

The role of the public sector in driving building programmes: alternative delivery models for infrastructure delivery

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Outline

- The evolution of the construction contracts
- The traditional approach to the delivery of public infrastructure
- Alternative approaches
- Current public sector realities
- A strategic approach to procurement
- The client as a driver of change

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Civil engineering in the UK

There were no civil engineering works of significance in the UK after the collapse of the Roman Empire until 1768

John Smeaton started the construction of the Clyde canal in 1768 providing a route for sea-going vessels between the Firth of Forth and the Firth of Clyde at the narrowest part of the Scottish Lowlands

This 35 mile canal was completed in 1790



Smeaton in 1768 he set down his management scheme for the construction phase with detailed tables of responsibility for:

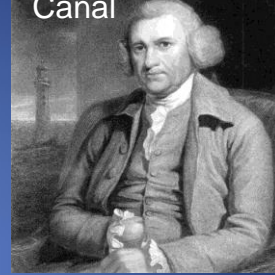
- the engineer in chief,
- the resident engineer and
- the 'surveyors' for the various geographical sections working under him.

This provides a model which is still used today – master servant

He favoured using contractors rather than directly employed labour, provided the contractor was not selected on the basis of the lowest tender.

Contracts based on a “master – servant relationship”

Forth and Clyde Canal



Sir Joseph Bazalgette's standard form of contract for London's major sewer projects and the embankments on the Thames 1860s was adopted by the Metropolitan Board of Works.

Model for first edition of the ICE contract published in 1945.

Standard forms of contract

Based on master servant relationship

Collaborative contracts

The basic interaction between Engineer and Contractor has mutated over the last hundred and fifty years from 'master and servant' to a simple collaboration between two specialist contributors.

Dr Martin Barnes, CBE



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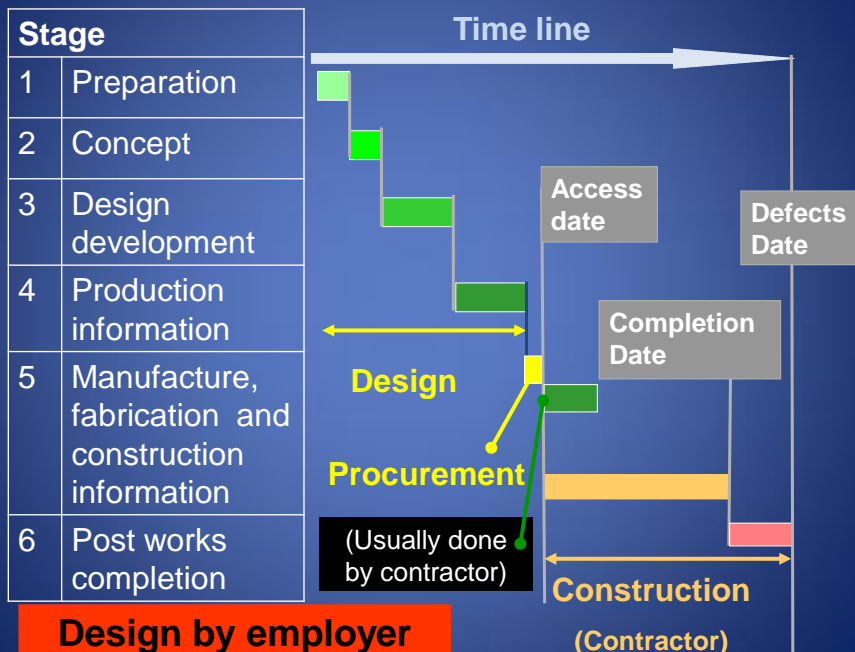
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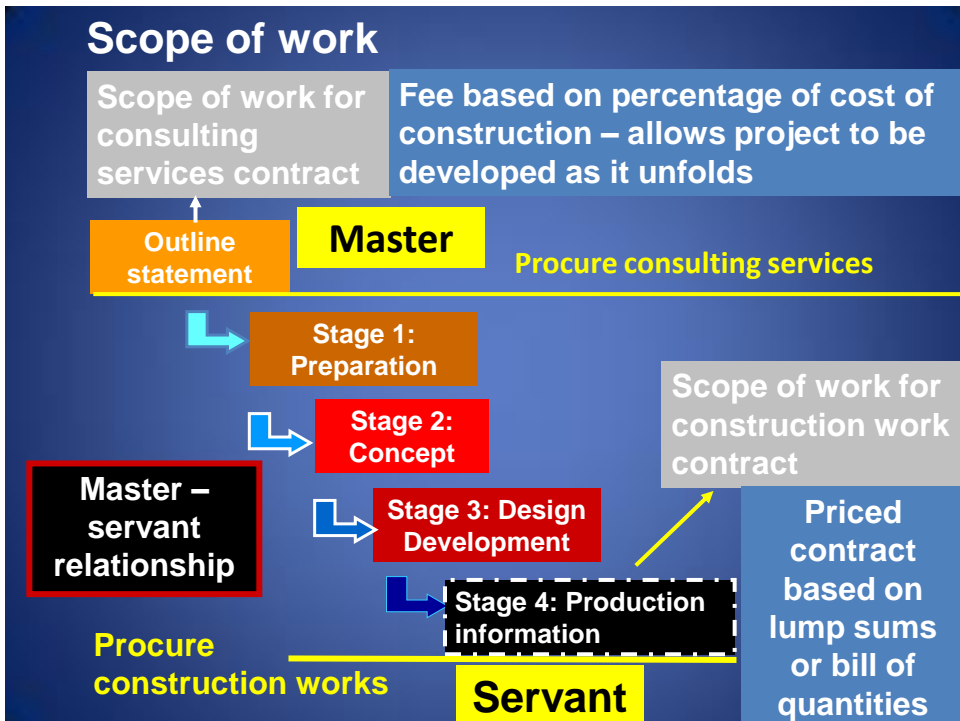
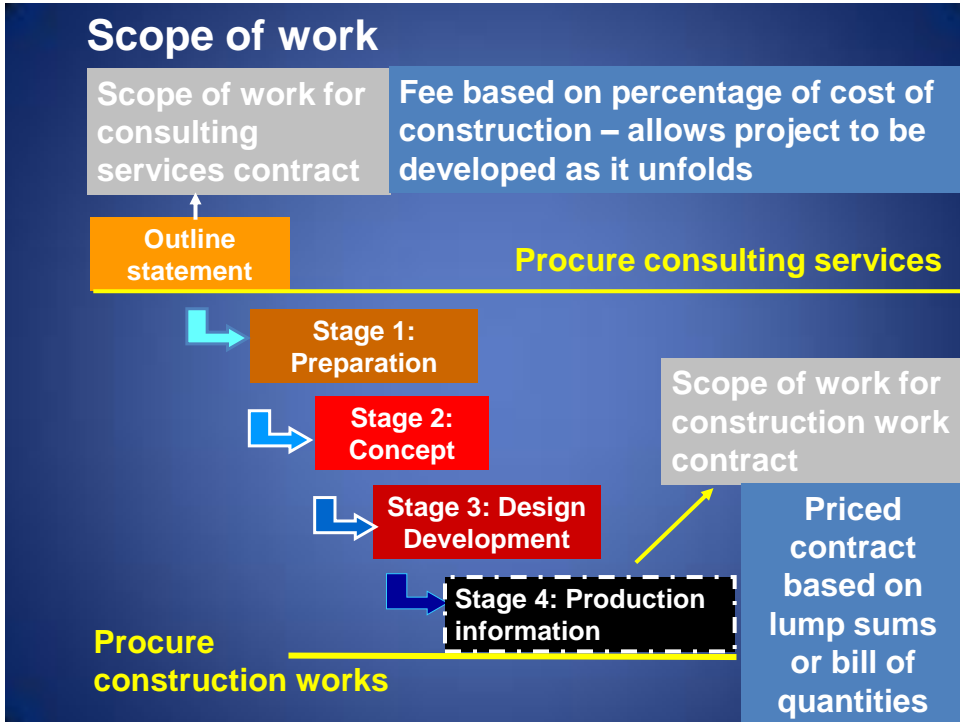
Structure of a contract (CIDB Standard for Uniformity in Construction Procurement)

