
INFRASTRUCTURE ASSET MANAGEMENT STRATEGY

Queenstown Lakes District Council
2018-2048



Adopted 28 June 2018

Foreword

This Infrastructure Strategy documents a second generation of Queenstown Lakes District Council's understanding and approach to tackling the strategic issues facing our region's core infrastructure. It is particularly rewarding as the General Manager who oversees infrastructure, to know that like the first generation, our internal staff prepared this second generation. What has made this process even more satisfying is that Queenstown Lakes District Council staff had the opportunity to work with and learn from other councils in New Zealand and Australia in the development and refinement of this strategy. It is through collaboration and sharing of knowledge that our sector can best respond to the needs of the communities we serve.

This version of the strategy is the first time we have sought to integrate our Local Government Act requirements with our ISO55000 asset management requirements. This integration has seen the bringing together of our previous Infrastructure Strategy with our Asset Management Strategy. This process has improved our understanding of some real and practical issues. Issues that need to be faced by our policy-makers, planners, engineers and – crucially – our community. Our district needs to address these strategic issues in order to ensure; our economy remains strong and diversified, our environment remains clean and healthy, and communities and visitors both enjoy a high quality of life.

In particular, we need to understand how weather patterns and climate change will affect the performance of infrastructure over the medium and longer term. In addition, how climate change might affect our customers' usage of core infrastructure services. Providing education and quality alternatives that encourage positive behaviour changes will be a fundamental part of any future approach. Transport mode shifts away from sole passenger, private vehicles, along with water metering and charges will be a particular challenge to historic beliefs as we continue to transition to be a metropolitan centre.

This strategy continues the increased focus in infrastructure planning, and signals increased capital investment and demand management activities. On the surface, this may appear challenging and there are practical issues to be considered. However, setting out the long-term needs and responses in this strategy, supported by robust evidence, represents an important step in providing the information to engage residents and businesses of our community for the next stages.

Ultimately – of course – planning can only go so far. The next important stage of the strategy is a phased and agile implementation. We will all have our part to play in our district's positive future.

Peter Hansby

General Manager, Property and Infrastructure
Queenstown Lakes District Council

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1.0 Executive Summary

The vision for Queenstown Lakes District, as stated in the Ten Year Plan, is: Vibrant Communities, Enduring Landscapes, Bold Leadership. Flowing from these are a series of specific outcomes.

Under 'Enduring Landscapes' the outcomes that relate to infrastructure management are:

- > efficient and effective infrastructure;
- > world class landscapes are protected; and
- > environmental sustainability and low-impact living is highly valued.

The core infrastructures activities to support these outcomes are:

- > land transportation;
- > water supply, wastewater and stormwater (three waters); and
- > solid waste management.

This Infrastructure Asset Management Strategy (IAMS) outlines the strategic issues facing Queenstown Lakes District Council (QLDC) as they relate to core infrastructure over the next thirty years.

As part of meeting the requirements of section 101B of the Local Government Act, this 30-year infrastructure strategy not only sets out the strategic issues, it also identifies the interventions available to QLDC and outlines the preferred intervention strategy. The Ten Year Plan, sets out the first ten years of investment plans to deliver these interventions in addressing the strategic issues.

QLDC has completed a three-year programme into improving its asset management systems. As such, QLDC has a sound understanding of the issues facing the district, with an evidence base, concerning the provision of three-waters, solid waste management and transportation infrastructures. These new asset management systems are based on the International Asset Management Standard (ISO55000) and are supported by a continuous improvement programme,

assessed annually against the International Infrastructure Management Manual (IIMM). QLDC has also sought to further improve community confidence in its infrastructure management by proactively undertaking Treasury's Investor Confidence Rating process. QLDC has an unqualified rating of "C".

There is an ongoing need to progressively improve customer engagement supported by improved descriptions and measurement of levels of service. This will better enable investment programmes that best balance customer needs and affordability.

The three-waters and transportation activities are well engaged with asset planning, with a number of key master-planning documents produced in recent years, along with a full suite of Asset/Activity Management Plans being produced in late 2017. These plans are underpinned by the Asset Planning Team who have a commitment to continuously mature asset management practices, asset data records (i.e. age and condition) and management of asset life cycles, including investment programming.

The significant challenges facing QLDC infrastructure over the next thirty years include (detailed in section 6):

- > demanding natural environment - understanding and responding to changes in our natural and climatic environments to ensure water supplies and sanitary services are healthy, safe and reliable;
- > growth in population and visitor numbers - transition from a decentralised 'holiday house' services model to an optimised 'metro' services model;
- > complexity of the built environment - implementing waste minimisation (paramount is costs and consents to landfill expiring);
- > challenging economy - delivering the substantial capital works programme, both financially and at a resourcing capacity level to address the step change in the level of service bought about by the rapid level growth; and
- > legislative changes - understanding stormwater quality and developing a strategy to comply with the proposed Otago Regional Councils Plan 6a.

Refer to the QLDC website for all completed strategies, business cases and asset/activity management plans.

ENDURING LANDSCAPES TOITŪ TE WHENUA



Environmental sustainability and low impact living is highly valued



Efficient and effective infrastructure

World class landscapes are protected



2.0 Purpose

The purpose of the IAMS is to give effect to QLDC’s Asset Management Policy. This document is designed to meet the requirements of section 101B of the Local Government Act 2002.

3.0 Governing Best Practice

A fundamental aspect of asset management is that it must align with the legislation and industry guidance. Figure 1 illustrates QLDC’s hierarchy of asset management.

FIGURE 1 GOVERNING FRAMEWORK



3.1 LOCAL GOVERNMENT ACT

Local Government in New Zealand is defined and administered under the Local Government Act 2002 (LGA). The LGA provides a framework for the establishment, functions and operation of local councils. Specifically, the purpose of Local Government infrastructure and services is set out in Section 10A as:

“To meet the current and future needs of communities for good-quality local infrastructure and local public services in a way that is most cost-effective for households and businesses.”

Where ‘good-quality’ means that infrastructure and services are efficient, effective and appropriate to present and anticipated future circumstances.

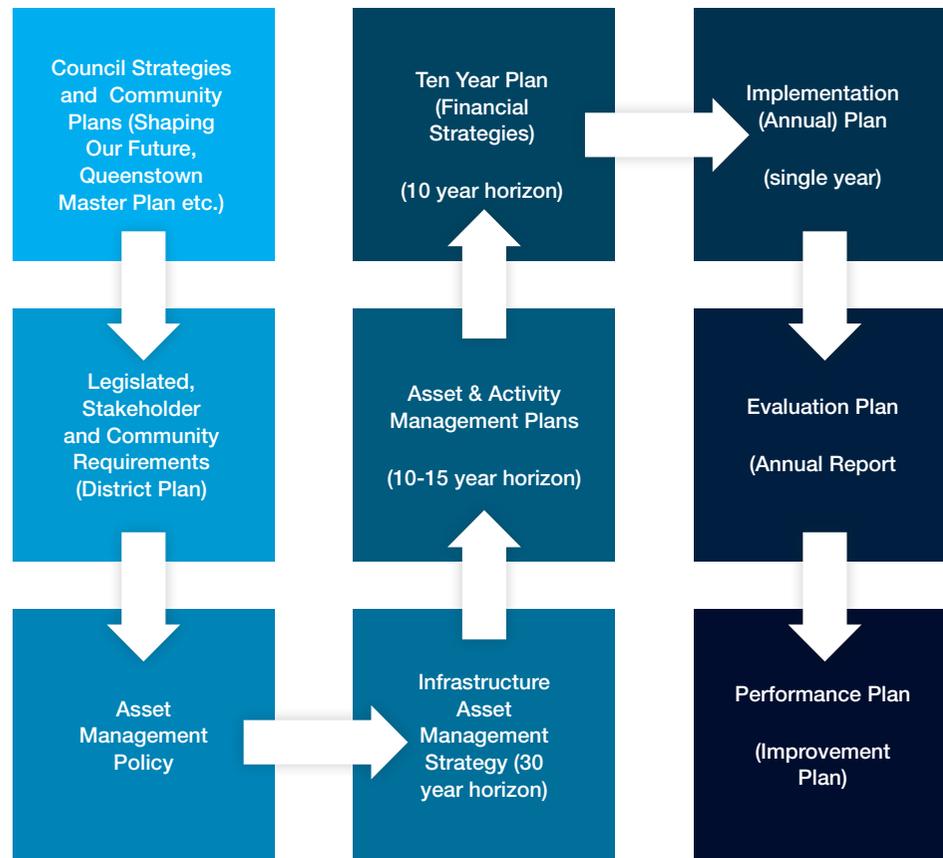
The LGA sets out in Section 11A that these requirements apply to: network infrastructure (i.e. roads, and three waters services); solid waste collection and disposal (including recycling); and the avoidance or mitigation of natural hazards.

In addition, Section 101 requires local authorities to move away from short-term thinking in favour of longer-term approaches, more consistent with the life cycles of community infrastructure. Section 101 is complimented with a new Section 17A, which requires councils to look beyond their geographic boundaries for more cost effective methods of delivering their services.

4.0 Asset Management Framework

QLDC's approach to implementing the governing framework in Figure 1 is illustrated in Figure 2 below.

FIGURE 2 ASSET MANAGEMENT FRAMEWORK



This approach has been developed to meet key legislative requirements and support robust asset management practice. Legislated, stakeholder and community requirements, along with business performance information inform the QLDC's Asset Management Policy and IAMS. The 30-year (design horizon) for the IAMS seeks to identify emerging issues for service delivery over the longer term. The strategic matters identified in the IAMS are identified, analysed and scoped using better business cases (BBC) before being programmed into the 15-year Asset/Activity Plans. Asset/Activity Plans are internal working documents and are reviewed and updated annually.

The first ten years of programmes from the Asset/Activity Plans are required to be consulted on with the community before being adopted into the Ten Year Plan (TYP). The last five years of programmes identified in the Asset/Activity Plans support a process to enable time for QLDC to investigate and gain an understanding of matters prior to community consultation before potential inclusion into the TYP.

The TYP sets out how QLDC and the community intend to balance competing priorities whilst delivering desired community benefits. The TYP is reviewed on a three-year cycle but can be 'tweaked' annually through a legislated consultation process.

Each year of the TYP is implemented following further consultation; this is known as the Annual Plan.

QLDC reports on the progress and success of its investment and service delivery annually in its Evaluation Plan (Annual Report), which is published in the last quarter of each calendar year. Improvement opportunities identified through all aspects of this process are captured in the Performance Plan and are used to inform programmed continuous improvement actions within the asset management activities. The Performance Plan is monitored and reported to Senior Management on a quarterly basis.

5.0 Asset Management Objectives

Within the context of the Ten Year Plan and legislative requirements, the aim of asset management is to:

“To plan, acquire, operate, maintain, replace and dispose of assets over the long-term, to meet agreed service standards and the foreseeable future needs of our community in the most cost effective way.”

This translates into specific objectives for asset management:

- > to deliver more efficient use and maintenance of existing infrastructure assets;
 - > to best manage demand for new assets with better integration with the District Plan, urban design and other non-infrastructure approaches;
 - > to regularly measure and advance the maturing of our AM practices;
 - > to continuously develop the capacity and capability of our staff in asset management and risk management; and
 - > to progressively improve the transparency and robustness (effectiveness) of investment decision making through evidence based investment (better business case approach).
- ### 5.1 KEY INFRASTRUCTURE UNCERTAINTIES
- This strategy is underpinned by a number of uncertainties, as noted in this section. These uncertainties are further developed in the context of the significant challenges detailed in section 6.
- > New assets and replacement of existing assets: With the exception of critical assets (as identified under the QLDC Risk Management Framework) all assets will be operated under a run to fail model as they can likely be replaced with generic or off the shelf replacement parts with only minor disruption to customer services.
 - > Response to growth (or decline) in the demand for services: QLDC will measure, update and confirm demand for services on an annual basis to ensure future projections for services are based on best available information, and is able to take into account effectiveness of any demand management programmes.
 - > Allowance for planned increases (or decreases) in service levels: QLDC will research, test and engage on the setting of service levels to best balance service efficiency and effectiveness, customer expectations, legal requirements and community affordability. Any significant service level change will be consulted on through the provisions of the Local Government Act 2002.
 - > Maintain or improve public health and environmental outcomes or mitigate adverse effects: QLDC holds resource consents for parts of its business operations as required under the Resource Management Act 1991. QLDC has an underlying approach that it will progressively seek to improve public and environmental health outcomes, as regulations require in the most affordable manner.
 - > Provision of resilience of infrastructure assets by identifying and managing risks: As outlined in the National Infrastructure Plan, QLDC has completed a natural hazard assessment across the district, initially focusing on three waters reticulation with a view to expanding this across other asset classes. This has been combined with latest generation asset criticality assessments. QLDC has a balanced programme of asset reinforcement, relocation and de-risking to support its insurance and other financial provisions for risk management.
 - > Actual asset life is shorter than designed asset life: As much as practicable, do not over stress the assets and seek to optimise and extend the effective life / capacity of existing infrastructure to reduce investment in new infrastructure (i.e. make best use of what is already in place).
 - > Reduce the adverse effects of wastewater: operate within resource consents and progressively rationalise wastewater treatment plants and progressively upgrade treatment capacity and technology (i.e. have fewer, better treatment plants than many, less well-operated plants).
 - > Reduce the likelihood of polluting high contact recreation areas: Seek and operate within resource consents. Actively monitor and invest in the wastewater networks to reduce the adverse effects of wastewater contamination at these key sites (i.e. do not have large wastewater facilities that could pollute the beaches and areas where people are most likely to have contact/recreational activities).

6.0 Strategic Assessment

VIBRANT COMMUNITIES
TE ORAKA HAPORI

BOLD LEADERSHIP
TE AMORAKI

ENDURING LANDSCAPES
TOITŪ TE WHENUA

COMMUNITY SERVICES & FACILITIES

INFRASTRUCTURE

WASTE MANAGEMENT

ENVIRONMENT

ECONOMY

REGULATORY FUNCTIONS & SERVICES

FINANCE & SUPPORT SERVICES

LOCAL DEMOCRACY

It is QLDC's responsibility to manage the community infrastructure assets in an efficient and effective way to best support a resilient community where environmental sustainability and low impact living is highly valued. Good custodianship of these assets requires that QLDC monitors and understands implications of changes in its business-operating environment.

The following have been identified as the most significant challenges affecting core infrastructure. Section 6.1 to 6.5 provides the evidence and also QLDC's assumptions of what we feel will take place:

- > Demanding natural environment
- > Growth
- > Complex built environment
- > Challenging economy
- > Variable legal / political

6.1 DEMANDING NATURAL ENVIRONMENT

The Queenstown Lakes District covers a total area of 9,357 km² and includes a number of significant lakes (Lake Hawea, Lake Wakatipu, and Lake Wanaka). The district is world-renown for its unspoiled natural environment and commerce-oriented tourism, especially adventure and ski tourism and has New Zealand's highest public sealed alpine pass. The natural environment of the district consists of a variety of systems including rivers, lakes, basins, wetlands, bush remnants, uplands and shorelines. During the peak periods of summer and winter, normal resident population of 38,048 can increase to 111,349 and 62,909 people respectively.

Queenstown (Tahuna) is the largest town in the district, and the second largest town in Otago after Dunedin. It is situated on the eastern side of Lake Wakatipu near the outlet of the Kawarau River. Using QLDC Growth Projections to 2058, the resident population of the Queenstown urban area is 22,081.

Wanaka is the second largest town in the district with an urban resident population of 11,986. It is situated at the southern end of Lake Wanaka, adjacent to the outflow of the lake to the Clutha River.

Other towns in the district include Arrowtown, Kingston, Glenorchy, Lake Hawea, Cardrona, Makarora and Luggate.

The district's lakes and groundwater resources are its raw water supplies. The quality of this water can affect the quality of drinking water provided. The quality of the lakes can be affected in a number of ways including, increases in turbidity and discharges of contaminants such as road runoff.

The district is a geologically unstable area given the proximity to the Alpine Fault and various other (moderate) faults through the district situated within the Southern Alps, part of the Pacific Ring of Fire. Uplift has been most rapid during the last five million years, and the mountains continue to be raised today by tectonic pressure, causing earthquakes on the Alpine Fault and other nearby faults.

The district is one of the coldest places in New Zealand with an average temperature of 11°C ranging from - 10°C to 35°C with ground frosts over 130 days per year. The clear winter days have a low average rainfall of 636mm per year and create a unique climate within New Zealand. It is expected the climate will become less predictable. The district is semiarid (all day sun and good drainage) to lake side/swamp (damp, poor drainage, little sun and heavy frosts).

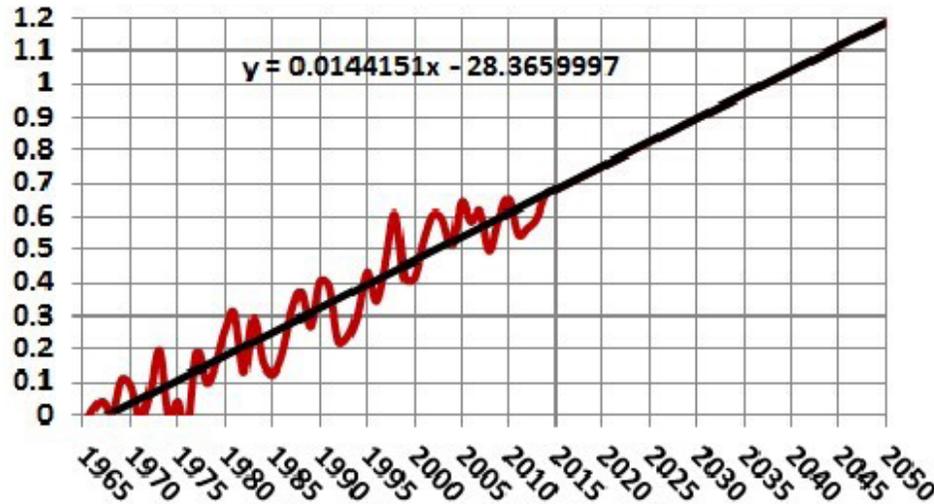
The Ministry for the Environment* predicts the following longer-term changes in the district's climate over the next 100 years when compared to 1990 levels:

- > temperatures are likely to be around 0.9°C warmer by 2045;
- > Otago is expected to become wetter, particularly in winter and spring where average annual rainfall is likely to increase by 12% by 2090 with winter rainfall predicted to increase by 29% by the same time;
- > the number and intensity of storms is expected to increase in winter and decrease in summer;
- > the frequency of extreme winds is likely to increase by between 2% and 5% in almost all regions of New Zealand in winter, and decrease by a similar amount in summer; and
- > significant decreases in seasonal snow are projected for the Otago region. The duration of snow cover is also likely to decrease, particularly at lower elevations. QLDC is likely to see a shift towards increasing rainfall instead of snowfall as snowlines rise to higher elevations due to rising temperatures.

* Reference: <http://www.mfe.govt.nz/climate-change/how-climate-change-affects-nz/how-might-climate-change-affect-my-region/otago>
** Reference: http://www.roperfd.com/science/globaltemperature_globalwarming.htm

Average temperatures have increased by 0.7°C over the past 50 years (refer Figure 3) and are expected to increase by 0.9°C within the next 30 years. It is expected that soils will dry out (as above) and irrigation will be less effective.

FIGURE 4 GLOBAL TEMPERATURE INDEX PROJECTED**



The actual extent and severity of these changes will be investigated progressively over the term of this plan in order to best manage existing infrastructure, plan and phase new infrastructure to ensure good quality services are affordable to the community.

Climate Change

QLDC is currently developing its first generation Climate Change Strategy – this strategy intends to broadly line up with the recent LGNZ Climate Change Programme – New Zealand’s commitment to the Paris Agreement.

There are two streams to this strategy, the first being emissions reduction. Identifying projects that reduce Councils and the Community’s emissions i.e. public transport, energy efficiency on large items such as swimming pools and pumping costs for three waters. Other initiatives currently underway include measuring the emissions base-

line for Council, i.e. what do we emit today, this will allow us to measure and report our future performance.

The second stream is about resilience and climate change, i.e. exploration of vulnerabilities and mitigation of the effects. If the future will be characterised by stormy and warmer weather, what is our exposure to that as a district? It is about identifying what aspects of a changing climate will most need to be responded to and what are our responses i.e. the district’s natural hazards are flooding and storms, warming temperatures and wind erosion. Identifying and actively pursuing ways to improve the district’s resilience.

Drinking Water Standards

QLDC has made a commitment to meet drinking water standards, on all Council water supplies, by 2028. As an interim measure to protect drinking water quality, and picking up one of the key recommendations of the Havelock Inquiry, QLDC has implemented temporary disinfection of its water networks. In addition, following advice from the Department of Internal Affairs, QLDC is looking at alternative delivery models by where it could meet drinking water standards within the next five years, or sooner. Refer to Appendix B for projects relating to drinking water standards.

