Guidelines for
Implementing Total Management Planning

Asset Management

INFRASTRUCTURE PLAN
Implementation Guide

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LIST OF ACRONYMS

EPP (Water)	Environmental Protection (Water) Policy 1997
KPI	key performance indicator
NR&M	Department of Natural Resources and Mines
SWOT	strengths, weaknesses, opportunities, threats
TMP	Total Management Plan
WSP	Water Service Provider

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 planning strategies and procedures and developing associated documentation.

2 OUTCOMES

Outcomes from effective infrastructure planning include:

- a cost-effective infrastructure investment program;
- minimisation of life cycle costs;
- integration into regional infrastructure planning studies;
- lower costs to the customer;
- continued achievement of service standards;
- protection of the natural environment; and
- the minimisation of risk.

3 OUTPUTS

Outputs from an infrastructure planning process include:

- an Infrastructure Plan (TMP sub-plan);
- a suite of strategic/detailed planning reports;
- an infrastructure investment program, revised, re-prioritised and updated on annual basis.

4 THE INFRASTRUCTURE PLANNING PROCESS

For most WSPs, particularly those servicing growing markets, infrastructure planning is a continuous interlinked process. For WSPs with static or declining markets and with limited impacts of regulatory requirements on infrastructure investment (e.g. stricter effluent licensing), the process may involve only a regular review of:

- performance;
- current and future system demands; and
- system performance in relation to service standards and regulatory requirements.

Infrastructure planning is a dynamic process consisting of a number of interrelated activities as illustrated in Figure 1. These are further discussed in the sections that follow.

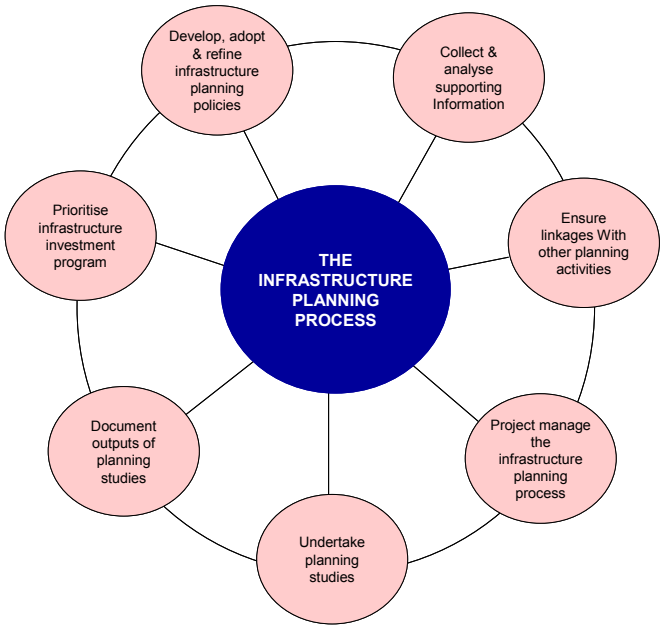


FIGURE 1: The infrastructure planning process

4.1 Developing, adopting and refining infrastructure planning policies

Each WSP will have a philosophy on infrastructure planning in response to its operating environment and experience. This philosophy will be expressed in formalised policies adopted by its board of management.

These policies could relate to such matter as:

- infrastructure planning principles such as:
  - the necessity to consider non-asset solutions, full life cycle costs, risks and existing alternatives before deciding to construct new or replacement assets;
  - application of strategic thinking to the planning process;
  - application of risk management to the infrastructure planning process; and
  - optimising infrastructure investment;
- customer/community consultation in the infrastructure planning process;
- responsibility for infrastructure planning (owner or operator);
- planning/design standards, guidelines, best practice, State planning policies;
- compatibility with land-use planning, regional planning, integrated catchment planning;
- planning documentation internal/external review, approval, monitoring and updating; and
- responsibilities and processes for infrastructure investment prioritisation.

4.2 Collecting and analysing supporting information

Effective information management is a critical foundation for infrastructure Planning. Without this foundation, the resources allocated to planning studies become focused instead on information capture and verification.

Specific information requirements for planning studies are listed in the appropriate planning and design guidelines published by NR&M and other organisations (refer References and Further Reading). Generally these can be grouped into:

- macro level information; and
- micro level information.

Macro information will set the context for the planning study and will include such matters as:

- water industry trends;

- economic trends impacting on customers;
- current and future land-use zonings;
- outputs from regional infrastructure studies;
- integrated catchment management policies and strategies;
- water allocations;
- the strategic direction for the WSP (as set out in the Business Management Plan and supporting sub-plans);
- business development opportunities for the WSP; and
- customer surveys.