Form of offer & acceptance	Formalises the legal process of offer and acceptance
Contract data	Establishes the risks, liabilities and obligations of the contracting parties and the procedures for the administration of the contract.
Pricing data	Records contractor's prices
Scope of work	Specifies and describes what is to be provided and any other requirements and constraints relating to the manner in which the contract work is to be performed
Site information	Describes the site as at the time of tender to enable the tenderer to price his tender and to decide upon his method of working and programming and risks.

Also known as works information or specifications

Traditional preplanned approach





Traditional forms of contract

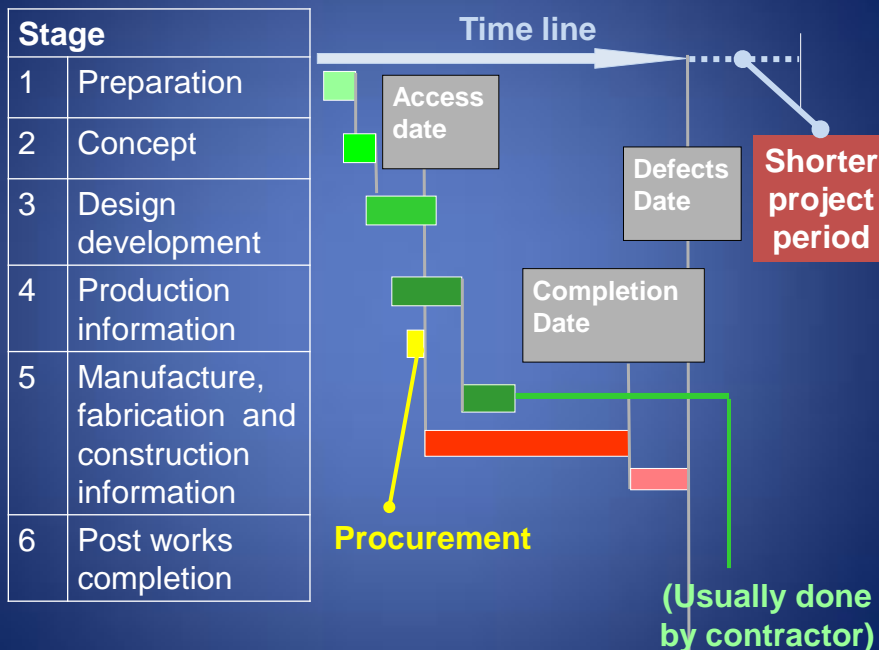
- framed around
 - the **design by employer** contracting strategy
 - **lump sum** contracts or **bills of quantity**

Design by employer	Contract under which a contractor undertakes only construction on the basis of full designs issued by the employer
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Lump sum	The Contractor undertakes to break the scope of work down into activities and price each activity as a lump sum, which he is paid on completion of the activity.
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Bill of quantities	The Contractor is paid an amount for the item of work in the bill which is the rate for the work multiplied by the quantity completed
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“Fast track” preplanned approach

