QUEENSTOWN PUBLIC TRANSPORT BUSINESS CASE

6 MAY 2024

VERSION 7.0

Document Version History

DATE	VERSION	AUTHOR	CHANGES
22/11/2022	1 (Draft)	J. Tan, I. Wong, A Deutsch	Initial working draft for ILM and context validation.
16/02/2023	2 (Draft)	I. Wong, J. Tan, A Deutsch	Addressed client and internal feedback, revised and added content.
10/8/2023	3 (Draft)	J. Tan	Updated to reflect refinements to ILM, additional evidence and QLDC Quality of Life Survey Results, edits and formatting.
24/08/2023	4 (Draft)	E. Whitfield	Response to comments
15/09/2023	5 (Draft)	L. Goodman, E. Whitfield	Response to comments
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06/05/2024	7 (Final Combined)	H. Fowler	Combine Parts A, B, and C Response to final comments and ensure consistency

Document Review

ROLE	NAME	REVIEW STATUS
Principal Transport Planner, WSP	C. Groom	Internal Review
Head of Transport Planning & Advisory, WSP	E. Whitfield	Internal Review
Project Manager, Otago Regional Council	S. Hubbard	Internal Review

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Glossary of Terms

ABBREVIATION	TERM
AADT	Annual Average Daily Traffic
BCR	Benefit Cost Ratio
Business Case	Queenstown Public Transport Business Case
CCO	Council-Controlled Organisation
CSF	Critical Success Factor
DBC	Detailed Business Case
District	Queenstown Lakes District Council
FY	Financial Year
GDP	Gross Domestic Product
GHG	Greenhouse gases
GPS	Government Policy Statement (on Land Transport)
IBC	Indicative Business Case
ILM	Investment Logic Map
IO	Investment Objective
IPM	Investment Prioritisation Method
IQA	Investment Quality Assurance
KPI	Key Performance Indicator
LCLR	Low Cost Low Risk
LTBF	Land Transport Benefits Framework
MBCM	Monetised Benefits and Costs Manual
MCA	Multi-Criteria Analysis
MoE	Ministry of Education
MoT	Ministry of Transport
MoU	Memorandum of Understanding
NLTF	National Land Transport Fund
NLTP	National Land Transport Programme
NZ	New Zealand
NZTA	NZ Transport Agency Waka Kotahi
NZUP	New Zealand Upgrade Programme
OCB	Outer Control Boundary
ODP	Operative District Plan (Queenstown Lakes)
ORC	Otago Regional Council
PAX	Passenger
PBC	Programme Business Case
PDP	Proposed District Plan (Queenstown Lakes)
PT	Public transport
PTOM	Public Transport Operating Model
QLDC	Queenstown Lakes District Council

QPTBC	Queenstown Public Transport Business Case
QBC	Queenstown Business Case (also known as Queenstown Transport Business Case)
RLTP	Regional Land Transport Plan
RCA	Road Controlling Authority
RPTP	Regional Public Transport Plan
SH6	State Highway 6
SH6A	State Highway 6A
SME	Subject Matter Expert
SPTF	Sustainable Public Transport Framework
SSBC	Single Stage Business Case
TDM	Travel Demand Management
VKT	Vehicle kilometres travelled
W2G	Way to Go Partnership

PART A: STRATEGIC CASE

1 INTRODUCTION

Queenstown is one of New Zealand's fastest growing regions, driven by growth in population, tourism, and supporting activities. This growth is placing increasing pressure on infrastructure, the transport system, and the environment. Specifically, the Queenstown Business Case[1] (endorsed in 2021) stated: ***…a step change is required to achieve the 40% alternative mode share needed during the PM peak on SH6A by 2028.***

Otago Regional Council (ORC) has commissioned the Queenstown Public Transport Business Case (QPTBC) to consider the opportunities for public transport in Queenstown. This represents a pivotal moment to help shape future growth and mobility patterns. The QPTBC (this business case) confirms the case for investment in a 30-year plan for future public transport investment decisions for Queenstown. The QPTBC is being delivered under the Way to Go (W2G) partnership with ORC's partners New Zealand Transport Agency Waka Kotahi (NZTA) and Queenstown Lakes District Council (QLDC).

This Strategic Case is the first of the five Cases. The purpose of the Strategic Case is to identify and evidence problems and opportunities to warrant investment. In doing so, this Strategic Case provides a robust evidence base to enable informed decision-making for the following key questions:

- What is the vision for the form and function of the Queenstown public transport network over the next 30 years, including decarbonisation of public transport?
- What strategic decisions need to be made to achieve this form and function?
- What infrastructure and service interventions are imperative to achieve this form and function?
- What investment pathways are necessary?

This Business Case has been prepared in accordance with the NZTA Better Business Cases guidance.

Geographic Scope

The QPTBC considers the existing public transport network and services within the Whakatipu Basin, as shown in Figure 1-1.

Figure 1-1: Geographical Area, QPTBC

[1] Also referred to as the Queenstown Transport Business Case

2 PROJECT CONTEXT

2.1 Work Completed to Date

The Queenstown Business Case sets the direction for this QPTBC. The Queenstown Business Case (2020) provides a **commitment to an integrated transport programme** for Queenstown with 'three pillars of investment'[2] to achieve the Investment Objectives:

1. Provide more efficient and reliable access for people and goods that:
    a. Sustainably manages growth,
    b. Reduces reliance on private vehicle travel,
    c. Enables enhanced land use.
2. Is adaptable to change and disruption,
3. Enhances the liveability and quality of the natural and built environment,
4. Enhances safety with a goal of Vision Zero.

The Queenstown Business Case was endorsed by NZTA, Queenstown Lakes District Council, and Otago Regional Council in early 2021. The basis of the endorsement was that two business case activities needed to be further developed: one for Travel Demand Management (TDM) and the second for Public Transport Services, this Business Case.

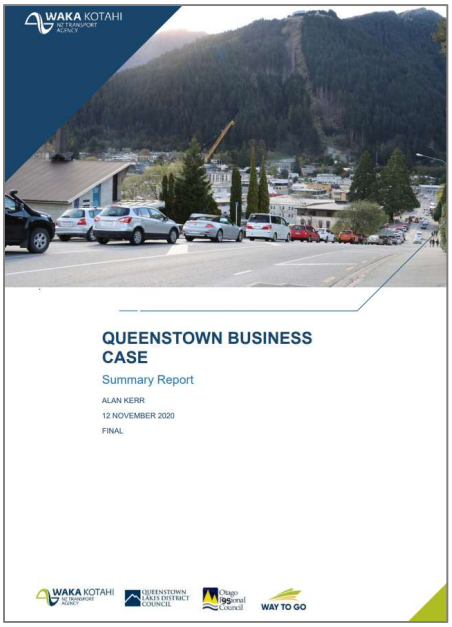

Figure 2-1: Queenstown Business Case (2020)

For avoidance of doubt, pricing mechanisms (such as public transport fares) and other demand management tools are considered within the scope of the TDM business case and therefore are out of scope of this business case.

In addition to the Queenstown Business Case, there has been significant work completed by the Way to Go partnership. This QPTBC should be read in conjunction with this work for a detailed understanding of the wider programme of investment in the Whakatipu Basin.

2.2 Planning for Growth

Queenstown is one of New Zealand's fastest growing regions, driven by growth in population, tourism, and supporting activities. Over the last 30 years the Queenstown Lakes District residential population has almost tripled from 15,000 residents to 41,000 residents (2021), along with significant visitor growth. By 2051, the resident population is expected to approximately double again along with annual growth in visitors as shown in Figure 2-2.

This growth is placing increasing pressure on infrastructure and the transport system. With this high growth anticipated over the next 30 years, strategic planning is required now to understand the investment needed to accommodate this growth whilst retaining:

- resident wellbeing
- visitor experiences
- environmental outcomes

[2] The 'three pillars of investment' are Infrastructure, Public Transport Service Operations, and Travel Behaviour Change.

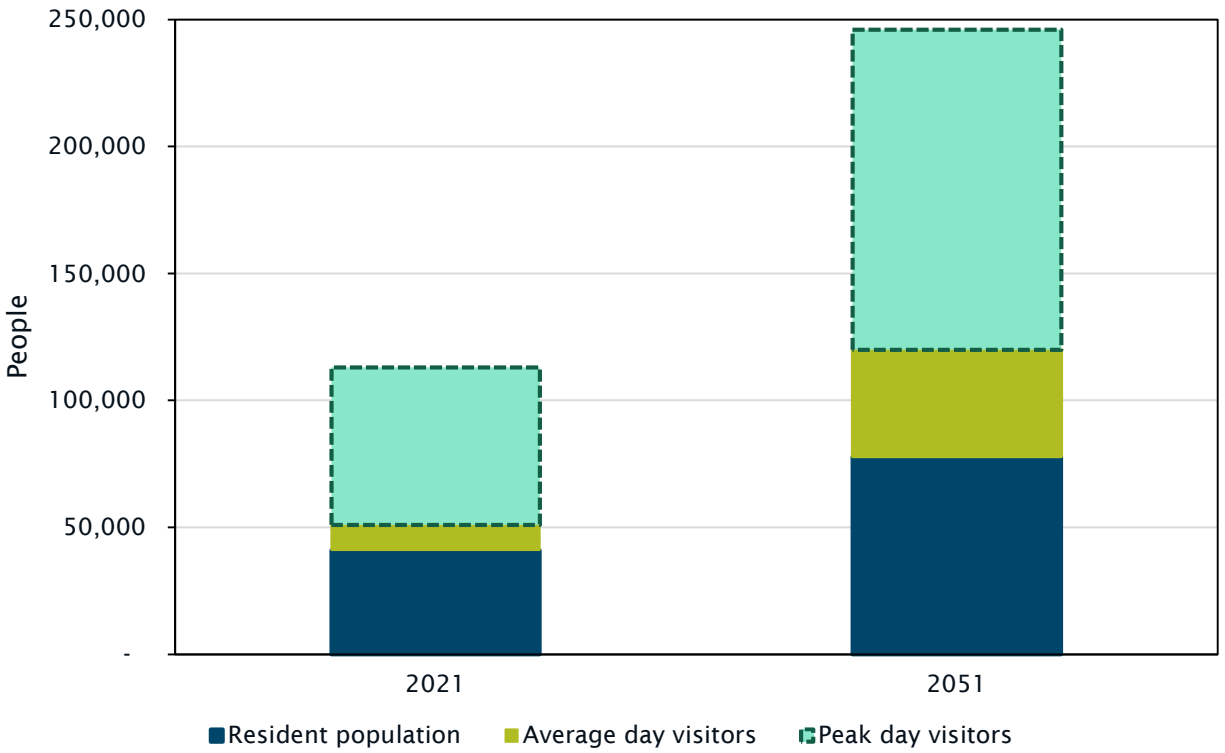

Figure 2-2: Queenstown Growth Projections[3]

The Queenstown Lakes Spatial Plan (July 2021) provides the long-term framework for managing growth in the District. The Spatial Plan promotes:

- A consolidated and mixed-use approach to growth that is focused on locations that are already fully or partially urbanised. Concentrating growth in the existing urban areas will mean more people live in areas where public transport, cycling, and walking is easy and attractive.
- Accommodating growth in this way requires enabling higher density development and a greater mix of uses than currently provided. This means that within the existing Queenstown urban area residential growth will increasingly move towards medium and higher density housing.
- As shown in Figure 2-4, the future growth areas in Queenstown will take place on the existing public transport routes and the proposed Frequent Public Transport Corridor. This Corridor represents a transformational shift in public transport provision in Whakatipu, offering a 'turn up and go' service, forming the "backbone" of the urban area of Queenstown.
- **Public transport, walking and cycling is the preferred option for daily travel** is one of the five Spatial Plan outcomes that describe the desired future state.

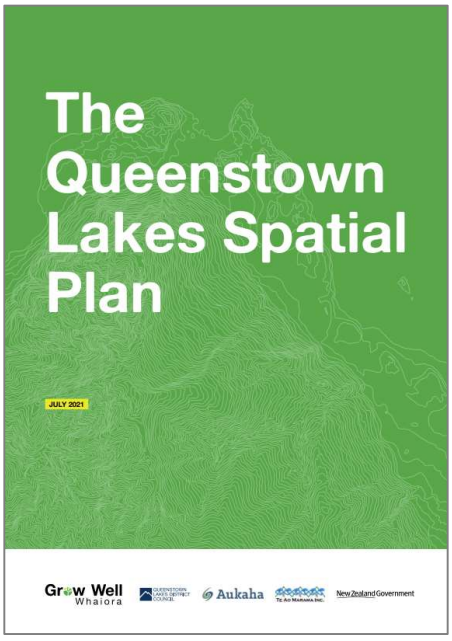

Figure 2-3: The Queenstown Lakes Spatial Plan (2021)

[3] Data sourced from QLDC Demand Projections to 2053 (July 2020) as reported in QLDC, 2021. *The Queenstown Lakes Spatial Plan*. Spatial Plan - QLDC

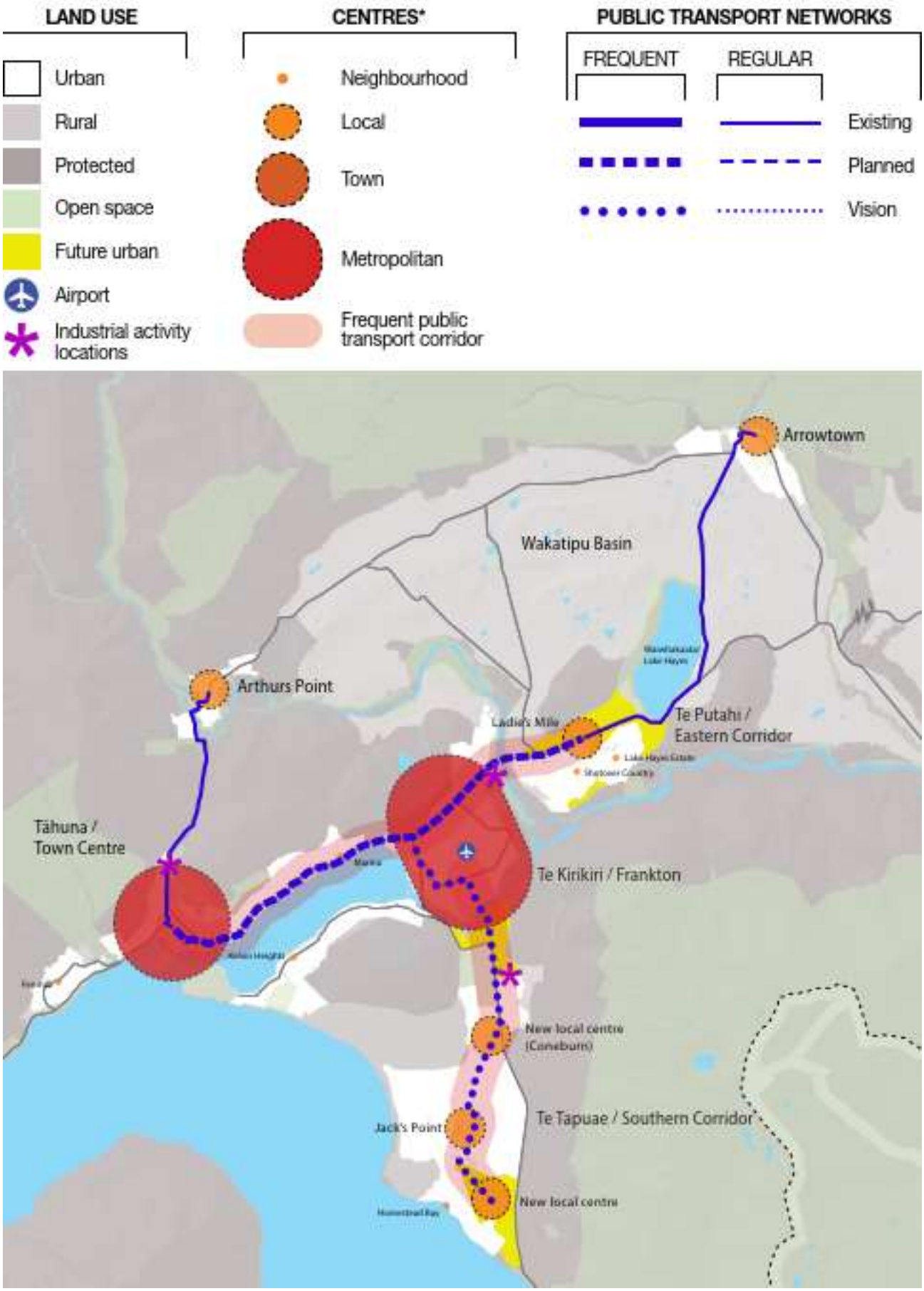

Figure 2-4: The Queenstown Lakes Spatial Plan (2021)

Air Travel

Air connectivity is a key component of the transport network in Queenstown Lakes and is also anticipating significant growth:

- Queenstown Airport is New Zealand's fourth busiest airport in passenger traffic. Annual passenger demand at Queenstown Airport is forecast to increase from 2.4 million in 2023 to 3.2 million in 2032.[4]
- In their draft Master Plan (2023), Queenstown Airport states prioritising public transport links to improve accessibility to the airport.
- Wānaka Airport also services the region, complementing Queenstown Airport. Future development constraints and opportunities have been identified for Wānaka Airport.
- A new airport is proposed at Tarras, highlighting the confidence of the aviation industry in the growth projections.

As well as the opportunity to provide a high-quality public transport network to enable visitors to access the District, airports are significant employment hubs; Queenstown Airport for example is '…*the single largest land use in the Frankton Metropolitan area'.*[5] This therefore represents a significant opportunity to align public transport investment with the anticipated growth both of passengers and of employment.

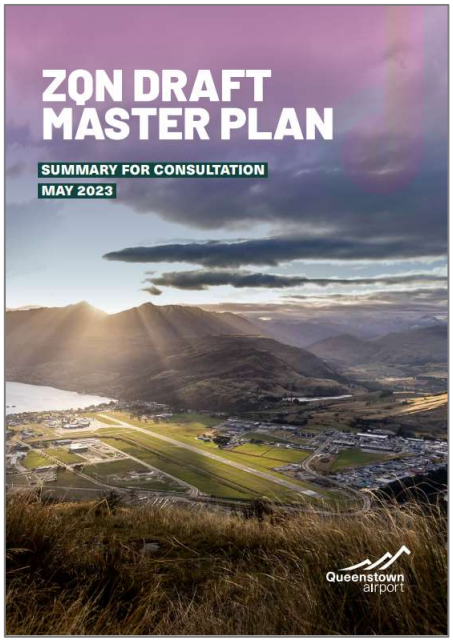

Figure 2-5: Queenstown International Airport Draft Masterplan (2023)

2.3 Transport Context

Topographically and Geographically Constrained

The transport network in the Whakatipu Basin is constrained topographically and geographically due to Lake Whakatipu and its mountains. This means that there is limited route choice, with the only route for moving people and transporting goods into and out of Queenstown town centre being State Highway 6A (SH6A).

When SH6A is closed (for example, because of a crash, or poor weather conditions), a detour is available via Arthur's Point. This route is not suitable for over-dimension vehicles, is capacity constrained by the one-lane Edith Cavell Bridge and increases the journey length between Lake Hayes and the Queenstown town centre by approximately 100 percent.

The topographical and geographical constraints on the transport network means that providing additional capacity through increasing the number of lanes, for example, is challenging and significantly expensive. This is a key motivator for increasing the mode share of public transport in Queenstown to make better use of the existing system.

[4] Queenstown Airport, 2023. *ZQN Draft Masterplan Summary 2023.* zqn-draft-master-plan-summary-2023.pdf (queenstownairport.co.nz)
[5] QLDC, 2021. *The Queenstown Lakes Spatial Plan.* Spatial Plan - QLDC

Mode Share

Like many cities in Aotearoa, travel in Queenstown is predominantly made by private vehicle. As illustrated in Figure 2-6, in Queenstown on Census Day 2018:

- Approximately two-thirds of residents in full- or part-time work travelled to work as either a driver or passenger of a private vehicle
- 14 percent walked to work
- Three percent cycled
- Five percent took public transport

A similar split is seen in the Census 2018 Journey to Education data.

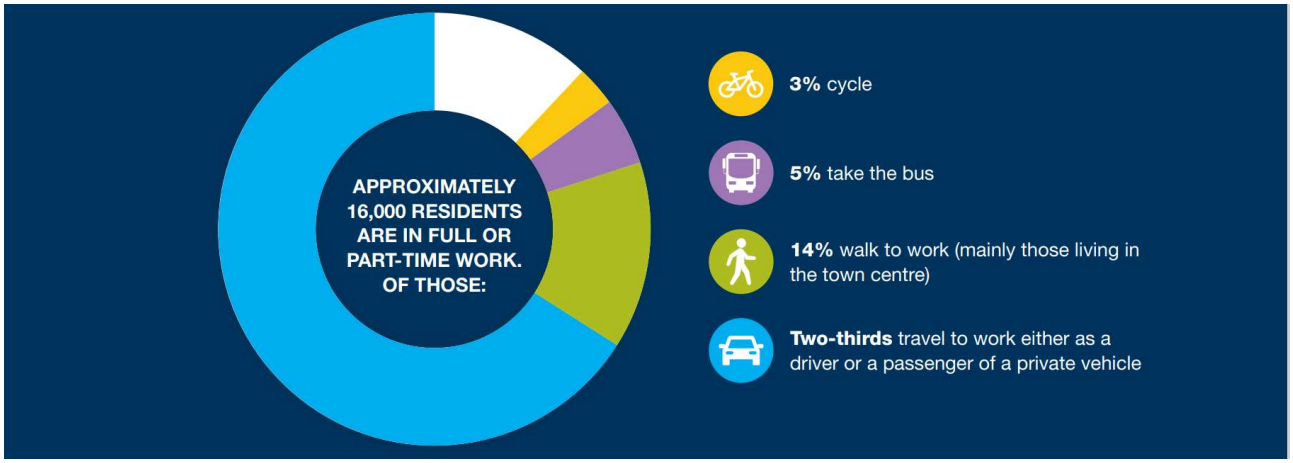

Figure 2-6: 2018 Census Journey to Work, Queenstown[6]

Given Queenstown's modest use of public transport, there are significant opportunities to be gained by enabling improved multimodal accessibility and providing greater transport choice.

Subsidised Public Transport Network

Queenstown's current public transport network comprises of five bus routes and a ferry service. Key details about this network are:

- The system has two hubs/bus interchanges at Frankton and Stanley Street (Queenstown).
- In November 2017 the bus routes were overhauled with a focus on trips that would contribute to reducing congestion, particularly on SH6A between the Queenstown town centre and Frankton.
- In parallel with the 2017 network changes, a $2 flat public transport fare structure and town centre parking charges were introduced representing carrot and stick incentives for public transport, respectively.
- Combined this saw a significant increase in bus patronage as shown in Figure 2-7; between November 2017 and 2018 there was a 236 percent increase (Bee Card data). This step-change in growth signifies there is a strong potential to have influence on travel behaviours when public transport is delivered in a way that is affordable and better aligned to users' needs.
- The ferry service is reported to be popular with 100 thousand trips made in the first ten months of operation (to October 2019). The ferry is primarily used by tourists.

[6] Way to Go, 2022. *Better Ways to Go – Queenstown Lakes District Mode Shift Plan*. item-2a-attachment-1-mode-shift-plan.pdf (qldc.govt.nz)

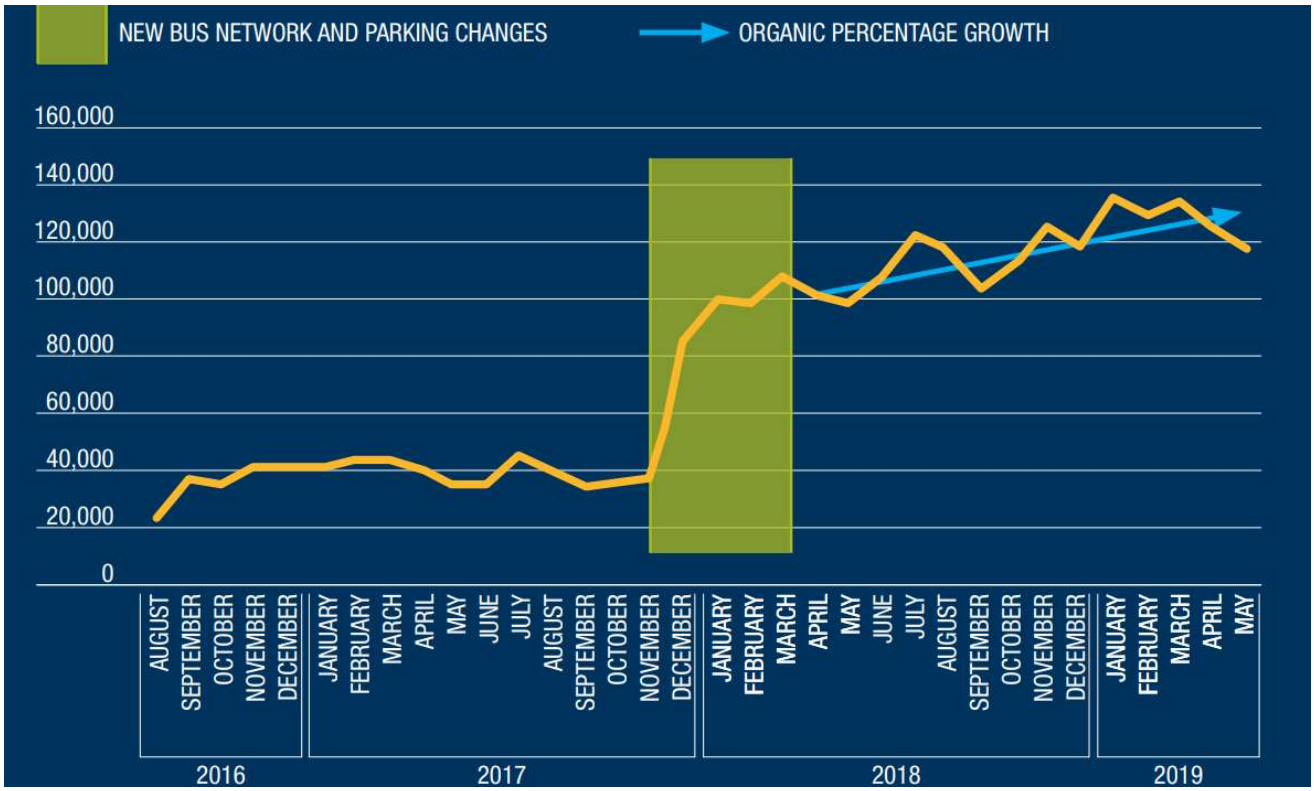

Figure 2-7: Whakatipu Basin Public Transport Patronage Growth[7]

More recently, bus use in Queenstown has surged in the post-COVID 19 period. Data released in early 2024 by Otago Regional Council reported 928,348 bus trips taken between July to December 2023. This is an increase of 44 percent compared to the same period in 2022 and represents patronage being at a six-year high. Use of ferry services has decreased however by 23 percent.[8]

Committed Infrastructure Funding

Funding commitments have been made for significant infrastructure investment in Queenstown:

- **Economic Stimulus Package** – a central Government partnership delivering the Queenstown Town Centre Street Upgrades ($35M Crown funding) and Town Centre Arterial upgrades Stage 1 ($50M Crown funding).[9]
- **Whakatipu Active Travel Network** – a programme of work to deliver an integrated active mode network, providing a genuine alternative to travelling by car.[10]
- **New Zealand Upgrade Programme (NZUP) Queenstown Package** - $115M Crown funding to provide dedicated public transport infrastructure including bus priority measures, bus lanes, bus hub improvements, intersection improvements, and pedestrian access improvements.[11] The full scope of this programme is currently under review.

This Strategic Case is designed to complement these investments to plan for the future of public transport so that the district is best placed to realise the benefits of infrastructure investment.

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[7] Way to Go, 2022. *Better Ways to Go – Queenstown Lakes District Mode Shift Plan.* item-2a-attachment-1-mode-shift-plan.pdf (qldc.govt.nz)

[8] Otago Regional Council, 2024. *Bus use on the rise in Dunedin and Queenstown.* Bus use on the rise in Dunedin and Queenstown (orc.govt.nz)

[9] New Zealand Government, 2020. *Queenstown infrastructure packed to bolster local economy.* Queenstown infrastructure package to bolster local economy | Beehive.govt.nz

[10] Queenstown Lakes District Council, 2023. *Whakatipu Active Travel Network.* Whakatipu Active Travel Network (qldc.govt.nz)

[11] Waka Kotahi NZ Transport Agency, 2023. *NZ Upgrade Programme Queenstown package.* NZ Upgrade Programme Queenstown package | Waka Kotahi NZ Transport Agency (nzta.govt.nz)

2.4 Social Context

Ageing Population

Statistics NZ Population projections expect the proportion of people aged 65 and over to triple in the next 25 years. Figure 2-8 shows the 2018 estimated and the 2048 projected (medium) age distribution for residents of the Queenstown Lakes District.

