7.0 FUTURE DEMAND

7.1 Factors Affecting Demand

There are a number of other factors that influence demand for the Transport asset 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 Transport asset however not described in detail are:

- Usage Efficiency
- Tourism/Events
- Vehicle ownership
- Leisure trends

7.2 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 managing of the fluctuating demand. Taupō has a large percentage of unoccupied dwellings which means that the base demand as compared to dwelling numbers is low. However this demand increases significantly during peak holiday periods, tourist seasons and when there are large events in town.

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

- Bylaws and legislation (including the District Plan)
- Traffic management devices
- Passenger transport
- Provision of walking and cycling infrastructure.
- Traffic counters are used to monitor the growth in traffic volumes.
- Traffic modelling for Taupō District was last updated using 2013 census data which identifies intersections which will be issues for the district based on the project population growth.

Other areas which may be used in future are:

- Education through increased customer consultation.
- User charges, which may be required by roading reforms.
- Parking restrictions, possible charging which will require full consultation.

7.3 Plans Related to Growth

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

- Growth Management Taupō 2050 The Council's asset management plans need to align with the Growth strategy to ensure efficient and affordable provision of infrastructure for the identified growth areas.
- Taupō Commercial & Industrial Structure Plan

- Kinloch Structure Plan
- Taupō West Structure Plan
- Mapara Valley Structure Plan
- Southern Structure Plan

7.4 Growth

7.4.1 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

7.4.2 GROWTH REVIEW SUMMARY - OCTOBER 2014

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.

Decisions on development works consider the short and long-term effects of growth when determining what is required. Council's method for determining growth is outlined in detail in its *Development Contributions (DC) Policy*. This is determined in conjunction Council's decision making processes and planning documents such as the *10-Year Plan*, the *Asset Management Plans*, and others.

Taupō District is home to 32,907 people who usually live here as well as the 43 percent of the district's ratepayers who live outside the district, many with holiday homes. Residents live mainly in the towns of Taupō (\sim 20,850), Turangi (\sim 2952) and Mangakino (\sim 741), although about 8361 also live in surrounding rural areas and lake and river settlements. We are also the holiday destination for hundreds of thousands of visitors each year.

Taupō District has seen continued growth despite the Global Financial Crisis (GFC), however at a very cautious level. Many of the residential developments that were started prior to the GFC have led to a high level of vacant residential sites and the district is in a good position to react to any upturn in the market. Taupō is continuing to average about 120 new lots per year since 2010.

Demand is affected by a mixture of economic and population growth factors, including:

• Demographics – The 2013 census has seen Taupō's population grow by 2% since 2006. Taupō's population is likely to continue to grow with it peaking at 2035¹. Taupō is continuing to see a significant drop in at the ages between 20-35 years of age as this group leaves the district to pursue education and other opportunities. Taupō is seeing

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¹ Jackson, N., "Taupō District, Demographic Trends and Projections, National Institute of Demographic and Economic Analysis", June 2014.

- an aging population that has a significant impact on the levels of service required. This occurrence is likely to see the need for smaller houses with less people per dwelling.
- Community expectations Council sets the communities levels of service has part of its 10-Year Plan process based on community feedback and the decision making processes.
- Employment Taupō is driven primarily by its unique characteristics, which is
 determined generally by tourism (labour intensive with lowly paid jobs), and conversely
 forestry and the energy generation (fewer opportunities and better paid);
- Land use changes Residential development in Taupō has continued, however at a
 more cautious level since the GFC. Taupō continues to be in a good position to react to
 any upturn in the residential market given the amount of consented residential
 development and level of infrastructure built over the past 10 years. Of particular note
 is the Kinloch settlement where land prices have dropped dramatically to meet the
 market and it is now an affordable location for family homes. This has had the effect of
 increasing the permanent population by some 50% in the 2013 census data and this
 trend is expected to continue;
- Commercial and industrial activity Taupō has also seen the completion of some large scale development projects, including the East Taupō Arterial (ETA), Mighty River Power's new Nga Tamariki Geothermal Power Plant, Te Mihi Geothermal Plant, major Transpower upgrades and Miraka's Milk Processing and UHT Plant at Mokai. Taupō has also seen a slight increase in further commercial and industrial developments, including, Mitre 10 Mega and Ashwood Park industrial development;
- National and regional policy and legislative requirements National policy, government spending, and the management of tax structures, provides an important direction and can either encourage or place constraints on the ability of areas to develop. Regional policy, through the management of natural resources impacts significantly on the ability of an area to grow. Taupō see's some prohibitive costs on development for certain areas that can be significant particularly when in close proximity to lakes and waterways²;
- External factors Global economic conditions have a significant impact on the ability of individuals to invest in and drive development, as seen with the GFC.

