UTILITY

Great minds to good use

Central Otago Cycle Trails

Demand Projections 2024 to 2028

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Revision: Final

Issued: 19/04/2024

Document Control

	Position
Document Title and Subject	Central Otago Cycle Trails - Demand Projections 2024 to 2028
Document Owner	Central Otago District Council
Issue Date	19/04/2024

Version Status and History

Version	Issue Date	Status and Changes
1.0	April 2024	First version of demand projections.

1 Context

1.1 Background

Cycle tourism is experiencing significant growth in Central Otago. The Lake Dunstan trail has proven more popular than expected (5 to 10 times higher than projected at design stage). This is bringing substantial economic benefits to the region, particularly Clyde, Bannockburn, and Cromwell. While the trail itself generally receives positive feedback there are areas for improvement in the general user experience. Any negative feedback being is associated with inadequate facilities, such as lack of shade, parking, and public amenities.

1.2 The Situation

Until now, the potential negative effects of non-trail activities such as vehicle parking and turnarounds, cyclist amenities (rest areas) have not been adequately considered or strategically planned for when developing trails. Rather, a reactive approach has been taken. Arguably, this has been the prudent approach to date. The large success of the Lake Dunstan Trail and the high growth in demand on the Queenstown trails warrants a more proactive approach to planning.

1.3 The Objective of Projecting Demand

The goal is to create the first iteration of demand projections for recreational cycle trails in Central Otago. The projections will:

1. Allow stakeholders to better understand how changes in demand may impact on the wider trail, the visitor experience and community, particularly ahead of the future trail extension through the Kawerau Gorge and the Roxburgh Gorge.
2. Allow stakeholders to better quantify the demand on associated cycleway design, facilities, infrastructure, accommodation, and hospitality offerings.

1.4 The Method

Given that this is a new assessment and will likely need to be done regularly going forward, Utility recommended an iterative approach to developing demand projections. This is the first iteration and is a high level, or 'top down' projection.

Iteration 1: Top-down method for the purpose of understanding how future trail extensions may impact demand – A top-down approach means developing the projections based on macro-level trends rather than building the bottom-up[1] from micro-level factors. Utility proposes to project the total quantum of demand based on the qualitative information available and of the major demand drivers for cycling. This first step will involve a review of available data to inform the build of a model and to output high level demand scenarios.

1. Research and review existing data: Research and identify any patterns and factors contributing to the observed growth. To validate pattern assumptions, investigate how similar trail systems in other regions have evolved and managed growth (e.g. Queenstown Trails).
2. Develop high level projection model and scenarios: A five-year annual demand projection has been performed. Peak day demand profiles are also projected to enable early intervention of the capacity demands on associated infrastructure. Demand is represented by total trips in both directions and all user types. Being a first iteration, it uses a 'top-down' approach based on macro-level trends in demand over the past 5 years. For Kawarau Trail and Lake Dunstan Trail, historic demand growth on the Gibbston Trail has been used as the basis of forward demand projection.

[1] A 'bottom-up' approach requires a more comprehensive data driven process which produces more accurate outputs but requires much greater level of data measurement than is currently available.

2 Summary of Findings

The Central Otago region in New Zealand is witnessing a significant increase in cycle tourism, fuelling economic benefits. This report is the first iteration of demand projections for the Lake Dunstan, Roxburgh Gorge, Clutha Gold and the Kawarau Gorge extension. Its purpose is to enable enhanced planning to manage any negative effects to the customer experience that may occur from higher-than-expected demand. The extension of the Clutha Gold Trail to Waihola, along with the anticipated connection of the Lake Dunstan Trail to Wanaka, have been excluded from the current analysis but are expected to increase demand throughout the region.

Method Used

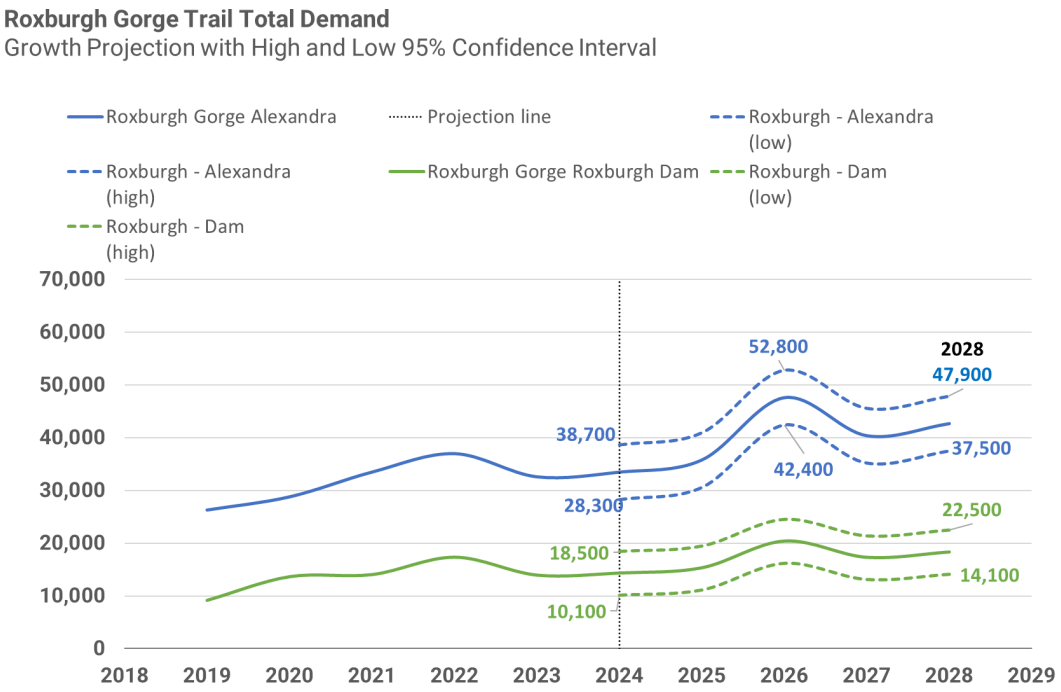
Data Review

Despite the presence of gaps, particularly in the monthly data for the Otago Central Rail Trail, the current quality of data available is very good. It is of sufficient quality to conduct a reliable demand projection over the next five years and establish peak day and peak hour demand.

Results

The accuracy of these projections is bound by a 95% confidence level based on the variance within historic data trends.

Figure 1 Projected Annual Demand – Roxburgh Gorge Trail



Across all the trails analysed, changes in demand over the past 5 years varies for each trail.

1. Roxburgh Gorge Trail and the Clutha Gold Trail: Historic demand growth on both trails is close to 50% over the past 5 years and is projected to continue at this level. Of note is that most of the trail demand is between Alexandra and Roxburgh and does not continue as strongly through to the Lawrence end of the Clutha Gold Trail.
- The extension of the Roxburgh Gorge Dam is anticipated to increase demand by 25% within the year of completion (2026/27) with demand reaching between 43,000 and 53,000 trips per year at the Alexandra end. For comparison, this demand is below that currently experienced on the Lake Dunstan trail.
2. Lake Dunstan Trail – After higher than anticipated demand during its opening, annual demand has settled back to 56,000 trips per year, which is the same as 2021 levels. Demand surged 25% after opening which may indicate likely demand surges upon opening of new trails. Of note is that

demand in January 2024 actually was 10% lower than the same period in 2023. This steady decline may indicate a "one and done" effect of new trail openings.

3. The Otago Central Rail Trail: The inner areas of the trail have experienced modest to no demand growth over the past 5 years, other than spikes and slumps during the Covid period. This is of note considering the opening of adjacent trails with comparatively higher demand growth. Some high demand occurs on the Airport Road section of the trail, but this is assumed to relate to commuter and local resident demand and possibly the Lake Dunstan Trail.
4. Queenstown Trails - Gibbston Trail: Demand has grown by 43% over the past 5 years on the Gibbston Trail. Annual demand on the Gibbston Trail is now the same as the Lake Dunstan Trail in 2023. This is of significance for future projections of the Kawarau Gorge trail, given it is essentially an out and back trail and thus a 'destination' trail. This demand and growth level is used to establish future demand on the Kawarau Gorge Trail.

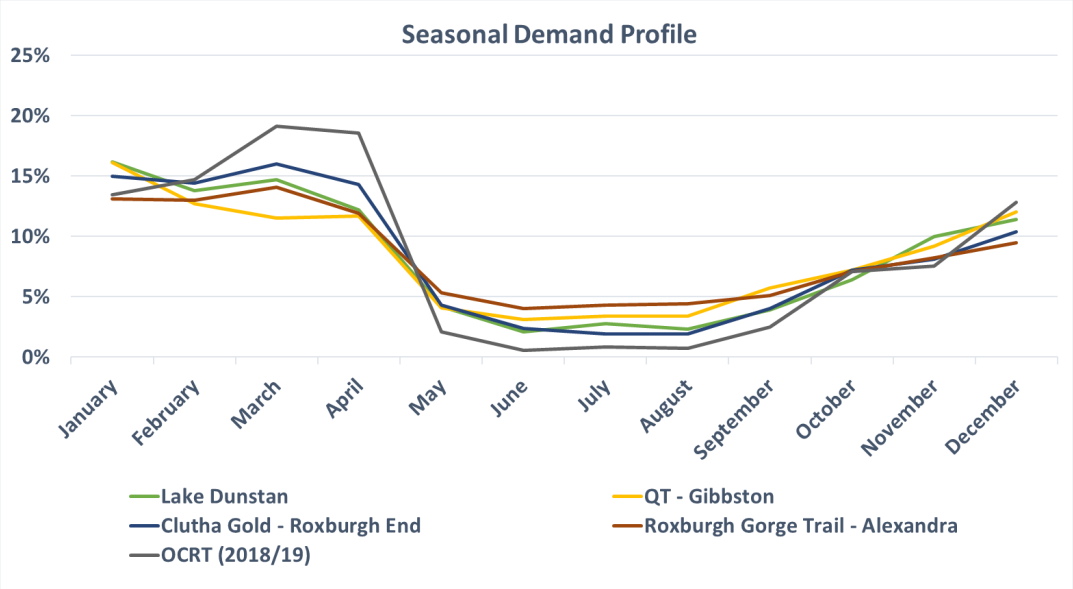
Table 1 Annual Demand Projection (2024 to 2028)

Trail		Range	2024	2025	2026	2027	2028	Annual Growth
Clutha Gold Trail	Lawrence End	*Low*	7,200	7,900	8,600	9,300	10,000	8%
		High	12,800	13,500	14,200	12,800	15,600	4%
	Roxburgh End	*Low*	8,800	9,700	14,300	11,500	12,400	8%
		High	17,200	18,100	22,700	19,800	20,800	4%
Roxburgh Gorge Trail	Alexandra End	*Low*	28,300	30,600	42,400	35,200	37,500	7%
		High	38,700	41,000	52,800	45,600	47,900	5%
	Roxburgh Dam End	*Low*	10,100	11,100	16,200	13,100	14,100	8%
		High	18,500	19,500	24,500	21,400	22,500	4%
Lake Dunstan Trail		*Low*	44,800	48,700	52,600	42,500	45,700	0%
		High	71,400	75,300	79,200	69,200	72,300	0%
Queenstown Trail Network	Gibbston Trail	*Low*	52,000	58,000	64,000	70,000	75,000	9%
		High	70,000	76,000	82,000	88,000	93,000	7%
Kawarau Gorge Trail (new from 2026)		*Low*	N/A	N/A	80,000	70,000	75,000	-1%
		High	N/A	N/A	102,500	88,000	93,000	-2%

Seasonal Peaks

As would be expected, cycle demand correlates to warmer seasons, with 80% of annual demand occurring between November and April each year. Demand is highest during January, February and March. Demand on the Otago Central Rail Trail tends to peak in March and April but experiences a much shaper decline during winter.

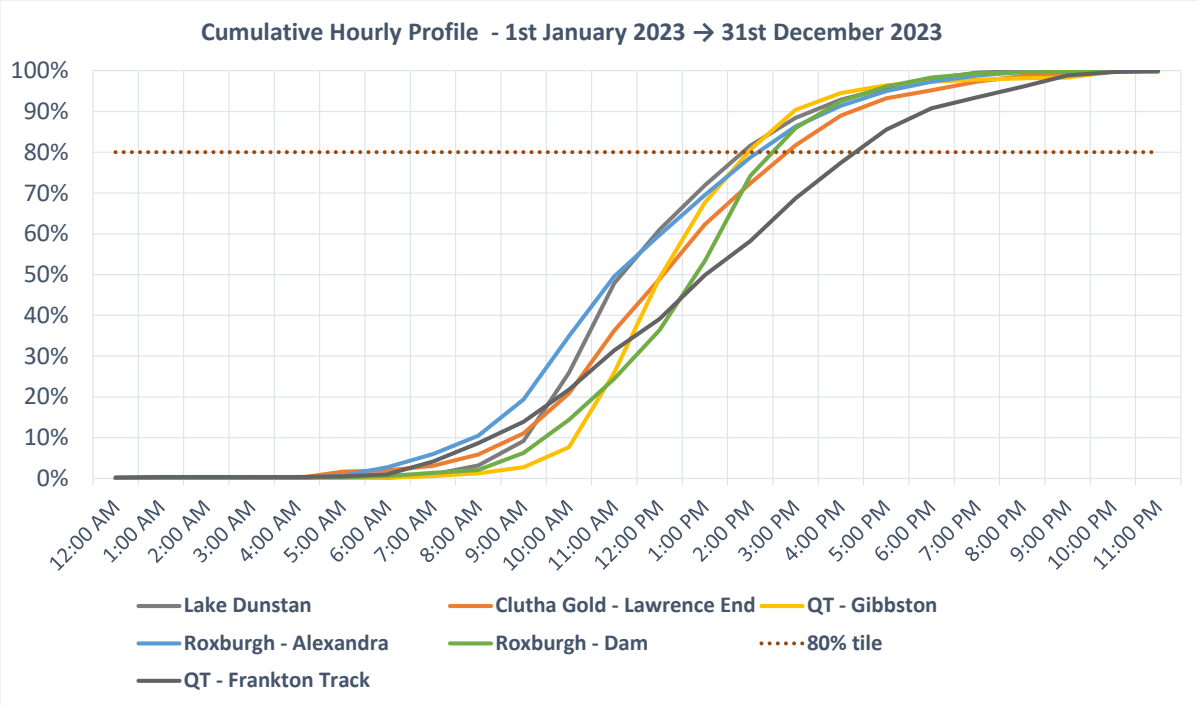
Figure 2 Historic Monthly Demand Profile - Lake Dunstan Trail



Peak Day Demand and Peak Hour Demand

Peak day demand is an important factor in managing capacity of trails and supporting infrastructure.

Figure 3 Daily Demand Profile – All trails.



Observations of note are:

- On most trails, 80% of users complete their journey by 2pm to 3pm
- The Roxburgh Gorge Trail, Lake Dunstan and Clutha Gold at Lawerence tend to start earlier, there may be opportunities to manage congestion at peak demands through staggered drop offs.
- The ratio of average day and peak day demand has been calculated at 3.5.

Demand on The New Kawarau Gorge Trail

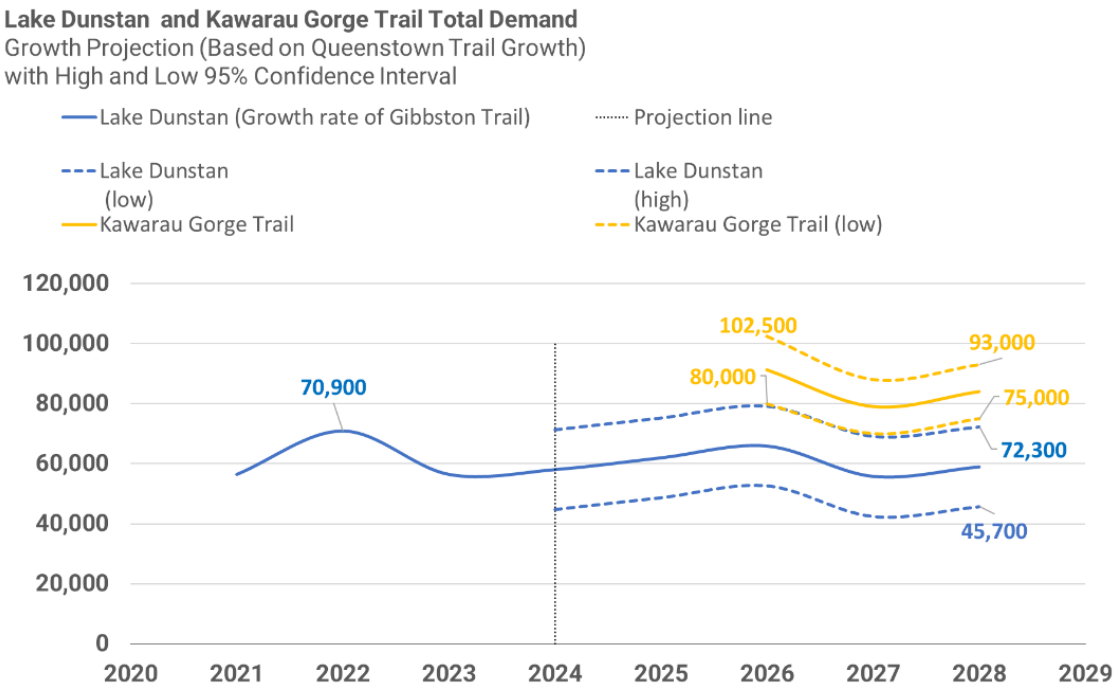
The projected annual demand for the Kawarau Gorge Trail is expected to surpass that of all other trails within the next five years, positioning it as a key feature in the region's trail network.

- Annual demand on the newly developed Kawarau Gorge Trail is projected to reach between 80,000 to 100,000 trips per year starting from 2026. This incorporates an 25% increase in demand within the first year following its opening. The Lake Dunstan Trail is projected to experience a similar resurgence in demand upon opening of the Kawarau Gorge Trail

- Peak day demand could reach between 770 and 980 trips per day and peak hour demand could reach between 175 and 225 trips per hour. This is almost 2 trips per minute in both directions. Such intensity in trail usage is likely to lead to significant gathering of individuals at key stopping or viewing points, where users may pause for periods exceeding 15 minutes.

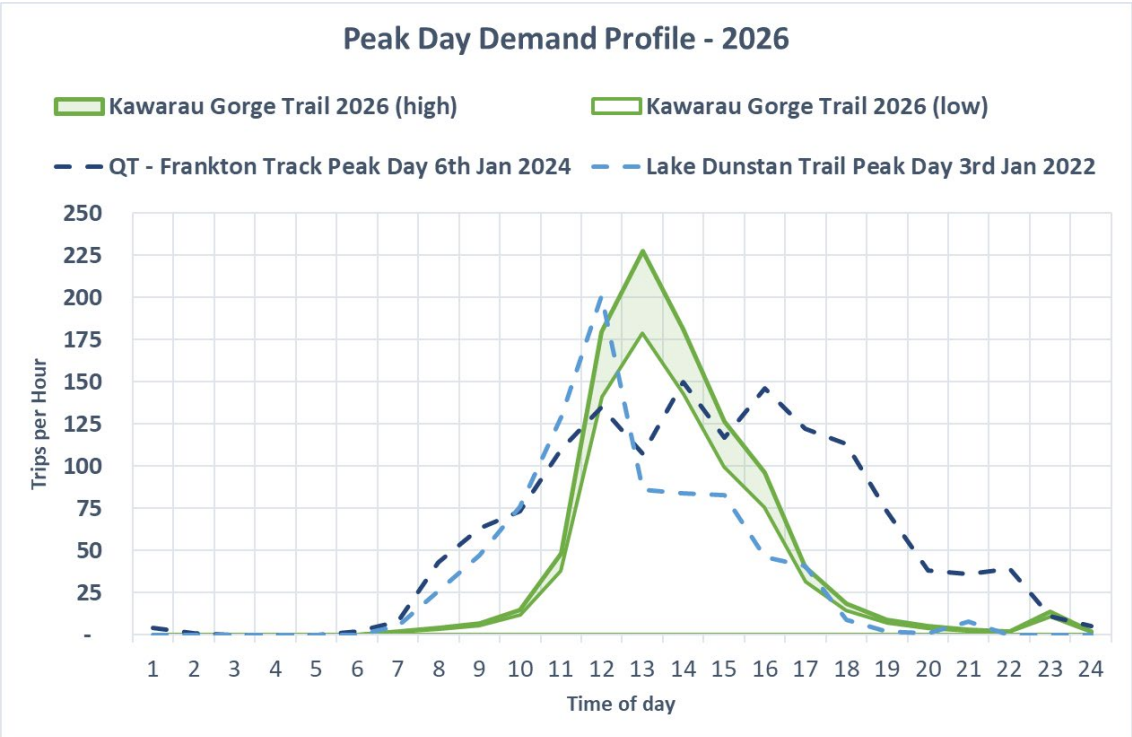
- Assuming a 3-hour journey time 300 to 600 people could be using the trail simultaneously during peak days. The isolation, poor cell coverage, and limited vehicle access present risks, highlighting the need for strong safety measures and clear communication before starting the trail.