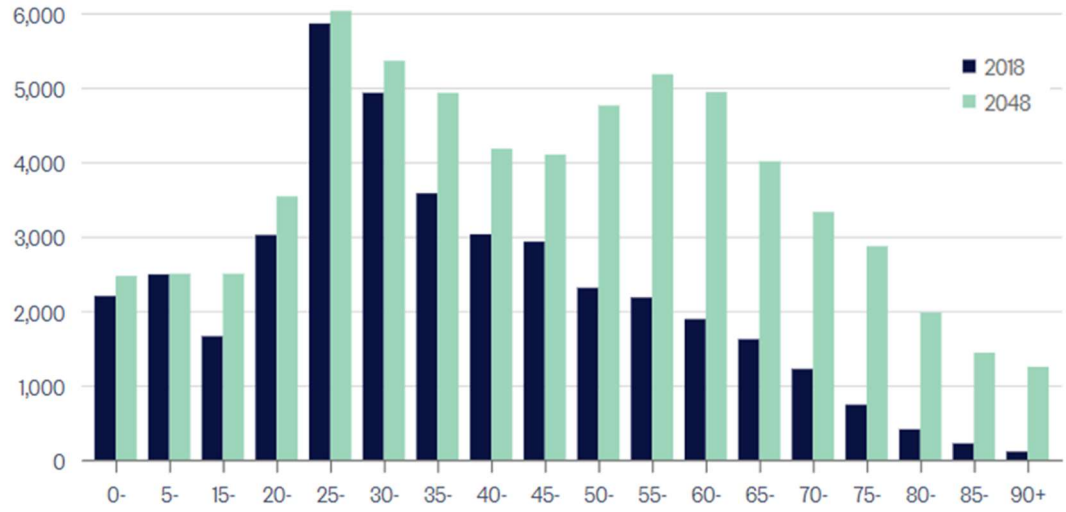


Figure 2-8: Estimated and projected age distribution, Queenstown Lakes District[12]

This demographic shift will have influence on the public transport demands. For example, people aged over 65 typically are more likely to travel during non-peak hours and typically have a higher reliance on public transport to provide their access requirements. As a result, there is expected to be increased demand for public transport, particularly off-peak services, in Queenstown.

Economic Environment

The tourism sector in Queenstown significantly contributes to the economy[13]. International visitors to Queenstown in 2019 made a substantial contribution of approximately $0.98 - $1.1B to the Gross Domestic Product (GDP) of the South Island.[14] Additionally, the Queenstown tourism sector accounted for approximately 64 percent of local employment in 2019. Notably, the local workforce in Queenstown is heavily reliant on migrant workers and holiday visa holders to meet the labour demands.[15]

This means that a significant proportion of people in Queenstown are transient and seasonal. In the context of public transport, such individuals are more likely to have higher dependency on public transport for several reasons, including:

- Lack of access to a personal vehicle
- Holding an overseas licence
- Coming from a country with well-established public transport systems and ingrained usage habits
- Employment as a low-wage worker with restricted resources
- Employment located in areas not well serviced by public transport, for example ski fields

[12] Statistics New Zealand, Estimates and Projections: Subnational population projections, by age and sex, 2018(base)-2048 2020. Estimated and projected age distribution in the Queenstown-Lakes District, New Zealand - Figure.NZ

[13] Tourism was 38 percent of Queenstown-Lakes District GDP in 2019 ecoprofile.infometrics.co.nz/Queenstown-Lakes%2bDistrict/Tourism/TourismGdp

[14] QLDC COVID-19 Recovery Intelligence Report May 22

[15] Submission to the Productivity Commission on the Immigration Inquiry, New Zealand Productivity Commission (2021)

3 DEFINING THE PROBLEM

Queenstown's transport problems are well documented in the studies and business cases preceding this project. This section sets out the process behind agreeing the problem statements, benefits statements, and investment objectives for the QPTBC.

A facilitated Investment Logic Map (ILM) workshop was held in October 2022 with representatives from Otago Regional Council, Queenstown Lakes District Council, and NZTA. The session began with a discussion framing the problems, key principles, and desired outcomes of the project from each organisation's perspective. The workshop participants then identified two problems relating to the key themes of **effectiveness** and **attractiveness** of public transport.

Following the workshop, the draft ILM was circulated to seek feedback. The Problem Statements were then refined incorporating feedback from the Way 2 Go (W2G) partners, peer reviewers and NZTA Investment Quality Assurance (IQA) team. Further refinement occurred before the Problem Statements and weightings for the QPTBC were finalised as shown in Figure 3-1.

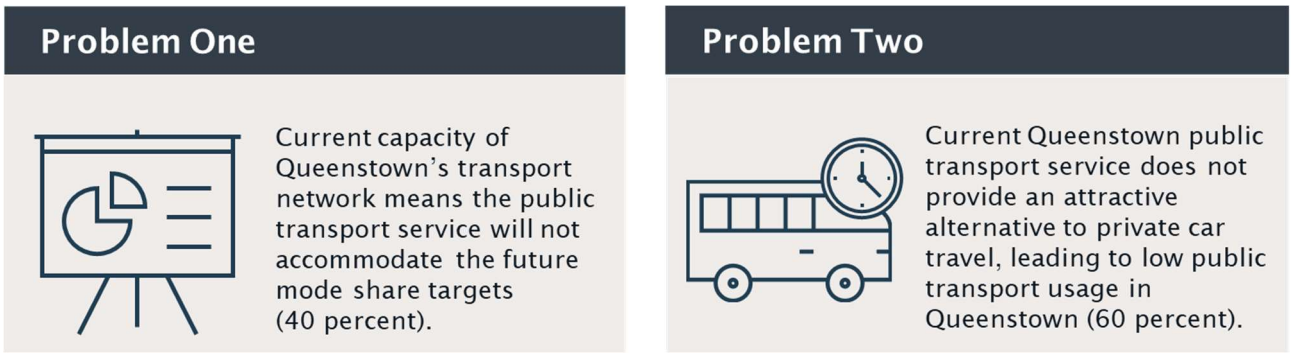


Figure 3-1: Problem Statements, QPTBC

The agreed ILM is shown in **Appendix A**. There is a strong link between the Queenstown PTBC problem statements and earlier Queenstown PBC as shown in Evolution of Statements in **Appendix A**.

3.1 Problem One

Problem Statement One relates to the effectiveness of public transport in the Whakatipu Basin. Project Partners confirmed Problem Statement One as:

> Current capacity of Queenstown's transport network means the PT service will not accommodate the future mode share targets (40%).

The evidence base for the causes and consequences of Problem Statement One are presented below.

Cause 1: The current public transport service is already at capacity

The current public transport network (bus) service capacity is estimated at 260 passengers per hour along SH6A[16]. Peak hour patronage data from 2021 (refer to **Appendix B**) shows the average number of passengers carried along SH6A was 199 people in the AM peak and 174 people in the PM peak. It is important to note this data is affected by the COVID pandemic as New Zealand's international border was closed in 2021. Therefore, with the return of international visitors, it is reasonable to assume that current patronage levels will be higher than reflected in the 2021 data.[17]

[16] See QPTBC Forecast Demand Advisory Paper

[17] Updated data (i.e. for 2023) was not available to include in this business case at the time of writing.

Additional pressure will be added to the current public transport network with the Ministry of Education (MoE) planning a staged discontinuation of most school bus services in Queenstown by 2025. Given that around 470 students presently rely on the MoE services, this change could lead to a substantial surge in demand for public transport services.[18]

Looking forward, public transport modelling[19] undertaken as part of this Strategic Case shows that, in order to maintain a functioning transport network in Queenstown, significant mode shift to public transport is required as shown in Table 3-1: Specifically, in the AM peak hour the number of people travelling by public transport on SH6A will need to be:

- 592 people by 2027
- 1,082 people by 2039
- 1,466 people by 2053

These numbers far exceed the current capacity of 260 people per hour.

Table 3-1: Public transport mode share required to maintain a functioning transport network

YEAR	ROUTE	AM PEAK HOUR		PM PEAK HOUR	
		PAX. / HOUR	PT MODE SHARE	PAX. / HOUR	PT MODE SHARE
2027	SH6A	592	27%	594	28%
	Shotover Bridge	323	18%	369	18%
	Kawarau Falls	186	11%	123	7%
2039	SH6A	1,082	40%	1,028	40%
	Shotover Bridge	514	25%	657	29%
	Kawarau Falls	1,033	40%	909	37%
2053	SH6A	1,466	47%	1,384	48%
	Shotover Bridge	772	34%	869	35%
	Kawarau Falls	1,687	53%	1,489	49%

Cause 2: The current roading network is also already at capacity

The roading network in Queenstown is also at capacity and struggling to cater for current demand, which is resulting in longer and more variable travel times for general traffic and public transport users. Congestion is experienced on SH6 and SH6A with the Annual Average Daily Traffic (AADT) on these roads more than 20,000 vehicle per day which exceeds the practical capacity of a two-lane road. As reported in the QBC, the practical capacity of SH6A was exceeded on 140 days in 2019.

By 2028, QBC modelling indicates that "average" conditions on SH6A will be similar to current peak travel times. Peak periods will experience regular gridlock with car and public transport travel times between Lake Hayes Estate and Queenstown regularly exceeding 60 minutes (compared to 15-20 minutes currently).

Bus trips are affected by the same congestion issues experienced by general traffic, as bus priority in Queenstown is limited. This congestion will impact the frequency and reliability of the Queenstown public transport network, limiting tourists from accessing key tourist spots and limiting residents from accessing important destinations such as employment, services, education, and

[18] See QPTBC Service Patterns Advisory Paper

[19] See QPTBC Forecast Demand Advisory Paper

social amenities. As an interim mitigation, NZTA has committed to deliver bus priority lanes on SH6 and SH6A through the NZ Upgrade Programme.

With no ability to build more capacity, it is imperative to make better use of the existing system to avoid these impacts. For Queenstown this means increasing public transport mode share, however (as evidenced in Cause 1), this is not possible without intervention.

Consequences

To enable the growth anticipated for Queenstown Lakes, it is critical that public transport mode share increases. However, the consequences of an already over-capacity public transport system and road network are deemed to be considerable barriers to achieving the required uplift in mode share and could have significant economic impact as shown in Figure 3-2.

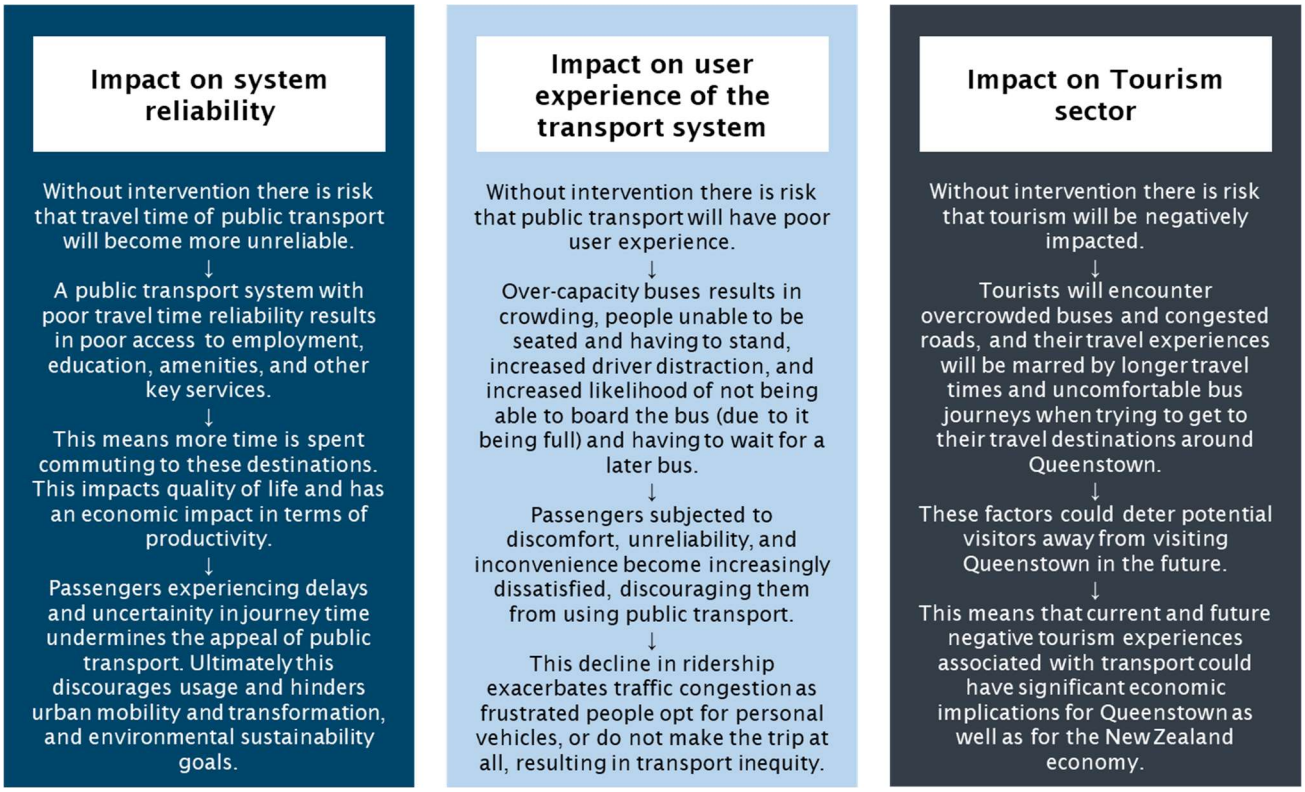


Figure 3-2: Consequences of Problem Statement One, QPTBC

Implications

The main implication of not addressing Problem Statement One is that public transport will become unreliable and will not reach the mode share targets required to maintain a functioning transport system. Consequently, the economic, environmental, social, and health effects of the problem will be exacerbated with the expected population growth in Queenstown. This will make it increasingly difficult for the District to achieve:

- Their carbon targets,
- The goals ofInāia tonu nei: a low emissions future for Aotearoa, and
- The vision of the Queenstown Lakes Spatial Plan.

3.2 Problem Two

Problem Statement Two relates to the attractiveness (both real and perceived) of public transport in the Whakatipu Basin. Project Partners confirmed Problem Statement Two as:

> Current Queenstown PT service does not provide an attractive alternative (reliability, directness, accessibility) to private car travel, leading to low PT usage in Queenstown (60%).

The evidence base for the causes and consequences of Problem Statement Two are presented below.

Cause 1: Poor Spatial Coverage of Existing Routes

Spatial coverage and connectivity are key factors in making public transport attractive and encouraging mode shift. In Queenstown, however, the current public transport system has limited spatial coverage and connectivity, resulting in an increased preference for driving over public transport with residents and visitors reporting the current network does not fulfil their needs as outlined below:

- Figure 3-3 shows the locations accessible currently via a 20-minute journey on public transport from either Stanley Street or Frankton Bus Hub without transferring. This shows the following locations are not accessible in 20 minutes: Quail Rise, the western end of Kelvin Heights, the southern end of Jack's Point and the route beyond Lake Hayes towards Arrowtown. These areas, Jack's Point in particular, are key growth areas for Queenstown.
- Residents have noted in the 2022 Quality of Life survey that the public transport routes are not aligned with their needs. For example, routes in Jack's Point, Remarkables Park, and Lake Hayes are circuitous and indirect, resulting in increased travel time.
- Mapping the existing network spatial coverage against the projected growth areas within the District reveals that the current challenges will intensify. The current network will not be sufficiently equipped to accommodate the increasing demand stemming from evolving land use, emerging development zones, and the anticipated population growth in the years ahead.
- In addition, many of Queenstown's key tourist destinations (for example The Playground, AJ Hackett Bungy, Coronet Peak Ski Area, Remarkables Ski Area, and many more) cannot be reached via existing public transport routes. Visitors (and employees) must either drive directly or use third party transport. This also results in a number of tourist coaches using space in Central Queenstown to collect passengers. There is an opportunity to reduce this through the public transport network providing greater connectivity to key destinations, for example bus services to the base of ski fields where passengers then transfer to a service operated by a tourism operator.
- Public transport provision has not kept pace with rapid development of new commercial and retail centres. This has led to a situation where 'Hawthorne Drive has bus stops but no buses, and the Frankton-Ladies Mile Highway has buses but no bus stops' (Queenstown Business Case). This reflects the need for an agile approach to providing public transport in the Whakatipu Basin that can respond as growth is realised.

Figure 3-3: 20-minute PT Catchment (one seat ride) from a Bus Hub[20]

Cause 2: Travel Time Penalties

In Queenstown, journeys made by private vehicle are typically faster than those made by public transport. Table 3-2 presents a comparison between journey times for trips made by private vehicle compared to trips made by public transport to the Queenstown town centre at peak hour. Notably, for all the five routes, travelling by private vehicle is shown to be faster. In some cases, public transport is estimated to take twice as long.

Table 3-2: Travel times of cars versus bus

ROUTE	DRIVE TIME (GOOGLE MAPS)	BUS JOURNEY TIME (TIMETABLES)
Frankton to Queenstown	9-14 minutes	15 minutes
Kelvin Heights to Queenstown	16-22 minutes	40 minutes
Jack's Point to Queenstown	16-22 minutes	45 minutes
Lake Hayes to Queenstown	16-22 minutes	30 minutes
Arrowtown to Queenstown	22-30 minutes	40 minutes

[20] Created with Google Earth as base map source

It is important to note that the times presented in Table 3-2 do not include the time for users of public transport to access the bus stop and wait for the service to arrive. Public transport users are further penalised when they are required to transfer between services, with some transfer times at Frankton Hub being as long as ten minutes. This further shows the travel time penalties associated with taking public transport.

Overall, this means that the relative attractiveness of public transport is decreased. This was reflected in the Quality of Life Survey presented in Figure 3-4 where from 2018 – 2022, residents increasingly disagreed that public transport was affordable, reliable, and frequent enough for their needs.

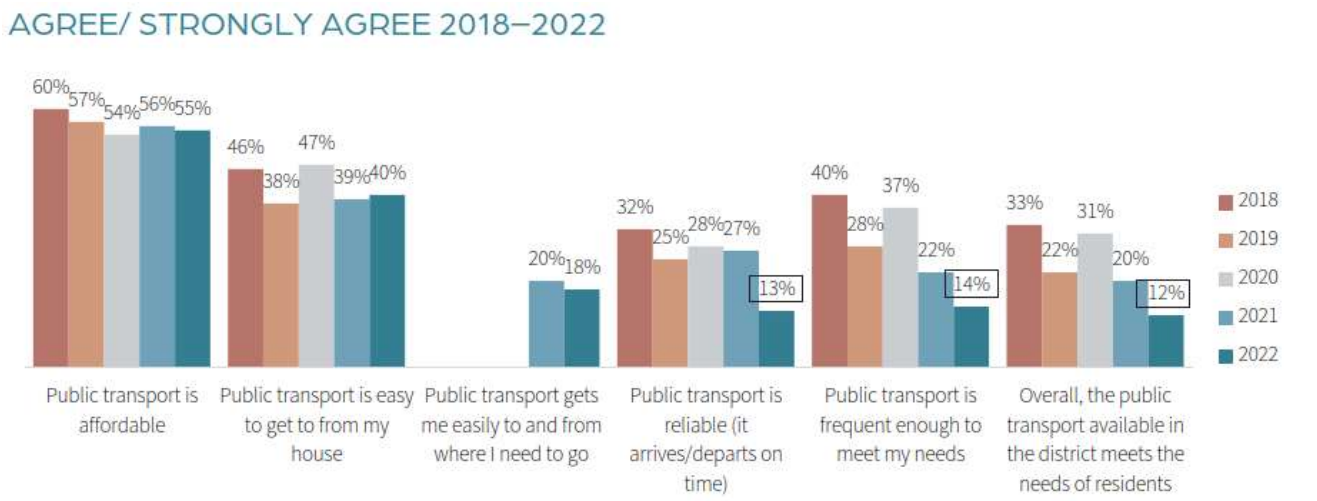


Figure 3-4: Survey results for indicators of public transport from 2018 – 2022[21]

Cause 3: Infrequent Services

Queenstown's bus and ferry system suffers from infrequent services, especially during off-peak hours, and lacks coverage in the early morning and late evening. These timetables fail to adequately meet the community's needs and do not provide an attractive level of service in Queenstown.

- The bus routes operate on intervals ranging from 30 to 60 minutes, except for Route 1 which runs every 15 minutes. Most services commence at 6:00 am and cease at 10:00 pm, with only Route 1 extending to midnight.
- Individuals with varied schedules and multiple destinations struggle to rely on infrequent public transport and it hinder commuters' ability to plan their journeys efficiently. This has been worsened in recent years due to service cancellations meaning people have been stranded and waiting for a long time for the next service to arrive.
- The lack of services before 6:00 am and after 10:00 pm present a significant barrier to many people, exacerbated by Queenstown's tourism-driven economy with diverse working hours.

Overall, the inability of public transport to meet the diverse travel needs of Queenstown's residents and visitors leads to a negative overall perception the system. This is pushing people toward more reliable transportation options. People then typically have an unwillingness to return to public transport without significant service improvements being made.

Cause 4: Poor Bus Stop Facilities

Residents have observed that the growth of tourists has placed pressure on current infrastructure and that infrastructure is insufficient to meet people's needs, for example, the lack of bus stops

[21] Quality of Life 2022 Survey Report, Queenstown Lakes District Council (2022)

especially close to accommodation (Quality of Life 2022 Survey Report).[22] Research shows that bus stops with the appropriate facilities are important in terms of improving a rider's experience and ridership.[23]

The quality of existing public transport facilities in Queenstown is limited and is consistent with public transport facilities provided historically across New Zealand, for example:

- Bus stops often lack signage, shelters, seating, and timetables/real time information
- Pedestrian access to bus stops is often via routes that are without the appropriate infrastructure such as kerb cutdowns, tactile pavers, and safe crossing points (particularly on high speed and high volume roads)

Appendix C provides more detail about five specific bus stop locations reviewed as a desktop study.

Improved facilities can be used to reduce disincentives or barriers for any potential new bus users. This is especially pertinent for users who are vulnerable or unfamiliar with public transport. A programme of works is underway by QLDC to provide shelters, lighting, bins, and bike racks but there is currently a lack of consistency across the network.

Figure 3-5: Example of bus stop - 672 Peninsula Rd, Kelvin Heights (August 2019)

[22] Quality of Life 2022 Survey Report, Queenstown Lakes District Council (2022)

[23] Why Bus Stops Matter, Transit Center (2018)

Consequences

To enable the growth anticipated for Queenstown Lakes, it is critical that public transport mode share increases and that there is a commitment to an agile public transport system that can change as growth is realised. However, the consequences of a public transport service that is considered unattractive will result in continued car dependency and emissions, social and transport inequity, and impacts on tourism as Queenstown grows, as shown in Figure 3-6.

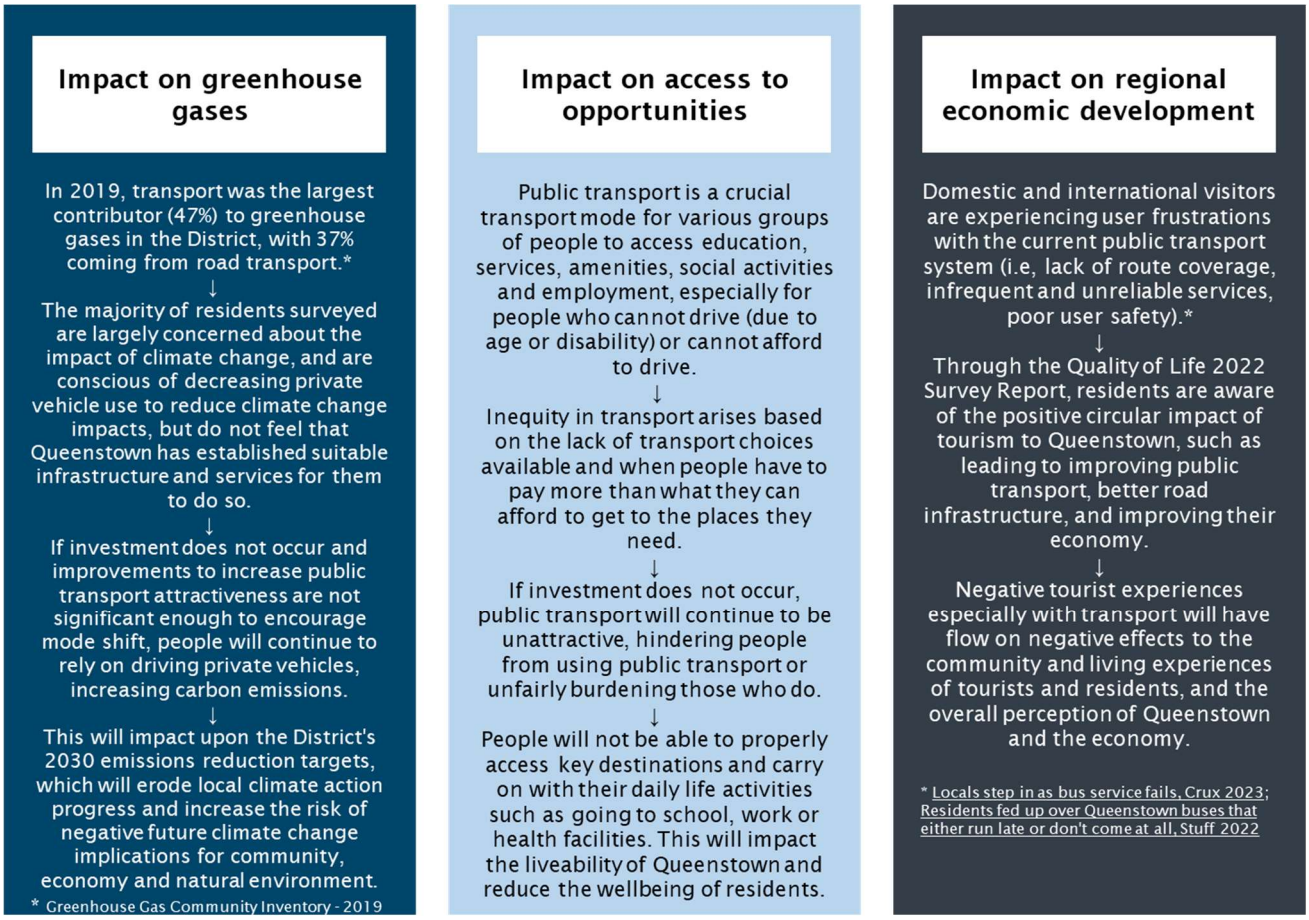


Figure 3-6: Consequences of Problem Statement Two, QPTBC

Implications

The main implications of not addressing Problem Statement Two are the barriers to public transport uptake in Queenstown Lakes will remain, and residents and visitors will continue to rely on single occupancy vehicles for daily travel. This will increase the accessibility-related challenges that the District is facing and people will miss out on economic and social opportunities as a result. This will make it increasingly difficult for the District to achieve:

- An attractive public transport network that meets the needs of the community,
- The goals of Māia tonu nei: a low emissions future for Aotearoa, and
- The vision of the Queenstown Lakes Spatial Plan.

4 STRATEGIC ALIGNMENT

Investment in Queenstown's public transport services aligns strongly with national, regional, and local policies, strategies, and plans as shown in Table 4-1.

Note (February 2024)

Table 4-1 represents government policy at the time of writing. It is however recognised that the national election in October 2023 resulted in a change in government and New Zealand is currently in a transition period with government policies anticipated to change. Alignment has therefore also been reviewed against *Transport for the Future* – The New Zealand National Party's transport programme (released July 2023) as an interim indication of government policy.

The QPTBC strongly aligns with the headline objectives of *Transport for the Future* of:

- **Reducing congestion**: It is well documented that the key to reducing congestion in Queenstown is through moving more people in fewer vehicles. Improving the attractiveness and reliability of public transport will make this mode of transport a viable option for more people and reduce their reliance on cars for their daily travel.
- **Providing more low emission transport options**: Through transitioning the public transport network to a lower carbon system, this provides people a low emission transport choice.
- **Unlocking land for housing**: To enable the housing growth anticipated for the Whakatipu Basin, whilst retaining a transport network that is functional, it is critical that more journeys are taken in a smaller number of vehicles (i.e. shared transport) as supported by the QPTBC investment.

The QPTBC also supports the benefits realisation of the Queenstown Package, a project that *Transport for the Future* committed to continuing. This investment will likely struggle to fully realise benefits without improvements to the public transport services, i.e bus lanes with few buses. This means there is risk of the Queenstown Package investment being underutilised if this QPTBC is not progressed. This Business Case both maximises existing investment and relies upon it to make this investment in public transport services worthwhile.

Finally, government policy will not change the need for a significant improvement in public transport in the Whakatipu Basin. It is widely acknowledged that there are limited other options because of the inability to expand the strategic road network due to the topographic and property constraints. This is compounded by Queenstown growing in population rapidly which puts further pressure on existing transport infrastructure.

