:
- programme and project management system; and
- a construction procurement system.

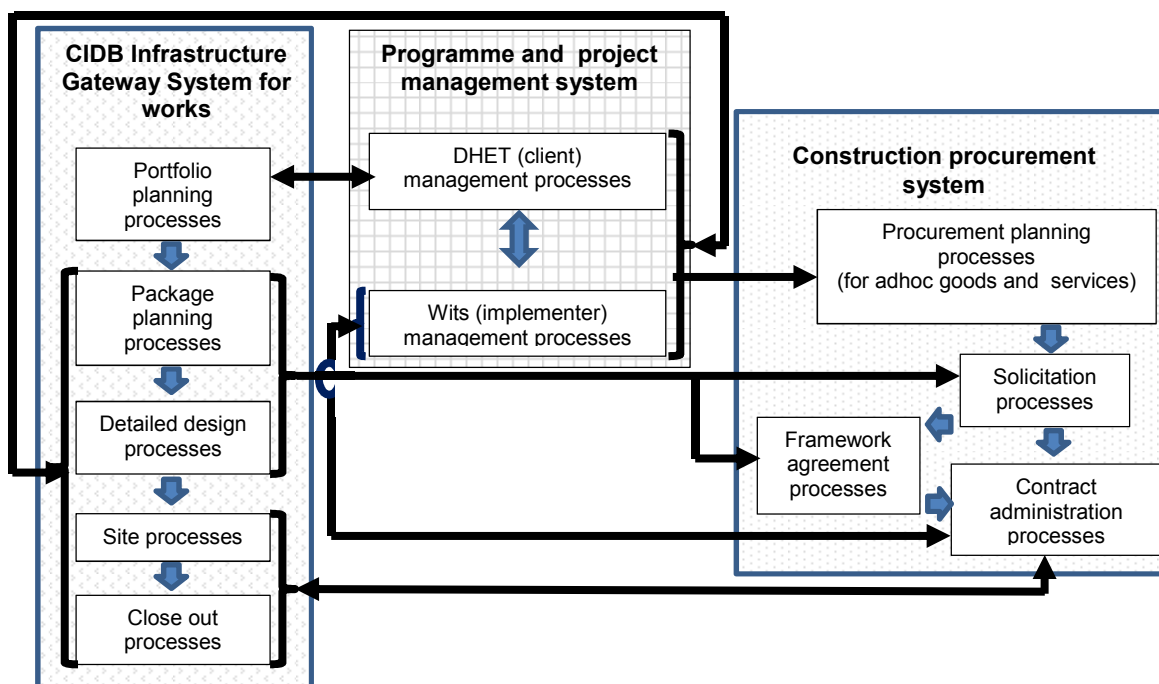


Figure 2: Supply chain management processes embedded within the IDMS

#### 3.2 CIDB Infrastructure Gateway System

The CIDB Infrastructure Gateway System (IGS) provides a number of control points (gates) in projects relating to the delivery and maintenance of infrastructure where a decision is required before proceeding from one stage to another. Such decisions need to be based on information that is provided and if correctly executed, provides assurance that a project involving the delivery or

<sup>1</sup> A package is construction works which have been grouped together for delivery under a single contract or a package order. A package order is the instruction to carry out construction works under a framework agreement.

maintenance of infrastructure remains within agreed mandates, aligns with the purpose for which it was conceived and can progress successfully from one stage to the next.

The CIDB IGS is based on the information flow as set out in Table 1.

**Table 1: Gates, stages and end of stage deliverables in the Infrastructure Gateway System**

Gate No	Information (deliverable) provided for a decision to be made at a gate / conclude a stage	Stage	
		No	Description
<b>Activities at a portfolio level</b>			
1	Infrastructure plan which identifies long term needs and links prioritised needs to a forecasted budget for the next few years	1	Infrastructure planning
2	Construction procurement strategy for implementing the infrastructure plan in the medium term	2	Procurement planning
<b>Activities at a package level</b>			
3	Strategic brief setting out the package information for a package	3	Package planning
4	Concept report setting out the integrated concept for the package	4	Package definition
5	Design development report setting out the integrated developed design for the package	5	Design development
6A	Production information which enables construction or the production of manufacturing and installation*	6	Design documentation
6B	Manufacture, fabrication and construction information for construction		
7	Works completed in accordance with requirements	7	Works
8	Works handed over to user complete with record information	8	Hand over
9A	Updated asset register	9	Close out
9B	Completed contract or package order		

### 3.2 Programme and Project Management System

The DHET (client) management system (governance and co-ordinating structures) is set out in the Agreement made and entered into with Wits. This agreement makes provision for a steering committee and an integration committee. The agreement requires Wits to project manage and resource the spatial and physical planning and development for the two new institutions in accordance with the approved preliminary Phase 1 Implementation Plan. It may be amended each year to authorise further work and expenditure as the project unfolds. (Authorisation for expenditure follows government's annual budgeting processes.)

