Background information for Stormwater Network - Noosa Shire LGIP 2018

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1. Introduction

This report provides the background information for the Stormwater Trunk Infrastructure Network to support the preparation of the Noosa Shire Local Government Infrastructure Plan under the Planning Act 2016.

This report specifies:

- Definition of trunk infrastructure
- Service catchments
- Demand assumptions and conversions
- Desired standards of service
- Network planning and modelling
- Network consisting and valuation methodology
- Schedule of works
- References to supporting information

2. Definition of trunk infrastructure

The stormwater network defined as trunk infrastructure is identified in Table 2.1

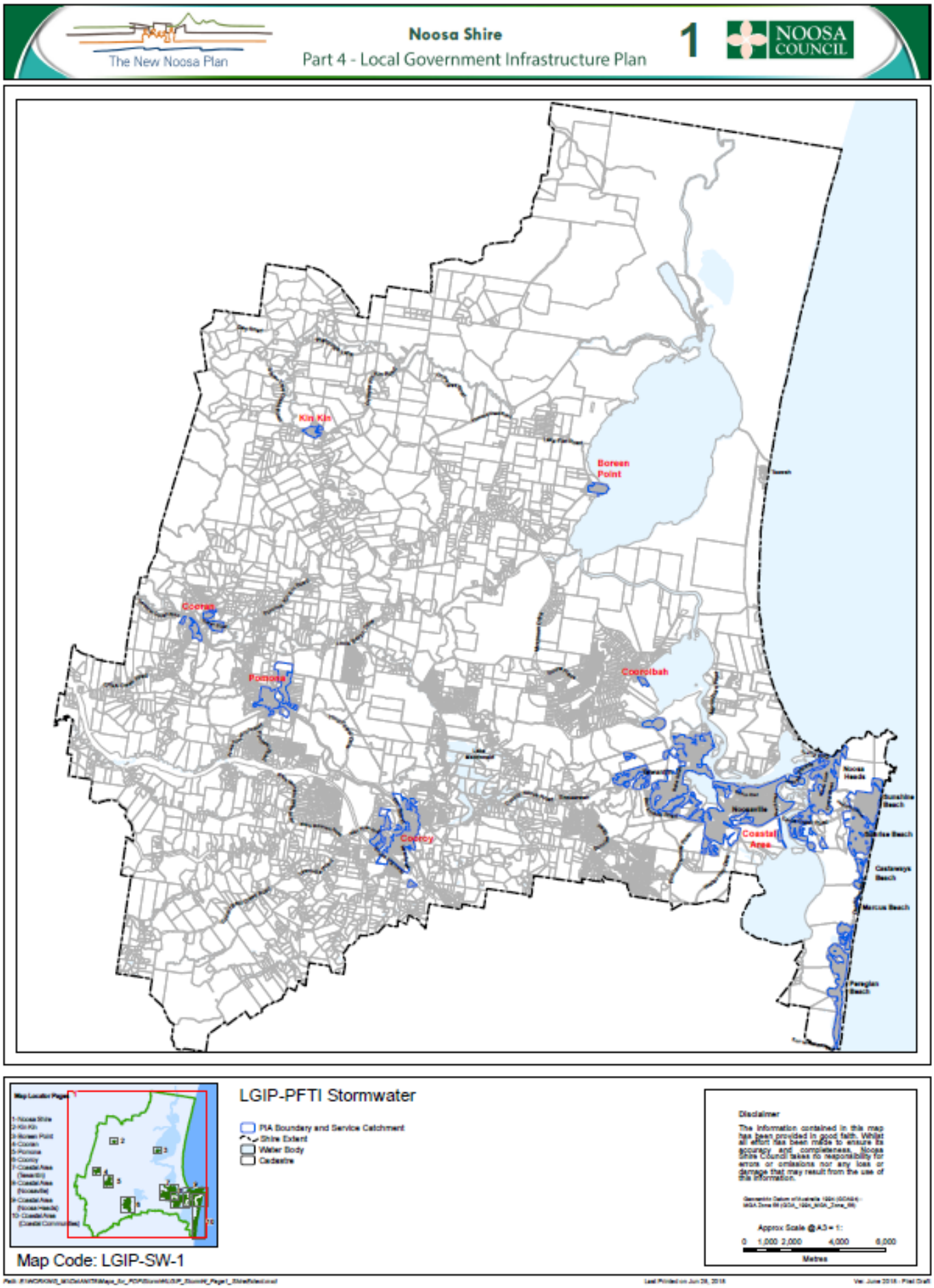
Table 2.1 Stormwater network trunk infrastructure