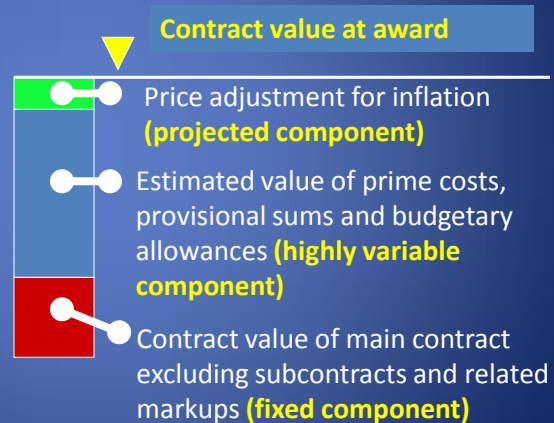


“Fast track” projects

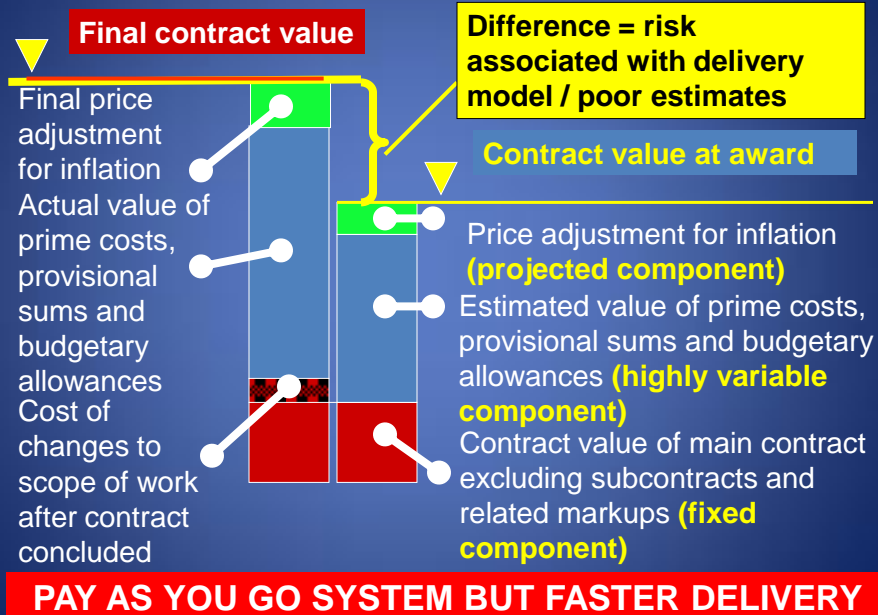
What happens if all the work cannot be identified at the time when the contract is concluded ?

- **Prime costs** – amounts stated which the contractor is to assume for materials or plant when building up his prices (adjusted when actual cost is known)
- **Provisional sums** for
 - work items not designed but identified including work by nominated and selected subcontractors
- **Budgetary allowances** for risk (uncertainty) and unforeseen items

Fast track projects



Cost overruns on fast track projects



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 Example

Office of Government Commerce (UK)

Common Minimum Standards for Procurement of Built Environments in the Public Sector

Procurement strategies and contract types must support the development of **collaborative relationships between the government client and its suppliers and shall facilitate the early appointment of integrated supply teams (each part of which should incorporate an integrated supply chain)**

Guidance states:

Traditional, nonintegrated procurement approaches should not be used unless it can be clearly **shown that they offer best value for money – this means, in practice they will seldom be used**

Alternative contract strategies

Management contract	Contract under which a contractor is responsible for planning and managing all post-contract activities and for the performance of the whole of the contract
Design and construct	Contract in which a contractor designs a project based on a brief provided by the client and constructs it
Develop and construct	Contract based on a scheme design prepared by the client under which a contractor produces drawings and constructs it

Alternative contract strategies

Stage	
1	Preparation
2	Concept
3	Design development
4	Production information
5	Manufacture, fabrication and construction information
6	Post works completion

Award contract

Management contract

Scope of work based on strategic brief

Note

Contractor responsible for later design stages
Consultant reviews contractor's design against project brief

Alternative contract strategies

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Award contract

Design and construct contract

Scope of work based on concept report

Note

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Note
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Alternative pricing strategies

Cost reimbursable contract

Fee includes profit and company overheads

Fee

Wages and salaries + Site overhead percentage

+
Materials at open market rates

Fee includes profit and superintendence

Fee

+
Equipment at agreed rates, market related rates or percentage up or down on a hire list

Subcontract costs

Alternative pricing strategies

Target contract

Addresses
productivity

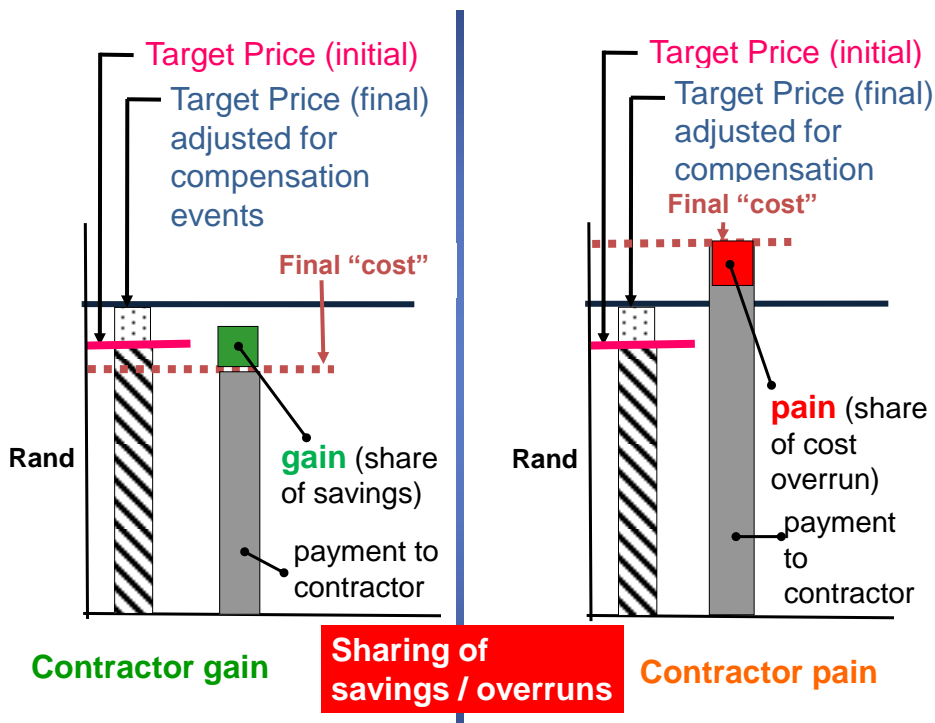
Used where the client wishes to share the cost risk