Figure 4 Projected Annual Demand – Lake Dunstan and Kawarau Gorge Trail



- High demand peaks frequently lead to congestion, creating logistical and management difficulties can be challenging and expensive to mitigate through physical infrastructure enhancements alone. Operational interventions will be the most cost-effective means of managing peak demand.
- As a basis of comparison, this level of peak hour demand is 20% higher than the highest peak hour demand day currently experienced on either the Lake Dunstan trail (3rd Jan 2022) and the Frankton Track in Queenstown (6th Jan 2024).

Figure 5 Projected Peak Day Demand 2026 – Kawarau Gorge Trail (Contrasted with previous peaks)



This level of peak demand is manageable but will still require advanced planning at trail heads and terminus to ease the impacts of congestion. Where a typical 30-minute loading/unloading period occurs, this could see close to 100 users and their vehicles accumulating in areas.

Next Steps

It is apparent that as demand for cycling in Central Otago increases, particularly with the introduction of new trails like the Kawarau Gorge Trail and Roxburgh Gorge Trail extension, a proactive approach to planning and operations is necessary. The suggested next steps are:

1. Invest in better and ongoing data collection on the Otago Central Rail Trail, Lake Dunstan and Kawarau Gorge trail as is done on the Queenstown Trail Network. Good quality enables much greater management and operation of the trails and provides an evidence base for future investment. This will be particularly important in the long-term maintenance and management of trails.
2. Engage with key stakeholders on these projections for feedback and establish necessary interventions to minimise adverse effects. Particularly, trail operators, accommodation providers, roading and facility infrastructure providers, telecommunications providers, track designers and builders and emergency services.
3. Detailed infrastructure impact assessment to identify pinch points, especially on trails and at trailheads expected to manage the highest demands. This could include parking areas, narrow/single track sections, ensuring regular mobile phone coverage, and increasing the number and size of rest areas with adequate facilities.
4. Review projections and assumptions in 12 months' time against actual demand to test their accuracy and reliability.

2.1 Disclaimer

While every effort has been made to ensure the highest possible degree of accuracy, real-world outcomes may vary due to unforeseen fluctuations in demand, changes in cycling trends, or broader issues such as global tourism trends and infrastructural developments. It is, therefore, recommended to revisit and update these projections periodically to assess the ongoing robustness of the anticipated scenarios.

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3 Existing Data Available

This first iteration focusses on understanding the quality of data available to establish the best method of projection. There is a substantial amount of useful data to based projections on. This is encouraging and adds to the ability to undertake projections.

Table 2 Good Quality Data – Can establish peak day and peak hour projections.

Trail	Counters	Measure	Data Confidence	Years Available	Frequency
Roxburgh Gorge	Alexandra	Daily counts – single direction	High	2019 to Current	Hourly
	Roxburgh Dam	Daily counts – single direction	High	2019 to Current	Hourly
Clutha Gold	Roxburgh End	Daily counts – single direction	High	2019 to Current	Hourly
	Lawrence End	Daily counts – single direction	High	2019 to Current	Hourly
Lake Dunstan	Lake Dunstan	Daily counts –Directional and user type	High	2021 to Current*	Hourly
Queenstown Trails	All trails	Daily counts – Directional and user type	High	2018 to Current	Hourly

* - Only 3 years of data available. Limits accuracy

Table 3 Reliable Data – Sufficient to establish annual and seasonal trends.

Trail	Counters	Measurement	Data Confidence	Years available	Frequency of Capture
Otago Central Rail	Airport Rd	Monthly counts – single direction	Medium	2017 to 2019	Monthly
	Chatto Creek	Monthly counts – single direction	Medium	2016 to 2023	Monthly
	Hyde	Monthly counts – single direction	Medium	2016 to 2023	Monthly
	Poolburn	Monthly counts – single direction	Medium	2016 to 2023	Monthly
	Rock and Pillar	Monthly counts – single direction	Medium	2016 to 2023	Monthly
	Waipiata	Monthly counts – single direction	Medium	2016 to 2023	Monthly
	Wedderburn	Monthly counts – single direction	Medium	2016 to 2023	Monthly
	Wedderburn Lodge & Cottages	Monthly counts – single direction	Medium	2021 to 2023	Monthly
	Corrigal Rd	Monthly counts – single direction	Medium	None	Monthly

3.1 Data Capture Completeness

There are some areas where data is missing, particularly monthly data on the Otago Central Rail Trail. At this stage of the project, rudimentary data cleansing has been completed to allow historic demand to be understood. This means correcting obvious errors or interpolating any gaps where needed to establish trends. The Otago Central Rail Trail data is not of adequate quality to undertake a forward projection without significant uncertainty.

3.2 High and Low Range - Confidence Intervals

Data is of sufficient quantity and quality to undertake high level demand projections of at least 5 years into the future. Accuracy will be limited to a 95% confidence level of high and low scenarios. This range is based on the standard deviation about the mean of at least 5 years of historic data where available.

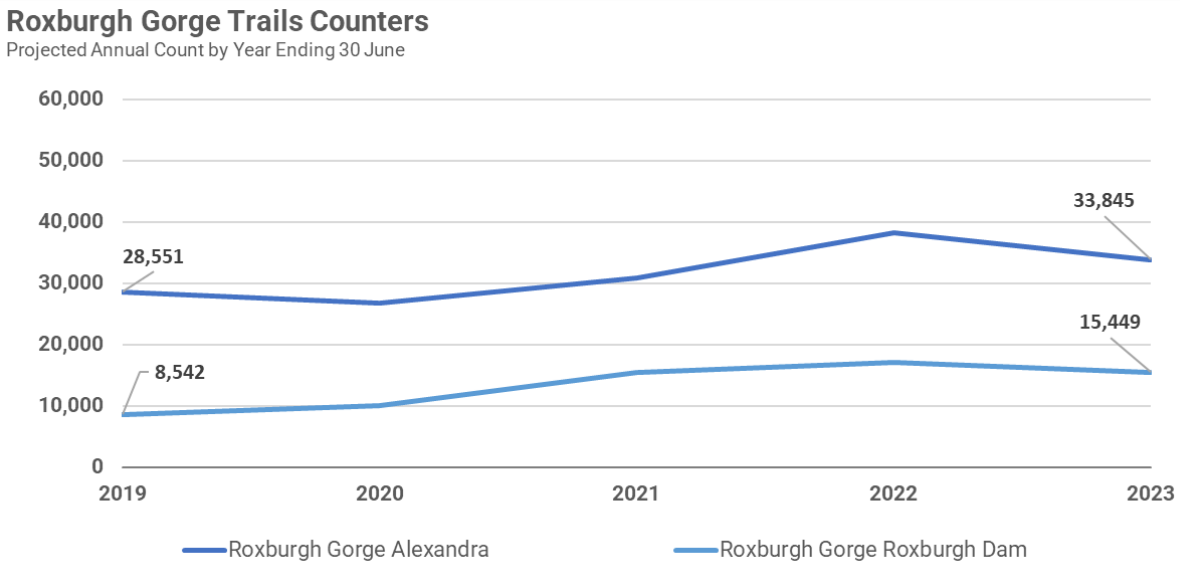
4 Historic Demand on the Trails

4.1 Roxburgh Gorge Trail

Demand has grown consistently on the Roxburgh Gorge Trail since 2019. Demand has increased between 20% and 50% over the past 5 years of data.

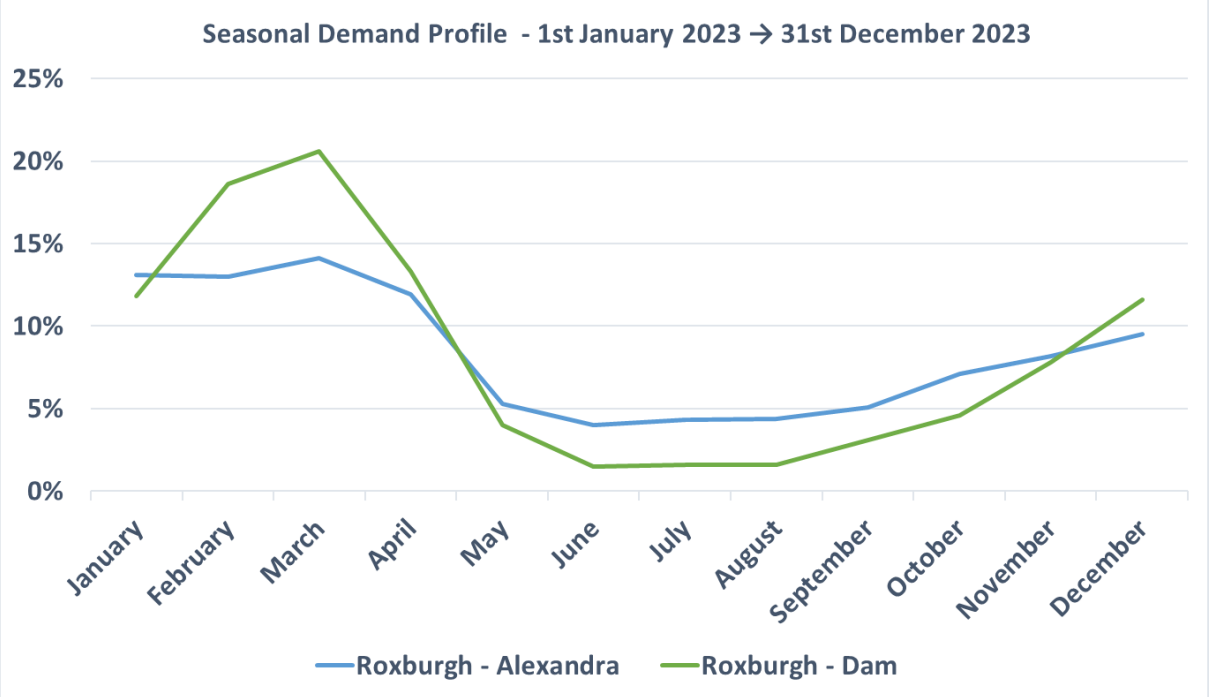
4.1.1 Annual Demand

Figure 6 Historic Annual Demand - Roxburgh Gorge Trails 2019-2023



4.1.2 Seasonal Demand

Figure 7 Historic Monthly Demand Profile – Roxburgh Gorge Trail



4.1.3 Peak Day Demand

Figure 8 Peak Hour Demand– Roxburgh Gorge Trail

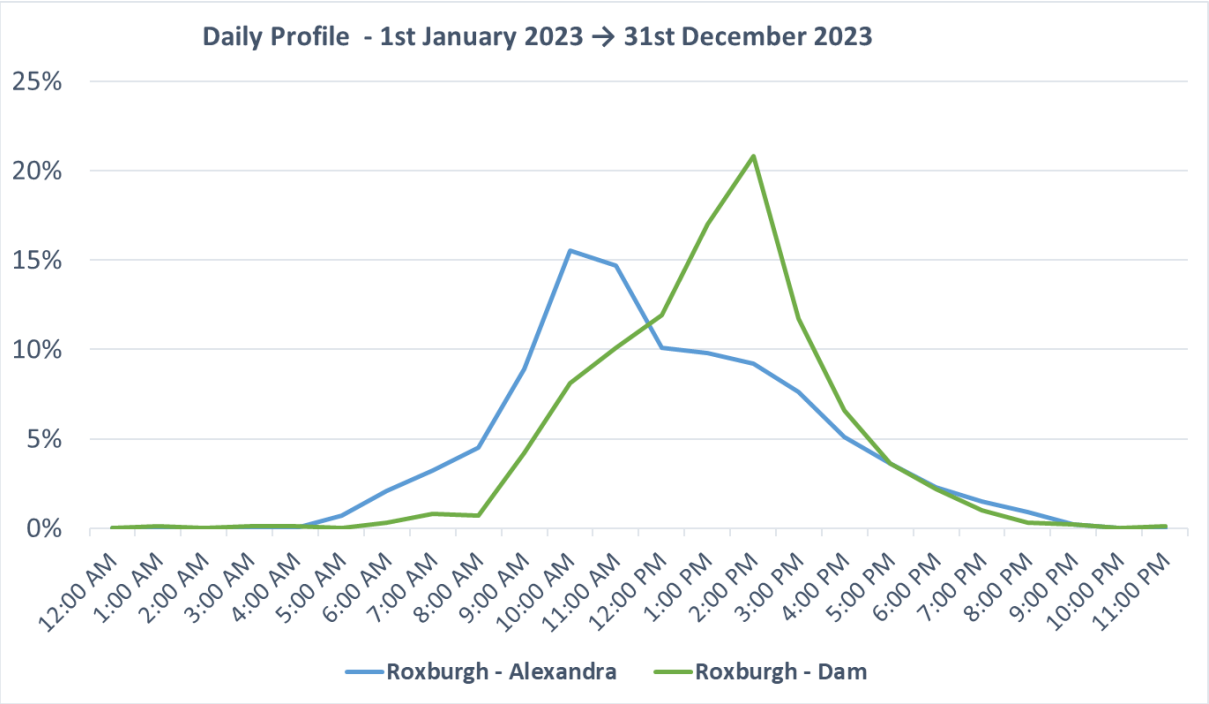
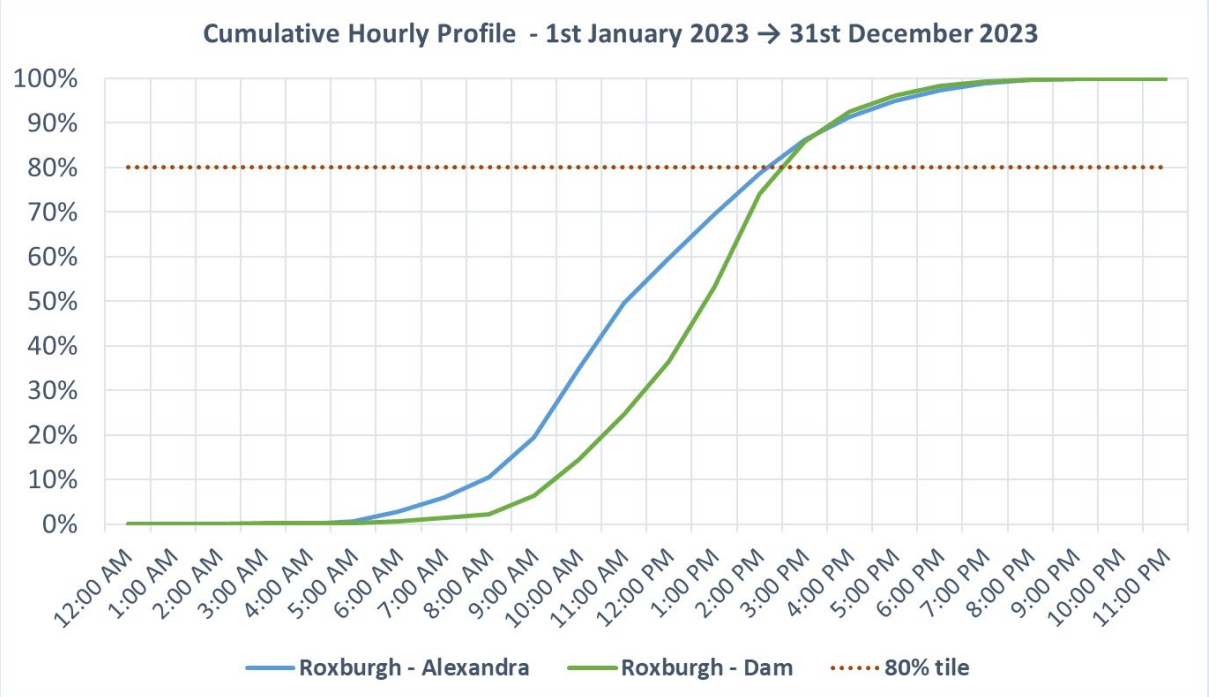


Figure 9 Diurnal Demand and 80th percentile by Time of Day – Roxburgh Gorge Trail

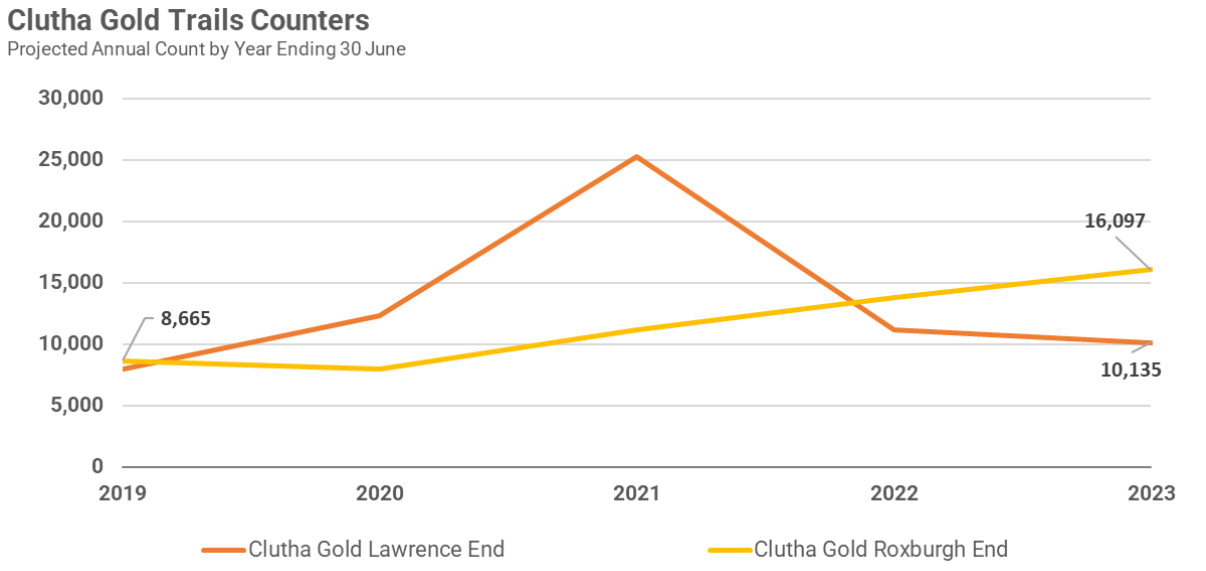


4.2 Clutha Gold Trail

Demand growth of between 20% and 100% has occurred on the Clutha Gold Trail over the past 5 years. This correlates with the data on the Roxburgh Gorge Trail, at Roxburgh. Extraordinary demand growth was recorded in 2021 on the Clutha Gold Trail at the Lawrence End. This could be due to the impacts of Covid 19 or has been collected in error and so is treated as an outlier.

4.2.1 Annual Demand

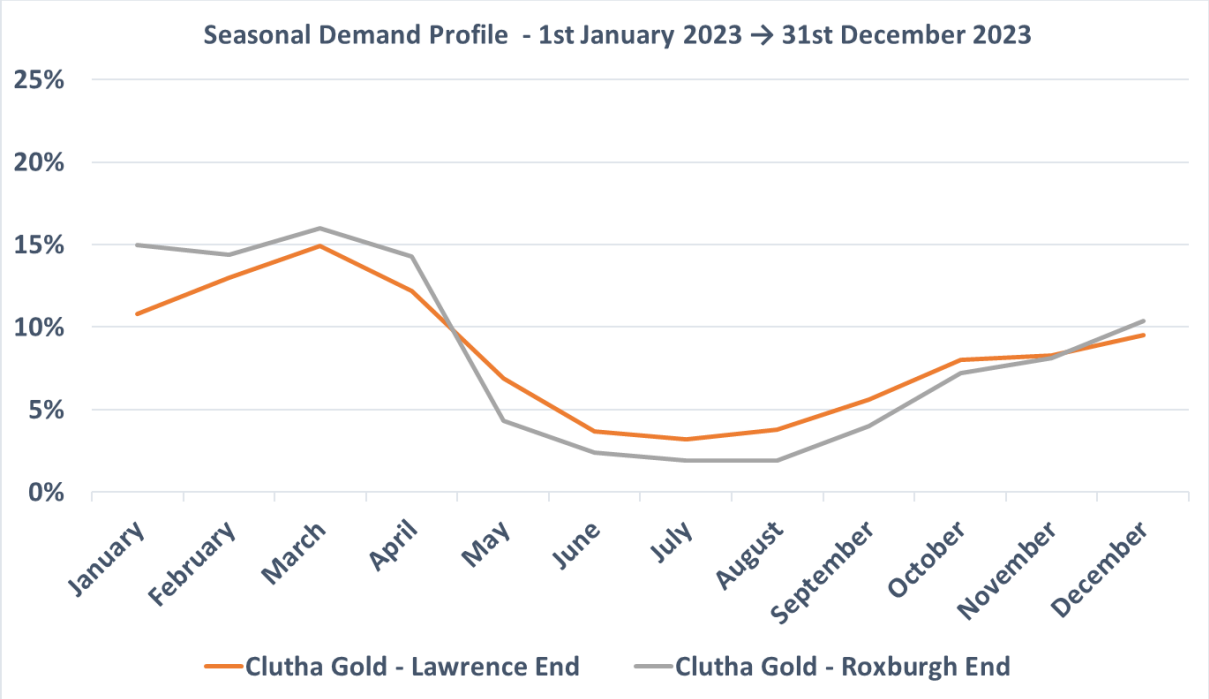
Figure 10 Historic Annual Demand - Clutha Gold Trail 2019-2023



4.2.2 Seasonal Demand

Seasonal demand for this trail occurs largely in late summer.