Table 4-1: Alignment of QPTBC with Key Strategies, Policies, and Plans

DOCUMENT	ALIGNMENT	
NATIONAL		
Te Tauākī Kaupapa Here a te Kāwanatanga mō ngā waka whenua | Government Policy Statement on Land Transport 2021	 HIGH	The QPTBC aligns with the Government Policy Statement (on Land Transport) 2021 by supporting the GPS strategic priorities of: • *Better Travel Options* – the focus of the project is to provide enhanced viable and attractive public transport choices for people in the Whakatipu Basin. • *Climate Change* – through providing transport choice this enables mode shift from private vehicle trips to zero-, or lower-, emission public transport trips which will reduce emissions and VKT.
Te Tauākī Kaupapa Here a te Kāwanatanga mō ngā waka whenua | Government Policy Statement on Land Transport 2024 (draft)	 HIGH	The QPTBC aligns with the draft Government Policy Statement (on Land Transport) 2024 by supporting the GPS strategic priorities of: • *Reducing emissions* – investment in the public transport network is crucial to transitioning Queenstown to a lower carbon transport system that provides affordable, accessible, and low-emission choices. • *Sustainable urban and regional development* – a reliable and frequent public transport network is key to managing road congestion and supporting housing and urban growth in the Whakatipu Basin.
The Living Standards Framework 2021	 MEDIUM	The Treasury Living Standards Framework enables consideration of policy impacts on the dimensions of wellbeing in a systematic and evidenced way. The QPTBC aligns with this framework through enabling an efficient and equitable public transport system in Queenstown. In turn this will contribute to individual and collective wellbeing through enabling communities to have safe access and reliable connections to key services, employment, and amenities.
Ināia tonu nei: a low emissions future for Aotearoa (2021)	 HIGH	The QPTBC supports the Climate Change Commission's advice to reduce emissions and transition to a low-emissions Aotearoa. It does this by helping people reduce their need to travel by single occupancy vehicle through improving peoples' access to active modes and public transport and encouraging these low emissions transport options over private vehicle use in Queenstown.
Te hau mārohi ki anamata | Aotearoa New Zealand's first emissions reduction plan (2022)	 HIGH	The emissions reduction plan is a commitment to a low-emissions, climate-resilient economy with a transition to net zero emissions by 2050 that is equitable for everyone. Key actions for the transport sector that the QPTBC supports are: reducing reliance on cars; and supporting people to use public transport and active modes with the intent of reducing carbon emissions.
Toitū Te Taiao | Our Sustainability Action Plan (2020)	 MEDIUM	This plan is shaped by the Avoid – Shift – Improve model: avoid/reduce reliance on private motor vehicles through integrated land use and transport planning; shift the travel of people and freight to low-emission modes, public transport, active and/or shared transport modes; and improve the energy efficiency of the vehicle fleet. The QPTBC aligns with the public transport elements of this plan.
NZTA Keeping Cities Moving (2019)		Keeping Cities Moving is a plan to improve travel choice and reduce car dependency in six high growth urban centres, one of which is Queenstown. Keeping Cities Moving and the QPTBC share the same goal to transition away from car-centric infrastructure and develop public transport in Queenstown through public transport investment.

	HIGH	
To Tātou Mahere mō te pūnaha waka whenua | Arataki (V2)	 HIGH	The QPTBC aligns with the Arataki 30-year focus in Ōtākou / Otago to encourage increased use of public transport to support urban development and thriving communities in Queenstown (and Dunedin). Arataki lists the most important issues to be resolved in the next decade in Ōtākou / Otago, with the first listed important issue being: • *Begin to reduce vehicle kilometres travelled, focusing on Tāhuna Queenstown and Ōtepoti Dunedin, in a way that's equitable and improves people's quality of life.* The QPTBC is a key strategic response to this issue.
REGIONAL		
Otago/Southland Regional Public Transport Plan (2021 - 2023)	 HIGH	The QPTBC aligns with the vision and the four objectives of the RPTP in terms of providing an inclusive, accessible, and attractive and integrated public transport system in Queenstown that promotes mode choice, reduces congestion and carbon emissions through mode shift, is affordable and adapted to future land use and traffic demand.
Otago Southland Regional Land Transport Plan (2021 - 2023)	 MEDIUM	The QPTBC supports the RLTP Strategic Objective 3 (Connectivity and Choice), Objective 4 (Environmental Sustainability) and Objective 5 (Future Focused). Creating genuine mode choice (which the QPTBC seeks to deliver) is listed as one of the 10-year priorities in the RLTP with specific reference to investment in multi-modal transport options.
LOCAL		
Better Ways to Go (2022)	 HIGH	Better Ways to Go is the mode shift plan for the Queenstown Lakes District. The QPTBC aligns with Better Ways to Go by investing in Public Transport to accommodate for growth and increasing mode share of active travel and public transport.
Queenstown Town Centre Masterplan (2017) & Frankton Masterplan (2020)	 MEDIUM	The QPTBC is aligned with these Masterplans, seeking to present public transport services that will improve the overall experience, liveability and meet future demand.
Grow Well | Whaiora Spatial Plan (2021)	 MEDIUM	The Queenstown Lakes Spatial Plan documents the vision and framework to align decision-making for the Queenstown Lakes District. The QPTBC uses the Spatial Plan as the basis for growth projections underpinning the business case and supports the overall vision of the Spatial Plan.
Queenstown Lakes District Climate and Biodiversity 2022 - 2025	 MEDIUM	The plan outlines the District's response to Climate Change. Transport is considered a key challenge with the plan listing ten actions that together seek to achieve a transport system that is low-emission and better connected. The QPTBC aligns with the public transport elements of this plan.

5 BENEFITS AND INVESTMENT OBJECTIVES

Benefits of Investment

The benefits of successfully investing to address the problems were identified and agreed by Project Partners as part of the ILM workshop in October 2022. The workshop participants identified and agreed to the following benefits and associated weightings:

- Improved public transport mode choice (40 percent)
- Improved access to economic and social destinations (40 percent)
- Reduced emissions from land transport (20 percent)

The above benefits were re-confirmed again at a subsequent workshop on 16 May 2023.

Investment Objectives

From the Problem Statements, evidence gathered, and identified Benefits of Investment, three Investment Objectives were developed and agreed with Project Partners. The Investment Objectives developed for the Queenstown Public Transport Business Case are shown in Figure 5-1.

Figure 5-1: Investment Objectives, QPTBC

The Investment Objectives outlined above will be used throughout the options assessment phase (the Economic Case) as a basis for assessing how proposed solutions or options align with the desired outcomes of the QPTBC.

Critical Success Factors

Critical Success Factors for this business case were also agreed with Way to Go partners. The Critical Success Factors are:

- Capacity (to accommodate targeted mode share)
- Implementability (is the infrastructure required within the scope of this business case)
- Consentability (for infrastructure required)
- Emissions (ability to meet zero tailpipe emission requirement for public transport vehicles)
- Readiness (is there sufficient technological and support within required timescales)

These Critical Success Factors will also guide the assessment of options through the Economic Case.

Key Performance Indicators

Table 5-1 maps the alignment of the potential benefits to Key Performance Indicators (KPIs) and the NZTA Land Transport Benefits Framework (LTBF). Further details for each KPI, in terms of the measurement method, baseline and expected results are detailed for the Preferred Option in the Management Case.

Table 5-1: Draft Outcomes and Key Performance Indicators Mapping

BENEFITS	INVESTMENT OBJECTIVE	LAND TRANSPORT BENEFITS FRAMEWORK (LTBF)	KPIS / MEASURES	TARGET
Improved public transport mode choice	Increase public transport patronage and mode share in Queenstown to maintain a functional network	8.1.2: Mode Shift from Single Occupancy Private vehicles	KPI 1: Increased mode share/mode shift from single occupancy private vehicles	Increase mode share by 2053: - Southern Corridor: 50%; - Eastern Corridor: 35%; - Western Corridor: 48%
		5.1.3: Travel time delay	KPI 2: More reliable journey times for public transport	Journeys by public transport are equal in duration, or faster than, travelling by private vehicle.
Reduced emissions from land transport	Reduce public transport CO_2 emissions in Queenstown to meet Government policy	8.1.1: CO_2 emission	KPI 1: CO_2 emissions	Reduce public transport CO_2 emissions by 100% by 2035
		8.1.3 Light vehicle use impacts	KPI 2: VKT reduction	Reduce VKT by 20% by 2035.
Improved access to economic and social destinations	Increase the number of jobs and social destinations accessible by public transport in line with Queenstown spatial planning	10.3.1: Access to key social destinations	KPI 1: Jobs accessible within 20 minute trip on public transport	Jobs accessible within 20 minute trip on public transport increases by 20% by 2053
			KPI 2: Destinations accessible within 30 minute trip on public transport	Destinations accessible within 30 minute trip on public transport increases by 20% by 2053.

6 UNCERTAINTIES LOG

The role of the Uncertainty Log is to identify areas of uncertainty that exist in the context of the QPTBC that may be within the sphere of influence of the Business Case. The Uncertainty Log includes the assumptions made that might influence the understanding of the Problem Statements and which may affect the effectiveness and feasibility of the alternatives and options developed (refer to the Economic Case).

The initial project risks and uncertainties identified through the development of the Strategic Case are outlined in Figure 8-1. These will be further explored through the Business Case.

Table 6-1: Uncertainty log - QTBC

FACTOR	COMMENTS
Scale of growth is higher than anticipated	This may result in key road links being at capacity sooner than expected, increase in the number of private vehicles used, increased pressure on public transport demand and impact mode share targets. **Mitigation:** Include sensitivity testing for growth assumptions to confirm the Preferred Option is deemed to offer the best overall value and economic advantage compared to the alternatives.
Constrained road space	There is limited road space for which to cater for private vehicles and road-based public transport (buses). Infrastructure improvements such as bus lanes, bus priority, road widening or an off-line public transport system are beyond the scope of this business case. **Mitigation:** Apply NZTA Early Appraisal Sifting Tool in the Economic Case to assess the alternatives and options and remove any that are out of scope or fatally flawed.
Legislation and policies developing or changing simultaneously/ faster than the development in the QPTBC	Change in policies may cause changes in transport investment. This may impact the strategic direction of this project. **Mitigation:** Demonstrate a strong case for investment. Monitor changes.
Price escalation due to inflation	Inflation may impact costs set out in the Financial Case. **Mitigation:** Cost estimate to be undertaken by a QS with appropriate contingencies applied based on current and anticipated market behaviours (trends) to account for cost escalation.
Influence and interactions with other related projects and developments	Policy / legislation development outside of the QPTBC may impact business case outcomes (for example MoT Congestion Charging). **Mitigation:** Demonstrate a strong case for investment. Monitor changes.
Unable to acquire land and/or resource consents	Queenstown's topography is challenging with less opportunities to acquire suitable flat land e.g., SH6 next to Lake Whakatipu. **Mitigation:** Early conversations with landowners and maintain frequent and transparent communication. Complete pre-application meeting(s) to understand the likely consent requirements / constraints.
Programme partners not aligned with overall business case goals	ORC, QLDC and NZTA have investment / business case interests in this business case and are coordinated through the W2G partnership. **Mitigation:** Oversight of this partnership is provided by the W2G Partnership Governance Group which acts to provide confidence in well-aligned delivery of the W2G programme.
Disagreement from community during consultation	This could result in potential impacts to programme and reputation or organised opposition to emerging Preferred Option.

	Mitigation: Regular and targeted consultation with key parties to understand concerns.
Demand may be different than forecast i.e MoE school patronage; NZUP	Assumptions have been made regarding the NZUP Package in the modelling methodology. Modelling does not specifically cover school bus patronage. These factors could influence model outputs and may change the requirements of the transport response. **Mitigation:** Include sensitivity testing for patronage to confirm the Preferred Option is deemed to offer the best overall value and economic advantage compared to the alternatives.
Travel and waiting time reliability	Impacts the level of confidence that customers have in the reliability of Queenstown public transport network which impacts public transport uptake. **Mitigation:** Include sensitivity testing for public transport uptake to confirm the Preferred Option is deemed to offer the best overall value and economic advantage compared to the alternatives.

7 THE CASE FOR CHANGE

- In the face of population growth that will double in the next thirty years, tourism growth, worsening traffic congestion, and pressing environmental concerns, the need for significant investment in public transport has never been more critical in Queenstown.
- Queenstown currently stands at a crossroads, where a congested network needs rapid intervention through a mode shift to non-car modes. Investing in robust public transport services is a pivotal step towards supporting a sustainable, efficient, and more accessible Queenstown that will thrive in the future and bring economic benefits to the region and Aotearoa New Zealand.
- There is also a risk of not acting – which may cause Queenstown to stagnate resulting in poor liveability for residents, and negative economic and reputational outcomes for the area and the rest of New Zealand. Visitor feedback already indicates that traffic congestion is the single biggest negative in an otherwise very highly regarded visitor destination with the consequent risk of Queenstown being bypassed by visitors, and associated impacts for NZ Inc.
- Significant investment has already been committed to infrastructure improvements in the Whakatipu Basin. This provides the opportunity to review public transport services and ancillary infrastructure in line with the committed infrastructure improvements to make the best use of this investment.
- This Strategic Case demonstrates a clear case for change.

PART B: ECONOMIC CASE

8 OPTIONS DEVELOPMENT AND ASSESSMENT

The Economic Case is the second of the five Cases. The purpose of the Economic Case is to identify and assess options to address the problems and opportunities for public transport in the Whakatipu Basin. The analysis builds on the Case for Change and evaluates how options will help achieve an effective and attractive public transport system. The Economic Case:

- **Outlines the 'do minimum' base case.** As a benchmark to compare and assess options, the 'do minimum' base case assumes no additional investment beyond what has already been committed and/or funded. It assumes maintaining the status quo service levels and, while it is not a 'do nothing' scenario, it can be described as a 'do nothing beyond current practice' scenario.
- **Summarises the approach to option development.** The options development process adopted for this Business Case is consistent with the NZ Transport Agency Waka Kotahi (NZTA) guidelines, intervention hierarchy, and optioneering process, which encourages making best use of the existing system, and then considering what new infrastructure might be needed to ensure that the Whakatipu Basin public transport services and network are fit for its growing future role.
- **Presents the Long List assessment.** The Long List was split into two sub-lists. The first considered service pattern options, building on the previous work presented in the Queenstown Business Case. The second sub-list considered technologies to decarbonise the public transport system. Each sub-list was assessed via a Multi-Criteria Analysis (MCA) process with Subject Matter Expert (SME) input and Partner decision conferencing to produce a short list for further consideration.
- **Presents the Short List assessment and identifies an emerging preferred solution.** The emerging preferred solution was found by evaluating the Short List via an MCA process with SME input and Partner decision conferencing. This confirmed the 30-year investment plan best aligned with the need for an effective and attractive public transport system is to operate an enhanced Bus Max service pattern (the 'Composite' option) with battery electric vehicles (buses and ferries).

To support the QPTBC, eight Advisory Papers were prepared, which provide details on the critical components of the public transport assessment. These are:

- **Advisory Paper 1 – Forecast Demand**, which discusses the Spatial Plan for future land growth, land use characteristics, and how this will inform land use and travel demand changes.
- **Advisory Paper 2 – Fleet Decarbonisation**, which describes the relevant transport and emissions policies and how they relate to the Project, the benefits/disbenefit of slow or fast fleet decarbonisation implementation and potential technologies for decarbonising the public transport system.
- **Advisory Paper 3 – Service Patterns**, how the public transport network should best meet future demand over the next 30 years through different bus types and service patterns options. The Service Patterns Paper develops a long list of service patterns, undertakes an initial assessment, and recommends a short list of service patterns for further development and assessment.
- **Advisory Paper 4 – On-Demand Services**, which identifies the potential for on-demand services to be included within Queenstown's proposed public transport network for areas that cannot be easily served by services on the fixed bus route network.
- **Advisory Paper 5 – Public Transport Hubs and Infrastructure**, which describes the staging and life of the Frankton and Stanley Street bus hubs and a new bus depot taking into consideration forecast fleet numbers, alongside other infrastructure requirements.

- **Advisory Paper 6 – Park and Ride**, tests the options for park-and-ride sites as part of Queenstown's future public transport network and how these can complement fixed route services.
- **Advisory Paper 7 – Ownership and Operating Model**, which covers changes that could be adopted in the future to existing ownership and operating models.
- **Advisory Paper 8 – System Management**, which covers what resources, systems and ongoing maintenance are required to deliver the step change in upgraded service and whether these proposals are deliverable.
- **Advisory Paper 9 – Sustainable Funding**, which sets out the appropriate funding mix from ratepayers, central government, and other alternative sources of revenue, including parking and developer/third party contributions.

Other reports and memorandums provided for reference are:

- **Short List Options Engagement Report**, which presents the results from the public consultation and engagement on the short list of bus network of options.
- **Economic Assessment Methodology**, which outlines in detail the methodology applied to undertake the economic assessment of bus network options.
- **Capital Cost Estimate Memorandum**, which describes the methodology and assumptions applied to estimate capital costs of implementing the preferred bus network option.
- **Operating Cost Estimate Memorandum**, which describes the methodology and assumptions applied to estimate operating costs of implementing the preferred bus network option.

This Business Case has been prepared in accordance with the NZTA guidelines.

8.1 Do Minimum

The Do Minimum is the scenario that all other options were assessed against. In confirming the Do Minimum with the Project Partners, both Treasury and NZTA guidance on how to define the Do Minimum were considered. In this case, the Do Minimum scenario defines what the public transport services, and wider transportation network, will look like and how they will perform with no additional investment beyond what has already been committed and/or funded.

In accordance with the NZTA Monetised Benefits and Costs Manual (MBCM), the Do Minimum does not take advantage of further change opportunities that may arise, such as the introduction of additional services or decarbonisation technologies. However, it should not be confused with a 'do nothing', as maintaining the current arrangements will have consequences and incur costs. Essentially, the Do Minimum scenario involves maintaining the status quo service levels and, while it is not a 'do nothing' scenario, it can be described as a 'do nothing beyond current practice' scenario.

The agreed assumptions for the Do Minimum for this Business Case are shown in Figure 8-1, aligned with the three pillars of investment documented in the Queenstown Business Case (QBC).

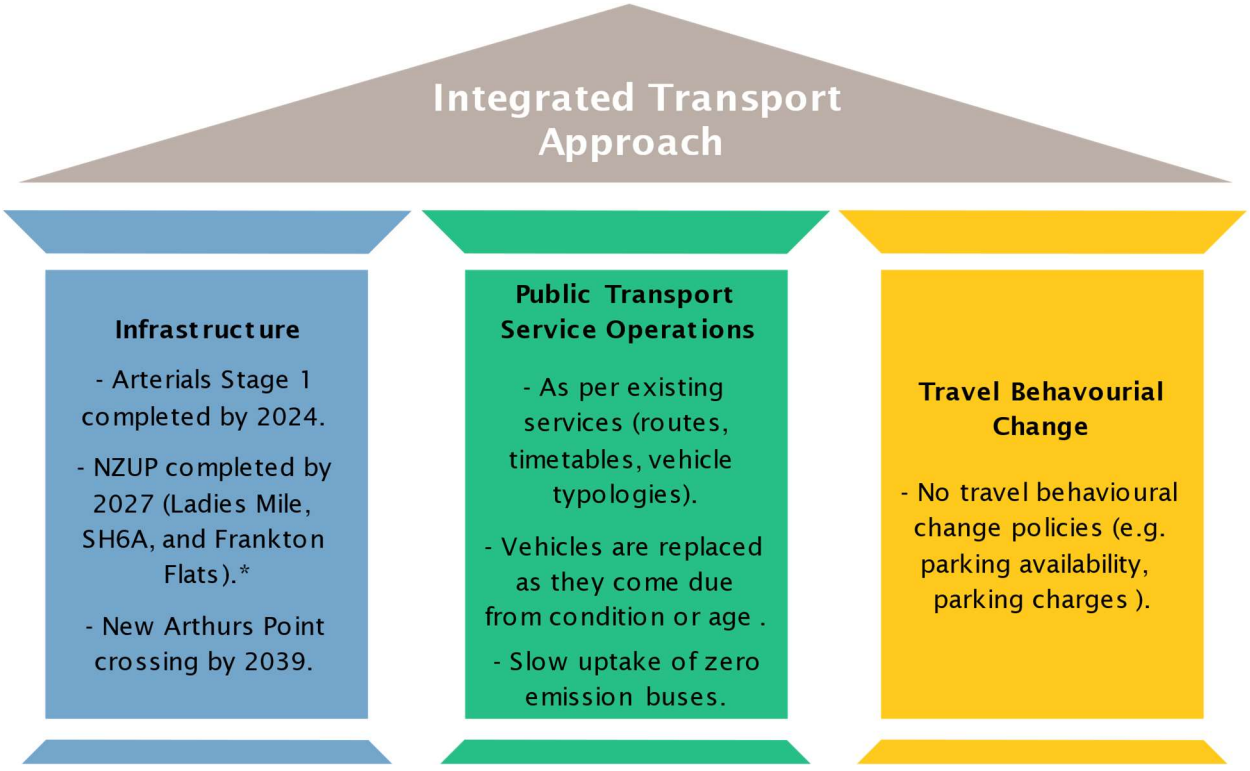


Figure 8-1: Do Minimum Assumptions, QPTBC

**Note: NZUP Queenstown Package has committed funding. However, due to the rising costs, the scope and timing of NZUP is understood to be confirmed in Quarter 1 2024.*

8.2 Options Identification

8.2.1 Intervention Hierarchy

This Business Case was developed considering a range of alternatives and options that seek to resolve the problems identified in alignment with NZTA's Intervention Hierarchy (Figure 8-2).

Figure 8-2: NZTA Intervention Hierarchy[24]

Integrated Planning

The Strategic Case detailed the numerous national, regional, and local policies and plans that have led to the development of this Business Case, including:

- Government Policy Statement on Land Transport
- Aotearoa New Zealand's Emissions Reduction Plan
- Arataki (v2)
- Keeping Cities Moving and Better Ways to Go
- Otago Southland Regional Public Transport Plan
- Otago Southland Regional Land Transport Plan
- Queenstown Lakes Spatial Plan
- Queenstown Lakes Climate and Diversity Plan
- Queenstown Business Case

Explicitly highlighted within these strategic documents is an absolute need to increase the mode share of public transport in the Whakatipu Basin as a key enabler of future growth. Consequently, the investments proposed through this Business Case are seen as the strategic response to many of these policies and plans.

The current, and future, congestion and capacity constraints on the transport network must be addressed if the outcomes being sought through the integrated land use planning that is underway

[24] New Zealand Government, Te Manatū Waka, 2023. Te Tauākī Kaupapa Here a te Kāwanatanga mō ngā waka whenua | Draft Government Policy Statement on land transport 2024/25-2033/34. Retrieved 17 August 2023 from Draft-Government-Policy-Statement-on-land-transport-2024.pdf

are to be achieved. To this end, this Business Case does not seek to reduce travel demand through integrated planning. Instead, its primary focus is on facilitating significant mode shift towards public transport as land use changes are realised in Queenstown. The options developed through this Business Case will consider how public transport can become more viable for a wider range of potential users through service changes and/or infrastructure enhancements.

Demand Management

Public transport is a critical component of promoting transport choice and reducing carbon emissions. This Business Case is being developed, in part, to determine the necessary public transport response resulting from broader demand management initiatives (planned or anticipated) aimed at reducing private vehicle travel. This Business Case aims to both increase the demand for public transport journeys by enhancing its attractiveness as a mode of choice, and to provide the necessary capacity to accommodate the mode shift that those wider demand management programmes and policies create. This will go some of the way to keep people and freight moving.

Best Use of the Existing System

The primary focus of this Business Case is to make **best use of the existing** (and committed) **system** to ensure that the Whakatipu Basin public transport services and network are fit for its growing future role. Increasing public transport services will make best use of the existing road infrastructure as more people are able to be moved with fewer vehicles.

New Infrastructure

Limited new infrastructure is proposed in this Business Case. The NZUP Queenstown Package already commits significant public transport infrastructure investment in the Whakatipu Basin. It is therefore the role of this Business Case to build onto the existing programme of works to fulfil the next step envisioned by the NZUP investment (i.e. to deliver the buses for the bus priority).

"…it's looking closely at how to best use buses and ferries and the investment decisions we'll all need to make over the next 15-plus years." – ORC Transport Manager, September 2023

8.2.2 Options Identification Methodology

The Whakatipu Basin public transport network is a complex system. The complexity is due to:

- The high degree of geographical and topographical constraints, influencing the historical and future development of the transport network and land use patterns.
- The presence of multiple interconnected projects currently being investigated or implemented in the Whakatipu Basin that will shape travel behaviours.
- Significant growth projections and new growth areas, particularly in the Southern Corridor.
- Fiscal challenges locally and nationally with significant systemwide investment required to achieve the required non-car mode share to get Queenstown moving.
- The limited timeframe available to make system changes to achieve the headline mode share targets before the network congestion will have significant economic, environmental, and social impacts.
- The various roles and responsibilities of all parties involved in delivering a quality public transport service in the Whakatipu Basin for residents and visitors.

Therefore, a detailed transport planning approach, which considers the three pillars of investment (infrastructure, public transport service operations, and travel behaviour change) in a holistic way was required to develop the long list. Specifically, the long list for this Business Case was developed through a dual-track process that involved the creation of two sub-lists in parallel.

- The first sub-list considered **service pattern** options, building on the previous work presented in the QBC. The objective was to identify the most suitable service routes, vehicles, and service frequencies, based on new Spatial Plan projections, to meet the projected demands of the local population and visitors in a way that is effective and attractive.
- The second sub-list considered **technologies to decarbonise** the public transport system. The objective was to identify technologies and solutions to minimise the environmental impact of the public transport system. Each technology was evaluated in terms of its feasibility, readiness for implementation, cost-effectiveness, health and safety, and potential to reduce carbon emissions.

Each sub-list was assessed via a Multi-Criteria Analysis (MCA) process with Subject Matter Expert (SME) input and partner organisation decision conferencing to produce a short list for further consideration.

This systematic approach, involving the concurrent development of these two sub-lists, positioned this Business Case to deliver an investment plan for a public transportation system that not only adapts to the evolving demands of the Whakatipu Basin's community, but also plays a substantial role in making meaningful progress towards decarbonisation commitments.

For completeness, aspects of the system that were out of scope for this Business Case are:

- Review of pricing mechanisms (such as public transport fares and parking charges)
- Development of a travel demand management (TDM) implementation plan
- Off-line options for public transport, other than to recommend when an off-line service should be investigated
- Development of a new strategic public transport model
- Detailed planning (e.g. bus stop locations) for new development proposals

8.2.3 Long List - Service Patterns

The long list options for Service Patterns were identified through a five-step process:

- Review previous business case work.
- Forecast public transport demand forecasts.
- Agree service design principles.
- Assess fleet options.
- Develop long list for service patterns.

This Economic Case provides a high-level summary of these steps. Full detail is provided in **Advisory Paper 3 –Service Patterns**.

Step One: Review Previous Business Case Work

An extract of the Preferred Option of the Queenstown Business Case is included below.

Meeting public transport demand will be undertaken through road based public transport priority, expansion of the bus network and an upgrade of the bus fleet… The strategy is for a road-based solution with vehicles increasing in scale over time from the current single-decker bust fleet to environmentally friendly (electric or hybrid) articulated vehicles… aimed at delivering a step change in high quality, high-capacity services… This will require a staged fleet upgrade over time and future investment in new depot facilities to provide for the expanded fleet.
Queenstown Business Case – Preferred Option Assessment (November 2020).

The proposed network, referred to as "Bus Max", which uses three high-capacity routes on SH6A heading to Jack's Point, Ladies Mile/ Lake Hayes, and Arrowtown (Figure 8-3). The key features are:

- Routes 1-3 inter-time on SH6A to provide a 3-4 minute peak frequency, and 5 minute all day frequency service between Queenstown and Frankton Hub
- Largely a one-seat ride to minimise end-to-end journey times (and transfers)
- Frequent services 6am to midnight on all routes
- Limited midnight to dawn services to provide 24/7 service
- High-capacity vehicles on routes 1, 2, and 3
- Public transport priority on SH6 East, SH6 South, and SH6A

The QBC developed the Bus Max concept to an Indicative Business Case level and therefore the concepts were expanded on during this Business Case, which included checking the validity of the previous work done against the new Spatial Plan forecasts.

The QBC explored road-based infrastructure improvements in detail, which resulted in proposed interventions of an arterial route around Queenstown town centre and public transport improvements (through NZUP) on SH6 and SH6A. Given the constrained network, the next logical infrastructure would be an off-line public transport system, which should be in place before a bus-based system reaches capacity. This is being considered as a separate study, with feasibility study funding being sought by NZTA for the 2024-27 National Land Transport Programme (NLTP).

