

**Guidelines for
Implementing Total Management Planning**

Asset Management

**ASSET PROCUREMENT
Implementation Guide**

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LIST OF ACRONYMS

BOOT	build, own, operate and transfer
BTO	build, transfer, operate
D&C	design and construct
KPI	key performance indicator
SWOT	strengths, weaknesses, opportunities, threats
TMP	Total Management Plan
WSP	Water Service Provider

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1 PURPOSE

This guide is intended to provide guidance for water service provider (WSP) practitioners and their consultants on the processes involved in establishing and implementing effective infrastructure procurement strategies and procedures and developing associated documentation.

2 ASSET PROCUREMENT

Asset procurement involves infrastructure project delivery and covers the design, construction and asset handover phases of the asset life cycle.

Outcomes

Outcomes from effective asset procurement include:

- delivery of infrastructure at the lowest life cycle cost;
- 'just in time' delivery of infrastructure, within quality and budgetary specifications to meet the requirements of the WSP and the customer.

Outputs

Outputs from the asset procurement process include:

- Asset Procurement Plan (TMP sub-plan);
- new and rehabilitated infrastructure; and
- documentation (e.g. tender and contract documents).

3 THE ASSET PROCUREMENT PROCESS

The asset procurement process is illustrated in Figure 1 and discussed in the sections that follow.

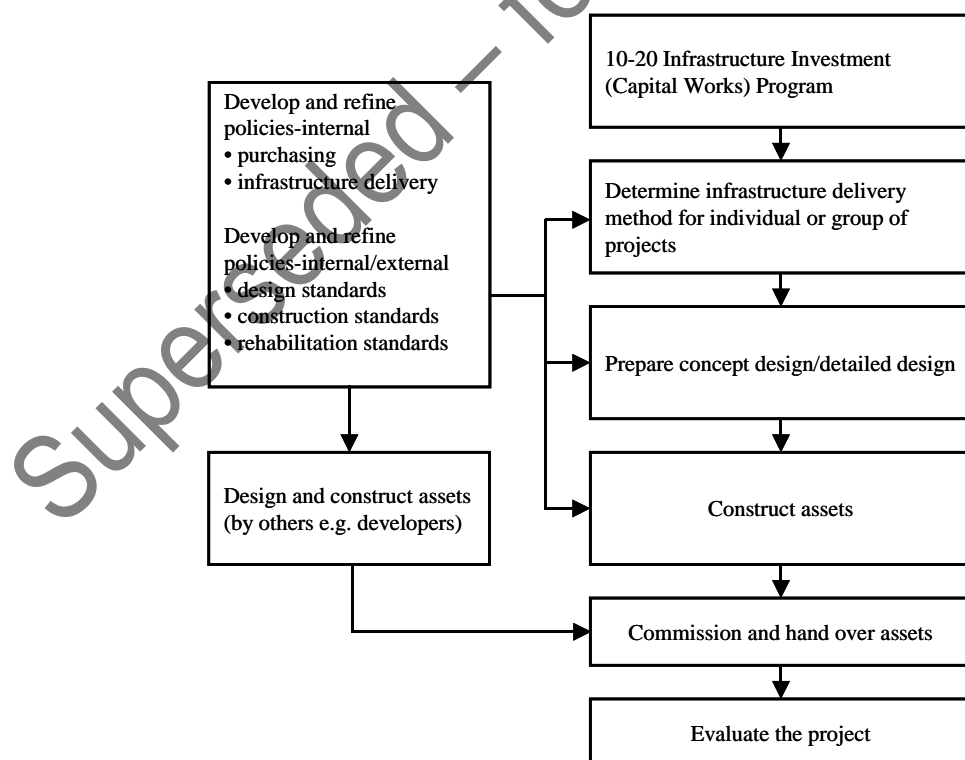


FIGURE 1: The asset procurement process

3.1 Developing and refining policies

A number of policies should be developed in relation to asset procurement. These include policies such as:

- purchasing policy;
- policy on infrastructure delivery; and
- design, construction and rehabilitation standards.