Figure 11 Historic Monthly Demand Profile - Clutha Gold Trail



4.2.3 Peak Hour Demand

The daily demand profile mimics other trails, where most of the journeys are completed by 3pm each day.

Figure 12 Peak Hour Demand– Clutha Gold Trail

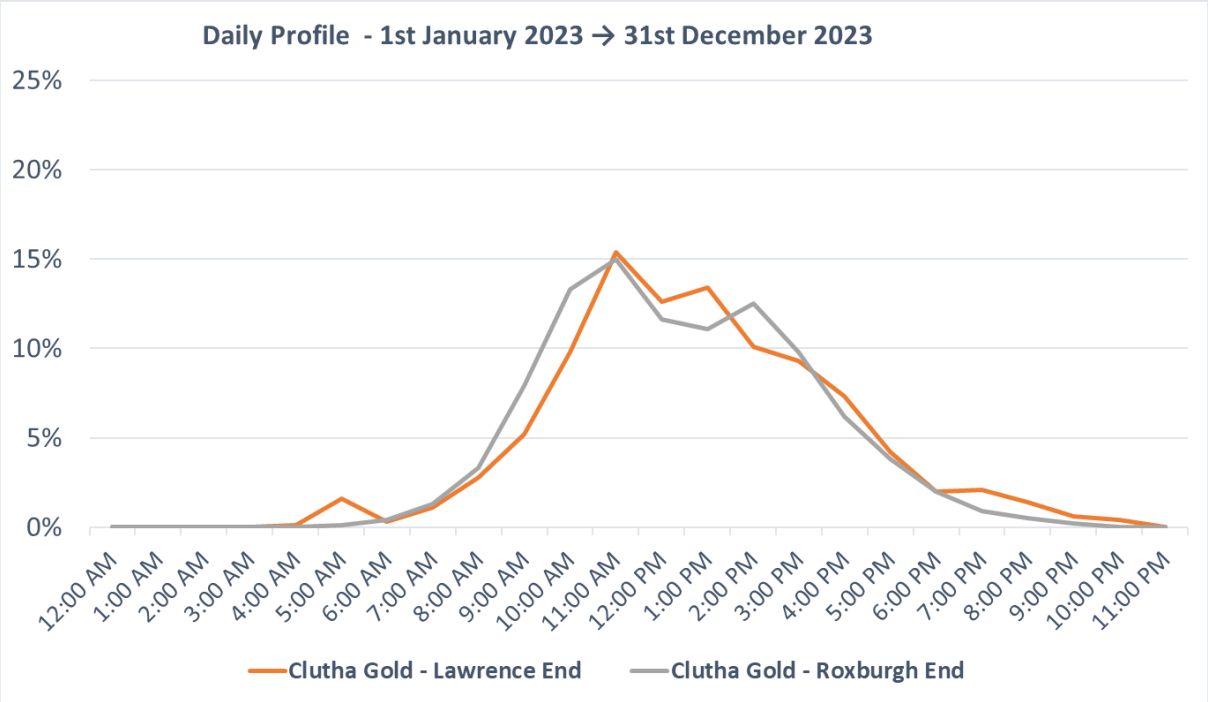
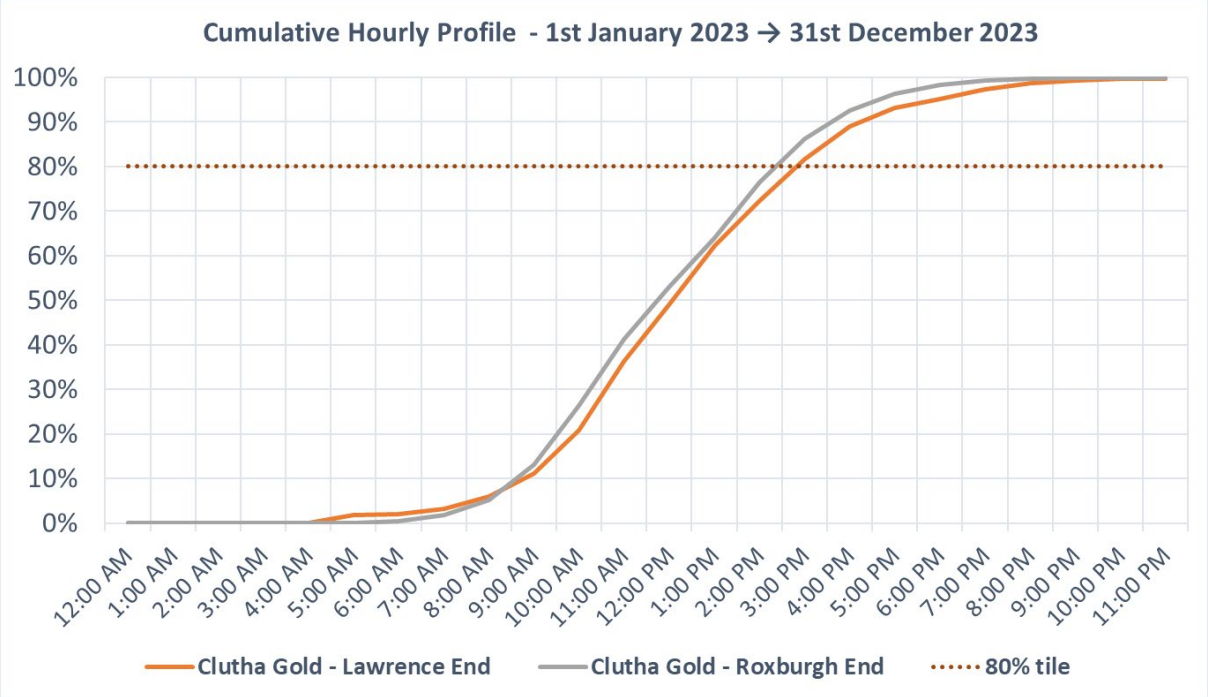


Figure 13 Diurnal Demand and 80th percentile by Time of Day – Clutha Gold Trail

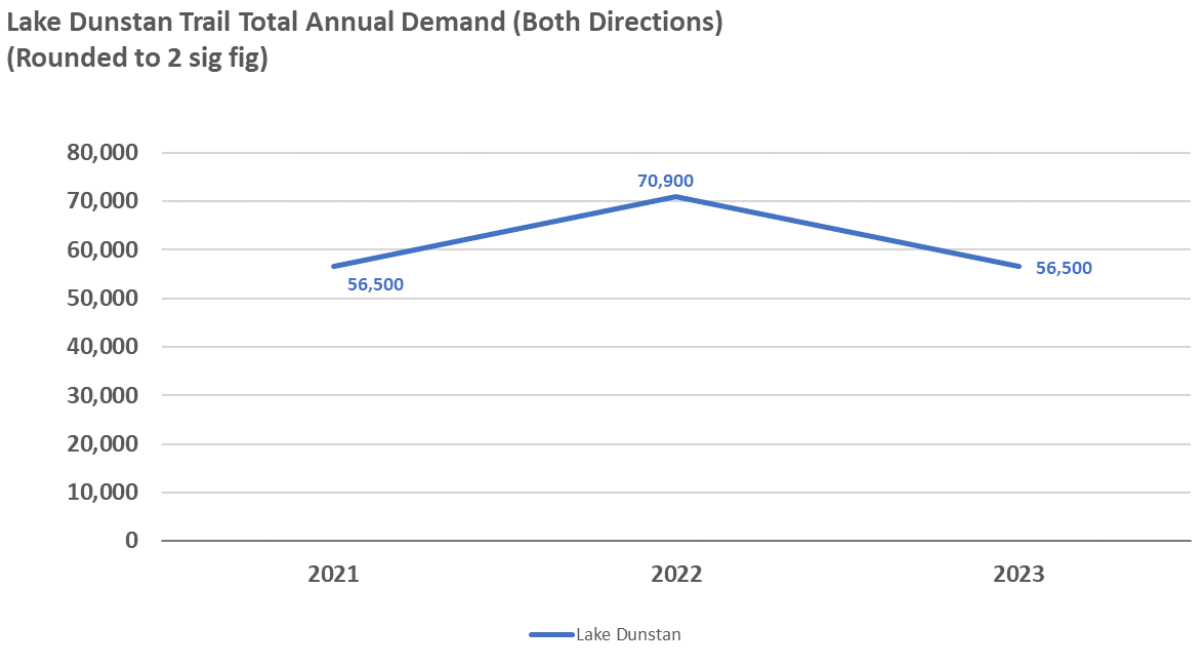


4.3 Lake Dunstan Trail

Just three full years of demand data is available to establish a trend. It shows a large increase in trail usage during the 18 months after opening, Annual demand has now stabilised to 56,500 total journeys per year (both directions).

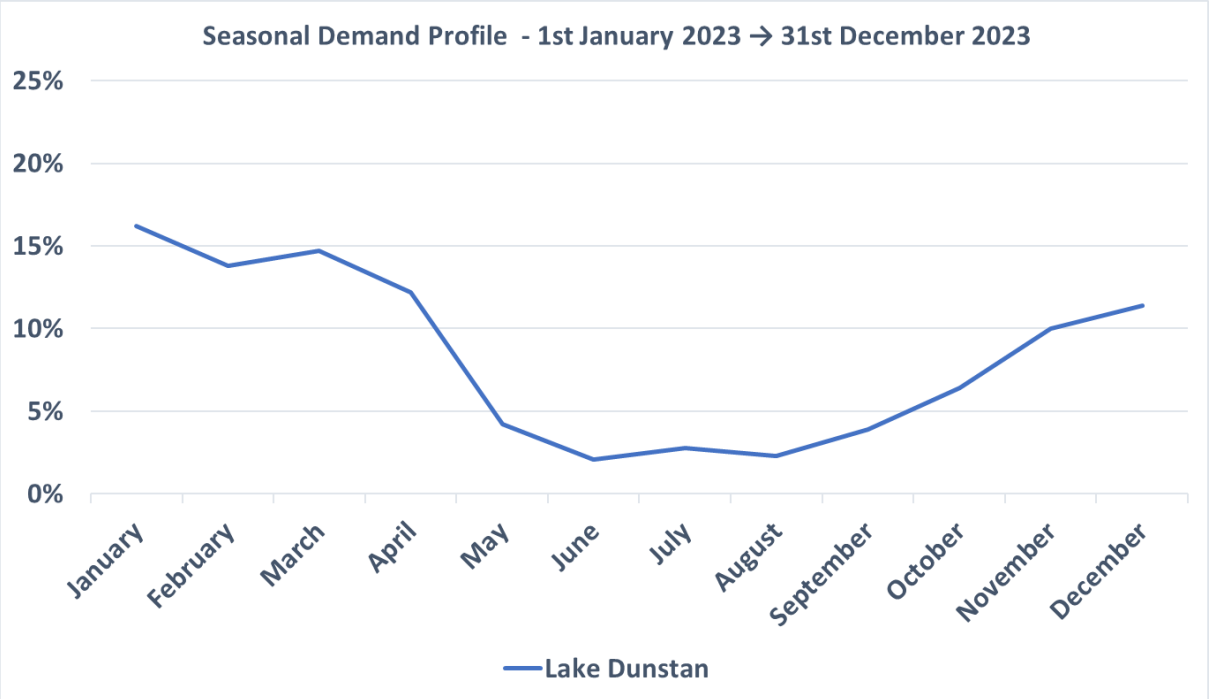
4.3.1 Annual Demand

Figure 14 Historic Annual Demand - Lake Dunstan Trail 2021-2023



4.3.2 Seasonal Demand

Figure 15 Historic Monthly Demand Profile - Lake Dunstan Trail



4.3.3 Peak Hour Demand

Figure 16 Peak Hour Demand– Lake Dunstan Trail

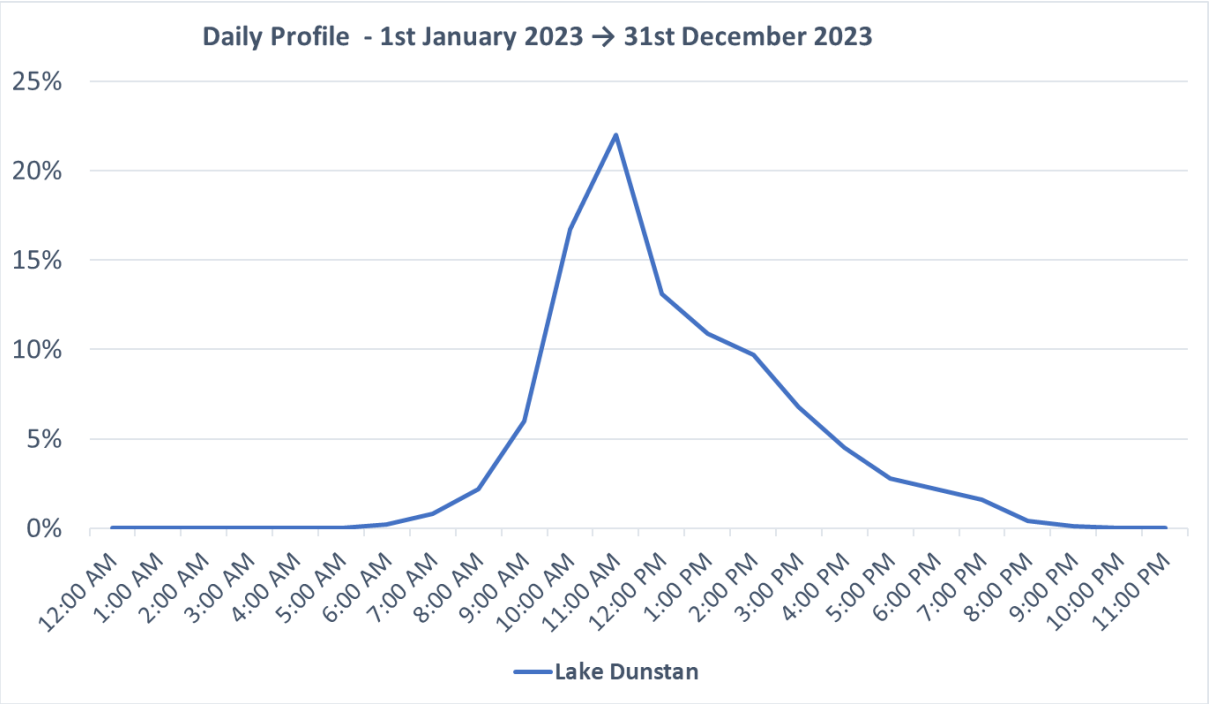
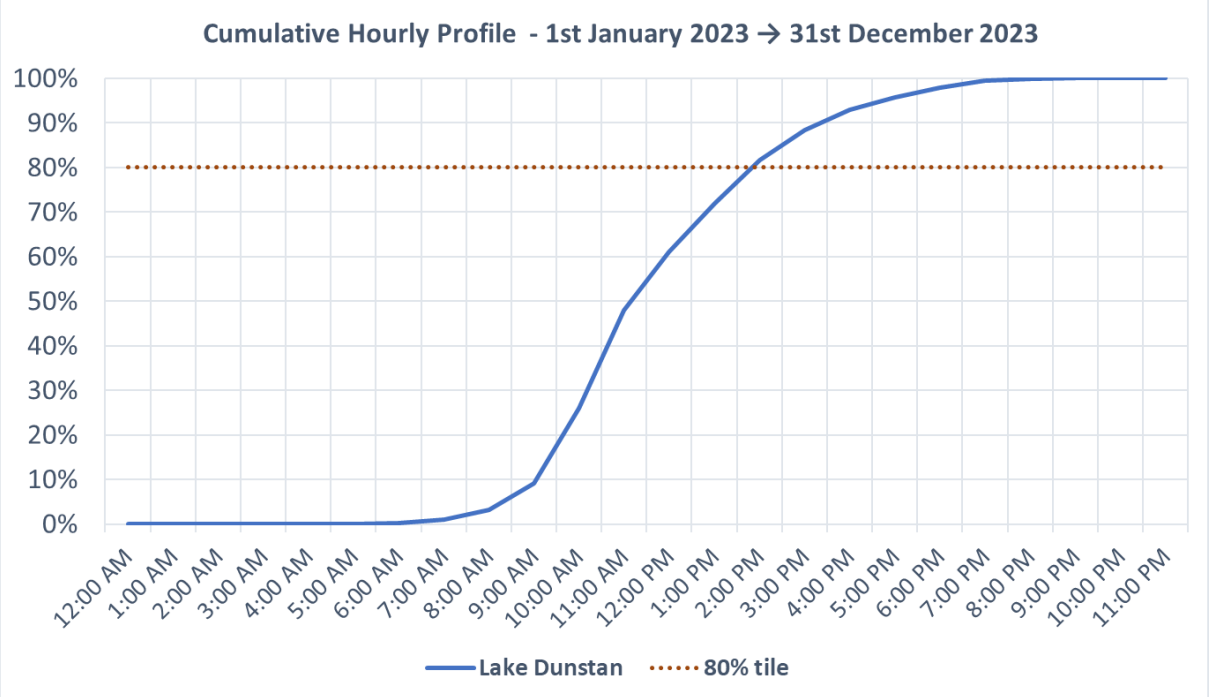


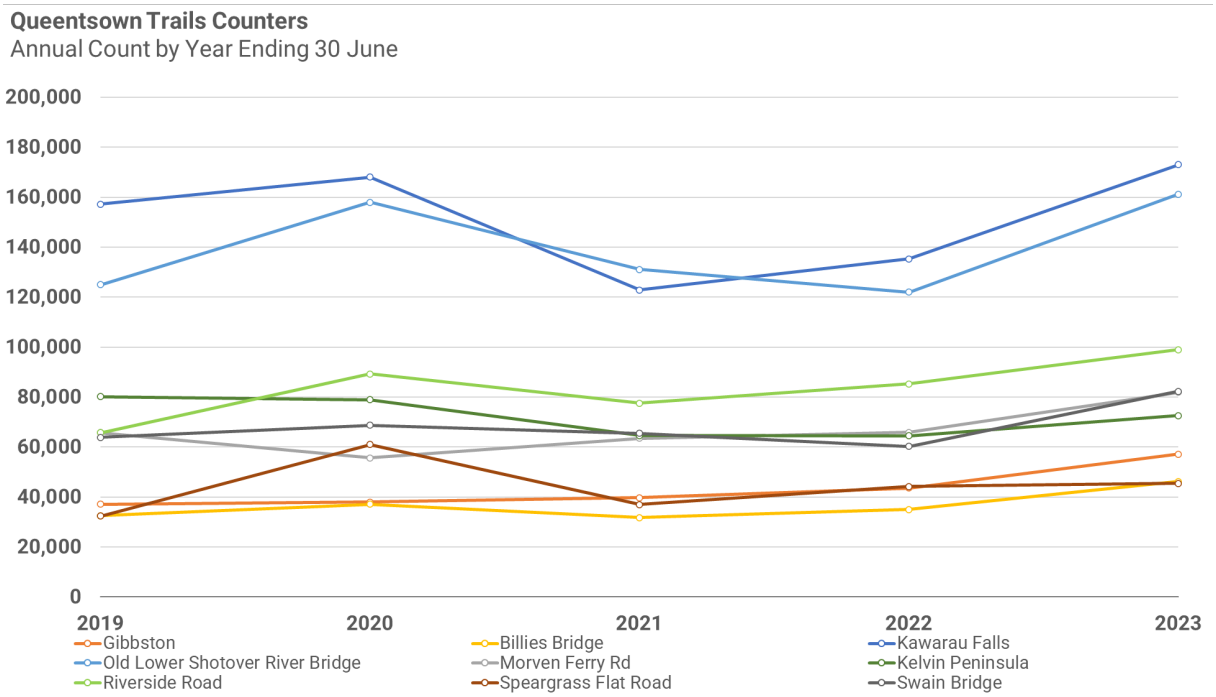
Figure 17 Diurnal Demand and 80th percentile by Time of Day – Lake Dunstan Trail



4.4 Queenstown Trails Network

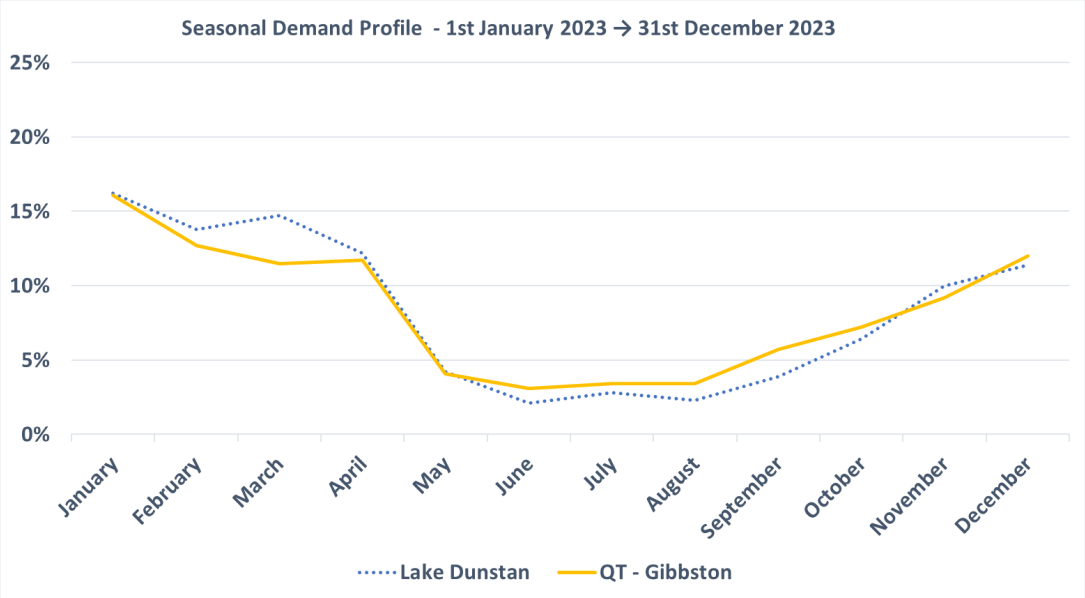
Extensive data on demand is available on the Queenstown trails. Demand growth has been consistent for several trails that are similar to Central Otago trails. Many trails in Queenstown, arguably double as commuter trails for residents. So, excluding these trails within assumptions on growth is important.