Network	System	Items included
Stormwater	Quantity	Piped drainage greater than 650mm diameter, culverts, manholes, inlets and outlets.
	Quality	Bio retention Basins / Infiltration Basins & Dispersion Bunds, Gross Pollutant Traps and Bio retention systems

3. Service Catchments

The trunk Stormwater Network supports seven catchments within the Priority Infrastructure Area (PIA). There are seven (7) Service Catchments that align with the priority infrastructure area boundaries are identified on the following map LGIP PFTI Stormwater and listed below.

1. Boreen Point
2. Kin Kin
3. Cooroiibah
4. Cooroy
5. Coastal Area
6. Cooran
7. Pomona


The New Noosa Plan
Noosa Shire
Part 4 - Local Government Infrastructure Plan
1
NOOSA COUNCIL
Kin Kin
Boreen Point
Cooran
Pomona
Cooroibah
Cooroy
Noosaville
Coastal Area
Noosa Heads
Sunshine Beach
Castaways Beach
Marcus Beach
Peregian Beach
LGIP-PFTI Stormwater
PIA Boundary and Service Catchment
Shire Extent
Water Body
Cadastre
Disclaimer
Approx Scale @ A3 = 1:
0 1,000 2,000 4,000 6,000
Metres
Map Code: LGIP-SW-1

4. Demand assumptions and conversions

The demand assumptions for the Stormwater Network are identified for each catchment as outlined in Table 4.1. The standard rates contained in Table 4.2 have been adopted for conversions of developable area to impervious area for each zone within Noosa Plan.

Table 4.1 Stormwater demand

Service catchment	Stormwater demand – impervious hectares in each catchment				
	2016	2021	2026	2031	Ultimate
Boreen Point	10.63	10.92	11.72	13.00	14.66
Kin Kin	8.14	8.24	8.82	9.02	13.48
Cooroibah	4.55	4.55	4.63	4.63	4.67
Cooroy	82.01	101.25	107.65	120.15	181.07
Coastal Area	808.49	840.16	908.67	951.16	1172.41
Cooran	28.10	28.27	29.71	31.70	34.18
Pomona	60.20	63.50	66.26	69.22	92.63

Table 4.2 Stormwater conversions

Planning Scheme zone	Conversion of developable hectare to impervious hectare
Community Facilities zone	0.85
Major Centre zone	0.9
District Centre zone	0.9
Local Centre zone	0.9
Neighbourhood Centre zone	0.9
Innovation zone	0.9
Low Density Residential zone	0.65-0.8
Medium Density Residential zone	0.76-0.82
High Density Residential zone	0.82
Rural Residential zone	n/a
Rural zone	n/a
Tourist Accommodation zone	0.9
Low Impact Industry zone	0.85
Medium Impact Industry zone	0.85
Recreation and Open Space zone	n/a
Environmental Management and Conservation zone	n/a

5. Desired Standards of Service

The Desired Standards of Service for the Stormwater network are identified in Table 5.1.

Table 5.1 Stormwater water desired standards of service.