Council needs to take consideration of this growth when determining demand and levels of service.

7.4.3 GROWTH MODEL- ESTIMATES FOR LTP 2018-2028

A *Taupō District Growth Model* has been in place since 1 July 2004 and was initially developed with the projected growth identified in TD2050. The *Taupō District Growth Model* and *Growth Model Review* have been updated and included in the current *Development Contributions Policy*, to reflect changes in the economy and the timing of key infrastructure.

The 2014 changes to the growth figures show a significant change in growth in the Taupō region. The projections are based on actual development numbers and realistic estimates of growth outlined in the *DC Policy* and *2015 Growth Model Review*.

The current and predicted levels of development within the region have been scaled back significantly. It is dangerous from a financial aspect to over estimate the level of future growth. Where growth is overestimated the requirement for capital expenditure is overstated, essentially elevating costs to the ratepayer with limited ability to collect development contributions.

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² Variation 5 seeks to protect water quality within near lakeshore areas. Strict guidelines for nitrogen disposal systems are mandatory. Compliance imposes significant costs on any development near lakeshore areas where Council reticulated wastewater networks are not available.

Under the *DC Policy* the cost of growth related infrastructure is the responsibility of the developer. If the development does not occur as projected but the project still proceeds, the cost of the growth related capital expenditure is transferred onto the rate payer, therefore ultimately increasing rates.

Growth in the number of lots and dwellings in the district has impacts on infrastructure demand. Growth also increases the number of rating units, and therefore has a revenue impact.

7.4.4 NEW LOTS TO BE CREATED

Consideration has been given to the optimistic discussions with developers, actual consent numbers over the past three years, demographic considerations³ and officers' estimates when estimating the potential lot numbers outlined in the *DC Policy* and the *Growth Model*.

The table below outlines those estimates for the next ten years. The areas that are not predicted to have any growth due to current capacity levels, such as, Hatepe, Motuoapa, Whareroa, and Five Mile Bay/Waitahanui have been removed.

Financial Year ENDING	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27	27/28
Total new lots 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/	25	35	55	35	30	30	30	30	30	30
Brentwood/										
Poihipi/Huka Falls										
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
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

³ Jackson, N., "Taupō District, Demographic Trends and Projections, National Institute of Demographic and Economic Analysis", June 2014.

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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 new lots for the district over the next TYP period (2018-2028) is estimated at 1304 lots, with 1254 water connections, as rural lots do not connect.

The estimated growth of the district; and water, wastewater, and transportation catchments; models are found in the *DC Policy* and *Taupō Growth Model*.

7.4.5 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 Equivalent Unit (HEU) to convert between population figures and the number of dwellings. Current Census data shows the HEU 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%⁴ 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*.

7.4.6 ESTIMATE - SCALE - SMOOTH

New lot projections were estimated on a development basis and then aggregated into catchments⁵. The data was then reviewed and amended in an officer discussion process which moderated the estimates.

Further out years becomes difficult to project with any accuracy. The impacts are most serious over the first three years of any TYP, or in any year when the projections are substantially greater than in any of the two preceding or following years. The final figures, by catchment, are outlined in the *DC Policy* and *Taupō Growth Model*.

7.4.7 ASSUMPTIONS

- The world economy will continue to reflect uneven growth.
- The exchange rate will continue to be relatively high which will keep international demand for holiday homes somewhat subdued.
- Population changes drive 60-70% of household formation in the District. With an ageing population the HEU will fall, so that for a given population more dwellings will be needed.
- The medium fertility population projections from Stats NZ (2012 update) are a reliable estimation basis for the District (Census 2013 data on the usually resident population suggest that this assumption may be unreliable because the data showed slower population than expected across the whole District.

