LOW CARBON LIVING CRC

Precinct Information Modelling

Collaboration:

Energy, Transport, Waste and Water Demand Forecasting and Scenario Planning for Precinct Projects

Work to date

The ETWW research project currently addresses residential precincts in terms of the characteristics of household types. These household types are derived from Mosaic demographic data. Figure 1 shows a section of the Excel input data for the Lochiel Park precinct.

	A	B	F	G	H	I
32			m2	10500		
33			size (kL)	0		
34						
35						
36		Mosaic Code (2013)		B05	C13	D16
37		Residents	Ave per hhold	2.63	2.24	2.60
38	Household Typology	Workers	Ave per hhold	1.75	1.27	1.84
39		Dependants	Ave per hhold	0.89	0.97	0.75
40		Income	Ave per hhold	$ 87,825	$ 79,371	$ 76,759
41		Household Type		3	1	2
42		Description	Type	Larger Detached	Apartment	Medium Size Detached
43			Proportion of total	9%	34%	57%
44			Households	10	36	60
45		Bedrooms	Ave per hhold	3.00	2.17	3.32
46				4.0	2.0	3.0
47		Bathrooms	Ave per hhold	1.47	1.22	1.79
48				2.0	1.0	2.0
49		Parking allocation off-street	Ave per hhold	2.0	1.0	2.0
50		Parking allocation on-street	Ave per hhold	1.0	0.5	1.0
51		Plot Size	m2	576	236	1069
52			m2	300	150	300
53		Outdoor green space	%	10%	0%	10%
54		PEV	Panels	15	12	10
55			Daily production (kW.hr)	12	10	8
56	Household Structure	Rainwater Tanks	size (kL)	4.5	1.0	3.0
57		Vehicles	total vehilces	1.6	1.4	1.8
58			electric vehicles	0.0	0.0	0.0
59			bicycles	2.0	2.0	2.0
60		Appliances - Electric	TV	2.5	1.0	2.0
61			Cooking	1.5	1.0	1.0
62			AC	3.0	1.0	2.0
63			HotWater	2.0	1.0	1.0
64			Washer	1.0	1.0	1.0
65			Dryer	1.0	1.0	1.0
66			Refrigerator	2.0	1.0	1.0
67			Lighting	0.0	0.0	0.0
68		Applicances - Gas	Cooking	0.0	0.0	0.0
69			Heating	0.0	0.0	0.0
70			HotWater	0.0	0.0	0.0
71		Appliances - Water	Shower	2.0	1.0	2.0
72			Toilet	3.0	1.0	2.0

Figure 1 A portion of ETWW input data for Lochiel Park

Some preliminary analysis is undertaken within the ETWW Excel spreadsheet, then this data is used as input to four software tools addressing energy, transport, water, and waste respectively. The results from those analyses are collated as output demand data. Figure 2[1] (over page) shows these ETWW data flows.

As a first step in collaboration between the PIM and ETWW projects, the PIM team have reproduced the ETWW input data in PIM format. Each of the Lochiel Park scenarios is a separate PIM model. These models are loaded on the PIM model server. The data is accessible through the internet either with dedicated client software (such as EDMModelServerManager or the PIM team's PIMViewer) or via an application programming interface. The current implementation (Figure 3, over page) shows how a shared repository for ETWW precinct data can be established and accessed.

[1] Source: Holyoak, N., Hadjikakou, M., Percy, S., Iankov, I., He, H. Energy, Transport, Waste and Water Demand Forecasting and Scenario Planning for Precincts. Workshop 6 - The Development and Application of the ETWW Model Foundation Version 1.0 as a Prototype