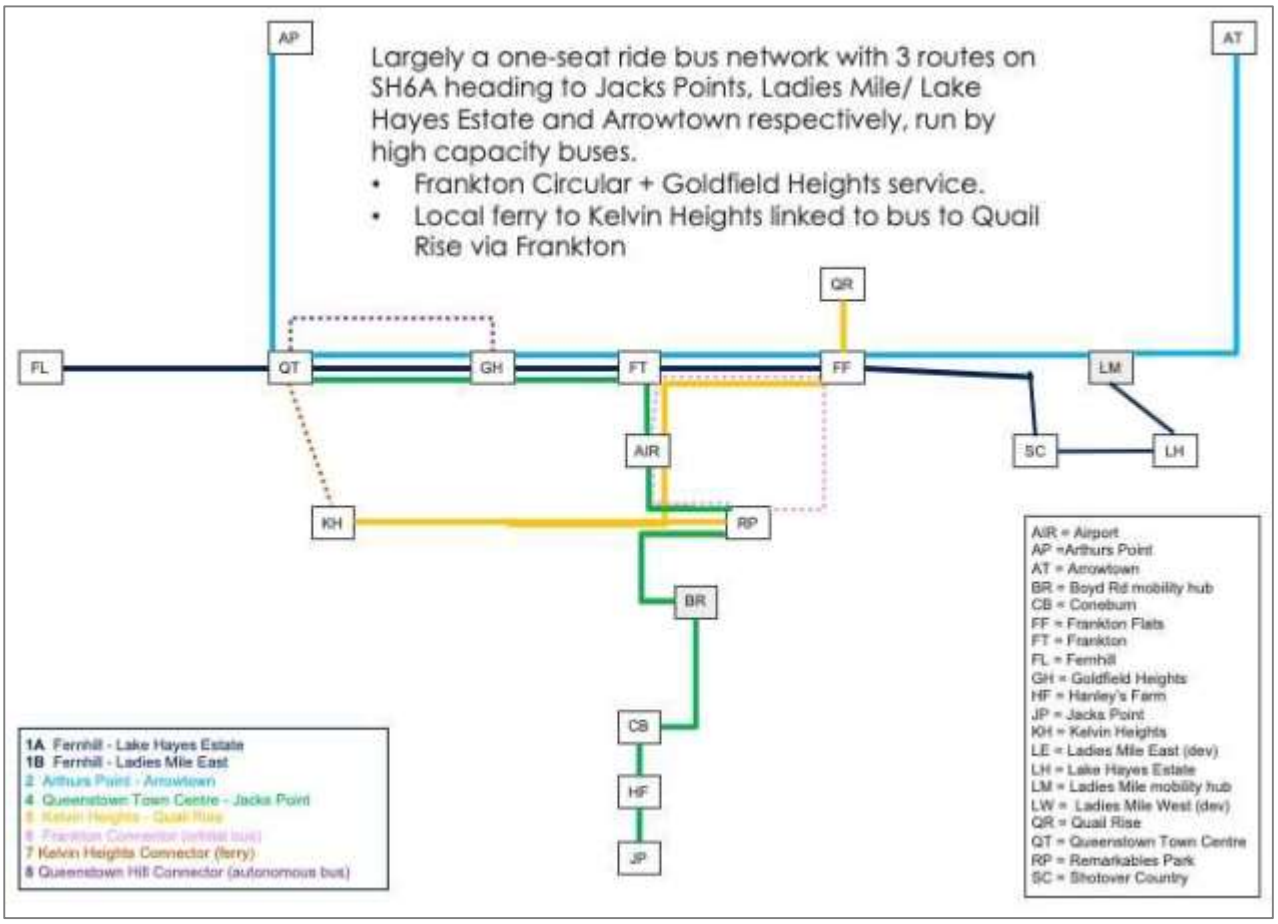


Figure 8-3: Indicated Preferred Network, Queenstown Business Case

By way of supplement, the Lake Whakatipu Public Water Ferry Service Detailed Business Case (DBC) (2019) assessed options for a Frankton Arm ferry service to be integrated into the public transport network. The preferred option consists of a ferry between Frankton Beach to Steamer Wharf (Queenstown), with incentive payment to the operator and capital costs for wharf upgrades.

Step Two: Forecast Public Transport Demand Forecasts

Public transport demand forecasts were made using the vehicle matrixes from the TRACKS 3-stage model and feeding these into a logit-based mode choice model. Demand forecasts in the short- (five years), medium- (15 years), and long-term (30 years) were considered. Details of the modelling methodology and results can be found in **Advisory Paper 1 – Forecast Demand**.

Step Three: Agree Service Design Principles

Seven service design principles were used to guide the development of the service pattern options which are informed by international and national practices for network design. The service design principles are shown in Figure 8-4.

Figure 8-4: Service Design Principles, QPTBC

Step Four: Fleet Option Assessment

An outcome of the demand forecasting (refer to Step Two) was the confirmation that the current vehicle fleet of standard sized buses will be unable to meet the forecasted demand along SH6A even when running at a frequency of 30 buses per hour (one bus every two minutes). Accordingly, a range of different types of public transport vehicles were considered as replacements for the current bus fleet.

The assessment recommended **articulated buses for core routes** as they would be able to provide sufficient capacity to meet mode shift targets whilst providing a reliable service, without needing a change to NZ legislation (required for bi-articulated vehicles). Articulated buses are recommended over double-deck buses due to passenger carrying capacity (approximately 110 passengers per vehicle), faster boarding and alighting times from multiple doors and the lack of stairs. The additional capacity also means that fewer bus drivers would be required compared to operating the service with standard buses; hiring and retaining bus drivers is a challenge both in Queenstown and nationally.

For secondary bus routes the lower passenger demand means that standard single deck buses could be used. Therefore, articulated buses would be limited to main corridors where the higher capacity is needed.

Full detail is provided in **Advisory Paper 3 – Service Patterns**.

Step Five: Develop Long List for Service Patterns

From a public transport planning perspective, the topography of Queenstown presents the opportunity to create a high-frequency and high-capacity service along the main residential corridors. These are the southern corridor (Jack's Point to Queenstown via Frankton) and eastern corridor (Lake Hayes Estate to Queenstown via Frankton). However, the challenge of having one main road between Queenstown and Frankton is that service duplication will need to be balanced against public transport access.

Building from the service design principles, the forecast demand, and the previous work, a long list of 11 network options was developed. This process involved initially identifying four different service themes, and subsequently creating options that aligned with these themes. During this stage, all online public transport modes were considered, including networks which require transfers and those which maximise one seat rides. The project team led this option development which was workshopped with the Way to Go Partners iteratively through a series of workshops.

The long list options for service patterns are documented in Table 8-1. Schematic network maps are available in **Advisory Paper 3 – Service Patterns**.

Table 8-1: Long List Options – Service Patterns, QPTBC

SERVICE THEME	OPTION NAME	OPTION DESCRIPTION
Multiple high-capacity bus routes with minimal transfers	1A – Bus Max	As proposed in the Queenstown Business Case with one seat rides[25] from Jack's Point, Arrowtown, and Lake Hayes to Queenstown via high-capacity bus routes.
	1B – Bus Max with additional Kawarau River Bridge	As per Option 1A except routes the Jack's Point service via a new bridge at the southern end of Remarkables Park, which removes the need for the Frankton Loop service as the Kelvin Heights to Quail Rise service caters for the cross Frankton transfers.
	1C – Bus Max via Malaghans Road	As per Option 1B except the Arrowtown to Queenstown high-capacity service is via Malaghans Road rather than SH6A. This creates more capacity on SH6A for buses. This option assumes an express (no-stop) service between Arrowtown and Arthurs Point, unless a Park and Ride is provided for at Speargrass Flat.

[25] One seat ride = a single uninterrupted journey on public transportation without the need to transfer to another vehicle/service.

SERVICE THEME	OPTION NAME	OPTION DESCRIPTION
Single high-capacity bus routes	2A – Queenstown to Frankton spine	A closed network public transport corridor between Queenstown and Frankton with connecting buses to outer suburbs.
	2B – Queenstown to Lake Hayes spine	As per Option 2A except extends the public transport corridor to Lake Hayes. This reduces the number of transfers required compared to 2A.
	2C – Queenstown to Remarkables Park spine	As per Option 2A except extends the public transport corridor to Remarkables Park via Queenstown Airport.
	2D – Queenstown to Jack's Point spine	As per Option 2A except extends the public transport corridor to Jack's Point via a new bridge at the southern end of Remarkables Park. Buses from Lake Hayes and Arrowtown 'hub' at Frankton.
One seat ride	3A – One Seat Ride Network	Similar to the current network, however delivered with high-frequency services and extends the Jack's Point bus to Queenstown.
Expand ferry services	4A – Frankton Beach ferry	High-capacity ferry services from Kelvin Heights and Frankton Beach. Jack's Point and Arrowtown buses continue to Queenstown.
	4B – Kawarau ferry	High frequency service using jet boats on the Kawarau River, with a feeder bus service to Lake Hayes, Shotover Country, and Ladies Mile.
	4C – Jack's Point ferry	High-capacity ferry to Homestead Bay, with supporting bus service from Jack's Point to Queenstown.

Note:

A key component of Options 1B, 1C, and 2D networks is providing bus priority on the southern corridor. One way to achieve this would be a new bridge at the southern end of Remarkables Park, replacing a proposed walking and cycling bridge as envisaged in the Spatial Plan. This would be a new public transport, walking, and cycling bridge approximately between Boyd Road and Red Oaks Drive over the Kawarau River. The benefits of a new bridge for public transport[26] would be as follows:

- Shortens the travel time from Jack's Point to Frankton and Queenstown town centre which would make public transport more attractive (and more competitive compared to travel by private vehicle).
- Would enable public transport vehicles to bypass the anticipated traffic congestion on the existing Kawarau Falls Bridge when the southern growth area is developed.
- Would avoid the need to divert buses from Jack's Point off SH6 to Remarkables Park, reducing public transport operating costs.
- Would simplify the public transport network and avoid the need for the Frankton loop service because cross town connections could be made at Remarkables Park and Five Mile.

[26] Note, this Business Case refers to a new bridge for public transport. It is in fact envisioned that the bridge will also cater to active modes, as identified in the Whakatipu Active Travel Network Business Case.

8.2.4 Long List - Decarbonisation Technology

Informed by a review of national, regional, and local policies to decarbonise the public transport system, and complemented by SME knowledge of trends and developments both nationally and internationally, the following options were long listed:

- Battery Electric
- Hydrogen Fuel Cell
- Renewable Natural Gas
- Bio-diesel
- Hybrid

Full detail of the options considered for decarbonisation technology is provided in **Advisory Paper 2 – Fleet Decarbonisation**.

8.3 Long List Assessment

8.3.1 Options Assessment Framework

Table 8-2 presents the MCA framework that was developed to use as a tool to evaluate the Long List options and assess their effectiveness in delivering an effective and attractive public transport system. The project specific MCA framework was developed with reference to the NZTA MCA user guidance and sample framework, consisting of the Investment Objectives (IOs), Critical Success Factors (CSFs), and Opportunities and Impacts (O&Is). This framework was workshopped with Way to Go Partners through several workshops to land a framework that consisted of criteria that could differentiate between options, and removing criteria that was not seen as a differentiator.

Table 8-2: Long List MCA Criteria, QPTBC

CRITERIA	SCORING CONSIDERATIONS
IO1: Increase public transport patronage and mode share in Queenstown to maintain functional network	To what degree is the option likely to attract, and retain, new passengers to the service? To what degree might the option contribute to achieving light VKT[27] reduction targets?
IO2: Reduce Queenstown public transport vehicle CO_2 emissions to meet Government policy	To what degree will the option reduce emissions from public transport vehicles in Queenstown to meet the requirement of zero tailpipe emissions?
IO3: Increase the number of jobs and social destinations accessible by public transport in line with Queenstown spatial planning	To what degree will the option enable transport choice and mobility as per the strategic priorities? How might the option support land-use decisions providing affordable and reliable access to services, employment, social needs?
CSF: Capacity	To what degree will the option be able to accommodate the targeted mode share?
CSF: Implementability	Is the infrastructure required to deliver the option within the scope of this Business Case? To what degree is the infrastructure considered technically feasible to implement?
CSF: Consentability	To what degree are there uncertainties / risks associated with consenting for the infrastructure required to deliver the option?
CSF: Readiness	Is there sufficient technology and support within the required timescales to deliver this option?
O&I: Environmental Impacts	What environmental impacts may be attributable to the option?
O&I: Social and Cultural Impacts	To what degree might the option impact communities, social frameworks, and cultural values. Identify both positive and negative repercussions on people and their way of life.

[27] VKT = vehicle kilometres travelled

In addition to scoring the options against the MCA framework, some aspects of the system required further criteria to assess the merits, impacts, and opportunities of each option. Where this is the case, it has been documented in this Economic Case. These sub-criteria were a useful tool in developing, refining, and selecting options but were not considered a substitute for the IOs or the CSFs. This approach is considered to align with the NZTA MCA user guidance, which states, "*This guidance provides for flexibility in approach to accommodate a project's specific circumstances.*"[28]

For completeness, Table 8-3 documents the general MCA criteria from the NZTA guidance that were not selected for use in this Business Case, alongside rationale.

Table 8-3: General MCA Criteria, QPTBC

GENERAL CRITERIA	RATIONALE
Potential achievability	• Considerations of 'technical' and 'consentability' already included in the project critical success factors. Not included to avoid double counting. • 'Safety and design' was not considered to differentiate between service pattern options. It was however included in assessment criteria for decarbonisation technologies under the criteria 'safety and change management'.
Potential affordability / value for money	• Costs assessed at short list stage alongside MCA. Affordability / value for money therefore not included as a criterion due to not having mutual independence from cost.
Supplier capacity and capability	• Not considered to differentiate between service pattern options. Assessed in Part C of Business Case with respect to ownership and operating models, system management, and sustainable funding model. • However, included in assessment criteria for decarbonisation technologies under the criteria 'skills, deliverability, and operational risk'.
Scheduling / programming	• Double counts with 'Readiness' critical success factor.
Climate change mitigation	• Impact on carbon emissions and light VKT already considered in Investment Objectives. Not included to avoid double counting.
Climate change adaptation	• Exposure to climate change risk or other natural hazards, and ability to adjust infrastructure and systems to better cope with the impacts of climate change, considered similar for each option, therefore not considered to differentiate between options.
Environmental effects (cumulative)	• Cumulative effects of the option, for example energy efficiency, resource/material scarcity, ecological footprint considered similar for each service pattern option. Considered for decarbonisation options.
Impacts on te ao Māori	• Not included as a criteria line-item in the MCA framework. Iwi involvement addressed in wider dialogue with ORC.
Property impacts	• Wholescale property impacts and acquisition not anticipated as part of this Business Case except for localised matters regarding specific infrastructure (e.g. depot, interchanges, stop locations, Park and Ride), therefore not considered to differentiate between options (i.e. all service pattern options will require a depot).

[28] NZ Transport Agency Waka Kotahi, 2023. Multi-criteria analysis: user guidance (February 2023, version 2). Pp 4. Retrieved 29 October 2023 from Multi-criteria analysis: user guidance (nzta.govt.nz)

Scoring

A standard seven-point scoring system was used to score the options, as presented in Table 8-4. When scoring, the options were compared against the Do-Minimum scenario which was assumed to have a neutral score of 0 against all criteria.

Table 8-4: Scoring scale, QPTBC

SCORE	DESCRIPTION
+3	Major positive impacts resulting in substantial and long-term improvements or enhancements of the existing environment.
+2	Moderate positive impact, possibly of short-, medium- or long-term duration. Positive outcome may be in terms of new opportunities and outcomes of enhancement or improvement.
+1	Minimal positive impact, possibly only lasting over the short-term. May be confined to a limited area.
0	Neutral – no discernible or predicted positive or negative impact.
-1	Minimal negative impact, possibly only lasting over the short-term, and able to be managed or mitigated. May be confined to a small area.
-2	Moderate negative impact. Impacts may be short-, medium-, or long-term and are likely to respond to management actions.
-3	Impacts with serious, long-term and possibly irreversible effect leading to serious damage, degradation or deterioration of the physical, economic, cultural or social environment. Required major rescope of concept, design, location, and justification, or requires major commitment to extensive management strategies to mitigate the effect.

[29] **Picture source:** Otago Regional Council, 2022. *Media Release: ORC provides PT Support for Queenstown students.* Retrieved from Media Release: ORC provides PT Support for Queenstown students | Otago Regional Council

8.3.2 Options Assessment - Service Patterns

The Long List options for Service Patterns were assessed at a workshop with Project Partners on 16 June 2023. Using **Early Assessment Sifting** principles, SMEs conducted a modelling assessment for each option. The focus was morning peak capacity at key network locations (SH6A, Shotover Bridge, and Kawarau Falls Bridge) to identify 'non-starter' options, i.e. those lacking sufficient passenger capacity to achieve the headline mode share targets. The key findings of the capacity assessment were:

- Options which do not provide high-capacity buses to Jack's Point fail to provide sufficient capacity by 2053 when the southern growth corridor is fully developed.
- A one-seat ride network does not provide sufficient capacity by 2039 because the demand from Lake Hayes and Jack's Point exceeds the capacity of a single deck bus service operating at a 10-minute frequency.
- Options which only use jet boats do not provide sufficient capacity by 2027 as the demand is approximately 300 people per hour from Lake Hayes and Remarkables Park with a jet boat every 10 minutes having a capacity of around 120 people per hour.
- Bus Max options provide sufficient capacity to meet mode shift targets.

Long list service pattern options that were assessed as unable of providing sufficient capacity to meet the 2053 mode share were removed from further consideration. This was because they were fatally flawed for Investment Objective 1.[30] The options determined to be fatally flawed were:

- ✗ 2A – Queenstown to Frankton spine
- ✗ 2B – Queenstown to Lake Hayes spine
- ✗ 2C – Queenstown to Remarkables Park spine
- ✗ 3A – One Seat Ride Network
- ✗ 4A – Frankton Beach ferry
- ✗ 4B – Kawarau ferry
- ✗ 4C – Jack's Point ferry

The remaining four long list options were assessed by Project Partners through decision conferencing:[31]

- Option 1A – Bus Max
- Option 1B – Bus Max with additional Kawarau River Bridge
- Option 1C – Bus Max via Malaghans Road
- Option 2D – Queenstown to Jack's Point spine

The project MCA framework was used as a guidance tool, as shown in Table 8-5.

[30] Investment Objective 1: Increase public transport patronage and mode share in Queenstown to maintain functional network.
[31] Decision conferencing = a structured format among individuals in a meeting.

Table 8-5: Long List Assessment Results – Service Patterns, QPTBC

CRITERIA	DO MIN[32]	1A	1B	1C	2D	COMMENTARY
IO1: Increase public transport patronage and mode share	**0**	**2**	**3**	**3**	**2**	Criteria assessed using the results of the modelled bus patronage. Increasing the frequency and capacity of the service above the Do Minimum means all non-Do Minimum options scored positively. In addition, inclusion of the new bridge would increase patronage from the south (Options 1B and 1C ▲**1**). Similarly, routing via Malaghans Road has increased patronage due to the more reliable travel time. Option 2D has the increased patronage advantage from the new bridge, but has less patronage from Lake Hayes/Shotover Country compared to the other options due to the need for passengers to transfer (**no change**).
IO2: Reduce Queenstown public transport vehicle CO_2	-	-	-	-	-	Not assessed as not a differentiator for service patterns options.
IO3: Increase the number of jobs and social destinations accessible by public transport	**0**	**2**	**3**	**3**	**1**	Public transport coverage across service patterns is relatively similar, criteria assessed by considering number of transfers required to make key journeys which could represent barriers to travel for people with limited mobility, and overall reduce attractiveness of trip. Bus Max (by design) reduces the number of transfers, therefore scored well (**2**). Options that include the proposed new public transport bridge scored best (**3**) as removes the need for the Frankton Loop and associated transfers. The Spine option (Option 2D) is an improvement on the Do Minimum for some journeys such as between Queenstown and Jack's Point (southern growth area) but will require increased transfers for other journeys (those not on the spine) and therefore was scored a **1**.
Capacity	**0**	**2**	**2**	**2**	**2**	All non-Do Minimum options that weren't removed by Early Assessment Sifting are able to provide sufficient capacity to meet the mode share target, and thus scored as a **2**.
Implementability	**0**	**0**	**-3**	**-3**	**-3**	Options that require additional infrastructure (i.e. new bridge or new wharf) scored as a **-3** to recognise the technical risks and funding involved in implementing the option. Note these items were agreed as being challenging to implement but <u>not</u> fatally flawed.
Consentability	**0**	**0**	**-2**	**-2**	**-2**	Options that require additional infrastructure (i.e. new bridge or wharf) scored as a **-2** to recognise the risks of consenting requirements and timeframes adversely impacting project delivery.
Readiness	-	-	-	-	-	Not assessed as not a differentiator.
Environmental Impacts	**0**	**2**	**2**	**2**	**2**	Improved efficiency of resource utilisation with increased patronage compared to Do Minimum.
Social and Cultural Impacts	**0**	**2**	**3**	**3**	**1**	Enhanced accessibility improves inclusivity and ensures a broader demographic can benefit from public transport. This positively contributes to social equity and community cohesion. Potential concerns, such as personal safety during transfers (2D) may prevent some people from using the service.
Unweighted Score	**0**	**10**	**8**	**8**	**3**	

[32] 1A = Bus Max
1B = Bus Max with additional Kawarau River Bridge
1C = Bus Max via Malaghans Road
2D = Queenstown to Jack's Point spine

The assessment outcome for the Long List Service Pattern options, along with summary rationale, are shown in Table 8-6.

Table 8-6: Long List Assessment Outcomes – Service Patterns, QPTBC

OPTION	OUTCOME	SCORING RATIONALE
Do Minimum	Progress to short list	Progress as a comparator.
1A – Bus Max	Progress to short list	Option has the highest unweighted score, with strong alignment against the Investment Objectives and limited anticipated implementation difficulties.
1B – Bus Max with additional Kawarau River Bridge	Progress to short list	Options 1B and 1C have the second highest unweighted score. Further investigation is required to understand the technical difficulties and consenting risks associated with the additional infrastructure to deliver these options (i.e. the new bridge).
1C – Bus Max via Malaghans Road	Progress to short list	
2A – Queenstown to Frankton spine	Do not progress	Fatally flawed as does not meet capacity critical success factor.
2B – Queenstown to Lake Hayes spine	Do not progress	Fatally flawed as does not meet capacity critical success factor.
2C – Queenstown to Remarkables Park spine	Do not progress	Fatally flawed as does not meet capacity critical success factor.
2D – Queenstown to Jack's Point spine	Progress to short list	Option delivers improved service against for trips on the spine from Queenstown to Jack's Point and can provide sufficient capacity for 2053 demands. Further testing with the community required to understand their views on transfer penalties for trips not on the spine. Further investigation is required to understand the technical difficulties and consenting risks associated with the additional infrastructure to deliver this option (i.e. the new bridge).
3A – One Seat Ride Network	Do not progress	Fatally flawed as does not meet capacity critical success factor.
4A – Frankton Beach ferry	Do not progress	Fatally flawed as does not meet capacity critical success factor.
4B – Kawarau ferry	Do not progress	Fatally flawed as does not meet capacity critical success factor.
4C – Jack's Point ferry	Do not progress	Fatally flawed as does not meet capacity critical success factor.

Short List Recommendation (Service Patterns)

Following the Long List MCA assessment with Project Partners, five options were identified for progression to the Short List. In discussions with Project Partners and SMEs, it became apparent that the options recommended for progression to the Short List from the Long List primarily centred around two key choices: **Bus Max** compared to **Jack's Point Spine**. The other options, rather than presenting entirely distinct alternatives, resembled variants that could be integrated with either of these two central options. The options progressed to Short List was therefore redefined as shown in the matrix in Table 8-7.

Table 8-7: Service Pattern Options progressed to Short List, QPTBC

CORE SERVICE PATTERN	VARIANTS			
	No variant	Additional Kawarau River Bridge (v1)	Malaghans Road (v2)	Jack's Point Ferry (v3)
Bus Max (1A)	Option 1A	Option 1A v1	Option 1A v2	Option 1A v3
Queenstown to Jack's Point Spine (2D)	Option 2D	Option 2D v1	Option 2D v2	Option 2D v3

Ferry services

Additional ferry services were considered as part of the public transport service patterns.

All options include the existing Frankton Arm service in a complementary manner to the bus network, providing a direct connection from Kelvin Heights to the town centre. Improvement to frequency is recommended to hourly initially, and then half hourly, to be better suited to public transport purposes. The stopping pattern is proposed to remain as existing.

Other ferry services were not included in the short list of options as they did not have a strong investment case for the following reasons:

Kawarau River ferry

Not Progressed: The shallow depth of the Kawarau Falls means that the size of vessels would be limited to speed boats and therefore relatively few passengers could be carried. Due to the small size of the vessel, higher labour costs and greater maintenance requirements; ferry services have higher operating costs than the equivalent bus service. The development patterns of Remarkables Park and Lake Hayes also do not support a ferry service as the town centre is an 800m walk from the river which is beyond a comfortable walking distance. Similarly for Lakes Hayes Estate the nearest houses to the river are a 500m walk on an unsealed path.

Frankton Beach ferry

Not Progressed: A proposal had been made for a Frankton Beach to Steamer Wharf ferry service that would connect to the airport via a walking and cycling corridor on Humphrey Street and Douglas Street. However, it is considered that it is not feasible for people to walk from the airport to the wharf as the distance is 1km (or a 10-15min walk) and most people would be travelling with bags. Although this distance is easy to travel on a bike it would be difficult for people to take their bikes on a ferry, and most visitors to Queenstown do not have access to a bike. Furthermore, the location of the existing Willows wharf on a shallow section of Lake Whakatipu would require an approximately 350m long wharf or dredging, both of which have significant environmental effects and consenting challenges, to service ferries larger than jet boat size.

8.3.3 Options Assessment - Decarbonisation Technology

The Long List options for decarbonisation technology were also assessed at the workshop with Project Partners on 16 June 2023. A high-level assessment of the technologies prepared by the SME (replicated in Table 8-8) was used for **Early Assessment Sifting.**

Table 8-8: Decarbonisation Technologies Comparison, QPTBC

CRITERIA	BATTERY ELECTRIC	HYDROGEN FUEL CELL	RENEWABLE NATURAL GAS	BIO-DIESEL	HYBRID
Tailpipe emissions	No tailpipe emissions	No tailpipe emissions	Tailpipe emissions	Tailpipe emissions	Tailpipe emissions
Operational readiness	Available now	Trial only, lease only	Not in NZ	Limited availability	Available, but not imported in NZ
Value for Money	Higher cost than diesel	Much higher cost than diesel	Similar to diesel costs	Similar to diesel costs	Similar to diesel costs
Resilience and future proofing	Upgrades & recycling available	Uncertain	Uncertain future path	Uncertain future path	Uncertain future path
Skills, deliverability, & operational risk	Some new skills required	Major new specialised skills, H&S & policy changes required	Some new skills required	No change	New skills required, increased complexity, & weight
Safety and change management	Well understood, manageable	Complex, major changes, hazardous substance approved handler required	Well understood	Well understood	Complex
Overall Rating			**Fatally Flawed**	**Fatally Flawed**	**Fatally Flawed**

Propulsion technologies were removed from further consideration if they do not meet the zero-tailpipe emissions requirement,[33] and therefore were fatally flawed for Investment Objective 2:[34]

- ✗ Renewable Natural Gas
- ✗ Bio-Diesel
- ✗ Hybrid

The remaining two Long List options were assessed by Project Partners through decision conferencing. The project MCA framework was used as a guidance tool, as shown in Table 8-9.

Note that the evaluation of fuel types specifically applies to buses, excluding ferries. Presently, Government Policy does not enforce zero-emission standards for ferries. However, it is expected that Queenstown ferries might adopt a similar approach to Auckland by utilising hybrid ferries. This decision is based on optimising charging requirements (ensuring timetable adherence), longer range than battery, and providing backup power in case of failure whilst sailing.

[33] By 2025, Government will only allow zero-emission vehicles to be purchased for public transport.
[34] Investment Objective 2: Reduce public transport CO_2 emissions in Queenstown to meet Government policy.

Table 8-9: Long List Assessment Results – Decarbonisation Technology, QPTBC

CRITERIA	DO MINIMUM	BATTERY ELECTRIC	HYDROGEN FUEL CELL	COMMENTARY
Increase public transport patronage and mode share in Queenstown	-	-	-	Not assessed as not a differentiator for decarbonisation options.
Reduce Queenstown public transport vehicle CO_2 emissions	**0**	**3**	**3**	Technology either meets policy of all new buses needing to have zero tailpipe emissions by 2025, or it does not (i.e. the Do Min).
Increase the number of jobs and social destinations accessible by public transport	-	-	-	Not assessed as not a differentiator for decarbonisation options.
Capacity	-	-	-	
Implementability	-	-	-	
Consentability	**0**	**3**	**-1**	Hydrogen technology requires substantial upstream infrastructure that will require consenting. Health and safety requirements of hydrogen vehicle refuelling requires an "approved hazardous gas handler" to undertake the transfer and restricts the possible locations for a depot. This may change as legislation moves forward - NZ does not currently have a complete set of policies or legislation in place to deal with bulk hydrogen. This is in progress but has not been promulgated.
Readiness	**0**	**2**	**1**	Battery electric scored a **2** as technology is already available but has an approximate 12-36 month procurement period. Hydrogen fuel cell scored a **1** as refilling technology is limited and consenting/operational matters have uncertainty.
Environmental Impacts	**0**	**2**	**2**	Reduced air and noise pollution, and potential for increased energy efficiency as technology develops for both non-diesel propulsion options. Resource considerations for battery production, but compares to resource depletion for diesel.
Social and Cultural Impacts	**0**	**2**	**1**	Positive perception due to sustainability of non-diesel propulsion options. Potential for negative public concerns about hydrogen production, storage and use for fuelling.
Unweighted Score	**0**	**12**	**6**	

Short List Recommendation (Decarbonisation Technology)

The assessment outcome for the Long List decarbonisation technology options is shown in Table 8-10.

