

Appendix C – Schedule of works model user manual

**Appendix C is part of Statutory guideline 03/14 – Local government
infrastructure plans**

The Schedule of works model (SOW) is in Excel format and can be downloaded from the department's website. The SOW is supported by the User Manual.

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1. Introduction

1.1. Background

The schedule of works model has been developed to enable a local government to prepare the schedules of works for their local government infrastructure plan (LGIP) for trunk infrastructure and determine the financial sustainability of their LGIP in a consistent and transparent manner.

It uses a standardised process to estimate future expenditure on trunk infrastructure and projected revenue from infrastructure charges. This enables local governments to identify any gaps between projected infrastructure charges revenue and proposed expenditure on trunk infrastructure.

The model also calculates catchment-based infrastructure servicing costs for the networks. This information may be used by local governments to identify efficient (cost effective) infrastructure servicing options.

If the local government has its own model that performs the same function as the DSDIP schedule of works model, it may use its own model. The purpose of the schedule of works model is as follows:

- to enable local governments to prepare schedules of works for trunk infrastructure;
- to enable local governments to identify any gaps between projected infrastructure charges revenue and proposed expenditure on trunk infrastructure;
- to enable local governments to identify cost efficiencies in infrastructure delivery by calculating catchment-based infrastructure servicing costs; and
- to facilitate the review of LGIP.

1.2. Purpose of this user manual

The purpose of this user manual is to provide step-by-step advice on how to use the schedule of works model prepared as part of this guideline.

The user manual also provides a description of the standardised calculation methodology and inputs used by the model. If a local government uses its own model, that model must use the same standardised processes and inputs.

1.3. Application of the Model:

The Schedule of Works model has been developed to meet the following transparency and “ease of use” requirements:

- as simple to use as possible while also including provision to allow more advanced users to change key assumptions;
- transparent enough to accommodate review by external third parties; and
- provide outputs which support local governments in understanding their current and projected trunk infrastructure costs.

The model has also been developed to meet the needs of the following target user groups:

- local government (as the primary user of the Model);
- independent experts who may undertake a review of the model;
- the State (in ensuring that key policy objectives are addressed);
- the development community; and
- the general public.

2. Model overview

The key components of the model are represented on the following schematic and are discussed below.

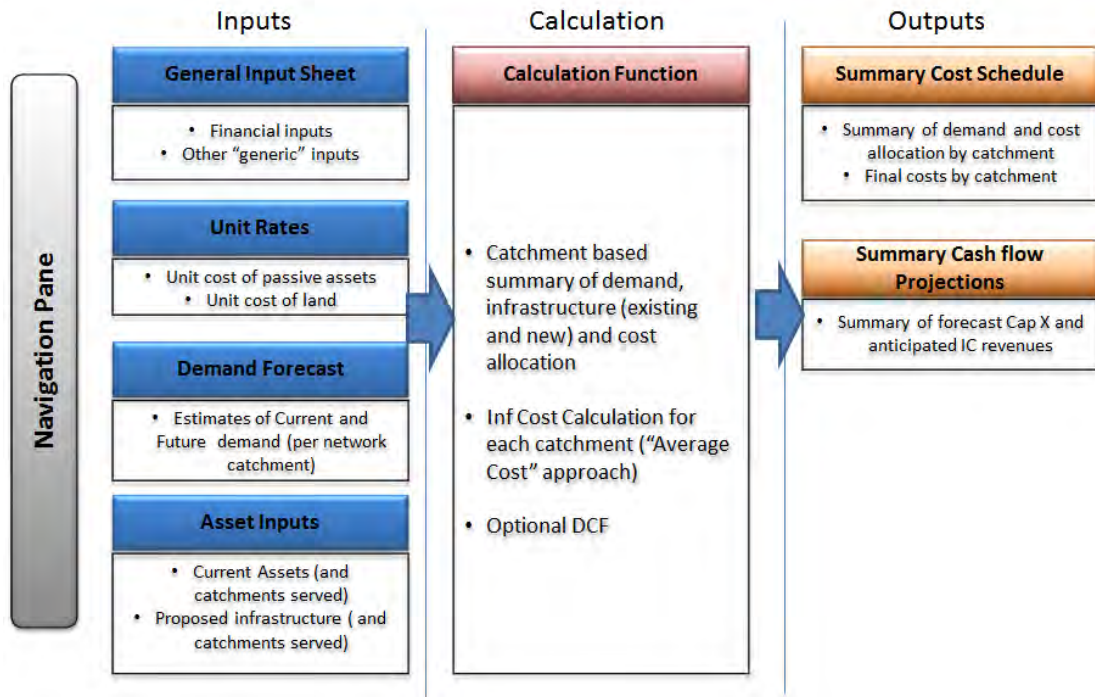


Figure 1 - Schedule of works model architecture

2.1. Navigation pane

For ease of use, the first page of the model provides a navigation pane. This page illustrates a clear process for the use of the Schedule of Works model (inputs, calculation and outputs) and also provides a hyperlink to each step of preparing the inputs.