Most WSPs have a formal purchasing policy, the objectives of which are to ensure:

- value for money for services; and
- accountability to stakeholders (e.g. shareholders and customers).

Some WSPs may have a philosophical or political approach to infrastructure delivery which could be formally clarified into a policy. A WSP's policy on infrastructure design, construction and rehabilitation standards is usually reflected in either:

- a formal infrastructure standards document; or
- reference to generic or national codes such as published by the Water Services Association of Australia (WSAA) or Standards Australia.

These policies or standards are necessary to:

- minimise life cycle costs;
- clarify requirements within the WSP
- clarify the requirements of external consultants, contractors and clients (e.g. developers);
- reflect the WSP's operation and maintenance experiences and requirements; and
- ensure a consistent approach to infrastructure development.

A formal infrastructure standards document would cover such issues as:

- design approval processes;
- construction and acceptance of infrastructure;
- design criteria and sizing of components;
- construction materials/standards;
- design details;
- standard drawings;
- construction specifications; and
- asset commissioning and handover procedures.

3.2 Determining the infrastructure delivery method

The method of infrastructure delivery may need to be determined in the planning stage, because some options impact on a WSP's financial projections. For example, the financial impact of funding a treatment plant from revenue or headworks funds will be totally different from that of funding it through a build, own, operate, transfer (BOOT) arrangement.

Infrastructure delivery needs to be consistent with a WSP's service delivery strategy. A summary of infrastructure delivery issues addressed by other organisations is given in Table 1 (also 'References and further reading').

TABLE 1: Summary of alternative infrastructure delivery options

Option	Process	Applicability
Sequential design and construction	Involves separate stages for design and construction. These stages could be undertaken by in-house teams or external contractors.	Suited to a large proportion of urban water and sewerage projects, including those where a reasonably detailed concept design needs to be developed (e.g. a dam or a pipeline in an environmentally sensitive area) or where, due to the nature and location of the works, there is little scope for post-tender innovation.
Design and construction (D&C)	A single company is responsible for both design and construction of the project, based on meeting explicit performance requirements. WSP takes over and operates infrastructure.	Suited to projects costing over \$1m, where there are many options that could meet performance requirements. It is applicable for a group of treatment works or major pumping stations.
Build, transfer, operate (BTO)	A private sector company is responsible for design, construction and operation of a facility (normally 20–25 years). Ownership is transferred to the WSP after commissioning, on payment of most of the capital cost.	Suited to projects over \$5m, involving a water treatment works or sewage treatment works, where operational costs are a significant proportion of the total life cycle costs, and where WSP wishes to maintain ownership of its facilities. May also be suitable for a group of projects such as a group of small town sewerage schemes.
Build own operate transfer (BOOT)	A private sector consortium is responsible for designing, constructing, operating, owning and financing a facility for the life of the project (normally 20–25 years). At the end of this period ownership of the facility is transferred to the WSP.	Suited to 'greenfields' projects over \$20m, involving a water treatment works or sewage treatment works, where operational costs are a significant proportion of the total life cycle costs and where projects are easily separable from the rest of a WSP's business.
Alliance	Where several companies or WSPs work together to deliver the project.	In special circumstances.
Concession	This is an extension of BTO where a private sector company is responsible for operation and maintenance of the system, and capital investment required over the life of the concession, typically 20–30 years.	In special circumstances.
Build own operate (BOO)	Similar to BOOT, except that the private-sector consortium is responsible for the facility in perpetuity.	In special circumstances.

The document from which Table 1 is derived outlines factors that should be considered in selecting the most appropriate infrastructure delivery option. These include:

- net present value of costs and revenues;
- size and complexity of project — as the size and complexity of a project increases, a greater opportunity exists to explore options for infrastructure delivery;
- WSP Policies — the WSP may wish to own and operate assets;
- finance — a BOOT scheme may be attractive where the WSP wishes to avoid taking on additional debt;