Assumptions and Uncertainty

Parts of the natural environment will deteriorate with increased urbanisation and population growth. Raw water quality will become more polluted, both naturally (lake snow/algae/turbidity) and with an increase in development and/or changes in urban run-off and other contaminants (metals – zinc, copper and hydrocarbons).

QLDC will need to increase its monitoring of the natural environment. The ability to predict and respond as to when a water treatment solution is no longer appropriate and public health maybe compromised is imperative.

The transportation network is vulnerable due to natural hazards such as the seismic activity from the Alpine Fault and land instability from landslides and rock falls. Physical restrictions of landscape due to mountains, valleys and lakes limits usable land and alternative routes are limited, with narrow lanes providing inadequate passing lanes/opportunities.

**Reference: http://www.roperid.com/science/globaltemperature_globalwarming.htm

Climate Change

The climate will become less predictable. An increase in wind will mean greater rates of evaporation, meaning irrigation will become less effective, this will lead to a potentially higher per capita consumption of water. High wind may result in the loss of topsoil and increased deposits in lakes and rivers, increasing turbidity and potential contamination.

Dryer conditions may result in higher risk for wild fire events. QLDC will review policies to understand and mitigate these risks which may involve policy change for example, scorched earth policies on verge maintenance, increased irrigation in parks and open spaces.

Lake level and valleys are prone to flooding and alluvial re-direction i.e. Kinloch.

The district has a number of dangerous trees, there are species chosen for their autumnal colours such as poplars; however, these are vulnerable to internal rot, not visible to the eye, and have a high risk of failure in high winds.

There is an increasing issue with discharge and contaminants resulting from road runoff into stormwater and potentially water supplies.

QLDC will continue to work with Central Government and Otago Regional Council to address the issues around Climate Change and will commit to implementing Water Standards, lifting the quality of freshwater resources and improving our drinking, waste and stormwater.

Drinking Water Standards

To determine the health impacts of a contamination event, we have considered a “Havelock North event” occurring in our district. QLDC could expect hospitalisations of up to 161 people, with as many as 25,000 people effected and as many as 70 fatalities. Those most at risk are people who are elderly, very young, and already sick, on dialysis or on chemotherapy.

Using the Ministry of Health’s data, the local cost of a contamination event in our district could reasonably be estimated to exceed \$75 million. These costs cover immediate medical care and lost productivity only.

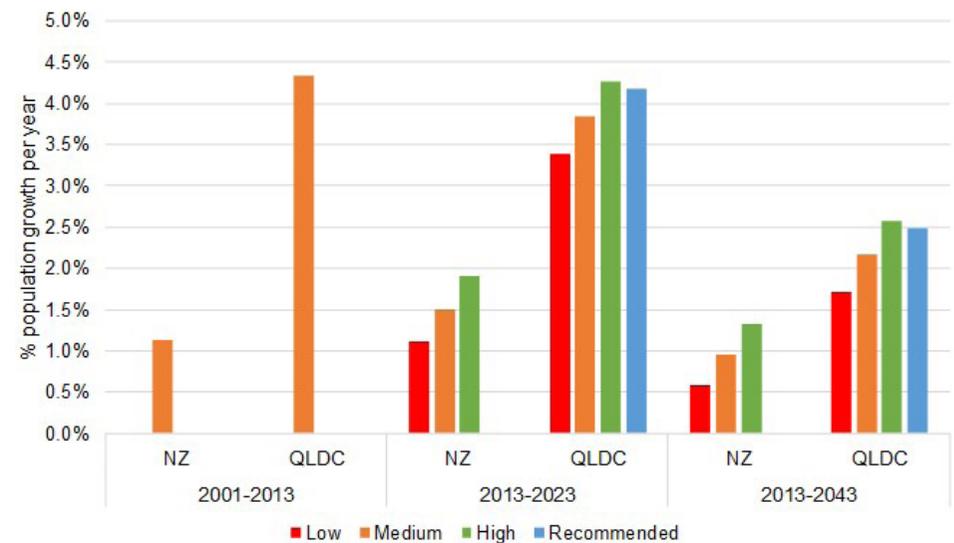
In addition, adverse international media coverage would place significant risk on the district’s tourism economy, estimated at \$6.8 million per day.

6.2 GROWTH

The Queenstown Lakes District is experiencing another period of sustained, rapid population growth. Increases in population, without effective demand management, places increased pressures on QLDC infrastructure and the quality of services supported.

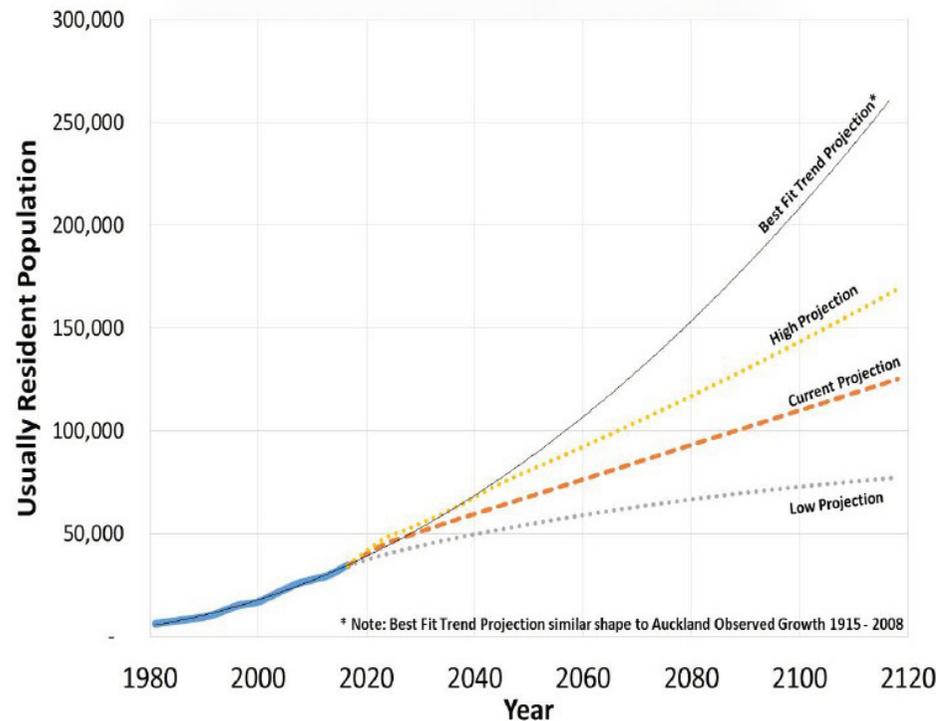
Resident population growth in the district has typically been around 4.1% per year since 1996. However, since the 2013 Census, the resident population has grown from 28,224 to 38,048 – a 34% increase in five years. This rate of growth is high when compared to most other towns in New Zealand.

FIGURE 4 NATIONAL & LOCAL % GROWTH (REF: STATS NEW ZEALAND & QLDC GROWTH PROJECTIONS TO 2058, 25 MAY 2017)



The extent and pace of growth means the community is facing numerous opportunities and problems. An increase in productivity means a thriving economy however; this also leads to lack of affordable housing, education and health facilities at capacity all of which inhibits the liveability of our district.

FIGURE 5 HISTORIC AND PROJECTED POPULATION 1980 TO 2120 (REF: STATS NEW ZEALAND & QLDC GROWTH PROJECTIONS TO 2058, 25 MAY 2017)



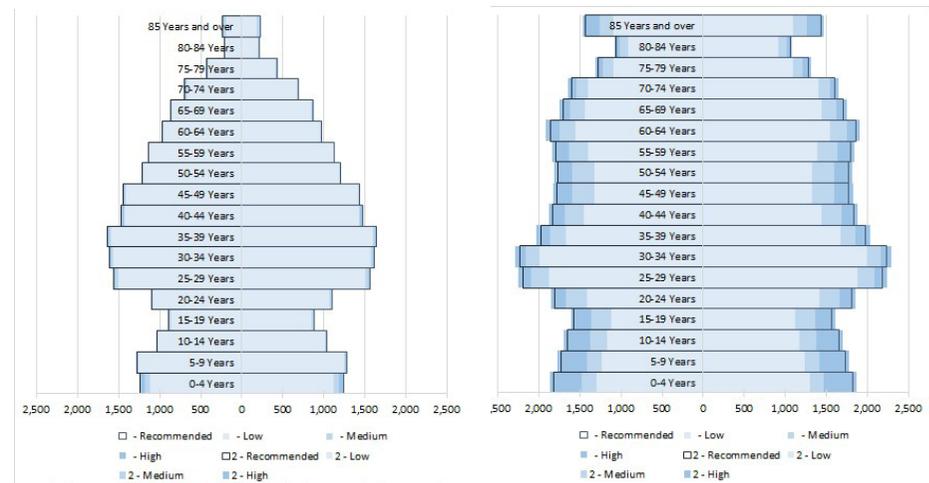
Historically, QLDC had taken a conservative approach to population projections, legacy forecasts have proven to be below actual growth rates. In 2015, QLDC undertook a review of these projections and the methodology now includes economic forecast data as well as adjusting the projections to a medium high as opposed to a medium projection. Under the revised 2017 medium-high population growth projections, the district's population is expected to increase by 102% to 66,355 by 2048.

In addition, there is a projected shift in age profile in terms of numbers but also as a proportion of our resident population. It is predicted resident population over 60 years of age will increase from 8% to 10% of the resident population over the next 30 years.

Another significant age change is residents under the age of five years. Anecdotally the district has the fastest growing population aged zero to five years in New Zealand.

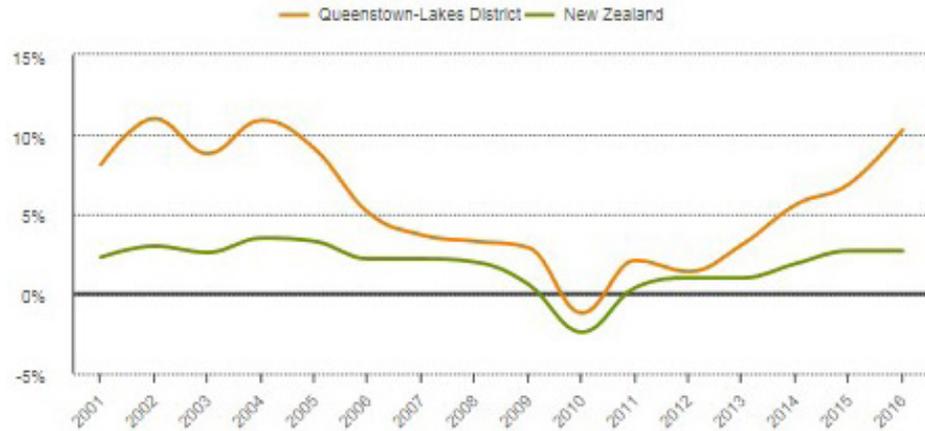
Central Government has identified Queenstown as a 'high growth urban area' with 29% projected population growth between 2018 and 2028. QLDC has responded with applications for the Special Housing Areas as well as the Housing Infrastructure Fund.

FIGURE 6 QUEENSTOWN LAKES DISTRICT DEMOGRAPHIC PROJECTIONS 2018 AND 2043



Infometrics (New Zealand independent economic forecaster) has reported the Queenstown Lakes District was New Zealand's top performing territorial authority during 2016, with employment expanding by 10.3% over the March 2016 year. This growth was almost four times the 2.7% rate of employment expansion seen nationally. It is estimated the number of jobs in the Queenstown side of the district grew by 11% over the March 2016 year, while job numbers over the hill in the Wanaka area climbed 8.6% over the same period.

FIGURE 7 EMPLOYMENT GROWTH 2001 – 2016 (INFOMETRICS)



The district is a recognised tourism destination that supports economic growth across the southern part of the South Island. The quality of the natural environment is an important factor in supporting economic growth within the district.

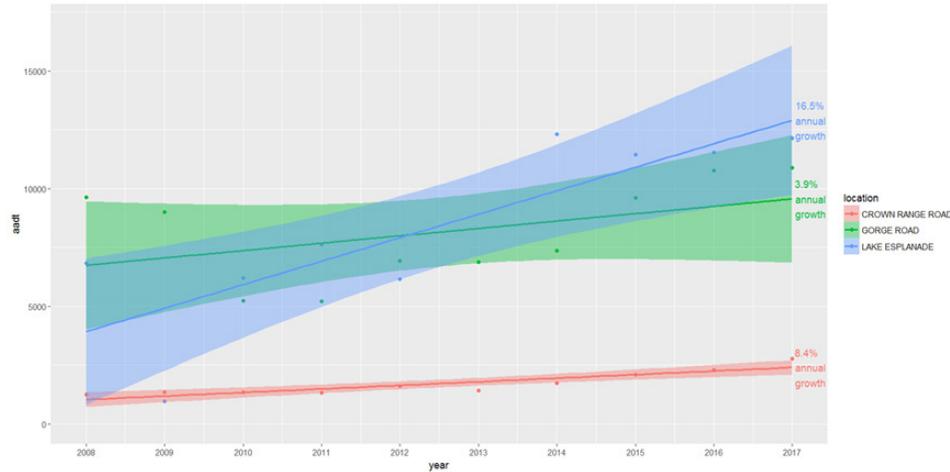
The growth in population and visitor numbers is supported by traffic count evidence from the NZTA. On the key State Highway corridors, there has been an up to 25% increase on the number of vehicles visiting the district in the past 12 months. This current rate of growth will potentially lead to a doubling of traffic every five years. When considering the historic response to growth the new capacity of any upgraded corridors could be consumed well before physical works are actually completed.

FIGURE 8 NZTA TRAFFIC COUNT GROWTH 2014-2016

Site	Location	2014	2015	% growth	2016	% growth
ID 00600947	Cromwell	3523	3886	10.3	4434	14.1
ID 00600970	Gibbston - before Gibbston Back Rd	3561	3868	8.6	4406	13.9
ID 00600980	Swiftburn - past Swiftburn Culvert	4260	4580	7.5	5287	15.4
ID 00600984	Crown Range on Arrow River Bridge	6645	6625	-	8318	25.6
ID 00600988	East of Strains Rd	9102	9733	6.9	11390	17
ID 00600991	Shotover - before Lower Shotover Rd	12110	12622	4.2	14062	11.4
ID 00600994	Frankton - north east of junction	17910	19654	9.7	23468	19.4
ID 00600996	Junction - Airport - between SH6&6A & Airport	17723	19180	8.2	19212	0
ID 00600997	North of Humphrey St	8303	9054	9.1	9987	10.3
ID 00690997	Between Southberg Ave & Bridge	7113	7626	7.2	8640	13.3
ID 00600999	South of Peninsula Rd	4049	4506	11.3	5605	24.4
ID 00601000	Remarkables after skifield	3476	3910	12.5	4768	21.9
ID 00601005	Between Jacks Point & Lakeside Estate	2399	2520	5	3085	22.4
ID 06A00001	Frankton - Telemetry Site 90	19811	21472	8.4	23925	11.4
ID 06A00006	Stanley St - Millenium Hotel	16467	17402	5.7	17829	2.5

In line with population and visitor growth, it is anticipated there will be an increase in freight task over time, particularly growth in the movement of manufactured and retail goods, construction materials and waste. The Frankton Business Park will likely provide the hub for the construction and commercial activities to support Queenstown’s future growth, and remain the focus for heavy vehicle movements into Queenstown.

FIGURE 9 LOCAL TRAFFIC GROWTH 2008-2017



Ministry of Business, Innovation and Employment has predicted visitor arrivals into New Zealand to grow at 5.4%pa, reaching 4.5 million visitors in 2022 from 3.1 million in 2015. Queenstown’s reputation as an international destination has led the rise in the NZ tourism economy. The district is currently worth an estimated \$2.5Bpa or 8% of GDP. Queenstown Airport Corporation has released its growth figures for end June 2017 with an overall 15% increase on the previous year’s record: 12% international passengers and 16% domestic passengers.

FIGURE 10 QUEENSTOWN AIRPORT CORPORATION MASTER PLAN OPTIONS 2017



Assumptions and Uncertainty:

The 2017 population growth projections highlight not only the increasing overall population but also the significant aging population as seen in Figure 6 above.

Proportionally there will be an increase of users in the community who are vulnerable to contaminants in water supplies; consequently, QLDC will have to get better at providing safe and reliable water, through meeting drinking water standards. With an increasing population under the age of five, pressure on schools also leads to congestion and safety impacts at peak time school drop off and collection.

The Queenstown Integrated Transport Strategy highlights certain sections of the QLDC transport network will reach maximum capacity within this 30-year period. An immense improvement programme is being developed in partnership with the Otago Regional Council, Queenstown Airport Corporation and NZTA to address the issues. The integrated programme will see huge improvements to provision of public transport including reviewing water based transport. Other options being explored through the Mass Rapid Transport Solution between Frankton and Queenstown

include light rail and a gondola. Further work is focusing on active travel networks which will look to increase the use of cycle trails for both recreational and commuter usage. Combined with education programmes this could go some way to ensuring QLDC's roads continue to deliver current levels of service. Diversification of transport options is a key tool in managing congestion (user demand) at peak times of the day. Other options such as increases to local funding may also provide an alternative, however this solution would need to be well understood and consulted on with the community ahead of any such decision.

QLDC has looked back 30 years to help inform looking forward 30 years. What this historic period shows is there have been two spikes in population growth around the 1990's and the 2000's, we are seeing a further spike in the mid 2010's. The second growth spike lasted about twice as long as the first growth spike which was approximately five years. There were two periods of levelling off, in the late 1990's and the late 2000's. Interestingly these periods of levelling off still result in growth of around 2%, which is considered high by national standards. The third growth spike currently being experienced appears to be steeper than anything previously experienced and may last as short as five years or potentially as long as 15. For that reason, we will review population projections every year. As much as possible QLDC will implement infrastructure that is modular and can be phased over time whether that be delayed or brought forward.

Recent collaboration between QLDC and Statistics New Zealand has seen an adjustment to the Census Area Units (CAUs) for the 2018 Census. The refined CAUs will provide a better granularity of population levels across the district, which will facilitate management of infrastructure in growth areas.

Although there is a high level of confidence in resident population growth projections, there is less certainty around future consumption (consumer usage) rates. Consumption rates affect overall demand for services and depending on the effectiveness of any demand management programmes, the timing of some investments may be able to be deferred. In addition, a greater understanding of visitor projections and consumption rates is required to ensure investment programmes are timely and affordable.

6.3 COMPLEX BUILT ENVIRONMENT

The term 'Enduring Landscapes' indicates quality built environments that meet local needs and respect the local character; it includes QLDC's infrastructure assets that

provide the setting for community activity. This can range from buildings and parks to whole subdivisions and towns – it also includes the supporting infrastructure, such as water supply, wastewater, stormwater and roads and all associated assets, i.e. pipes, reservoirs, superfast internet, autonomous vehicles and signage.

There are a number of issues, which affect the performance of the assets and the ability to renew them; these are discussed later in the document.

The local climate conditions and elevation shortens the construction period. Topographic and seismic conditions, combined with seasonal changes may also accelerate deterioration of assets. This can complicate timings of renewals to ensure appropriate whole of life costs are achieved. Due to the risk of natural hazards, QLDC has commenced a business continuity planning process using the ISO 22301 Business Continuity Standard. This process will better inform QLDC and its ability to prepare for, respond to, and recover from disruptive incidents such as temporary loss of office accommodation, with disrupting services to the community.

Housing Infrastructure Fund

QLDC has secured \$50 million – 3,200 houses in Central Government's new Housing Infrastructure Fund (HIF). Two new greenfield sites (Quail Rise South and Ladies Mile) on the Frankton Flats and an extension of the Kingston township.

Ladies Mile - The Ladies Mile medium density residential development will provide a further 1,000 residential dwellings for the district. It includes provision for public transport infrastructure and will improve existing capacity and safety of the access into Lakes Hayes Estate and the level of service on State Highway 6.

Quail Rise - The Quail Rise South project will enable the construction of up to 1,100 residential dwellings in close proximity to Frankton Flats. The development includes a new road linking Ferry Hill Drive to the roundabout at the junction of SH6 and Hawthorne Drive, and pedestrian/cycleway access beneath SH6.

Kingston – This will bring forward the provision of three waters infrastructure schemes. This will enable the development of special zoned land and other sites within Kingston township, allowing approximately 950 more houses. Benefits include affordable housing for the district and improved public health for the community.

Assumptions and Uncertainty

Infrastructure will deteriorate and be damaged by third parties as well as natural hazards. Reviews will need to be undertaken as to post event functionality of facilities, this may require upgrading of buildings and structures that are expected to operate post a natural hazard event.

Deterioration may increase with climate change; hotter, colder, wetter, and/or dryer. The sewer network is expected to deteriorate quicker, projected increases in daytime temperatures will increase rates of corrosion in our pipe networks, reducing their longevity. Renewing early and investigations into alternative materials and erosion protection would be considered.

In terms of roading infrastructure, hotter and dryer conditions may lead to longevity of the network whilst wetter conditions may lead to increased deterioration or a change in approach to drainage. Forward planning and identification of opportunities are key. Infrastructure that encourages a wide range of transportation mode choice is preferred going forward.