2.2. Inputs

Key inputs to the model include:

- general Inputs including base year and financial modelling term;
- financial modelling inputs including, escalation rates and discount rate;
- current and projected infrastructure demand; and
- infrastructure cost data including unit rates, scope, cost and allocation of existing and future trunk infrastructure.

2.3. Calculation methodology

The calculation methodology used by the model to prepare the outputs is identified in section 3 of this user manual.

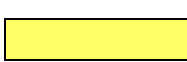
2.4. Outputs


The key model outputs include:

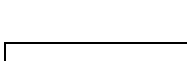
- tables of existing and future trunk infrastructure for each network identifying details of the scope, estimated cost (works and/or land), planned timing (for future infrastructure only) and allocation of costs to service catchments. Information contained in the future trunk infrastructure tables can be used to prepare the schedule of works tables in the LGIP;
- a summary table of infrastructure costs, infrastructure demand and infrastructure servicing cost for each service catchment of the trunk infrastructure networks; and
- projections of forecast total capital expenditure on trunk infrastructure, revenue from infrastructure charges and net cash flow.

2.5. Colour coding

The following standardised colour coding system is used in the model:

 Yellow cells require input from the user. For example: the scope of existing/future trunk infrastructure and current/projected demand.

 Green cells are automatically calculated by the model and should not be changed.

 White cells are for additional comments. These are particularly useful for recording the sources of key information and/or the assumptions which underpin the inputs.

3. Step-by-step guide to using the model

3.1. Navigation pane

The primary purpose of the navigation pane (Figure 1) is to guide the user through the process of using the model. This worksheet provides hyperlinks to each of the worksheets within the model. The top left corner of each of the destination worksheets contains a hyperlink back to the navigation pane.

Key actions required on this worksheet are as follows:

- insert the organisations name in the lead text box which will then populate the title of subsequent worksheets;
- insert and update version control and date stamping cells. This is particularly important where several models have been prepared for alternative servicing scenarios (e.g. alternative growth strategies) being considered; and
- identify key issues relevant to the specific case being modelled in the comments box.

3.2. General inputs

The first step in the process is to identify the key financial inputs used by the model in calculating costs. Each input is defined using a description, a reference cell, input value and comments.

The purpose of the “reference” cell is to display the name of the variable which is used in the model. This allows the user to better understand the components of calculations. The approach is designed to assist in making calculations more transparent, easier to interpret and review.

Figure 2 – General Input Sheet

Insert Organisations Name Here

[Return to Navigation Pane](#)

General Input Sheet

General Inputs		Reference	Value	Comments
Base Year		YEAR	2012	
Term (between 15 and 30 years)		TERM	20	
Application of Discounted Cash flow				
Calculate charges using Discounted Cash flow? (Y/N)		DCFTRIGGER	Yes	
General Financial Inputs				
Discount Rate (WACC):				
Average 10 Year Bond Rate		TenYr	4.00%	
Option 1	Basic Margin on 10 Yr. Bond Rate	Margin	3.50%	3.5% is the baseline figure quoted in LG Bulletin 06/01
	WACC:	WACC1	7.50%	
Option 2	Capital Structure (% Debt)	Capstr		
	Market Risk Premium	Risk	6.00%	
	Asset Beta	AssetBeta		
	Cost of Debt	Debt		
WACC:		WACC2	4.00%	
WACC Option to be applied in the calculation?		WACC1	7.50%	
Escalation Rates				
Capital Escalation - Future Cap X		PPI	4.00%	ten (10) yr. average Roads and Bridges Index (ABS 6427, Table 15, Index 3101)
Capital Indexation Rates - Historical (June Qtr.)				
			2012	102.50
			2011	100.30
			2010	96.60
			2009	95.20
			2008	91.80
			2007	83.20
			2006	80.10
Land Escalation		LandInd		
Charges Escalation Rate		ChargeInd		

General Inputs:

- **Base year-** this is the year from which all calculations will be undertaken and the reference year for the discounting of cash flows and demand streams.