Total of tendered prices is the 'target'

- controls productivity
- kept equitable by adjusting the target to accommodate scope changes and events that are the Employers risk etc
- target not reduced where changes to the scope of work proposed by the Contractor are accepted by the Employer

Paid on a cost reimbursable basis

Over-run (pain), under-run (gain) is shared per an agreed formula



What is a framework agreement?

ISO / DIS 10845-1, Construction procurement – Part 1: Processes, methods and procedures,

A framework agreement is an agreement between an organization and **one** or **more** contractors, the purpose of which is to establish the terms governing contracts to be awarded during a given period, in particular with regard to price and, where appropriate, the quantity envisaged

Framework agreements allow the employer to procure work on an as-instructed basis over a set term without necessarily committing to any quantum of work

Principles

Framework agreements

- are entered into following a competitive selection process
- need to establish the following as a minimum:
 - the basic terms of the contract
 - the term of the contract (3 or 4 years)
 - the broad scope of the work which may form the basis of a package order
 - the basis by which contractors are to be remunerated for instructed work
 - the manner in which competition between framework contractors may be reopened (where more than one contractor is admitted to a framework agreement)

Essential elements of a framework agreement

A **package** is works within the scope of work of a framework agreement which is instructed within a stated period of time

A **package order** is an instruction to carry out a **task** and may only be issued within the term of the agreement

A **framework contract** is only entered into with those who have the capability and capacity to carry out the likely work

A framework agreement is a contract where the terms of payment are agreed in the absence of a detailed scope of work

Pricing strategies

Lump sum

Bills of quantities

Activity schedule

Cost reimbursable

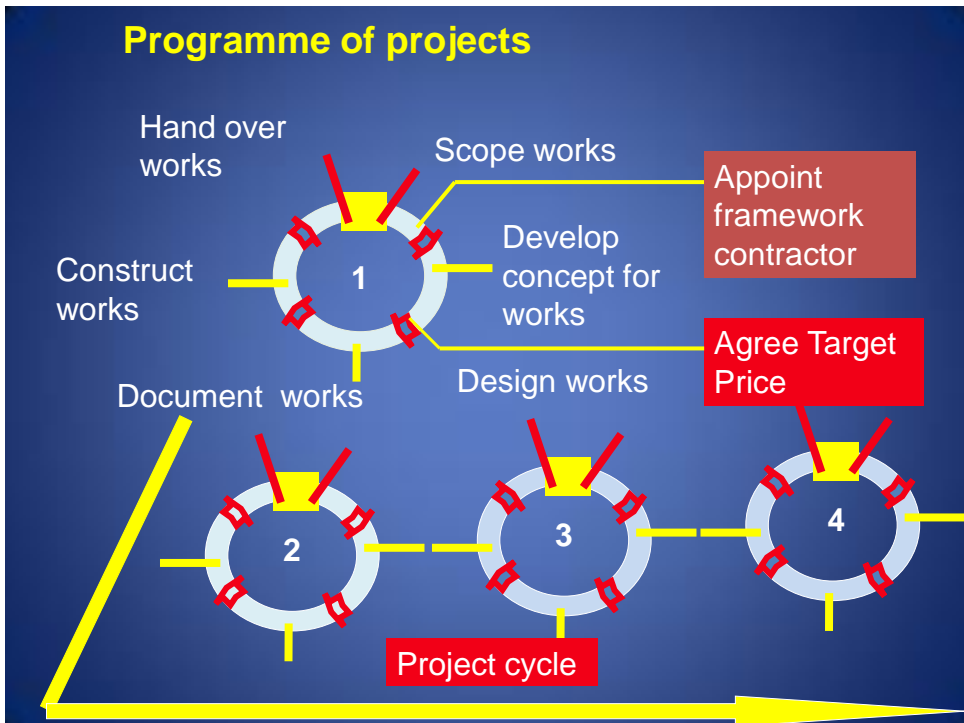
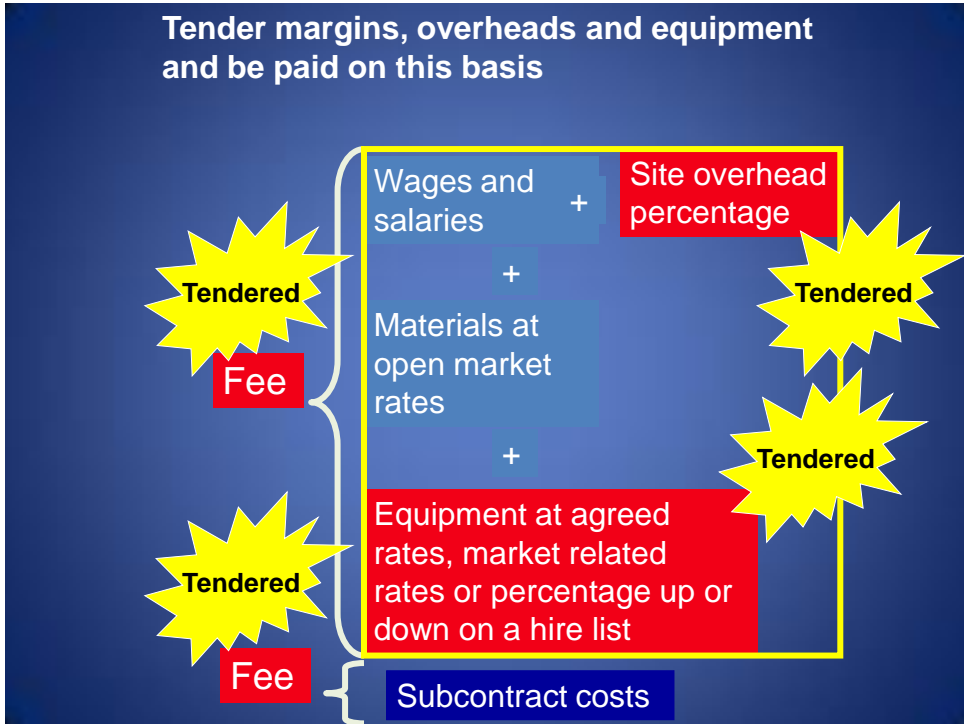
Target cost