Micro-level information is the technical information required to develop optimal infrastructure planning outputs, and will include:

- infrastructure attributes such as:
  - size;
  - design capacity; and
  - location;
- operating context (how the system works — could effectively be illustrated through a schematic layout);
- service standards, system service levels and performance;
- current, historical and future customer demands, by customer type (A number of scenarios will need to be considered for future demands.);
- calibrated/verified operational data such as quantity (including system losses), quality and reliability of service;
- infrastructure-related costs — capital costs, unit rates, operation, maintenance, depreciation, administration;
- customer complaints;
- survey information (topographical;/cadastral);
- geotechnical information; and
- rainfall.

The level of information will increase with the type of planning report, as illustrated in Table 1. It should be noted that the quality and reliability of the information should be consistently high for all planning report types.

TABLE 1: Information requirements

Planning report type [1]	Level of information
Preliminary/concept/feasibility planning report	Low
Strategic/master planning report	Higher
Detailed planning report	Highest

[1] Refer to Table 2 for objectives of each type of report.

4.3 Ensuring linkages with other planning activities

Infrastructure planning, particularly at a strategic level, is undertaken within the context of a 'web' of planning-related initiatives. These are driven by Commonwealth, State and local governments and regional organisations such as catchment management groups, regional organisations of councils and regional planning initiatives. Infrastructure planning initiatives may also be driven by business planning of major customers, adjacent WSPs and possibly competitors. This web of planning initiatives is illustrated in Figure 2.

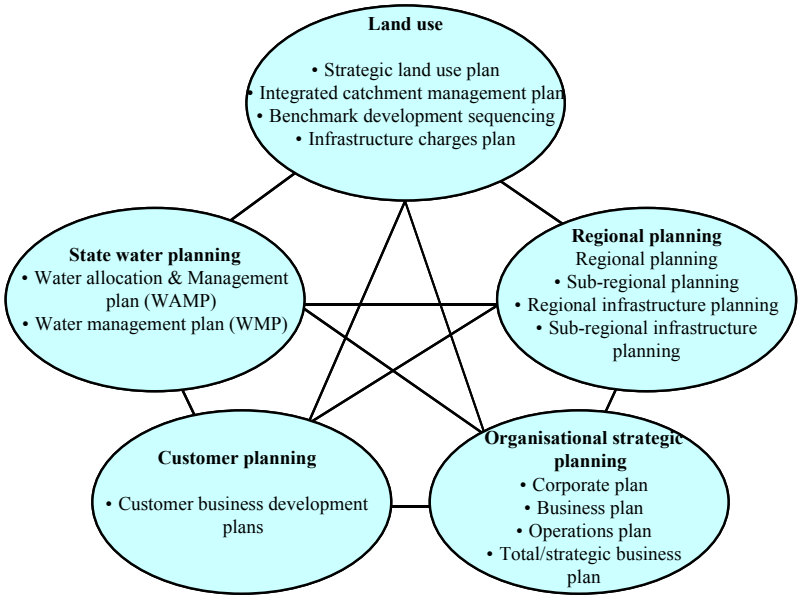


FIGURE 2: The planning web

4.4 Project managing the infrastructure planning process

Project management of infrastructure planning involves a number of activities including the following:

- **Programming and budgeting for infrastructure planning studies.** This will include programming infrastructure planning (at a preliminary, strategic or detailed level) in response to:
  - timeframe since previous studies;
  - outputs from other studies;
  - business development opportunities;
  - customer-related or operational problems; and
  - changes in regulations (e.g. environmental issues).
- **Determining the degree of infrastructure planning required.** The appropriateness of different levels of planning is summarised in Table 2.
- **Briefing and monitoring** (quality, timeliness and value for money) of infrastructure planning work undertaken internally or by consultants.
- **Coordinating the handover of infrastructure planning documentation** including:
  - registering, storing and distributing planning reports; and
  - registering and storing supporting information such as CAD/GIS files, network models.
- **Ensuring updating** of:
  - infrastructure investment (capital works) program;
  - infrastructure charges plan;
  - planning report schematic 'map'; and
  - planning report summaries.
- **Coordinating** internal review and documentation approval by the WSP.

TABLE 2: Infrastructure planning levels

Infrastructure planning level	Output	Objectives
Preliminary/concept/ feasibility planning	Preliminary/Concept/ Feasibility Planning Report	▪ To assess the technical feasibility of a project (e.g. new scheme or scheme augmentation). ▪ To determine whether the WSP should invest in more detailed investigations. ▪ To provide indicative estimates of financial and non-financial returns from the project.
Strategic/master level planning	Strategic/Master Planning Report	▪ To determine short-, medium- and long-term (50-year) strategies (infrastructure investment and non-asset solutions) in relation to major scheme components (e.g. sources, trunk mains, treatment plants). ▪ To provide a linkage to regional planning. ▪ To provide outputs to an Infrastructure Charges Plan.
Detailed level planning	Detailed Planning Report	▪ To provide detailed infrastructure investment strategies (short, medium and long term) at zone/sub-catchment level and for facilities such as pump stations and treatment plants.