Table 8-10: Long List Assessment Outcomes – Decarbonisation Technology, QPTBC

OPTION	OUTCOME	RATIONALE FOR INCLUSION / EXCLUSION
Do Minimum	Progress to short list	Progress as a comparator.
Battery Electric	Progress to short list	Considered the most suitable as the technology is already available in New Zealand, and has zero-tailpipe emissions.
Hydrogen Fuel Cell	Progress to short list	Technology has zero-tailpipe emissions, however the technology is still being developed and is not likely to be ready for implementation within the project timeframes.
Renewable Natural Gas	Do not progress	Fatally flawed as does not meet zero tailpipe emissions requirement.
Bio-Diesel	Do not progress	
Hybrid	Do not progress	

[35] Picture source: Ritchies in Queenstown (myguidequeenstown.com)

8.4 Short List Assessment

8.4.1 Short List Public Engagement

To inform the Short List assessment, four drop-in events were scheduled in the Queenstown area for residents and visitors to discuss the Short List Service Pattern options[36] with the project team:

- Thursday 21 September 2023, 10am to 2:30pm, Frankton
- Thursday 21 September 2023, 4pm to 6pm, Stanley Street Bus Hub
- Saturday 23 September 2023, 10am to 2pm, Arrowtown – **Cancelled due to weather events**[37]
- Saturday 30 September 2023, 9am to 2pm, Queenstown CBD

An option to provide online feedback was also made available.

The 230 pieces of feedback received from the online, postal, and in-person surveys revealed key community sentiments and recurring themes:

The majority (52 percent) of respondents preferred Bus Max, citing minimal transfers as the reason for their preference. 16 percent favoured either option, and seven percent favoured the Jack's Point Spine.

Significant support (72 percent of respondents) for Malaghans Road sub-option due to avoiding congestion on the state highway network.

Support for retaining the existing Fernhill to Remarkables Park service, enabling an airport focussed service with fleet configuration to accommodate luggage and to accommodate airport workers.

Support for a direct connection to Five Mile and Remarkables Park, recognising that local trips for essential services, retail, and entertainment options now tend to favour these locations over the Queenstown town centre (which is seen by residents to have evolved into a tourist-dominant destination).

Desire for increased ferry sailings and cheaper fares (outside of the remit of this Business Case).

[36] Propulsion technology options were considered to be a technical and policy driven decision and were not consulted on with the public to retain the focus on the Service Pattern options.

[37] A state of emergency was declared for Queenstown on 22 September 2023 following a high rainfall event that resulted in localised flooding, debris flows, and land instability across the district. The state of emergency was lifted on 24 September.

8.4.2 Short List Organisation Feedback

Four feedback submissions were received from stakeholder organisations:

- Ministry of Education
- Queenstown Airport
- RealNZ
- The Lightfoot Initiative

Ministry of Education

Following the routine review of Ministry-funded bus routes in Queenstown and engagement with ORC in 2022, a significant number of students no longer meet the eligibility criteria for school bus services. The Ministry of Education submission primarily focuses on students moving from school bus services to the public transport network. The Ministry highlighted the need to consider the increased patronage on public transport from the change, supported minimal bus transfers for students, and raised the suitability of bus stop locations near schools.

Queenstown Airport

Queenstown Airport supports Bus Max increasing frequency and span of services, the Malaghans Road variant, and on-demand services (Queenstown Hill and Goldfield Heights). The Airport noted the following investments would improve the travel experience for airport employees and visitors:

- More airport focused services with less transfers (e.g. Queenstown town centre to the airport)
- Buses with sufficient luggage capacity
- Improvements to ticketing

The Airport indicated disappointment that a Frankton Beach ferry service was not included.

RealNZ

RealNZ supports the development of an integrated transport plan and network, and the decarbonisation of public buses and ferry fleet. They support bus priority measures on the SH6 and 6A and recommend the prioritisation of private tourist commuter buses alongside public buses.

Like Queenstown Airport, RealNZ would like the ferry service offering expanded services to Lake Hayes Estate, Homestead Bay, and Kingston. RealNZ also saw potential for a more ambitious on-demand service, including Jack's Point, Hanley's Farm, Homestead Bay, and the airport.

The Lightfoot Initiative

The Lightfoot Initiative supports Bus Max and reducing the number of transfers, the Malaghans Road variant, and on-demand services (Queenstown Hill and Goldfield Heights). Their submission suggested the following additions / modifications:

- Five-minute service frequency during peak hours
- A frequent and low-cost airport focused service
- On-demand services for Arrowtown
- Investigations into a ferry terminal at the jetty near Kawarau Falls Bridge
- Park and Ride (Boyd Road, Gorge Road and Morven Ferry Road)

A full summary of the short list engagement is provided in the Short List Options Engagement Report.

8.4.3 Short List Assessment Criteria

To enhance the granularity of the Short List assessment, further criteria were incorporated into the options assessment framework (agreed with Project Partners). These additional criteria were included to robustly interrogate and compare each option, allowing for a more thorough understanding of their suitability and potential impact. This broader evaluation scope aids in more informed decision-making, confirming the selection of the most suitable public transport solution that aligns closely with the community's needs and priorities.

Table 8-11 documents the further criteria. These criteria were categorised into two sections: those for scoring service patterns, and those for evaluating decarbonisation technology. This segmentation was done to retain a compact list of criteria that would be able to differentiate between options and appropriately reflect the main objectives of the project.

Table 8-11: Short List Assessment Criteria, QPTBC

CRITERIA	DESCRIPTION	USED TO ASSESS
Operational flexibility	Ease with which public transport vehicles could be moved around the network in response to operational issues.	**Service patterns**
Frequency	How long customers are anticipated to need to wait for services.	
Travel time	End to end travel time considering level of priority, mode, and transfers.	
Transfers	Number of transfers required for cross town journeys.	
Resilience and future proofing	Is there a clear future path for this technology? Is there ability to reuse or recycle technology at end of life?	**Decarbonisation technology**
Skills, deliverability, and operational risk	Degree to which new skills, operating procedures, and policies will be required.	
Safety and change management	Degree to which new safety issues or risks, and associated safety procedure are required for the technology.	

8.4.4 Short List Assessment - Service Patterns

The service patterns options were assessed in October 2023 with Project Partners to agree an emerging preferred option. To facilitate an informed decision-making process, the project SMEs presented the options for comparison with summary of key analysis undertaken, including:

- Transport modelling results (refer to **Advisory Paper 1 – Forecast Demand**)
- Summary of public engagement (refer to the **Short List Options Engagement Report**)
- High level costs and benefits (refer to the **Economic Assessment Methodology**)

The short list options were then scored through decision conferencing with the Project Partners against the MCA framework. A summary of the discussions raised during the scoring process is provided, followed by the scoring in Table 8-12.

- **Bus Max** is the preferred core service pattern as it attracts higher public transport mode share, has greater reliability, has greater VKT reduction, and provides better accessibility, in particular cross-town journeys are faster without the need to transfer.

- The **Malaghans Road** variant does not provide a significant measurable difference to mode share compared to the core Bus Max option. However, it provides a degree of resilience to the public transport network, provides mitigation for the disruption to journeys as a result from NZUP construction on SH6A, and was strongly supported by community feedback.

- The inclusion of a **Kawarau River Bridge** would improve access to retail, employment, and services because Remarkables Park could be served with a direct route from Jack's Point. However, a new bridge would have potentially significant technical complexities and consenting risks based on initial investigations finding poor ground conditions as part of the proposal for an active mode bridge. This is considered to involve significant capital cost with uncertain funding sources in a challenging fiscal environment.

- The addition of a **northbound bus lane on SH6** between Boyd Road and Kawarau Falls Bridge would improve journey times and reliability for the main growth area in Queenstown. The northbound bus lane combined with a frequent, high-capacity service would support a mode shift towards public transport and thereby reduce traffic congestion on the Kawarau Falls Bridge. The design would need to consider the interactions with the Whakatipu active travel network A7 Hillside cycle route (Jack's Point to Frankton).

  The modelling results show that the Bus Max network with the northbound bus lane would increase public transport patronage more than the Bus Max network with Kawarau River Bridge. This is because total demand from the southern growth corridor 600 people per hour in 2053 for Bus Max with bus lane and 520 people per hour for Bus Max with bridge. The difference is due to the SH6 providing a more direct route to Queenstown town centre and the forecast congestion on Lucas Place.

- The **Jack's Point Ferry** was shown by the transport model to increase mode share and accessibility similar to the additional bridge. Like the additional bridge, the ferry will have significant capital costs associated with infrastructure, such as the construction of a new wharf and breakwater at Jack's Point, upgrades to the Steamer Bay wharf, and the purchase of the ferries. There is also a risk that the ferry is competing to attract the same demand that the bus service caters to.

  Overall, there was not a strong investment case to support a Jack's Point Ferry. In particular, the cost per new customer would be significant and did not provide a value for money investment. **It was agreed to not progress the Jack's Point ferry within this Business Case**. Note this does not preclude revisiting this decision should funding be sourced for the capital costs.

- There is Partner support for splitting the Queenstown to Jack's Point service into two separate services: one from Fernhill to Remarkables Park, and one from Queenstown to Jack's Point bypassing Remarkables Park (although this then requires a transfer to travel from Jack's Point to Remarkables Park). This is not represented in the current variants but was agreed to be added for consideration in the Composite Option (see below).

Based on the workshop discussion and the engagement feedback, a further option was identified by the Project Partners and then subsequently scored with Partners (also shown in Table 8-12). The additional option, referred to as the **Composite Option,** uses Bus Max as the core service pattern complemented with what was considered the preferred variants:

- Bus lanes on SH6
- Services via Malaghans Road

- Splitting the Jack's Point service
- No additional Jack's Point Ferry

The Composite Option is shown schematically in Figure 8-5.

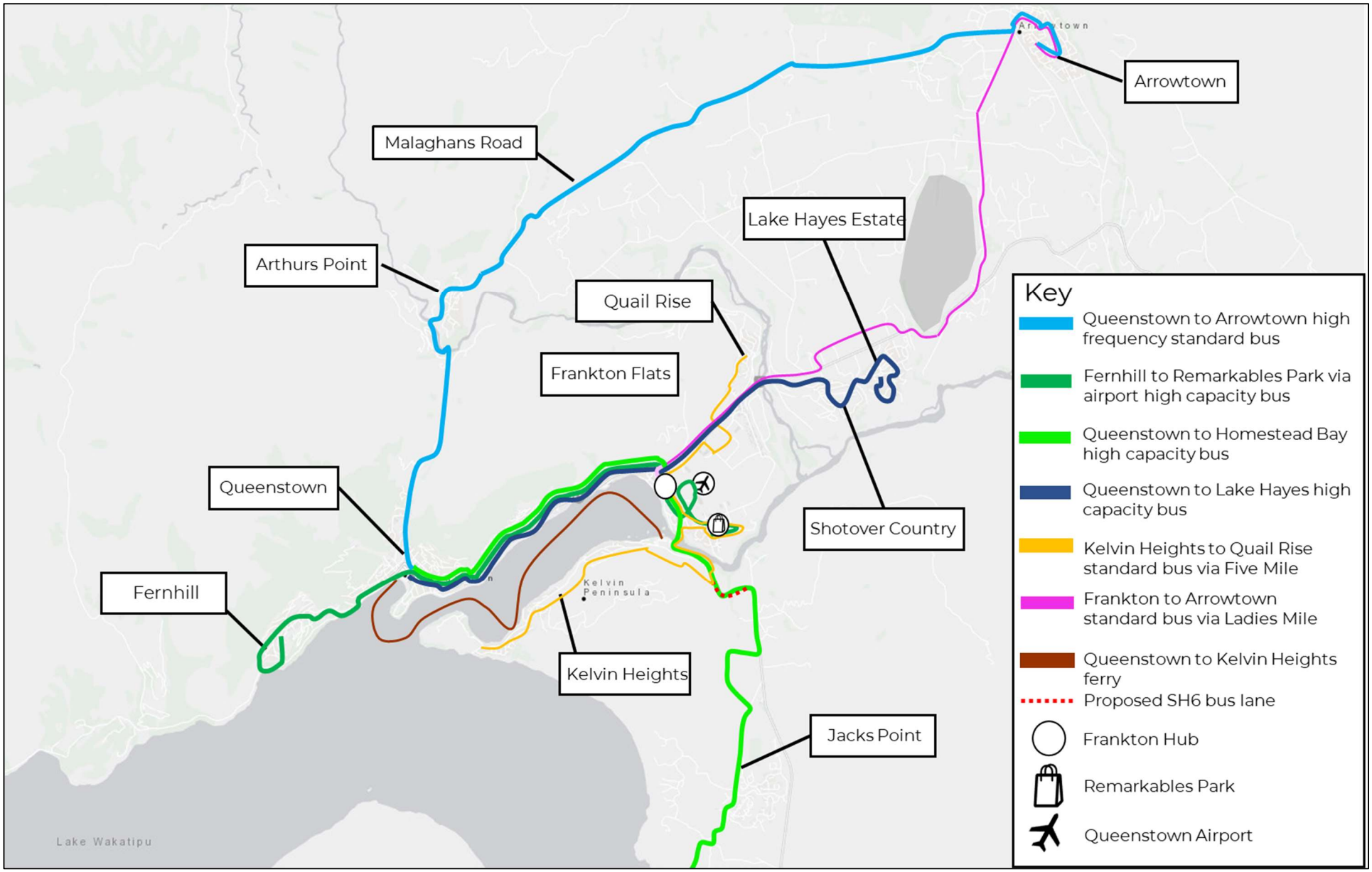


Figure 8-5: Composite Option, QPTBC

Table 8-12: Short List Assessment Results – Service Patterns, QPTBC

CRITERIA	DO MINIMUM	BUS MAX	BUS MAX + NEW BRIDGE	BUS MAX + MALAGHANS ROAD	BUS MAX + NEW FERRY	JACK'S POINT SPINE	JACK'S POINT SPINE + NEW BRIDGE	JACK'S POINT SPINE + MALAGHANS ROAD	JACK'S POINT SPINE + NEW FERRY	COMPOSITE OPTION
IO 1 KPI 1[38]	0	2	3	2	3	1	2	1	2	3
	Assessed using results from transport modelling. Under Bus Max patronage is forecast to generally triple from 2027 to 2053 (**2**). Jack's Point Spine has less additional patronage than Bus Max (**1**). Adding the bridge variant increases patronage above the base core service pattern, as does the new ferry (▲**1**). Malaghans Road has no material difference in total patronage to the base service pattern (no change). Composite option increases patronage on Bus Max base (▲**1**).									
IO 1 KPI 2[39]	0	2	2	2	3	1	2	1	2	3
	Assessed using results from transport modelling comparing afternoon peak to off-peak modelled bus travel times. Do Minimum has 8-minute variability for Jack's Point to Queenstown. This reduces to 6-minutes for the Spine (**1**), 4-minutes for Bus Max (**2**), and 2-minutes for the Composite Option (**3**). Ferry allows trips for some users to avoid congestion on SH6A which is source of travel time variability (▲**1**). Malaghans Road also allows some users to avoid SH6A congestion, but overall only minor improvement due majority of demand being on the southern growth corridor and therefore not influenced by Malaghans Road option (no change).									
IO 2 KPI 2[40]	0	1	2	1	3	1	2	1	3	3
	Assessed using results from transport modelling. All non Do-Minimum options provide an estimated VKT reduction in the range of 1.7 to 2.3 percent. This reduction is low as the model includes all trips, for example rural and intercity trips that are higher in VKT and less likely to transfer to public transport. The Jack's Point Ferry variants and the Composite Option resulted in the greatest reduction in VKT (**3**).									
IO 3 KPI 1[41]	0	1	2	1	2	1	2	1	2	2
	Assessed using results from transport modelling using simplified matrix from main suburbs to Queenstown, Five Mile, and Remarkables Park. All journey times (waiting time plus travel time) are improved compared to the Do Minimum. The new bridge and the new ferry both reduce travel time for trips from Jack's Point (▲**1**). Likewise, splitting the route in the Composite Option combined with the northbound bus lane also reduces travel time for trips from Jack's Point (▲**1**). Malaghans Road reduces travel time for trips from Arrowtown, but like IO 1 KPI 2 the overall improvement for the network is minor (no change).									
IO 3 KPI 2[42]	0	1	2	1	2	1	2	1	2	2
	Scoring assigned as per IO 3 KPI 1 as jobs and destinations tend to be located in the same place.									

[38] Increase mode shift away from single occupant vehicles by 2053.
[39] Increase percentage of scheduled service trips between 59 seconds before and four minutes and 59 seconds after the scheduled departure time of selected point by 2053.
[40] Reduce VKT by 2053.
[41] Increase jobs accessible within a 20-minute trip on public transport by 2053.
[42] Increase destinations accessible within a 30-minute trip on public transport by 2053.

CRITERIA	DO MINIMUM	BUS MAX	BUS MAX + NEW BRIDGE	BUS MAX + MALAGHANS ROAD	BUS MAX + NEW FERRY	JACK'S POINT SPINE	JACK'S POINT SPINE + NEW BRIDGE	JACK'S POINT SPINE + MALAGHANS ROAD	JACK'S POINT SPINE + NEW FERRY	COMPOSITE OPTION
Capacity	0	2	2	2	3	2	2	2	3	2
	Both core service patterns (Bus Max and Jack's Point Spine) provide enough capacity to meet the targeted mode share (**2**). Variants other than the new ferry do not materially impact capacity (no change). The ferry provides a supplementary service for the southern growth corridor which could be used to increase overall capacity (▲**1**).									
Implementability	0	0	-2	0	-2	0	-3	0	-2	-1
	The new bridge is technically challenging due to ground conditions (-**3**). The new ferry requires a new wharf which will involve dredging or piling, this is considered to be less challenging from an engineering point of view (-**2**). The bus lanes in the Composite Option will involve sealing an existing grass shoulder than will need to be assessed for changes to stormwater (-**1**). *Note: the scoring for Bus Max + New Bridge was revised from -**3** to -**2** during the workshop session to reflect there is an opportunity to create northbound bus lanes on SH6 leading to the existing Kawarau Falls Bridge instead of constructing a new bridge, with the former anticipated to have lesser implementability challenges.*									
Consentability	0	0	-2	0	-2	0	-2	0	-2	-1
	Anticipated consenting complexities with permitting new wharf/marina at Jack's Point, and new piers in Kawarau River for new bridge (-**2**). Other options do not have infrastructure outside of the road reserve, however the bus lanes in the Composite Option will involve sealing an existing grass shoulder than will need to be assessed for changes to stormwater (-**1**).									
Readiness	-	-	-	-	-	-	-	-	-	-
	Not assessed as not a differentiator.									
Environmental Impacts	0	2	2	2	2	2	2	2	2	2
	Improved efficiency of resource utilisation with increased patronage compared to Do Minimum. Localised environmental impacts may occur regarding specific infrastructure (e.g. depot, interchanges, stop locations), therefore not considered to differentiate between options (i.e. all service pattern options will require a depot).									
Social and Cultural Impacts	0	2	3	3	3	1	1	1	1	3
	Enhanced accessibility improves inclusivity and ensures a broader demographic can benefit from public transport. This positively contributes to social equity and community cohesion. Potential concerns, such as personal safety during transfers (spine options) may prevent some people from using the service.									
Operational flexibility	0	-1	-1	-1	-2	-1	-1	-1	-2	-1
	Do Minimum uses standard fleet vehicles (10m length) which can, for the most part, divert to alternative routes (if available) if the route is blocked, e.g. a crash. Articulated vehicles, which are proposed for capacity reason, would be restricted to only using prior approved routes. This reduces operational flexibility (-**1**). The ferry option would be restricted in the sense that a wharf was damaged, the service would not be able to berth elsewhere (-**2**).									

CRITERIA	DO MINIMUM	BUS MAX	BUS MAX + NEW BRIDGE	BUS MAX + MALAGHANS ROAD	BUS MAX + NEW FERRY	JACK'S POINT SPINE	JACK'S POINT SPINE + NEW BRIDGE	JACK'S POINT SPINE + MALAGHANS ROAD	JACK'S POINT SPINE + NEW FERRY	COMPOSITE OPTION
Frequency	0	2	2	2	2	2	2	2	2	2
	Do Minimum longest average weight time is 30-minutes for Jack's Point journeys. Under Bus Max and Jack's Point Spine service patterns, the longest average wait time is 7.5-minutes for Kelvin Heights. Variants do not change timetable frequencies, however public transport priority measures (e.g. new bridge, bus lanes, new ferry) will reduce travel time variability which would provide customers with more consistent wait times day to day.									
Travel time	0	1	3	3	3	0	1	1	1	3
	Bus Max service pattern reduces the number of transfers by design, and therefore reduces travel time (**1**). Jack's Point Spine results in increased transfers for journeys not contained within the spine, and therefore increased total travel time for customers from Arrowtown, Lake Hayes, Arthurs Point, and Fernhill. The new bridge, Malaghans Road, the new ferry, and the Composite Option all improve travel time to/from different areas than the base service pattern.									
Transfers	0	0	0	0	0	-3	-2	-3	-3	0
	For the Jack's Point Spine options, two transfers are required to get from Fernhill / Arthurs Point to Five Mile / Lake Hayes / Arrowtown (**-3**), although the new bridge reduces the need for transfers to get from Jack's Point to Remarkables Park (▲**1**). For all other options, one transfer is needed to travel to Frankton destinations that are not directly served (no change from Do Minimum).									
OPEX (high-level est.)	0	-2	-1	-2	-3	-1	-1	-1	-2	-2
	Current operating costs are approximately $7.5M. Operational costs for Bus Max estimated at $23M (**-2**) and Jack's Point Spine estimated at $19.5M (**-1**). Adding the bridge has operating costs savings by reducing the route length (▲**1**). Malaghans Road has only minor impact, approximately $1M, on operating costs (no change). New ferry increases operational costs due to costs associated with the ferry, estimated at approximately $6.8M per annum (▼**1**). Splitting the Remarkables Park services in the Composite Option is estimated to cost $1.1M more (no change).									
CAPEX (high-level est.)	0	-1	-3	-2	-2	-2	-3	-2	-2	-1
	Capital cost estimate for Bus Max is $50M including costs for a bus depot and minor corridor infrastructure improvements. The new bridge is a significant additional cost (▼**2**). Malaghans Road assumes cost for a Park and Ride (▼**1**), although this may be removed from the option. The ferry requires capital expenditure for the new wharf and breakwater (▼**1**).									
Economic Efficiency	0	1	2	2	2	2	3	3	3	3
	All non Do-Minimum options are in the 'low' BCR[43] range between 1.0 and 3.0. Either core option provides significant benefit above Do Minimum. Jack's Point Spine performs better than Bus Max due to the lower operating costs (approximately $50M, discounted) over the 40-year appraisal period. Benefits include crash cost reduction, air pollutions, GHG emissions, travel time, VOC, and congestion reduction.									
Unweighted Score	**0**	**13**	**16**	**16**	**17**	**7**	**9**	**9**	**10**	**22**

[43] BCR = Benefit Cost Ratio

Sensitivity Testing

Sensitivity testing, which involves adjusting weightings, sharpens the decision-making process. Systematically varying these weights pinpoints influential factors, leading to informed decisions aligned with the strategic objectives. This approach enhances the evaluation framework's resilience and flexibility. The sensitivity tests applied to the Short List MCA scores are shown in Table 8-13. In all tests, the Composite Option was favoured.

Table 8-13: Sensitivity Testing – Service Patterns, QPTBC

WEIGHTINGS[44] (PERCENTAGE)				DO MINIMUM	BUS MAX	BUS MAX + NEW BRIDGE	BUS MAX + MALAGHANS ROAD	BUS MAX + NEW FERRY	JACK'S POINT SPINE	JACK'S POINT SPINE + NEW BRIDGE	JACK'S POINT SPINE + MALAGHANS ROAD	JACK'S POINT SPINE + NEW FERRY	COMPOSITE OPTION
IOs	CSFs	ACs	C&EE										
33	33	33	0	0.0	5.0	6.0	6.0	6.7	2.7	3.3	3.0	3.7	7.3
50	25	25	0	0.0	5.5	7.3	6.3	8.3	3.3	5.0	3.5	5.5	8.8
25	50	25	0	0.0	5.3	5.3	6.3	6.0	3.3	2.5	3.5	3.3	6.8
25	25	50	0	0.0	4.3	5.5	5.5	5.8	1.5	2.5	2.0	2.3	6.5
25	25	25	25	0.0	3.3	4.0	4.0	4.3	1.8	2.3	2.3	2.5	5.5
16	16	16	50	0.0	1.5	2.0	2.0	1.8	0.8	1.2	1.5	1.3	3.7
10	40	10	40	0.0	2.5	1.9	3.1	2.0	1.9	0.6	2.4	1.3	3.7

[44] IOs Investment Objectives
CSFs Critical Success Factors and Opportunities & Impacts
ACs Assessment Criteria (short list)
C&EE High level costs and economic efficiency

Cost Benefits Analysis

Cost Benefits Analysis, including incremental analysis, was used as another tool to assess the Short List options. For the incremental analysis, Jack's Point Spine was the lowest cost option that all other Short List options were compared with to ascertain whether the incremental benefits outweigh the incremental costs. All options except Jack's Point Spine + Malaghans Road had a positive incremental BCR. The Composite option had the highest overall BCR and highest incremental BCR.

Table 8-14: CBA – Service Patterns, QPTBC

	BUS MAX	BUS MAX + NEW BRIDGE	BUS MAX + MALAGHANS ROAD	BUS MAX + NEW FERRY	JACK'S POINT SPINE	JACK'S POINT SPINE + NEW BRIDGE	JACK'S POINT SPINE + MALAGHANS ROAD	JACK'S POINT SPINE + NEW FERRY	COMPOSITE OPTION
Net Benefit	$563M	$781M	$554M	$819M	$520M	$738M	$510M	$775M	$756M
Net Cost	$306M	$356M	$319M	$383M	$281M	$335M	$294M	$358M	$311M
BCR	**1.8**	**2.2**	**1.7**	**2.1**	**1.9**	**2.2**	**1.7**	**2.2**	**2.4**
Incremental Benefit	$43M	$261M	$34M	$299M	-	$218M	-$10M	$255M	$236M
Incremental Cost	$25M	$75M	$38M	$102M	-	$54M	$13M	$77M	$30M
Incremental BCR	**1.7**	**3.5**	**0.9**	**2.9**	**-**	**4.0**	**-0.8**	**3.3**	**7.9**

Emerging Preferred Way Forward – Service Patterns

It is recommended to further consider the **Composite Option** as the preferred Service Pattern to achieve the public transport attractiveness and effectiveness objectives of the Queenstown Public Transport Business Case, and to support the integrated land use planning of national, regional, and local transport policies.

The Composite Option is an enhanced and refined version of the Bus Max option initially recommended in the Queenstown Business Case.

8.4.5 Short List Assessment - Decarbonisation Technology

The Short List options for decarbonisation technology were also assessed at the workshop with Project Partners on 20 October 2023. The purpose of this workshop was to agree an emerging preferred option. To achieve this through informed decision-making, the project SME for decarbonisation technologies presented the options for comparison. Key workshop discussion points raised were:

- Hydrogen needs a Class II hazardous gas operator to refuel. This is currently a very bespoke skillset in New Zealand. This could mean it would be difficult for ORC to have a competitive supply arrangement that offers value for money as they would be limited to a small number of suppliers who are certified. Further, consenting and policy restrictions on transporting and refuelling hydrogen are quite substantial due to the explosive risk.
- It is incorrect to state there are zero emissions with either of these technologies. Hydrogen, in particular, has significant upstream emissions as generation, cooling, storage, and distribution of hydrogen all create a carbon load.
- Both technologies have resilience challenges. Hydrogen trials in New Zealand currently have limits on storage volumes (i.e. one day of supply). On the other hand, battery electric relying on overnight charging may have next-day service disruptions if there is a power outage.
- The Edith Cavell bridge has a current weight constraint of 50 tonnes. Electric buses have a greater weight than diesel buses with a fully laden weight of 16-21 tonnes compared to 13-19 tonnes for a diesel bus[45]. Therefore, wear on the bridge structure will need to be managed until the replacement bridge is built however the bridge weight limit would not prevent electric buses from being used.

Based on the above discussion points, the options were scored through decision conferencing with the Project Partners against the MCA framework as shown in Table 8-15.

