

6.0 FUTURE DEMAND

6.1 Factors Affecting Demand

There are a number of factors that influence demand for the Stormwater assets within the Taupō District. These are described below and include:

- Growth in development and therefore population
- Community expectations

Other factors which influence the demand on the Stormwater asset however not described in detail are:

- Usage Efficiency
- Need for quality improvement
- Climate change
- Resource Consent requirements

Council has undertaken modelling works for catchments such as the Taupō CBD and Industrial areas where future growth or network capacity is not sufficient. Council has not undertaken modelling of the entire network due to the cost but may need to undertake this work in certain areas to support the identification of over land flow paths and their effects on private property.

Council uses its service request system as well as contract reports for the three waters contract to determine network utilisation and capacity issues. These sites are then further investigated to determine solutions.

Network demand can be affected by things such as climate change, which has led Council to change its code of practice in regards to network provision to 1:10 network 1:100 flow path provision. Due to climate change, large portions of Councils network is not now appropriately sized, but due to the cost of increasing the network capacity Council has made the decision not to undertake upgrades unless properties are experiencing flooding or for growth and thus rely on overland flow.

Areas such as parts of the Taupō CBD, while there would be impact from 1;100 year event, the need for upgrading is mitigated to a degree by the fact that stormwater will mostly be handled by the overland flow paths (predominantly roads) to the Lake, and so costly upgrades of the network can be delayed. (Some areas will require mitigation)

The validating of overland flow paths from the Lidar survey will form part of Councils hazards register. Also Council records information regarding capacity issues, such as manhole lids lifting and flooding incidents and uses this information to plan network upgrades. Council considers that that the accuracy of data on the maintenance of the network is sufficient, but more work needs to be done to determine the condition of assets which will drive the renewal program and so has programmed a CCTV program to inspect around at least 10% of the piped network per year.

6.2 Demand Management

Demand management is:

".....the modification customer demands for services in order to maximise use of existing assets or to reduce or defer the need for new assets."

A unique feature of demand management in Taupō District is the local soil structure that allows high levels of ground soakage, but also has the ability of becoming Hydrophobic after long periods without rainfall. (See results of Paenoa Rd event 2011)

Council in 2009 reviewed its Code of Practise for the development of land to allow for the effects of climate change as well as increasing the capacity size requirements of new infrastructure.

Taupō CBD

Council through the District Plan has provided rules that identify that most domestic property are to dispose of stormwater up to a 1:10 year event on site. The district plan also has selected areas within the industrial and CBD areas of the district where more intensive development may occur and which may require additional infrastructure to service.

As properties can still soak to ground due to the pumice soils, they still have an option when considering developing their sites. Levels of service for this area to date have not been compromised but it is inevitable that developers will want to increase coverage on their sites and will look to Council to provide connections. The provision of this infrastructure will depend on the cost of the network upgrade verses the cost of onsite soakage in the future.

Most, if not all of the central CBD is now hard surface and a large portion of the buildings are connected to the network. If storm events exceed the current network capacity the over land flow path modelling identifies that the roads act as a conduit to transport Stormwater to the Lake or river.

The Lidar survey data identifies that the over land flow paths (mainly roadways) can cater for large flows and where flow crosses private property these sites will be investigated during the validation process.

Further modelling of the network as part of the over land flow path identification works will also assist in determining future capacity issues in these areas.

This Asset management plan will endeavour to provide the required infrastructure as required by the Growth management plan but must also consider Councils current funding strategy.

Industrial Area Taupō

Areas such as the Taupō industrial area, bounded by Manuka and Matai streets are progressively being built on with buildings having total site coverage. There are still a number of these properties disposing of Stormwater on site, usually by soak holes underneath the building envelope.

Council staff has previously investigated the cost of providing increased service capacity to enable site connections. Part of the catchment would travel south to dispose into the gully adjacent to crown park which would mean the downstream infrastructure would also require increased capacity and the residual catchment would need to drain north into the Tauhara soakage pond. At this stage this is not creating levels of service problems due to the good soakage, but as site development intensifies there may be increased demand to connect to the network.

Currently there has not been a demand to increase coverage over these sites as more industrial and light commercial properties have come onto the market. So growth at this time does not trigger this investment so the project has been pushed out of the thirty year plan and will need to be considered in future Amp documents.