Central Government's 2017 Government Policy Statement on transport has expanded the focus on freight movements to include tourism. Encouraging freight, may lead to vehicles carrying increased capacity and tonnage, which will require the roading network to be assessed in terms of accessibility. This may lead to the reinforcement of structures particularly where the current bridge stock is restricted by size or weight. Impacts of tourist growth, particularly self-drive can increase congestion, travel time reliability and potentially safety risks with drivers inexperienced in New Zealand road conditions.

It is likely QLDC business operations will experience at least one disruptive event during the period of this plan. There is also recognition that the Alpine Fault has a rupture frequency of around 300 years and it last ruptured in 1717. Scientific estimates predict the Alpine Fault has a 50% chance of rupturing as a magnitude eight earthquake or larger within the next 50 years.

There are a number of asset types where QLDC seeks to better understand changing customer needs through improved data and analysis:

- > Recent pipeline failures within the water supply network are indicating that an era of PVC pipe is failing far earlier than expected. This is thought to be due to the pipe standard used being more brittle than modern PVC materials; and

- > Extensive capital spend is planned through the Queenstown Town Centre Masterplan (TCMP) to revitalise Queenstown CBD in the next ten years:
 - Understanding the condition of the three waters infrastructure and programming renewal/upgrades is critical to ensuring the success of the TCMP and minimising disruption.
 - The town centre is a complex built environment with often varying user needs i.e. balancing the expectation of pedestrians, cyclists and vehicles. The planned arterial route aims to remove vehicles to the edge of town opening more space in the town centre for cyclists, pedestrians and other non-vehicle users.

6.4 CHALLENGING ECONOMY

QLDC is a district with a thriving economy, which is strongly driven by tourism, both domestic and international. A rapidly rising residential population has driven development, which is providing a booming construction industry. Subdivision and the resultant development enables the creation of new housing and land use opportunities, and is another key driver of the district's economy.

Queenstown Lakes has experienced very strong economic growth over the last decade (over double the New Zealand average), with population and visitor growth providing the main stimulus. Visitor and lifestyle-related industries (accommodation, food services, rental services and recreation services) and property and service industries (construction and construction services, general professional services, health services, real estate) have grown strongly. Gross Domestic Product per capita has not grown as fast.

FIGURE 11 QUEENSTOWN & NEW ZEALAND GROSS DOMESTIC PRODUCT

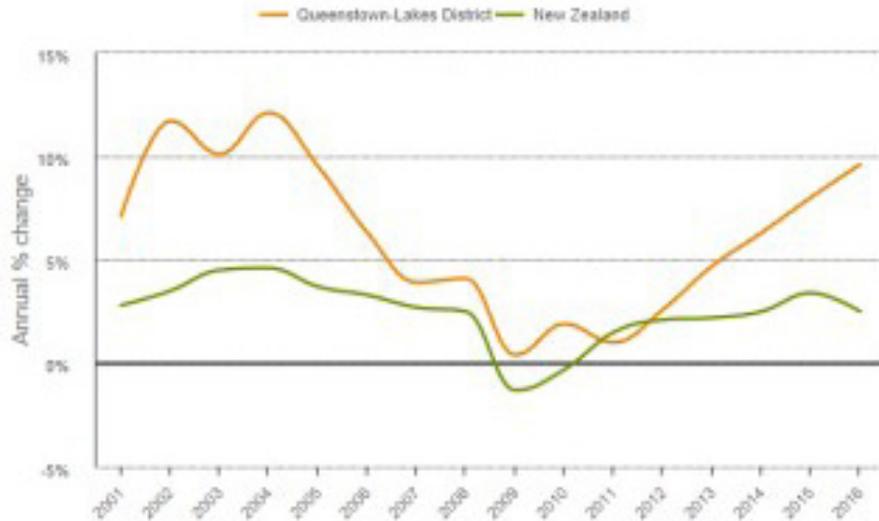
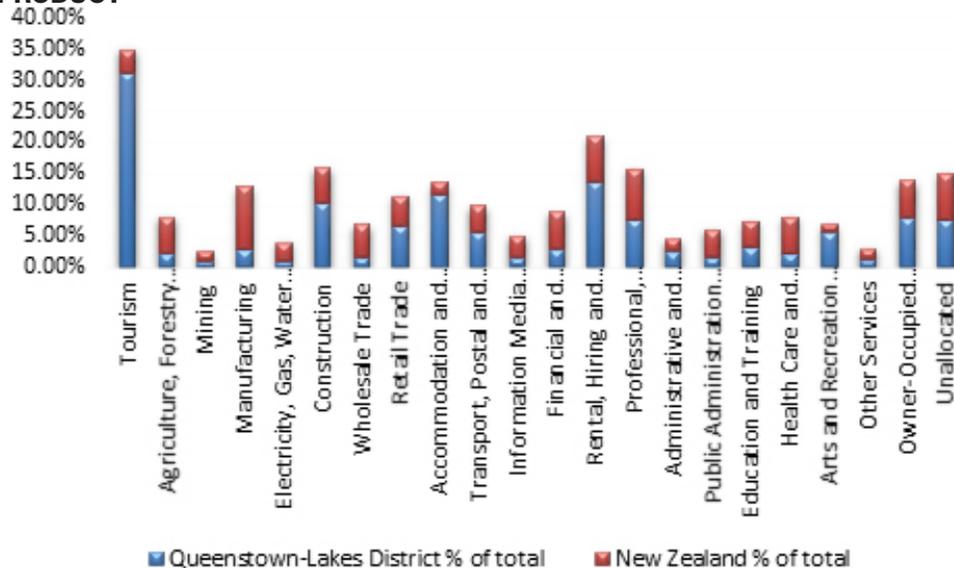


FIGURE 12 % INDUSTRY PROPORTION OF 2016 GROSS DOMESTIC PRODUCT



Employment has grown very strongly but estimated labour productivity in the district is well below the national level and earnings from salaries and wages are relatively low. Median income from all sources is, however, relatively high, likely reflecting that a high proportion of income is from investment and self-employment.

Due to the smaller resident population, QLDC does not have the depth of resources available and has to rely on the broader regional, national and international markets to provide resources, talent and investment. The affordability in the district brings broader issues in terms of attracting, securing and retaining staff. This is replicated within our contractors, suppliers and local businesses; this can all affect delivery of infrastructure.

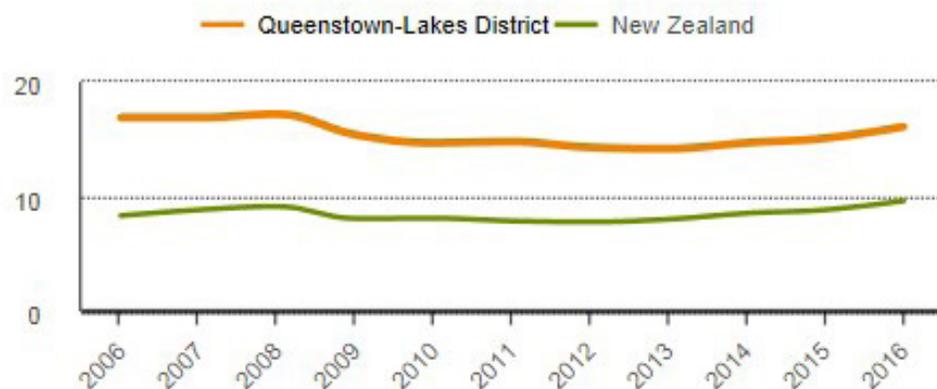
The district is distant from markets for goods and services and other urban centres. Distance increases transport and trade costs. When combined with the small local market, local businesses will struggle to achieve the same economies of scale as those in the same industries in larger markets, which constrains their productivity performance (and hence constrains profitability and incomes).

In 2016, Infometrics reported the median salary for the district was \$49,780; the median house price in this same year was \$803,241. This provides a ratio of house price to income (liveability ratio) of 15, this compares to Auckland’s liveability ratio of eight for the same period.

The district has high house prices. This is due to a combination of population growth and the second home market that has pushed up demand; and higher building costs (due to location related higher transport cost for materials, as well as high demand for a limited supply of local construction labour) and higher land costs.

FIGURE 13 QUEENSTOWN AND NEW ZEALAND HOUSING AFFORDABILITY

Housing affordability (higher is less affordable)



Over the next ten years and beyond, QLDC is facing its largest and compounding complex infrastructure capital works programme. QLDC are exploring the following options and mechanisms to address the risk of capacity to deliver intended programmes:

- > reviewing the current capacity and quality of all Three Waters activities. This status along with completed BBC's take into account and address the increased growth and forecasted growth as well as new regulatory regimes;
- > approaching the supply chain early in the procurement process to find the most appropriate method to get the best value for projects. i.e. packages of works and timings;
- > grouping similar projects together to incentivise the supply chain by increasing potential value. i.e. a programme around multiple three waters reservoirs;
- > reviewing the build, operate, manage, transfer models; and
- > maximising good rates by having longer contract periods and potential extensions.

The National Infrastructure Plan seeks that New Zealand's infrastructure is resilient,

co-ordinated and contributes to a strong economy. As a key selling point for New Zealand's Tourism Industry, the district has a large impact on the National Tourism Economy.

Factors to be considered in developing a strong economy include demonstrating an understanding of:

- > limited funding available to respond to competing demands - ensuring optimised decision-making processes are in place, including transparent processes for prioritisation and justification of asset expenditure;
- > changes in Central Government funding models i.e. the One Network Road Classification (ONRC) – this will affect the capacity to prioritise capital works programmes to meet current and future service demand through community participation in decision making;
- > consider asset disposal/rationalisation to fund alternative assets and services; and
- > value for money - ensuring we get the maximum impact from our efforts to drive growth by strengthening our focus on delivering measurable value from the investment in the land transport sector. It reflects expectations to ensure a strong rationale for projects and activities by seeking better and smarter ways of operating.

The ONRC, which applies to transportation, and the newly released Metadata Standards (applies to both three waters and transportation) will increase transparency on infrastructure performance and ultimately influence investment levels nationally.

Assumptions and Uncertainty:

Queenstown is an adventure tourism destination; the majority of ski fields make artificial snow, as natural supply is no longer sufficient nor reliable. The manufacture of good quality man-made snow cannot generally occur above an ambient air temperature of 3°C - with a predicted average air temperature increasing by 0.6°C there will be fewer days when snowmaking is possible which will impact Queenstown's ability to be a ski resort and the revenue this creates. However, new and alternative activities on the same land (e.g. downhill mountain biking) is a new growth industry for the district.

QLDC sources around 50% of its funding for transportation projects and expenditure from NZTA's National Land Transport Plan. The mechanism for funding approval is via the Regional Land Transport Plan.

Currently QLDC has an enhanced Funding Assistance Rate (FAR) for Special Purpose Roads (SPR), which is around 90-100%. NZTA have signaled they will be reducing the enhanced FAR to meet the local road FAR progressively over the next ten years. It is possible that levels of service (i.e. quality of roads or acceptable levels of congestion) will have to change as QLDC seeks to deliver its roading programme with reduced NZTA funding or seek increases in other funding sources.

QLDC is also looking at other options where by the ownership of SPR's such as the Crown Range and the road to Glenorchy would be moved from QLDC to NZTA. Although this would save QLDC money in maintenance, it may also result in changes to the levels of service (i.e. quality of roads or number of closure days) on those roads.

Fluctuations in growth stemming from changes in interest rates and the global economy are likely to mean Queenstown will be less affordable, yet still desirable. This will create a transient community, like London, where people will house 2-4 people per room to make it affordable. People will be forced to remote rural townships (Kingston, Glenorchy) to purchase or live which will in turn place increased stress on water supplies, sewer systems and roads as these towns transition to become commuter suburbs (demand will spike for short periods of time to facilitate increased travel time to work).

QLDC will continue to host a wide range of community and commercial events as an investment in the community through arts, community and sports events. It is an investment in direct economic benefit to our district.

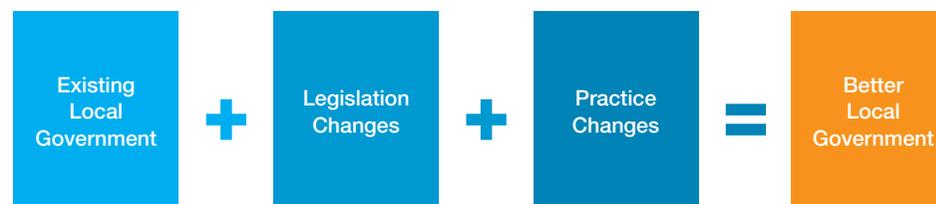
Central Government directive is the expectation to see benefits from tourism –using the roading network to provide a better experience for the tourists.

QLDC has appointed an Economic Development Manager role in response to the need for QLDC to develop a plan for delivering the objectives of the Economic Development Strategy.

6.5 VARIABLE LEGAL / POLITICAL

There have been a number of legislative and practice changes introduced to New Zealand's Local Government sector since the development of the 2015 Ten Year Plan in 2014. These changes require modifications in business focus, activities and ultimately better delivery of community outcomes. The following diagram illustrates the pressures placed on QLDC as a result of these changes.

FIGURE 15 CHANGES TO LOCAL GOVERNMENT PRACTICES



Changes in Legislation:

- > Local Government Act 2002, Section 10 sets out the purpose of Local Government. In late 2014 this section was updated placing a move away from 'lowest cost' services to a requirement that councils provide services that are 'efficient and effective'.
 - > Implication – QLDC has to demonstrate in a measureable way, year on year, that its services are efficient and effective.
- > Local Government Act 2002, Section 17A, a new provision that enables cross boundary sharing and delivery of services between councils to leverage, amongst other things, economies of scale.
 - > Implication – These shared services have been proven to deliver more efficient service delivery for 'neighbouring towns' in separate districts. Investigations are underway across Otago to determine what, if any, efficiencies can be gained through shared services arrangements.
 - > Implication – QLDC has to have the efficiency of its service delivery reviewed and confirmed, at least every six years, for all services.

- > Local Government Act 2002, Section 101B, a new provision that requires long term (at least 30 year horizon), strategic consideration of services and funding of their resilient delivery.
 - > Implication – QLDC’s short term actions and near term investments (Annual and Ten Year Plans) must clearly demonstrate that they give effect to the long-term issues and needs of the community.

Changes in Practice:

- > Local Government Funding Agency – The LGFA is a Council-Controlled Organisation (CCO) operating under the LGA. LGFA specialises in financing the New Zealand Local Government sector, the primary purpose being to provide more efficient funding costs and diversified funding sources for New Zealand local authorities. LGFA was established to raise debt on behalf of local authorities on terms that are more favourable to them than if they raised the debt directly.
 - > Implication – to not be a member of the LGFA might imply that funding of the council debt is sub-optimal.
- > National Infrastructure Plan – The NIP recognises that New Zealanders quality of life and our economic wellbeing is very reliant on good quality infrastructure. The NIP seeks to ensure that New Zealand’s infrastructure is resilient and coordinated such that it best contributes to a strong economy and high living standards. The NIP has identified maturing asset management practices in Local Government is a key measure of building the right thing, at the right time and at the right price.
 - > Implication – QLDC will have to demonstrate its asset management practices are maturing, resulting in progressively improving investment decisions.
- > Local Government Risk Management Agency – Following the Canterbury Earthquakes a review of Local Government identified a lack of knowledge and consistency in risk management and the principles for hazard reduction.
 - > Implication – QLDC will need to be able to clearly demonstrate that, if there was an event, QLDC understands and has best managed its risks to ensure that recovery is the quickest and that costs are the lowest to ratepayers.

- > 60 / 40 Review – Treasury is reviewing the system by which Central Government and Local Government apportion and share costs following a natural hazard event. The current approach is vague and not easily quantifiable for either party, which creates uncertainty. A new, clearer approach based on Maximum Probable Loss has been proposed.

- > Implication – QLDC will need to investigate, analyse, develop and fund a suite of controls and mitigations for responding to a set threshold of natural hazard event.

- > Government Policy Statement for Transport – Is the Government’s primary tool to communicate what it wants to achieve in land transport, and how it expects to see funding allocated across the likes of road policing, road safety promotion, State Highways, local roads and public transport. The 2017 key priorities include economic growth and productivity; it also reaffirms the focus on road safety and increases the emphasis on value for money. Meeting these outcomes successfully will attract funding.

- > Implication –A direct implication for QLDC following the 2017 GPS was the recognition of tourism as a key economic contributor to the national economy. Transport activities, which support tourism growth and productivity, will receive funding to provide a safe and resilience network.

- > National Policy Statement for Urban Capacity Development – The policy enables central government to prescribe objectives and policies for matters of national significance, which are relevant to achieving the sustainable management purpose of the RMA.

- > Implication – Local authorities need to ensure better liaison between departments and as such, QLDC has formulated the NPS Project Team incorporating staff from, Planning & Development, Property & Infrastructure, Corporate Services and Finance to ensure requirements are met.

- > Metadata Standards – Land Information New Zealand is leading the development of national Metadata Standards for how we capture, describe and store data. These standards will mitigate inefficiencies in local government operations and decision making brought about by inconsistent data, low quality data, and non-capture of data across New Zealand.

- > Implication – QLDC will need to transfer its data capture and storage systems to the new standards. These standards will increase transparency on QLDCs investment decisions.
- > Investor Confidence Rating (ICR) – the two yearly assessment of the performance of investment-intensive agencies in managing investments and assets that are critical to the delivery of services. The ICR provides an indication of the level of confidence investors (such as NZTA) can have in an agency’s ability to realise a promised investment result if funding was committed. Following three years of measuring maturity on its core infrastructure. QLDC has recently completed its first (internally assessed) Treasury ICR.
- > Implication - QLDC believes the ICR is an important tool in which to benchmark its investment performance with other infrastructure providers.

Assumptions and Uncertainty:

From a legal perspective, there may be increased regulation, which will likely include some sort of economic regulation. QLDC is responding to this now by increasing the number of external audits on the various aspects of its infrastructure business (Asset Management Maturity and Investor Confidence Rating).

This may also lead to changes in delivery models for local government services as demonstrated in the Auckland, Waikato and Wellington water sectors. There is uncertainty around the timing of such a model change but also the pace at which it would occur. Auckland achieved its transition in less than 12 months through legislation change. Waikato is not using legislation and this change is expected to take ten years to be fully embedded.

From a political perspective, there may be a shift in priorities and policies with the new Government. QLDC will continue to engage with Ministers and LGNZ to address many of the issues the district faces. There will be nine Local Government elections and therefore nine opportunities for change in political direction or strategic focus. We note that following the 2009 TYP, we moved into an extended period of political austerity. Following the 2016 elections, the political environment has transitioned to a ‘can-do’, investment positive approach. QLDC’s focus on strong asset management, supported by better business case approaches and evidence based investment, is assumed to reduce future investment volatility and the risk of significant political changes.

7.0 Infrastructure Portfolios

Underpinning the provision of QLDC’s infrastructure services to the community is a significant asset base that includes land transportation roads, water pipes, drains and treatment plants. QLDC is responsible for the care and management of this broad range of assets for the benefit of current and future communities. In the QLDC Annual Report 2016-17 QLDC’s total asset portfolio was valued at \$1.3 billion.

QLDC recognises future asset audits will improve QLDC’s knowledge of its asset portfolio. Future updates of each Asset/Activity Plan will progressively improve the records and performance data of all existing assets, including updating quantities and valuations.

7.1 SERVICES SUPPORTED BY QLDC ASSETS

The following table highlights the types of services that QLDC assets support. This list is intended to illustrate the relationship between QLDC assets and services.

TABLE 1 ASSETS SUPPORTING SERVICES

Land Transportation (liveability)	<ul style="list-style-type: none"> Movement of people and goods Connectivity and accessibility Corridors for utility services Passive recreation Flood protection Safe systems (i.e. lighting and barriers)
Three Waters	<ul style="list-style-type: none"> Public health Flood protection Environmental protection
Solid Waste Management	<ul style="list-style-type: none"> Waste minimisation Refuse collection Landfill provision Transportation Disposal/recycling

A brief summary of factors that can be expected to influence community demand for services is also presented below to indicate the type of analysis required when forecasting future asset needs.

Land Transportation

QLDC owns and operates transportation corridors (and associated support infrastructure, i.e. streetlights, signage etc.) to provide the community with safe and efficient access to their homes, schools, places of work, recreational areas and public services. These corridors also support the national, regional and local economy by enabling the efficient movement of goods and services and tourism.

QLDC is in a state of transition in how it operates its transportation network. This has been led by Local Government reforms, adoption, implementation and embedding of the ONRC as well as ensuring the continual upskilling of in-house resources to ensure capability, capacity and continuity. QLDC is moving from a legacy business model of 'operating transport infrastructure assets' to a proactive, evidence/risk based, and outcome focused 'integrated transportation solution' that meets the requirements of the customer.