Many WSPs will have Quality Management procedures in place for project management of the infrastructure planning process.

4.5 Undertaking infrastructure planning studies

A preliminary/concept study would address the issues at an appropriate level of detail. A strategic or detailed infrastructure planning study would consider the following issues:

- the objectives and desired outcomes for the study;
- related studies;
- the WSP's strategic direction (as outlined in the Business Management Plan);
- regulatory requirements;
- characteristics of the study area;
- the existing system, including:
  - infrastructure location, capacity and performance;
  - the current operating context/philosophy;
  - current performance including service standards, operational problems; and
  - current operating efficiency;
- current historical customer demands; and future demand scenarios for different customer groups, covering annual, monthly and daily average and peak demands;
- gap analysis (includes identifying the gaps between current performance and required current and future performance);
- system analysis and modelling; and
- identification and evaluation of options. This process would involve the application of strategic thinking whereby assumptions are challenged, alternative ideas are generated and appropriate and/or innovative solutions developed.

The process may involve community/customer consultation, depending on the nature of the study or WSP policy.

The infrastructure planning process would critically evaluate non-asset solutions such as:

- improvements to operational efficiency and effectiveness;
- more efficient use of existing infrastructure;

- demand management (supply and demand side);
- infiltration/inflow reduction.

The evaluation of options would include:

- economic evaluation using net present value (NPV) and internal rate of return (IRR) of revenues and costs;
- assessment of changes in service levels (should each of the options proceed) to be evaluated in terms of service improvements in:
  - reliability;
  - quality;
  - quantity;
  - environmental; and
  - operational efficiency;
- assessment of the risks associated with each option, which could include the following risk categories:
  - social and political;
  - public health;
  - safety;
  - structural or serviceability failure of assets;
  - financial;
  - environmental; and
  - legislative/legal;
- benefits of each option to various stakeholders (customers, owners, operator and regulator, and the general community);
- selection of the most appropriate option;
- commercial implications of the project in relation to such matters as:
  - whether the project is financially viable;
  - what contributions from the owner (e.g. State or local government) or payments for community service obligations are required to make the project financially viable;
  - options for project delivery;
  - opportunities for tax minimisation; and
  - whether there are other potential markets that would enhance the financial viability of the project.

The evaluation process may be facilitated through a value management study. Value management is a structured, analytical process for developing innovative, holistic solutions, and is a useful tool in both the infrastructure planning and design phases. It. While many of the principles should already be an integral part of the infrastructure planning process, value management builds on the synergy of a team approach. Additional information on value management is included in Appendix B.

Detailed information on the planning and design of urban water supply and sewerage schemes is included in the relevant Guidelines listed in References and Further Reading.

4.6 Document outputs of planning studies

The infrastructure planning process will provide the following outputs:

Planning reports

A planning report should be user friendly and clearly communicates its findings, analysis and recommendations to relevant stakeholders. The use of diagrams and schematic layouts will assist the communication of ideas.

Planning report — summary

The summary will provide an overview of key points arising from a planning study. A sample layout is shown in Appendix C1. This may be useful for larger WSPs, or ones that undertake a significant number of planning and other studies. For smaller WSPs a listing of planning studies may be adequate.

Planning report relationship diagram

This diagram will allow a WSP and others to gain a picture of the relationships between the planning documentation that has been developed and major scheme facilities or components. A sample is illustrated in Appendix C2.

Infrastructure planning overview document

This is a TMP sub-plan which addresses:

- current infrastructure planning processes within WSP;
- the external environment in relation to infrastructure planning;
- future strategies/initiatives in infrastructure planning;
- action plans supporting the strategies; and
- a listing of key supporting documents, should the reader require more detailed information.

4.7 Developing and prioritising the infrastructure investment (capital works) program

Planning studies will identify a range of projects to be incorporated in the infrastructure investment (capital works) program. Good business practice dictates that a WSP will prioritise projects, to maximise financial and non-financial returns. These projects may involve non-asset solutions (e.g. demand management), as well as new or replacement infrastructure. The prioritisation process, illustrated in Figure 3, is similar to that for evaluating options in individual planning studies. Further information is provided in Appendix D. It is likely that only projects programmed for the short term (e.g. 1–3 years) can be confidently prioritised. For smaller WSPs with limited capital works projects, the prioritisation process should be relatively simple and could be based on an informal benefit/risk assessment. The process can also be used to prioritise non-infrastructure initiatives (e.g. demand or energy management), if required.