Table 8-15: Short List Assessment Results – Decarbonisation Technology, QPTBC

CRITERIA	DO MINIMUM	BATTERY ELECTRIC	HYDROGEN FUEL CELL	COMMENTARY
IO1: Increase public transport patronage and mode share …	-	-	-	Not assessed as not a differentiator.
IO2: Reduce Queenstown public transport vehicle CO_2 emissions to meet Government policy	**0**	**3**	**1**	Both non-do minimum technologies comply with the zero-tailpipe emissions requirement. However, infrastructure for hydrogen (e.g. refuelling) not expected to be available in New Zealand until after 2030. This timeframe means the existing fleet will need to be kept in service for longer, resulting in increased emissions compared to battery electric technology which is already available.
IO3: Increase the number of jobs and social destinations accessible by public transport …	-	-	-	Not assessed as not a differentiator.
Capacity	-	-	-	
Implementability	-	-	-	

[45] Source: New Zealand Public Transport Design Guidelines: Battery Electric Bus Charging

Consentability	0	3	-1	Battery technology already available in New Zealand. Hydrogen for use in public transport is not yet consented in New Zealand, nor is publicly accessible refuelling as hydrogen is a Class II hazardous gas.
Readiness	0	3	-3	Battery technology already available in New Zealand. Hydrogen technology is still in trials, currently expected to be ready by 2030. Hydrogen refuelling is not ready in New Zealand, expected in selected locations in North Island by 2030.
Environmental Impacts	0	2	2	Reduced air and noise pollution, and potential for increased energy efficiency as technology develops for both non-diesel propulsion options. Resource considerations for battery production, but compares to resource depletion for diesel.
Social and Cultural Impacts	0	2	1	Positive perception due to sustainability of non-diesel propulsion options. Potential for negative public concerns about hydrogen production, storage and use for fuelling.
Resilience and futureproofing	0	2	-2	Batteries can be guaranteed by the supplier for 8 to 10 years, and then can be used in a 'second life' before commercial recycling. Hydrogen components (nano-scale materials, catalytic carbon wound resins etc) cannot be recycled.
Skills, deliverability, and operational risk	0	2	-2	Battery electric skills are developing and growing in several cities and transport hubs in New Zealand, for example Scania has announced 172 technicians in service for their battery electric trucks. Hydrogen is more problematic, and very few skills exist in New Zealand currently.
Safety and change management	0	-1	-3	Any energy storage is a fire risk, however new LiPo[46] batteries are less likely to combust. Hydrogen is extremely explosive and cannot be used near open heat sources. Compressions and distribution of hydrogen must comply with Class II hazardous gas regulations.
Unweighted Score	**0**	**16**	**-7**	

Sensitivity Testing, Cost Benefits Analysis, and Appraisal Summary Table

These were undertaken for decarbonisation technology as there was a clear mandate from the assessment to progress with battery electric. Specifically, hydrogen technology was considered to be fatally flawed for use (i.e. not suitably advanced in New Zealand) in the first 15 years of the investment plan.

Emerging Preferred Way Forward – Decarbonisation Technology

It is recommended to further consider **battery electric** buses and ferries as the preferred technology to achieve the decarbonisation objectives of the Queenstown Public Transport Business Case, and

[46] LiPo = Lithium Polymer

to address the requirements of the Emissions Reduction Plan and other regional and local transport policies.

8.5 Supporting Measures

As outlined in Section 8.2 - Options Identification, following the identification of an emerging preferred option, this Business Case considered the complementary elements of the system (supporting measures) that would support efficient and attractive public transport in the Whakatipu Basin. This included assessment of:

- On-demand services
- Public transport hub and interchange requirements
- Bus depot requirements
- Park and Ride facilities
- Physical road network changes

8.5.1 On-Demand Services

The role of on-demand services, as well as their limitations, were documented based on existing schemes and trials in Aotearoa New Zealand and Australia. Table 8-16 presents the fourteen opportunities that were identified and assessed in the Whakatipu Basin. Assessment considered:

- Expected peak time travel demands and destination
- Walkability of the area
- Availability of fixed route public transport under the proposed Bus Max service pattern

For further detail, refer to **Advisory Paper 4 – On-Demand Services**.

Table 8-16: Assessment of Potential On-Demand Services, QPTBC

LOCATION / SERVICE GAP	DESTINATION	WALKABILITY	PROPOSED FIXED ROUTE NETWORK	RECOMMENDATION
Queenstown Hill and Goldfield Heights	Stanley Street and Frankton Hub	Poor: 20-minute walk to top of hill	Frequent bus routes along SH6A	**Investigate on-demand services**
Quail Rise	Frankton	Good: typically five-minute walk to Ferry Hill Drive	Frequent bus route to Frankton	Increase frequency on fixed route service for both Quail Rise and cross-Frankton trips
Kelvin Heights	Frankton	Good: short walk to Peninsula Road	Frequent bus route to Frankton	Increase frequency on fixed route service for both Kelvin Heights and cross-Frankton trips
Ladies Mile	SH6	Good: five-minute walk on flat	Frequent bus route along SH6	Serve Ladies Mile with fixed bus route from Arrowtown, whether bus service diverts into Ladies Mile is dependent on the road network and pedestrian crossing provision on SH6.
Lower Shotover	Frankton and Queenstown	Poor: 15-minute walk to nearest bus stop (up to)	Frequent bus route along Stalker Road	Amend fixed route service to serve Tonis Terrace.
Queenstown Airport	Stanley Street	Good: stop is 50m from terminal	Frequent bus route to Queenstown	Better suited to high-capacity fixed bus service due to high demand.

LOCATION / SERVICE GAP	DESTINATION	WALKABILITY	PROPOSED FIXED ROUTE NETWORK	RECOMMENDATION
Jack's Point	Frankton and Queenstown	TBD: depends on road links and routing	Frequent bus route to Queenstown	Investigate once clarity on internal road connections available
Queenstown tourists	Tourism destinations e.g. ski fields	N/A	Not served	Out of scope for public network. Private operators to provide. There are potential connections to the base of ski field with private connection to chair lift.
Speargrass Flat	Frankton and Queenstown	Poor: rural area	Option for bus route along Malaghans Road	Investigate Park and Ride which is better suited to serving a rural area with high levels of car ownership.
Arrowtown	Frankton and Queenstown	Good, excluding Manse Road area	Frequent bus route to Queenstown	Increase frequency on fixed route service due to long trip distance. Potential to amend route to better serve new housing in Arrowtown south. Is not feasible to serve Millbrook due to lack of suitable internal roads and low density of housing.
Fernhill	Queenstown	Good: five-minute walk to Fernhill Road	Frequent bus route to Queenstown	Retain a fixed route service as is easy to serve as an extension of bus route from South or East
Queenstown late night	Suburban areas	Depends on journey	Span of service up to midnight	Long span of fixed route service combined with availability of taxis/app-based rideshare potentially limits demand
Arthurs Point	Queenstown	Good: five-minute walk to Arthurs Point Road	Frequent bus route to Queenstown	Retain a fixed route service as is easy to serve as an extension of bus route from South or East. A footpath is required to install a bus stop so improvements would need to be tied to new bridge.
All suburbs	Whakatipu High School	Depends on journey	Frequent bus route from Jack's Point, Quail Rise, and Kelvin Heights	Demand too high for on-demand. School served by both public buses and MoE school buses

Recommendation

This assessment identified Queenstown Hill and Goldfield Heights as the areas with the most promising potential for on-demand transit in Queenstown. This is because the steep terrain makes it challenging to walk to fixed bus routes on SH6A, the steep and winding streets present challenges to service this area with a conventional sized bus, and the likely high potential to replace car trips to the Queenstown town centre. The demand for bus services from outlying towns to Queenstown was evaluated and modelling found that there is insufficient patronage to warrant a service.

There was some support for on-demand services in the Short List public engagement with 24 percent of respondents stating they would use an on-demand service for Queenstown Hill and Goldfield Heights. Note this will be skewed based on the transport needs of each respondent; for example a resident of Arrowtown would likely respond that they would not use this service.

It is outside of the scope of this Business Case to undertake detailed investigation of, or present a funding case for, on-demand services in the Whakatipu Basin. A basic review of existing on-demand services in New Zealand was undertaken to provide a high-level estimate on how much running an on-demand service would be expected to cost ORC. An on-demand service for Queenstown Hill and Goldfield Heights to central Queenstown will cover an area of about 5km^2. The Devonport, Auckland

on-demand service (since discontinued) covered an area of about 6.5km^2, which is the most comparable size. The Devonport trial cost $1 million in its first year. Adjusting for size, a high-level estimate of about $750,000 per year in operating costs is assumed for Queenstown Hill / Goldfield Heights.

It is also important to recognise that this above assessment was undertaken on the anticipated growth areas. As with all projects of a long lifespan, particularly in the Whakatipu Basin, it is important that an agile approach is taken to on-demand services. This means that this assessment should be revisited as, and when, growth is realised.

8.5.2 Public Transport Hubs and Interchanges

Interchanges play an important function in a connected public transport network. The existing hubs in Stanley Street and Frankton were reviewed by the Project Team to ascertain if their design can accommodate the Composite Bus Max proposal. A need for new interchanges were also identified at Five Mile and Remarkables Park to align with the proposal as outlined below.

For further detail, refer to **Advisory Paper 5 – Public Transport Hubs and Infrastructure**.

Stanley Street Bus Hub

There are overlapping projects that will change the way in which buses and general traffic move around the town centre. These projects include Queenstown Arterials, Project Manawa, and Town Centre Street Upgrades. The combined concept design for these projects is shown in Figure 8-6 and has been used as a starting point for the design work. The planned changes that most relevant to bus operations are:

- Reducing the volume of through traffic on Stanley Street by providing an alternative route to Fernhill, Glenorchy, and Arthurs Point (Queenstown Arterials)
- Consolidating Stanley Street stopping points in a single block and widening Stanley Street to have a bus lane in each direction (Project Manawa)
- A plaza between Athol Street and Stanley Street with new bus shelters and footpaths (separate bus interchange project)
- Making the intersection of Ballarat Street and Camp Street a shared space with buses needing to reposition using a different route (Town Centre Street Upgrades)

Figure 8-6: Concept design for Stanley Street and surrounding streets

Two design options were then developed for the Hub as amendments to the combined concept design considering the proposed Composite Bus Max service pattern routing and design vehicles. Through workshop discussions with the Project Partners, the Do Minimum option was preferred or the Do More, which consists of the following changes to the design shown in Figure 8-6:

- Mid-block kerb build-out
- Removal of left-turn lane from Stanley Street to Shotover Street, reducing the approach to one lane (all turns allowed) to shorten the crossing distance for pedestrians
- Lengthening of bus bays and kerb realignment to allow for articulated bus design vehicle

The Do Minimum amends the proposed design for the town centre. At the time of writing, funding and timeframe commitments for the related projects are uncertain. To ensure Stanley Street can accommodate the articulated buses required to deliver the public transport services, an interim option is proposed. This option makes low-cost amendments to the current layout at Stanley Street to guarantee that the Hub can meet the operational needs for this business case. The interim option forms part of the funding request for this Business Case and consists of:

- Reconfiguration and lengthening of bus bays to provide for articulated bus design vehicle
- Kerb realignment
- Closure of driveways (consultation with landowners required)
- Supporting infrastructure including bus shelters, hard stand area, signage, and driver amenities

A concept design for the interim option is provided in **Advisory Paper 5 – Public Transport Hubs and Infrastructure**.

Frankton Bus Hub

The existing Frankton Bus Hub has concept plans for a staged upgrade as part of the NZUP investment. Stage One, which is committed, is an improved on-street facility as shown in Figure 8-7. Stage Two is an off-road facility proposed to be delivered in the longer-term (Figure 8-8). This

Business Case first considers the changes required to the Stage One design to accommodate articulated vehicles, and then looks at the Stage Two design.

Figure 8-7: Artist impression, Frankton Bus Hub NZUP Stage One[47]

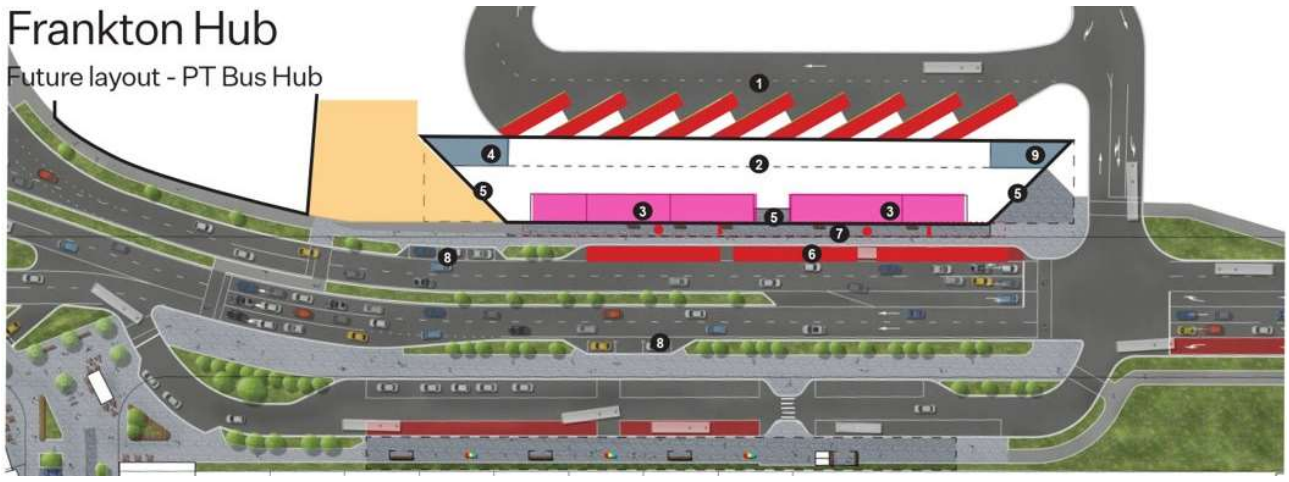


Figure 8-8: Concept for long-term layout of Frankton Hub, NZUP (unfunded)

Stage One

The features from the proposed designs for Stage One are:

- Increased number of bus bays with mixed sawtooth and linear layout
- Dedicated tourist operator bays and dedicated taxi stands
- Signalised access to the bus hub from SH6A
- New bus shelters and increased seating
- Facilities for bus drivers

This Business Case developed three options to amend the Stage One design to suit the proposed Composite Bus Max service pattern routing and articulated vehicles, being the Do Minimum, the Do More, and the Do Maximum. Through workshop discussions with the Project Partners, the Do Minimum was preferred, which consists of the following changes:

- Minor layout improvements to reduce pedestrian walking distances and reduce conflicts

[47] Gallery | Waka Kotahi NZ Transport Agency (nzta.govt.nz)

- Lengthening of sawtooth bus bays to allow for articulated bus design vehicle

The difference in cost between the NZUP Stage One design and proposed design changes has been included as a capital cost for the Queenstown Public Transport Business Case project.

Stage Two

The longer-term plan for the Frankton Hub through NZUP is an off-road facility with station building on golf course land using an angled platform design. The existing bus hub would be converted to tour coach use with public buses using the new facility. **This Business Case considers this investment can be delayed for the following reasons:**

- The proposed service pattern uses a regular instead of pulse timetable[48]. As a result of the shift to a high frequency network, buses are not needed to arrive at the same time as the wait between connecting services is short. This change would decrease the number of passengers and buses that would use Frankton hub at any one time.
- The proposed service pattern uses a multi-interchange design rather than relying solely on Frankton Hub. This means improved bus stop infrastructure provided at Five Mile and Remarkables Park, enabling passengers to make transfers that provide for more direct journeys (and not necessarily needing to transit at Frankton Hub). This is a departure from the QBC which recommended avoiding a multi-interchange design for legibility, cost, and reliability. The purpose of the multi-interchange design is to enable passengers to travel both clockwise and anticlockwise around Frankton with only one transfer. This provides a better overall service offering.
- As the Frankton Hub is being extended as part of NZUP there will be enough bus stops to service the forecast number of buses until 2053 based on the forecast passenger demand for public services. Therefore, future expansion of the bus hub is not required based on the proposed service patterns and frequencies.

Five Mile Interchange

Five Mile was identified for an interchange in the Bus Max service pattern as the surrounding land use at Five Mile is a major retail destination which will attract trips and people, and therefore a higher level of amenity and facilities is warranted.

The first step in the assessment was to identify the preferred location for an interchange. Five locations were compared for their respective performance against the following criteria:

- Distance between interchange stops
- Maximum number of lanes to cross (pedestrians)
- Total traffic volume of roads to cross
- Distance to nearest facility
- Availability of kerbside space
- Availability of space to provide shelter
- Property ownership
- Complexity of delivering civil works

The preferred long-term location for the Five Mile Interchange is **State Highway 6** once the intersection with Grant Road is signalised and Frankton North is developed**.** This is because State Highway 6 provides a direct route to Queenstown and avoids the traffic congestion on Grant Road.

[48] A pulse timetable is when all buses are timed to arrive at the same time which is useful for transfers in a low frequency network.

In the interim period it is recommended that buses from Quail Rise and Lake Hayes continue to use the Grant Road stops.

Remarkables Park Interchange

A similar process was followed for an interchange in Remarkables Park. Four locations were compared for their respective performance against the same criteria developed for the Five Mile Interchange.

The preferred location for the Remarkables Park Interchange is **Hawthorne Drive near Tex Smith Lane.** An interchange in this location is close to the town centre and amenities and would provide the most direct route for buses.

Recommendation

This assessment recommends changes to the concept designs for the Stanley Street and Frankton Hubs to accommodate the proposed Bus Max service pattern and the proposed articulated bus design vehicle. These changes should be included in the programme of works for Project Manawa and the NZUP Frankton improvements, respectively. However, to account for uncertainty of implementation timeframes of the town centre changes, an interim option is also recommended.

8.5.3 Bus Depot

The existing bus depot is too small to accommodate the increase in peak vehicle requirement that would result from increased service levels and is not in the optimal location for a high voltage power connection that is needed for electric bus charging. The process that was followed to identify feasible locations for a new bus depot included:

- Estimating the size of the bus depot that would be required for the proposed bus network. A long-term view was taken by basing the calculation on the number of buses forecast to be needed in 30 years' time.
- Considering commercial land parcels that would be of a size large enough to accommodate the bus depot.

A single depot serving the network was recommended by the project SMEs[49], rather than many satellite depots, due to the limited availability of land in Queenstown and the relatively small scale of the public transport network. Alternatively, two smaller sites could be developed, reflecting the restrictive land availability in Queenstown.

Options for an electric bus depot were initially developed at a suburb level of detail, rather than evaluating individual sites. Ten options were long-listed and assessed for:

- Availability of suitably zoned land (i.e. Commercial or Industrial) of sufficient parcel size and currently undeveloped
- Flat topography
- Proximity to termini
- Anticipated complexity to provide required power connection
- Distance to Cromwell[50]

Three options were progressed to a short list for further assessment, being **Queenstown (Gorge Road)**, **Frankton**, and **Coneburn**. An initial Planning assessment was then undertaken to confirm

[49] SME = Subject Matter Expert

[50] Anecdotally it is known that some bus drivers live in Cromwell and commute to work in Queenstown. This is because Cromwell has lower housing costs. However, Cromwell is a 45-minute drive from Frankton not accounting for traffic. Therefore, a bus depot that is located on the eastern side of Queenstown would be more accessible for staff travelling from Cromwell.

any fatal flaws with respect to zoning provisions, activity status, and potential consenting pathways and constraints. The key findings of this assessment were:

- Gorge Road is not considered to be feasible for the electric bus depot due to lack of available sites of the required estimated size unless multiple parcels can be acquired, and challenges with providing the power connection.
- Both Frankton Flats B and Coneburn have zonings that would provide for the establishment of a bus depot and ancillary offices as a reasonably straightforward proposition due to the activity status. There will still likely be resource consent in some form required (e.g. for the buildings). However, as the activity is permitted any consenting risk is considered comparatively low. The plans specifically identified these zones as an appropriate location for service activities.
- At the Coneburn Industrial Zone a limiting factor for driver accommodation is the activity status of residential activity (prohibited). Therefore, any associated driver accommodation would need to be located off-site.
- At the Coneburn Industrial Zone another limiting factor is the ecological work required as a precursor to development. The status/timing of this would need to be established with the owner.
- The Coneburn Industrial Zone is currently only serviced with water.
- The Coneburn Industrial Zone is relatively remote from the current urban form and services of Frankton, noting the residential neighbourhoods of Hanley Farm and Jack's Point to the south-west.
- At the Frankton Flats B Zone a limiting factor for driver accommodation is the Outer Control Boundary (OCB) which limits the potential sites (noting there are nearby areas zoned for residential activity and the area is well serviced with retail, supermarkets and other professional services).
- The Frankton Flats B Zone is well serviced with three waters infrastructure.
- The Frankton Flats B Zone is near the existing Frankton Bus Hub.
- The Remarkables Park Special Zone is not available for service activity due to it being a prohibited activity.

Full detail of the options and consideration for a bus depot are provided in **Advisory Paper 5 – Public Transport Hubs and Infrastructure**.

Recommendation

This assessment identified Frankton and Coneburn as the areas with the most promising potential for an electric bus depot in Queenstown, with a preference for Frankton north of the airport. However, it is noted that other considerations (land cost) will mean that the Coneburn Zone should not be dismissed in its entirety but does not offer all the advantages the Frankton Flats B Zone does. The Remarkables Park Special Zone is considered a 'non-starter'.

Further due diligence is recommended to understand development costs, land availability, and engagement with Aurora Energy[51] to confirm electric grid capacity and resourcing required for the high voltage power connection.

At the time of writing, positive conversations have been held with Queenstown Airport regarding a potential lease site in Frankton.

[51] Aurora Energy is the Distribution Company for Queenstown-Lakes District (as well as Dunedin and Central Otago).

8.5.4 Park and Ride

Options for Park and Ride were developed with a review of strategic context (parking strategy, masterplans, network operating framework), population density and development patterns, and reference to the Whakatipu Park and Ride Single Stage Business Case (SSBC), and accessibility mapping of the proposed Bus Max service pattern (refer to Figure 8-9).

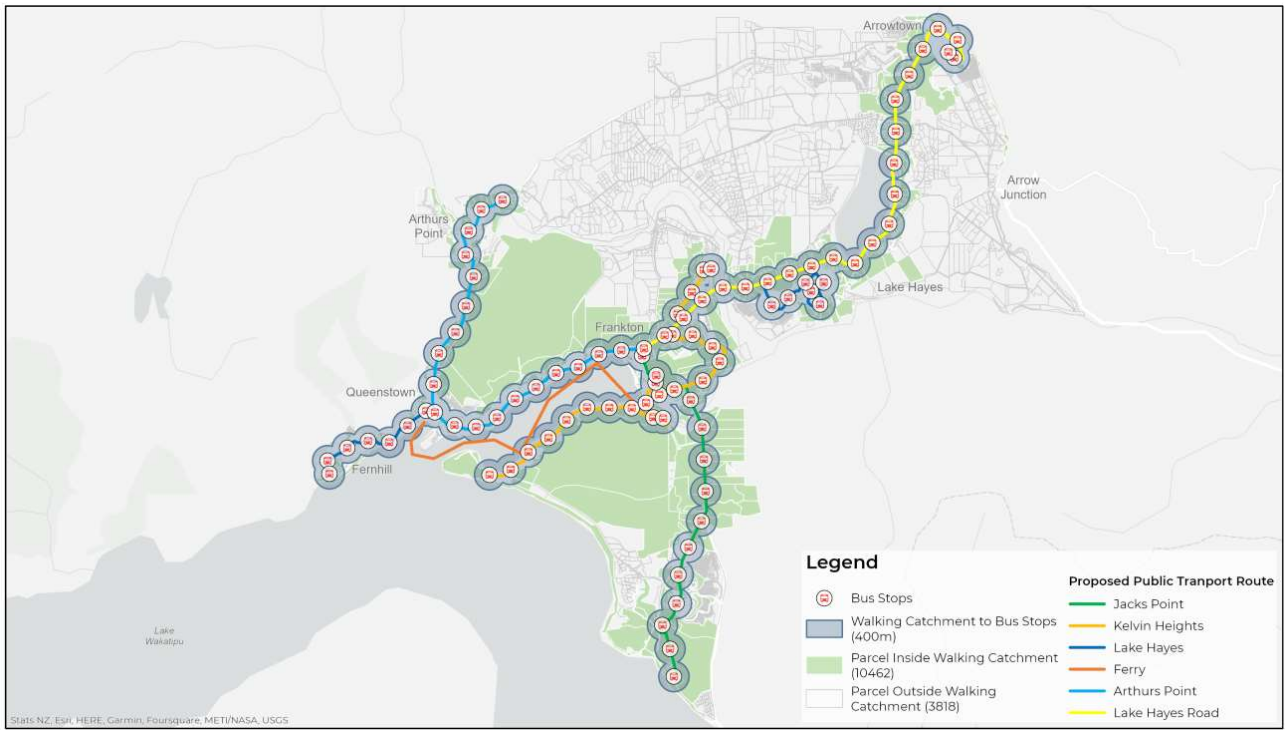


Figure 8-9: 400m Walking Catchments, Proposed Bus Max Service Pattern[52], QPTBC

Three options were short-listed:

- Speargrass Flat Park and Ride, to improve coverage of this semi-rural area reducing the number of private vehicle trips to Queenstown. If progressed, this location would need to be serviced by a bus route, likely the Malaghans Road add-on potential route.
- Cromwell Park and Ride, to support a Cromwell to Queenstown service
- No Park and Ride

For further detail, refer to **Advisory Paper 6 – Park and Ride**.

Recommendation

In discussions with SMEs it was agreed that significant investment in a Speargrass Flat Park and Ride was not justified due to the limited patronage uplift seen in the demand modelling results. This was due to the Park and Ride not offering a travel time advantage compared to driving due to the lack of bus priority on Gorge Road. Furthermore, the residents of Speargrass Flat typically have a low price sensitivity due to high incomes and therefore the cost of parking in Queenstown was found to have less of an impact on mode choice.

For the Cromwell Park and Ride the modelling results showed moderate patronage on a Cromwell to Frankton service which did not warrant the high operating costs of a 100km round trip service. Furthermore, the presence of private transport providers offering transfers between Queenstown airport and Cromwell means that demand would be split between multiple services. The forecast land use within Cromwell has a higher share of local employment which reduces the demand for

[52] Theoretical stop spacing

Cromwell to Queenstown commuter trips. As a publicly funded Cromwell to Frankton service is not recommended, then a Cromwell Park and Ride is not required.

Overall, through workshops with Project Partners it was agreed that a Park and Ride is not part of the Preferred Option for Queenstown public transport and would not provide value for money. In part this is due to the high cost of land in the Whakatipu Basin.

8.5.5 Physical Network Changes

To understand any road network constraints on the operation of buses across the proposed Composite Bus Max network, vehicle tracking was completed using AutoCAD. Tracking curves were plotted for a 19 m articulated bus (Auckland Transport specification) and a 12.6 m long rigid large bus. These buses are larger than the current bus fleet in Queenstown which are 10 m rigid buses. Larger buses will be required on the Queenstown public transport network in the future to accommodate growth in passenger numbers. Note that due to Queenstown's strong tourism market, including winter sports tourism, it is recommended that greater allowance for luggage space is made in the interior layout of the bus fleet. Further details are in the Commercial Case.

Three intersections in Lake Hayes were identified as being a constraint for bus operations, with an example shown in Figure 8-10. In these locations, minor intersection modifications have been proposed so that the intersections are able to accommodate the planned bus movements.

Other network changes identified in this assessment related to the design of existing bus stop infrastructure. As articulated buses are introduced to the network, the length of bus stops, including entry and exit tapers if not in-lane stops, will need to be amended. In some locations this may present challenges such as a reduction in on-street parking, a need for sight distance assessments, and changing of drop kerbs and tactile paver infrastructure to align with doors.

For further detail, refer to **Advisory Paper 5 – Public Transport Hubs and Infrastructure**.

Recommendation

It is recommended that these street upgrades are scheduled to be completed as part of low-cost low-risk (LCLR) programmes for QLDC and NZTA (dependant on the RCA[53]). If these upgrades are not completed, an interim response would be to operate medium sized buses (equivalent to the current bus fleet) at the expense of ridership capacity.