QUANTITATIVE STANDARDS (primarily about the capacity of the network)	
ITEM	**DESIRABLE STANDARD**
Overall objective	In accordance with Urban Stormwater Management Strategy, Noosa Council 2002 (Version 1- Revision 2 dated 8 August 2006), to Manage Stormwater Quantity to Ensure flooding impacts are minimised and environmental base flows in creeks and rivers are maintained.
Design	In accordance with: • Planning Scheme Policy 6 - Engineering Design Standards - Roads, Drainage And Earthworks ; • The Noosa Plan, Water Quality and Drainage Code
QUALITATIVE STANDARDS (primarily about the performance of the network)	
ITEM	**SPECIFICATION OBJECTIVES & STANDARDS**
Overall objectives	In accordance with: • Environmental Protection (Water) Policy 2009; • Noosa River Environmental Values and Water Quality Objectives (July 2010); • Mary River Environmental Values and Water Quality Objectives (July 2010); • South East Queensland Regional Water Quality Management Strategy September 2001; • Queensland Water Quality Guidelines 2009 (EPA); • Noosa River Plan 2004; • Noosa River Catchment Management Strategy 2001; • Urban Stormwater Management Strategy, Noosa Council 2002 (Version 1- Revision 2 dated 8 August 2006). • Noosa Council Stormwater Asset Management Plan (adopted 22 October 2015)
Stormwater Pollutants	In accordance with the water quality objectives to protect environmental values under the: • Noosa River Environmental Values and Water Quality Objectives (July 2010) - Environmental Protection (Water) Policy 2009; • Mary River Environmental Values and Water Quality Objectives (July 2010) - Environmental Protection (Water) Policy 2009.
Soil Erosion and Sediment Transport	In accordance with the water quality objectives to protect environmental values under the: • Noosa River Environmental Values and Water Quality Objectives (July 2010) - Environmental Protection (Water) Policy 2009; • Mary River Environmental Values and Water Quality Objectives (July 2010) - Environmental Protection (Water) Policy 2009. On Site Construction standards to minimise soil erosion & sediment transport in accordance with: • Soil, Erosion & Sediment Control, Engineering Guidelines for Queensland Construction Sites, June 1996, The Institution of Engineers, Australia, Queensland Division.

Waterway - Health and Amenity	In accordance with the water quality objectives to protect environmental values under the: • Noosa River Environmental Values and Water Quality Objectives (July 2010) - Environmental Protection (Water) Policy 2009; • Mary River Environmental Values and Water Quality Objectives (July 2010) - Environmental Protection (Water) Policy 2009. In accordance with the Vision & Desired Environmental Outcomes for the Noosa River System in accordance with the Noosa River Plan 2004 - Parts 1& 2.
Design	In accordance with The Noosa Plan: • Sustainable Building Design Code – addressing water efficiency and stormwater management incorporating water harvesting and reuse and reducing impervious area; • Waste Management Code and supporting planning scheme policy - addressing the design and location of bin storage areas, recycling, waste separation and bin wash down areas; • Landscaping Code - addressing effective landscape treatment and water management to optimise stormwater filtration and minimise sedimentation and erosion activity and runoff; • Water Quality and Drainage Code – addressing the management of wastewater, stormwater, run-off, groundwater and environmental flows as part of an integrated water cycle system, including the use of WSUD, managing stormwater quality, erosion and sediment. Supported by the Engineering design standard-roads, drainage and earthworks PSP. • Biodiversity Overlay – addressing the management, conservation and rehabilitation of biodiversity values including riparian vegetation, aquatic fauna, soils, landforms, waterways and drainage lines.

6. Network planning and modelling

Flood studies and stormwater management plans have been prepared across Noosa Shire using a range of methodologies appropriate to the needs of the particular catchment and extent of background information available.

The following background planning and investigation documents have informed the future planning and schedule of works for stormwater and are contained in Appendix A.

6.1 Girraween Stormwater Management Plan 2006

The main purpose of the Girraween Stormwater Management Plan (SMP) is to protect the natural ecosystems within the Girraween study area by mitigating the impacts of stormwater runoff generated from urban development. The SMP also identifies a prioritised implementation plan for the recommended management actions.

The preparation of this SMP considered the impact of existing residential and commercial development on the receiving environment and potential future impacts from proposed development “nodes” located around the perimeter of the heath vegetation.