To understand and deliver a successful integrated transport solution QLDC must:

- > monitor, address and embed growth in all transport activities;
- > focus on customer journeys, from origin to destination, that span across network boundaries and modes. To this end, it will be the catalyst to more collaborative working arrangements across the Otago/Southland region, and with other transport providers such as NZTA State Highways, Queenstown Airport Corporation and Otago Regional Council;
- > enable customers to better assess service delivery options and their costs against the nationally consistent customer outcomes of the ONRC in an appropriate way for the QLDC network;
- > demonstrate where QLDC's network performance and cost of delivery sits on a comparative basis to similar networks i.e. self-benchmarking analysis;
- > using the Business Case Approach and ONRC framework will provide Councillors and co-investors a more consistent and coherent platform for decision making;

- > further develop robust evidence-based cases for investment, ensuring understanding of the asset lifecycle, the costs and options;
- > enhance its capability to deliver greater value for money from its existing infrastructure assets, and give greater consideration to customer focused transport solutions for future customers; and
- > demonstrate best practice activity management that addresses the principles of the business case approach supported by good practice asset management.

For further information, the Land Transport Activity Management Plan 2017 is located on the QLDC website.

Three Waters

Within this document, drinking water, wastewater and stormwater are sometimes referred to collectively as the 'three waters'.

As the primary water supplier to the district, QLDC is required to provide a supply of water to homes and businesses that is safe for human consumption. Safe and reliable drinking water supplies are recognised as being crucial to the wellbeing and prosperity of our district.

QLDC also provides reticulated wastewater services (also known as sewerage services). Reticulated wastewater systems are recognised internationally as the most cost-effective and efficient method of protecting public health in urban areas from outbreaks of waterborne diseases that are associated with human and business liquid wastes. Reticulated systems also enable cost effective treatment and disposal, which helps to support improved environmental outcomes.

The strategic objectives for three waters management are:

- > to ensure no contamination of public water supply attributed to three waters infrastructure;
- > adverse effects on the environment from three waters infrastructure are managed/mitigated; and
- > ensure compliance with resource consents.

Stormwater systems are provided to protect private properties and buildings from rainwater and groundwater. Effective management of rainwater within these systems is vital to controlling erosion and land stability, as well as ensuring public amenity of open spaces and protection of the environment.

For further information, the Three Waters Asset Management Plan 2017 is located on the QLDC website.

Solid Waste Management

This activity ensures sustainable waste management that protects public health and the environment. The solid waste management activity is managed in three sub-activities: waste minimisation and recycling, refuse collection and landfill provision.

QLDC has adopted a Waste Management and Minimisation Plan (WMMP). This WMMP identifies QLDC's vision, goals, objectives, targets and methods for achieving effective and efficient waste management and minimisation.

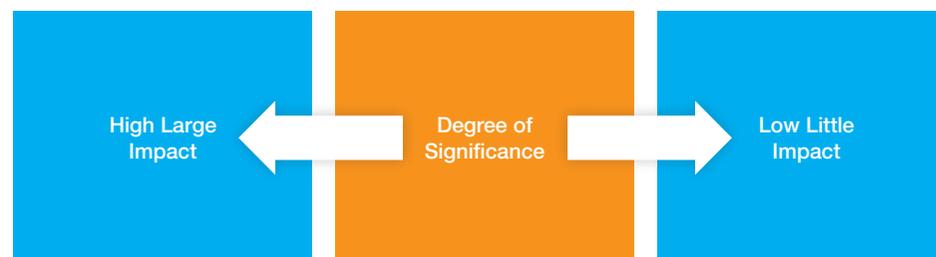
To develop this WMMP, QLDC completed a Waste Assessment (WA) which details:

- > existing waste services provided in the district (Council and non-council);
- > waste quantities, composition and flows;
- > identification of issues;
- > future demand for services;
- > vision, goals, objectives and targets for waste management and minimisation;
- > guiding principles to direct how to get to where the Council wants to be; and
- > an options assessment/statement of proposals for waste services and identified district issues through the Waste Management and Minimisation Programme Business Case (PBC).

For further information, both the WMMP and WA are located on the QLDC website.

8.0 Significant Infrastructure Issues, Options and Implications

QLDC's thresholds and criteria for determining significance is:



- > **Importance to Queenstown Lakes District** – the extent to which the matters impact on the environment, culture and people of the district (e.g. significant capital projects);
- > **Community interest** – the extent to which individuals, organisations, groups and sectors in the community are affected by the Council's decisions;
- > **Inconsistency with existing policy and strategy** – the extent of inconsistency and the likely impact; and
- > **The impact on the Council's capability and capacity** – the impact on the objectives set out in the Financial Strategy, Ten Year Plan and Annual Plan.

This section summarises the significant infrastructure issues facing the district. In general, decisions to invest (or not) in infrastructure are mostly influenced by legislative requirements, delivering levels of service and managing risks.

Appendix B

Further detail such as the current understanding of the matter, options for managing those issues and the likely implications of undertaking, or not undertaking the actions/investments proposed can be found in Appendix B. A summary has been provided of Appendix B on page 46.

LAND TRANSPORTATION

CHALLENGE

PROPOSAL

More People
More Congestion

Integrated public transport
Understanding land use change
Influencing behaviour by providing modal choice

Changes to Central
Government Funding

Improve asset management maturity
Find new (non rates) financial sources

Climate Change and Extreme
Weather Events

Environmental monitoring
Leveraging technology to improve resilience

SOLID WASTE MANAGEMENT

CHALLENGE

PROPOSAL

More People
More Rubbish

Education
Increased recycling options
Targeted charging

Responding to Legislation and
Regulation

Staff member dedicated to minimising waste
Targeted organics and glass programmes

THREE WATERS

CHALLENGE

PROPOSAL

Changes to our Natural
Environment

Increase environmental monitoring
Improve runoff/discharge controls
Improve water supply resilience

Responding to Legislation and
Regulation

Comply with Drinking Water Standards and
Network Consents

More People use More Water

Education
Water metering and targeted charges beyond
2028

Climate Change and Extreme
Weather Events

Environmental monitoring
Leveraging technology to improve resilience

ASSET MANAGEMENT

CHALLENGE

PROPOSAL

Government call for Core
Infrastructure Maturity
Asset Management Maturity
Strong Local Economies

Smart cities
Business Case to Central Govt (seeking support)
Alternate infrastructure delivery models (PPP,
BOOT etc)

9.0 Capital and Operating Expenditure

All expenditure in this document is represented in both ‘dollars of today’ and ‘inflated’ for future years. QLDC’s methodology for applying inflation to capital forecasts is based on economic predictions sourced from Business and Economic Research Limited (BERL), a NZ company who specialise in economic research, analysis, advice and consultancy.

In addressing the issues identified in the previous section of this strategy, QLDC expects to spend around \$1.38B (uninflated) on new or replacement infrastructure between 2018 and 2048. This includes addressing a backlog in investing in water quality and capacity projects. This backlog has occurred overtime through previously low projections of growth, delays in implementing volumetric water charges, and delays in confirming the most appropriate method of meeting the drinking water standards. Over the same period, \$1.15B (uninflated) is expected to be spent on operating costs, (excluding interest, overheads and depreciation). These figures are anticipated to be spread across the infrastructure asset activity areas as follows:

TABLE 2 TOTAL FORECASTED INFRASTRUCTURE SPEND 2018 – 2048 (CAPITAL & OPERATIONAL)

UNINFLATED	THREE WATERS	SOLID WASTE	TRANSPORT
Operational Spend	\$576,705,202	\$286,672,071	\$290,033,131
Capital Spend	\$608,651,432	\$38,039,178	\$737,175,718
TOTAL	\$1,185,356,634	\$324,711,249	\$1,027,208,849
INFLATED	THREE WATERS	SOLID WASTE	TRANSPORT
Operational Spend	\$598,021,604	\$412,729,231	\$380,808,610
Capital Spend	\$778,388,468	\$46,859,300	\$903,873,674
TOTAL	\$1,376,410,072	\$459,588,531	\$1,284,682,284

When comparing operational expenditure depreciation budgets and capital expenditure renewals budgets, transport and water supply show a reasonable alignment however wastewater and stormwater reflect a very low percentage

indicating these assets are not being replaced in accordance with recognised industry standard asset lives. Further work is planned over the next three years to confirm and refine QLDC’s asset life values given the age of its network and local environmental factors (i.e. longer asset life values may be appropriate for our ground conditions). Initial indicators are asset materials selection, combined with favourable ground conditions, and a relatively young asset life are suggesting a longer asset life may be appropriate in our district. Precedent exists nationally and internationally that this could be the case. For example, former Auckland city’s wastewater pipelines. The rates of depreciation in this plan are not influenced by investment in new assets for growth, i.e. the Housing Infrastructure Zones, they are based on best available asset performance data.

TABLE 3 PERCENTAGE OF RENEWALS BY DEPRECIATION

ACTIVITY	% RENEWALS BY DEPRECIATION
Solid waste	37%
Transport	74%
Stormwater	21%
Wastewater	13%
Water Supply	73%

The 30 year period of this IAMS includes appropriate capital spend for the renewal of infrastructure. Whilst there has been a focus to address deferred maintenance over the past decade, the timing on renewals is reliant on other major projects e.g. Town Centre Masterplan. If this project’s timing were to change, planned timing for renewals may be bought forward.

Issues of affordability are considered in detail as part of QLDC’s Financial Strategy, as required by section 101A of the Local Government Act. Options for funding investment are modelled and discussed in this document. Typically QLDC funds investment through debt, to enable intergenerational charging, over the life of these long-lived assets, for those that benefit from their use.

Total operational and capital annual expenditure for three waters, solid waste management and transport for the 30 year period is shown in Figures 15 to 20 following.

FIGURE 19 INFRASTRUCTURE EXPENDITURE PROJECTIONS 2018-2048 (BY DRIVER - GROWTH, IMPROVEMENTS AND RENEWALS) – INFLATED

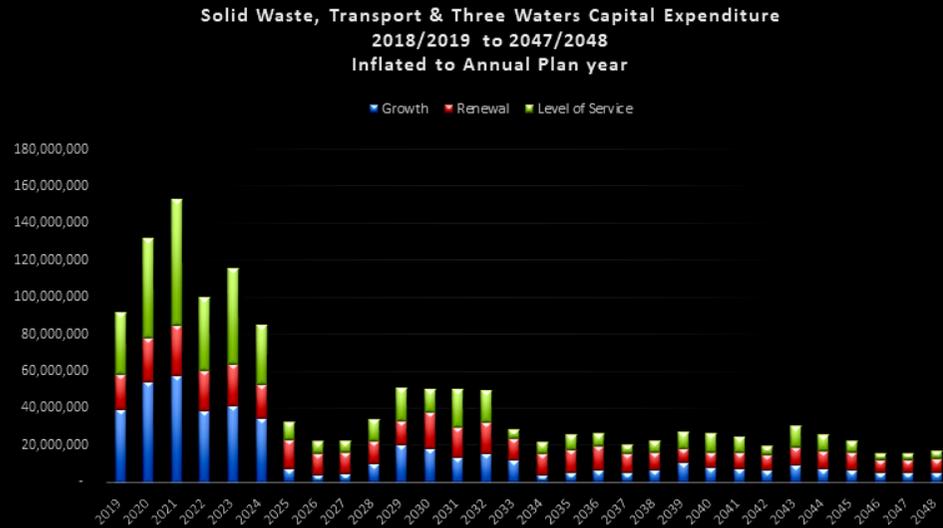
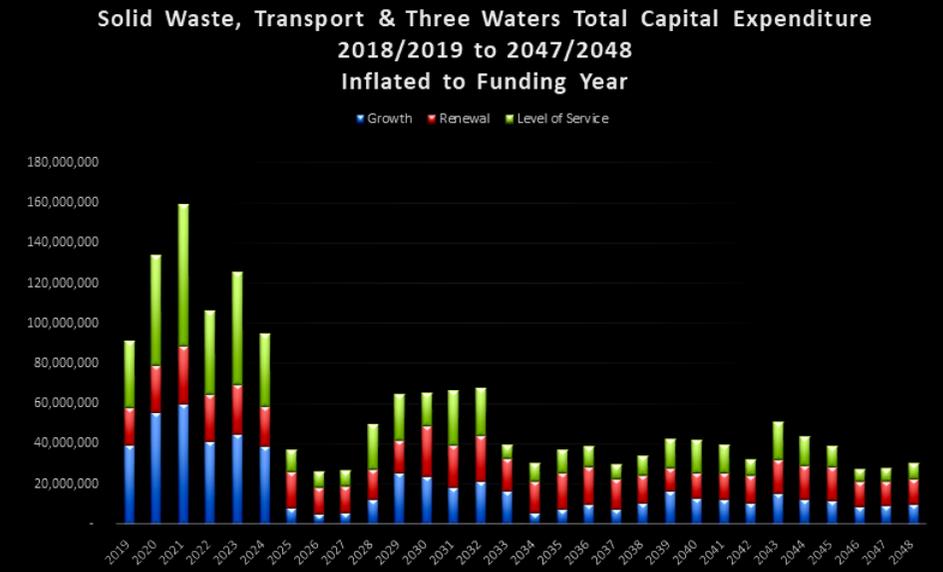


FIGURE 20 INFRASTRUCTURE EXPENDITURE PROJECTIONS 2018-2048 (BY DRIVER - GROWTH, IMPROVEMENTS AND RENEWALS) – UNINFLATED



10.0 Major Projects Timeline

Following the analysis of context, capital expenditure drivers, significant issues and risk, the major infrastructure projects (defined for the purpose of this IAMS, as being \$5 million or more of capital expenditure (inflated) or of particular investment interest to the community) expected to be undertaken in the 2018-48 period are shown below. Projects listed below indicate actual project start date however financials are for the 2018-48 period.

TABLE 4 MAJOR PROJECTS 2018/19 - 2048/49

SERVICE	PROJECT	COST	START YEAR	COMPLETION	DETAILS	PROJECT CODE
Solid Waste	Recycle centre plant upgrade	\$10.8M	2016/17	2042/43	Recycle centre plant coming to end of life. Investigate options for new plant ahead of new contracts 2018.	CP0006631
Solid Waste	Transfer Station Upgrades - Wanaka	\$6.4M	2019/20	2043/44	Consent, design, and construction of improvements and extensions to the Ballantyne Road Transfer Station	CP0006672
Solid Waste	Transfer Station Upgrades - Wakatipu	\$11.7M	2018/19	2043/44	Consent, design, and construction of improvements and extensions to the Glenda Drive Transfer Station	CP0006673
Solid Waste	Gas Capture Facility	\$8.2M	2018/19	2047/48	Consent, design and construction of a gas capture and disposal facility at Victoria Flats Landfill	CP0006674
Storm Water	Lake Hayes Stormwater Minor Works	\$6.6M	2017/18	2031/32	Basic upgrades to the system. To reduce the frequency of flooding events to private property. This budget has been pushed out 3 years from GHD's original estimate.	CP0004093
Storm Water	Queenstown Stormwater - Design and Minor Works	\$15.3M	2018/19	2031/32	Upgrades of the existing piped network to 10 year pipe containments	CP0004107
Storm Water	Stormwater - Asset Management Improvements	\$14.1M	2016/17	2048/49	AM improvements: Policy, documentation, data/process improvements and network analytics	CP0006275

SERVICE	PROJECT	COST	START YEAR	COMPLETION	DETAILS	PROJECT CODE
Storm Water	Wakatipu Stormwater Capital Works	\$14.8M	2032/33	2044/45	To reduce the frequency of flooding events to private property.	CP0006524
Storm Water	Kingston HIF	\$7M	2018/19	2024/25	Construct trunk main to support new subdivision	CP0006831
Storm Water	Upper Stone Creek / Tenby St WNK13	\$5M	2025/26	2028/29	A number of localised ponding and capacity issues have been identified in the upper reaches of Bullock Creek in the vicinity of Stone and Tenby Streets (WNK13)	CP0006850
Storm Water	North East Frankton Flats Stormwater	\$17.2M	2018/19	2028/29	New stormwater pipeline from Frankton Flats to Lake at Frankton Beach	CP0006890
Transport	Shotover Bridge (Arthurs Point) duplication	\$39.6M	2018/19	2031/32	Design and construct new bridge to replace existing two way single lane bridge which is under increasing pressure from traffic growth. 20/21 DBC. 21/22 Intermediary works including traffic signals on Edith Cavell Bridge	CP0006296
Transport	Wakatipu Active Travel Network	\$51.7M	2018/19	2035/36	On/off road connected pedestrian cycle network. Additional active mode crossing of Shotover River. Improve high level bicycle link to Fernhill. Cycle hire scheme. Marketing, promotion & education. Cycle storage facilities, lockers & showers	CP0006763
Transport	Queenstown Parking Improvements	\$48M	2018/19	2023/24	Management of parking cost, supply & time restrictions to encourage mode shift, manage travel demand and use of infrastructure in the town centre and Frankton. P&R activities separated out as a PT item.	CP0006764
Transport	Queenstown Town Centre Pedestrianisation	\$49.5M	2018/19	2025/26	Restrict vehicle access by time and/or location, including delivery restrictions on freight. Include circulation of buses around the town centre. Assumed to include portions of Shotover, Camp, Ballarat and Church Streets.	CP0006765

SERVICE	PROJECT	COST	START YEAR	COMPLETION	DETAILS	PROJECT CODE
Transport	Queenstown Town Centre Arterial	\$148.8M	2018/19	2023/24	Investigate and construct a new arterial enabling expansion of the town centre including PC50, development of the lake front and development of town centre PT hub.	CP0006766
Transport	Hansen Road to Hawthorne Drive link	\$38.3M	2035/36	2036/37	An alternative to SH6 as an access road to enable additional housing supply to the north of SH6 at Frankton.	CP0006767
Transport	Water taxi service/ferry network	\$6.1M	2018/19	2024/25	Investigation and implementation of water based infrastructure to support water transport at four locations;Town Centre 19/20, Parks St 21/22, Kelvin Heights 23/24 and Frankton 24/25	CP0006770
Transport	Queenstown PT Improvements - Hub	\$25.5M	2019/20	2022/23	In Town centre and Frankton (Frankton delivered under Grant Rd to KFB Stage 2)	CP0006773
Transport	Wanaka Parking Improvements	\$11.3M	2019/20	2023/24	Design of additional parking facilities	CP0006776
Transport	Public Realm Upgrades	\$15.9M	2020/21	2032/33	Street Scaping and Improvements	CP0006869
Transport	HIF Ladies Mile	\$6.3M	2018/19	2020/21	Access improvement from State Highway to provide accessibility for the delivery of HIF to address rapid growth and lack of affordable housing	CP0006879
Transport	Improved access Lake Hayes reserve (Widgeon Place)	\$18.9M	2026/27	2038/39	Improved access road to potential extension of Widgeon Place Reserve (playing fields)	CP0006883
Transport	Travel Management Queenstown	\$5.5M	2018/19	2023/24	Intelligent transport systems, including implementation of communication networks, VMS and on street data gathering	CP0006884
Transport	Lakeview Development - Road & Public Realm	\$5.9M	2018/19	2021/22	Design and construct internal road network including footpaths and shared spaces.	CP0006894

SERVICE	PROJECT	COST	START YEAR	COMPLETION	DETAILS	PROJECT CODE
Transport	Wakatipu - Low Cost/Low Risk	\$35.7M	2018/19	2047/48	Amalgamation of NZTA subsidised projects such as pedestrian facilities, street lighting and kerb and channels. Areas with quality issues are identified and managed.	CP0005063
Transport	Wanaka - Low Cost/Low Risk	\$39.3M	2018/19	2047/48	Amalgamation of NZTA subsidised projects such as pedestrian facilities, street lighting and kerb and channels. Areas with quality issues are identified and managed.	CP0005064
Transport	Civic Heart	\$10.9M	2018/19	2020/21	Business case planning for the new Civic Heart including a town hall upgrade in lieu of the memorial Hall which may be demolished.	CP0006996
Transport	Wanaka Town Centre Masterplan	\$27M	2018/19	2037/38	Masterplan development; DBC, detailed design and implementation.	CP0006997
Waste Water	CBD to Frankton Reticulation	\$10.2M	2016/17	2023/24	Provide solution to mitigate risk of failure and capacity constraints for trunk sewer system between Queenstown CBD and Frankton Beach.	CP0004013
Waste Water	Glenorchy New Wastewater Scheme	\$7.9M	2028/29	2031/32	Provisions for a new wastewater scheme in the Glenorchy Township, including reticulation.	CP0004028
Waste Water	WW - Growth Component For Projects Beyond LTP (2025)	\$54M	2035/36	2047/48	Wanaka North upgrade. Construct New Lakeside Rising Main, Rata Street PS and Rata Street Rising Main	CP0006283
Waste Water	Project Pure Treatment Upgrade	\$6M	2017/18	2021/22	Major upgrade at Project Pure WWTP to install third SBR tank to cater for future inflows from Luggate and Hawea.	CP0006284
Waste Water	Project Shotover Upgrade - Stage 3	\$28.1M	2018/19	2031/32	Adverse effects on the environment from 3W infrastructure are managed/mitigated.	CP0006287