The base year must align with the local government's base year for the demand projections. However, the base year does not need to be the reference year for the cost inputs as the model includes some provision for the adjustment of costs to the base year.

Choose the year of the base date and identify any assumptions or rationale that underpins the selection of this input in the white comment box provided.

- **Term-** the model has the capacity to calculate costs over a modelling term of between fifteen (15) and thirty (30) years from the base year.

Identify the appropriate modelling term for the analysis.

Application of Discounted Cash flow

- **Application of discounted cash flow (DCF)-** the use of a DCF modelling methodology in calculating the net present value (NPV) of estimated revenue and expenditure and the infrastructure servicing cost is optional.

Discounting is a commonly accepted financial technique which is designed to recognise the level of uncertainty inherent in long term financial projections.

Discounting facilitates the analysis of unevenly distributed cash flows (revenue and expenditure) over a modelling term by calculating the present value (PV) of each cash flow at a common date. A NPV is simply the sum of the PV of a series of cash flows.

Use of discounted cash flow is not mandatory. The “DCFTrigger” value cell contains a “Yes/No” drop down menu. The default position is “Yes”. To disable the DCF functionality of the model, select “No”.

General Financial Inputs

- **Discount rate-** the model includes two options for deriving the discount rate to be used by the model when applying a DCF methodology. Both options reflect the parameters for deriving a discount rate as provided in Local Government Bulletin 06/01. The first option provides a simple means for estimating an appropriate discount rate by adding a fixed premium (of 3.5%) to the ten year bond rate. This approach may be appropriate for small to medium Councils for whom variability of the discount rate is considered a relatively small determinant of cost.

The second option is to calculate the discount rate as the weighted average cost of capital (WACC) for the Council. This calculation should reflect the Council’s cost of debt, capital structure and cost of estimate as determined using the capital asset pricing model with key inputs consistent with those suggested in local government bulletin 06/01. This approach is more appropriate for larger Councils for whom calculation of an accurate discount rate may have significant implications.

If using a DCF methodology, select a discount rate (i.e. WACC1 or WACC2) from the drop down menu.

Considerations relevant to deriving the Weighted Average Cost of Capital (WACC):

Local Government Bulletin 06/01¹ prescribes two ways of measuring the weighted average cost of capital as follows:

- For **small to medium sized Councils** the guide suggests that the rate of return on assets should be 3.5% over the ten year bond rate.
- For **larger Councils** the guide suggest that an appropriate rate should be determined using the Weighted Average Cost of Capital and the Capital Asset Pricing Model using inputs within the following ranges:

Business Activity	Asset Betas	Post Tax Nominal Premium to ten year Bond Rate (%)
Water and Sewerage	0.35-0.45	2.1 to 2.7
Road Construction and Maintenance	0.42 – 0.52	2.5 – 3.1
Cultural/Recreation/Leisure	0.45 – 0.55	2.7 – 3.3

For the majority of Councils, the first of the two calculation methodologies (i.e. rate of return on assets as 3.5% over the ten year bond rate) may be sufficient. However the state recognises that the larger, more sophisticated Councils may have a detailed estimate of their weighted average cost of capital. Where a Council has derived its WACC independently, the user has to identify the source document which outlines how the rate was calculated. It is anticipated that this document would include reference to the parameters suggested within Local Government Bulletin 06/01 and reproduced above.

Either approach needs to incorporate an agreed definition of the appropriate “ten year bond rate”. The current ten year bond rate is at historical lows (at around 3%). It may be argued that, in the current global financial climate, such a low rate is an anomaly. To accommodate the various changes in the bond rate which occur during the business cycle, users should apply a long term measure (i.e. a 10 year average) of the ten year bond rate as the appropriate figure to be used in calculation of the costs.

- **Capital escalation rate – future trunk infrastructure works-** this is the rate which will be used to escalate the construction cost of future trunk infrastructure to its planned date (Year provided). This rate should reflect anticipated increases in construction costs and should be supported by a brief statement of assumptions.

¹ Queensland Department of Local Government and Planning, “Update on National Competition Policy Issues”, Local Government Bulletin Ref 06/01; 6th June 2001

The ten year average annual increase in the Australian Bureau of Statistics (ABS) published Producer Price Index (Road and Bridge Construction Index for Queensland) should be used as the capital escalation rate unless it can be demonstrated that another rate is more appropriate.