The Gibbston trail is an out and back trail and despite this, is still showing strong demand growth. It is also the starting point of the planned Kawarau Gorge extension. The Kawarau Gorge extension of the Gibbston Trail is scheduled for completion in 2026.



4.4.1 Seasonal Demand

Figure 18 Historic Monthly Demand Profile - Gibbston Trail



4.4.2 Peak Hour Demand

Figure 19 Peak Hour Demand– Gibbston Trail

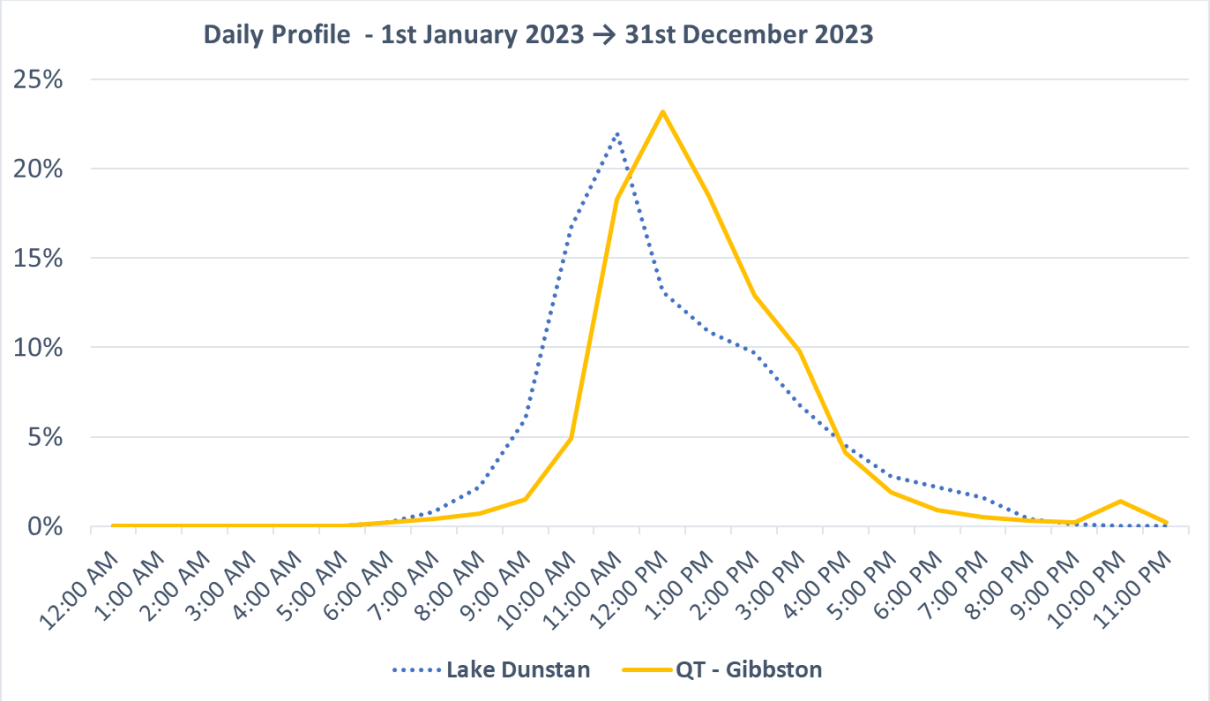
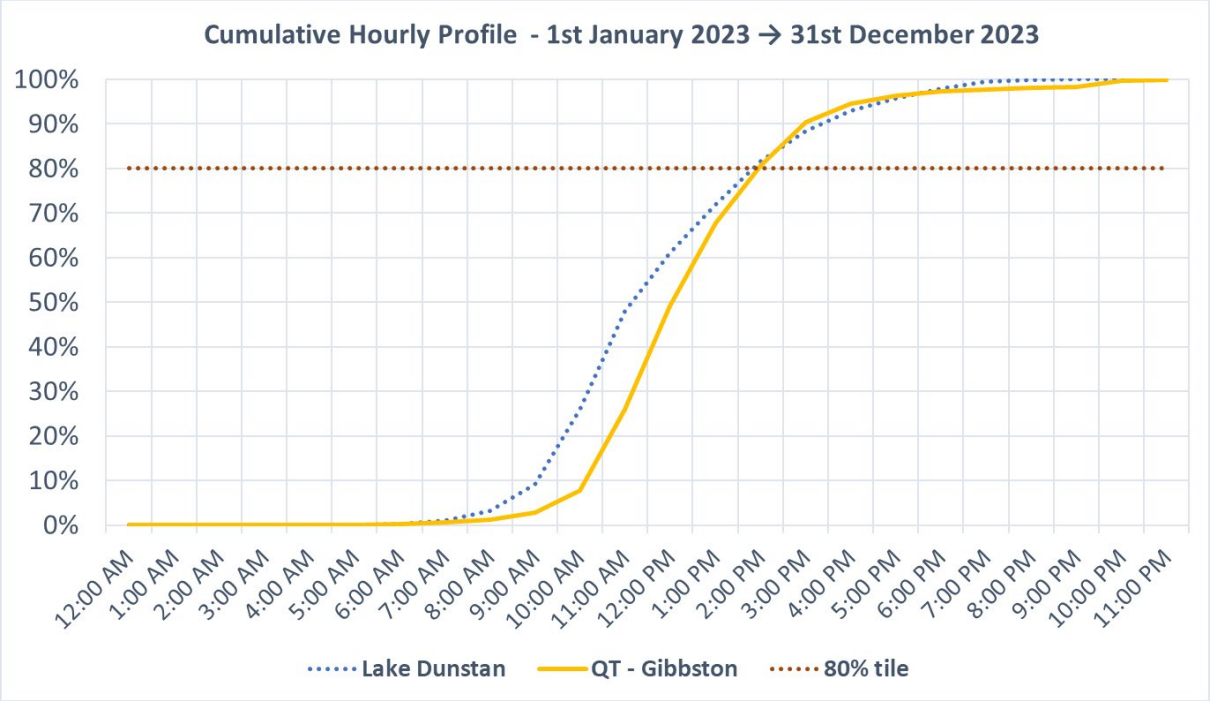


Figure 20 Diurnal Demand and 80th percentile by Time of Day – Gibbston Trail

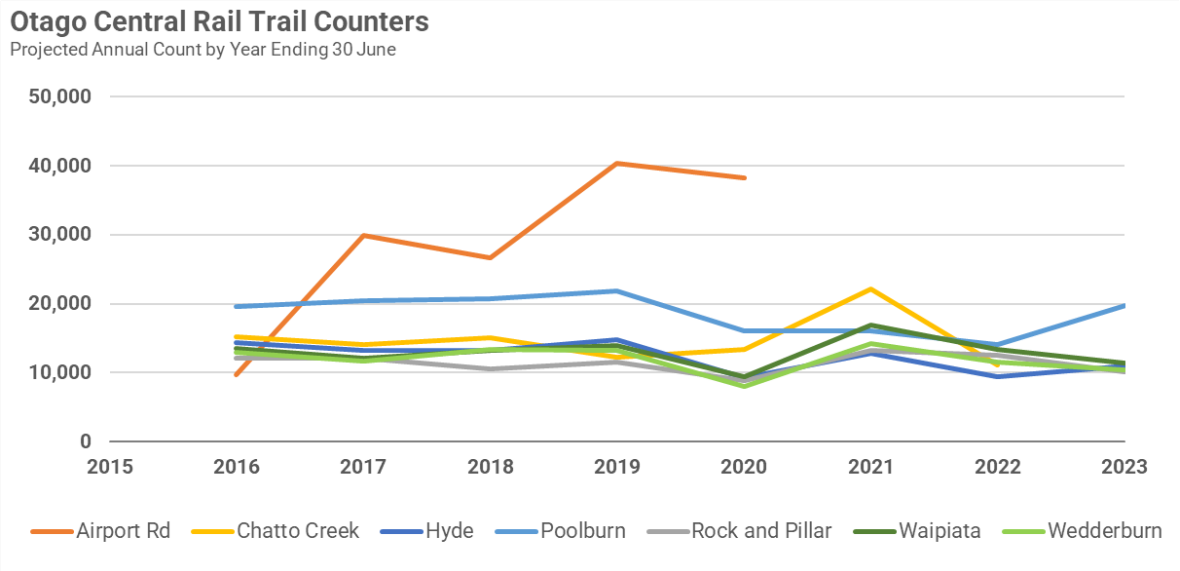


4.5 Otago Central Rail Trail

Demand on the Otago Central Rail Trail has remained steady since 2016 with little to no increase in demand except for fluctuations in 2020 and in 2021, most likely due to Covid-19.

The highest demand sections are Airport Road, Poolburn and Chatto Creek. Demand on the counter at Airport Road, the section between Clyde and Alexandra townships is significantly higher. This is assumed to be influence by either commuter traffic between the towns as well as recreational use by locals as compared to dedicated trail goers on the remaining counters. No reliable hourly, monthly or daily data is available in recent years to undertake an assessment of these patterns.

Figure 21 Historic Annual Demand - Otago Central Rail Trail 2016-2023



4.5.1 Demand Projection

Of note, is that the data available shows there has been little to no comparative change in demand in the past 3-to-6-year period on the Otago Central Rail Trail (Covid impacts aside). This is despite the increases in demand recorded in the adjacent Lake Dunstan, and Roxburgh Gorge Trails. The assumption that demand may increase with the extension of these trails to Queenstown and Dunedin respectively, carries some uncertainty based on this observation.

A demand projection has not been undertaken. Because any projection forward of the Otago Central Rail Trail demand will reflect historic usage, flat demand and will have a high level of uncertainty.

Of note, is that the flattening of demand on this trail, one of the earliest established (2007) and comparatively well supported and catered for trails (Townships and accommodation), could also indicate a similar drop in demand for other trails in the distant future (> 10 years).

4.6 Conclusions of Historic Demand Since 2019

Across all the trails analysed, changes in demand over the past 5 years does not follow a particular trend.

1. Roxburgh Gorge Trail and the Clutha Gold Trail: Demand growth on both of these trails is close to 50% over the past 5 years. Most of the trail demand is between Alexandra and Roxburgh and does not continue as strongly through to the Lawrence end of the Clutha Gold Trail.
2. Lake Dunstan Trail – After higher than anticipated demand during its opening, annual demand has settled back to 56,000 trips per year, which is the same as 2021 levels. Demand surged 25% after opening which may indicate likely demand surges upon opening of new trails. Of note is that demand in January 2024 actually was 10% lower than the same period in 2023. This steady decline may indicate a "one and done" effect on new trails.
3. The Otago Central Rail Trail: The inner areas of the trail have experienced modest to no demand growth over the past 5 years, other than spikes and slumps during the Covid period. This is of note considering the opening of adjacent trails with comparatively higher demand growth. Some high demand occurs on the Airport Road section of the trail, but this is assumed to relate to commuter and local resident demand and possibly the Lake Dunstan Trail. Future demand has not been projected on these trails, largely due to poor data and little to no historic growth over the past 5 years.
4. Queenstown Trails - Gibbston Trail: Demand has grown by 43% over the past 5 years on the Gibbston Trail. Annual demand is now the same as the Lake Dunstan Trail. This is of significance for future projections of the Kawarau Gorge trail, given it is essentially an out and back trail and thus a 'destination' trail. This demand and growth level is used to establish future demand on the Kawarau Gorge Trail.

The following two tables list annual trail demand in both directions, for all types of users (cycle and pedestrian) and the change in demand over 5 years, as normalised in 2019.

Table 4 Total Demand Recorded (Both directions)

Trail	2019	2020	2021	2022	2023
Clutha Gold Trail - Lawrence End	8,900	26,000	11,900	11,200	9,700
Clutha Gold Trail - Roxburgh End	8,500	9,600	11,400	14,400	12,600
Roxburgh Gorge Trail - Alexandra End	26,300	28,800	33,500	37,000	32,600
Roxburgh Gorge Trail - Roxburgh Dam	9,100	13,600	14,000	17,300	13,900
Lake Dunstan Trail	0	0	56,500	70,900	56,500
Otago Central Rail -Airport Rd	40,400	38,200	49,000	56,000	63,000
Otago Central Rail - Chatto Creek	12,200	13,400	22,200	11,100	15,000
Otago Central Rail - Hyde	14,800	9,300	12,900	9,400	11,000
Otago Central Rail - Poolburn	21,900	16,000	16,000	14,000	19,800
Gibbston Trail (As a comparator)	37,800	40,500	43,800	45,600	54,200

Table 5 Demand Growth Since 2019 (5 Years), Normalised at 1,000 in 2019

Trail		2019	2020	2021	2022	2023
Clutha Gold	Lawrence End	1,000	2,916[2]	1,337	1,254	1,082
	Roxburgh End	1,000	1,122	1,338	1,684	1,479
Roxburgh Gorge	Alexandra	1,000	1,094	1,274	1,406	1,239
	Roxburgh Dam	1,000	1,494	1,534	1,894	1,525
Lake Dunstan	Lake Dunstan			1,000	1,255	1,000
Otago Central Rail Trail	Airport Rd	1,000	945	No data	No data	No data
	Chatto Creek	1,000	1,098	1,816[3]	913	No data
	Hyde	1,000	630	870	637	741
	Poolburn	1,000	731	731	640	902

[2] Likely spike due to Covid 19 lockdowns.
[3] Likely spike due to Covid 19 lockdowns.

Trail		2019	2020	2021	2022	2023
	Rock and Pillar	1,000	760	1,135	1,081	873
	Waipiata	1,000	678	1,212	960	816
	Wedderburn	1,000	611	1,081	879	785
Queenstown Trails Network	Gibbston	1,000	1,072	1,157	1,205	1,434
	Billies Bridge	1,000	1,142	975	1,077	1,420
	Kawarau Falls	1,000	1,069	781	861	1,101
	Old Lower Shotover River Bridge	1,000	1,263	1,048	976	1,289
	Morven Ferry Rd	1,000	847	966	1,001	1,246
	Kelvin Peninsula	1,000	984	806	804	905
	Riverside Road	1,000	1,358	1,181	1,297	1,505
	Speargrass Flat Road	1,000	1,883	1,140	1,365	1,403
	Swain Bridge	1,000	1,077	1,026	944	1,289

5 Demand Projections

5.1 Method Used

Instead of building a typical, 'bottom-up' model of known demand drivers, projections forward are based on the macro-level linear trends of actual demand. This approach simply reflects:

1. That this is the first iteration of this process, and the level of planning maturity that currently exists.
2. Modelling the underlying variables and their influence on future demand is complex for an activity such as this. It carries a lot of assumptions and uncertainty and is unlikely to improve the accuracy of projections within the bounds of the data available.

For all trails except the Kawarau Trail and the Lake Dunstan Trail, future demand is projected forward based on the 5-year historical demand trend. For Kawarau Trail and Lake Dunstan Trail, historic demand growth on the Gibbston Trail has been used instead.

Each projection includes a high and low estimate based on the 95% confidence interval of historical data around the mean. At least 5 years of historical data has been used to establish trends, where possible.

5.2 Test of Correlation and Causation

To evaluate the efficacy of our top-down demand projection approach, we undertook a desktop assessment, examining two likely demand influencers: local residential growth, which indicates the potential rise in local trail users, and passenger arrivals at Queenstown airport, as a proxy for tourist demand. Despite the intuitive connection of these factors with cycling demand, our analysis revealed minimal correlation between them and the actual usage figures of the cycle trails. This outcome underscores the limitations of directly linking specific variables to cycle demand and validates our decision to rely on broader trend projections for the interim.

Table 6 Demand Drivers Considered

Comparative Drivers	2019	2020	2021	2022	2023
Queenstown Trails - Gibbston Demand	37,831	40,539	43,763	45,605	54,248
Normalised to 1000 in 2019	1,000	1,072	1,157	1,205	1,434
Queenstown Airport Arrivals	2.39M	1.30M	1.15M	1.86M	2.41M
Normalised to 1000 in 2019	1,000	541	482	779	1,007
Central Otago Peak Day Population Growth		47,034	48,028	49,943	51,857
Normalised to 1000 in 2020		1,000	1,021	1,062	1,103
Lake Dunstan Trail			56,522	70,937	56,519
Normalised to 1000 in 2021			1,000	1,255	1,000

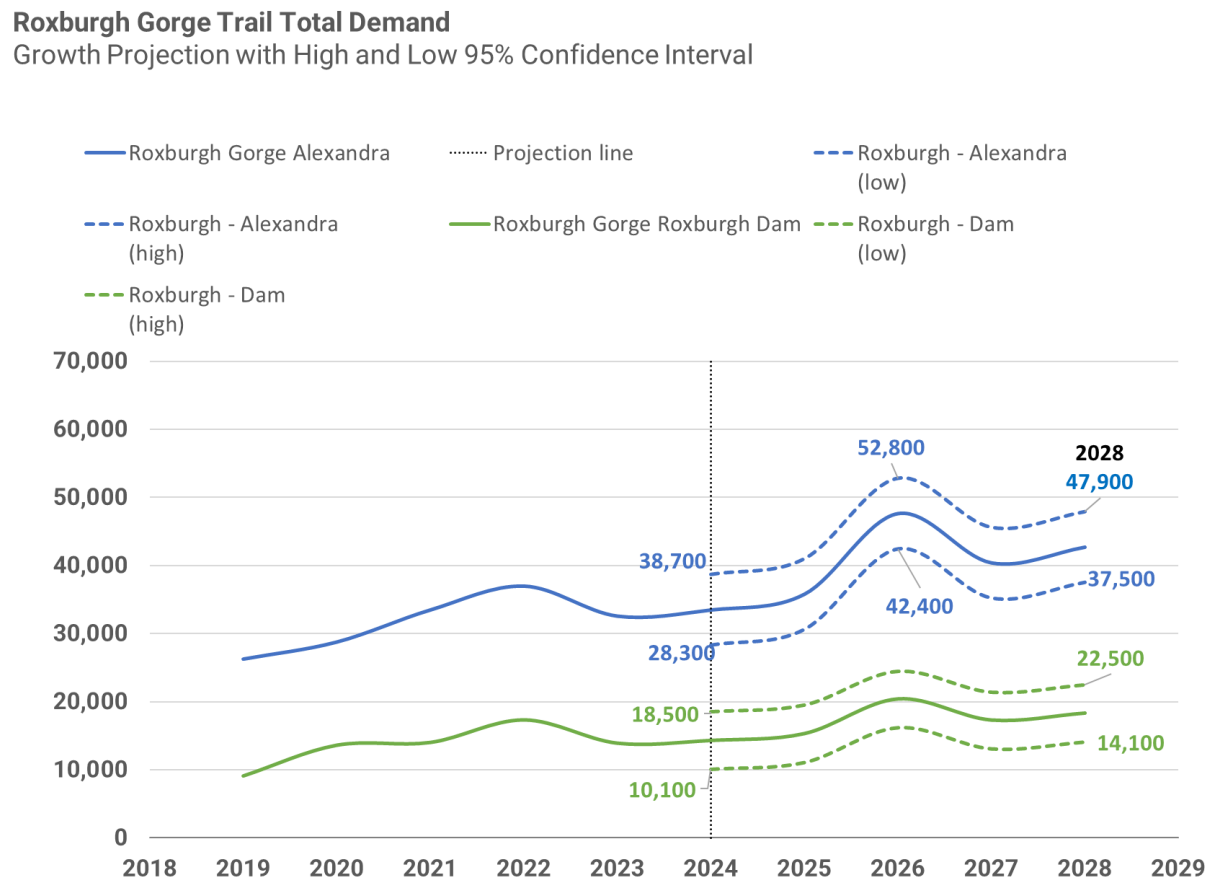
5.3 Projected Demand

The following sequence of charts shows projected demand at an annual, seasonal and peak day level.