Not suitable –require scope of work to price the work

Possibly – but what about productivity?

Suitable – as a cost parameters can be pre-agreed and target can be negotiated

Early contractor involvement possible with target contracts using design by employer or design, construct or develop and construct contracting strategy



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Africa infrastructure country diagnostic

Overhauling the engine of growth: Infrastructure in Africa by Vivien Foster – September 2008

Focuses on 24 countries that together account for 85 % of GDP, population and infrastructure aid flows of Sub-Saharan Africa

Getting more out of current spending

Countries typically only manage to execute about two thirds of the budget allocated to investment in infrastructure

Observation

public investment can increase by 50% by simply addressing institutional bottlenecks that inhibit capital budget execution including better planning of investment projects, earlier completion of feasibility studies, more efficient procurement processes and multi-year budgeting

President Zuma in his 2011 State of the Nation address announced

- government will be spending R846 billion over the next three years on public sector infrastructure

Minister Pravin Gordhan (Finance) highlighted the following pertinent issues in the 2010 Budget Speech:

- A major site of both wastage and inefficiency is in our procurement system. Through a combination of corrupt practices, **inefficient procurement, poor planning** and, in some instances, collusion by the private sector, we are not getting the kind of value from our purchases that our people deserve.

Analysis of SA's EPWP programme (2006)

SA national cabinet raised concerns about the small size, limited impact and limited visibility of Expanded Public Works Programme (EPWP) projects

Why?

4478 municipal infrastructure grant projects

- total value of R13,2 billion
- the average size of projects was a mere R 2,8 million
- 2% of the projects exceeded R 20 million.

Provincial departments

- average size of projects was R1,9 million
- 1,4% of projects exceeded R20 million

Multiplier effect

$(n + y + z) \times \text{no of projects}$

Example (Limpopo Department of Education)

5 year programme with 2406 projects (748 maintenance) with an average value of R 2,3 m

Assume 1 x Qs, 1 x Architect and 1 x Civil / structural engineer plus 0,1 project managers for non maintenance and 0,5 for maintenance projects

No of contracts = $(1 + 3 + 0,1) \times 1658 + 748 \times 0,5$
= 7172 contracts

How do you manage this?

Current delivery system

- Delivered using a traditional preplanned approach to construction (design by employer) with priced contracts
- Public sector clients don't have internal design staff and outsource the design to consultants with poor controls over the design
- Each project is a contract

Results

A consultant driven, stop / start mode of delivery, often with disappointing outcomes

SA distribution of employment of engineers over time

Employer	Percentage distribution (%) of engineers and technologist	
	1967 (HRSC)	2005 (Lawless)
State owned enterprises	12	6
Government including provincial	12	4
Local government	15	10
Consultants	31	51
Industry or business	28	23
Academia	2	6

Migration from public sector to consulting sector

} Stable

Observation

There are two distinctly different strategies to address the current lack of service delivery and poor project outcomes.

- 1) **increase the numbers of built environment professionals** within government to manage and oversee the current approach to delivery.
- 2) **harnesses the capability and capacity of** the built environment professionals located within the **private sector to delivery infrastructure using a radically different delivery process**

Numbers or systems?