SERVICE	PROJECT	COST	START YEAR	COMPLETION	DETAILS	PROJECT CODE
Waste Water	Project Shotover Upgrade - Stage 4	\$33.3M	2028/29	2043/44	Adverse effects on the environment from 3W infrastructure are managed/mitigated.	CP0006288
Waste Water	Wastewater - Asset Management Improvements	\$16M	2016/17	2047/48	AM improvements: Policy, documentation, data/process improvements and network analytics.	CP0006292
Waste Water	Construction of New Rata St Wastewater PS	\$7.2M	2019/20	2029/30	Construction of new trunk main to reduce criticality of Lakeside PS and meet future growth demands to NE Wanaka.	CP0006829
Waste Water	HIF Kingston Wastewater New Scheme	\$25.9M	2018/19	2024/25	Construction of a treated reticulated wastewater network for the Kingston township.	CP0007009
Water Supply	Kingston Water Supply New Scheme - HIF Project	\$7.8M	2018/19	2020/21	(HIF) Construction of a treated reticulated water supply network for the Kingston township.	CP0004050
Water Supply	Design & construct new Beacon Point WTP	\$20.2M	2018/19	2021/22	Scoping, concept and detailed design of new WTP with construction of 26MLD (26000m ³ /day WTP) to follow.	CP0004228
Water Supply	New Two Mile Water Treatment Plant	\$35.7M	2016/17	2044/45	Design and construction of new Two Mile WTP. QTN Water Master Plan Project. Includes Land Purchase. Two Staged Expansion.	CP0004244
Water Supply	Design & construction new (second) Beacon Point reservoir	\$14.7M	2018/19	2029/30	Design and construction of new (second) 6000m ³ storage reservoir. Includes Land purchase adjacent to existing reservoir & WTP site.	CP0004255
Water Supply	Growth Component For Projects Beyond LTP	\$20.5M	2024/25	2047/48	Network and pump upgrades to meet growth as identified in water master plans	CP0006277

SERVICE	PROJECT	COST	START YEAR	COMPLETION	DETAILS	PROJECT CODE
Water Supply	Water Supply - Asset Management Improvements	\$16M	2016/17	2047/48	AM improvements: Policy, documentation, data/process improvements and network analytics	CP0006281
Water Supply	New Shotover Country Water treatment Plant	\$35.1M	2016/17	2040/41	Design and construction of new Shotover Country WTP. QTN Water Master Plan Project. Includes Land Purchase. Two Staged Expansion.	CP0006485
Water Supply	Ladies Mile / Lake Hayes Network	\$7M	2018/19	2022/23	Land Purchase and construction of new water reservoir and network to connect ladies Mile and Lake Hayes to SOC Network. BBC to be completed	CP0006821
Water Supply	New Hawthenden reservoir	\$18.5M	2029/30	2041/42	New Water Pump Station, pipeline/s and supply reservoir to service South Wanaka. Wanaka Water Master Plan project.	CP0006865
Water Supply	Transmission Pipeline (stage 1)	\$5.5M	2019/20	2021/22	Wanaka Water Master Plan project. 3km of 500mm dia watermain down Anderson, McPherson & Golfcourse Rd. Project delivery subject to growth development & model projections. Golf Course Rd watermain upsizing driven by growth SWanaka	CP0006987

11.0 Asset Management Systems and Elements

QLDC continues to progressively align with the requirements of the International Standard ISO55000 for Asset Management (ISO55000). The 2017 versions of the Asset Management Policy, IAMS, and Asset/Activity Plans have been reviewed and prepared with consideration to ISO55000 and the IIMM.

In this section, the status of QLDC's asset management practices is reviewed in order to identify gaps and opportunities for ongoing improvement.

FIGURE 21 – ELEMENTS OF ASSET MANAGEMENT



The specific areas of asset management practices are targeted to give effect to the asset management objectives are outlined below.

11.1 CAPABILITY AND CAPACITY

QLDC recognises that asset management skills and understanding need to be present at all appropriate levels of Council, from field staff to managers. QLDC continues its process to assess and determine the competencies required for the various asset focused roles, and building the awareness, knowledge, and skills to best fulfil them.

A key step on this process has been to map capability, capacity, and identifying competency gaps. This gap analysis is used to develop asset management competency improvement and training plans.

Key advancements in this area include:

- > alignment to organisational objectives as well as its Asset Management Policy;
- > asset management through the Better Business Case (BBC) Outcomes Framework document;
- > the hiring or contracting of competent persons to undertake specialist activities i.e. population projections, condition assessments and computer modelling;
- > attending industry meetings, forums and conferences to present and share knowledge; and
- > provide regular opportunities for the Infrastructure Committee members (Councillors) to gain exposure to the world of asset management.

11.2 CONTINUOUSLY IMPROVE ASSET KNOWLEDGE

In accordance with the Infrastructure Data Management Policy, QLDC's assets will be contained in appropriate corporate registers; these will include accurate data and have reporting functionality to facilitate asset management decisions:

- > Transportation assets – RAMM
- > Three waters assets – Infor
- > Solid waste management - GIS

All financial dataset are primarily held within Technology One.

QLDC's maintenance management approach continues to be tested and refined within the various asset registers using evolving analytical techniques. This approach supports the timely delivery of reactive maintenance activities while continuously leveraging asset performance data to better inform planned programmes.

QLDC recognises the value high-quality data can bring to business decision-making and will continue to invest in improving the quality and completeness of asset data to support this outcome.

11.3 INTEGRATE SERVICE AND ASSET MANAGEMENT

Guided by the Ten Year Plan, QLDC's operational service planning work continues to track and predict the current and changing future community needs. This service level information, together with asset performance assessments informs future capital investment in non-infrastructure solutions, new or upgraded assets, asset renewals and asset retirement.

As set out in the National Infrastructure Plan, QLDC is working with stakeholders to develop an inclusive approach to guide future service and asset management decision-making.

QLDC will continue to invest in enhancing its service planning knowledge, skills and operational practices with a commitment to a continuous improvement approach. Specifically, this will include closer liaison with other council asset managers, industry groups and other lifelines utilities.

11.4 IMPROVE FINANCIAL SUSTAINABILITY

The long-term sustainability (resilience) of any council is significantly influenced by its financial practices.

Financial plans, developed within each Asset/Activity Plan will outline funding requirements to best meet community needs. These financial plans will, in turn, inform the Ten Year Plan and annual plan budget decisions.

QLDC prioritises rates funding for legal compliance, legislative change, renewal, maintenance and operation of existing assets ahead of financing new works or asset upgrades.

Decisions to provide new services or assets to the community shall be based on BBC justifications. All BBCs will provide appropriate analysis of lifecycle funding for renewal, maintenance and operation.

In addition, QLDC is open to funding of new infrastructure assets or asset upgrades through the disposal of surplus land.

QLDC will continue to investigate economic opportunities for improving fairness of cost allocation to customers and improving transparency to better inform customer decision making for services.

In recognition of the need to establish an appropriate balance between developing new assets and maintaining its existing asset base, Council is committed to managing its assets in accordance with sound, industry recognised financial asset management practices. These practices include:

- > reducing the 'funding gap' between what is budgeted and what is required for the maintenance/renewal of current infrastructure through better utilisation of risk management techniques;
- > balancing investment in new infrastructure compared with maintenance/renewal of existing infrastructure; and
- > testing investment in new infrastructure with non-infrastructure solutions such as demand management.

Lifecycle cost analysis is undertaken as part of the better business case preparation process. A standard template tool has been developed to facilitate consistency across the organisation.

11.5 EMBED RISK MANAGEMENT FRAMEWORK AND MITIGATION PRACTICES

The QLDC Corporate Risk Management Framework (RMF) is based on Risk Management ISO31000. Work progresses through the Risk Working Group to monitor and refine risk management practices and systems at QLDC. The RMF has been rolled out across QLDC at a corporate level and is in the process of being embedded at an operational level. QLDC's Audit, Finance and Risk Committee provides governance-level oversight on the effectiveness of the QLDC's RMF, internal controls, legislative and regulatory compliance, external audits and financial reporting.

QLDC has developed a risk register containing a set of strategic and operational risks, each of which has been assessed for their likelihood and consequences both before and after the mitigations and controls in place are considered. This list provides guidance to the organisation as to the materiality of key risks and the importance of mitigations and controls.

A core part of the RMF is to record a list of "critical assets"—assets that are critical to QLDC providing its core services and thus have a high consequence of failure. QLDC has begun its application of a Criticality Assessment Framework to its three waters and roading infrastructure.

QLDC is moving to better integrate formal risk assessments into its asset decision making. The end result of this integration will be each investment decision being based on a consistent, robust and quantitative assessment of risk.

To mitigate risk, QLDC will:

- > establish and deliver maintenance and renewal service standards that preserve critical assets, mitigate risk and meet the desired service outcomes based on this RMF;
- > not accept the transfer of third party assets, unless minimum acceptable quality standards are met as set out in the QLDC Land Development and Subdivision Code of Practice;

- > prioritise and proactively inspect and protect its assets and their performance.
- > insure all critical assets for loss, damage and public indemnity; and
- > in the event that an asset can no longer be maintained in a safe condition, it shall be retired from service and any foreseeable hazards to the community are mitigated.

11.6 ENHANCE RESILIENCE OF ASSETS

Councils are required to "provide for the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks" (LGA, s101B (3)(e)). However, building a resilient system in the context of Local Government goes beyond financial provisioning for infrastructure damage, to include interdependencies with other infrastructure (power, telecommunications), considering adequate levels of service post-event, and other dimensions of community preparedness (National Infrastructure Unit, 2015). Resilience also needs to consider longer-term factors, which evolve slower, such as climate change.

Actions underway to enhance the resilience of our community include:

- > completed earthquake analysis for responding to a maximum probable loss (MPL) event (1:1000 years as suggested by NZ Treasury) following the continuing review of the national insurance policy (the 60/40 Policy);
- > continually evolving our understanding of service-critical assets, in order to prioritise efforts;
- > undertake hazard loss modelling for three waters and roading infrastructure to inform future investment decisions in the support of service resilience (for example relocate, reinforce, de-risk, run to fail, insure);
- > developing a business continuity plan, with a particular focus on infrastructure; and
- > continued involvement in the Otago Lifelines Project (first report dated September 2014, and currently under review).

11.7 ENSURE LEGISLATIVE COMPLIANCE

QLDC seeks to manage its asset inventories in a manner that ensures the assets and the services they provide are compliant with all relevant legislations and regulations.

This can be a challenge as sometimes changes in legislation can require a significant investment. This can require existing investment plans to be revised or revenues increased to meet the new requirements. QLDC shall be responsive to changes in legislations and regulations and provide appropriate funding to ensure compliance occurs in a timely manner. QLDC is currently progressing two backlog items of regulatory change, namely meeting the drinking water standards and management of gas/odour at its Victoria Flats Landfill. Both changes are planned to be addressed by the year 2027, as set out in the 2018 Ten Year Plan.

QLDC continues to actively engage with other industry stakeholders to ensure its knowledge, understanding and responses to changes in legislation and regulations are appropriate. To support this, QLDC is commencing a new programme to better educate its staff on existing legislated requirements, supported by a continuous improvement process of identifying and responding to gaps in QLDC operations and legislation. QLDC will continue to utilise self-audits, combined with external audits as required to identify opportunities for improvement.

11.8 IMPROVE ENVIRONMENTAL SUSTAINABILITY

QLDC seeks to ensure that QLDC assets have minimal adverse effects on the environment, as tested under the Resource Management Act 1991.

Energy and water efficient technologies shall be incorporated into asset renewal and upgrade projects as a preference. As seen in the adoption of low energy (LED) technology for street lighting.

QLDC is working with its energy retailers and distributors to gain greater understanding of its energy consumption (electricity and gas). QLDC consumes more than 15GWh of energy across its sites, with this figure dominated by water and wastewater pumps, treatment plants and large recreational facilities like the Queenstown Events Centre. A recent focus has been on ensuring QLDC is well placed to run effective procurement processes, to find the least-cost suppliers of the energy services needed. This is also providing far greater visibility over opportunities to reduce energy consumption through, for example, energy efficiency measures.

QLDC is also working closely with Delta, the provider of critical supply infrastructure to the district. QLDC and Delta now have a better understanding of the criticality of electricity supply to many of the core services that QLDC provides to the community.

QLDC has been successful in reducing the per capita water consumption within the district and will continue to monitor and seek further reductions.

TABLE 5 – WATER CONSUMPTION PER CAPITA PER DAY

	2014/2015	2015/2016	2016/2017
Water consumption	558 litres/per/day	543 litres/per/day	529 litres/per/day

11.9 INFORMATION SYSTEMS

QLDC has established an Information Communications and Technology (ICT) Steering Group made up of representatives of the various business units. This group is responsible for capturing, prioritising and funding improvements to the QLDC information systems. A new initiative is underway to better capture, scope and programme systems and technology requirements of the infrastructure department. This project known as Project Horizon is being led by the General Manager of Property and Infrastructure. The project aims to ensure that key infrastructure services are not unduly delayed or compromised by failure to understand and resource systems and technology components of these investments.

- > QLDC continues to maximise the available functions of the recently replaced financial information system in order to improve the quality and integration of financial reporting.
- > QLDC is yet to source a single, centralised Asset Management Information System (AMIS) that holds all asset information required to support QLDC's day-to-day asset management activities and financial reporting needs. There is however the data warehouse, this is a repository linking the various information systems which facilitates and centralises standardised reporting.
- > In the absence of a centralised AMIS, QLDC utilises a number of systems as indicated in the table below. The multiplicity of independent systems makes data integrity management and real-time reporting time-consuming and somewhat challenging.

- > QLDC has implemented a customer request and complaints system (in Technology One) to record QLDC's responses to customer requests.
- > Improving the quality and integration of QLDC's AMIS is the focus of recent improvements underway via the ICT Steering Group.
- > Field staff that are responsible for asset inspections and maintenance activities have access to mobile computing systems or mobile geospatial information.
- > Business Continuity Plans in terms of information systems is being led by the QLDC Knowledge Management Team – this is an on-going process of development and review.

CountryNet	SCADA time-variable data system	Three waters assets	
InfoNet	Asset performance assessor	Three waters assets	
Mike Urban	Asset performance assessor	Three waters assets	
POE Tracker	Business case management (xls)	Not asset specific	2018
Technology One	Capital planning and investment database	Not asset specific	
MS Excel	Risk management system	Not asset specific	2018
Spreadsheets	Purpose built spreadsheets are used to store and analyse assets	Various assets	
ProMapp	Business process mapping	Not asset specific	2027
CS-VUE	An external inventory of resource consents issued by the Regulator	Not asset specific	
SCADA	Captures and stores electronic records relating to electrical and mechanical assets	Three waters assets	2017/18
GIS	Electronic as-built data, pipe asset register, aerial photography and property information system	Not asset specific	
Pocket RAMM	Used out of the office to perform asset maintenance on mobile devices – in the field.	Transport assets	
GIS Mobile	Allows field staff access to GIS whilst out of the office	Not asset specific	

TABLE 6 – INFORMATION MANAGEMENT SYSTEMS

SYSTEM	DESCRIPTION	ASSETS	NEXT REVIEW
Technology One	Finance system	All assets (except property)	2024
Qmaps	Geographic information system (GIS)	All assets to varying degrees of accuracy	
Technology One	Customer request system	Not asset specific	2024
HP TRIM	Document management system	Not asset specific	Decommissioned in 2018
Technology One	Enterprise content management (HP TRIM replacement)	Not asset specific	2024
RAMM	Road assets management	Transport assets	
Infor (Hansen)	Both QLDC asset management system and contractor works order and tracking system	Three waters assets	2018

11.10 ASSET DATA AND KNOWLEDGE

Land Transportation

Asset Management has been supported by the Road Asset and Maintenance Management (RAMM) system for many years. RAMM provides the repository for asset inventory and condition data, reporting, asset valuation and maintenance contract administration tools.

The data in the RAMM database is regularly audited by NZTA in their capacity as co-sponsor of the QLDC investment programme. However, with the change to the One Network Road Classification (ONRC) system being rolled out by NZTA it has become apparent the quality and quantity of information held within the databases will need to improve to meet the new 'evidence based investment decision' model which ONRC requires. It is understood the move to the ONRC approach and not the current quality of the data will have the greatest effect on the roading investment programme moving forward.

NZTA have signaled that QLDC, when compared to other councils, has a high level of investment relative to the scale of its roading network. NZTA have advised councils will likely need to take on more risk in terms of how they invest in their roading networks under the ONRC approach. The implications of this risk shift when developing the roading investment programme and continues to be investigated and tested.

NZTA introduced an updated Investment Assessment Framework (IAF) in 2017, which replaces the legacy investment development methodology. The 2017 IAF reflects the GPS for transport and embraces the ONRC philosophy.

QLDC continues to place a strong focus on building maturity through maintaining a robust improvement programme. Levels on investment in this improvement programme will continue to increase in the upcoming years to support more robust investment decisions and better estimating of risk.

Three Waters

Infor is the repository and reporting system for three waters asset data, which captures and stores electronic records relating to asset inventory, work history, valuation, condition and investment.

Improved data quality has been achieved through data cleansing, simplification of processes and integrations with external systems. Ongoing data quality has also been improved through the development of an enhanced upload portal for new asset data. Without continued improvements to these datasets, there is an increased risk of substandard investment decisions, unforeseen asset failure and increased frequency of service outages. QLDC is proactively working to improve the completeness and quality of its water records.

As such, the methodology for developing the QLDC investment programmes has been based on use of hydraulic models and engineering judgement. These models have been going through an on-going programme of calibration deemed fit for purpose for strategic purposes, and have been used to identify performance issues and upgrades required to the three waters networks. These programmes will be reviewed over time as funding is approved to further develop the computer models. Tools such as these computer models will continue to be upgraded and refined for the foreseeable future.

As the understanding of asset performance continues to mature, the levels of service review and risk management framework (including Treasury's Better Business Case Model), and the investment programmes will continue to become more robust.

Until these improvement programmes completely mature and demand management activities are implemented, the current investment programmes are cannot be fully optimised.

Solid Waste Management

QLDC has no formal information system nor asset data repository for its solid waste management assets; this is being reviewed as part of the Waste Management Assessment and Waste Management Minimisation Plan. To support this, a new dedicated Waste Management resource role has been approved.

Data Confidence

The Ten Year Plan includes programmes of work for asset management improvements across all infrastructure portfolios. These programmes include items to increase data knowledge and confidence.

Refer to section 10.0 for asset management improvement projects.

TABLE 7 – INTERNATIONAL INFRASTRUCTURE MANAGEMENT MANUAL (IIMM) RATING SYSTEM

A	Highly reliable data based on sound records, procedures, investigations and analysis, which is documented properly and recognised as the best method of assessment.
B	Reliable data based on sound records, procedures, investigations and analysis, which is documented properly but has minor shortcomings, for example the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation.
C	Uncertain data based on sound records, procedures, investigations and analysis, which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available
D	Very uncertain data based on unconfirmed verbal reports and/ or cursory inspection and analysis. Dataset may not be fully complete and most data is estimated or extrapolated.
N/A	Data does not exist or is not relevant

TABLE 8 – OVERALL CONFIDENCE OF ASSET DATA

		ASSET CONDITION	ASSET PERFORMANCE	DATA COMPLETENESS	OVERALL CONFIDENCE OF ASSET DATA
TRANSPORT	Street lighting				
	Bridges and structures				
	Drainage facilities				
	Footpath				
	Marking (road delineation)				
	Street furniture and minor structure				
	Railing				
	Retaining wall				
	Signage				
	Traffic facility				
	Sealed pavement - surfacing				
	Sealed pavement - base course, sub base				
	Unsealed pavement				
THREE WATERS	Water supply				
	Wastewater				
	Stormwater				
SOLID WASTE	Public litter bins				
	Residential collections				
	Transfer stations				
	Recycling centre				
	Landfill				

11.11 SERVICE AND ASSET PLANNING

The importance of quality asset data, analysis and understanding the performance of physical assets is key to the delivery of QLDC's infrastructure services. QLDC's current approach to the following service and asset management planning practices has been reviewed with the intention of identifying improvement actions:

- > demand forecasting;
- > legislative change;
- > defining service levels;
- > asset management planning;
- > capital works planning; and
- > long term financial planning.

It is recognised that there are other practices that have a critical impact on service delivery. These will be considered in detail in future revisions of the Asset/Activity Plans, as appropriate for the relevant asset class.

11.12 DEMAND FORECASTING

In 2017, QLDC undertook its third annual review of its population projections. It was recognised that due to the rapid growth rates, and their implications for infrastructure performance and funding models, it was crucial that QLDC considers growth in all of its activities and the rate of change means QLDC needs to regularly track any increases or decreases in movement. The 2017 review has resulted in QLDC continuing to project growth to an above-medium projected population.

The conversion of population projections to demand forecasts is the responsibility of QLDC's Infrastructure Analysts – that being the conversion of population data to an actual 'customer use' value. This work continues to gain maturity, supported by demand measurement systems such as traffic counts, cell phone metadata and water metering. A complicating factor in this process is the high rates of population change day to day, combined with limited demand management activities. For example, solid waste volumes and revenues are both currently increasing faster than population increases. This suggests that water metering, progressively rolled out in the water sector is a fundamental need to ensure our water services are efficient and that waste and leaks are minimised.