Insert the adopted capital escalation rate.

- **Capital escalation rate – historical-** the historical capital escalation rates are used by the model to (de)escalate infrastructure cost estimates to their current value as at the base date. For example, if a cost estimate for infrastructure works was calculated in current value terms as at 2009 and the base year of the model is 2011, then the model will adjust this estimate to an equivalent 2011 current value using the historical changes in the capital escalation rate between 2009 and 2011.

Insert the relevant historical capital escalation rates.

- **Land escalation rate-** this is the escalation rate that is applied to the acquisition cost of land included in the model. The rate applied should be equivalent to a long term (10 year) measure of average escalation of unimproved capital value (UCV) for land within the local government area. In the absence of such a detailed escalation rate, a ten year average of the Consumer Price Index (CPI) should be used.

Insert the adopted land escalation rate.

- **Capped charge escalation rate-** this is the escalation rate which is used to escalate the local government charges levied under its adopted infrastructure charges resolution (as provided for under section 631 of the SPA), in calculating projected revenue.

Insert the adopted capped charge rate.

3.3. Unit rates

3.3.1. Unit rates for land

Land acquisition costs for all networks are calculated using unit rates input in a single worksheet, the “Unit rates – land” worksheet (unless the user overrides this value with a more accurate estimate). On this worksheet, the following three options are provided for the input of the average acquisition cost per square metre of land (\$/m²):

- one average land cost for the entire local government area (option 1);
- land cost by location (e.g. suburbs or catchments) within the local government area (option 2); and

- land cost as defined by the local government (e.g. land use zoning or physical constraints such as flooding) (option 3).

Input land costs under any or all three options provided are then available for use in valuing land for each of the infrastructure networks. The Existing trunk assets and Future trunk assets worksheets allow the user to select a “land valuation type” (option) to be used for valuing land for the trunk infrastructure items input for a particular worksheet. It is recommended that a consistent approach is adopted for each trunk infrastructure network. However, it is not necessary for all trunk infrastructure networks to use the same land valuation option.

Figure 3 – Land Unit Rates

Insert Organisations Name Here
Land Costs

[Return to "Unit Rate" sheet](#)

Unit Rates

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td colspan="2" style="background-color: #4a7ebb; color: white; text-align: center;">Option 1 - Generic Land Cost</td></tr> <tr><td style="width: 60%;">Unit Cost of Land (\$/m2)</td><td style="width: 40%;">Landcst</td></tr> <tr><td colspan="2" style="background-color: #4a7ebb; color: white; text-align: center;">Option 2 - Land Cost (by Location)</td></tr> <tr><td colspan="2" style="background-color: #d3d3d3; text-align: center;">Landcst2</td></tr> <tr><td style="background-color: #d3d3d3; text-align: center;">Location</td><td style="background-color: #d3d3d3; text-align: center;">Cost of Land (per m2)</td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> </table>	Option 1 - Generic Land Cost		Unit Cost of Land (\$/m2)	Landcst	Option 2 - Land Cost (by Location)		Landcst2		Location	Cost of Land (per m2)																	<div style="background-color: #ffffcc; width: 20px; height: 20px; margin: auto;"></div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td colspan="2" style="background-color: #4a7ebb; color: white; text-align: center;">Option 2 - Land Cost (by Type)</td></tr> <tr><td style="width: 60%;">Landcst2</td><td style="width: 40%;"> </td></tr> <tr><td colspan="2" style="background-color: #d3d3d3; text-align: center;">Landuse type</td></tr> <tr><td style="background-color: #d3d3d3; text-align: center;"> </td><td style="background-color: #d3d3d3; text-align: center;">Cost of Land (per m2)</td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> <tr><td style="background-color: #ffffcc;"> </td><td style="background-color: #ffffcc;"> </td></tr> </table>	Option 2 - Land Cost (by Type)		Landcst2		Landuse type			Cost of Land (per m2)																
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3.3.2. Unit rates for infrastructure works

The unit rates for the different types of infrastructure for a network can be put into the Unit rates worksheet for that network. This functionality is useful for these infrastructure asset types which include linear or discrete assets (i.e. those for which a unit rate per meter or per item may be appropriate). Selection of relevant unit costs should be consistent with estimates of current replacement costs used within Council’s Asset Register and/or industry benchmarks for such assets. Ideally the rates used will have been through an accounting audit process (QAO). This is particularly relevant for existing assets where the value of the asset defined in the model should be able to be reconciled with the current replacement costs that underpin Councils Asset Register.