- regulatory approvals — the need for a detailed concept design for regulatory approvals for certain projects may limit options to sequential design and construction;
- timing — D&C may lead to quicker project completion;
- design needs — D&C, BTO, concession or BOOT may be favoured if the best design process skills are with a contractor or operator;
- construction — BTO, concession or BOOT may be favoured for a ‘greenfields’ site with high project cost and some complexity and scope for innovation;
- operation — sequential or D&C may be favoured where a WSP's operational efficiency for similar facilities is high. BTO, concession or BOOT may be favoured where the desired technology is best available through private sector options, or where the WSP wishes to introduce a competitive element to provision of services in its area; and
- risk management — sequential would be favoured where detailed site investigations are necessary to adequately develop and cost a concept design, or where there is considerable uncertainty in demand/load projections. BTO, concession or BOOT would be favoured where the WSP wishes to transfer management of design, construction and operation interface risk to the private sector.

For each project a risk management plan should be prepared to identify how all potential risks for the delivery of the project would be managed (refer Section 3).

3.3 Assets provided by others

A significant amount (about \$150m per annum) of water industry assets are donated by others — usually developers who arrange for the design and construction of water and sewer reticulation mains and services for subdivisions.

These WSP assets are designed and constructed in accordance with the WSP's adopted design and construction standards. Audit inspections are undertaken during the construction phase to ensure that the works conform to the approved drawings and specified construction standards.

3.4 Project-managing the asset procurement process

Most WSPs will have some form of project management procedures in place. The Australian Institute of Project Management outlines nine elements of project management (refer ‘References and Further Reading’). These include the management of:

- **integration** — the processes required to ensure that various elements of the project are properly coordinated;
- **scope** — the processes required to ensure that the project includes all the work required, and only that required, for successful completion;
- **time** — the processes required to ensure timely completion of the project;
- **cost** — the processes required to ensure that the project is completed within the approved budget;
- **quality** — the processes required to ensure that the project will satisfy the needs for which it was undertaken;
- **human resources** — the processes required to make the most effective use of people involved with the project;
- **communications** — the processes required to ensure timely and appropriate generation, collection, dissemination, storage and ultimate disposition of project information;
- **risk** — the processes concerned with identifying, analysing and responding to project risk; and
- **procurement** — the processes required to acquire goods and services from outside the performing organisation.

Each WSP should set up formalised processes, at an appropriate level, to address each one of these elements.

3.5 Commissioning and handover of assets

Formalised procedures should be developed for commissioning and handing over infrastructure. Issues to be addressed include:

- asset inspection, condition and performance assessment;
- compliance tests;
- 'as constructed' drawings, including digital copies;
- asset register (attribute and cost) information, including digital copies;
- operation and maintenance manuals;
- training of WSP operation staff for specialist equipment/processes; and
- 'maintenance period' procedures and final asset acceptance.

3.6 Evaluating the project (post-completion review)

The project must be reviewed to evaluate the level of service provided and to determine opportunities for improvement. Issues to be considered include:

- achievement of project objectives such as:
 - required performance;
 - budget — capital, and operation and maintenance;
 - timeliness; and
 - quality of asset;
- appropriateness of consultants' briefs;
- design performance;
- project management/procedures; and
- comparison of performance and project costs against similar facilities.

4 RISK ISSUES

Potential risks associated with infrastructure procurement include:

- performance requirements or demand that differ from planned projections;
- regulatory approvals;
- design, construction and operation risks;
- financial risks;
- commercial risks;
- government policy changes;
- political risks;
- environmental impacts of construction activities;
- workplace injuries;
- poor contractor performance;
- business failure of contractor;
- acquisition of substandard assets; and
- inadequate community consultation.

5 TMP REQUIREMENTS

Each WSP's Total Management Plan (TMP) should include an outline of key issues and identified strategies addressing these issues for the WSP's services in respect of asset procurement. Appendix A provides indicative content and appropriate TMP development level for this sub-plan.

A hierarchy has been established to define the level to which a WSP should develop its plan under total management planning. This is discussed in more detail in the TMP Development Guide. The development level depends on the size of the WSP (in terms of the replacement cost of its assets).

REFERENCES AND FURTHER READING

Capital Project Procurement Manual: Capital works investment, New South Wales Government, Sydney, 1993.