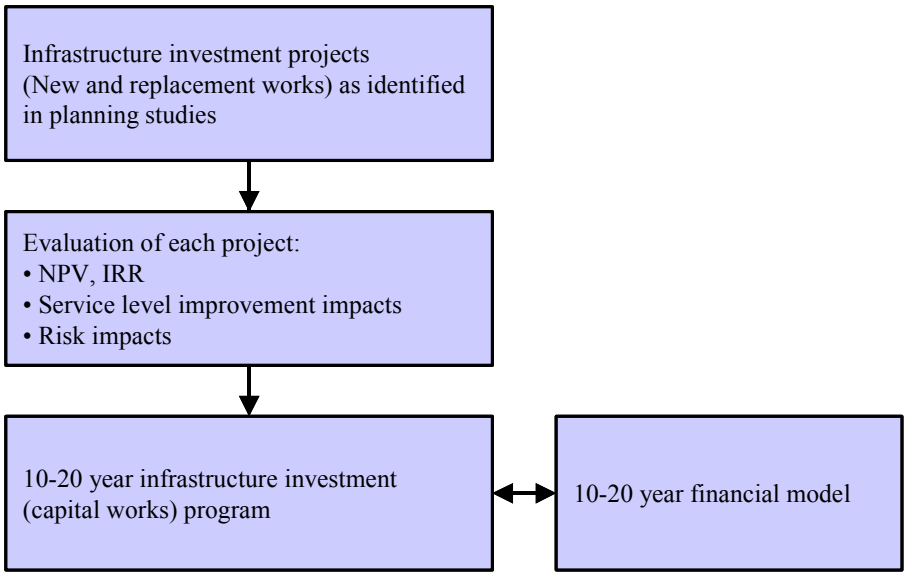


FIGURE 3: The project prioritisation process

The result of the process will be a 10–20 year infrastructure investment (capital works) program although the confidence in the planning and prioritisation will be less the further into the future.

5 RISK ISSUES

Potential risks associated with infrastructure planning include:

- inadequate financial resources allocated to the infrastructure planning process;
- insufficient lead time to allow adequate planning;
- planning based on inaccurate data, resulting in inappropriate infrastructure investment decisions;
- over-conservative projections, resulting in premature or non-optimal infrastructure investment;
- underestimation of projections, resulting in deterioration in service levels in the medium to long term;
- inadequate infrastructure investment;
- inadequate linkages with other planning initiatives;
- inadequate community consultation;
- pressure group action;
- inappropriate infrastructure planning level (e.g. detailed planning when a feasibility plan would have been more appropriate); and
- inadequate financial resources to fund desired infrastructure investments.

6 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 infrastructure planning. 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

Project Evaluation Guidelines, Queensland Treasury, 1997.

Guidelines for Planning and Design of Water Supply Schemes, Water Resources Commission, Brisbane, 1989.

Guidelines for Planning and Design of Sewerage Schemes, Volumes 1 and 2, Water Resources Commission, Brisbane, 1991.

Total Asset Management Manual, New South Wales Asset Management Committee, NSW Department of Public Works and Services, 2001.

APPENDIX A: Content and development level of sub-plan

TABLE A1: Indicative sub-plan content

Sub-plan features	Infrastructure Plan content
Issues covered in sub-plan	▪ Infrastructure planning — strategic and detailed. ▪ Regional infrastructure planning. ▪ The infrastructure planning process. ▪ Local government planning scheme.
Purpose of plan	▪ To provide an overview of the WSP's current infrastructure planning processes and documentation. ▪ To outline issues that need to be addressed in the infrastructure planning process. ▪ To outline future infrastructure planning initiatives.
Policies that may be required	▪ Infrastructure planning principles. ▪ Firefighting flows. ▪ Infrastructure planning responsibility. ▪ Planning/design standards. ▪ Customer/community consultation. ▪ Compatibility with other planning initiatives. ▪ Responsibilities and processes for infrastructure investment prioritisation.
Other Total Management Plan elements that are intimately linked to this sub-plan	▪ Financial Management Plan: this requires outputs such as the infrastructure investment program (10 years) for new and replacement assets. ▪ Service Standards Plan: service standards should drive the infrastructure planning process. ▪ Asset Evaluation and Renewal Plan: will provide information on existing assets. ▪ Water Demand Management Plan and Sewer Infiltration/Inflow Management Plan: these will provide non-asset strategies for meeting service delivery.
External issues contributing to the current operating environment that need to be considered	▪ NR&M requirements. ▪ Infrastructure planning within a regional context. ▪ Creative/strategic approach required for infrastructure planning. ▪ Use of real operational data. ▪ Non-asset solutions and other alternatives to be considered before constructing new infrastructure. ▪ Integrated Planning Act. ▪ Infrastructure planning to be compatible with benchmark development sequencing plan (for local government planning schemes). ▪ Impacts of commercialisation on infrastructure investment. ▪ Need for existing infrastructure to operate at maximum capacity. ▪ Need to provide financial returns and meet service standards. ▪ Revised NR&M fire fighting flow guidelines.