Up to two types of assets of varying description may be entered for each network.

Specific site condition, contingency and project owner’s cost factors can also be put into the unit rate worksheets. Comments may also be provided to explain the source of and rationale for such factors.

The model uses the unit rates contained in these worksheets to calculate the typical value of trunk infrastructure items in the relevant network’s Existing trunk assets and Future trunk assets worksheet. This is particularly useful for asset types for which a “per m” or “per item” value may be appropriate.

However, where assets are unique (e.g. bridges, pumping stations etc.), the model includes provision for a more accurate cost for that item of infrastructure to be included in the relevant asset valuation sheet.

The site condition, project owner’s cost and contingency factors may be applied to the unit rates when calculating the cost of a specific trunk infrastructure item on the Future trunk assets worksheet. However, only the site condition factors can be applied to the costing of existing trunk assets.

The site condition multipliers can be used to reflect the fact that costs can vary between locations (e.g. the cost of construction is different in the CBD vs. Greenfields residential or industrial areas) or may vary with site condition (e.g. presence of rock, sand, expansive clays, acid sulphate soils etc.). The “Site/Condition Allowance” table can be used to set both the parameters and the relevant multipliers. If no information is provided on site/condition multipliers, the model simply defaults to a value of 1.0.

It is critically important that the Asset Unit Rates represents a “base case” and do not already include provision for such site/condition factors. **The potential for such “double counting” of costs will be a key focus of any review.**

3.4. Development and demand projections

Projected development

This component of the model requires the user to identify the existing and forecast demand which underpins the planning for trunk infrastructure and anticipated revenues.

The first sheet in this section of the model provides the “baseline “assumptions for growth in dwellings and commercial/industrial development (GFA) as contained in the local governments infrastructure plan (LGIP) Table 3.1.4 and 3.1.5.

Figure 4 – Anticipated growth (sourced from LGIP)

Insert Organisations Name Here
Anticipated Growth

[Return to "Commitment Demand"](#)

LGIP Table 3.1.4—Existing and projected residential dwellings						
Projection area	development type	Existing and projected residential dwellings				
		2012	2017	2022	2027	2032
Area 1						
Total						
Area 2						
Total						
Outside priority infrastructure area (total)						
Total						
<insert local government area name>						
Total						

LGIP Table 3.1.5—Existing and projected non-residential floor space						
Projection area	LGIP development type	Existing and projected residential dwellings				
		2012	2017	2022	2027	2032
Area 1						
Total						
Area 2						
Total						
Outside priority infrastructure area (total)						
Total						
<insert local government area name>						
Total						

Levied Charges

Include the projected development over the modelling term in terms of dwellings and non-residential floor space (m² GFA) on the anticipated growth worksheet.

The projections do not need to be divided into all the projection areas identified in the LGIP. Rather, the areas by which the projections are grouped should reflect the infrastructure charge areas identified under the local government's charges resolution.

The model allows projections to be grouped for up to 3 residential development types and 3 non-residential development types in each area. The projections must be provided in 5 year increments starting from the base year.

The local government's levied charge may be identified for each development type in each area by which the projections have been provided.

The development projections and levied charges data put into this worksheet are used by the model to forecast the revenue that the local government can expect to receive from infrastructure charges. The revenue projections from residential and non-residential development can be viewed by scrolling to the right on the anticipated growth worksheet.

Catchment demand

Separate demand sheets are provided for each infrastructure type within which the user may enter the existing and projected demands within each catchment proposed for the given type of infrastructure. The unit measure of "demand" will depend on the infrastructure type in question for example:

- water infrastructure may use Equivalent Persons (EP)
- sewer infrastructure may also use EP (noting that water infrastructure EP is typically defined differently to sewer infrastructure EP);
- road transportation may use a measure of "trips";
- park may use actual population; and
- stormwater infrastructure may use impervious hectares.

The model does not apply any limitation on the unit of demand for each infrastructure type. However, forecast demand for each trunk infrastructure type should be capable of being reconciled with these "baseline" LGIP figures entered into the "Anticipated Growth" sheet.

The existing (base year) and projected infrastructure demand over the modelling term within each service catchment of the network may be input into the Catchment demand worksheet provided for each network.

The demand projections can be provided in 5 year increments starting at the base year (first table), or alternatively, the user may directly enter demand projections for each year (second table). If the user elects to input demand on a yearly basis the five year cohorts table (first table) should be left blank.

A unique catchment name must be identified for each network catchment included in the modelling. However, a catchment number is optional.