[53] RCA = Road Controlling Authority

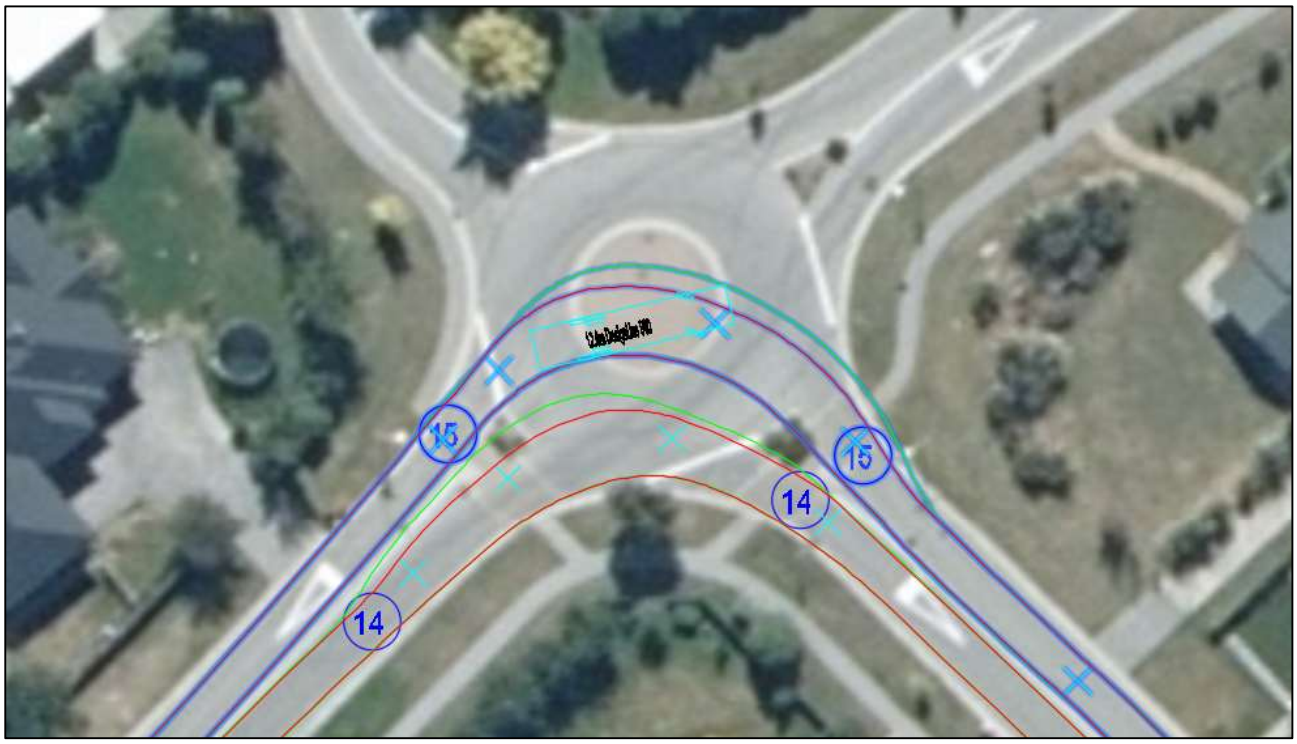


Figure 8-10: Bus Tracking, QPTBC

9 PREFERRED OPTION

The 30-year investment plan best aligned with the need for an effective and attractive public transport system is to operate an enhanced Bus Max service pattern (the 'Composite' option) with Battery Electric vehicles (buses and ferries) with supporting system improvements.

9.1 Selection of Preferred Option

Overall, the Preferred Option was agreed by the Project Partners for the following reasons:

- Providing reduced average wait times, a reduced need for transfers, and improved travel time reliability, resulting in attracting higher public transport mode share and greater VKT reduction demonstrated through the transport modelling.
- Providing the more direct, and therefore more efficient and attractive, service for the southern growth area (Jack's Point / Homestead Bay) to Queenstown but not at the expense of other customers making trips elsewhere on the network.
- Providing bus priority on the southern growth corridor, resulting in journey times that are more competitive with journey by private vehicle thereby reducing the public transport travel time.
- Retaining a Fernhill to Remarkables Park service, connecting hotels to the airport, as strongly requested through the public engagement. As Hawthorne Drive develops, this service can be extended to reflect development patterns.
- Providing a service via Malaghans Road that was strongly supported by public engagement feedback for journeys between Arrowtown and Queenstown.
- Using proven, safer, and readily deployable zero emissions technologies that can service the required range for bus services in Queenstown.
- Enabling the benefits of the NZUP investment in supportive infrastructure start to be realised from the first day of the programme roll-out and endure for a predicted 30 years.
- Presenting a strong investment story (addressing the community's immediate transport access needs whilst also playing a substantial role in making meaningful progress towards decarbonisation commitments).
- The stakeholder consultation strongly indicates stakeholders are likely to support the Preferred Option.

Through the MCA process, the Preferred Option fulfilled the Investment Objectives, Critical Success Factors, and assessment criteria to the same (or higher) extent as the other options, with similar or smaller impacts and risks. Incremental Cost Benefit Analysis showed the Preferred Option to have the highest Benefit-Cost Ratio (BCR) and highest incremental BCR, providing reassurance that value for money has been sought.

The MCA process also reflected there are some disadvantages with the Preferred Option, but these were assessed to be outweighed by the benefits, with less drawbacks compared to the other options:

- A transfer is currently required at Frankton Hub to travel from Jack's Point/Homestead Bay to Remarkables Park. This is unchanged by the Preferred Option.
- Increased operational costs as a direct trade-off of increasing frequency of services, extending the timetable hours of operation, and extending routes (e.g. Frankton to Jack's Point becomes Queenstown to Homestead Bay).

The selection of the Preferred Option was made cognisant of, but without being influenced by, the challenges associated with providing a public transport depot in the Whakatipu Basin. All options would require a depot and therefore would be equally affected by the challenges. However, it is appreciated that the depot is a critical component of a successful public transport system.

9.2 Description of Preferred Option

The Preferred Option is to operate an enhanced Bus Max service pattern (the 'Composite' option) with battery electric vehicles (buses and ferries) with supporting system improvements. The Preferred Option is shown schematically in Figure 9-1.

Once fully realised, the Preferred Option will provide a high frequency, high-capacity bus network with core routes running from Queenstown to main suburbs and secondary routes connecting at Frankton. This public transport network supports the planned housing growth in the southern and eastern corridors, provides public transport travel times that are competitive with driving, and provides greater access to employment, shops, and services.

The initial public transport service changes would be made using the current bus fleet and by varying the existing operating contracts. Further service enhancements would be made during the second operating contract including increased frequency, capacity, and hours of operation. The greatest changes would occur with the third operating contract including the implementation of electric articulated buses and an electric bus depot(s).

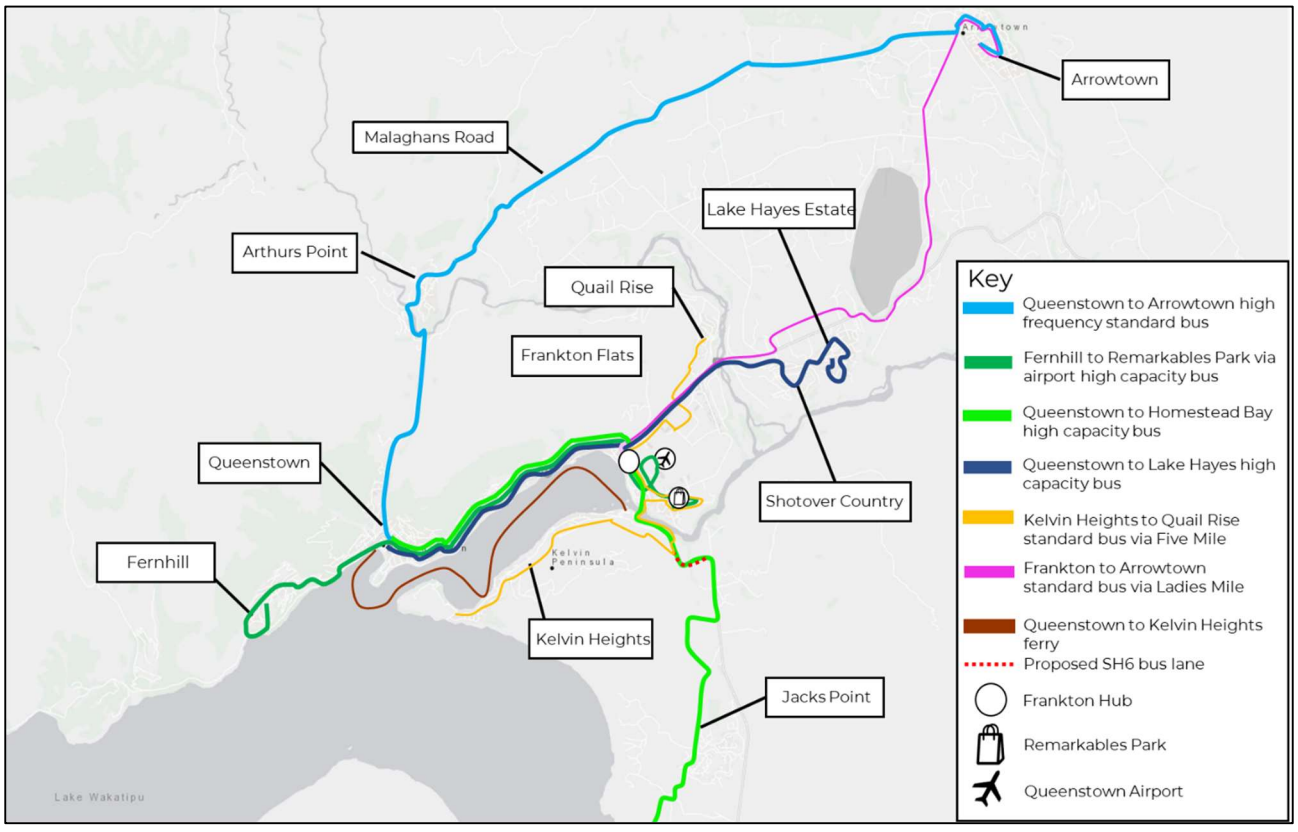


Figure 9-1: Preferred Option, QPTBC

The proposed network shown schematically in Figure 9-1 responds to anticipated growth patterns in the Whakatipu Basin based on the Spatial Plan assumptions. With any project spanning a long-life span, and particularly in the Whakatipu Basin which is known to have accelerated growth, there must be an agile approach that can adapt to development patterns as developments come on-line. For example:

- Extension of the Fernhill to Remarkables Park route along Hawthorne Drive
- Extension of routes to service the growing area of Arrowtown south
- Straightening out the Jack's Point route once the road connection to Hanley's Farm is built
- Diverting the Arrowtown to Frankton bus into Ladies Mile once this suburb is built

It is therefore recommended to review the business case at least once per NLTP period to review service levels and adjustments to meet growth, development, and changes in policies.

There is also the potential to change the routes and termini within the town centre to better serve the new development that is occurring at Lakeview. Staging of the Arterials project influences the ease at which buses can circulate around the town centre without being stuck in traffic congestion. Therefore, without the Arterials Stages 2 and 3 it is likely that the Lake Hayes bus service would continue to terminate at Stanley Street with the Remarkables Park bus operating along Lake Esplanade. Therefore, the Arterials project would have an influence on future public transport accessibility within the town centre.

In Scope

The Preferred Option comprises eight core interventions:

- Public Transport Service and Fleet Improvements
- Stanley Street Hub changes
- Frankton Hub changes
- Establishment of a depot(s) for electric buses
- SH6 bus lanes (approximately Kawarau Falls Bridge to William Rees Cottage)
- Local road minor intersection improvements (to accommodate articulated buses)
- Bus stop changes and related infrastructure / signage on local roads
- Bus stop changes and related infrastructure / signage on state highways

Specific detail of the above interventions is provided in the accompanying Advisory Papers.

It is acknowledged there are limited bus priority infrastructure interventions in the Preferred Option. However, these are embedded into the existing NZUP programme in the Do Minimum of this Business Case. The NZUP Queenstown Package commits significant public transport infrastructure investment, and this Business Case is tasked with fulfilling the next step envisioned by the NZUP investment. Nonetheless, it is believed a similar outcome (total package of NZUP plus QPTBC Preferred Option) would have ended up as preferred had this Business Case started from a blank sheet.

The current review of implementation timeframes for the NZUP Queenstown Package is acknowledged. There exists a risk of investment misalignment, potentially hampering the realisation of benefits for the Preferred Option. For instance, a delay in implementing bus priority infrastructure compared to increasing services could impede improvements in reliable bus travel times. This would limit the attractiveness of public transport and hinder achievement of the desired mode shift. The proposed implementation strategy for the QPTBC is staged, which mitigates some investment risks. Periodic reviews of service levels every three years allow for agile adjustments to dependencies and growth in the Whakatipu Basin. Ultimately, however, delay in investment could undermine efforts to encourage a mode shift towards public transport.

Additional Scope

A key finding of the Preferred Option assessment is that the Investment Objective to “maintain a functional network” cannot be fully achieved by the public transport services alone proposed in this Business Case. It is recommended that Travel Demand Measures are investigated to support the investment of this business case and drive further mode shift to travel modes other than the private motor vehicle.

Examples of Travel Demand Measures include:

- Promotion, education, and travel planning
- Price based tools, including bus fares and parking/congestion/time of use charges.
- First and last mile improvements for active modes
- Limiting access via private vehicle

- Infrastructure investment in further improving bus competitiveness beyond NZUP e.g. bus priority at traffic signals
- Retesting of the Queenstown Business Case with the new service patterns and Spatial Plan to determine the additional demand management measures required

In addition, given the rapid growth occurring in Queenstown, an offline solution such as a gondola is suggested to be further investigated in the 2024-27 period. This will allow a lead time for investigation, consultation, land acquisition, design, procurement, and construction. Due to the certainties in the timing and sequencing of interdependent projects it is recommended that the first stage of the offline solution investigation would be more detailed modelling of the town centre under several scenarios. These scenarios could include different timings of projects, differing levels of parking provision in the town centre and signal priority for buses. The proposed public transport network using articulated buses has sufficient capacity to accommodate the desired mode shift and population growth until 2053. Therefore, the purpose of the study would be to investigate whether buses could circulate around the town centre in all foreseeable scenarios and the degree to which an offline route would support further public transport mode shift.

Out of Scope

Matters out of scope include:

- Structural condition assessments and upgrade of ferry infrastructure (such as wharves)
- Development of a new strategic public transport model
- Detailed planning (e.g. bus stop locations) for new development proposals
- Public transport fare structure

9.2.1 Taking a Staged Approach

Preferred Option

The Preferred Option is to stage investment and implementation over time to take the current network to the desired future state by 2035, as summarised in Figure 9-2, with the aim being to increase all routes to a walk-out-and-catch frequency (every 15min or better) serviced by zero emission vehicles. The public transport services have been designed to be able to accommodate the expected increase in demand over the next 30 years through further increases in frequencies (up to every 5min).

The infrastructure changes required before articulated buses can be implemented are modifications to the Stanley Street Bus Hub, Frankton Bus Hub (proposed to occur as part of NZUP), lengthening of idented bus stops and modifications to some intersections.

Secondary Option

An alternative staging option has also been developed, called the **Secondary Option**, which is premised on delaying the outlay of capital investment in an electric bus depot(s) as long as possible. This option recognises the cashflow challenges in the current fiscally constrained environment and provides ORC a longer lead time to plan for the bus depot(s). It is recognised that this option may not be as financially advantageous in the long-term however due to cost escalation and expected land price increases in the Whakatipu Basin due to land scarcity.

In this alternative option, the transition to electric buses is planned to occur in 2035 when a new electric bus depot(s) would be available. All buses would be decarbonised by 2035 in line with government policy with second-hand diesel buses being used in the interim period. The transition from standard to articulated buses will also align with a new bus operator contract (in 2035). A trade-off however is that more buses, and drivers, will be required than if articulated buses were used (as per the preferred option) as the latter have greater seating capacity.

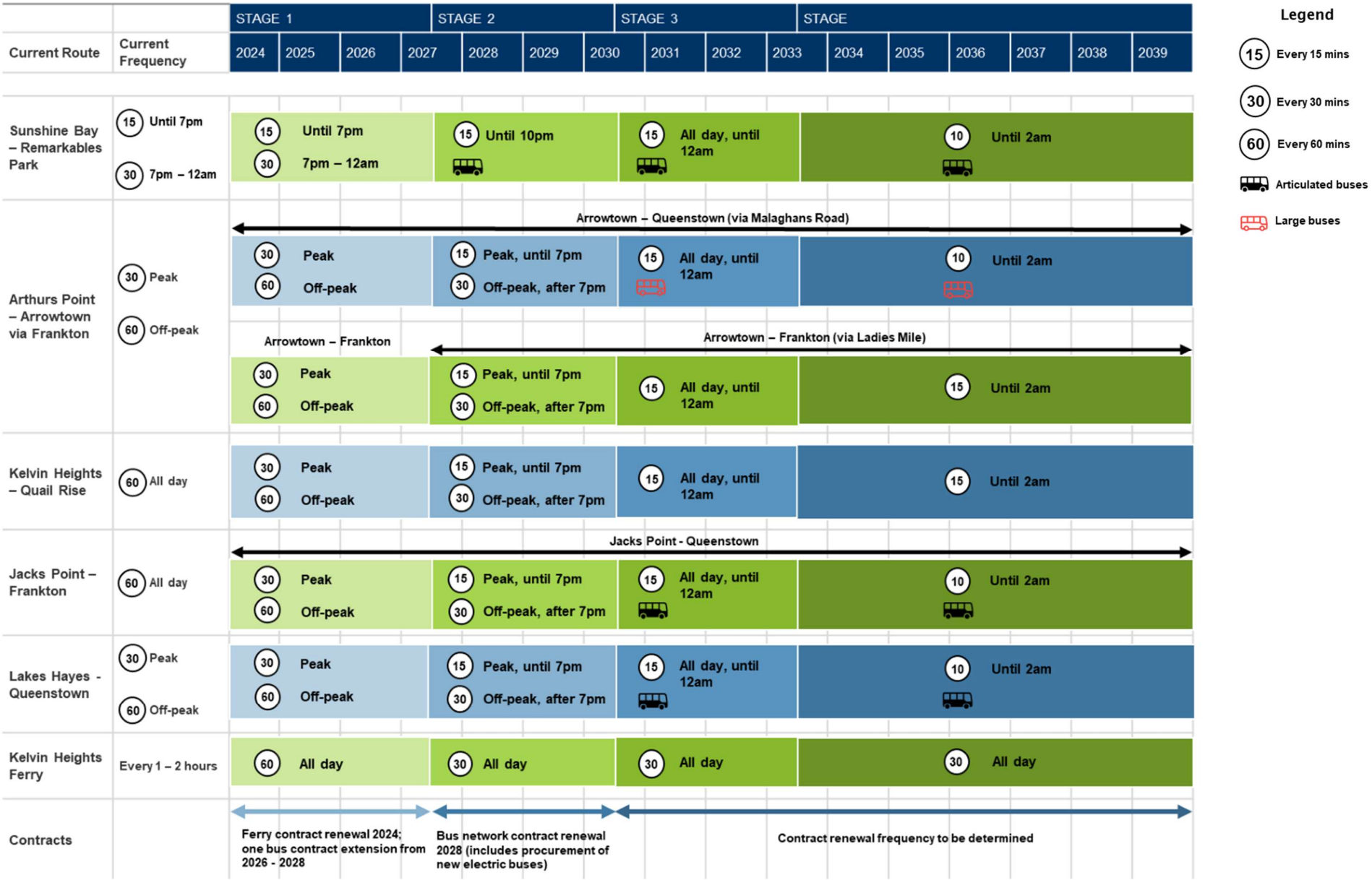


Figure 9-2: Indicative Staging – Preferred Option, QPTBC

10 PREFERRED OPTION – ASSESSMENT

This section identifies impacts and outcomes of the proposal to fulfil ORC and NZTA requirements for appraisal. This section assesses the performance of the Preferred Option against three key measures:

- Economic analysis
- Project outcomes evaluation
- Investment prioritisation

10.1 Preferred Option Economic Analysis

The Preferred Option has been economically evaluated in accordance with the guidance provided within the NZTA Monetised Benefits and Costs Manual (MBCM), 2023. Provided below is a summary of the economic evaluation, this is supplemented by the Economic Assessment Methodology.

10.1.1 Assumptions

The core assumptions which have informed the economic analysis are listed below and in Table 3-1:

- 38-year economic evaluation window allow for two-year construction period.
- Capital expenditure is at the midpoint of NLTP periods
- Timing of capital expenditure is based on the preferred programme staging
- Linear extrapolation has been applied between model years
- No growth has been assumed after 2053
- Year zero is 2022 with costs and benefits discounted to 2022 figures
- 4 percent discount rate

10.1.2 Benefits

Table 10-1provides a summary of the monetised benefits that have been calculated for the preferred option and the primary data sources that were used.

Table 10-1: Economic Evaluation - Benefits, QPTBC

BENEFIT TYPE	MONETISED (MILLION $)	DATA SOURCE
Impact on social cost of deaths and serious injuries	$53	Annualised Crash Costs from TRACKS Network Model Output from Abley.
Impact of air emissions on health	$30	VEPM Emission Factors. VKT from TRACKS Network Model Output from Abley.
Impact on greenhouse gas emissions	$7	VEPM Emission Factors.
Impact on network productivity and utilisation	$1,019	VOC, Congestion, and Travel Time Costs from TRACKS Network Model Output from Abley.

10.1.3 Cost Estimates

Capital Costs

A breakdown of the capital cost estimates for the Preferred Option is provided within Table 10-2. Further breakdown of the costs is provided in the Capital Cost Estimate Memorandum. The Do Minimum Option is assumed to have no capital cost.

Table 10-2: Economic Evaluation - Capital Cost Estimates, QPTBC

PROGRAMME ELEMENT	CAPITAL COST ESTIMATE
Stanley Street Bus Hub	$564,000
Frankton Bus Hub	$1,572,000
Nine Bus Stop Modifications	$1,185,000
Four Intersection Changes	$544,000
Five Mile and Remarkables Interchanges	$1,212,000
Electric Bus Depot	$59,529,000
SH6 Northbound Bus Lane (Kawarau Falls Bridge to Willian Rees Cottage)	$3,615,000

Maintenance Costs

Maintenance costs are assumed to be the same under both the Do Minimum and Preferred Option.

Operating Costs

A comparison of the annual Public Transport operating estimates for the Do Minimum and Preferred Option in 2039 is provided within Table 10-3. Further breakdown of the costs is provided in the Operating Cost Estimate Memorandum.

Table 10-3: Economic Evaluation - Operating Cost Estimates, QPTBC

PROGRAMME ELEMENT	OPERATING COST ESTIMATE
Do Minimum	$11,000,000
Preferred	$25,000,000

10.1.4 Benefit Cost Ratio (BCR)

The Benefit Cost Ratio for the Preferred Option is estimated to be **2.3**.

Comparison with Earlier Stages

The Queenstown Business Case (2020) reported a BCR of 3.3 for Phase 2 of the recommended programme which includes: *public transport (BRT) services (incrementally rolled out and enabled by the investment already made through the NZUP) and travel behaviour change measures.*

Sensitivity and Risk Analysis

Sensitivity and risk analysis has been carried out to test how sensitive the assessed benefits and costs are to change to demonstrate the robustness of the assessment. The outcomes are presented in Table 10-4.

Table 10-4: Economic Evaluation - Sensitivity and Risk Analysis, QPTBC

SCENARIO	TEST	BCR
3% Discount Rate	3% Discount Rate	2.5
6% Discount Rate	6% Discount Rate	2.1
Capital cost underestimated	Capital Cost +20%	2.3
Capital cost overestimated	Capital Cost -20%	2.5
Benefits overestimated, and costs underestimated	Total benefits -20% and total costs +20%	1.6
Transport modelling benefits overestimated	Crash, air emissions, GHG, travel time, and congestion benefits -20% each	1.7

The sensitivity results demonstrate the Preferred Option represents a value for money investment through achieving a BCR above 1, even under scenarios where discount rates increase.

10.2 Outcomes Evaluation

Table 10-5provides a summary of how the Preferred Option achieves the Investment Objectives for this Business Case.

Table 10-5: Preferred Option Investment Objectives Assessment, QPTBC

INVESTMENT OBJECTIVE	LTBF MEASURE	ALIGNMENT
Increase public transport patronage and mode share in Queenstown to maintain a functional network		
KPI 1-1: Increased mode share / mode shift from single occupancy private vehicles	8.1.2 Mode shift from single occupancy private vehicles	The preferred option is predicted to increase public transport mode share at all key points (SH6A, Shotover Bridge, and the Kawarau River Bridge). The greatest shift is in the AM peak on SH6A where public transport mode share is predicted to increase from 14% to 34% in 2053. However, this is short of achieving the investment objective of 47% public transport mode share at this location.
KPI 1-2: More reliable journey times for public transport	5.1.3 Travel time delay	The preferred option reduces travel time variability for key public transport services in 2053. For example, the variability for the key Jack's Point to Queenstown service is predicted to reduce from eight to four minutes.
Reduce public transport CO_2 emissions in Queenstown to meet Government policy		
KPI 2-1: Reduce CO_2 emissions	8.1.1 CO_2 emissions	The preferred option fully decarbonises the public transportation system using battery electric technology. The CO_2 emissions saved from a reduction in VKT is 5,100 tonnes of CO_2 over the 40-year assessment period.
KPI 2-2: Reduce VKT by 2053	8.1.3 Light vehicle use impacts	The preferred option reduces morning peak period VKT by 4.2%, interpeak by 1.5% and PM peak by 3.3% compared to the do min in 2053.
Increase the number of jobs and social destinations accessible by public transport in line with Queenstown spatial planning		
KPI 3-1: Jobs accessible within 20-minute trip on public transport	10.3.1 Access to key social destinations	The preferred option reduces public transport journey times between the southern growth corridor and Queenstown town centre to within 20 minutes. The southern growth corridor is expected to have 3,900 dwellings when fully developed.

KPI 3-2: Social destinations accessible within 30-minute trip on public transport		The preferred option reduces public transport journey times between the southern growth corridor and Queenstown town centre to within 20 minutes. The southern growth corridor is expected to have 3,900 dwellings when fully developed.

A key finding of the Preferred Option assessment is that the Investment Objective to "maintain a functional network" cannot be fully achieved by the public transport services alone proposed in this Business Case. There are further aspects that, if delivered, will support the success of the investment, and drive further mode shift to travel modes other than the private motor vehicle as documented in Section 9.2.

10.3 Investment Assessment Profile

Cost Benefit Appraisal

NZTA is required to prioritise investments made through the NLTP and ensure that these investments achieve value for money. The GPS emphasises value for money to maximise the impact of money spent to achieve the Government's strategic priorities.

As shown in Section 10.1.4 - Benefit Cost Ratio (BCR), a BCR of 2.3 was estimated for the Preferred Option. This indicates that the benefits of the proposal will provide a return on the expected costs over the life of the investment.

Investment Prioritisation Method Profile

The project had a 2021-24 Investment Prioritisation Method (IPM) rating of 1, being **VH/H/M**, when included in the NLTP for the Business Case phase.

The draft 2024-27 NZTA IPM was applied to the pre-implementation and implementation phases of this proposal which is a **stage 2** IPM investment decision.

Note: Although a staged approach across multiple NLTP periods is proposed, the assessment has been done against the 2024-27 IPM. It is noted that it is possible that the investment sought may be subject to changes in transport policy.

An initial assessment indicated that this proposal aligns with NZTA policy and is eligible for NLTP funding from the **Public Transport Services**, **Public Transport Infrastructure**, **Local Road Improvements**, and **State Highway Improvements** activity classes (refer to Part C – Financial Case).

Note: As the proposal for improvements to public transport services are considered a step-change to lift levels of service, the proposal has been assessed as an improvement activity rather than a continuous programme.

GPS Alignment

The strategic alignment of the proposal against the six draft GPS 2024 strategic priorities is as follows:

- *Maintaining and operating the system:* not applicable. The proposal is not looking to address a level of service gap in the network through a maintenance-based intervention.
- *Increasing resilience:* **MEDIUM**. The proposal aligns with Action 8.6 (Invest in public transport and active transport) of the National Adaptation Plan: *Investment in multi-modal infrastructure can increase the resilience of the transport system and help manage the vulnerability of existing assets. More use of public transport and active modes will help reduce reliance on private vehicles. It will increase system redundancy, improve equity, and support sustainable growth. Safe and attractive alternatives to driving create a more resilient transport system, support sustainable growth, and reduce emissions.*

The Preferred Option was shown through traffic modelling to increase public transport mode share at key points on the network (SH6A, Shotover Bridge, and Kawarau River Bridge). The greatest shift is in the AM peak on SH6A where **public transport mode share is predicted to increase from 14 percent to 34 percent in 2053**.

- *Reducing emissions:* **HIGH**. The proposal reduces CO_2 equivalent vehicle emissions for public transport vehicles by 100 percent through a transition to zero emission vehicles. The Preferred Option was shown through traffic modelling to achieve a **4.2 percent reduction** in AM peak period VKT compared to the Do Minimum for 2053. Note the model includes areas not serviced by public transport (e.g. rural areas) and therefore this is a 4.2 percent reduction on all trips, including those unlikely to be made by public transport.
- *Safety:* not applicable. The proposal is not looking to directly address risk corridors and intersections to achieve a reduction in deaths and serious injuries. However, it is likely that there may be some transport safety benefits from increasing public transport services because of an implied reduction in light vehicle VKT. This was assessed through the Economic Analysis to be **$53 Million of monetised benefits** for annualised crash costs.
- *Sustainable urban and regional development:* **HIGH**. This project has a high impact on mode choice. The Preferred Option was shown through traffic modelling to increase public transport mode share at key points on the network (SH6A, Shotover Bridge, and Kawarau River Bridge). The greatest shift is in the AM peak on SH6A where **public transport mode share is predicted to increase from 14 percent to 34 percent in 2053**.