5.3.1 Roxburgh Gorge Trail

5.3.1.1 Annual Demand

Figure 22 Projected Annual Demand – Roxburgh Gorge Trail



5.3.1.2 Seasonal Demand

Figure 23 Projected Seasonal Demand 2028 – Roxburgh Gorge Trail – Alexandra End

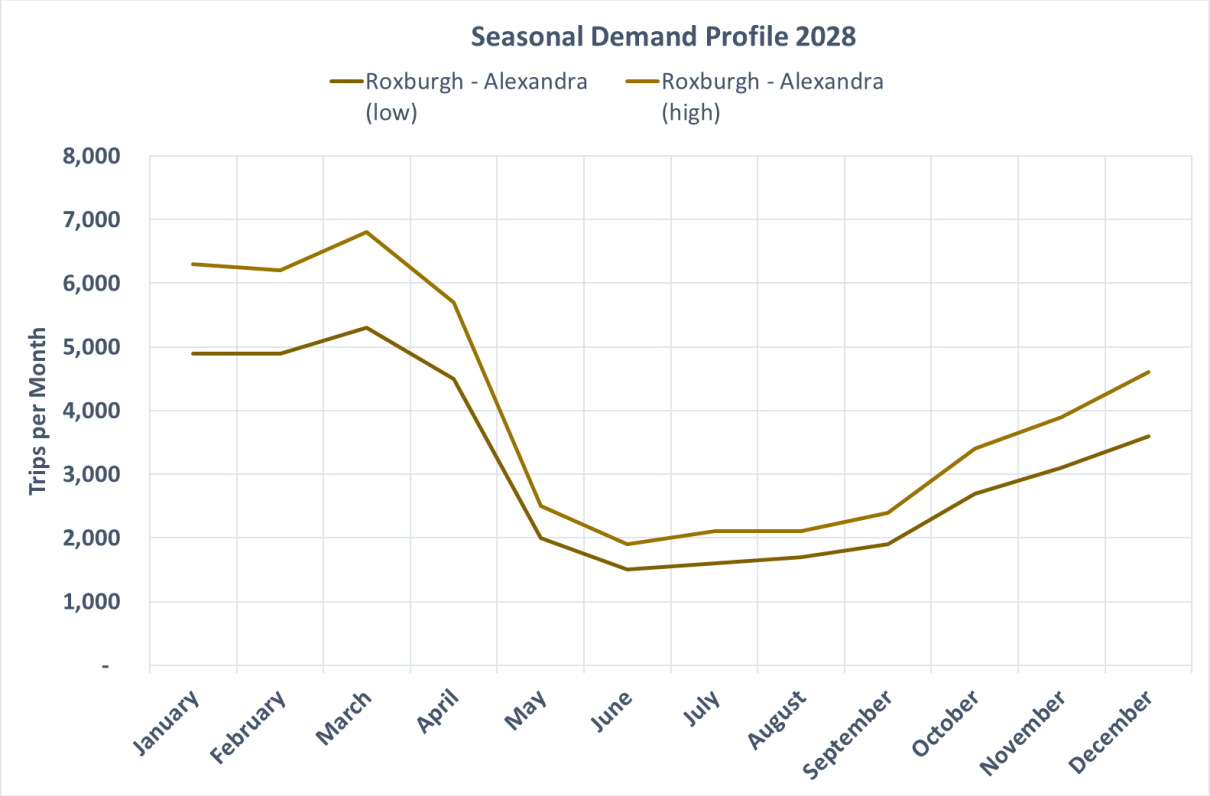
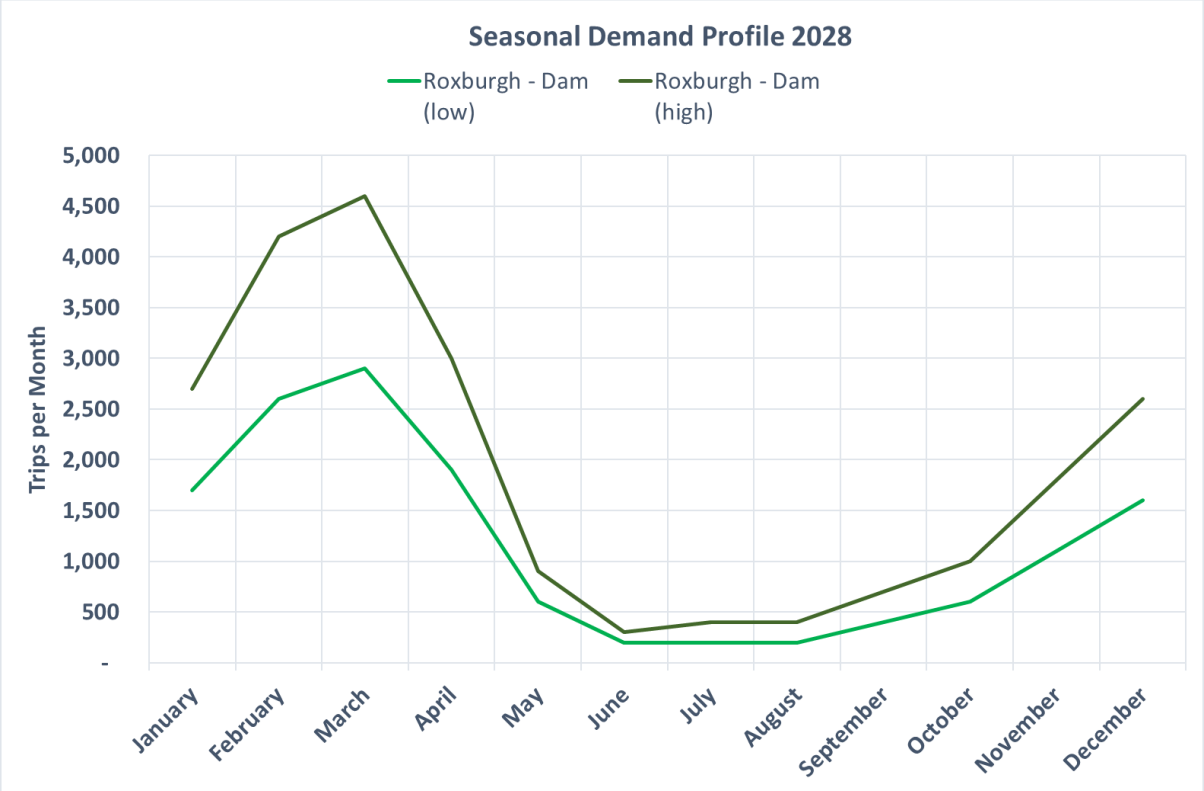


Figure 24 Projected Seasonal Demand 2028 – Roxburgh Gorge Trail –Dam End



5.3.1.3 Peak Day Demand

Figure 25 Projected Peak Day Demand 2026 – Roxburgh Gorge Trail – Alexandra End (Upon opening of new gorge trail and Kawarau extension)

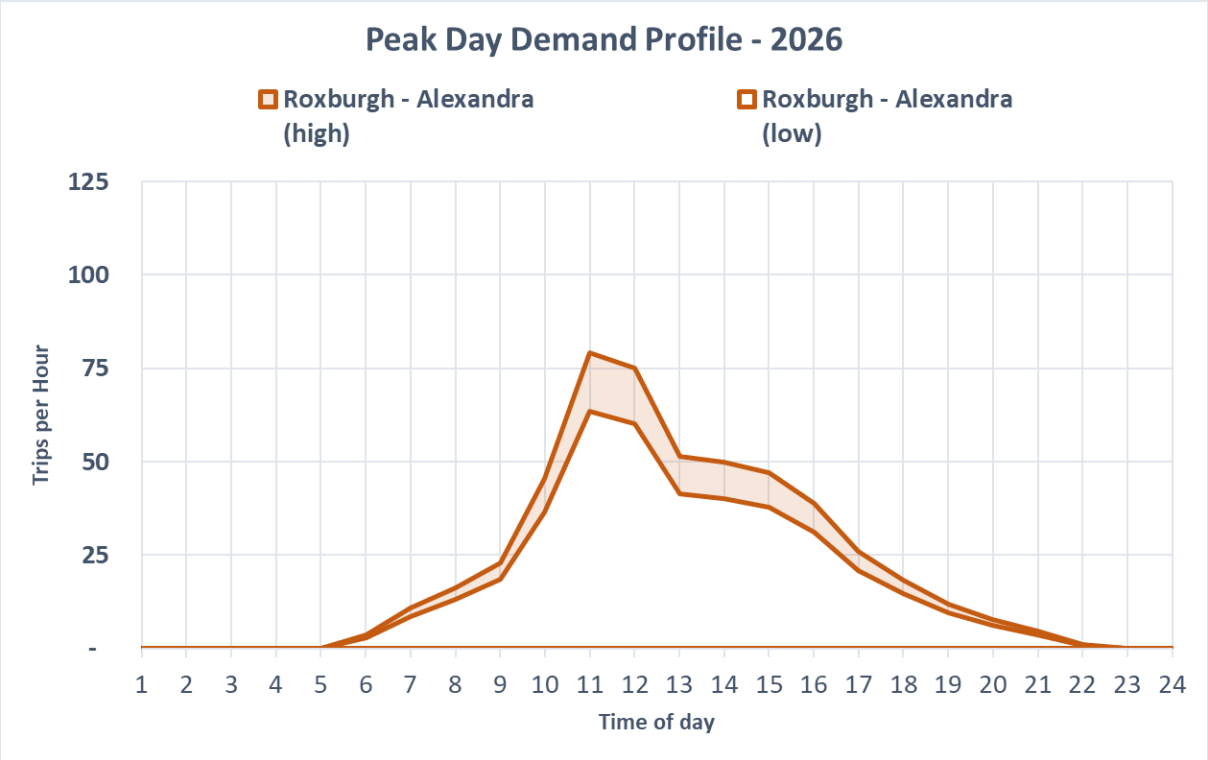


Figure 26 Projected Peak Day Demand 2026 – Roxburgh Gorge Trail – Roxburgh End (Upon opening of new gorge trail and Kawarau extension)

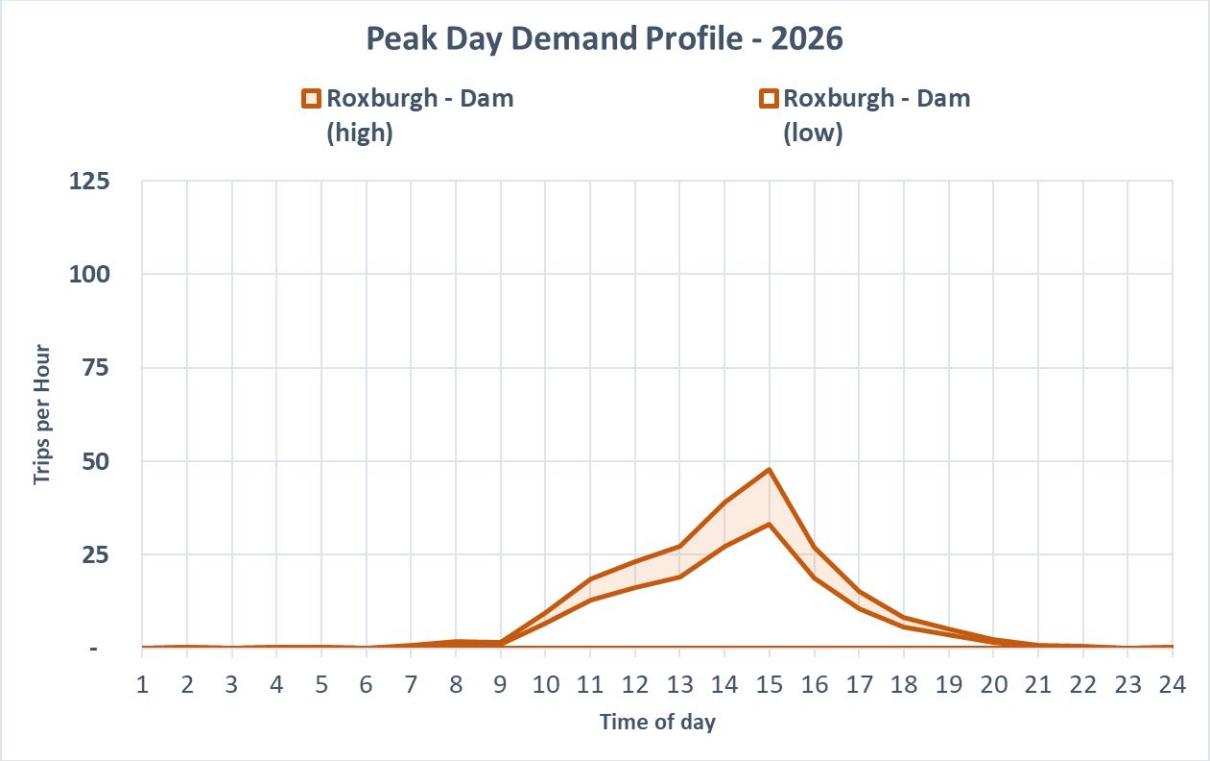


Figure 27 Projected Peak Day Demand 2028 – Roxburgh Gorge Trail – Roxburgh End

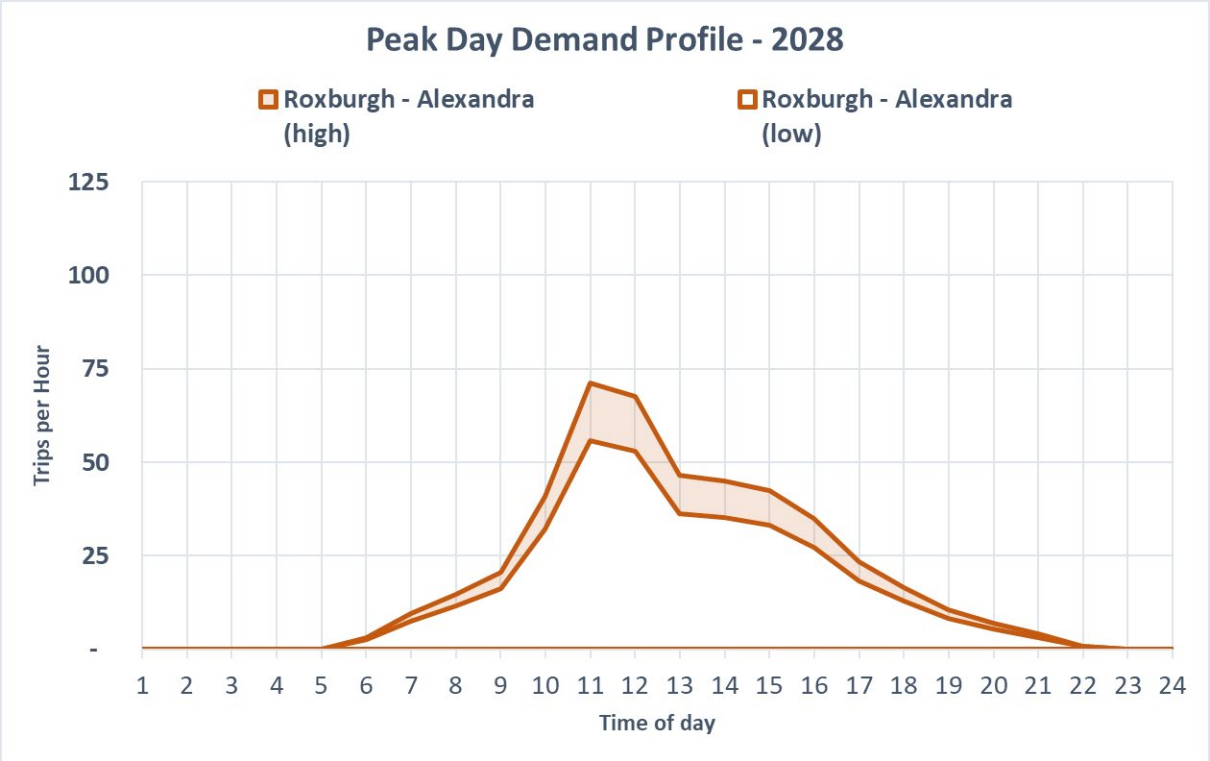
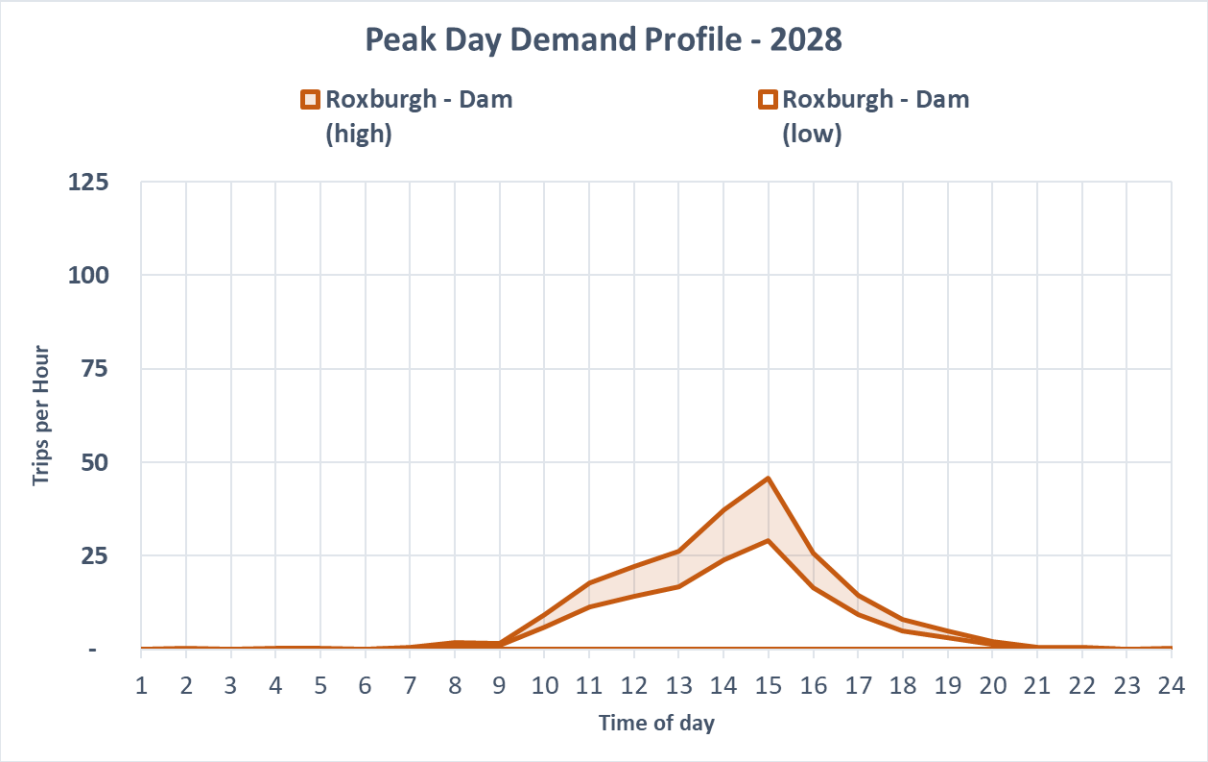


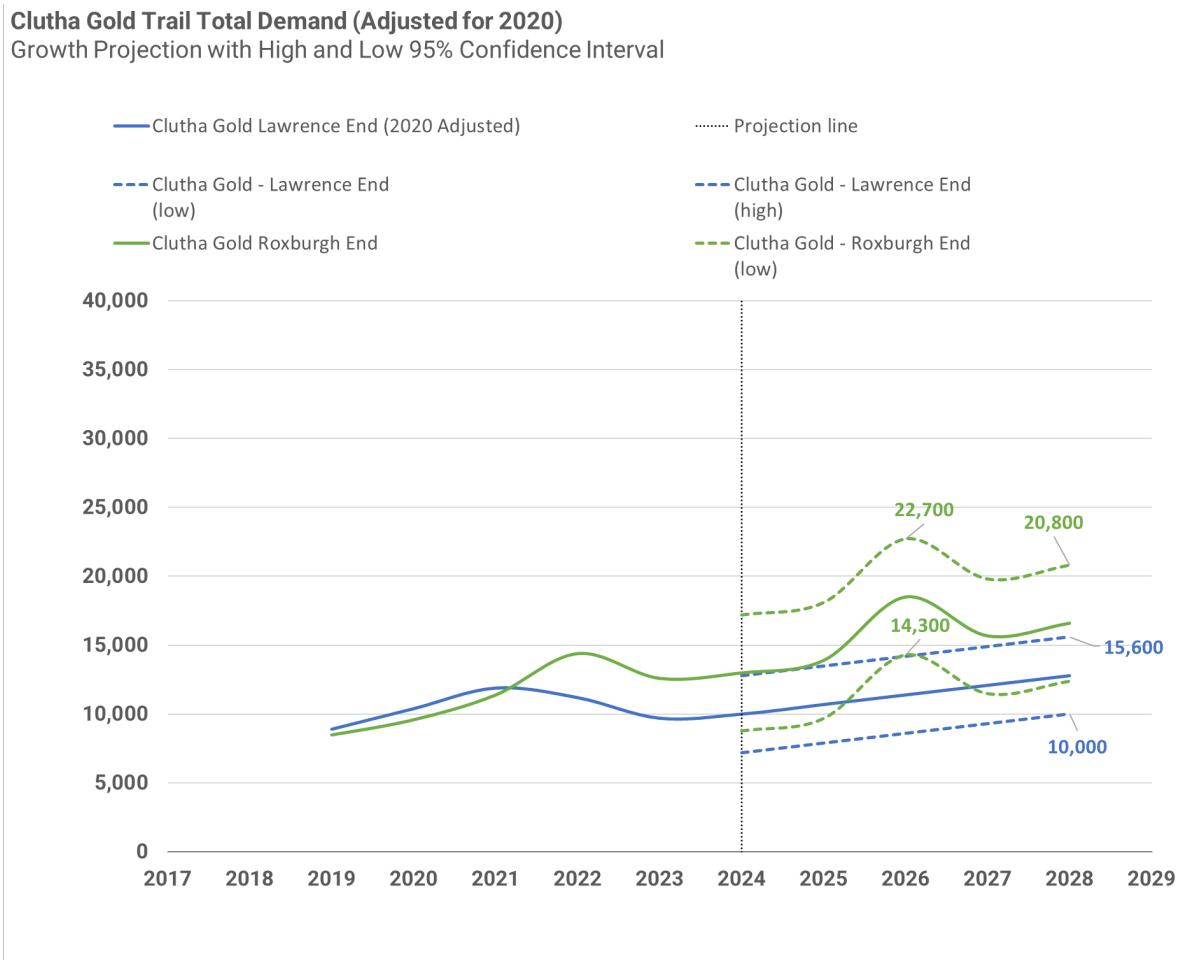
Figure 28 Projected Peak Day Demand 2028 – Roxburgh Gorge Trail – Roxburgh End