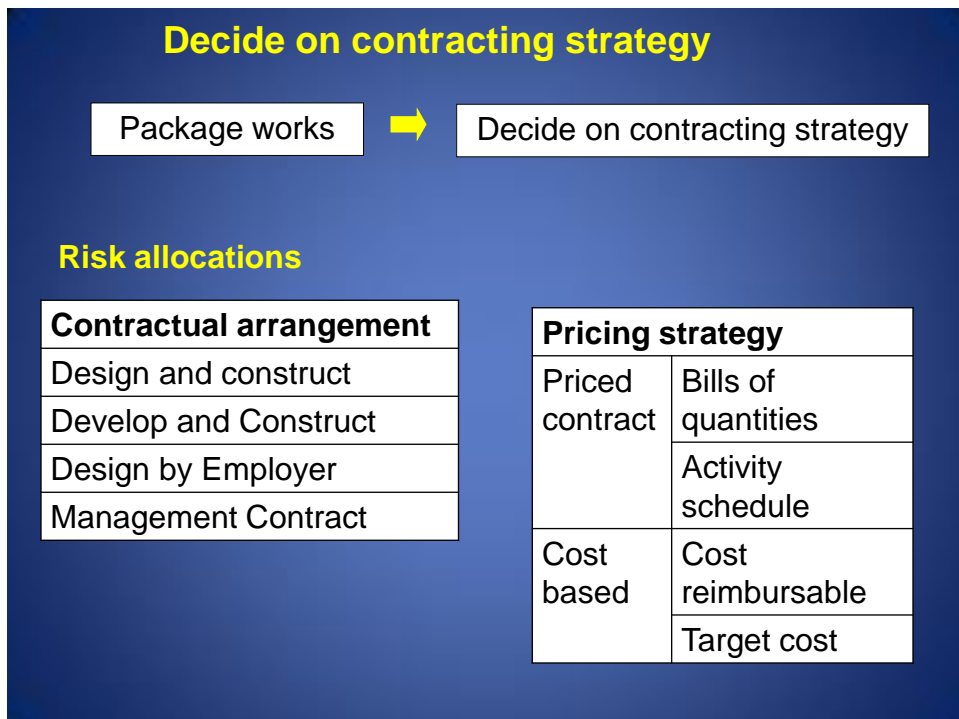
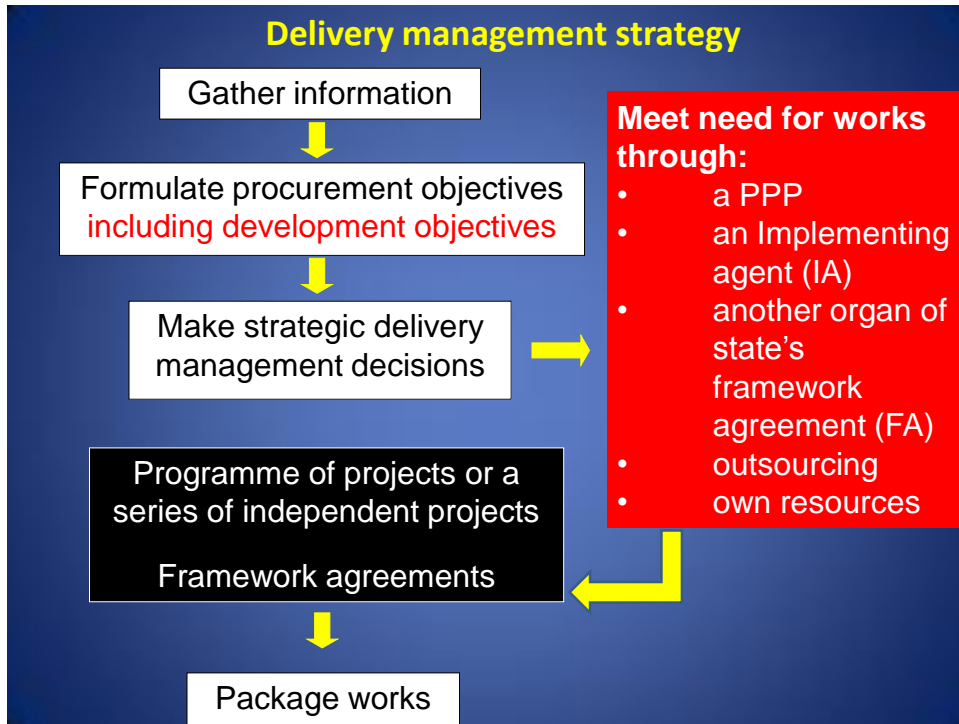
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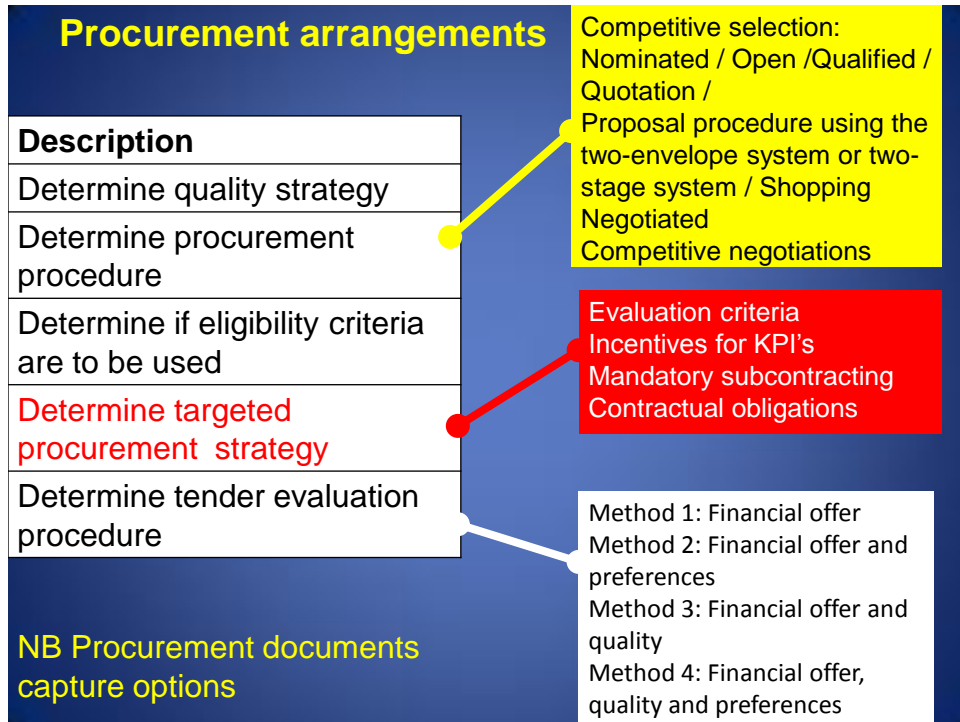
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Procurement strategy

The selected packaging, contracting, pricing and targeting strategy and procurement procedure for a particular procurement

The procurement strategy identifies the best way of achieving objectives and value for money, taking into account prevailing risks and constraints.