Sub-plan features	Infrastructure Plan content
Issues that need to be considered in summarising the status of current operations	▪ Corporate direction for infrastructure planning. ▪ Responsibility for infrastructure planning within the organisation. ▪ Population growth/decline rate. ▪ Regional planning issues that impact on infrastructure investment. ▪ Summary of findings from benchmark development sequencing study, including identified growth areas. ▪ The infrastructure planning process. The discussion should include: - how planning is instigated; - how planning is undertaken — strategic or detailed, and frequency; - the quality of supporting information systems; - system capacity (summary information); - demand/flow/population modelling; - demand management and other non-asset solutions; - distribution/collection system modelling; and - status of planning documentation (refer to supporting documentation) — this should include an overview of planning for key elements of the WSP's infrastructure. ▪ Processes for project evaluation and prioritisation. ▪ Broad SWOT analysis of relevant operations.
Strategic basis of the plan	The strategic elements forming the basis of the plan should include: ▪ goal for asset management; ▪ objective(s) for infrastructure planning; ▪ adopted KPIs; and ▪ management strategies and performance targets. The management strategies developed will be based on the projected population growth/decline rate, the identified key strategic issues and SWOT findings, including risk assessment, in respect of infrastructure planning, and on the required TMP development level. Many WSPs are likely to require strategies relating to supporting information systems (including modelling) for infrastructure planning, programming future planning studies and maintenance of a 10-year infrastructure investment program. The strategies should be supported by detailed action plans covering a period of up to 3 years.
Suggested performance measures	Outcome: ▪ Number of building approvals refused through service delays. ▪ Infrastructure current cost/current Environmental Plan (EP.) under EPP(Water). ▪ Infrastructure current cost/ML water supplied. Output: ▪ Infrastructure planning expenditure as percentage of total infrastructure (new works) expenditure.
Supporting documentation	This will depend on the WSP, but typically would include: ▪ 10–20 year infrastructure investment (capital works) program; ▪ planning report summaries (larger WSPs) (possibly in separate volume); ▪ listing of planning reports (smaller WSPs); ▪ schematic map of planning studies; ▪ Benchmark Development Sequencing Study (separate); and ▪ Project Evaluation and Prioritisation Manual, if developed.

TABLE A2: Required sub-plan development level

Development level[1]	Target management mechanisms of Infrastructure Plan
3	▪ 10-year capital works/infrastructure investment program (new and replacement works) that is sustainable within constraints of WSP. ▪ Hierarchy of planning documentation existing (master/strategic plans and detailed planning studies). ▪ Planning report outputs reflected in financial model. ▪ Rolling program for planning studies. ▪ Optimised infrastructure investment as demonstrated through financial modelling, demand modelling and an objective project evaluation/prioritisation. ▪ System models calibrated and used as a planning and operational tool.
2	▪ 10-year capital works/infrastructure investment program (new and replacement works) that is sustainable within constraints of WSP. ▪ Hierarchy of planning documentation existing (master/strategic plans and detailed planning studies). ▪ Planning report outputs reflected in financial model. ▪ Rolling program for planning studies. ▪ System models calibrated.
1	▪ 10-year capital works/infrastructure investment program (new and replacement works) that is sustainable within constraints of WSP. ▪ Relevant planning reports prepared in last 5 years (only applicable where growth or service level issues need to be addressed). ▪ Planning report outputs reflected in financial model and 10-year capital works program.

[1] Defined in Section 4.2 of TMP Development Guide.

APPENDIX B: Value management

The concept of Value Management is described in detail in the *Value Management Guideline* included in the NSW Government Asset Management Committee's Total Asset Management Manual, prepared by the NSW Department of Public Works and Services and published by the New South Wales Government in 2001.

In general terms, Value Management (VM) may be described as a structured, analytical process for developing innovative, holistic solutions to complex problems. It involves representatives of key stakeholders in a facilitated workshop.

It is the team based creative approach to problem solving that sets Value Management apart from other management tools. It builds upon the strengths, knowledge and experience of the participants through the creation of an environment in which much shared understanding and learning takes place. The synergy of the team generally leads to comprehensive, value improved outcomes which could not otherwise be achieved.