Figure 5 - Catchment demand input sheet

While the model has the capacity to accommodate up to thirty (30) catchments, users should seek to limit the number of catchments. Where different catchments yield similar costs, they should be amalgamated (as far as practical). In this regard, costing catchments may well differ from planning or engineering catchments. Planning or engineering catchments may differ based on the specific characteristics of that infrastructure type (e.g. transport hubs, geographical drainage catchments etc.) while costing catchments should be primarily defined by material differences in cost.

The model also includes provision for the user to identify the “Ultimate” demand for each catchment. For the purposes of the model, the “Ultimate” demand is the level of demand generated when the catchment is developed to its full capacity (also refer to the LGIP template definition of Ultimate development). This may be different from development that occurs from the stated “base date” to the models “horizon year”.

The purpose of the “Ultimate Demand” column is to assist the local government (and any independent reviewers) to clearly identify those catchments for which there remains significant additional growth potential at the end of the modelled period. Those catchments for which there is likely to be a significant increase in growth (beyond the models “Horizon year” are those for which the local Government (and independent reviewer) should review for “spare capacity” for which a terminal value may be appropriate (refer Section 3.2)

<p>Detailed Catchment Forecasts:</p> <p>An objective and consistent estimate of demand is fundamental to the cost modelling. It is envisaged that local governments will be able to demonstrate a clear (tabulated) linkage between:</p> <ul style="list-style-type: none">• planning scheme projections of changes in land use, growth in population, dwellings, employment and provision of commercial/industrial land (as contained in the LGIP Tables);• technical reports which outline the need for infrastructure included in the cost modelling; and• contribution rates (by location and per land type) used to determine the revenues.

3.5. Trunk asset data

The Existing trunk assets and Future trunk assets worksheet for each network contains the following details for each existing and future trunk infrastructure item:

- scope (consistent with the definitions provided in the LGIP guideline);
- estimated value (works and/or land);
- anticipated timing (future infrastructure only); and
- allocation of the value of trunk infrastructure to service catchments.

Land valuation type

Select the land valuation option for a network at the top of the relevant trunk asset worksheet. The model will then populate the drop down box “Land location/ type” field with the types identified for that option in the Unit rates – land worksheet.

As outlined in section 3.3 of this user manual, whilst a different land valuation type/option for may be used for each network, a consistent valuation methodology should be adopted within each network.

In the case where the value of land is predetermined (e.g. where there may exist a contract for sale on a given site), the relevant land value cell could be directly overwritten by putting in the exact value

Basic asset data

Identify the following information for each trunk infrastructure item in this section of the worksheet:

- Asset ID
- LGIP map reference
- Asset type
 - The asset type is limited to “Passive/Lineal” or “Active/Non Lineal” options for certain networks. The selection of passive/lineal or active/non lineal asset types triggers appropriate conditional formatting within the worksheet. This is designed to assist the user to provide the necessary scope of data required for different asset types. This is a mandatory field for the water supply, sewerage and road transport worksheets.
- Asset class
- Asset name

- Description

Asset attributes

This section of the worksheets apply the asset type information provided to lookup the relevant unit rate to be used to calculate the value of the trunk infrastructure works. The inputs required differ for each network but typically include:

- unit rate type – this field will be populated automatically using a list of unit rate types that the user specified in the Unit rate worksheet. This is a mandatory field for passive/lineal assets;
- asset length/unit - this is a mandatory field for passive/lineal assets;
- diameter/width/hierarchy; and
- depth (if required).

Basic asset valuation

In the case of passive/lineal assets, this section of the worksheet will provide a baseline estimate of the value of the asset calculated based on the asset attribute data specified above. No further input is required for these assets.

In the case of non-lineal or unique assets, the user can provide a baseline estimate of the value of each item.

The appropriate site/condition, contingency and project owner's cost factors may also be selected for each infrastructure item from the drop down list provided. Alternatively, another value may be entered (project owner's cost and contingency should be put in as percentage values).

Land attributes

This section of the assets worksheets uses the information contained in the Unit rates – Land worksheet to calculate an estimate for the land acquisition cost for a specific infrastructure item. The key inputs in this section of the worksheet include:

- land type (identified from a drop down list based on the land valuation option selected at the top of the worksheet); and
- size of land to be acquired in hectares.

The model calculates the value of the land using the unit rate for the type of land selected from the Unit rates-land worksheet.

If a more accurate valuation exists for specific land, the user may override the calculated land value with the more accurate value for that land.