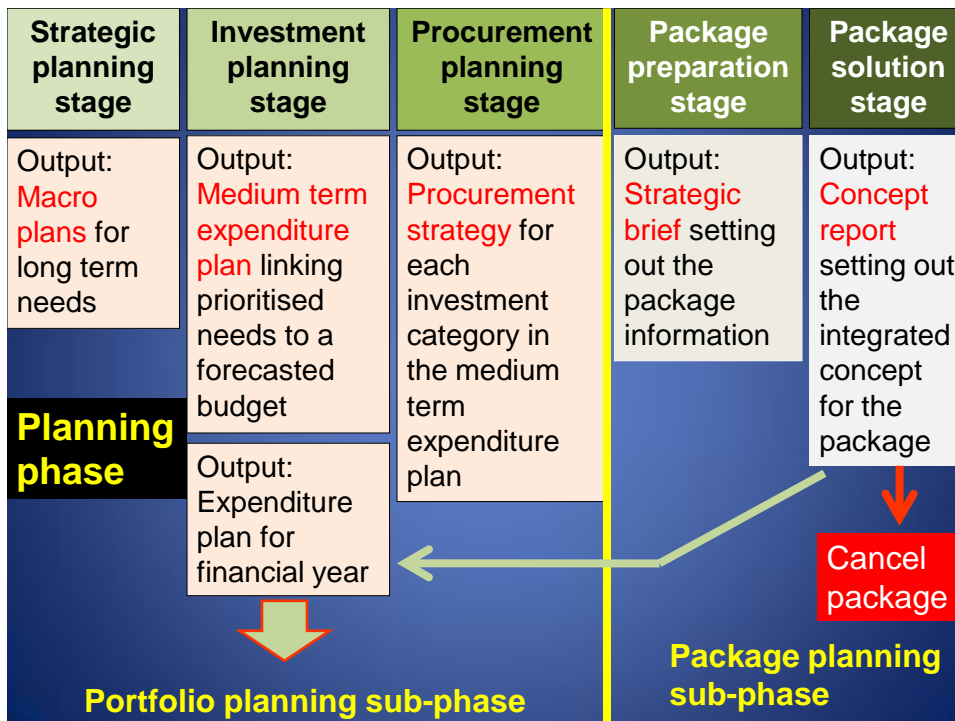
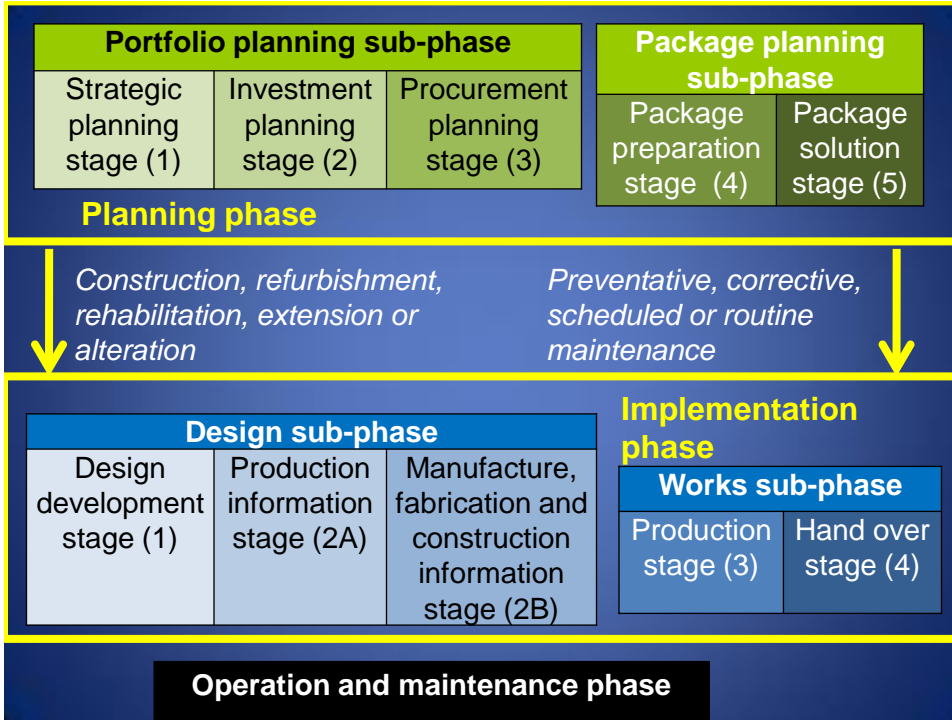