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⁴ Statistics NZ data

 $^{^{\}rm 5}$ Water, Wastewater and Transportation, Taupō Growth Model.

7.4.8 RESIDENTIAL GROWTH PREDICTIONS

The total estimated residential yield for the District over the next TYP for the 10 year period (2018-2028) is estimated at 1304 lots.

7.5 Meeting increased/changing demand

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

- Other non asset based methods eg use of passenger transport modes.
- Capital Expenditure building new assets
- Operational/maintenance expenditure there may be a change to the cost to operate
 or maintain 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 roads built to cater for growth.

7.5.1 OTHER NON ASSET BASED SOLUTIONS DEMAND MANAGEMENT TOOLS TO MANAGE CHANGES IN DEMAND

A unique feature of demand management in Taupō District is the managing of the fluctuating demand. Taupō has a large percentage of unoccupied dwellings which means that the base demand as compared to dwelling numbers is low. However this demand increases significantly during peak holiday periods, tourist seasons and when there are large events in town.

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

- Bylaws and legislation (including the District Plan)
- Travel Demand Management
- Traffic management devices
- Passenger transport
- · Walking and cycling facilities

Other areas which may be used in future are:

- Road safety education through increased customer consultation.
- Parking charges

7.5.2 CHANGE IN CLIMATE

• Transportation network will be impacted by climate change particularly the linkages along the Lakefront including some of the reserve land. This will impact the cycleway and walkways which could be compromised due to rising lake levels and this will create new opportunities or challenges in maintaining connected networks. This will be managed by paying particular attention in the planning, design and construction of new paths near overland flow paths or adjacent to coastal areas or being mitigated by water flows by energy companies. With climate change there will be increase in temperatures and possible heavier rainfalls. This will mean for the Transport asset some changes may be applied to surface materials and/or for maintenance interventions such as roads which normally had frost or ice may in the future not need signage and/or grit spread. On the reverse, roads in low lying areas may require additional signs and maintenance etc. A link to the storm-water AMP and Parks & Reserves AMP may assist in identifying overland flow paths and the impact to the road network.

7.5.3 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. The table below outlines the infrastructure required, the cost of this infrastructure and the timing of the provision of components with a Council cost share. Refer to Appendix I for Project Sheets.

Area	Project	Cost to Council (\$,000)	Construction timing	Notes
Acacia Bay	Collector Road 2 (Off Acacia Bay Rd between Lochaber Dr and Brentwood Av).	\$0	2045+	As the development sizes trigger the necessity for a collector road individually there is no upsizing component required of Council. Therefore the cost of this will be entirely on the developer.
Acacia Bay	Norman Smith St Upgrade (short term).	\$575K	2018/2019	Investigation is being completed in 2017/2018 and will provide options both short and long term for the intersection and CBD traffic flows.
Acacia Bay	Norman Smith St upgrade (medium term).	\$1,050K	2022/2023 2023/2024 to 2024/2025	Design starts in 2022 if short term measures need improving/updating.
Acacia Bay	Second Bridge crossing	\$100K design \$13M construction	2028/2029 to 2029/30	Will depend on whether prior measures have worked with improved traffic flows. \$100K for design & cost estimates, construction from 2028/29 to 2029/30.
Taupō	Poihipi Rd widening	\$approx. 400K (for each stage)	Stage 3 construction from 2018/19	Stage 2 completed. Stage 3 design planned from 2018/19 with estimated cost of \$30K for design.
Taupō	Post ETA Enhancements • Priority changes • Tongariro St traffic calming • CBD lakefront development	\$500K \$5075K \$2525K	From 2021/2022+	Construction of enhancements along Tongariro Street including traffic calming, narrowing.
Taupō	Spa Rd four Laning	\$2,750M	From 2041/42	The growth of the industrial area and commercial development area triggers the necessity of widening Spa Road and easing the traffic congestion at the peak times. Funded by TDC and NZTA.