5.3.2 Clutha Gold Trail Annual Demand

5.3.2.1 Annual Demand

Figure 29 Projected Annual Demand – Clutha Gold Trail



5.3.2.2 Seasonal Demand

Figure 30 Projected Seasonal Demand 2028 – Clutha Gold Trail – Roxburgh End

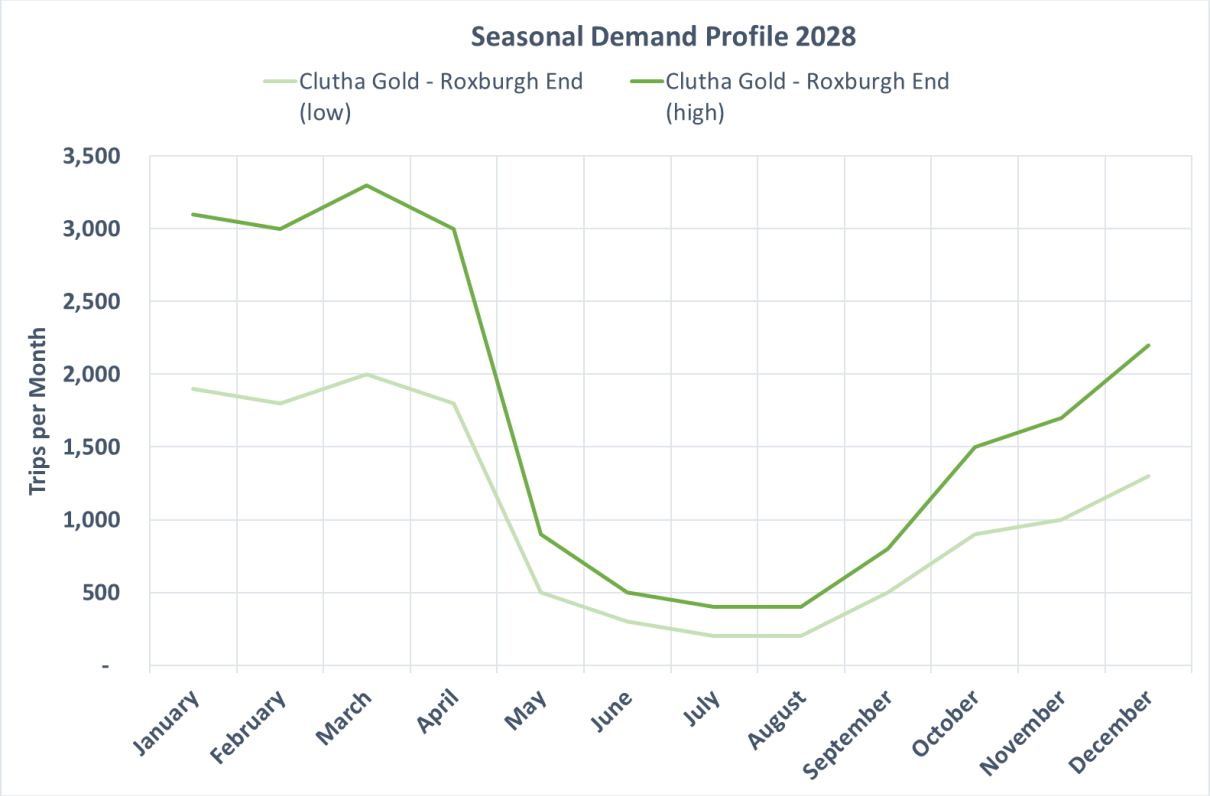
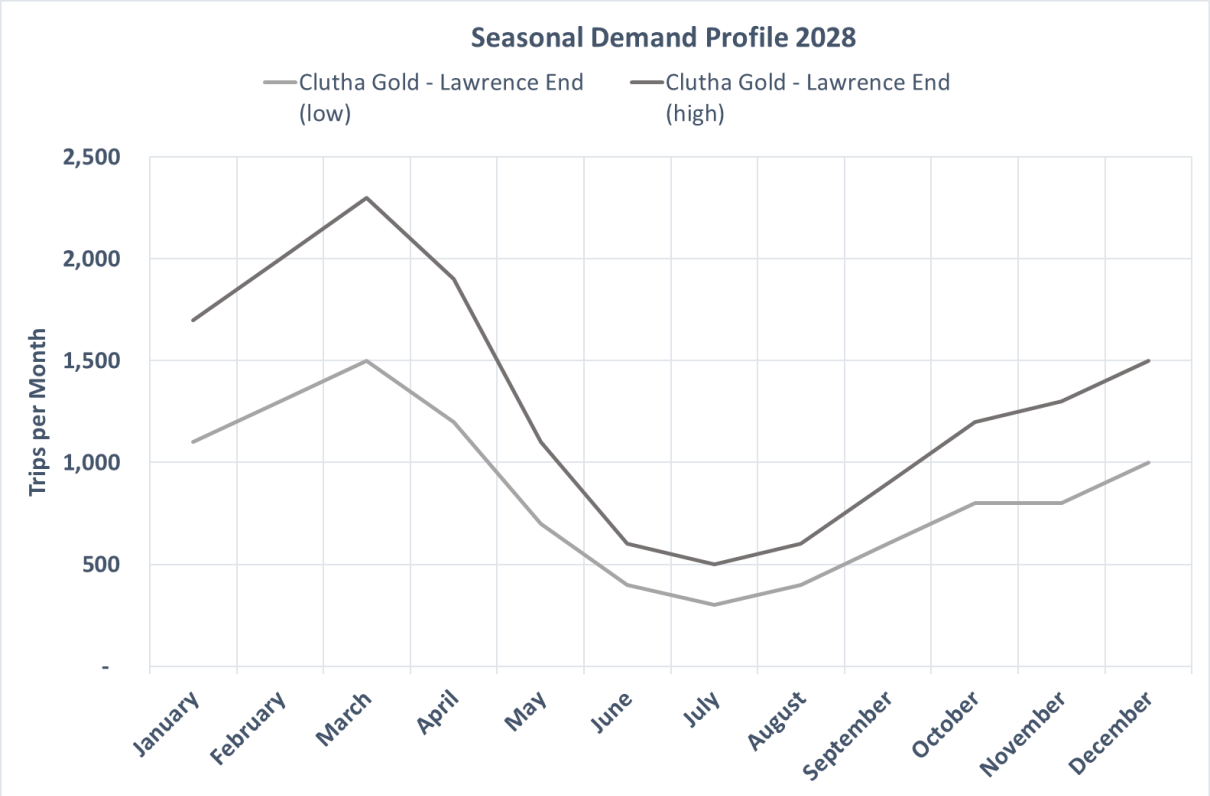


Figure 31 Projected Seasonal Demand 2028 – Clutha Gold Trail – Lawrence End



5.3.2.3 Peak Day Demand

Figure 32 Projected Peak Day Demand 2026 – Clutha Gold Trail – Roxburgh End

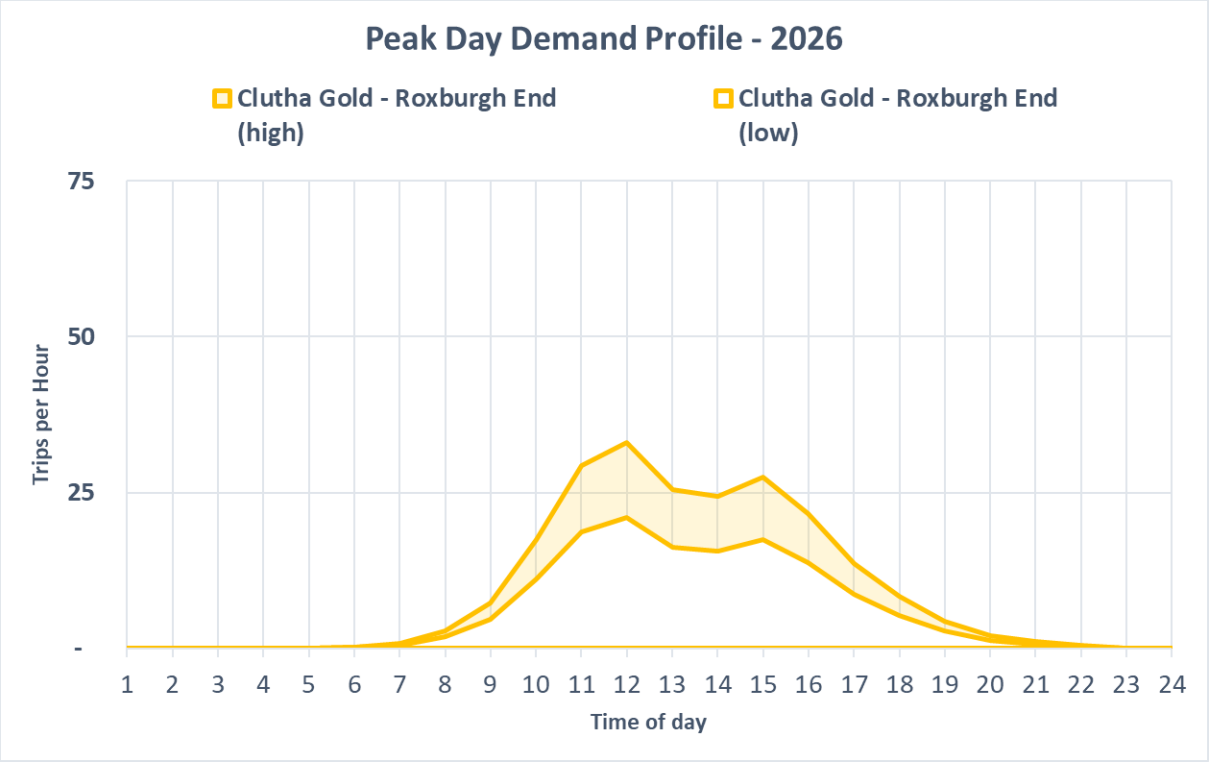


Figure 33 Projected Peak Day Demand 2028 – Clutha Gold Trail – Roxburgh End

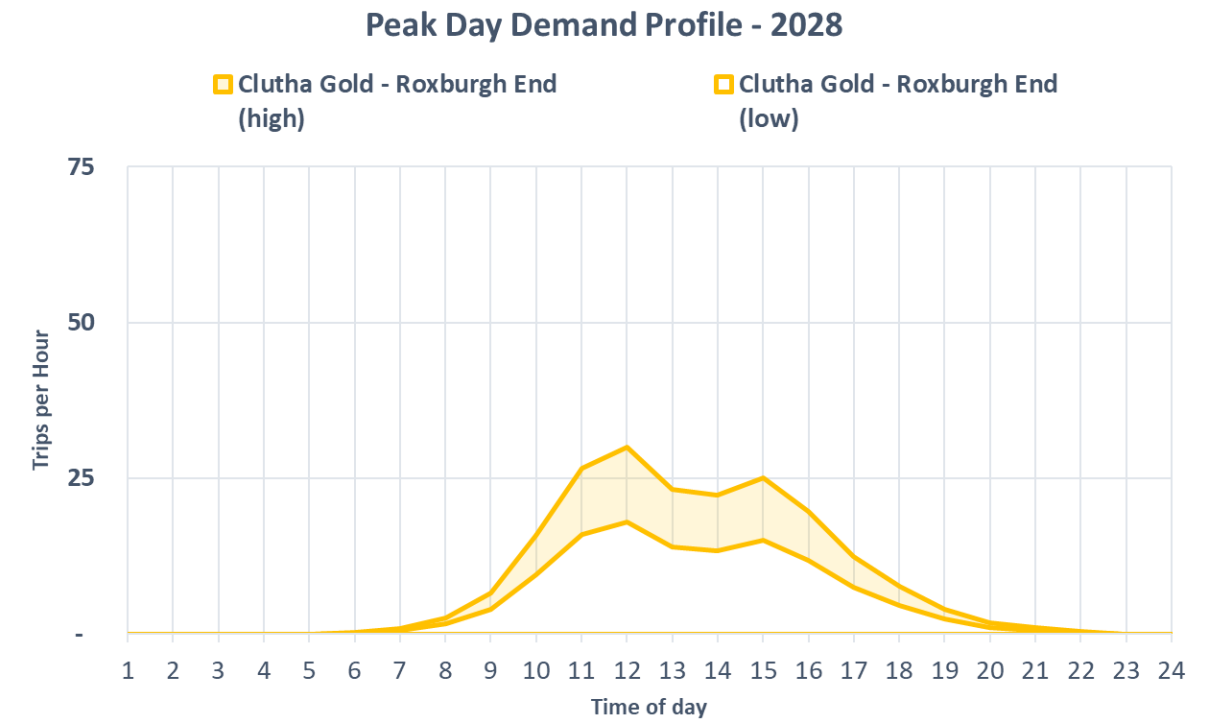


Figure 34 Projected Peak Day Demand 2026 – Clutha Gold Trail – Lawrence End

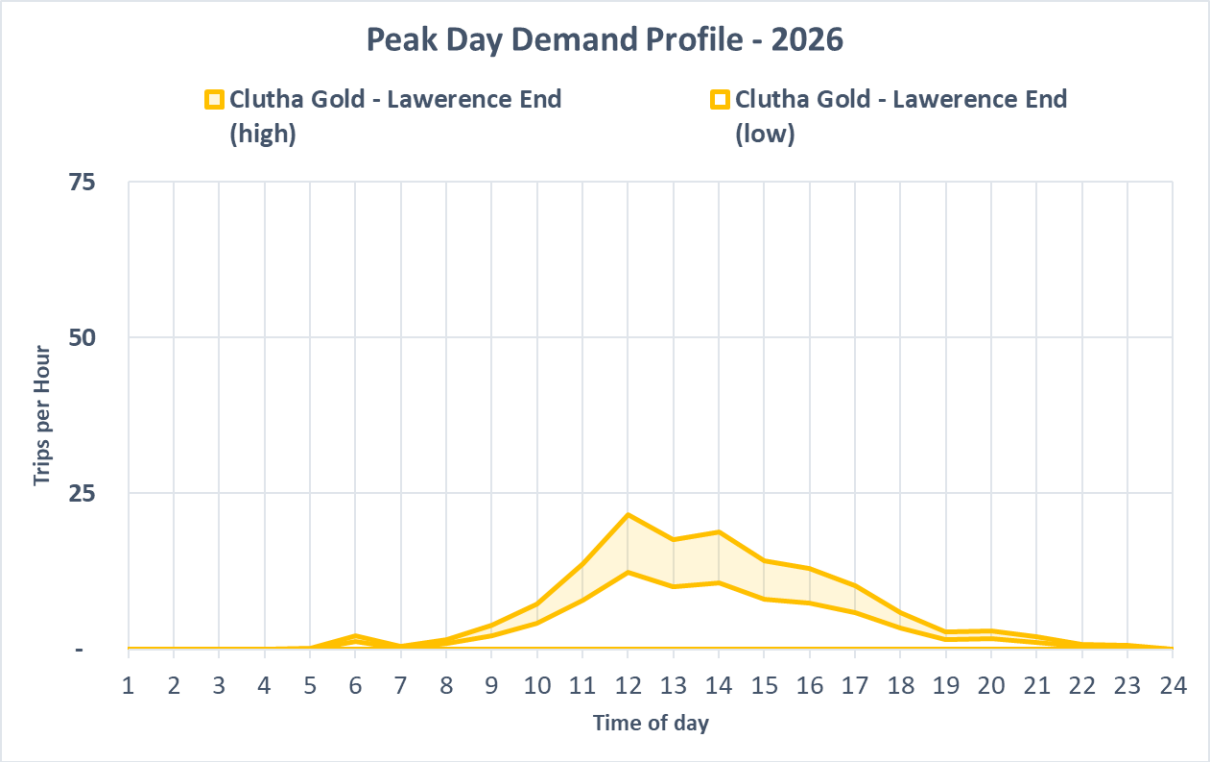
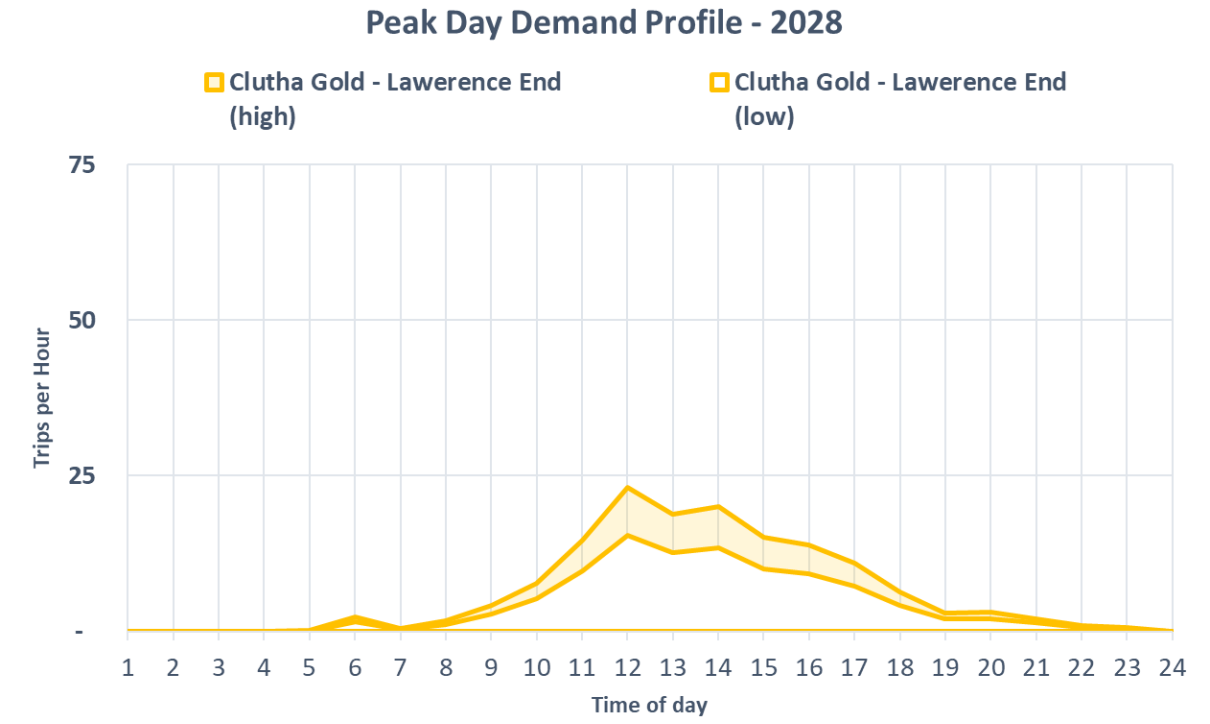