Pressures arising from increases in catchment imperviousness, modified catchment hydrology and increased loadings of stormwater pollutants (including nutrients) are the key management focus of the SMP.

The SMP made recommendations with regard to stormwater treatment which is included as SW05, SW06, SW07, SW08 and SW09 in the Schedule of works in Section 8 of this report.

6.2 Pinaroo Park Bushland Management Plan 2004

The Pinaroo Park Bushland Management Plan informed the SW04 works for bio retention and stormwater outlets in the Schedule of works in Section 8 of this report.

6.3 Noosa Flood Modelling

Flood modelling in the Pomona catchment identified the need for flood mitigation works in Rifle Street Pomona identified as SW01 in the Schedule of works in Section 8 of this report.

Flood modelling in the Daintree Estate identified the need for flood mitigation works including drainage and concrete bund walls identified as SW02 in the Schedule of works in Section 8 of this report.

7. Network costing and valuation methodology

7.1 Existing trunk infrastructure

The existing asset valuation for the stormwater trunk infrastructure network is valued at July 2016.

Cost unit rates have been applied to the value of the existing trunk infrastructure networks in the SOW model. These are based on the financial revaluation applied to Council's asset classes as required under *Local Government Regulations 2012* and the *Australian Accounting Standards*.

These rates have been developed by independent external valuers and validated by the Queensland Audit Office as part of the annual audit of Council's financial statements.

Table 7.1: Source of Cost Unit Rates for Existing Passive Assets Class

Infrastructure network	Financial year	Valuer	Valuation type
Stormwater	2014/15 indexed to 2016	Aurecon	Full comprehensive + unit rates

Once identified, the location of these assets were verified spatially through the GIS and reconciled to the financial records in the corporate financial system, Technology One.

Other key assumptions relating to existing infrastructure are:

- In instances where items of existing trunk infrastructure have been identified and verified spatially in GIS but not yet capitalised in the finance system, the costs of these items has been calculated based on unit rates. Ultimately all these items will be recognised on the financial asset register in accordance with the Australian Accounting Standards.
- Each asset has been allocated to one or more catchments based on its purpose, location and hierarchy.
- No escalation has been applied to existing assets.

7.2 Future trunk infrastructure

Past stormwater projects have provided sufficient information and relevance in determining the estimated cost for future stormwater projects. Costs and unit rates associated with delivering similar past projects have been used as a basis to inform the costs in the Schedule of works.

Quotations, issues for works and consultant's briefs have all formed supporting material to establish a level of confidence in determining and assessing applicable rates in calculating estimates for the schedule of works.

Appendix A includes detailed cost estimate calculations.

Note the 10% cost associated with Design and Document comprise 8% design and 2% documentation.

Where relevant, the cost estimate included in the SOW model is the sub-total which excludes the confidence allowance.

8. Schedule of works

Table 8.1 Stormwater Drainage Network

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Base cost	% Renewal
SW01	Pomona , Rifle Street Pomona Rifle Street Flood Mitigation	2016 / 2017	$2,500,000	0
SW02	Tewantin, Cooroy Noosa Road Noosa Cooroy Road (opposite Tewantin Golf Course) Upgrade of Culverts and auxiliary drainage	2016 / 2017	$198,478	60
SW03	Tewantin, Daintree Estate – Golf Course Drive Upgrade of Stormwater Infrastructure	2016 / 2017	$1,250,000	0
SW04	Noosa Heads, Pinaroo Park, Reconstruction of Stormwater outlet including GPT / Bio retention Basin and Dispersion Bund Upgrades	2021 -2026	$368,001	50
SW05	Noosa Heads, Cooyar Street Street (East of Noosa Springs Drive) Bio retention Basin / Infiltration Basin & Dispersion Bund	2021 -2026	$219,551	0
SW06	Noosa Heads, Cooyar Street (Opposite Wyandra)	2021 -2026	$333,270	60