It is important to understand that the process is about seeking improved value-for-money outcomes that maximise the standards of quality or performance within the resource limits available. It is also possible that a workshop can result in a totally different approach to a project, or in some cases the abandonment of a project where an alternative was clearly shown to be more appropriate.

Value Management may be applied at the strategic or concept development stage, the preliminary design stage, or the detailed design stage. It may be used to develop a brief, to review buildability, to address particular problems or to undertake a Post Occupancy Review. It may be applied in conjunction with other tools such as Risk Management, Economic Appraisal, Strategic Planning, etc.

Once the decision to initiate a Value Management Study is taken, an independent facilitator or facilitation team is engaged. There are three discrete stages of the Value Management Study.

Stage 1: Preparation

Essential preparation includes:

- Setting of objectives for the Study and identification of the activities necessary to achieve the objective;
- Invitation of participants;
- The gathering of any relevant background information and its distribution to the invited participants;
- The selection of a venue;
- The 'preparation' of the participants.

Stage 2: Workshop

A VM workshop is generally of two days duration and involving anything up to 30 selected participants. The facilitator's role is to manage the process and to step the group through the five phases of the Value Management methodology.

Stage 3: Post workshop

The post workshop stage during which the Study is reported on and the manager has a central role in following up the actions as recorded in the Action Plan.

The value management methodology

The Value Management workshop comprises five key phases:

Information phase
This phase is about 'finding out'. Participants identify the 'problem situation', examine assumptions and givens, share information, clarify the key purpose, determine objectives and rationale, identify key issues and concerns.

Analysis phase
This phase involves the identification of the system, the system functions, the relationship between the functions and performance requirements.

Creativity phase
Generation of ideas as to how those functions can be provided in a way which represents improved value.

Judgement phase
During this phase, ideas are identified which are considered worthy of further consideration. They are evaluated and used to develop potential options.

Development phase
The development phase involves the participants in refining the options, selecting the preferred option, agreeing on the way forward and developing the Action Plan.

APPENDIX C1: Typical planning report summary format

REPORT TITLE:	REFERENCE NO.
Planning Report – Water Supply – B North Zone	W3/97

Date:	By:
July 1997	AAA Consultant

Report purpose

- To investigate the possibility of serving zone from the S Hill Zone rather than directly off the B supply main.
- To investigate infrastructure augmentation requirements to meet growth to ultimate population.

Summary of key results and recommendations

- Zone experiencing relative steady growth.
- XXX Products (a major water consumer) is located adjacent to the zone.
- 3 options considered. Most cost-effective option is to supply the zone (and XXX plant) from the S Hill Zone, which is serviced by the 750 mm diameter E supply main.
- Some of the reticulation mains in the zone are nearing the end of their serviceable life.
- B North and S Hill Zones to be amalgamated by the year 2000.
- Pressure tests to be undertaken at XXX products to confirm available pressures.
- Negotiations to be undertaken with XXX products to establish opportunities for a contribution.
- Field tests to be undertaken to confirm demands/pressures.