A Guide to the Project Management Body of Knowledge, Project Management Institute, Newtown Square, PA, 2000.

Water and Sewerage Infrastructure Delivery Options, Department of Land and Water Conservation (DLWC), Local Government and Shire Association of New South Wales, 1999.

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APPENDIX A: Content and development level of sub-plan

TABLE A1: Indicative sub-plan content

Sub-plan features	Asset Procurement Plan content
Issues covered in sub-plan	<ul style="list-style-type: none"> Project management. Infrastructure delivery. Infrastructure design and construction.
Purpose of plan	<ul style="list-style-type: none"> To provide an overview of the WSP's current asset procurement process. To outline future initiatives and strategies in asset procurement.
Policies that may be required	<ul style="list-style-type: none"> Purchasing policy. Infrastructure delivery. Design, construction and rehabilitation standards.
Other Total Management Plan elements that are linked intimately to this sub-plan	<ul style="list-style-type: none"> Infrastructure Plan: provides the 10–20 year infrastructure investment (capital works) program. Asset Evaluation and Renewal: 'as constructed' and other information will be transferred onto an asset register.
External issues contributing to the current operating environment that need to be considered	<ul style="list-style-type: none"> Options that now exist in developing infrastructure, from traditional design/construction to a full BOOT model. Increased focus on capital expenditure. Contestability of design and construction services. The need to have appropriate design and construction standards in place to minimise life cycle costs.
Issues that need to be considered in summarising the status of current operations	<ul style="list-style-type: none"> Expenditure on asset procurement (10-year infrastructure investment (capital works) program for new and replacement works). Current methods of infrastructure delivery. Expenditure on design and construction using internal resources and contractors. Processes for consultant/contractor selection and management. Project management processes. Value management processes. Design, construction and rehabilitation standards. Processes for minimising life cycle costs. Procedures for acquiring, storing and using 'as constructed' information. Asset handover procedures — from day labour works, contract works and donated assets. Broad SWOT analysis of relevant operations.
Strategic basis of the plan	<p>The strategic elements forming the basis of the plan should include:</p> <ul style="list-style-type: none"> goal for asset management; objective(s) for asset procurement; adopted KPIs; and management strategies and performance targets. <p>The management strategies developed will be based on the identified key strategic issues and SWOT findings, including risk assessment, in respect of asset procurement, and on the required TMP development level.</p> <p>Many WSPs are likely to require strategies for developing appropriate standards, refining project management processes and evaluating infrastructure delivery options.</p> <p>The strategies should be supported by detailed action plans covering a period of up to 3 years.</p>
Suggested performance measures	<p>Outcome: ratio of infrastructure expenditure to programmed expenditure</p> <p>Output: percentage of projects within budget</p> <p>percentage of project overruns (\$ terms)</p>

Supporting documentation	<p>This will depend on the WSP, but typically would include:</p> <ul style="list-style-type: none"> ▪ infrastructure design, construction and rehabilitation standards document; and ▪ evaluation of infrastructure delivery options.
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TABLE A2: Required sub-plan development level

Development level ¹	Target management mechanisms of Asset Procurement Plan
3	<ul style="list-style-type: none"> ▪ Infrastructure design, construction and rehabilitation standards documented. ▪ Infrastructure delivery benchmarked against best practice. ▪ Infrastructure delivery options regularly evaluated. ▪ Formalised project management processes in place. ▪ Formalised processes for consultant/contractor selection and management. ▪ Value management processes in place. ▪ Documented asset handover procedures in place. ▪ Post completion audits undertaken of selected projects.
2	<ul style="list-style-type: none"> ▪ Infrastructure design, construction and rehabilitation standards documented. ▪ Infrastructure delivery options regularly evaluated. ▪ Formalised project management processes in place. ▪ Formalised processes for consultant/contractor selection and management. ▪ Value management processes in place. ▪ Documented asset handover procedures in place.
1	<ul style="list-style-type: none"> ▪ Infrastructure design, construction and rehabilitation standards documented. ▪ Documented asset handover procedures in place. ▪ Appropriate project management processes in place.

¹ Defined in Section 4.2 of TMP Development Guide.