Column 1 Map reference	Column 2 Trunk infrastructure	Column 3 Estimated timing	Column 4 Base cost	% Renewal
	Upgrade existing Bio retention System and Gross Pollutant Trap			
SW07	Noosa Heads, Cooyar Street (Elanora Terrace to Safari Street) Bio retention Basin / Infiltration Basin & Dispersion Bund	2021 -2026	$141,701	0
SW8	Sunrise Beach, Ben Lexcen Drive and Grasstree Court Bio retention Basin / Infiltration Basin & Dispersion Bund	2021 -2026	$366,852	0
SW9	Sunrise Beach, Dame Patti Drive. Stormwater outlet Upgrade / Gross Pollutant Trap and Bio retention system	2021 -2026	$75,821	0

9. Sources and supporting documents

- Girraween Stormwater Management Plan 2006
- Pinaroo Park Bushland Management Plan 2004

10. Appendices

10.1 Appendix A Cost estimates for future stormwater projects.

10.2 Appendix B Stormwater Demand calculations

PIA Service Catchment	New Noosa Plan zone Urban Development	Ultimate Urban Developable Lot Area m2 (from GIS)	Conversion Rate Urban Developable area to Impervious area	ULTIMATE Urban Impervious Area m2	ULTIMATE Urban Impervious Area Ha	PIA Catchment Development Projections & Demands	2016	2021	2026	2031	UTLIMATE
						Res Total Dwellings	242	249	268	296	310
						Non-Res GFA	2203	2169	2169	2669	7949
Boreen Point	Local Centre	17056.75136	0.9	15,351.08	1.54	Imp Ha	0.43	0.42	0.42	0.52	1.54
	Low Density residential	200632.3483	0.65	130,411.03	13.04	Imp Ha	10.18	10.47	11.27	12.45	13.04
	Community Facilities	979.5086974	0.85	832.58	0.08	Imp Ha	0.02	0.02	0.02	0.03	0.08
					14.66	TOTAL IMP Ha	10.63	10.92	11.72	13.00	14.66
						Res Total Dwellings	61.00	62.00	68.00	70.00	87.00
						Non-Res GFA	3,765.00	3,765.00	3,765.00	3,765.00	8,642.00
Kin Kin	Local Centre	10890.05927	0.9	9,801.05	0.98	Imp Ha	0.43	0.43	0.43	0.43	0.98
	Low Density residential	131204.1022	0.65	85,282.67	8.53	Imp Ha	5.98	6.08	6.67	6.86	8.53
	Low Impact Industry	19967.79513	0.85	16,972.63	1.70	Imp Ha	0.74	0.74	0.74	0.74	1.70
	Community Facilities	26779.22443	0.85	22,762.34	2.28	Imp Ha	0.99	0.99	0.99	0.99	2.28
					13.48	TOTAL IMP Ha	8.14	8.24	8.82	9.02	13.48
						Res Total Dwellings	114	114	116	116	117
Cooroibah						Non-Res GFA	0	0	0	0	0
	Low Density residential	71825.26238	0.65	46,686.42	4.67	Imp Ha	4.55	4.55	4.63	4.63	4.67
					4.67	TOTAL IMP Ha	4.55	4.55	4.63	4.63	4.67
						Res Total Dwellings	1111	1524	1539	1696	2766
						Non-Res GFA	106392	118788	133000	150237	209081
Cooroy	Low Density residential	1006406.942	0.75	754,805.21	75.48	Imp Ha	30.32	41.59	42.00	46.28	75.48
	Medium Density residential	232020.9594	0.82	190,257.19	19.03	Imp Ha	7.64	10.48	10.59	11.67	19.03
	Low Impact Industry	210726.5989	0.85	179,117.61	17.91	Imp Ha	9.11	10.18	11.39	12.87	17.91
	Medium Impact Industry	79772.76403	0.85	67,806.85	6.78	Imp Ha	3.45	3.85	4.31	4.87	6.78