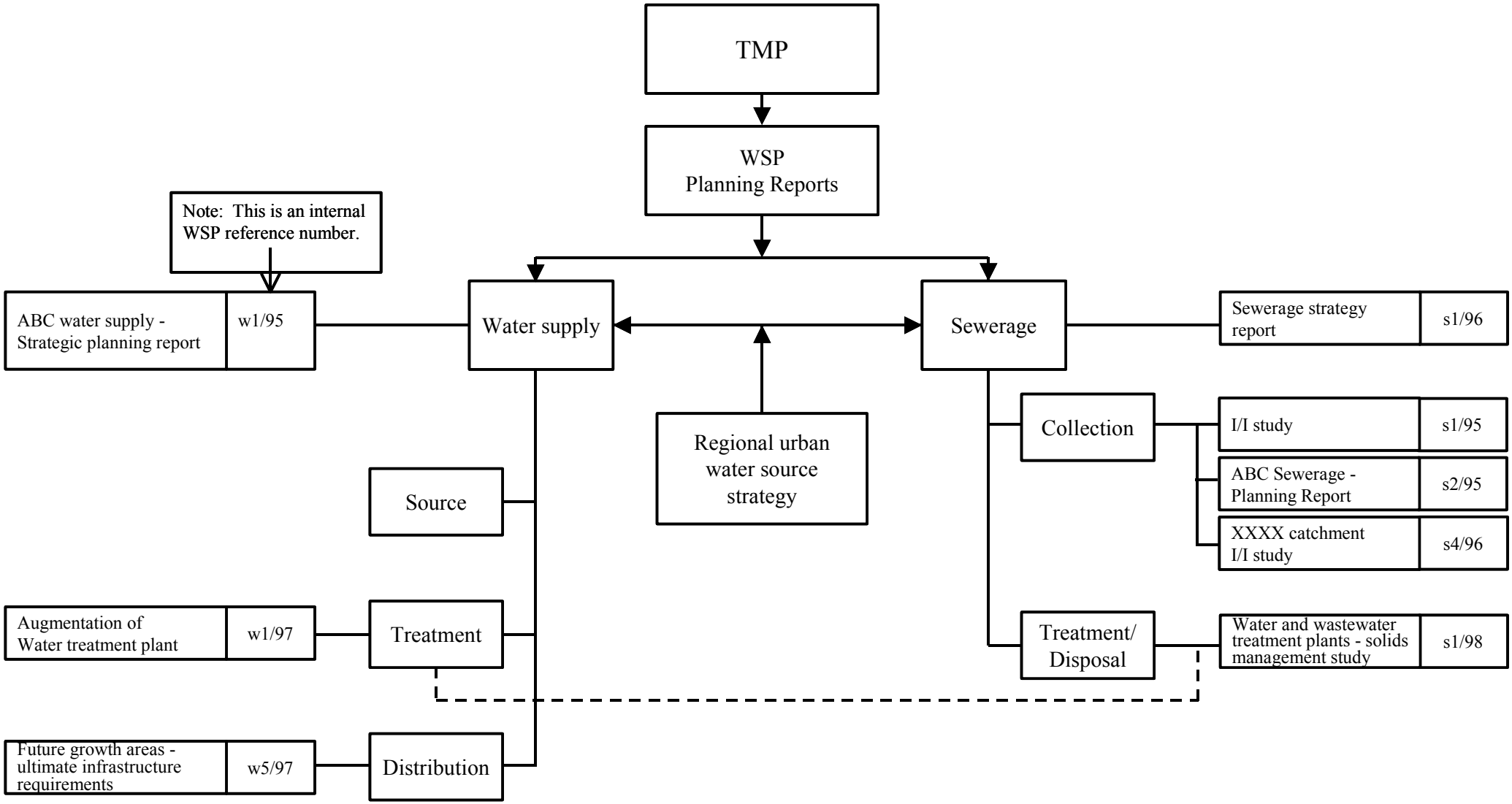
Period	Works required	Diameter (mm)	Length (m)	Rate ($/m)	Cost including supply to XXX plant
1997	300 mm diameter main augmentation along M Street from B Street to R Road	300	315	260	$82 000
2000 (refer notes 2 and 3)	450 mm diameter main augmentation along B Road from McC Street, under the railway line to the corner of B Street and V Street	450	395	500	$198 000
2000 (refer note 2)	375 mm diameter main augmentation along B Street from V Street to L Street	375	350	390	$137 000
2002 (refer note 3)	250 mm diameter main from the corner of B and L Streets to the property boundary at the XXX Products plant	250	710	200	$142 000
2011 (refer note 1)	225 mm diameter main augmentation along M Street from R Road to W Street	225	230	180	$42 000
TOTAL					$601 000

Notes:

1. Timing of augmentation dependent on the rate of future development and growth in demands within the B North Zone. Augmentation timing to be refined in future years.
2. To proceed following the construction of the C Street 15 ML reservoir. Required in order to serve B North Zone from the S Hill Zone.
3. Required to serve XXX plant from the S Hill Zone.

Report status at June 1998: 1997 works completed.

APPENDIX C2: Planning report relationship diagram



APPENDIX D: Prioritising the infrastructure investment program

Planning studies will identify a range of projects to be incorporated in the infrastructure investment (capital works) program. Good business practice dictates that a WSP will only invest in projects that maximise financial and non-financial returns.

This is achieved through prioritising the projects identified in the planning and other studies. These projects may involve non-asset solutions (e.g. demand management) as well as new or replacement infrastructure. The following is an example of a prioritisation methodology. It includes the following:

- Evaluating the NPV, IRR, pay period and NPV/customer for each project.
- Evaluating the improvement impacts if the project proceeds in relation to:
  - reliability;
  - quality (e.g. drinking water quality, effluent standards);
  - quantity (e.g. delivery capacity);
  - environmental; and
  - operational efficiency.

So that the relativity of impacts on the WSP can be evaluated, the impact factor should be multiplied by a weighting factor. The weighting factor would be determined on basis of the strategic direction for the WSP. The resulting figure becomes the total improvement score. A sample calculation format is shown in Table D1.