Area	Project	Cost to Council (\$,000)	Construction timing	Notes
Taupō	Spa Rd/Tauhara Rd intersection improvements	\$1.2M	Design completed, construction 2029/30 and 2030/31	This intersection was included in post ETA enhancement projects. Funded by TDC and NZTA.
Taupō	Broadlands Rd widening (stage 1)	\$550K (to be confirmed)	Design from 2020/21+	Funded by TDC and NZTA & development contributions. This project is to be staged with both stages estimated at \$550K each.
Taupō	Broadlands Rd widening (stage 2)	\$550K (to be confirmed)	Design from 2025/26+	Funded by TDC and NZTA & development contributions. This project is to be staged with both stages estimated at \$550K each. To follow stage 1.
Taupo	Broadlands Rd widening (stage 3)	\$550K (to be confirmed)	Design from 2029/30+	Funded by TDC and NZTA & development contributions. This project is to be staged with both stages estimated at \$550K each. To follow stage 2.
Taupō	Broadlands Rd curve easing (RP5.2-5.4)	\$195K including \$15K design	Design from 2025/26 to 2027/28	Funded by TDC and NZTA
Taupō	Broadlands Rd curve easing (RP11.5-11.7km)	\$205K including \$25K design	Design from 2026/27+	Funded by TDC and NZTA.
Taupō	Broadlands Rd curve easing (RP23.3 – 23.5km)	\$185K including \$15K design	Design from 2025/26+	Funded by TDC and NZTA.
Taupō	Collector Road (from Ashwood Park to Broadlands Rd	\$0 (see note)	When required	The subdivision development in the area triggers the construction of this route. Fully funded by Developer as the Industrial blocks develop.
Taupō	Collector Road (through East Urban Lands council subdivision)	\$0 (see note)	When required	As the development sizes trigger the necessity for a collector road individually there is no upsizing component required of Council. Therefore the cost of this will be entirely on the developer.
Taupō	SH1/Wharewaka intersection upgrade	\$800K	From 2023/2024 to 2024/2025	The adjacent subdivision and ETA need the upgrade of this intersection to cater for traffic using it. Possible cost share between TDC, NZTA and developer.

Area	Project	Cost to Council (\$,000)	Construction timing	Notes
Taupō	SH1/Collector Rd intersection upgrade (Between Heeni St and Rainbow Dr)	\$0	When required	The adjacent subdivision and ETA need the upgrade of this intersection to cater for traffic using it. All funding is from the developer.
Kinloch	Collector Road (on the south side of Whangamata, near the intersection of Whangamata and Kinloch)	\$0	When required	As the development sizes trigger the necessity for a collector road individually there is no upsizing component required of Council. Therefore the cost of this will be entirely on the developer.
Turangi	Proposed road access (On the west side of Taupahi St, between Kutai St and Koura St)	\$0	When required	Access to development from Taupahi Rd.
Western Lakeshore	Tukino Rd Extension	\$unknown (see note)	NA	Extend Tukino Rd to link in with development. Funding is from the developer, total cost is unknown.

Table 7.1: Capital Projects Required to Service Taupō District Growth

7.5.4 OPERATIONAL EXPENDITURE DUE TO CHANGES IN DEMAND

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

Area	Project	Additional Operational Cost per annum	Timing
Acacia Bay	Collector Road 2 (Off Acacia Bay Rd between Lochaber Dr and Brentwood Av)	\$1,000	2045+
Acacia Bay	Norman Smith St Upgrade	\$5,000	2022+
Acacia Bay	Second Taupō Town River Crossing	\$8,000	2029+
Acacia Bay	Acacia Bay Rd/Mapara Road Collector (Stage 1)	\$0	2045+
Acacia Bay	Acacia Bay Rd/Mapara Road Collector (Stage 2)	\$0	2045+
Taupō	Poihipi Rd widening	\$5,000	Stage 1 completed & Stage 2 construction from 2018/19.
Taupō	Post ETA Enhancements • Tongariro St traffic calming	To be estimated during each design phase.	From 2022/2023
Taupō	Lake Tce traffic calming	To be estimated during design phase	Completed