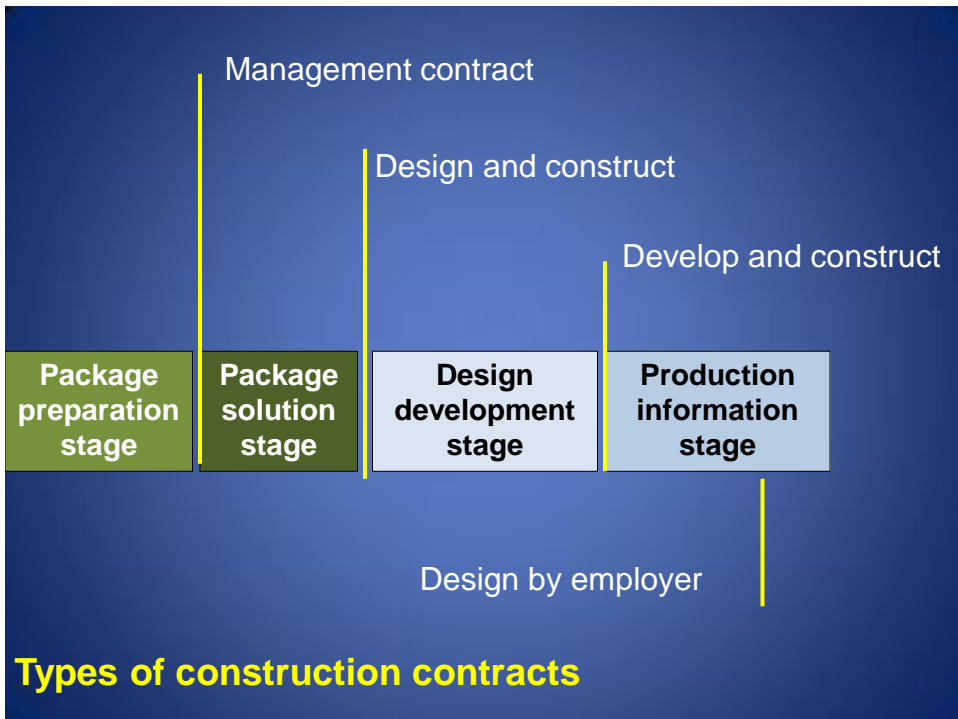
Managing the delivery process from a client's perspective

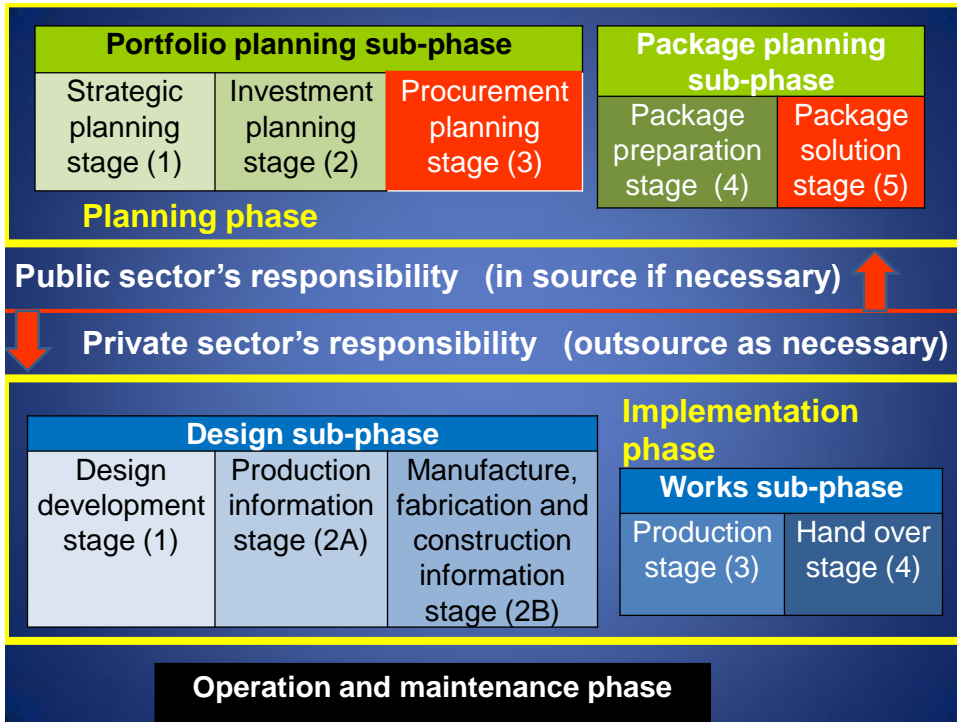
Need to

- re-examine the way in which projects are planned and implemented
- take a more strategic approach to delivery
- put in place a more rigorous approach to managing procurement
- reshape the stages of delivery to enable
 - the public sector to have a better control over implementation
 - enable any contracting strategy to be used



Design development stage	Production information stage	Production stage	Hand over stage
Output: Design development report setting out the integrated developed design for the package	Output: Production information which enables construction or the production of manufacturing and installation information for construction	Output: Works completed in accordance with the requirements	Output: Works taken over by user complete with record information and statutory certificates
Design sub-phase		Manufacture, fabrication and construction information stage	Works sub-phase
Implementation phase		Output Manufacture, fabrication and construction information for construction	





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A culture change is needed to improve performance in the delivery of infrastructure

From	To
Master-servant relationship of adversity	▶ Collaboration towards shared goals
Fragmentation of design and construction	▶ Integration of design and construction
Allowing risks to take their course or extreme and inappropriate risk avoidance or risk transfer	▶ Active, collaborative risk management and mitigation
Meetings focused on past – what has been done, who is responsible, claims. etc	▶ Meetings focused on “How can we finish project within time and budget available?”
Develop project in response to a stakeholder wish list	▶ Deliver the optimal project within the budget available
“Pay as you go” delivery culture	▶ Discipline of continuous budget control

Constructability and cost model determined by design team and cost consultant <u>only</u>	▶ Constructability and cost model developed with contractor’s insights
Short-term “ <i>hit-and-run</i> ” relationships focused on one-sided gain	▶ Long-term relationships focused on maximising efficiency and shared value
Procurement strategy focussed on selection of form of contract	▶ Selected packaging, contracting, pricing and targeting strategy and procurement procedure aligned with project objectives
Project management focussed on contract administration	▶ Decisions converge on the achievement of the client’s objectives

Clients are the drivers of change and need to call the shots – its all about setting objectives, taking a strategic approach to procurement, making appropriate choices and tightly managing a well defined process

Thank you