	Community facilities	649273.7761	0.85	551,882.71	55.19	Imp Ha	28.08	31.35	35.11	39.66	55.19
	District Centre	74302.2262	0.9	66,872.00	6.69	Imp Ha	3.40	3.80	4.25	4.81	6.69
					181.07	TOTAL IMP Ha	82.01	101.25	107.65	120.15	181.07
						Res Total Dwellings	21603	22277	24080	25180	31129
						Non-Res GFA	637541	686359	744182	782601	951912
Coastal Area	Low Density residential	6074214.11	0.8	4,859,371.29	485.94	Imp Ha	337.23	347.75	375.90	393.07	485.94
	Medium Density residential	1816863.432	0.82	1,489,828.01	148.98	Imp Ha	103.39	106.62	115.25	120.51	148.98
	Low Density residential (Tewantin)	3243915.798	0.75	2,432,936.85	243.29	Imp Ha	168.84	174.11	188.20	196.80	243.29
	Community Facilities	1200829.864	0.85	1,020,705.38	102.07	Imp Ha	68.36	73.60	79.80	83.92	102.07
	High Density residential	323578.711	0.82	265,334.54	26.53	Imp Ha	18.41	18.99	20.53	21.46	26.53
	Tourist accommdation	615955.4663	0.9	554,359.92	55.44	Imp Ha	38.47	39.67	42.88	44.84	55.44
	Major centre	322560.7733	0.9	290,304.70	29.03	Imp Ha	19.44	20.93	22.70	23.87	29.03
	District Centre	164422.636	0.9	147,980.37	14.80	Imp Ha	9.91	10.67	11.57	12.17	14.80
	Local centre	17387.79372	0.9	15,649.01	1.56	Imp Ha	1.05	1.13	1.22	1.29	1.56
	Neighbourhood Centre	40069.02723	0.9	36,062.12	3.61	Imp Ha	2.42	2.60	2.82	2.96	3.61
	Low Impact Industry	223729.9348	0.85	190,170.44	19.02	Imp Ha	12.74	13.71	14.87	15.63	19.02
	Innovation	38656.48603	0.9	34,790.84	3.48	Imp Ha	2.33	2.51	2.72	2.86	3.48
	Medium Impact Industry	454804.017	0.85	386,583.41	38.66	Imp Ha	25.89	27.87	30.22	31.78	38.66
					1,172.41	TOTAL IMP Ha	808.49	840.16	908.67	951.16	1,172.41
						Res Total Dwellings	303	305	322	332	355
						Non-Res GFA	6929	6929	6929	10251	11789
Cooran	Local Centre	14248.73293	0.9	12,823.86	1.28	Imp Ha	0.75	0.75	0.75	1.12	1.28
	Low Density residential	463663.4144	0.65	301,381.22	30.14	Imp Ha	25.72	25.89	27.34	28.19	30.14
	Community Facilities	32415.53454	0.85	27,553.20	2.76	Imp Ha	1.62	1.62	1.62	2.40	2.76
					34.18	TOTAL IMP Ha	28.10	28.27	29.71	31.70	34.18
						Res Total Dwellings	464.00	499.00	514.00	550.00	790.00
						Non-Res GFA	38,367.00	39,701.00	41,962.00	42,799.00	52,988.00
Pomona	Local Centre	28751.13696	0.9	25,876.02	2.59	Imp Ha	1.87	1.94	2.05	2.09	2.59
	Low Density residential	708325.1492	0.65	460,411.35	46.04	Imp Ha	27.04	29.08	29.96	32.05	46.04
	Medium Density residential	54642.78604	0.76	41,528.52	4.15	Imp Ha	2.44	2.62	2.70	2.89	4.15
	Low Impact Industry	15274.44731	0.85	12,983.28	1.30	Imp Ha	0.94	0.97	1.03	1.05	1.30
	Medium Impact Industry	41106.40713	0.85	34,940.45	3.49	Imp Ha	2.53	2.62	2.77	2.82	3.49
	Community Facilities	412367.1082	0.85	350,512.04	35.05	Imp Ha	25.38	26.26	27.76	28.31	35.05
					92.63	TOTAL IMP Ha	60.20	63.50	66.26	69.22	92.63