TABLE D1: Determination of total improvement score

	Improvement impact score **0 = Low** **5 = High**	**Weight** **0–10**	**Improvement impact** **(if project proceeds)**	**Comments**
Reliability				
Quality				
Quantity				
Environmental				
Operating efficiency				
Total improvement score				

- Evaluating the risks if the project is postponed or does not proceed. This involves evaluating the project in terms of the following consequential risk categories:
  - social and political;
  - public health;
  - safety;
  - structure or serviceability failure of assets;
  - financial;
  - environmental; and
  - legislative/legal.

For some projects a risk profile verses time might be required to present adequate information for making decisions. Many projects could be deferred for 12 months with limited risks and the risk evaluation could be useless. A reasonable timeframe during which the risk might materialise should be chosen (e.g. What would be the risks if the project is deferred, say, for 5 years?).

Some projects under evaluation may be the result of a risk analysis of the existing WSP, in which case substantive documentation should already exist that quantifies the risk of not proceeding with the project.

The risk impact score is multiplied by a weighting factor to provide a total risk score, as shown in Table D2.

TABLE D2: Determination of total risk score

	Risk impact score **0 = low** **5 = high**	**Weight** **0–10**	**Risk impact** **(if project does not proceed)**	**Comments**
Reliability				
Quality				
Quantity				
Environmental				
Operating efficiency				
Total risk score				

The information is then compiled into a prioritisation worksheet, as shown in Table D3. The 10–20 year financial model should provide an indication of the maximum infrastructure investment expenditure (new or replacement assets).

The approved infrastructure investment program will be the prioritised projects within the prioritisation worksheet the accumulated cost of which is less than the maximum infrastructure investment expenditure identified through the 10–20 year financial model. The process is illustrated in Figure 3 of this Implementation Guide and reproduced here as Figure D1.

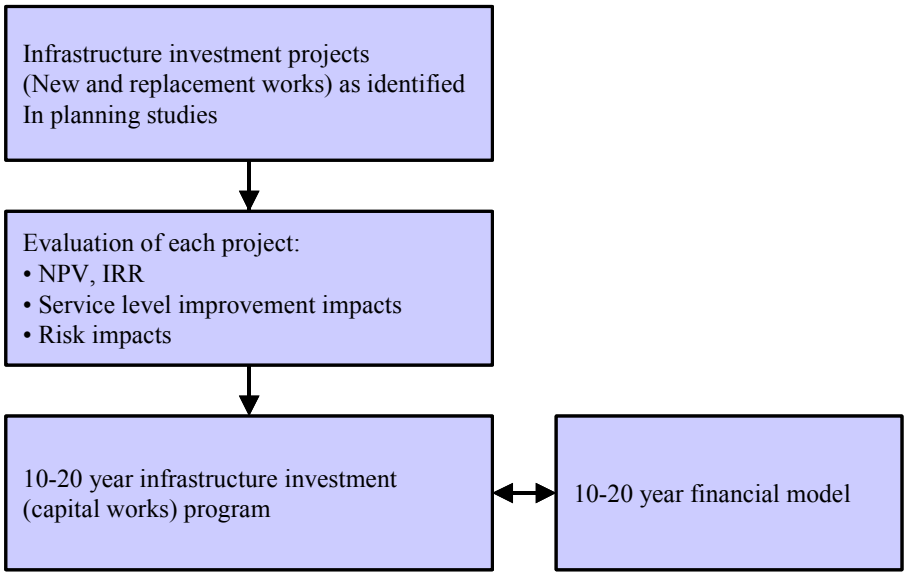


Figure D1: The project prioritisation process

TABLE D3: Prioritisation worksheet

Project No.	Project name	Total cost $	Start date	Current year $	Project EP	IRR %	Payback years	NPV $m	NPV/EP $/EP	Improve score	Risk score	Comment	Priority
1	ZZZ sewerage upgrade	1 740 000	99/00	1 740 000	1 161	5.63	8	1.80	1 550	85	55	Based on CSO = $363 000 p.a.	6
2	Energy management for sewerage schemes	36 000	99/00	36 000	120 000	2 187	1	0.43	4	55	25		1
3	Sewerage extension program – M Street	80 845	99/00	80 845	69	6.56	7	0.07	1 014	81	44	Based on CSO = $14 500 p.a.	5
4	BBB water supply	4 260 000	99/00	960 000	5 774	16.16	5	0.42	73	54	60		3
5	CCC water supply	822 000	99/00	787 000	1 188	5.54	8	0.70	589	75	33	Based on CSO = $105 000 p.a.	7
6	XXX South high level zone	229 000	99/00	57 000	1 610	43.62	3	0.25	155	75	51		2
7	YYY high water supply augmentation	8 983 000	99/00	2 368 030	53 533	9.87	9	5.68	106	68	77		4
1999/2000 Total investment				$6 038 875									

NOTE: Cost of capital based on 7%

NPV & IRR at 20 year