Area	Project	Additional Operational Cost per annum	Timing
Taupō	Spa Rd four Laning	To be estimated during design phase	2041/42+
Taupō	Spa Rd/Tauhara Rd intersection improvements	To be estimated during design phase	Design completed. Construction deferred 2029/30
Taupō	Broadlands Rd widening (Stage 1)	To be estimated during design phase	
Taupō	Broadlands Rd widening (Stage 2)	To be estimated during design phase	
Taupō	Broadlands Rd curve easing (RP5.2-5.4)	To be estimated during design phase	
Taupō	Broadlands Rd curve easing	To be estimated during design phase	
Taupō	Broadlands Rd curve easing (RP23.3 – 23.5)	To be estimated during design phase	
Taupō	Collector Road (from Napier Rd/Crown Rd/Ashwood Park to Broadlands Rd)	\$0	When required
Taupō	Collector Road (through East Urban Lands council subdivision)	\$26,000/yr	When required
Taupō	SH1/Wharewaka intersection upgrade	\$0	From 2024/25+
Taupō	SH1/Collector Rd intersection upgrade (Between Heeni St and Rainbow Dr)	\$0	2025/26+ or when required
Kinloch	Collector Road (on the south side of Whangamata, near the intersection of Whangamata and Kinloch)	To be estimated during design phase	2025/26+ or when required
Turangi	Proposed road access (On the west side of Taupahi St, between Kutai St and Koura St)	\$0	2045+
Western Lakeshore	Tukino Rd Extension	\$1,500/yr	Unknown

Table 7.2: Operational Budget Required to Service Taupō District Growth

7.6 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	Notes
Pavements	500m	10km	\$1,736,000	300m urban, 200m rural (value includes formation, pavement, 1 st and 2 nd coat seals)
Footpaths	600m	12km	\$621,600	Not including Council's 4km per year (assume all developer)
Street Lights	7	140	\$230,500	1 per 50m urban plus 1 rural flag light per year
Road markings	Nil	Nil	Nil	New roads are local roads with minimal markings
Signs	7	140	\$42,000	1 rural road (2 signs – SNP, control), 2 urban streets (5 signs – 2 x SNP, 1 x control, 2 x other)
Traffic Controls	1	20	\$200,000	e.g. kea crossings, roundabouts, splitter islands etc
Bridges		2	\$120,000	2 large culverts ephemeral gullies year 10
Culverts	7	140	\$375,000	On rural road – 1 per entrance (average 4 entrances), 1 across intersection, 2 across road
Structures		2	\$30,000	1 bus shelter every 5 years
Drainage				
Rural water tables	100m	2km	Inc. in pavements	25% of the rural length both sides
Kerb and channel	700m	14km	\$560,000	Rural – 25% of the 200m both sides, Urban – both sides entire length
Cesspits	8	160	\$144,000	Spaced at 80m where kerb and channel installed
Stormwater piping	550m	11km	\$1,650,000	Leads – 50m Main – 300m pipe plus 200m to lead to outflow or adjacent catchment
Berms	1km	20km	Incl. in pavements	Both sides all roads
Cycling	Nil	Nil	Nil	Not provided by developers (included in lifecycles as Council investment)
Off Site Parking	Nil	Nil	Nil	Not provided by developers
TOTAL			\$5,719,100	

Table 7.3: Predicted Transport Assets from New Development: 2018 - 2028

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

7.7 Community Expectations

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

- Seal extension (rural customers).
- Footpath construction and safe facilities.
- Streetlight upgrades/extensions.
- Crash reduction/safety related projects.
- Bus Services.

Customer opinion is to be gauged more thoroughly as part of increased consultation, as detailed in the improvement plan.

7.8 Tourism

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

The 2013 census indicated that the Taupō District had a population of 32,907. However, the number of people staying in the Taupō district during the peak tourism season of the Christmas/New Year school holiday period has been estimated to be 1.68 times that number and possibly more when large events are on. We design assets for peak demand based on historical data and we base this on lots rather than permanent population.