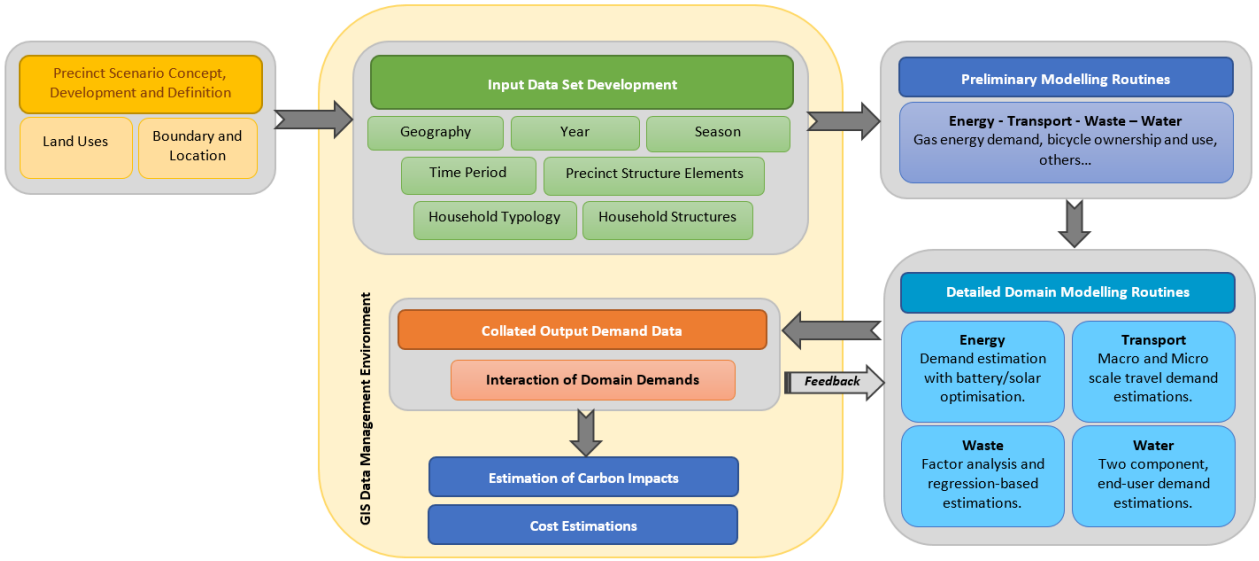

Figure 2 ETWW operational flowchart

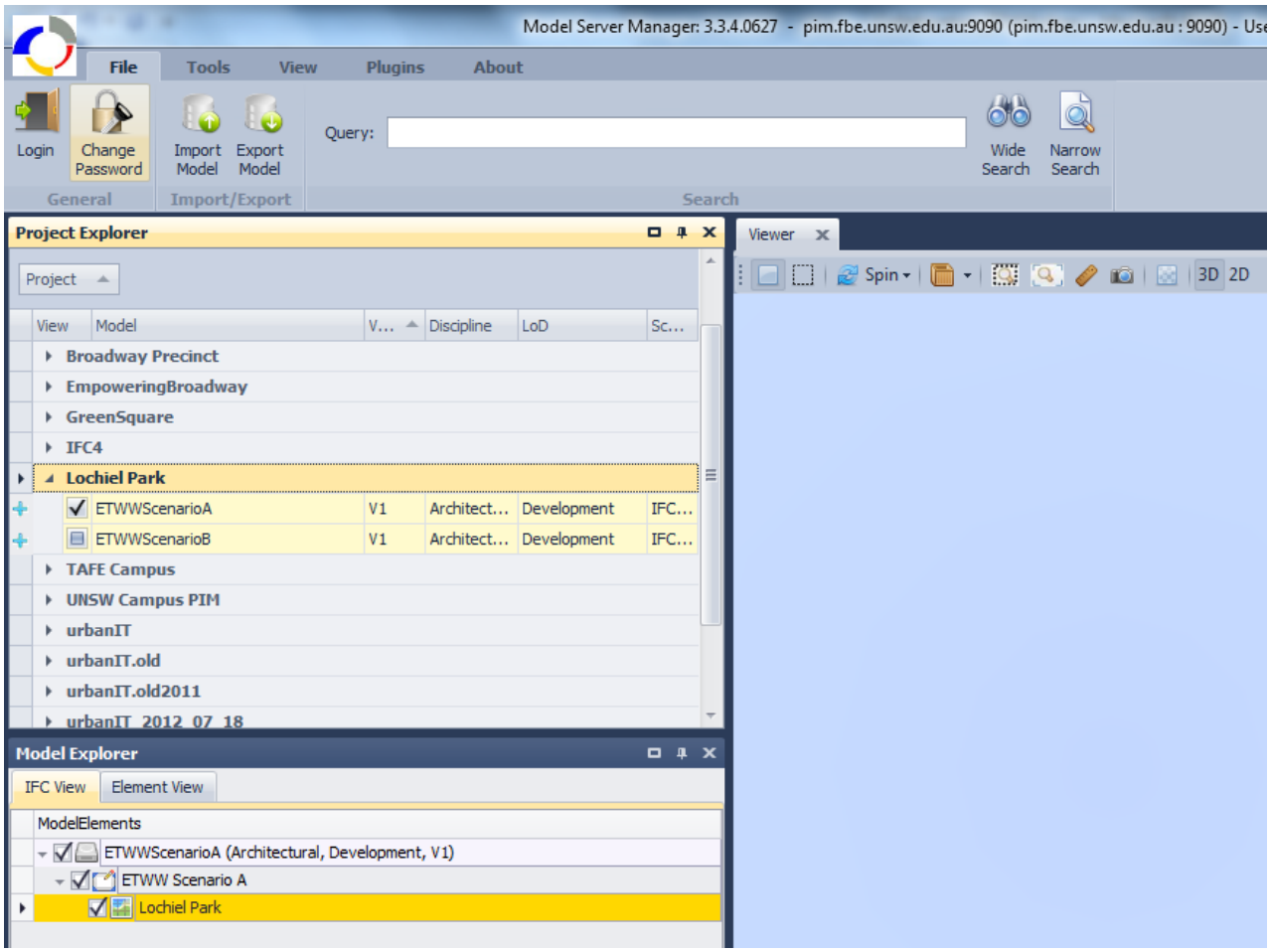

Figure 3 Two scenario models for Lochiel Park on the PIM model server

Continuing work

The ETWW project now has scenario data for the Tonsley precinct in Adelaide. The PIM team have a PIM model of the masterplan for Tonsley that is a geometric massing model with associated planning data (Figure 4). As well as a residential component, the Tonsley PIM model contains educational amd commercial zones. A logical next step in the collaboration between the two teams is to combine both sets of data into a shared model housed on the PIM model server.