TDC currently uses the following techniques to manage demand for Stormwater:

- Legislation.
- Comprehensive discharge, resource consent requirements and conditions.
- Education through increased customer consultation.
- District Plan.
- Code of Practice
- Education in Schools plus paper and radio
- Non network based demand measures

Stormwater infrastructure for new developments is supplied by the developer. Council's updated code of practice includes climate change as well as best practice stormwater design.

Council's intention is to use where possible land based disposal systems where stormwater quality can be enhanced. Where green fields development occurs Council's comprehensive consent requires that catchment management plans are developed. Council will also continue to develop structure plans that identify the location and size of developments which will impact the ability of areas to develop.

Council is now looking to utilise the numerous gully systems to provide quality improvement and disposal capacity as the gully systems have considerable capacity to store and soak large rainfall events but care must be taken to ensure this soakage potential is not lost during any earthworks.

6.3 Plans Related to Growth

In addition to the general Council planning documents such as the District Plan there are other planning documents that relate to demand in relation to the Stormwater asset. These include:

Growth Management Taupō 2050 - The Council's asset management plans need to be aligned with the strategy to ensure more efficient and affordable provision of infrastructure for the identified growth areas.

- Taupō Urban Structure Plan
- Taupō Town Structure Plan
- Kinloch Structure Plan
- Taupō West Structure Plan
- Southern structure Plan
- Commercial Industrial structure Plan

6.4 Growth

6.4.1 GROWTH MANAGEMENT STRATEGY

In June 2006 the Council adopted Taupō District 2050 (TD2050), the Growth Management Strategy for the District. The growth management strategy identifies where urban growth is anticipated so that land use and infrastructure planning can be aligned. TD2050 has been incorporated into the District Plan by way of plan changes, particularly Plan Change 21 which identifies the future urban growth areas.

This strategic approach to integrating land use and infrastructure is intended to be supported by subsequent structure planning of the urban growth areas to identify the detailed settlement pattern and infrastructure servicing. Council has prepared structure plans for:

- Kinloch
- Mapara Valley
- South-western Bays Settlements (including Turangi); and
- Commercial and industrial areas within Taupō Township

A growth model was developed based on the anticipated population increase and associated residential lot increases in TD2050. The growth model is reviewed and updated every three years prior to the review of the asset management plans and development of the long term plan. The review of the growth model is based on census data estimates, feedback from developers and analysis of resource consents.

Financial Year ENDING	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28
Total Residential properties per year	135	161	162	151	122	126	122	134	97	94
Running Total for LTP	764	925	1087	1238	1360	1486	1608	1742	1839	1933
Taupō South	25	55	55	55	55	55	55	55	30	30
Nukuhau/Brentwood/ Poihipi/Huka Falls	25	35	55	35	30	30	30	30	30	30
Taupō Town	20	20	20	20	20	20	20	20	20	20
Total Lots Created	70	110	130	110	105	105	105	105	80	80
Acacia Bay (including lower Mapara Rd)										
Total Lots Created	2	2	2	2	2	2	2	2	2	2
Kinloch										
Total Lots Created	10	22	0	12	0	7	0	0	0	0
Mapara Valley										
Total Lots Created	5	5	5	5	5	5	5	5	5	5
Five Mile Bay/Waitahanui	0	0	0	0	0	0	0	0	0	0
Total Lots Created	0	0	0	0	0	0	0	0	0	0
Turangi										
Total Lots Created	2	2	2	2	2	2	2	2	2	2
Pukawa/Omori/ Kuratau										
Total Lots Created	18	15	18	0	3	0	3	0	3	0
Rural Other										

Total Lots Created	5	5	5	5	5	5	5	5	5	5
--------------------	---	---	---	---	---	---	---	---	---	---

Table: Estimated lots created over the period 2018-28 from the Taupō Growth Model

The total estimated residential yield for the district over the next TYP period (2018-2028) is estimated at 1304 lots.

- OCCUPANCY PER DWELLING

The long term trend for more than fifty years has been for a decrease in the number of people per dwelling. This is true across all ages. Occupancy among aging populations is especially low, with widowed partners typically living alone.

Council uses a Household Unit Equivalent (HUE) to convert between population figures and the number of dwellings. Current Census data shows the HUE is approximately 2.6 people per household. Statistics New Zealand projects the average occupancy rate will decrease to 2.1 by 2021 due to an aging population and changes in family structures.