Customer engagement through volumetric charges based on water metering is critical to ensure the water sector is financially sustainable and is best able to deliver efficient and effective services that meet the current and foreseeable future needs of the community.

Refer to section 12.0 for further asset management maturity observations.

11.13 LEGISLATION AND GOVERNMENT DIRECTION

QLDC is able to maintain its knowledge and changes in legislation that affects its business through a combination of professional memberships (i.e. Institute of Professional Engineers of NZ), business networks, attending conferences and memberships with technical associations (i.e. Water NZ, Institute of Public Works Engineers Australasia, Society of Local Government Managers, Road Controlling Authorities Forum etc.). Further advice is available through QLDC's internal legal team.

A corporate repository of all QLDC's existing policies, by-laws, strategies, publications and standard operating procedures is maintained regularly and highlights when documents are scheduled for review or end of life.

11.14 DEFINING SERVICE LEVELS THAT MEET COMMUNITY EXPECTATIONS

To give certainty to those residents and businesses that are connected to council services, local authorities should define a level of services to their customers for a specified cost. The benefits of this include:

- > helping to ensure value for money services as performance can be measured quantitatively;
- > the delivery of value for money is a balance between social benefits, legislative requirements and full cost recovery for the services provided. As such it is important to be able to clearly demonstrate the local authority's decision-making processes around trade-offs between these competing factors; and
- > it increases the understanding and hence the willingness of the various consumers to pay for services. As such, transparent cost recovery of water services cannot be achieved without a certain guaranteed service level.

Based on recent customer surveys, satisfaction with infrastructure measures remains largely similar to previous years. Satisfaction is highest with wastewater, which has also increased significantly. Satisfaction with street cleaning and sealed roads have also increased this year, while satisfaction with water supply and footpaths remain similar to last year's results. Satisfaction with street lighting and unsealed roads has decreased this year although these changes are not statistically significant. Notably, respondents aged under 34, those who own a holiday home in the area, or residents who are non-ratepayers in the area appear to be more satisfied with infrastructure.

It is recognised that continuous improvement of all portfolios is necessary given that community needs are not static and there is an ongoing drive for better local government services. QLDC determines its asset requirements to meet service needs using various mechanisms including, but not limited to the following:

- > review of customer requests;
- > community satisfaction survey findings;
- > analysis of population (growth) projections and other demographic profile changes;
- > asset renewal planning, including condition inspections; and
- > stakeholder consultation during the development of various plans and strategic documents not limited to but including:
 - > Ten Year Plan;
 - > land development and subdivision code of practice;
 - > land use planning – District Plan review;
 - > Infrastructure Asset Management Strategy;
 - > land development plans;
 - > Infrastructure masterplans; and
 - > National Policy Statement on Urban Growth and Development.

Utilising the Internal Affairs (DIA) non-financial metrics and the ONRC performance framework, QLDC will continue to monitor community satisfaction regarding the performance of its delivery of community service outcomes.

In addition, QLDC gains feedback on service satisfaction through its annual Resident and Ratepayers survey and customer (RFS) feedback processes.

QLDC translates community needs (service levels) into measurable technical levels of service (asset performance targets) consistent with QLDC's strategic direction and within financial and other practical constraints in the BBC Outcomes Framework.

11.15 CAPITAL WORKS PLANNING

QLDC has recently migrated its standalone external project database into an internally designed and maintained system, which is integrated with QLDC's Enterprise Technology One system. This capital works module links to both the financial and projects/contracts modules. A requirement was to develop and implement a more consistent and transparent approach to prioritisation, as such this new module incorporates the Risk Management Framework and is supported by the BBC framework, replacing the legacy prioritisation tool.

11.16 IMPROVEMENTS IN SERVICE AND ASSET MANAGEMENT

It is recognised at QLDC that Asset/Activity Plans are best to be reviewed and improved on an annual basis. This annual review enables capability and capacity in asset management to be developed and disciplines and processes to be embedded. As such, the Asset/Activity Plans are viewed as working documents that guide asset management practices across the organisation. Asset/Activity Plans must align with the current Asset Management Policy and strategic objectives and respond to any changes in the legislative environment. As part of the Better Local Government approach, this is creating a strong focus for maturing asset management at QLDC.

QLDC has previously developed Asset/Activity Plans for its core infrastructure services of land transportation, solid waste management and three waters.

These Asset/Activity Plans document the status of the assets at the time of writing. Adoption of ISO55000 principles, combined with Institute of Public Works Engineering Australasia (IPWEA) guidelines and the IIMM since 2014, provides a forum for continual maturity through the identification of "gaps" and enables benchmarking of QLDC's asset management practices against industry standards.

The level of asset management awareness varies across the organisation and Asset/ Activity Plans have historically been outsourced to consultants to write. The Asset Planning Team was set up to oversee QLDC's Property and Infrastructure asset management capability development and improvement program. The purpose of the Asset Planning Team is to provide a forum for integrated and sustainable planning, development and management of QLDC infrastructure across relevant QLDC business units.

11.17 ASSET MANAGEMENT WORK PRACTICES

QLDC's current approach to work practices have been reviewed with the intention of identifying improvement actions. Most obviously, processes are not well documented or mapped, hence understood or followed. Through changes in staff and the subsequent questioning of processes a number of work practices have been identified as a priority for upgrade, namely:

- > project scoping – transfer of projects from strategy and performance to project delivery;
- > asset handover – transfer of new assets from developers to QLDC; and
- > process mapping – implement an interactive, web-based library of processes that are easily searchable, repeatable and easy to follow.

Refer to section 12.0 for further asset management maturity observations.

11.18 ORGANISATIONAL CONTEXT

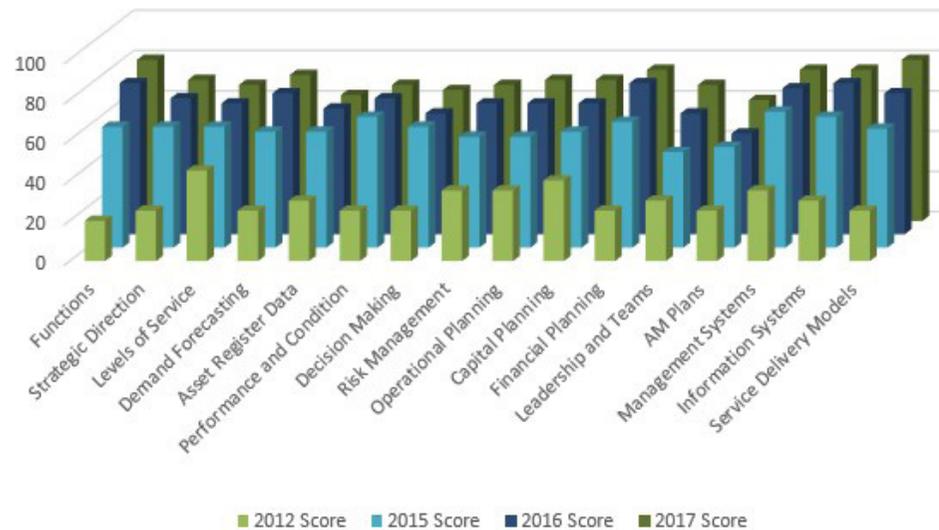
Successful asset management underpins long-term sustainability of the community. It is important for everyone in the organisation to understand what asset management is about and to understand that sound asset management planning and strategies are an organisation wide responsibility. As discussed previously, asset management at QLDC now forms part of QLDC's strategic planning framework. As such, funding and the level of asset management capability and capacity influence the degree to which QLDC's outcomes can be achieved.

12.0 Asset Management Maturity

QLDC's Asset Management Policy provides the overall direction to guide the sustainable management of QLDC's asset portfolio as a platform for service delivery. Together with this IAMS, it shows how QLDC intends to progressively improve and mature asset management across the organisation.

The Asset Planning Manager shall review and update this IAMS annually, following review of the Asset Management Policy. The Asset Planning Manager will also monitor significant infrastructure issues and interventions, and report progress to the Executive Leadership Team and the elected members at least every 12 months. This annual review shall occur prior to the end of each calendar year, in line with QLDC's business planning timeline, to enable changes or new initiatives to be incorporated into the Annual Plan funding cycle.

As part of the continuous maturity in asset management practices, QLDC undertakes an annual asset management maturity assessment – based on the New Zealand Asset Management Support (NAMS) and IIMM guidelines. The assessment identifies current state in a number of areas of asset management, while also identifying areas for improvement and setting overall targets as defined in the NAMS guidelines. QLDC is working towards advanced in most aspects of asset management. The improvements shape the performance plan, which is a high-level view of the key areas of improvement identified to enhance the asset management planning process within QLDC. Status of the performance plan is reported to Senior Management quarterly.

FIGURE 22 – ASSET MANAGEMENT MATURITY ASSESSMENTS 2012-2017

Key observations from the Asset Management Maturity review undertaken by Infrastructure Decisions Limited in late 2017 included continuing improvement in alignment of practices across the transport and three waters activities, other notable improvements include:

- > The quality and substantiation of the Asset/Activity Management Plans and ten year programmes put forward for the 2018 Ten Year Plan (when compared to the 2015 Ten Year Plan);
- > The capital planning database transition to in-house management is completed and is used as a single source of information for all capital programmes (Annual Plan, Ten Year Plan, Asset/Activity Management Plans, Infrastructure Strategy); and
- > The Strategy and Planning team is now fully resourced and, amongst other things, has been further developing strategic business cases for major projects / programmes in the Ten Year Plan with the BBC process starting to be worked through to design and delivery stages. A new role is also focussed on better management of development infrastructure which has been an issue in the past.

- > Disaster loss modelling has been undertaken to better understand the resilience of the network to earthquakes and the potential financial consequences. A network resilience plan is a future goal.
- > There has been further development of the criticality framework.
- > There is a Council-wide programme for using Promapp to map workflow processes across the Council to improve quality, alignment and efficiency. At this stage the focus has been on documenting processes and establishing quality controls is a future target.
- > Work is being done to review ownership / management of data for consistent provision and use of information across the Council.

While it is good that progress is being made against the asset management improvements, it is also very positive to see that previous improvements are being embedded into business-as usual practices. Investment and attention are required to maintain scores as well as improve them.

The following aspects of QLDC's asset management status are focus areas for improvements:

- > Attention be given to managing the quality and effectiveness of processes (documentation, review, audit processes);
- > Priority be given to bringing in the asset criticality work into operational and CAPEX planning processes – the work is running in parallel but needs to dovetail – as well as regional and local 'lifelines' projects;
- > Levels of service and cost options for key areas be explored with the new Council as part of the Asset/Activity Plan development leading into the next TYP; and
- > Establish KPIs to monitor and demonstrate the benefits being achieved through asset management improvements.

Appendix A: Legislation and Industry Guidance

RESOURCE MANAGEMENT ACT

Enacted in 1991, the Resource Management Act seeks to promote the sustainable management of natural and physical resources. Sustainable management means managing the use and protection of resources in a way, which enables communities to provide for their social, economic, and cultural well-being while meeting the reasonably foreseeable needs of future generations.

LAND TRANSPORT MANAGEMENT ACT

The Land Transport Management Act 2003 establishes the rules to contribute to an effective, efficient, and safe land transport system in the public interest.

HEALTH & SAFETY AT WORK ACT

This is a new Act, which came into force in 2015 to provide for a balanced framework to secure the health and safety of workers and workplaces by protecting workers and other persons against harm to their health, safety, and welfare by eliminating or minimising risks arising from work or from prescribed high-risk plant.

WASTE MINIMISATION ACT

The Waste Minimisation Act 2008 encourages a reduction in the amount of waste we generate and dispose of. The aim is to reduce the environmental harm of waste and provide economic, social and cultural benefits.

HAZARDOUS SUBSTANCES AND NEW ORGANISMS ACT

The purpose of this Act is to protect the environment, and the health and safety of people and communities, by preventing or managing the adverse effects of hazardous substances and new organisms.

CIVIL DEFENCE EMERGENCY MANAGEMENT ACT

The Civil Defence Emergency Management Act 2002 creates a framework within which New Zealand can prepare for, deal with, and recover from local, regional and national emergencies.

HEALTH ACT

The Health Act 1956 seeks to improve and protect public health and ensure all proper steps are taken to secure the abatement of any nuisance or removal of any conditions likely to be injurious to health or offensive.

DRINKING WATER STANDARDS

Recognises the essential health benefits of safe and reliable water supplies to communities. It imposes on QLDC, under the power of the Health Act, to take all practicable steps to ensure an adequate supply of drinking water and ensure that drinking water complies with the Drinking Water Standards. As at June 2017, QLDC water supplies, as a whole, do not meet the Drinking Water Standards and significant investment in water treatment throughout the District has been identified in this document to meet QLDC's obligations.

HAVELOCK NORTH WATER INQUIRY

In September 2016, the Government established an Inquiry into the Havelock North water contamination event. The Inquiry has proceeded in two stages. Stage one focuses on identifying what happened, what caused the outbreak, and assessing the conduct of those responsible for providing safe drinking water to Havelock North. Stage two has made recommendations which if adopted seek to address the likelihood of such an outbreak occurring again.

NATIONAL INFRASTRUCTURE PLAN

Updated in late 2015, the National Infrastructure Plan set out to progressively ensure our infrastructure is resilient and coordinated and contributes to strong economic growth and high living standards. Specifically it requires that New Zealand will have modern, integrated and efficient infrastructure supported by mature asset management practices, through the consideration of both demand and supply side solutions and systems benchmarking.

NATIONAL LIFELINES

Recognises the essential infrastructure and services that support our community (i.e. water, wastewater and stormwater, electricity, telecommunications and transportation networks including roads). Representatives of these 'lifelines' collaborate regionally with scientists, engineers and emergency managers to reduce vulnerabilities to regional scale emergencies with an emphasis on pre-event planning.

GOVERNMENT POLICY STATEMENT FOR TRANSPORT

The Government Policy Statement is the Government's primary tool to communicate what it wants to achieve in land transport, and how it expects to see funding allocated across the likes of road policing, road safety promotion, State Highways, local roads and public transport. The Government's key priority in the 2018 GPS is economic growth and productivity; it also reaffirms the focus on road safety and increases the emphasis on value for money.

NATIONAL POLICY STATEMENT FOR URBAN GROWTH AND DEVELOPMENT

The National Policy Statement enables Central Government to prescribe objectives and policies for matters of national significance, which are relevant to achieving the sustainable management purpose of the Resource Management Act (RMA). In particular; ensuring urban environments can meet demand and provide choices to meet the needs of people, communities and future generations for a range of dwelling types, locations, working environments and places to locate businesses; robust evidence processes to inform planning decisions; and urban environments that can respond to the changing needs of people, communities and future generations.

NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT

The National Policy Statement for Freshwater Management provides direction on how local authorities should carry out their responsibilities under the RMA for managing fresh water. The Government has announced a plan to improve New Zealand's waterways so that 90% are 'swimmable' by 2040. At the moment, 72% are considered safe to swim in, most of the time. Improving our lakes and rivers will take time and there is more we need to do in the years ahead to make it happen. The Clean Water package is an important step in achieving our goal of better water quality for New Zealanders.

NATIONAL LAND TRANSPORT PLAN

The National Land Transport Programme (NLTP) for 2018–21 contains all the land transport activities, including public transport, road maintenance and improvement, and walking and cycling activities, that the NZ Transport Agency (NZTA) anticipates funding over the next three years. The NLTP focuses on four themes, underpinned by the continued emphasis on value for money: encouraging economic growth and productivity; making journeys safer; shaping smart transport choices; and effective and resilient networks.

REGIONAL POLICY STATEMENT FOR OTAGO

The Regional Policy Statement (RPS) sets the direction for future management of Otago's natural and physical resources. It provides the foundation for the development of regional plans and district plans.

OTAGO/SOUTHLAND REGIONAL LAND TRANSPORT PLAN

The Regional Land Transport Plan (RLTP) sets out the strategic direction for land transport in Otago and Southland, and list activities for the next three years (by NZTA and local authorities) which are recommended for funding from the National Land Transport Fund.

OTAGO/SOUTHLAND REGIONAL PLAN: WATER

This plan promotes the sustainable management of Otago's water resources. To achieve this, the plan has policies and methods (which include rules) to address issues of use, development and protection of Otago's freshwater resources, including the beds and margins of water bodies.

STANDARDS

Use of standards aid in the creation of products and services that are safe, reliable and of good quality. The following International Organisation for Standards (ISO) have been aligned and where appropriate adopted for use throughout QLDC's asset management planning framework:

ISO 22301:2012 provides a framework to plan, establish, implement, operate, monitor, review, maintain and continually improve a Business Continuity Management System (BCMS). It is expected to help organisations protect against, prepare for, respond to, and recover when disruptive incidents arise. QLDC is currently adopting this standard but it is not fully embedded within the organisation as yet.

ISO 31000:2009 is a family of standards relating to risk management. The purpose of this standard is to provide principles and generic guidelines on risk management. QLDC has adopted this standard within the Risk Management Framework.

ISO 55000:2014 is an international standard covering management of physical assets. QLDC is aligning all asset management documentation to this standard but has no plans to seek accreditation at this time.

Appendix B: Significant Infrastructure Issues

The below tables are a key to the ‘Significant Infrastructure Issues’ and QLDC’s ability to clearly demonstrate it meets and complies with:

TABLE 9 KEY TO SIGNIFICANT INFRASTRUCTURE ISSUES AND IMPLICATIONS (LEGISLATION AND GUIDANCE)

ACRONYM	THE IMPLICATIONS OF A PARTICULAR OPTION:	REQUIREMENT OF:
LGA	QLDC can demonstrate that it meets current and future needs of the community in a cost effective way.	Local Government Act
RMA	QLDC is able to actively promote sustainable management of the district’s natural and physical resources.	Resource Management Act
NIP	QLDC can show it is working towards resilient and efficient infrastructure that supports a diverse, resilient local economy and a good quality of life in our district, underpinned by robust asset management practices.	National Infrastructure Plan
HA	QLDC can demonstrate it is actively seeking to improve and protect public health, and its infrastructure is not causing risks to public health.	Health Act
LTMA	QLDC’s operations and investment are measurably contributing to an effective, efficient and safe land transport system.	Land Transport Management Act

NLTP	QLDC can demonstrate that its investment plans are well aligned with the Otago / Southland Land Transport Plan and the broader New Zealand Land Transport Plan.	National Land Transport Plan
WMA	QLDC can show that it is seeking to deliver measurable improvements in solid waste education and management to improve environmental, social and cultural benefits.	Waste Minimisation Act

TABLE 10 KEY TO SIGNIFICANT INFRASTRUCTURE ISSUES (IMPLICATIONS)

ACRONYM	ASPECT	THE IMPLICATIONS OF A PARTICULAR OPTION:
\$	Investment	Relative costs between options: \$ = minimum cost, \$\$ = medium cost, \$\$\$ = most expensive. Minimum cost is in the order of millions of dollars. Medium cost is tens of millions of dollars. Most expensive cost is many tens of millions of dollars.
T Yrs.	Timing	Delivery timeframes: < = implemented within indicated time frame, > greater than indicated timeframe. Note: QLDC expects all of the decisions in this section as “options considered” and “preferred solution” to be made with the adoption of the 2018 TYP. This is because, these decisions primarily relate to responses to legislative, regulatory or changing demographic needs. It is recognised these decisions represent a watershed moment for QLDC.

LAND TRANSPORTATION SIGNIFICANT ISSUES / SIGNIFICANT CHANGE

OPTIONS CONSIDERED TO MANAGE LAND TRANSPORTATION INFRASTRUCTURE

MEET INTENTIONS OF:

IMPLICATIONS:

LGA	RMA	NIP	GPS/ NL/ TP/ LTMA	\$'S	TIME/ YRS
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CUSTOMER CHANGES:

- > Our community continues to grow and change - this effects how well our transport assets function.
- > Roads that were designed and built years ago are now required to service an increasing number of cars and other types of vehicles.
- > In addition, our services need to respond to changing technology, safety regulations and differing levels of customer experience.
- > The upgrading and replacement of our transportation assets needs to be coordinated with other services such as water and electricity networks - as well as the road users themselves.
- > As the district continues to grow, changes in travel patterns and destinations will impact on travel times and network efficiency.
- > Our customer's experience of the transport network is assessed through the One Network Road Classification (ONRC) system developed by NZTA.
- > There are a number of key structures (bridges, retaining walls etc.) owned by QLDC, NZTA and other parties which are critical to effectiveness and resilience of our transport services.
- > The resident population and tourist profile of the district is growing and changing.
- > The different visitor and resident needs are not always provided for in the transport network which can result in unhappy users.
- > In addition, vehicle counts have increased by 10% in the past 12 months, and 50% in the past five years. Improved linkages and transport options to our airport are critical as the airport is a key destination in our region.
- > People require choice on travel modes and an integrated transport service facilitates this - we note often visitors are already familiar with using public transport in their own cities.
- > Building new, wider roads will not meet projected needs. Moving transportation modes from other than single passenger private cars will be essential.
- > A key emerging issue is that QLDC is transitioning from a series of semi-rural, holiday towns to permanent urbanised areas. This change is occurring very quickly, and is one of the fastest land-use transitions occurring in New Zealand.
- > Road assets and configurations that were once appropriate for the vehicle numbers are no longer adequate or appropriate as this transition continues.
- > Road layouts will need to be improved for safety and other reasons. This will require designating land for future purchase to improve roading layouts and safety.
- > Investment is required to improve our ability to predict and respond to future service requirements, including the use of autonomous vehicles.
- > Moreover, planning and delivery of transport infrastructure will need to be more agile to better respond to our changing needs, and technology will need to inform road users to make the best travel choices.