Figure 35 Projected Peak Day Demand 2028 – Clutha Gold Trail – Lawrence End



5.3.3 Lake Dunstan and Kawarau Gorge Trail Annual Demand Projection

5.3.3.1 Annual Demand

Figure 36 Projected Annual Demand – Lake Dunstan Trail

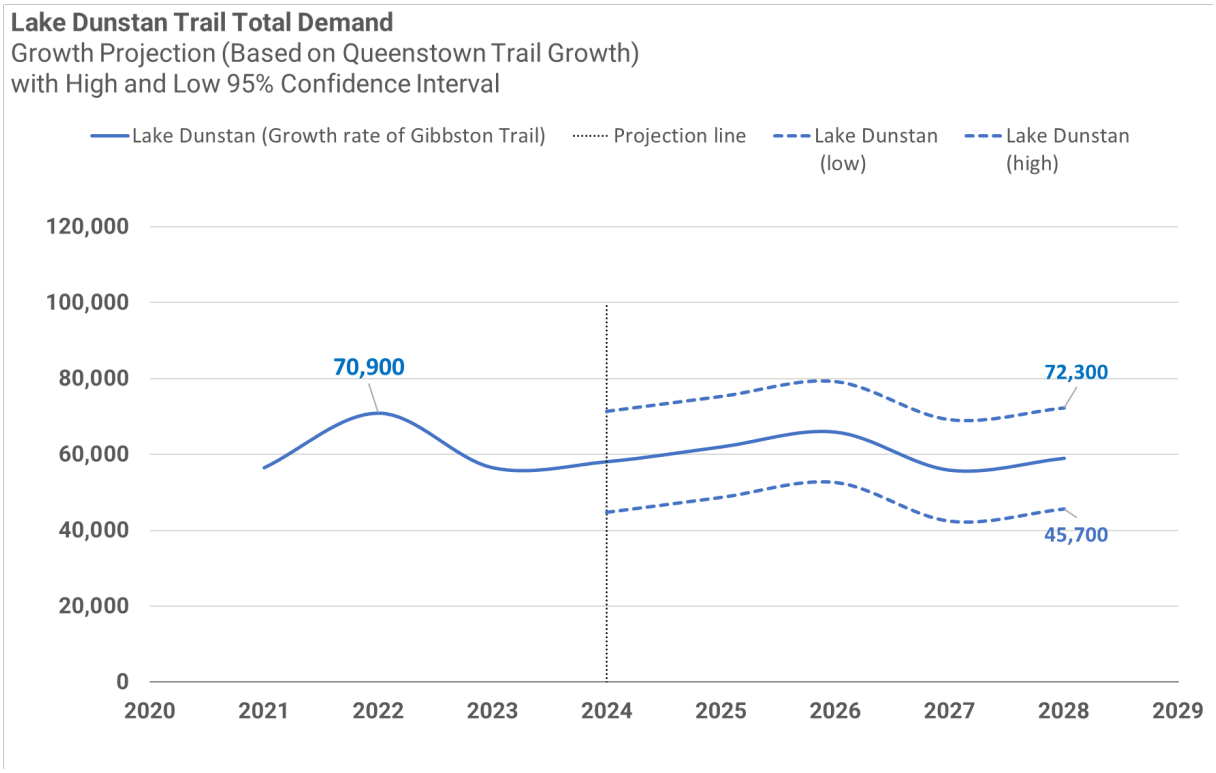
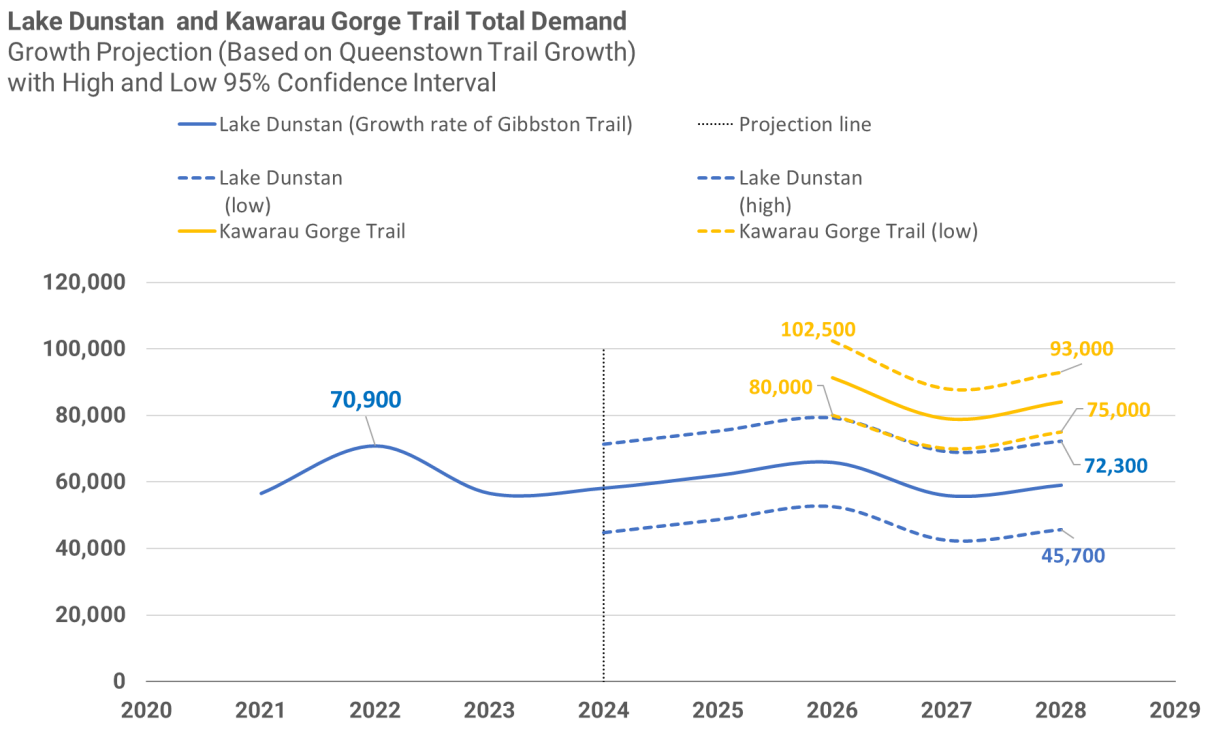


Figure 37 Projected Annual Demand – Kawarau Gorge Trail



5.3.3.2 Seasonal Demand

Figure 38 Projected Seasonal Demand 2026 – Lake Dunstan Trail

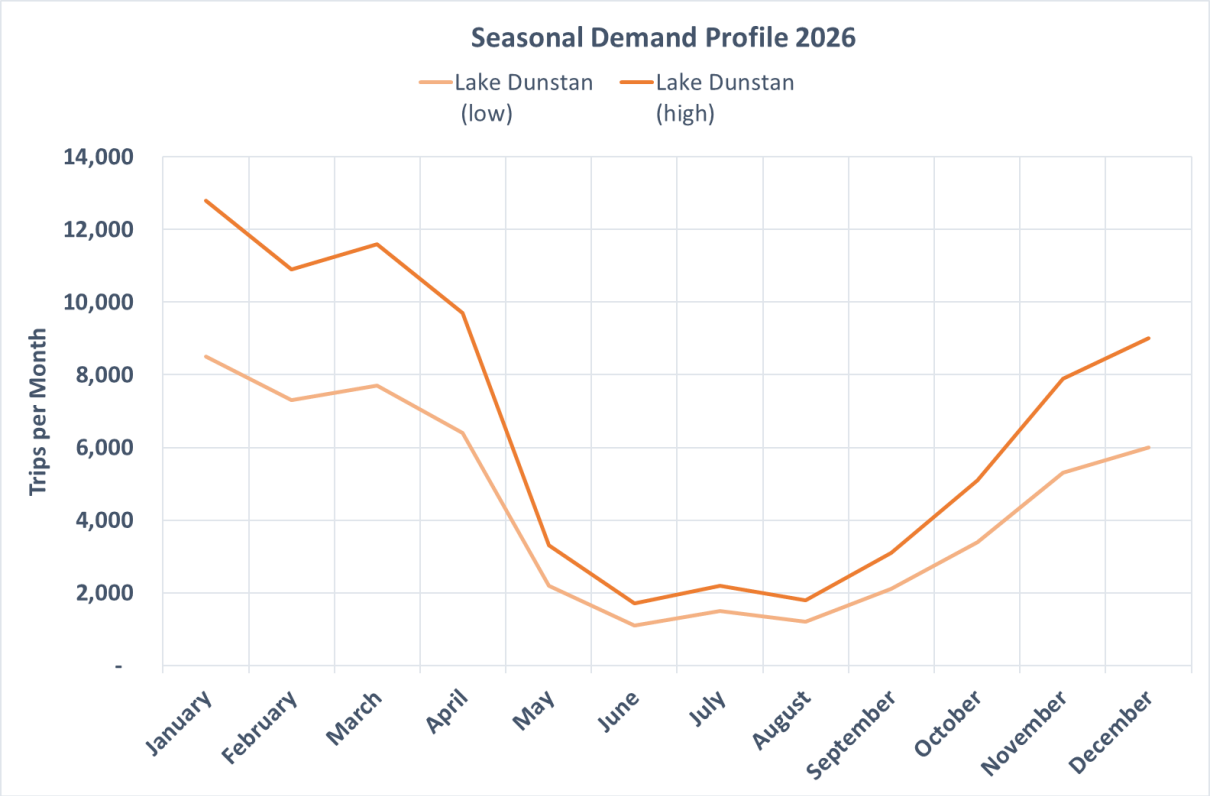


Figure 39 Projected Seasonal Demand 2028 – Lake Dunstan Trail

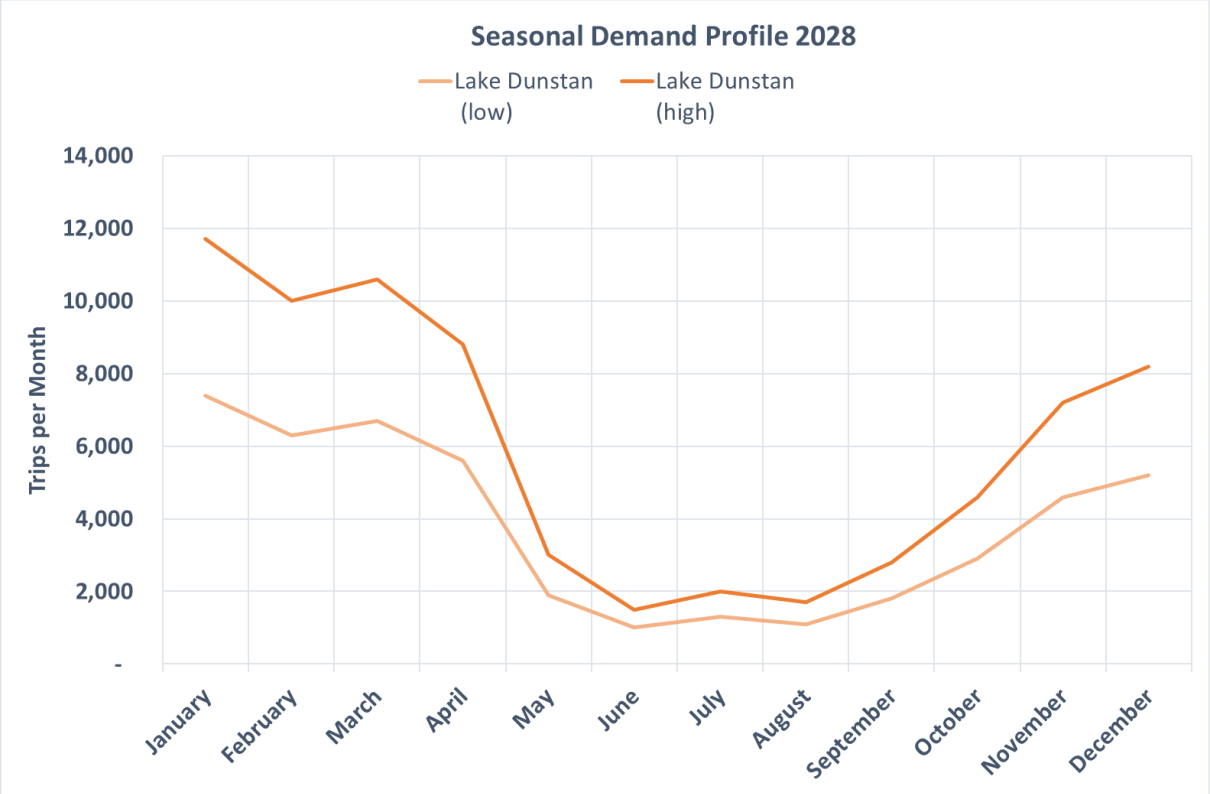


Figure 40 Projected Seasonal Demand 2026 – Kawarau Gorge Trail

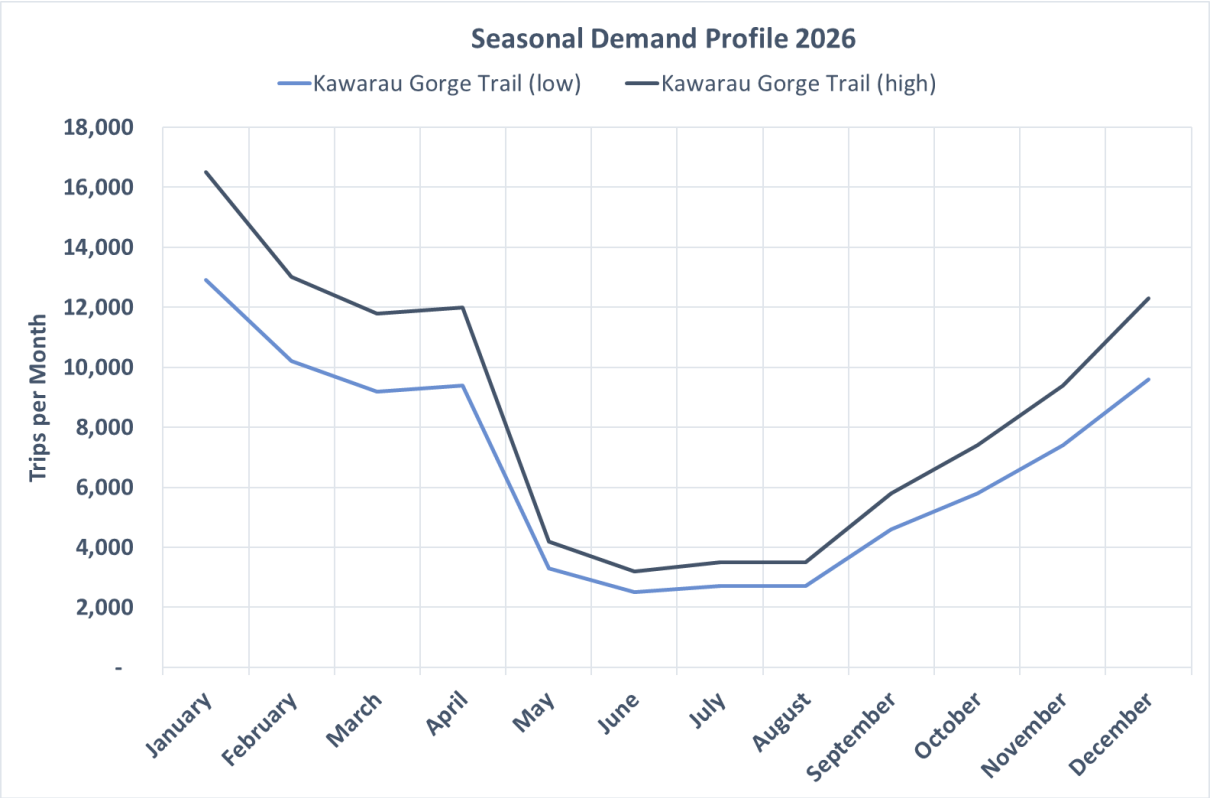
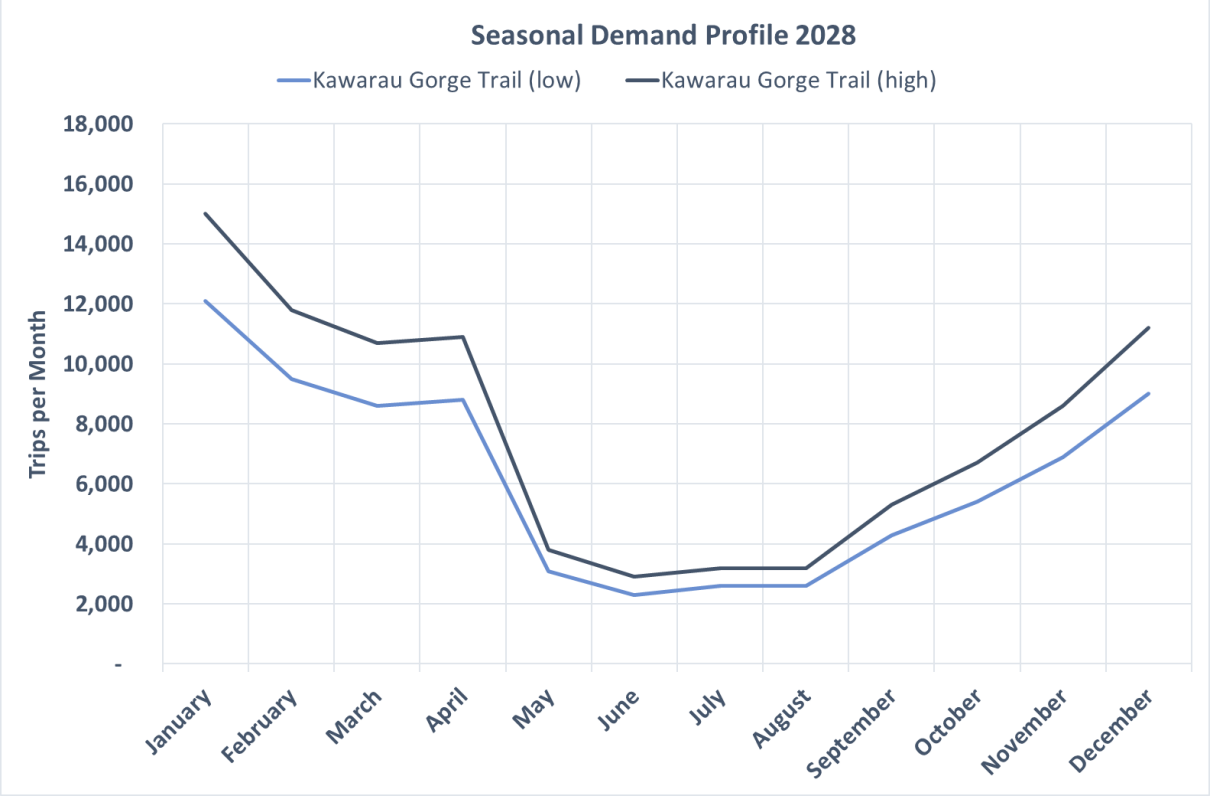


Figure 41 Projected Seasonal Demand 2028 – Kawarau Gorge Trail



5.3.3.3 Peak Day Demand

Figure 42 Projected Peak Day Demand 2026 – Lake Dunstan Trail (Contrasted with previous peaks)

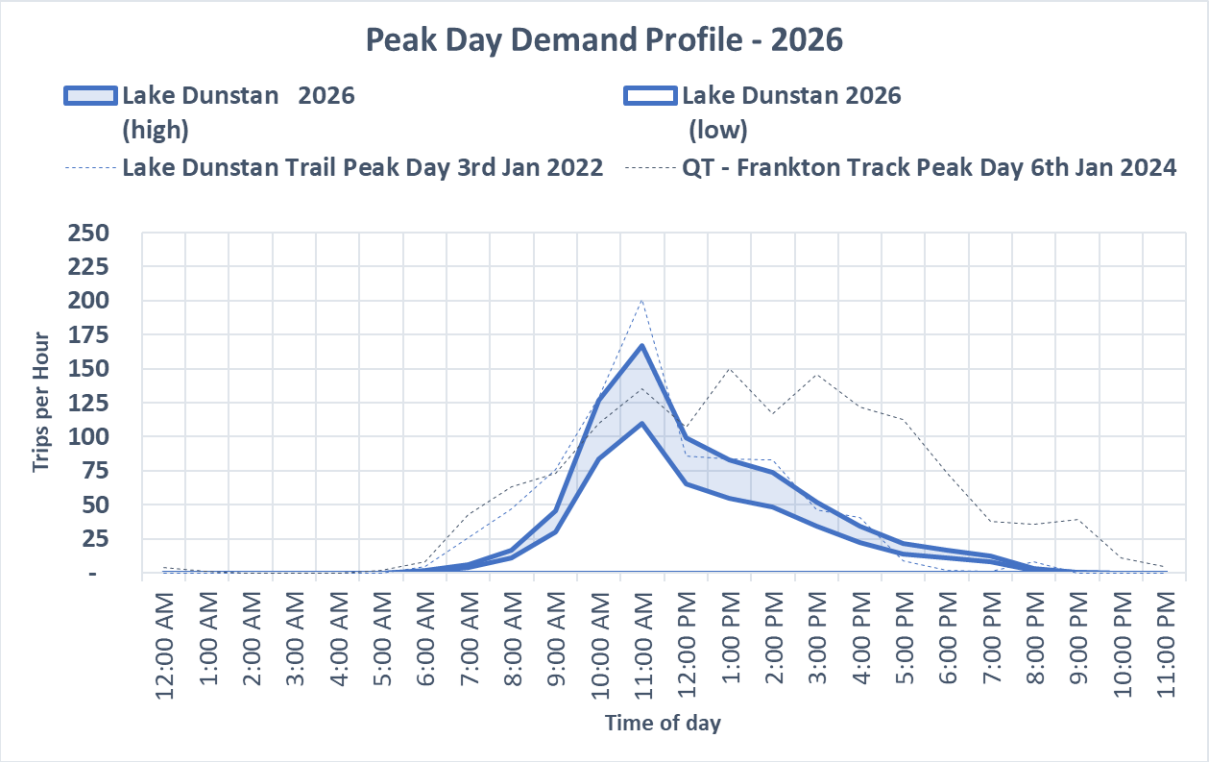


Figure 43 Projected Peak Day Demand 2028 – Lake Dunstan Trail (Contrasted with previous peaks)