In Taupō District, this figure is complicated by holiday homes which form approximately 30%¹ of the district's dwellings. This figure is difficult to fully determine due to the difference between out-of-town ratepayers and what is likely to be deemed a holiday home.

However, as a consequence of this high number of possibly empty homes for a significant part of the year Council needs to consider peak usage and populations when determining demand. This peak demand is particularly relevant when considering demand on infrastructure, such as water and wastewater outlined in detail in the *DC Policy* and *Taupō Growth Model*.

6.4 Meeting increased/changing demand

Increased/changing demand can be met by using a number of methods including;

- Non Asset
- Capital
- Operational
- Developer provided

6.4.1 NON ASSET SOLUTIONS

Increased/changing demand can be met by using a number of methods including;

- On site disposal
- Ongoing education
- Use of ephemeral gullies
- Rain gardens
- swales

6.4.2 CAPITAL EXPENDITURE DUE TO CHANGES IN DEMAND

The development of 1304 lots in the district in the coming ten years will require new infrastructure as well as necessitating the upgrading of the current network to cater for the additional demand.

Developers are responsible for providing new infrastructure in new developments and the increasing of capacity in the existing network if required.

These upgrades may incorporate:

- The use of storage and detention systems
- Low impact urban design

¹ Statistics NZ data

- Above ground stormwater solutions including rain tanks and rain gardens as well overland swales.
- The use of ephemeral gullies for detention, quality improvement and for avoiding erosion.
- Modelling of the network affected.
- Use of best practise Stormwater disposal
- Storm water quality improvement

Council has not provided any capex funding for increases in demand in the short term as this will be developer driven. Capex has been provided for quality improvement and back log demand where the exiting network is below capacity due to climate change or other factors. As the current growth estimates are shown to be reasonably flat there is also no demand funding in the thirty year funding plan.

Table 1: Capital Projects Required to Service Taupō District Growth

6.4.3 OPERATIONAL EXPENDITURE DUE TO CHANGES IN DEMAND

The development of 1304 lots in the district in the coming ten years will have an impact on operational costs.

- Operational/maintenance expenditure – there may be a change to the cost to operate or maintain Councils assets due to growth or to changes in demand. There may also be increased operations and maintenance due to new assets created. E.g. increased maintenance costs of new Stormwater infrastructure built to cater for growth.

Council will see an increase in operational costs as Council obtains additional Stormwater reserves and gully systems with detention ponds, and gully walls that will require planting mowing and pest plant removal as well a new quality improvement devices that will require clean out.

Funding of this expenditure is discussed in the financial section of this asset management plan (section 9) and strategies for operation and maintenance of assets in section 4.

6.5 Infrastructure Acquired From Developers

TDC will also acquire a number of assets from developers. An estimate of the quantities of these is outlined in the table below.

Asset type	Per year	Total	Value 10yr	Notes
Pipes	1500 m	15000m	\$3,000,000	Subdivisions moving to more open systems
Manholes	40	400	\$900,000	
Detention Ponds	2	20	\$600,000	Sub-divisions require quality improvement prior to final disposal to receiving environments
TOTAL			\$4,500,000	

Table 2: Predicted Stormwater Assets from New Development

The additional maintenance and operations costs resulting from these new assets are included in the cash flow projections.

6.6 Community Expectations

Customers are primarily concerned with expansion of existing network services such as:

- Pipe network
- Overland flow path provision
- Quality improvement
- Ephemeral gully development
- Health & Safety

6.7 Tourism

The effect of tourism is to increase the population and perceived growth over short periods.

This taken into account in that we design stormwater assets for peak demand and we base this on lots rather than permanent population.

Overall Tourism does not have a significant impact on Councils reticulated network, but Tourism has an impact on the decisions around stormwater quality and the discharges into the receiving environments.

The local community and tourists to the district are no longer satisfied with seeing floatable contaminants coming from stormwater outlets, especially those on the Taupō lakeshore. This in part has driven the quality improvement program. It has also driven the provision of adequate litter service to make sure that the community and visitors have the ability to discard material appropriately when that are out and about.

As the Lake is also the main tourist attraction and is also used for a number of high profile events it is imperative that local lake and river quality is not only maintained but enhanced.