Wits's Campus Development and Planning Unit has established programme and project management systems to manage projects associated with the delivery of the two new universities.

### 3.3 Construction procurement system

Procurement is the process which creates, manages and fulfils contracts. Procurement commences once a need for goods, services, engineering and construction works or disposals has been identified and it ends when the goods are received, the services or engineering and construction works are completed or the asset is disposed of.

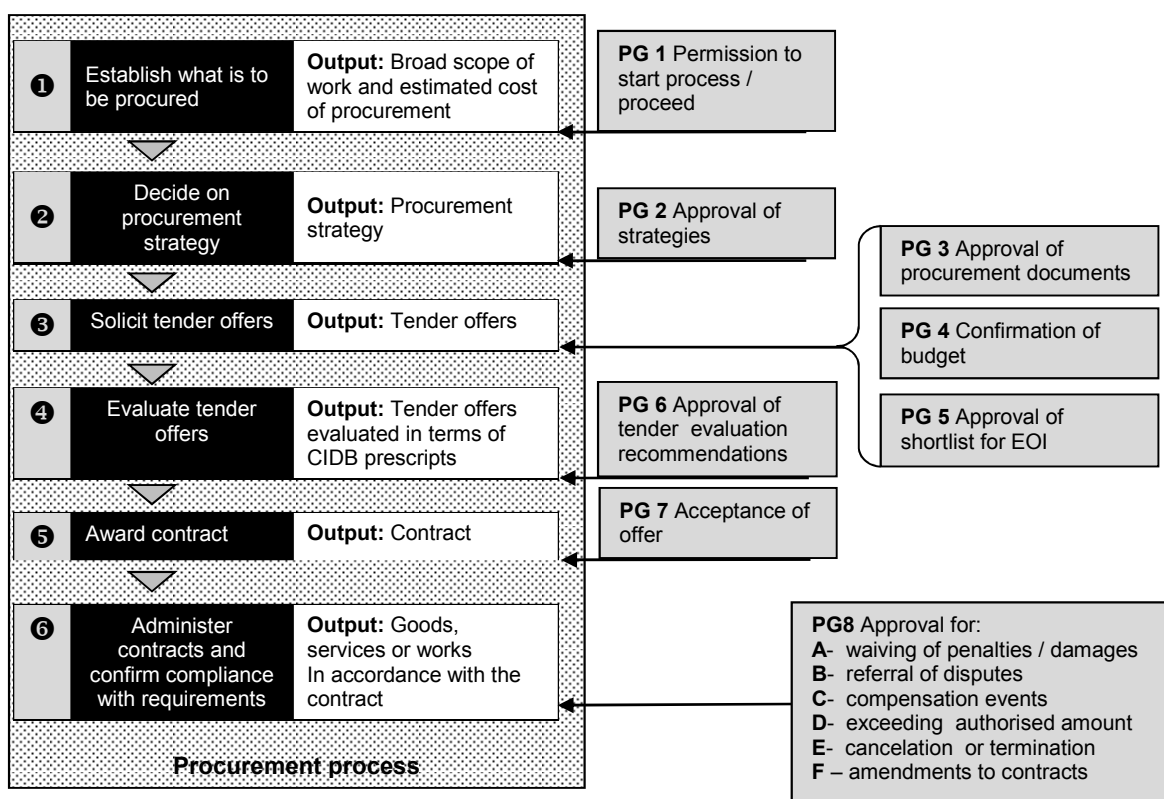
There are six basic activities associated with procurement processes which establish actions and deliverables / milestones associated with the procurement process as indicated in Figure 3. Procedures and methods used in conjunction with policies guiding the selection of options and the application thereof are required to implement these procurement processes. Procurement documents are needed to communicate to tenderers a Wit's procedures and requirements up to the award of a contract and to establish the basis for the contract that is entered into with the successful tenderer i.e.

the agreed terms and conditions, the prices and the nature and quality of the goods, services or construction works that are required.

Procurement processes and procedures need to be managed and controlled (see Figure 3). Accordingly, governance activities need to be linked to milestones in the procurement process. At the same time, policies are required to govern the usage and application of particular procurement procedures, requirements for recording, reporting and risk management, procedures for dealing with specific procurement related issues, assignment of responsibilities etc.

Procurement processes are accordingly underpinned by methods and procedures and are informed and shaped by the policies of the procuring entity. A procurement system accordingly comprises:

- rules and guidelines governing procedures and methods;
- procurement documents which include terms and conditions, procedures and requirements;
- governance arrangements to manage and control procurement; and
- organisational policies which deal with a range of specific procurement issues.