Refined asset value

This section of the Existing trunk assets worksheets escalate the infrastructure value (gross valuation) from the valuation year to calculate the current value as at the base year. If the valuation year is left blank, the model assumes that the valuation reference date is the base year.

For example, if the unit rates valuations reflect the current cost as at 2009 and the base year is 2011, then the model will use the indexation rates provided in the "General input sheet" to escalate the calculated gross valuation to a current cost as at the base year, 2011.

Asset allocation

For each asset, the user can identify the service catchment(s) serviced by the trunk infrastructure item by selecting the "y" option from the drop down list provided under each service catchment. The model also allows the user to manually enter "y" in the relevant cells. NOTE - the model will not recognise any other text characters.

Alternatively the model can also accommodate a decimal value to be entered instead of a "y". The user can use a decimal value where only part of the catchment is serviced by an asset. For example, a park may only serve 60% of a certain catchment. In this instance, the user could allocate 0.6 of the asset to that catchment.

Once the serviced catchment(s) have been identified for an infrastructure item, the model will calculate the value of that item allocated to each service catchment.

Future trunk assets

Identify the following additional information in the Future trunk asset worksheets:

- **Contingency-** the model will select the appropriate contingency value based on the project delivery date as follows:
 - Project Delivery (0-5yrs); 7.5%
 - Project Development (5-10yrs); 15%
 - Project Scoping (10-20yrs); 20%
 - Project Identification (20yrs +): 25%
- **Project owner's cost-** select the appropriate project owner's cost for each infrastructure item from the drop down list provided (this list looks up the Unit rate worksheet). Alternatively, override the data contained in the drop down cell with an appropriate value expressed as a percentage.

- **Year provided-** identify the year that the infrastructure is planned to be provided. This field is used by the model to escalate the cost for the infrastructure item to its current value at the planned date.
- **Percentage renewal-** the user is also required to identify the extent to which new works may also be made necessary by renewal of existing assets. This cell is designed to allow the user to clearly account for those assets which are part renewal and part enhancement (e.g. if a 200mm water main is approaching the end of its useful life and will be replaced by a larger main to provide additional capacity then such an item has characteristics of both renewal (the costs of which should be excluded from the calculation) and system augmentation (which may be a legitimate inclusion in the calculation of cost)).

Considerations for Review of the Value of Future Trunk Infrastructure:

The determination of cost is subject to review. The principles underpinning a review of such costs may reflect the approach outlined in the 2009 “Review of On Costs and Contingency Allowances” undertaken by Evans and Peck² which advocated for the development of a **base estimate** of a project, defined as the sum of:

- Construction Costs including:
 - **Direct Costs** - cost of construction based on established quantities and established unit rates. This will include any “site allowance” (e.g. additional cost factors arising from the locality of the asset (e.g. Greenfield vs. residential vs. CBD etc.);
 - **Indirect Costs** - cost to the constructor of developing a plan and program; and
 - **Margin** – including corporate overhead.
- Project Owners Costs
 - Costs of owners internal staff, project management and design fees, land costs, levies etc.

The **Project Owners Costs** (applied to the “base estimate”) should be contained within the following ranges:

Expense	Roads	Water	Sewerage
Master Planning	0-3%	0-2%	0-2%
Survey	2%	2%	2%
Geotechnical Investigation	1-3%	1%	1%
Design	6-8%	6-10%	6-10%
Project Management & Contract Admin.	4-6%	4-6%	4-5%
Environmental	0-1%	0-1%	0-1%

An additional **Contingency** may then be applied to the base estimate. The purpose of such contingency is to provide “an allowance to cover a specified level of risk in

² Evans and Peck, “Review of On Cost and Contingency Allowances” (undertaken for QCA), September 2009

the project implementation” phase. Contingency rates to be applied to the “base estimate” would accommodate P50 risk allowances³ and fall within the range specified below:

Project Phase	Contingency Range P50
Project Identification (20yrs +)	20-30%
Project Scoping (10-20yrs)	15-25%
Project Development (5-10yrs)	10-20%
Project Delivery (0-5yrs)	3-10%

The timing of projects (and appropriate contingency rate) should reflect those already contained in Councils short (0-5yr) and long term (5-30yr) capital investment programs which are reflected in the Council Asset Management Plan and Long Term Financial Forecasts.

Application of on costs or contingencies should be undertaken in a manner consistent with the above assumptions. Those undertaking a review of the modelling should specifically review the scope and appropriateness of any contingency applied in the baseline estimates.