OPTIONS

1. Do nothing / status quo.
 2. Optimise existing services with increased travel mode options, including bus services and cycling options.
 3. Influence demand by introducing user charges (i.e. peak congestion charges).
 4. Optimise existing services (multi-mode) and introduce user charges.
 5. Invest in additional, broader transport networks options i.e. mass transit systems such as gondolas, water based public transport.
- > Reactive programme of road safety upgrades to protect road users.
 - > Risk-based programme of road safety upgrades to protect road users.
 - > Investigate and promote tools to facilitate communications regarding travel and network conditions.
 - > Stronger integration and collaboration between all key infrastructure and land use planning activities to optimise delivery
 - > More use of water based transport.

PROPOSED SOLUTION

- > Optimise existing services with increased travel mode options, including bus services and cycling options.
 - > Risk based programme of road safety upgrades to protect users.
 - > Retain dedicated asset management team, align asset management with good industry practice and actively engage with asset management sector leaders to share learnings / gain efficiency.
 - > Investigate and promote tools to facilitate communications regarding travel and network conditions.
 - > Promote integration of transport infrastructure planning with land uses, and behavioural change through current transport strategies (Queenstown Town Centre Transport Strategy, Queenstown Integrated Transport Strategy, Queenstown Masterplan and future master-planning for Wanaka).
- Growth** = Allow forward planning of integrated transport networks, to align spatially and chronologically with land use planning.
- Level of Service (LoS)** = Grow the networks to anticipate and accommodate growth to retain desired LoS.

YES	NO	NO	NO	\$	N/A
NO	YES	YES	YES	\$\$	<10
NO	YES	YES	YES	\$\$	>10
NO	YES	YES	YES	\$\$	>10
YES	YES	YES	YES	\$\$\$	>30

YES	YES	YES	YES	\$\$	<10
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LAND TRANSPORTATION SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE LAND TRANSPORTATION INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	GPS/ NL/ TP/ LTMA	\$'S	TIME/ YRS

FUNDING CHANGES:

- > NZTA is transitioning councils to a nationally consistent funding model.
- > Most QLDC roads are currently funded 51% by NZTA, with the exception of the roads to Glenorchy and through Cardrona. These two roads are currently funded over 90% by NZTA. However, this funding will be reduced in stages to 51% as well.
- > The ONRC system, which categorises all roads into one of six categories; based on how busy they are, whether they connect to important destinations, or are the only route available. The ONRC is designed to bring consistency to roading investment practices.
- > To maintain the current quality of the roads in our district, it is assumed funding from local sources will need to increase.
- > An historic disparate approach to road management by the various parties (NZTA, ORC, QAC, DOC and QLDC) is being replaced with jointly developed, integrated planning.
- > Historic investment processes have struggled to adequately consider future demand which has led to delays in providing new or expanded services.
- > Traditional planning and funding methods, are not responsive to the rates of growth currently observed. Ratepayer funding is not a sufficient or fair method to make up any shortfall in a tourism focussed region.
- > In addition, new technologies may require less dependence on fossil fuels resulting in less tax and funding for road investments.
- > To be successful, there is an emerging need to investigate targeted and alternative sources of funding for transportation services.

OPTIONS

1. Do nothing.
2. Commence phased reductions in service levels to align with nationally appropriate levels (ride comfort, travel times etc.).
3. Source additional local funding to retain existing service levels (i.e. user and congestion charges, petrol tax).
4. Source additional other funding to retain existing service levels (i.e. private public partnerships).
5. Identify additional Crown funding opportunities.

PROPOSED SOLUTION

- > Commence phased reductions in service levels to align with nationally appropriate levels (ride comfort, travel times etc.) and alternative funding options for key investments.
 - > Investigate effects of the increasing use of access to Crown Estates on infrastructure from Departments of Conservation (DoC) and - Tourism, to identify where costs should lie (determine evidence that DoC and/or Central Government should be contributing).
 - > Investigate significant sources of funding through demonstration of benefits to the wider network (i.e., funding a share of the - Queenstown Masterplan by demonstrating the increased benefits to tourism and Regional / National growth).
- Levels of Service (LoS) = Ensure that LOS are maintained through possible significant growth by promoting a user pays (directly or indirectly) approach.

YES	NO	NO	NO	\$	N/A
YES	YES	YES	YES	\$	>10
NO	YES	YES	NO	\$\$	>20
NO	YES	YES	YES	\$\$	>20
NO	YES	YES	NO	\$	>20
YES	YES	YES	YES	\$	>10

LAND TRANSPORTATION SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE LAND TRANSPORTATION INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	GPS/ NL/ TO/ LTMA	\$'S	TIME/ YRS

ENVIRONMENT CHANGES:

- > Changes in our local climate will affect the performance of our transport infrastructure.
- > Projected increases in the frequency and size of rainfall events will require changes to our drainage systems to protect it from washouts and flooding.
- > Projected increases in daytime temperatures will increase rates of deterioration of our road surfaces, reducing their longevity.
- > Projected decreases in snow days may impact our ski season and our local economy.
- > We are continuing to monitor freeze days and their effect on road break up. Changing weather patterns may shorten our already constrained available period for construction.
- > The district is vulnerable to transport network closures and restrictions which may disrupt visitor routes and isolate communities from core services and necessities.
- > A changing and more volatile weather environment with extremes puts pressure on the drainage infrastructure which is crucial to extending the life and robustness of the transport network.

OPTIONS

1. Do nothing
2. Monitor weather patterns, customer use patterns, asset performance and annually review asset management plans.
3. As per (2.) but include climate scenario modelling (risk management scenarios) to improve asset management plan reviews.
 - > Targeted low energy lighting (LED) upgrades
 - > Introduce transport modes with fewer environmental impacts.
 - > Alternative routes and crossings at key lifelines areas.

PROPOSED SOLUTION

- > Monitor weather patterns, customer use patterns, asset performance and annually review asset management plans.
 - > Targeted LED upgrades.
 - > Actively incorporate and improve active and public travel networks (Queenstown integrated transport strategy, public transport - network review, Queenstown Masterplan and future master-planning for Wanaka).
 - > Actively investigate alternative routes and crossings through business case planning.
- Growth** = Changing technologies will need step changes in infrastructure thinking, including reliance on historic funding providers.
- Resilience** = Provision of, or future planning for recovery will produce efficiencies.

NO	NO	NO	NO	\$	N/A
YES	YES	YES	YES	\$	<1
YES	YES	YES	YES	\$	<5
YES	YES	YES	YES	\$	<1

LAND TRANSPORTATION SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE LAND TRANSPORTATION INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	GPS/ NL/ TP/ LTMA	\$'S	TIME/ YRS

INDUSTRY MATURITY/CHANGES:

- > Central Government has signaled a clear requirement for councils to improve their asset management practices.
- > New national data standards, risk management requirements and specific asset management maturity obligations are being developed.
- > These changes are set to impact capability and capacity issues across the broader local government sector - i.e. Better Local Government Reforms.
- > The key outcome of these reforms will be measurable improvements in asset performance, investments and overall community satisfaction and resilience.
- > A recent review of the water services has identified the benefits of understanding natural hazards and their potential effects on key infrastructure. This approach could benefit our road network in terms of improving understanding, link criticality and improving network resilience.
- > A balanced portfolio of insurance, asset reinforcement, and asset relocation will be required moving forward to meet the NIP outcomes.
- > This will be important to ensure QLDC meets its obligations as a Lifeline Utility provider. (N.B. a lifeline utility is legally required to function 'to the fullest possible extent' (even at a diminished level) during and after an emergency, participate in emergency management planning, and provide free-of-charge technical assistance to the Director of Civil Defence Emergency Management.)
- > Decisions by other parties for major modal shifts i.e. the move from tourists out of buses into private cars and campervans approx. 15 years ago. Inability to assess, plan and fund rapidly changing transport user demands in a timely way results in some poor investment prioritisation and decisions.
- > Legislative change (National Policy Statements) on the need to align land use planning with the forward planning of infrastructure.

OPTIONS

1. Do nothing.
 2. Retain dedicated asset management team.
 3. As per (2) and align council practices with good industry practices.
 4. As per (3) and actively engage with central and local government sector leaders.
 5. As per (4) and independently audit council practices with industry standards.
- > Robust and sound decision making based on evidence and analysis through the Better Business Case framework.
 - > Self-insure.
 - > Asset criticality review and reconfirm risk mitigation strategies are appropriate including third party insurance.
 - > Build understanding of natural hazards to better target risk mitigation strategies and insurance cover.
 - > Develop business continuity plans to good industry practice.
 - > Maintain currency in technology and innovation.
 - > Embrace the share economy.

PROPOSED SOLUTION

- > Retain dedicated asset management team, align with good industry practices and actively engage with central and local government sector leaders.
 - > Grow the team in emerging areas, such as technology and economic performance.
 - > Regularly review asset criticality, understanding of natural hazards, risk mitigation strategies - including insurance cover and align business continuity plans to good industry practice.
 - > Investigate simplification of funding / approval practices.
- Renewal = Future technology and innovation may significantly alter the need for existing infrastructure networks, especially roading.

NO	N/A	NO	NO	\$	N/A
NO	N/A	YES	YES	\$	N/A
YES	N/A	YES	YES	\$	<5
YES	N/A	YES	YES	\$	<5
YES	N/A	YES	YES	\$\$	>5

YES	N/A	YES	YES	\$	<5
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IMPLICATIONS OF NOT PROCEEDING

- > Increase in congestion, impacting the district economically, its ability to grow and undermining efficient access to the CBD, social/education and tourism activity areas.
- > Difficulties in delivering a strong and vibrant local economy/businesses and industry not actively supported.
- > Increase in road crashes and reduced customer confidence in travelling by road.
- > Lack of uptake in alternative modes of transport.

THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	HA	\$'S	TIME/ YRS

NATURAL RESOURCE CHANGES:

- > Unprotected water sources are resulting in increased contaminants and algae in lake water.
- > Algae impacts our water services by blocking home filters and water meters reducing and interrupting water pressure.
- > Turbidity, can impact the effectiveness of our UV disinfection treatment.
- > There is also a potential risk that algae could result in discoloured water and lead to increased taste and odour complaints.
- > Understanding the implications of stormwater run-off as development continues in the urban environment.
- > Investing for stormwater treatment at the source.

OPTIONS

1. Current approach/investment.
2. Improve catchment runoff controls, relocate development, remove or treat stormwater runoff to lakes.
3. Improve water treatment process and controls to address the risks of water supply safety and reliability.
4. Improve water treatment and basic catchment runoff controls.
5. Abandon existing water sources and develop new water sources (i.e. deep bores, new protected lake catchments or desalination).

PROPOSED SOLUTION

Our 30 year strategy incorporates numerous stormwater projects identified through a risk based scoring system via the stormwater Catchment Management Plans (CMP) developed for the district.

- > This system has resulted in approximately 50 stormwater related projects planned for over the next 15 years with a total estimated cost of \$55m.
- > Using hydraulic models, CMPs and flooding complaints, a series of quick win projects including one each in Queenstown, Wanaka and Arrowtown were identified. These projects along with the ground investigations and model updates have been programmed in the ten years of the 2018 Ten Year Plan.

The Council will provide safe and reliable stormwater drainage services demonstrated by no stormwater related health issues and no flooding of consented building platforms.

- > We will deliver on this target by ensuring that minimum stormwater system capacity during a simulated 24 hour duration, ten year return period storm, will ensure:
 - That no consented habitable floors for building platforms, are flooded.
 - That no erosion to private property occurs.

Local Government Act:

- > Stormwater per capita demands are expected to remain unchanged where increases in impermeable surfaces are offset with appropriate sustainable urban design and potential increases in rainfall events over the longer term.

Regional Plan for Water:

- > With respect to discharges from any new stormwater reticulation system, or any extension to an existing stormwater reticulation system, to require:
 - the separation of sewage and stormwater;
 - measures to prevent contamination of the receiving environment by industrial or trade waste; and
 - the use of techniques to trap debris, sediments and nutrients present in runoff.

QLDC will work collaboratively with ORC to understand the requirements for stormwater treatment prior to discharge to freshwater bodies.

Environmental = controlling erosion, avoiding property damage, ensuring public amenity of open spaces and protection of the environment.

NO	YES	NO	NO	\$	N/A
YES	YES	YES	NO	\$\$\$	>50
YES	YES	YES	YES	\$\$	<5
YES	YES	YES	YES	\$\$	<10
NO	YES	NO	YES	\$\$\$	>10

YES	YES	YES	YES	\$\$\$	<15
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THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	HA	\$'S	TIME/ YRS

REGULATION CHANGES:

- > Foreign matter in sewers is resulting in increased blockages of the network.
- > Most notably this is caused by tree roots, construction debris and fats.
- > Blockages of the sewers result in backing up and overflow of untreated sewerage to private property and/or the environment.
- > Understanding our water supply security and compliance to Drinking Water Standards following the Havelock North contamination event.
- > Understand our responsibilities within the Otago Regional Council newly released Urban Water Quality Strategy
- > Ministry for the Environment have initiated workshops to discuss Urban Water Quality moving forward - QLDC will need to address any outcomes from this working group.
- > No treatment of industrial/ commercial trade waste i.e. fats, oils and grease (FOG) and oil and grit interceptor waste.
- > Disposal of sludge from wastewater treatment plants.

OPTIONS

1. Do nothing.
2. Targeted sewer inspection and cleaning programme.
3. Adopt and enforce Trade Waste Bylaw.
4. Install larger pipes and upgrade pump stations to grinder pumps to pass debris.
5. Possible fat, oil and grease treatment through vermicomposting.
6. Educate to assist with efficient grease trap waste recovery.

PROPOSED SOLUTION

Wanaka wastewater management

- > New wastewater pump station.
A new pump station is proposed to be built close to the Aubrey Road / Rata Street junction that will work to service a large part of north Wanaka (streets along and off Beacon Point Road), Peninsula Bay, Kings Drive and Kiromoko estate. The pump station would serve to reduce significant load into the Lakeside Road No 1 pump station and also the Dungarvon Street pump station within the CBD.
- > Upgraded Gordon Road pump station.
The Gordon Road pump station will be upgraded to cater for increased growth in the South Wanaka area. This CAPEX project is growth related and is being planned in response to the new subdivisions at Meadowstone Drive and Alpha Ridge.
- > Treatment
Project Pure treatment plant will continue to provide high quality treatment of wastewater for the Wanaka ward. The capacity of this treatment plant will be increased to cater for future growth within the region. The current consent is valid until 2041.

Queenstown wastewater treatment

- We will continue major investment in the upgrade and improvement of our Shotover wastewater treatment plant with a view to reducing the environmental impact of this process. A major shift in our treatment and disposal of wastewater will see treated effluent discharged to land rather than into the Shotover River from 2020 onwards. The quality of treated effluent will continue to improve as phased improvements and upgrades continue at the Shotover treatment plant.
- More than \$15million is earmarked for CAPEX works at the Shotover treatment plant over the next five years which will be spent on building a new MLE tank, clarifier and improving the capacity of the plant in order that all sewerage entering the plant can be dealt through the MLE activated sludge treatment process. Additional investment will be made to deliver other significant works at this site;
- > supply and installation of a dedicated treatment process to deal with fats, oil and grease,
 - > installation of a land disposal system in order that we can move away from discharge of treated effluent to the Shotover River, and
 - > decommissioning of the old oxidation ponds.

Table continued on next page

NO	YES	NO	NO	\$	N/A
NO	NO	YES	YES	\$\$	<5
YES	NO	YES	YES	\$\$	<5
NO	YES	YES	YES	\$\$\$	>30
YES	YES	N/A	YES	\$\$	>10
YES	YES	N/A	YES	\$	>5
YES	YES	YES	YES	\$\$	<5-10

Table continued from previous page

PROPOSED SOLUTION

Queenstown Wastewater Network Masterplan

The Queenstown Wastewater Network Masterplan identified a need for the following projects to be delivered within the next ten year Ten Year Plan cycle in order to meet our strategic objectives. These individual components will work to optimise the solution for a fully aligned masterplan offering greater efficiency across the Queenstown wastewater network.

- > New and improved wastewater pumping stations
- > Upgrades at Marine Parade pump station including a duplicate outlet manifold and a duplicate rising main.
- > This is to improve resilience and reliability at this critical wastewater pump station.

Growth projects

A number of works are planned in response to growth in the Wakatipu ward:

- > A rising main from Kawarau Falls Bridge to the new large diameter gravity line that runs down the Eastern Access Road to Shotover treatment plant.
- > Construction of a new wastewater pump station to service the Remarkables Park and south Frankton area.
- > Construction of new pumping mains over the Kawarau Bridge to service Hanley Downs and Kelvin Heights.

Optimisation projects

- > Reconfiguration of the Kawarau Place pump station in order to realise the benefits of the new Remarkables Park pump station and to reduce load on the Frankton Beach pump station.
- > Modifications to the Willow Place pump station in order to alter its pumping route to realise the benefits of the new large diameter gravity line that runs down the Eastern Access Road to Shotover treatment plant.

Hawea wastewater management

Decommissioning of oxidation ponds.

QLDC have assessed a number of options relating to the long term conveyance and treatment of wastewater in Hawea. A 'Better Business Case' process was followed that identified a preferred option for servicing of wastewater in the township.

The proposed solution is to construct a sewer pump station and pipeline to convey sewage from Hawea to the QLDC Project Pure wastewater treatment plant located adjacent to Wanaka airport.

Conveyance to Project Pure treatment plant.

The pipeline would be approximately 12km in length and routed via Hawea flat before crossing the Clutha River and discharging into the existing Project Pure treatment plant. This project will assist in delivering the following environmental benefits:

- > reduced risk of unconsented discharge,
- > move infrastructure away from high value recreational assets,
- > future compliance with discharge permits associated with consented wastewater treatment facilities.

Trade Waste/Solid Waste Management

- > Reviewing QLDC Trade Waste Bylaw to include all discharges from an industrial/commercial property
- > To protect the receiving environment (i.e. lake or stormwater)
- > Scope ad investigate possible treatment systems for trade waste
- > Vermicomposting (worm) trial underway
- > Investigation of anaerobic digestion (the combination of organic waste, FOG and sludge which generates biofuel and a soil condition)

THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	HA	\$'S	TIME/ YRS

CUSTOMER CHANGES:

- > Changing community requirements are impacting on the performance of our assets.
- > Assets installed many years ago are now being required to service an increasing number of houses and businesses.
- > Issues have also been identified with poor quality construction of some legacy pipelines will need to be addressed.
- > The upgrade and replacement of our assets must be coordinated with other services and road corridor users.
- > The changing needs of the community will impact on service reliability and resilience.
- > Increases in the number of properties and business using our legacy assets will require both behavioural changes (demand management) and investment in new/ expanded assets.
- > As the population grows, the areas which the Council services will need to change. This will require designating land for future purchase to locate a number of new water reservoirs.
- > QLDC's primary legislation requires it to demonstrate that its services are "efficient and effective".
- > Physical measurement of asset performance is a key aspect of confirming service efficiency. (i.e. minimising waste).
- > Actively monitoring community use, complaints and future needs is fundamental to ensuring service effectiveness.
- > Failure to optimise asset performance, customer use, and understanding future needs will result in ineffective and low quality investment.

Table continued on next page

OPTIONS

1. Do nothing.
2. Reactive programme of water safety upgrades to protect public health.
3. Risk based programme of water safety upgrades to protect public health.
4. Immediate implementation of water safety upgrades to protect public health.

PROPOSED SOLUTION

Queenstown water supply

Our masterplan is to supply water to Queenstown and Frankton via the existing Two Mile lake intake pump station and Shotover Country Bore pump station. New treatment plants will be constructed at these sites in order that we can supply safe drinking water to the public that is compliant with DWSNZ 100% of the time. These two water pump stations and treatment plants will be designed and built to have the capacity to serve the Queenstown, Frankton, Lake Hayes Estate, Shotover Country and Hanley Downs area for the next thirty years.

- > Two Mile WTP: 14,000m³ capacity by 2058.
- > SOC bore WTP: 27,000m³ capacity by 2058.

The masterplan involves the construction of several new storage reservoirs across the Queenstown network in order to service the Frankton flats and Hanley Downs area.