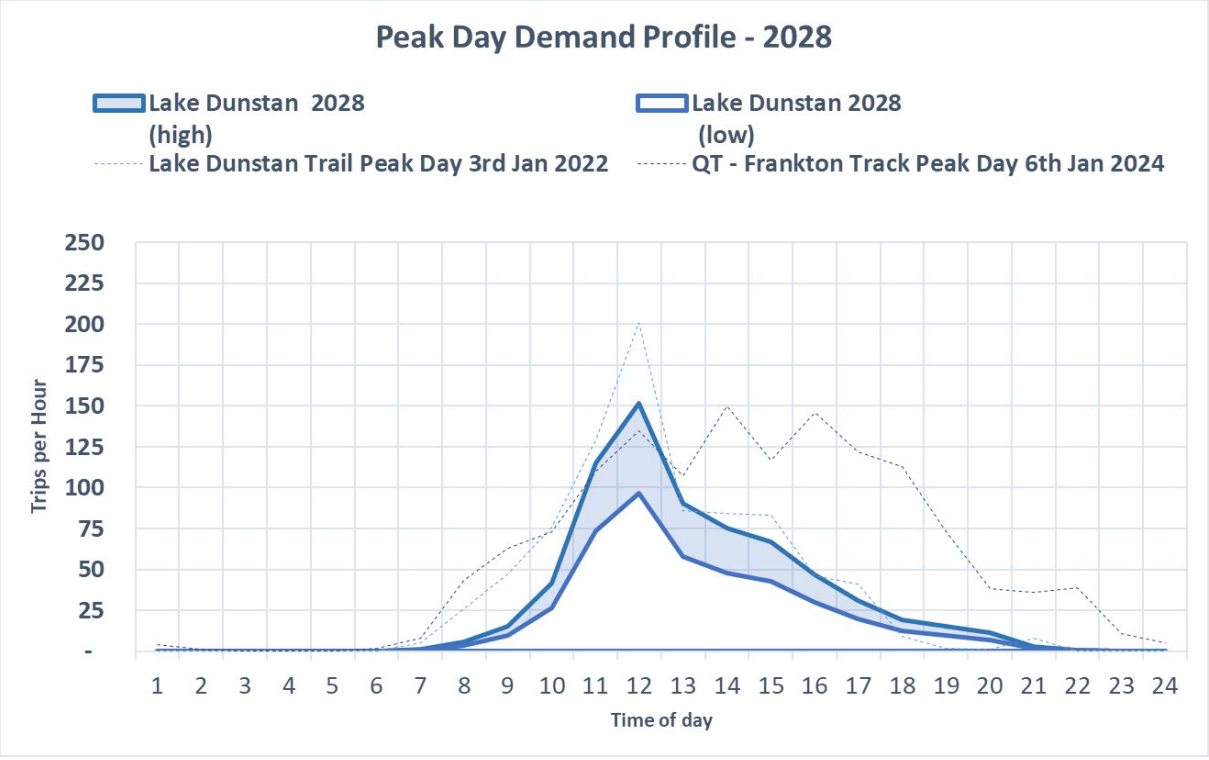


Figure 44 Projected Peak Day Demand 2026 – Kawarau Gorge Trail (Contrasted with previous peaks)

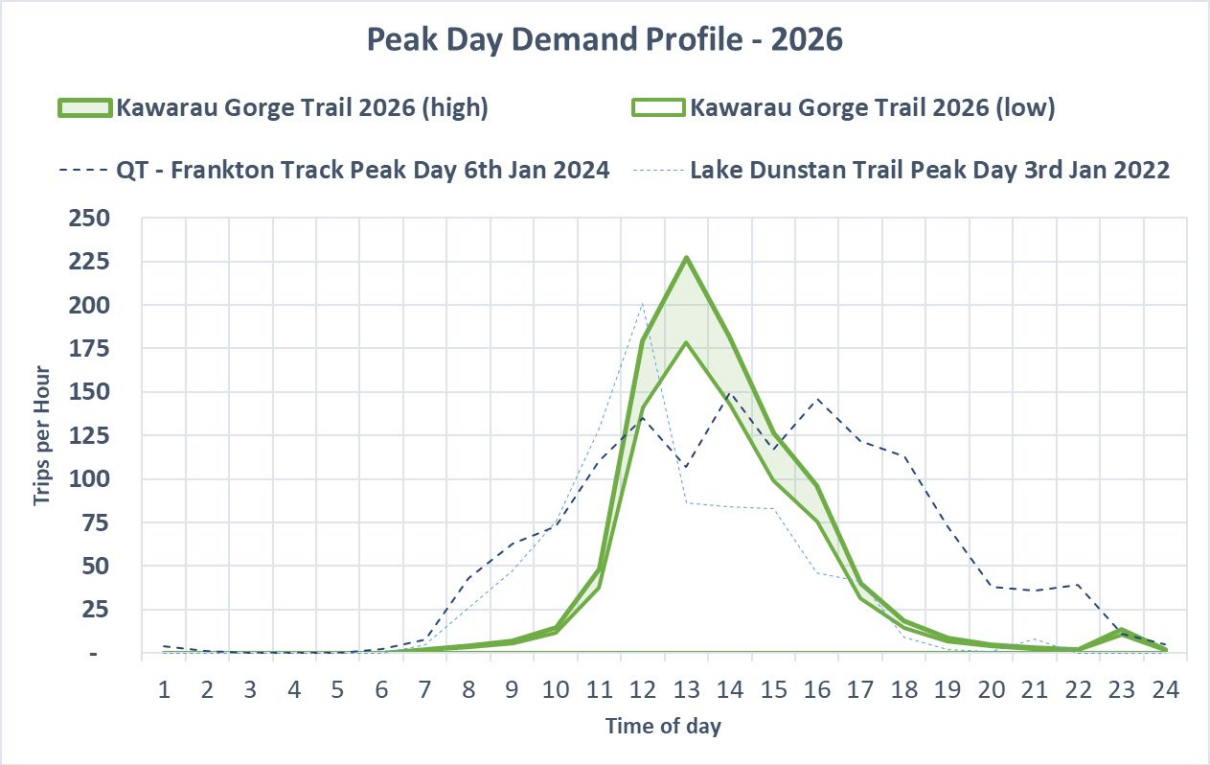
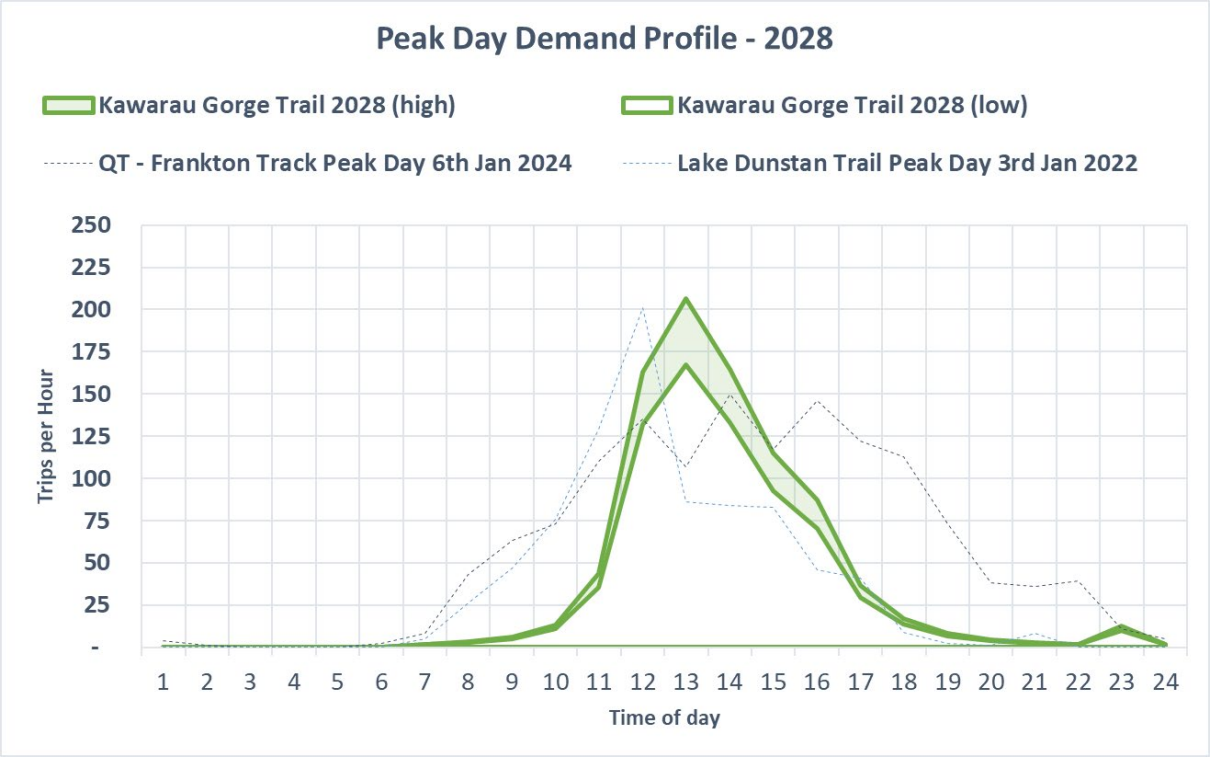


Figure 45 Projected Peak Day Demand 2028 – Kawarau Gorge Trail (Contrasted with previous peaks)



5.4 Demand Projection Tables

Table 7 Projected Annual Demand 2024 to 2028 – High and Low Ranges

Trail		Range	2024	2025	2026	2027	2028
Clutha Gold Trail	Lawrence End	Low Projection	7,200	7,900	8,600	9,300	10,000
		High Projection	12,800	13,500	14,200	14,900	15,600
	Roxburgh End	Low Projection	8,800	9,700	14,300	11,500	12,400
		High Projection	17,200	18,100	22,700	19,800	20,800
Roxburgh Gorge Trail	Alexandra End	Low Projection	28,300	30,600	42,400	35,200	37,500
		High Projection	38,700	41,000	52,800	45,600	47,900
	Roxburgh Dam End	Low Projection	10,100	11,100	16,200	13,100	14,100
		High Projection	18,500	19,500	24,500	21,400	22,500
Lake Dunstan Trail		Low Projection	44,800	48,700	52,600	42,500	45,700
		High Projection	71,400	75,300	79,200	69,200	72,300
Queenstown Trail Network	Gibbston trail	Low Projection	52,000	58,000	64,000	70,000	75,000
		High Projection	70,000	76,000	82,000	88,000	93,000
Kawarau Gorge Trail (new)		Low Projection	NA	NA	80,000	70,000	75,000
		High Projection	NA	NA	102,500	88,000	93,000

Table 8 Projected Peak Day Demand 2024 to 2028 – High and Low Ranges

Trail		Range	2024	2025	2026	2027	2028
Clutha Gold Trail	Lawrence End	Low Projection	70	80	80	90	100
		High Projection	120	130	140	140	150
	Roxburgh End	Low Projection	80	90	140	110	120
		High Projection	160	170	220	190	200
Roxburgh Gorge Trail	Alexandra End	Low Projection	270	290	410	340	360
		High Projection	370	390	510	440	460
	Roxburgh Dam End	Low Projection	100	110	160	130	140
		High Projection	180	190	230	210	220
Lake Dunstan Trail		Low Projection	430	470	500	410	440
		High Projection	680	720	760	660	690
Queenstown Trail Network	Gibbston trail	Low Projection	500	560	610	670	720
		High Projection	670	730	790	840	890
Kawarau Gorge Trail (new)		Low Projection	NA	NA	770	670	720
		High Projection	NA	NA	980	840	890

Table 9 Projected Peak Hour Demand 2026 and 2028 – High and Low Ranges

Trail		Range	2026	2028
Clutha Gold Trail	Lawrence End	Low Projection	12	15
		High Projection	22	23
	Roxburgh End	Low Projection	21	18
		High Projection	33	30
Roxburgh Gorge Trail	Alexandra End	Low Projection	64	56
		High Projection	79	71
	Roxburgh Dam End	Low Projection	33	29
		High Projection	48	46
Lake Dunstan Trail		Low Projection	110	97
		High Projection	167	152
Queenstown Trail Network	Gibbston trail	Low Projection	142	167
		High Projection	183	206
Kawarau Gorge Trail (new)		Low Projection	179	167
		High Projection	227	206

6 Next Steps

It is apparent that as demand for cycling in Central Otago increases, particularly with the introduction of new trails like the Kawarau Gorge Trail and Roxburgh Gorge Trail extension, a more proactive approach to planning and operations is required than has taken place. The suggested next steps are:

1. Invest in better and ongoing data collection on the Otago Central Rail Trail, Lake Dunstan and Kawarau Gorge trail as is done on the Queenstown Trail Network. Good quality enables much greater management and operation of the trails and provides an evidence base for future investment. This will be particularly important in the long-term maintenance and management of trails.
2. Engage with key stakeholders on these projections for feedback and establish necessary interventions to minimise adverse effects. Particularly, trail operators, accommodation providers, roading and facility infrastructure providers, telecommunications providers, track designers and builders and emergency services.
3. Detailed infrastructure impact assessment to identify pinch points, especially on trails and at trailheads expected to manage the highest demands. This could include parking areas, narrow/single track sections, ensuring regular mobile phone coverage, and increasing the number and size of rest areas with adequate facilities.
4. Review projections and assumptions in 12 months' time against actual demand to test their accuracy and reliability.

7 Key Assumptions and Limitations

7.1 Linear Trend Projection Method

The projection methodology assumes past growth trends to forecast future demand. While historical data is crucial, the assumptions of linear growth may carry uncertainty with factors like new trail openings, significant improvements in infrastructure, or even global tourism trends. These can significantly affect growth rates, potentially in non-linear ways.

7.2 Direction of Travel and User Type

For simplicity, all data is the combined demand on the trail of all users and directions. Future iterations can enhance the projections to include directional elements.

7.3 Peak Day Demand Calculation

Peak day demand is an important factor in establishing impacts on many aspects of the user experience and the capacity of supporting systems and infrastructure. It has been calculated based observing the historic ratio of peak day trips recorded compared to the average day of all historic data. From this, a ratio is determined, called the peak day factor, which can then be used to calculate future peak day demand, from an annual demand projection.

Peak Day Demand = Average Day x Peak Day Factor: Where;

Average Day Demand = Annual Demand ÷ 365 days

The peak day to average day ratio, or Peak day ratio used for all calculations was 3.5.

This was based on a historic average of the 99th percentile of peak day values recorded. The reason the maximum values were not used, was due to large skews of data possible from extraordinary events or from data errors.

Table 10 Peak Day Demand Recorded - All Years.

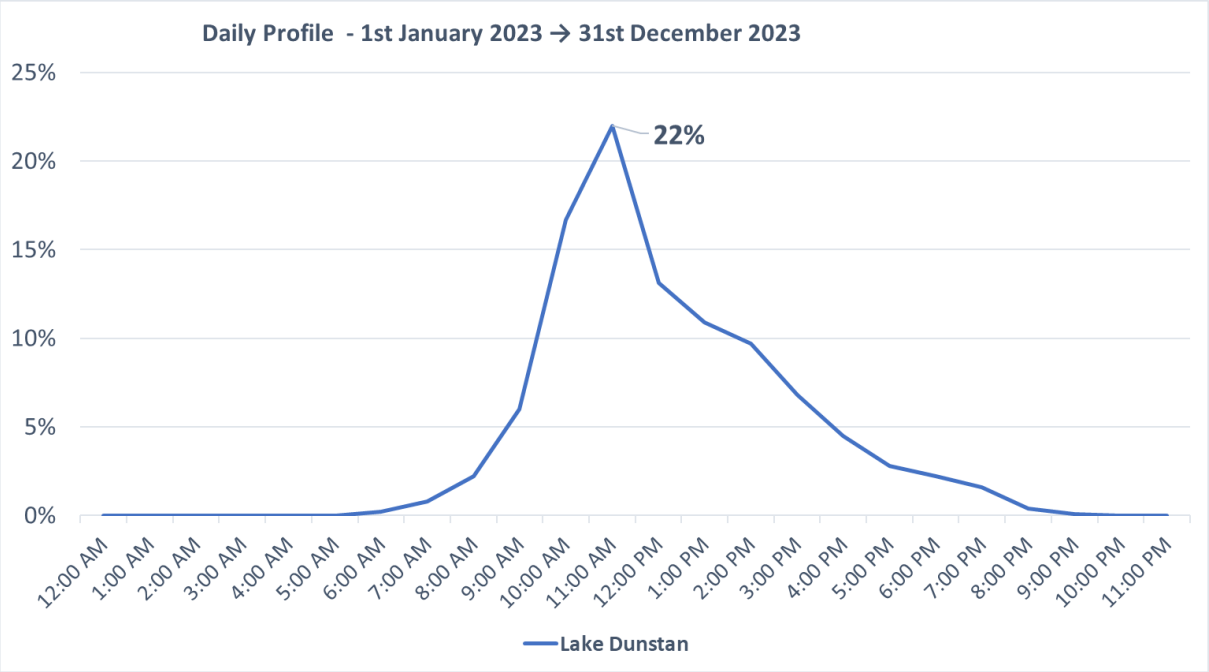
Demand per Hour recorded	Lake Dunstan	Clutha Gold - Lawrence End	Clutha Gold - Roxburgh End	QT - Gibbston	Roxburgh - Alexandra	Roxburgh - Dam
Maximum	844	714	176	2281	768	990
99th percentile	634	405	131	459	284	270
95th percentile	449	124	101	345	213	156
90th percentile	364	82	86	290	185	109
85th percentile	305	69	76	257	166	92
Average Day	172	55	49	180	124	60

Table 11 Peak Day to Average Day Ratios

Variable	Lake Dunstan	Clutha Gold - Lawrence End	Clutha Gold - Roxburgh End	QT - Gibbston	Roxburgh - Alexandra	Roxburgh - Dam
99th percentile	634	405	131	459	284	270
Average day	172	55	49	180	124	60
Peak to Average Day Ratios	3.7	7.3	2.7	2.6	2.3	4.5

7.4 Peak Hour and Peak Day Profiles

The peak day profiles attempt to show the distribution of demand throughout the day. Doing so also shows the potential peak hour demand likely on a trail, on the peak day. These profiles are established by simply allocating the peak day value calculated in the future, across the peak day profile of usage captured with historic data. These are shown in the Historical Demand section for each trail. Lake Dunstan's daily profile is shown below as an example. For instance, a peak day profile for Lake Dunstan during peak season is shown below. If a peak demand of 1,000 is projected, approx. 22% of this demand or, 220/hour trips could occur at 11am.



7.5 Lake Dunstan and Kawarau Gorge Trail Extension

Demand has been projected forward 5 years based on the historic 5-year demand growth of the Gibbston Trail. The Gibbston trail is an out and back trail and is still showing strong demand growth. It is also the starting point of the planned Kawarau Gorge extension. The Kawarau Gorge extension of the Gibbston Trail is scheduled for completion in 2026. An additional one-off surge in demand of 25% is also projected within the first 12 months of opening. This is based on similar on-off surges witnessed on the Lake Dunstan Trail upon opening. Note that this excludes any connection of the Lake Dunstan Trail through to Wanaka as it was out of scope.

7.6 Roxburgh Gorge Trail and Extension, Clutha Gold Trail Extension

Demand on these trails has been projected based on a linear trend of historic demand. An additional, one-off surge in demand of 25% is also projected within the first 12 months of opening of the Roxburgh Gorge extension. This is based on similar on-off surges witnessed on the Lake Dunstan Trail upon opening. Note that this projection excludes the impact of any future connection of the Clutha Gold trail through to Dunedin as this is unclear when and if it will occur.

7.7 Otago Central Rail Trail

The decision not to undertake a demand projection for the Otago Central Rail Trail is founded on several critical observations. Primarily, the trail has experienced little to no significant change in demand over the past 3 to 6 years, contrasting with the increased demands noted on adjacent trails such as the Lake Dunstan and Roxburgh Gorge Trails. It is assumed that future demand is unlikely to change.

7.8 Demand Projection Timeframe and Potential Declines in Demand

Of note, is the stagnant demand growth of the Otago Central Rail Trail since 2016. This introduces a level of uncertainty in predicting future demands beyond 5 years.

This levelling off in demand could suggest a potential future decrease in demand for other trails, especially in a timeframe exceeding ten years. Given these factors, any demand projection over 5 years would be speculative at best, carrying considerable risk of inaccuracy.

7.9 High and Low Confidence Intervals

All projections are inherently inaccurate, so the extent of inaccuracy needs to be understood. Projections forward have been presented as a range of high and low using a statistical analysis of historic annual demand.

These high and low ranges represent the 95% confidence interval of true demand being with these intervals. This means, that we can be 95% sure that the true value being projected, is within these high and low ranges.

These ranges become narrower, as more data becomes available over time and the more the historic demand aligns to a linear growth trend assumption. Exponential demand trends were not considered to be appropriate.

7.10 Spikes in Demand from Covid 19 Lockdowns and Border Closures

It is reasonable to assume that during periods of lockdowns and border closures, trails experienced a spike in usage as residents sought outdoor activities within the bounds of restrictions. Conversely, trails heavily reliant on international tourism may have seen a decrease in demand during the border closures. For the purposes of projecting demand, significant spikes and/or drops in demand on existing trails (not those opened during 2020-2022) have had these spikes “normalised” into a linear trend of historic demand.