3.6. Cost schedule summary

The Summary cost schedule worksheet provides a summary of trunk infrastructure costs, projected demand, and the infrastructure servicing cost for each catchment of each network.

If data has been incorrectly entered at one of the previous stages, a cell will default to a null value. Where this occurs, the cause of the null value should be investigated.

3.7. Cash flow projections

The Cash flow Projections worksheet provides a summary of cash flow projections which reflects the proposed expenditure on future trunk infrastructure and projected revenues from infrastructure charges.

This worksheet also provides the estimated NPV of expenditure and revenue as well as the NPV of net cash flow over the modelling term.

The user needs to directly put in the estimated revenues anticipated from infrastructure in the base year.

4. Other Issues

³ P50 risk allowances are an estimate which has a 50% probability that the value will not be exceeded.

4.1. Submission Material Guidance

Much of the data that is required for the infrastructure modelling should be available as an outcome of Council’s broader financial reporting, engineering and planning functions. The following table provides a succinct summary of possible data sources within Council:

Item	Source Document	
	Scope	Value
Existing Assets	Scope of existing asset base is typically available in the Councils Fixed Asset Register and/or contained on their GIS system	Valuation for existing assets will be the Current replacement Cost as contained on the Councils Fixed Asset Register . In addition, various specific valuation reports may be available
Future Assets	The cost and value of these assets are typically contained in technical planning studies , the Councils Capital Improvement Plan, Long Term Financial Forecasts and/or Councils Asset Management Plans for these infrastructure items. On occasion, some Council also have feasibility studies and/or business cases which identify the cost and scope of specific items.	
Existing Demand	Estimates of existing and forecast demand are key inputs into the process.	
Forecast Demand	As outlined in Section 3.4.2, it is envisaged that users will be able to provide a clear (tabulated) linkage between: <ul style="list-style-type: none"> • Planning Scheme / LGIP projections of changes in land use, growth in population, dwellings, employment and provision of commercial/industrial land; • Technical reports which outline the need for infrastructure include in the cost modelling; and • Contribution rates (per land type) used to apply the charges. Council should be able to demonstrate the relationship between each of these three aspects of demand to support a review of the cost calculations.	
Financial inputs	Key Financial Inputs (e.g. Weighted Average cost of capital, cost of debt, capital structure) are typically available within Council Financial Policies (e.g. Debt Management Policies), as a supporting document to the Long Term Financial Forecasts and/or from the notes to Council financial statements .	

4.2. Timeframe and Terminal values

For practical purposes, the current model is limited to a time horizon of thirty (30) years. It is recognised that it’s common for the infrastructure planning of some networks to be undertaken over a longer period. This reflects the cost effectiveness of building trunk infrastructure early in the development process. As such, it is possible for anomalies to arise in the calculation of infrastructure costs. One of the most common such anomalies is when a large item of infrastructure is identified for construction relatively late in the modelled period (say year 27-29) and for which it may be reasonable to assume that some proportion of that expenditure should be allocated to growth which occurs outside the 30 year modelled period.

For those catchments where the “ultimate” demand is significantly higher than the demand at the end of the 30 year modelled period (i.e. ultimate demand is greater than 30% of the estimated demand at the end of the 30 year period), users should

examine the schedule of future trunk infrastructure to identify the scope of works planned (if any) in the final five (5) years of the 30 year period modelled.

Where infrastructure within this period is more than 20% of the value of total 30yr catchment expenditure, users are required to include a “terminal value adjustment” for such items. The terminal value would be calculated using following algorithm:

Terminal Value =	Value of the infrastructure identified using the prescribed parameters x (Design Demand for that infrastructure – actual demand for that infrastructure in year 30)/ Design Demand for the infrastructure item
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This formula will provide an estimate of the value of the “terminal value” which should be included in the “Future Trunk Assets” sheet as a negative sum and with a “Year provided” being the final year of the modelled period. The model will then recognise this as a value that needs to be removed from the cost base of affected catchments.

This approach should compensate for any “spare capacity” which may exist in such infrastructure at the end of the modelled period.

Criteria for estimating and applying a terminal value:

- items must be material in value (i.e. >20% of the total (30yr) expenditure within a catchment;
- items must fall within the last five (5) years of the 30 year modelled period; and
- the “terminal value” of such items are to be calculated using the above formula and included in the “Future Trunk Asset” sheet as a negative value and with a projected date of 30 years from the base date.