Since the data would now be held in an online repository as an alternative to the Excel spreadsheet format, the PIM team will develop prototype software interfaces for one or more of the the ETWW domain modelling tools in order to show the feasibility of working against a PIM-formatted online repository. This will demonstrate the way that an analysis tool can collect a subset of the model data appropriate for its specific use, and write back results to the shared repository to inform further analysis iterations by any of the tools. If the data model also has a geometric representation, as noted for Tonsley, then this can additionally provide a means to display the various analysis results graphically relative to locations across the site.

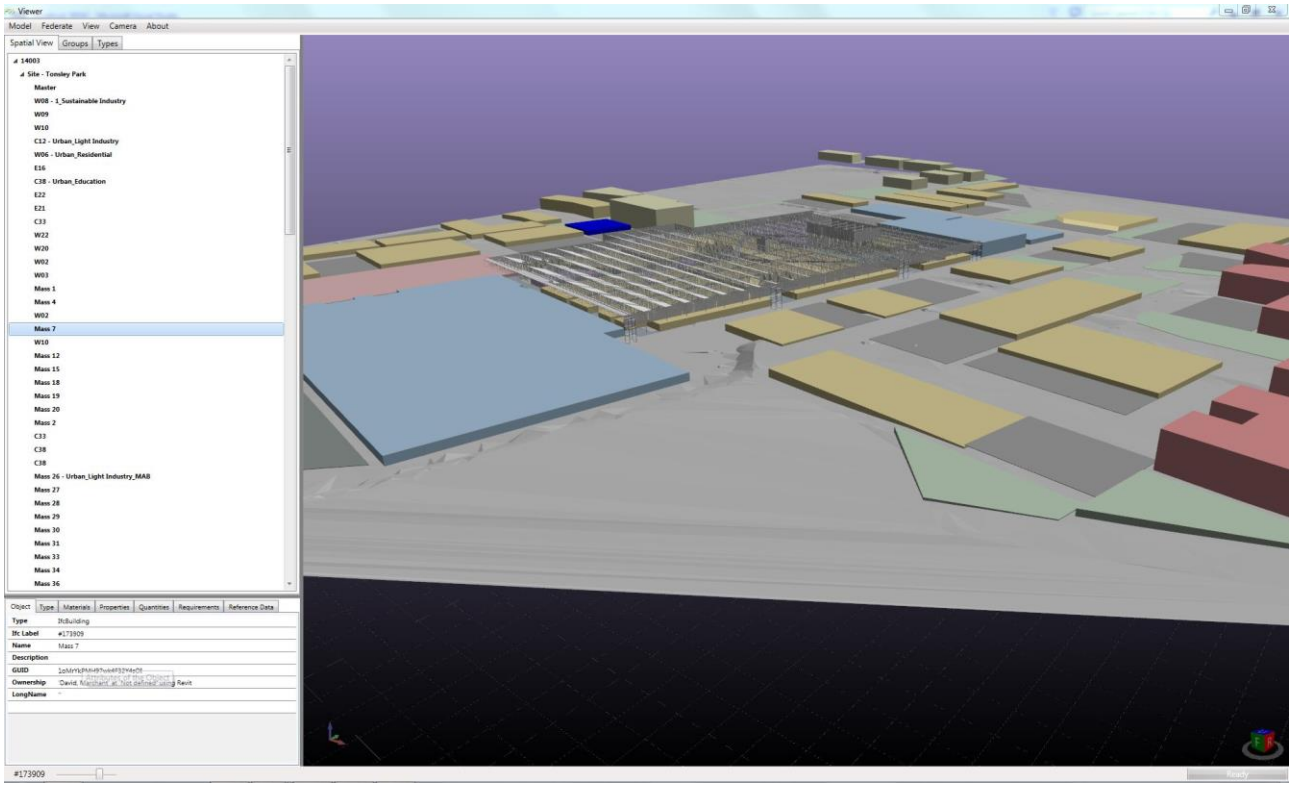

Figure 4 Tonsley master plan viewed using PIMViewer