Note: PG = procurement gate i.e. a control point

**Figure 3: Procurement activities and control points associated with the procurement process**

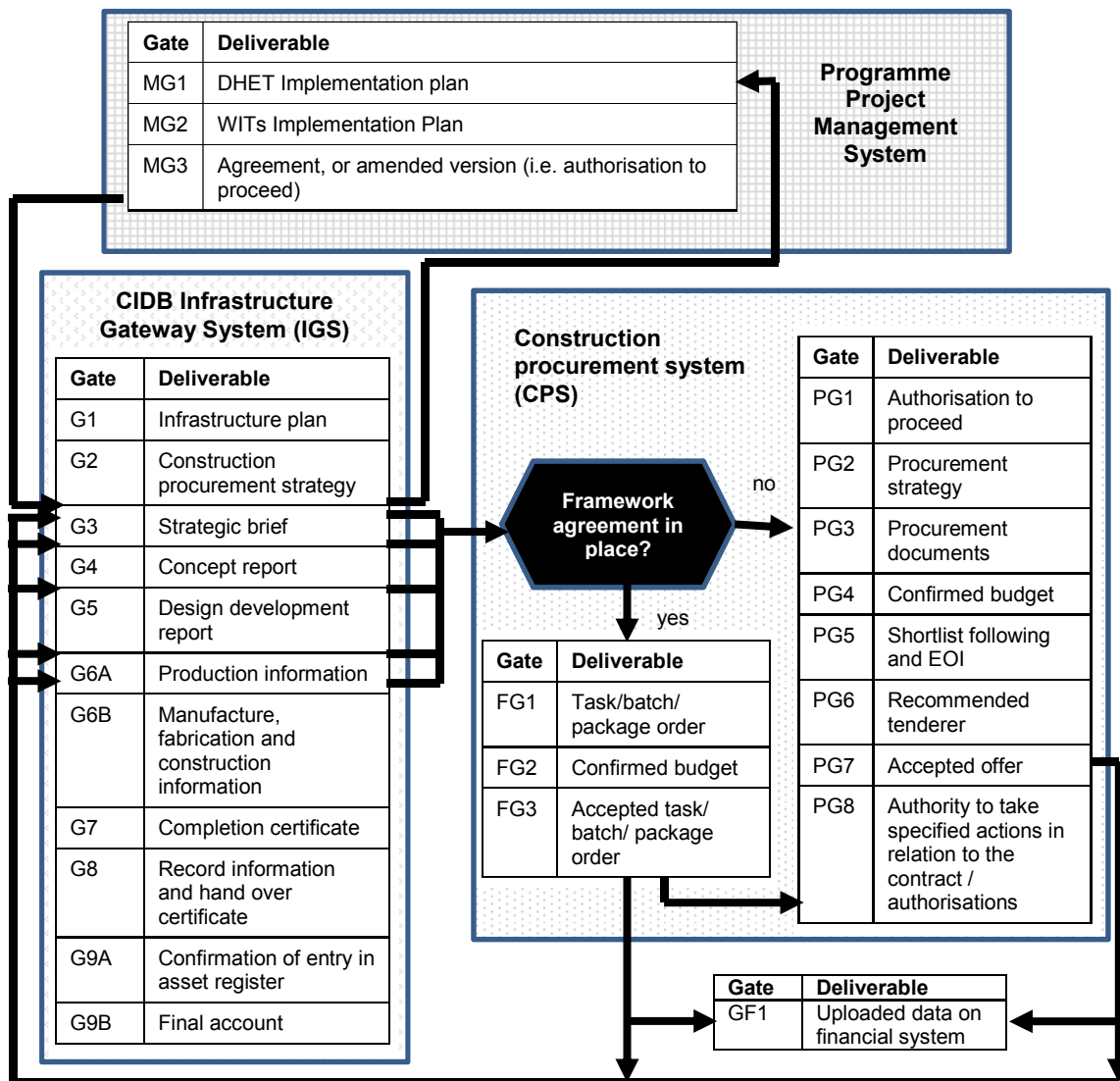
#### 4 SCM controls

There is a relationship between achieving operational objectives, managing risks and maintaining effective controls. Risk (the effect of uncertainty on objectives) can impact upon an organisation's ability to achieve objectives including those relating to compliance with legislative requirements, fraud and corruption. Operational activities can mitigate risks. Effective controls are, however, needed to reasonably ensure that:

- strategic and operational objectives are achieved;
- workplace integrity and regulatory responsibilities are met;
- resources are effectively and efficiently used and protected from fraud, waste and mismanagement;

- decision makers are provided with reliable and timely information; and
- information loss is minimised.

The SCM system comprises a number of interacting and interrelating elements with a number of processes and sub processes that convert inputs into outputs in the form of deliverables. The logical location of a control point is at the end of such processes. The IGS, CPS and the Programme and Project Management System which collectively constitute the IDMS's SCM system, incorporate gates at the end of each process or sub process which are linked to deliverables as shown in Figure 4. These gates (or control points) require a decision to be made before proceeding and are in the main tied tightly to the management of risks.



Note: The linkages between IGS gates and CPS gates are dependent on the contracting strategy that is adopted

**Figure 4: Gates (control points) within infrastructure processes**