Wanaka water supply

The Wanaka Water Masterplan is to dedicate resources at the Beacon Point reservoir and water treatment plant to ensure future security of supply for Wanaka. The existing Western reservoir will be decommissioned in order to reduce the need to construct two new water treatment plants for Wanaka. As a result, a number of network reconfigurations will be required to ensure supply levels of service are maintained and improved upon.

- > A new large diameter cross town trunk main will be required to supply water through to south Wanaka.
- > A new 6000m³ reservoir will be constructed adjacent to the existing Beacon Point reservoir.
- > A new 5000m³ reservoir will be constructed to the south of Wanaka to supply into the Cardrona Valley Road area and neighbouring subdivisions.
- > A new pressure booster pump station will be constructed to boost mains pressure within the existing western and 'Far Horizon' supply zones.

Arrowtown water supply

The new infrastructure planned for this scheme includes the following:

- > installation of a new production bore together with a new bore pump,
- > upsize of the existing bore pump to increase supply capacity,
- > construction of a new reservoir to increase treated water storage volume by 2200m³, and
- > ensure full compliance with DWSNZ through UV disinfection and chlorine dosing.

Table continued on next page

NO	NO	NO	NO	\$	N/A
NO	NO	NO	NO	\$	N/A
YES	NO	YES	YES	\$\$	<10
YES	YES	YES	YES	\$\$\$	>30

YES	YES	YES	YES	\$\$	<15
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THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	HA	\$'S	TIME/ YRS

Table continued from previous page

CUSTOMER CHANGES:

- > This may result in service interruptions, assets having to be replaced sooner and overall costs increasing.
- > The population profile of the district is growing and changing.
- > Our district has the highest rate of growth in people aged 0 - 5 years.
- > In addition our population over the age of 60 is also increasing rapidly.
- > These population groups are more at risk to water quality variances.
- > In addition, increases in tourist numbers placed increase demands on the reliability and availability of our water supplies.
- > A new investment programme is required to improve the safety and reliability of our water supplies.
- > Key emerging issue in that QLDC is transitioning from a series of rural holiday towns and destinations to a thriving, permanent resident urbanised district.
- > This transition is occurring very quickly, and is possibly the fastest transition currently being observed in New Zealand.
- > Service levels and that were once standard practice are no longer acceptable or appropriate as this transition continues.
- > Investment is required to improve our understanding of service levels and predicting future service requirements.
- > Investment in key infrastructure will need to be more flexible and able to be delivered, and added to, in a modular way.

Table continued from previous page

PROPOSED SOLUTION

The preferred option provides a supply scheme that will cater for current demand projections in 2048 (i.e. a 30 year lifespan - subject to ongoing demand forecast updates).

Luggate Water supply

A new long term proposal is planned to future proof provision of safe drinking water for Luggate and the neighbouring Wanaka airport supply scheme. A number of options were considered with the preferred solution involving the connecting up of these two separate schemes.

- > A new bore pump station will be installed at Wanaka Airport. Raw water from this source will be treated through UV disinfection and chlorine dosing. This would ensure full compliance with DWSNZ.
- > A new reservoir located at Wanaka Airport will provide security of supply to Luggate while also providing for firefighting requirements at the airport.
- > A new 4km pipeline will be constructed between Wanaka airport and Luggate.
- > The tank farm at Luggate will be retained but the existing bore pump station will be decommissioned.

Glenorchy water supply

As with our other remote water supply schemes, Glenorchy's water supply scheme is being placed under pressure from continuing development coupled with ageing infrastructure.

A water supply masterplan will be developed in 2018/19 to identify the need to invest and seek to identify a solution that delivers on our strategic objectives for supply of safe drinking water in accordance with our levels of service.

The new supply scheme will likely include new or upgraded bores and a water pump station together with increased reservoir storage capacity. The existing reservoirs will be decommissioned and replaced.

A new water treatment plant will be designed and built to ensure full compliance with DWSNZ. The treatment processes required to ensure full compliance is achieved will be determined only once any new groundwater source is extensively sampled. A chlorine dosing system will be installed in the interim until a permanent treatment solution is determined.

Hawea water supply

A new Hawea bore pump station and treatment plant was installed and commissioned in 2015 and supplies Hawea with safe drinking water. QLDC will continue to invest further monies in this supply scheme in order to meet all strategic objectives relating to our public drinking water supplies, specifically:

- > to ensure no illness attributed to inadequate public water supply,
- > compliance with NZ Drinking Water Standards (Bacteria and Protozoa) by 2028, and
- > to provide connection for new subdivision within QLDC service area not currently serviced by private scheme.

THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	HA	\$'S	TIME/ YRS
ENVIRONMENT CHANGES: <ul style="list-style-type: none"> > Changes in our local climate will affect the performance of our ground water sources and infrastructure. > Projected increases in the frequency and size of storm events will overload our drainage systems resulting in increased flooding. > Projected increases in daytime temperatures will increase rates of corrosion in our pipe networks, reducing their longevity. > Projected increases in temperature and wind will reduce the effectiveness of irrigation and increase water use per person. > Projected decreases in snow days will impact our ski season and local economy (i.e. a key source of funding for infrastructure). > Likely fluctuations in ground water levels (scarcity) and changes in ground water quality. > Implementing wastewater solutions for smaller communities as Otago Regional Council has a driver to move away from septic tanks. 	OPTIONS <ol style="list-style-type: none"> 1. Do nothing 2. Monitor weather patterns, customer use patterns, asset performance and annually review asset management plans. 3. As per (2.) but include climate scenario modelling (risk management scenarios) to improve asset management plan reviews. 	NO	NO	NO	N/A	\$	N/A
		YES	YES	YES	N/A	\$	<1
		YES	YES	YES	N/A	\$	>5
		YES	YES	YES	N/A	\$	<1
	PROPOSED SOLUTION <p>The Council will provide safe and reliable reticulated wastewater services demonstrated by no wastewater related illnesses attributed to QLDC's wastewater infrastructure and no breach of resource consent resulting in successful prosecution.</p> <ul style="list-style-type: none"> > Monitor weather patterns, customer use patterns, asset performance and annually review asset management plans. > Investing into source resilience i.e. bore upgrades, new intakes and existing intakes. > To reduce the risk of known single points of failure that result in discharges of wastewater into lakes and waterways and other high public usage areas. <p>Investment objectives;</p> <ul style="list-style-type: none"> > To ensure no illness is attributed to inadequate public wastewater infrastructure. > To reduce the frequency of uncontrolled wastewater discharges. Our corporate performance measures will be to have <3 dry weather overflow per 1000 wastewater connections and <5 odour complaints per 1000 wastewater connections. > To ensure no contamination of public water supply attributed to three waters infrastructure. 						

THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	A	\$'S	TIME/ YRS

INDUSTRY MATURITY/CHANGES:

- > Central government has signaled a clear requirement for improving asset management practices.
- > To that end, new data standards, new service delivery models, risk management requirements and specific asset management maturity obligations are being developed.
- > These changes are set to address capability and capacity issues across the broader local government sector - i.e. Better Local Government Reforms.
- > The key outcome of these reforms will be measurable improvements in asset performance, investments and overall community satisfaction and resilience.
- > Following the Canterbury Earthquakes, central government has encouraged improved local government understanding of their natural hazards.
- > The Alpine fault last ruptured in 1717. History shows it ruptures approximately every 300 years. It is likely to rupture during the term of this plan.
- > QLDC's water services are at risk to natural hazards including flood, lake tsunami and earthquakes.
- > A review of the current natural hazard shared funding arrangements between central and local government is nearing completion.

Table continued on next page

OPTIONS

1. Do nothing.
2. Retain dedicated asset management team
3. As per (2) and align council practices with good industry practices.
4. As per (3) and actively engage with central and local government sector leaders.
5. As per (4) and independently audit council practices with industry standards.

PROPOSED SOLUTION

- > Sourcing additional funding for three waters infrastructure.
- > Local Government New Zealand (LGNZ) and the Ministry of Business, Innovation and Employment (MBIE) are exploring options for addressing persistent barriers to regional economic development and growth, which include the issue of funding infrastructure in high volume tourist areas. One potential option are Special Economic Zones (SEZs) which could provide a mechanism for addressing these barriers.
- > Regularly review asset criticality, understanding of natural hazards, risk mitigation strategies - including insurance cover and align business continuity plans to good industry practice.
- > QLDC has been successful in sourcing funding from MBIE through the Housing Infrastructure Fund (HIF) in relation to proposed developments in Ladies Mile, Quail Rise and Kingston. This money will be used to build infrastructure to facilitate the supply of housing within the local market. QLDC's code of practice, service level agreements and all other corporate performance measures will continue to apply as new and existing networks are upgraded and expanded.

Improving and exceeding water quality parameters:

- > QLDC welcomes the government review into the Havelock North water contamination incident and looks forward to receiving the outcomes and recommendations from this process. We will embrace any change made to the regulation of water supplies and / or any improvements and enforcement of the NZ Drinking Water Standards (DWSNZ).
- > QLDC will continue to remain heavily involved in any development of regional freshwater quality standards and targets and wishes to be seen as a champion for environmental protection. Indeed, QLDC is presently looking at reissuing its three waters levels of service technical specification which aims to clearly identify numerous performance indicators by which our service delivery is measured.
- > QLDC has agreed to permanently disinfect its water supply networks as one of a number of steps to increase regulatory compliance.
- > This proposal is consistent with the our 2018 Ten Year Plan that aims to ensure all water supplies in the district comply with their respective Health Act requirements not later than the year 2028.
- > QLDC understands its obligations relating to public water drinking supplies under both the LGA and Health Act and wishes to reiterate its duties as a drinking-water supplier.

Table continued on next page

NO	N/A	NO	NO	\$	N/A
NO	N/A	YES	NO	\$	N/A
YES	N/A	YES	YES	\$	<5
YES	N/A	YES	YES	\$	<5
YES	N/A	YES	YES	\$\$	>5
YES	N/A	YES	N/A	\$	<5-10

THREE WATERS - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE THREE WATERS INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	NIP	A	\$'S	TIME/ YRS

Table continued from previous page

INDUSTRY MATURITY/CHANGES:

- > It is expected that QLDC will be solely responsible for all losses up to and including a one in 500 year event, possibly higher.
- > QLDC will need to review and update its risk mitigation plans, including its insurance policies and improved testing of its investment programmes for addressing service resilience.

Table continued from previous page

PROPOSED SOLUTION

- > Take all practicable steps to ensure an adequate supply of drinking water, notify any risk to that supply, ensure that drinking water complies with the Drinking Water Standards for New Zealand 2005 (revised 2008) (DWSs), and if the supplier becomes aware that water is not meeting the DWSs, to carry out the remedial action set out in the DWSs, or all other practicable steps if no remedial action is specified.
- > Take reasonable steps to protect its source of raw water from contamination, to protect all aspects of the drinking-water supply system from pollution and to ensure the drinking water supplied is wholesome.
- > Monitor the drinking water supplied to determine its compliance with the DWSs and detect and assess public health risks.
- > Prepare and implement a water safety plan.
- > Keep records that contain sufficient information to enable a DWA to assess compliance with Part 2A, the DWSs and the water safety plan.
- > Investigate any complaint received about the quality of drinking water and take action to remediate the problem, if the complaint is upheld.
- > Provide reasonable assistance to drinking-water assessors, designated officers, and medical officers of health.

IMPLICATIONS OF NOT PROCEEDING

- > Inadequate water supply to service population growth and support a strong and resilient local economy.
- > Inadequate pressure and flow to meet firefighting requirements.
- > Inability to provide a safe and resilient water supply affecting public health.
- > Resource Management Act compliance unable to be achieved, leading to increasing fines and loss of public and visitor confidence.
- > Increased discharges of untreated sewerage to the environment.
- > Continued and increased risk to people's safety within specific overland flow paths that are in proximity to private buildings.
- > Increased contamination of recreational and amenity lakes and rivers.
- > Increased vulnerability to cyber-attacks on drinking water computer systems.

SOLID WASTE MANAGEMENT - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE SOLID WASTE MANAGEMENT INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	WMA	NIP	\$'S	TIME/YRS

REGULATION CHANGES:

- > QLDC must work within the requirements of the Local Government Act (2002). QLDC must be able to demonstrate that its services are "efficient and effective". The cheapest option may not always be the most cost-effective option for the customer and/or the environment over the medium to longer term.
- > The New Zealand Waste Strategy 2010 sets out Central Government's long-term priorities for waste management and minimisation in New Zealand. QLDC must meet these priorities.
- > The Otago Regional Council (ORC) must ensure that the requirements of the National Policy Statement on Urban Development Capacity are met, through its regional management plans.
- > It is likely that there will be stricter air quality and odour controls in the future. Processes at QLDC's outdoor landfills may need to change to meet any new requirements.
- > It is likely that any changes in air quality or odour controls will apply to both operational and closed landfills.
- > QLDC will need to meet new regulations from Central Government and Waste Management New Zealand Ltd regarding stockpiling and recycling used tyres.
- > Responding to changes in the New Zealand Emissions Trading Scheme by 2020.

OPTIONS FOR REGULATION AND CUSTOMER CHANGES:

- Programme 1:** QLDC waste management services to continue as is.
- Programme 2:** Do minimum - provide minimum level of service to meet the minimum legal requirements.
- Programme 3:** More customer support - continue with current refuse and recycling collections and waste facilities but increase education and regulation.
- Programme 4:** More services - provide more waste minimisation services and facilities and retain current education and regulation.
- Programme 5:** Full QLDC service - more waste minimisation services, facilities, education and regulation. QLDC providing full service supported by education and regulation.
- Programme 6:** Focus on organics and glass - provide more waste minimisation services and facilities that target organics and glass, and retain current education and regulation.
- Programme 7:** Focus on construction and demolition (C&D) and glass - provide more waste minimisation services and facilities that target C&D and glass and retain current education and regulation.

NO	NO	NO	NO	\$	<1
YES	YES	YES	NO	\$	<5
YES	YES	YES	NO	\$	<5
YES	YES	YES	NO	\$\$\$\$	>5
YES	YES	YES	YES	\$\$\$\$\$	>5
YES	YES	YES	YES	\$\$\$	3-9
YES	YES	YES	YES	\$\$\$\$	>5

SOLID WASTE MANAGEMENT - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE SOLID WASTE MANAGEMENT INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	WMA	NIP	\$'S	TIME/ YRS
<p>CUSTOMER CHANGES:</p> <ul style="list-style-type: none"> > The changing needs of the community are impacting on the performance of QLDC's waste management assets – i.e. street rubbish bins and district recycling facilities. > Waste management assets installed many years ago are now being required to service an increasing number of residents, businesses and holiday makers. > Over the past years there has been an increase in per capita waste. This is not consistent with QLDC's Waste Minimisation Plan which seeks to reduce per capita waste. > New developments are not necessarily compatible with legacy waste collection services (i.e. limited truck access issues). > Waste solutions to district specific issues need to focus on the needs of both residents and visitors. > The upgrade and replacement of our waste management assets must take into account developments on both new land (greenfield) and land that has been re-purposed (brownfield). This applies to land within the district and land under the control of neighbouring councils. > The changing needs of the community will impact on service quality and reliability. QLDC must provide and support opportunities to minimise waste through reduction, reuse, recycling and recovery. > Educate and support waste generators (residents, visitors, and businesses) by providing options and advising them of their responsibilities. <p>Table continued on next page</p>	<p>PROPOSED SOLUTION FOR REGULATION AND CUSTOMER CHANGES:</p> <p>Programme 6: Focus on organics and glass - provide more waste minimisation services and facilities that target organics and glass, and retain current education and regulation.</p> <ul style="list-style-type: none"> > Continue to provide educational information to customers, to promote QLDC waste services and advise how customers can responsibly dispose of organic and recyclable materials, including using private waste collection services. > Continue to update the QLDC waste website. > Continue to investigate and provide (if appropriate) promotional support for commercial waste minimisation e.g. Agrecovery, Plasback, zero waste events, beach clean events. > Continue with existing waste education and promotional programmes for the general public, visitors, businesses, and in schools e.g. Enviroschools, EERST, Dr Compost, Waste Free Parenting, "Love Food Hate Waste". > Continue to provide subsidies for composting tools e.g. bokashi buckets for food scraps, worms. > Enforce existing event waste management regulatory requirements. > Continue with council-provided refuse collection service for urban households. Investigate process improvements e.g. receptacles, funding method. > Continue with council-provided refuse collection service for CBD businesses. Investigate CBD-specific processes e.g. frequency, receptacles (e.g. Big Belly Bins). > Continue with council-provided recycling collection service for urban households. > Implement a change to glass recycling processes to increase quality, quantity and yield and introduce consistency between wards (e.g. separate co-mingled, separate kerbside sorted, fully co-mingled recycling, Container Deposit Legislation). > Continue to promote, educate and incentivise home composting. > Continue to provide organic waste drop-off facility and mulching at transfer stations. > Introduce council-provided organic waste collection service for urban households. > Provide an organic waste processing facility (funding and service delivery options to be determined through project business case. Likely to be aligned with bio solids processing option). > Implement enhancements to bio solids end-use e.g. co-composting, solar drying, incineration, monofill, direct land application. > Monitor quality and quantity of construction and demolition (C&D) wastes at the Wakatipu transfer station and Victoria Flats landfill on an ongoing basis to gain a greater understanding of the types and quantities of material that could be diverted. > Support and enable, where practicable, private operators in providing a construction and demolition (C&D) facility. > Continue to check and maintain resource consent compliance at all waste handling facilities and closed landfills for which QLDC holds resource consents. <p>Table continued on next page</p>	<p>YES</p>	<p>YES</p>	<p>YES</p>	<p>YES</p>	<p>\$\$\$</p>	<p>IMPLEMENT 3-9 YRS / EMBED AND MAINTAIN IN 10-20 YRS</p>

SOLID WASTE MANAGEMENT - SIGNIFICANT ISSUES / SIGNIFICANT CHANGE	OPTIONS CONSIDERED TO MANAGE SOLID WASTE MANAGEMENT INFRASTRUCTURE	MEET INTENTIONS OF:				IMPLICATIONS:	
		LGA	RMA	WMA	NIP	\$'S	TIME/ YRS
<p>Table continued from previous page</p> <p>CUSTOMER CHANGES:</p> <ul style="list-style-type: none"> > In addition to the recent upgrades to wastewater treatment plants in Wanaka and Queenstown, the district is required to manage an increasing amount of waste water treatment plant sludge (bio solids). This is an issue many Councils are struggling with. Often the cheapest method of management is to dispose of this sludge in landfill, but this can create gas and odour problems. > The Victoria Flats landfill operator is reluctant to receive the district's bio solids, and QLDC must make alternative long term arrangements. > Provide effective and efficient waste services that are funded appropriately. > Reconfigure Wanaka Transfer Station to respond to future demand and potentially extend its hours of operation. > QLDC's existing landfill is expected to reach capacity in 2049 with limited waste diversion practices in place (waste reduction, recycling etc.), or 2074 with maximum diversion. 	<p>Table continued from previous page</p> <p>PROPOSED SOLUTION FOR REGULATION AND CUSTOMER CHANGES:</p> <ul style="list-style-type: none"> > Continue to monitor the capacity of available landfill, and search for alternative disposal options should the capacity decrease below a safe future-proof level. > Continue with the waste disposal services provided at the Victoria Flats landfill. > Continue to provide refuse transfer stations that include resource recovery facilities in Wakatipu and Wanaka. > Investigate introduction of differential pricing tools to increase diversion at both the landfill and transfer station facilities (either through Council advertised fees and charges or by influencing site operator). > Operate the transfer station and recycling centre facilities through a contractual agreement that optimises the separation of diverted material in terms of quality and the cost of providing the service. > Investigate reconfiguring both the Wakatipu transfer station and Wakatipu recycling centre layouts to encourage drop-off of reusable and recyclable materials before disposing of residual waste and improve throughput capacity. > Provide facilities at Council transfer stations for domestic quantities of hazardous waste, including batteries and oil. > Provide drop-off facilities at the Council transfer stations for e-waste to an extent that they are affordable and complement national schemes or services. > Provide drop-off facilities at the Council transfer stations for agrichemicals to an extent that they are affordable and complement national schemes or services. > Investigate if a policy or bylaw is required for the management of health care waste (in line with communications strategies by neighbouring councils). > Continue to provide public litter bins for waste in accordance with Council's responsibilities under the Litter Act (1979). Review bin type and cleaning frequency as required. > Provide public recycling bins alongside litter bins where practical and cost-effective. > Continue to prepare a document for visitors that explains waste minimisation opportunities and consumer responsibilities. > Continue to install drinking water fountains to encourage refill/reuse of drinking vessels and reduce plastic bottle waste. > Use additional languages to English to aid in communication and education of waste disposal and management. <p>IMPLICATIONS OF NOT PROCEEDING:</p> <ul style="list-style-type: none"> > Reduced ability to recycle, resulting in increased discharges to landfill and shortening landfill life. > Failure to comply with the Waste Minimisation Act and subsequent lack of public confidence. > Increasing volumes of uncollected waste resulting in pollution, amenity and potential health issues. 						