  This project also addresses high priority access focused issues required to achieve agreed integrated land use and multi-modal plans. The emphasis is on reducing reliance on private cars and providing better travel options via public transport. The proposal reduces public transport wait and travel times, with most public transport journeys under 20 minutes.
- *Integrated freight systems:* not applicable. The project does not explicitly seek to address this GPS priority. However, it is likely that there may be some freight benefits from increasing public transport services because of a reduction in light vehicle VKT.

The proposal shows strong multi-outcome alignment, and therefore has been assessed as a **HIGH** draft GPS alignment.

Scheduling

- *Criticality:*

  Given the rapid pace of growth in the Whakatipu Basin, the need for significant investment in public transport has never been more critical in Queenstown. Without investment in NLTP 2024-27, there will be significant challenges to maintain an efficient and productive transport network in Queenstown.

  The proposal aligns with the Minister's expectations in draft GPS 2024 which states that growth in the capacity, frequency, and quality of public transport services are critical to our future.

  In addition, the ability of the proposal to help accelerate and deliver on the VKT reduction plan to achieve regional and national strategic priorities also cannot be understated.
- *Interdependency:*

  The proposal is part of the overall Queenstown Business Case recommended programme and non-delivery of Stage 1 in the 2024-27 NLTP would significantly impact and delay the realisation of other parts of the programme. This includes the Crown infrastructure investment made through the NZUP funding.

  Taking a wider programme perspective, there is significant investment in the Do Minimum that will likely struggle to fully realise benefits without improvements to the public transport services, i.e bus lanes with relatively few buses. This means there is a risk of the NZUP investment being

underutilised if this QPTBC is not progressed. This Business Case both maximises existing investment and relies upon it to make this investment in public transport services worthwhile.

The proposal therefore has been assessed as a **HIGH** rating for both criticality and interdependency. This is because the timing to deliver these activities and their importance to realising the benefits of the integrated package require immediate and sustained effort to deliver the component part, so the Queenstown programme can be delivered at the pace required.

Efficiency

The proposal has a BCR of 2.3 and therefore an efficiency rating of **LOW**.

Overall Ranking

Applying the draft 2024-27 IPM prioritisation matrix with **H** for GPS alignment, **H** for Scheduling, and **L** for Efficiency, this proposal has an overall investment priority score of **2**.

PART C: COMMERCIAL, MANAGEMENT, AND FINANCIAL CASE

11 COMMERCIAL CASE

11.1 Purpose

The purpose of this Commercial Case is to provide decision makers with appropriate assurance of the deliverability of the commercial elements of the Preferred Option. This includes:

- Procurement
- Implementation
- Property strategy
- Consenting
- Market capacity and capability assessment

11.2 Procurement

11.2.1 Ownership and Operating Models

The current roles and functions for the provision of public transport services in Queenstown are shown in Table 11-1. Otago Regional Council currently contracts out the operation of public transport services to private transport operators, in accordance with the Public Transport Operating Model (PTOM). There are three units (groups of services) within Queenstown which are shown in Table 11-2.

Table 11-1: Organisation roles and functions in Queenstown's public transport network

ORGANISATION	ROLE	FUNCTIONS
Otago Regional Council	Procuring organisation	• Network planning • Procuring services • Funding partner • Monitoring services • Marketing
Queenstown Lakes District Council	Road controlling authority	• Provision of bus stops and bus priority on local roads • Funding partner
NZTA Waka Kotahi	Road controlling authority and regulator	• Provision of bus stops and bus priority on the state highway network • Funding partner • Regulation of vehicles including buses
Ritchies Transport and Go Orange	Transport operators	• Provision of services • Employment of operational staff • Owners of fleet • Owners of depot

Table 11-2: Public transport operating contracts from Otago Regional Public Transport Plan

UNIT	DESCRIPTION	CONTRACT DATES	AWARDED TO
6	Queenstown Airport to Fernhill; Jack's Point to Arrowtown	18 September 2017 to 19 November 2028	Ritchies Transport
7	Arrowtown to Arthurs Point; Lake Hayes to Queenstown; Kelvin Heights to Frankton Flats	18 September 2017 to 19 November 2026	Ritchies Transport
8	Trial Frankton Arm to Queenstown Bay ferry service	18 September 2017 to 30 June 2024	Go Orange, whose parent company is RealNZ.[54]

The PTOM was replaced by the Sustainable Public Transport Framework (SPTF) in August 2023. The SPTF will be used for the next round of public transport contract tenders in the Whakatipu Basin. The SPTF supports a more holistic approach to providing public transport, focusing on improving services to support environmental and health outcomes, and fairer treatment of employees.

Future ownership and operating model options available for the Whakatipu Basin under the SPTF were discussed with Way to Go (W2G) partners at a workshop on 18 August 2023. Five options were considered:

- Full privatisation of depot and fleet
- Status quo
- Third-party ownership of assets
- Public ownership of assets
- Council-controlled organisation (CCO)

Additional detail about each of the five ownership and operating model options is provided in **Advisory Paper 7 – Ownership and Operating Model** and **Advisory Paper 8 – System Management.**

The five ownership and operating models were evaluated based on seven criteria, as illustrated in Table 11-3. These criteria were deemed important to enable the public transport service to meet the Investment Objectives of the QPTBC. The evaluation involved comparison of the options to the status quo (PTOM) scenario and determining whether there would be a positive or negative deviation from the status quo.

[54] At the time of writing, RealNZ was looking to sell its Queenstown ferry business to a new owner

Table 11-3: Evaluation of Ownership and Operating Models, QPTBC

Key: ^ Positive compared to status quo v Negative compared to status quo n/c No change

CRITERIA	PRIVATISATION	THIRD PARTY OWNERSHIP		PUBLIC OWNERSHIP		CCO	COMMENTARY
		DEPOT	FLEET	DEPOT	FLEET		
Enabling a transition to zero emissions bus fleet	v	^	^	^	^	^	Under privatisation, private operators have a limited financial incentive to operate zero emissions buses without a government requirement due to the higher purchase price. The cost of providing refuelling infrastructure at depots (such as high voltage power connection and charges for electric buses) is also a large barrier to the adoption of zero emission vehicles. Options which guarantee the investment in depots (i.e. third party ownership, public ownership, and CCO) are seen as beneficial.
Driver pay and conditions	v	n/c	n/c	n/c	n/c	^	Privatisation would remove the pay requirements in operating contracts and therefore driver pay would be set by the market. On the other hand, a CCO would enable government to directly control pay and conditions. However, improvements would be dependent on budget availability and political willingness.
Quality of service for customers	v	n/c	n/c	n/c	n/c	n/c	Privatisation is seen as negative as it would likely result in a significant reduction in level of services as operators would typically focus on profitable routes at the expense of lower demand routes. The incentives contained in operating contracts for on-time performance and fleet condition are considered to provide a good quality of service for customer.
Operational cost efficiency for councils	^	^	n/c	^	n/c	v	Third party and public ownership of depots are positive because it is expected to remove a barrier to entry for new operators, thereby potentially increasing market competition. A CCO is seen as negative, as with the removal of competitive pressures there is a risk that over time the operator could become less efficient in terms of labour and processes. Fleet are a depreciating asset and therefore public ownership of fleet is not expected to result in cost savings.

Capital cost efficiency for councils	n/c	n/c	n/c	⌄	⌄	⌄	The upfront capital cost to purchase assets is a challenge for public ownership and CCO models. Options which retain private ownership of assets do not burden councils with the upfront costs but can have higher operating costs.
Ability to respond to changes in customer needs	⌄	n/c	n/c	⌃	⌃	⌃	Under privatisation the council would have limited influence over private operators. With public ownership of depots and fleets, it would reduce the need to negotiate with operators/investors for service changes.
Complexity of management regime for councils	⌃	⌄	⌄	⌄	⌄	⌄	Third party ownership of depots would require a complex legal agreement to ensure the correct incentives are in place for investors to achieve the public outcomes sought. Public ownership of fleet would require a lease agreement with operators that covered maintenance and repair of vehicles.

Preferred Option – Ownership and Operating

The Preferred Option was agreed to be public ownership of the bus depot and for bus operators to retain ownership of the fleet and continue to run the services. If public ownership of the bus depot is not supported, then third-party (investor) ownership of the bus depot should be explored.

The reason for recommending public ownership of the bus depot is that there is limited industrial-zoned land in Queenstown that is of sufficient size to serve as a bus depot. This means that securing a site large enough for a bus depot would be an expensive and time-consuming process, which may be a barrier to entry for new operators. Another important factor is the significant investment in battery electric bus charging infrastructure and associated power connection. Public ownership or third-party ownership would allow the investment in charging infrastructure and power connection to be protected and transferred to the next operator at the end of a contract term.

11.2.2 Procurement – Bus Services

Preferred Option

It is recommended that the contract for Unit 7 be extended to match the completion date of Unit 6 (i.e. 19 November 2028). The purpose of this is to align the end dates of Units 6 and 7 so that all bus services in Queenstown could be tendered as one combined unit to 2035. New bus contract would be for operating a fleet of electric standard and articulated buses using an electric bus depot. The implementation date of the electric bus fleet and the new depot has been aligned as the buses would be charged overnight using charging infrastructure that would be included in the depot development.

The Ministry of Education (MoE) has informed ORC that some of the school buses which it contracts in Queenstown no longer meets its eligibility policy. Therefore, it has been assumed that as a stop gap measure, ORC would pick up the school bus contracts either with the current operator or a new operator. It is intended that a review of school bus services within the Whakatipu Basin is completed by ORC before the new combined bus contract is let. The purpose of the review is to identify any gaps in services, any duplication with the preferred bus network, and any capacity issues. The reviewed school bus timetables would then be included in the new combined bus contract and implemented with the roll out of the new bus network.

It is recommended that ORC completes an advance notice to potential suppliers to inform bus operators of the future procurement opportunities. This advance notice will stipulate servicing the Whakatipu Basin with zero emission articulated vehicles. The reason for advance notice is to inform bus operators not in Queenstown of the upcoming contract tendering and that the level of public transport services is planned to significantly increase. Furthermore, the advance notice would provide bus operators with the opportunity to engage with bus manufacturers on options with the type of fleet requested (battery electric articulated and standard buses).

The next step would be a request for information that would be used by ORC to gauge interest in the contracts and the market capacity to deliver the services. Bus operators will also need to confirm they could secure the fleet required to operate the services.

The final procurement step would be a request for proposal where suppliers are formally asked to propose how they would achieve the outcomes sought and their prices for operating the services. Due to Queenstown's unique labour market (large tourism, hospitality, and construction industries relative to population size) it is recommended that a high weighting is given to bus operators strategy and track record for hiring and retaining drivers.

At the time of writing this business case, there had been significant wait times for the delivery of new electric buses due to disrupted supply chains and high demand. Wait times of 12 months for standard battery electric buses and 18 months for bespoke battery electric buses (such as articulated buses) are expected. Therefore, it is recommended that sufficient time is provided to the successful tenderer to develop fleet specifications*, engage with bus manufacturers, place an order and for the buses to be delivered before commencing the new contracts.

> **Due to Queenstown's strong tourism market, including winter sports tourism, the passenger requirements are nuanced compared to a standard urban fleet. It is recommended that internal layout of the vehicle is strongly considered during fleet procurement, including the ability to safely transport luggage, ski equipment, mobility devices, prams, and other items that tourists are likely to need to transport with them.*

Secondary Option

The proposed procurement for bus services under the Secondary Option (delaying capital expenditure of the bus depot) follows the same principles as for the Preferred Option. The differences pertain to timeframes and contract stipulations, resulting from the delayed implementation of the electric bus depot(s).

- The contract for Unit 7 to be extended to match the completion date of Unit 6 (i.e. 19 November 2028).

- Tender a six-year combined contract (2028 to 2035) to be serviced with large diesel buses and an operator-owned depot. It is anticipated that bus operators are unlikely to struggle with supply of second-hand diesel vehicles with many expected to become available as other main centres in New Zealand and Australia decarbonise.
- Tender a nine-to-twelve-year combined contract from 2035 onwards that stipulates servicing the Whakatipu Basin with zero emission articulated vehicles and an ORC-owned bus depot.

On-demand Services

With regards to on-demand services, it is recommended that this is a separate unit from the bus services but is tendered at the same time as the bus unit. This is because on-demand service can be operated by a range of different types of companies, including taxi companies, bus operators and specialist on-demand providers. On-demand services also have specific system requirements for the booking of trips and dynamic route planning, which is different from the requirements for delivering bus services. Tendering simultaneously with the bus unit would allow bus operators to choose whether to also bid for the on-demand unit or just for the bus unit.

11.2.3 Procurement – Bus Depot

The provision of a suitable bus depot is a key requirement for the implementation of future public transport services. It is also a key driver for when electric buses are implemented due to the need for depot charging facilities. The current bus depot on Glenda Drive, privately owned by Ritchies Transport, is space-constrained and is not large enough for the number or size of buses required in the future. The current bus depot also does not have a high voltage power connection and secondary substation to provide sufficient power for charging.

There is a severe lack of industrial land in Queenstown that is of sufficient size to serve as a bus depot. Frankton (the preferred option) and Coneburn have been identified as areas for further investigation. Alternatively, two smaller sites could be developed, reflecting the restrictive land availability in Queenstown.

The ownership of the depot(s) could either be public (ORC) or private (bus operator); a decision to be made in the next phase of work. Presently in Queenstown, the bus depot is privately owned. Opting for public ownership offers advantages such as:

- Safeguarding the investment in charging infrastructure, and
- Reducing barriers to entry for new bus operators - the difficulty in securing a depot would limit bus operators' ability to deliver the required increase in public transport services and result in less competitive bus contract tendering.

However, these benefits come at the expense of upfront public capital investment. The estimated cost for the depot is $59.5M including land purchase costs, with $17M of this being for charging infrastructure and power connection.

The **Preferred Option** is to progress the bus depot(s) at the earliest opportunity as the bus depot(s) is considered the key constraint to decarbonisation of public transport in Queenstown. It is acknowledged however that development of a new bus depot with capabilities to service a fully electric fleet is a significant capital expense. There are procurement pathway options that will influence the burden of this capital expense on cashflow that will need to be considered by Way to Go Partners:

- **Development of two depots** would reduce the size of land required to be purchased in one location and may mean there are more options available. There will be cost inefficiencies associated with electrifying two depot sites. However, there may be some operational cost savings by being able to locate closer to route ends thus reducing dead running time.
- Initial conversations have also identified potential opportunities to **lease land** to build a depot on. This however has risk associated with investing in infrastructure (e.g. charging, buildings etc) on a site owned by a third party. There is also risk that the costs associated with the lease

agreement and access rights are higher than anticipated and become unaffordable during the life of the business case.

The other procurement pathway is considered in the **Secondary Option** which is premised on delaying the outlay of capital investment in an electric bus depot(s) as long as possible. This option recognises the cashflow challenges in the current fiscally constrained environment and provides ORC a longer lead time to plan for the bus depot(s). It is recognised that this option may not be as financially advantageous in the long-term however due to cost escalation and expected land price increases in the Whakatipu Basin due to land scarcity. For this reason, it is recommended that consideration is given to land purchase in the short-term depending on appetite and if a suitable opportunity comes to the market.

The latest possible implementation of the electric bus depot(s) has been assessed to be 2035. This is based on contract extension of the current bus contracts 2026-2028 to align end dates of contracts, followed by an interim diesel bus contract of six years (2028 to 2035), then an electric bus contract with depot from 2035. It is estimated that it will take a minimum of four years to plan, design, and build the depot, which means that work on a depot needs to commence in 2031 to meet a 2035 implementation date.

As a result of delaying the electric bus depot(s), it is likely that bus operators will use aged fleet during the interim diesel bus contract. It is anticipated that bus operators are unlikely to struggle with supply of second-hand diesel vehicles with many expected to become available as other main centres in New Zealand and Australia decarbonise. A trade-off however is that more buses, and drivers, will be required than if articulated buses were used (as per the preferred option) as the latter have greater seating capacity.

On-demand Services

It is envisaged that on-demand vehicles would either be housed at a bus depot if both the bus and on-demand contracts are awarded to a bus company. If the bus and on-demand contracts go to different providers, then it is considered that the private market can provide a suitable depot for on-demand services. This is because the space required to house the on-demand vehicles is much smaller, and the power demand could be accommodated (for electric vehicles) using the low-voltage power network.

11.2.4 Procurement – Ferry Services

For the Frankton Arm ferry service, it is recommended that ORC creates a new unit and contracts out this service to a ferry operator. This would replace the current exempt service which has proven uneconomical to run without a subsidy. The tendering of the ferry service provides an opportunity to improve the frequency of the service to hourly initially, and then half-hourly from 2027, and to revisit the fares policy for the ferry. The bus and ferry contract dates do not need to be aligned as there is little synergies between operating buses and ferries.

11.3 Implementation Strategy

11.3.1 Preferred Option

It is anticipated that Queenstown's new public transport network will be delivered in stages with regular increases in service levels and capacity to encourage mode shift and accommodate population growth. A three-yearly staging is proposed in accordance with National Land Transport Fund (NLTF) three-year periods.

Stage 1: 2024-2027

- Introduction of Arrowtown to Queenstown route via Malaghans Road
- Extension of Jack's Point service from Frankton to Queenstown
- Increased frequency of Kelvin Heights to Quail Rise and Jack's Point services to 30 minutes at peak times
- Renewal of ferry operator contract
- Increase the frequency of ferry services to be hourly
- Extension of Unit 7 contract until 2028
- Infrastructure upgrades to the bus hub at Stanley Street and Frankton
- Infrastructure upgrades to bus stops to accommodate articulated buses

Concurrently, the New Zealand Upgrade Programme (NZUP) project will be under construction. This will result in an upgraded bus interchange in Frankton and bus lanes on SH6. The implementation of the Arrowtown to Queenstown via Malaghans Road route will allow some buses to avoid the expected congestion at the SH6 / SH6A intersection roundabout.

For the Stage 1 improvements, ORC will work with the existing bus operator (Ritchies Transport) to implement the service enhancements within the constraints of the existing depot, fleet, and driver numbers. Depending on how the current bus services have been scheduled, extending and increasing the frequency of the Jack's Point route may result in a small increase in peak vehicle requirements. It is recommended that ORC engage with Ritchies Transport to discuss varying the existing contracts and transferring additional fleets and drivers (if required) from operations elsewhere in New Zealand. As with all negotiated contract variations, there is the risk that the best possible price might not be achieved; however, the potential for extending Unit 7 contract to 2028 should act as an incentive for the operator.

Within the Stage 1 period it will be critical to advance development of the electric bus depot. Key activities for this period will include establishing a governance structure with partners, development of a procurement plan, business case, property strategy and acquisition, and design.

Stage 2: 2027-2030

- Introduction of Arrowtown to Frankton route via Ladies Mile
- Increase the frequency of the Sunshine Bay to Remarkables Park to 15 minutes throughout the day
- Increase the frequency of other bus routes to 15 minutes peak and 30 minutes off peak
- Increase frequency of the ferry service to 30 minutes throughout the day
- Implementation of six articulated buses (plus spares) on core routes
- Implementation of the first tranche of electric buses (number will depend on when existing buses are coming to end of life)
- New bus operator contract from November 2028

- New bus depot (owned by ORC or a third party)
- Straightening of Jack's Point service once the Jack's Point to Hanley Farm link road is complete
- Amending the Kelvin Heights to Quail Rise route once new Quail Rise to SH6 link road is complete
- Remove the 'clock-facing' element of the timetable and replace it with frequent connections
- Completion of the NZUP project

The new bus operating contracts in 2028 provide the opportunity to implement a new fleet and to increase service frequencies to walk-out-and-catch on core routes. The 2027-2030 period would provide the step change in public transport service frequency and capacity that would attract new ridership. It is envisaged that articulated buses would be battery electric, with midlife standard diesel buses being used on secondary routes and school routes. As diesel buses reach the end of their useful life, they will be replaced with battery electric buses.

Stage 2 would include the electrification of the bus fleet, the implementation of articulated buses and the delivery of an electric bus depot(s). The electrification of the bus fleet has been aligned with the new depot due to the need to provide charging infrastructure including substations, chargers, and dispensers. The implementation of articulated buses would provide a significant increase in capacity and would enable future demand can be accommodated. The interdependencies for the articulated buses are bus stop lengthening and modifications to local road intersections to improve vehicle tracking.

Stage 3: 2030-2039

- Increase frequencies on all routes to 15 minutes all-day
- Increase span of Sunshine Bay to Remarkables Park to 4am to midnight to accommodate airport workers
- Increase the span of other bus services to 6am to midnight
- Implementation of additional 18 articulated buses (plus spares) for the Lakes Hayes to Queenstown and Jack's Point to Sunshine Bay routes
- Ongoing replacement of diesel buses with electric buses
- Implementation of bus lanes on SH6 south of Kawarau Falls Bridge
- Replacement of Edith Cavell Road bridge with a new two-lane bridge

The increases in service frequencies and span after 2028 would involve the varying of the new contract. It is recommended that a planned increase in peak vehicle requirements is contained in either a contract provision or a memorandum of understanding with the operator. This will make it easier to increase service frequencies as the operator is better able to manage their fleet as they have a long-term view of fleet numbers.

Stage 3 would see the full implementation of walk out and catch frequencies across the network throughout the day. The span of services would also be increased to better accommodate airport workers who travel in the early morning and hospitality workers who travel in the late evening. The implementation of bus lanes on SH6 south of Kawarau Falls and the replacement of Edith Cavell Road bridge would see improved service reliability.

11.3.2 Secondary Option

The secondary option (delaying capital expenditure of the bus depot) programme staging is as follows:

Stage 1: 2024-2027

- Introduction of Arrowtown - Queenstown via Malaghans Road and Arrowtown - Frankton route via Ladies Mile routes
- Extension of Jack's Point service from Frankton to Queenstown
- Increased frequency of Kelvin Heights to Quail Rise and Jack's Point services to 30 minutes at peak times
- Tendering of ferry operating contract
- Increase the frequency of ferry services to hourly
- Extension of Unit 7 contract until 2028 to align bus contract end dates
- Infrastructure upgrades to the bus hub at Stanley Street and Frankton

Stage 2: 2027-2030

- Introduction of large diesel buses on Remarkables Park – Sunshine Bay, Lake Hayes - Queenstown and Jack's Point – Queenstown routes to increase capacity
- Increase the frequency of the Arrowtown – Queenstown, Arrowtown – Frankton, Kelvin Heights – Quail Rise routes to every 30 minutes until 7pm and every 60 minutes 7pm to midnight
- Increase frequency of Jack's Point – Queenstown service and Lake Hayes – Queenstown routes to every 15 minutes until 7pm and every 30 minutes 7pm to midnight
- Increase frequency of the ferry service to 30 minutes
- New bus operator contract from November 2028
- Straightening of Jack's Point service once the Jack's Point to Hanley Farm link road is complete
- Amending the Kelvin Heights to Quail Rise route once new Quail Rise to SH6 link road is complete
- Completion of the NZUP project

Stage 3: 2030-2033

- Increase frequency of Arrowtown – Queenstown, Arrowtown – Frankton and Kelvin Heights – Quail Rise routes to 15 minutes until 10pm and every 30 minutes 10pm to midnight
- Implementation of bus lanes on SH6 south of Kawarau Falls Bridge
- Replacement of Edith Cavell Road bridge with a new two-lane bridge

Stage 4: 2033-2039

- New bus operating contract in 2035
- Electric bus depot commissioned
- Electric articulated buses on Sunshine Bay – Remarkables Park, Jack's Point – Frankton and Lake Hayes – Queenstown routes
- Electric standard sized buses on other routes
- Bus stop and intersection changes to accommodate articulated buses

11.4 Property Strategy

The proposed electric bus depot(s) will require the procurement of additional property. Other elements of the preferred option are expected to be accommodated within the existing road reserve. Accordingly, this section focuses on the proposed bus depot(s).

Advisory Paper 5 – Public Transport Hubs and Infrastructure outlines the requirements for a bus depot and the best areas to locate a bus depot based on operational and urban planning criteria. This paper identified that a bus depot that could accommodate up to 56 articulated buses and seven standard buses would be required. Including the footprint required for electric charging, cleaning and maintenance, car parking and office space, it was estimated that just over 10,000m^2 would be required. Alternatively, two smaller sites could be developed, reflecting the restrictive land availability in Queenstown.

Frankton and Coneburn were identified as the most suitable locations for a bus depot, with the preferred location being Frankton. The criteria used to assess locations were:

- Number of flat, square(ish) sites of over 8,000m^2
- Number of undeveloped sites over 8,000m^2
- Complexity in providing sufficient power connection
- Distance to bus route termini

The 50th percentile capital cost estimate for the construction of a new electric bus depot is $45.5 million (excluding land). This includes consultancy fees, management costs, construction of yard and office/ maintenance building and contingencies. Property costs depend on the on the location of the depot, an estimate based on average ratings values for commercial sites in Frankton gives $14 million for a 10,000m^2 site. Sites in Coneburn are likely to be cheaper but would have higher operating costs from longer dead runs.

Initial assessments of potential sites found no industrial zoned sites large enough to accommodate a new bus depot within Frankton. Therefore, utilising a site zoned for commercial uses, such as at Hawthorne Drive, and applying for resource consent would be more feasible. Another option would be to locate the site at Coneburn, which has larger industrial zoned sites and is currently in the land development stage so currently has greater availability of sites.

Once the business case has been endorsed by partners and the preferred ownership model for the bus depot has been confirmed, the next steps to identify a preferred location(s) would be:

- Engage with Aurora early in the process to confirm electric grid capacity and plan high voltage power connection including substations.
- Engage with landowners in Frankton and Coneburn on timeframes for subdivision and willingness to sell. Consider lease of land only if a long-term lease can be secured as a large investment in site improvements would be required to develop a depot.
- Engage with current and potential bus operators on their requirements for a depot.
- Undertake due diligence on preferred sites that investigates the cost of development and consenting risks.

It is also recommended to engage with Queenstown Airport regarding a potential long-term lease of Airport land for the depot, particularly currently undeveloped land off Hawthorne Drive on the north side of the runway. The advantages of leasing land from the Airport are that it would lower the upfront costs and would provide access to a centrally located site. The disadvantage of a lease arrangement is that it is more difficult to protect the investment in site improvements without favourable lease terms. If the lease arrangement was for a long timeframe (18 plus years) and aligned with the end date of the contract, then a leased site could be suitable.

11.5 Consenting

This business case is for the investment into public transport services and associated infrastructure including bus hub upgrades, intersection upgrades, bus lanes and electric bus depot(s). The provision of public transport services themselves is not expected to trigger the need for consents[55]. The highest risk activity from a consenting perspective is the new electric bus depot(s) and accordingly this section focuses on the depot(s). Consenting plans for supporting activities (such as local intersection changes and the southern corridor bus lane) will be developed alongside the technical assessments of those activities.

An initial planning analysis was undertaken for the bus depot(s). This is described in **Advisory Paper 5 – Public Transport Hubs and Infrastructure** and summarised here. The paper concludes that establishing a bus depot and ancillary offices at Frankton and Coneburn would be reasonably straightforward. A resource consent is required for the buildings.

QLDC currently has two district plans; the Operative Queenstown Lakes District Plan (ODP) and the Proposed Queenstown Lakes District Plan (PDP). The activity of a bus depot does not fit neatly into the definitions of the ODP or PDP, as it is a bespoke activity. It is considered that the best fit for a bus depot is a 'Service Activity', which is defined as the:

> *'…use of land and buildings for the primary purpose of the transport, storage, maintenance, or repair of goods.'*

The assessment considers three possible locations for a bus depot; Coneburn Industrial Zone, Frankton Flats B Zone and Remarkables Park. To help alleviate the bus driver shortage in an expensive district such as Queenstown Lakes, the provision of driver accommodation at the bus depot is an option that has been considered.[56] This would complicate the consenting process as it would require a residential activity being consented in an industrial zone. In both locations, driver accommodation could be accommodated nearby as a preferable option.

11.5.1 Coneburn Industrial Zone

Coneburn is located along the southern growth corridor opposite SH6 of Jack's Point and Hanley's Farm residential developments. The PDP identifies the Coneburn Industrial Zone as:

> *"The Coneburn Industrial Zone provides for industrial and service activities. Conversely, standalone offices, residential and almost all retail uses are excluded within the zone in order to ensure that it does not become a mixed use zone where reverse sensitivity issues and land values make industrial and service activities unviable within the zone."*

A bus depot would be permitted in the Coneburn Industrial Zone. Coneburn is not the preferred location because of the distance between Coneburn and the start/end of most proposed routes. However, it is an adequate alternative option if suitable land in Frankton is not available.

11.5.2 Frankton Flats B Zone (North of Airport)

The Frankton Flats B Zone has been excluded from the PDP. This zone has been split into six Activity Areas, as shown in Figure 11-1.

[55] Note: Upgrading existing bus stops to add shelters can trigger consenting requirements

[56] Note: Funding for provision of driver accommodation on-site at a depot is to be considered in a future application separate to the funding of public transport services under the NLTF

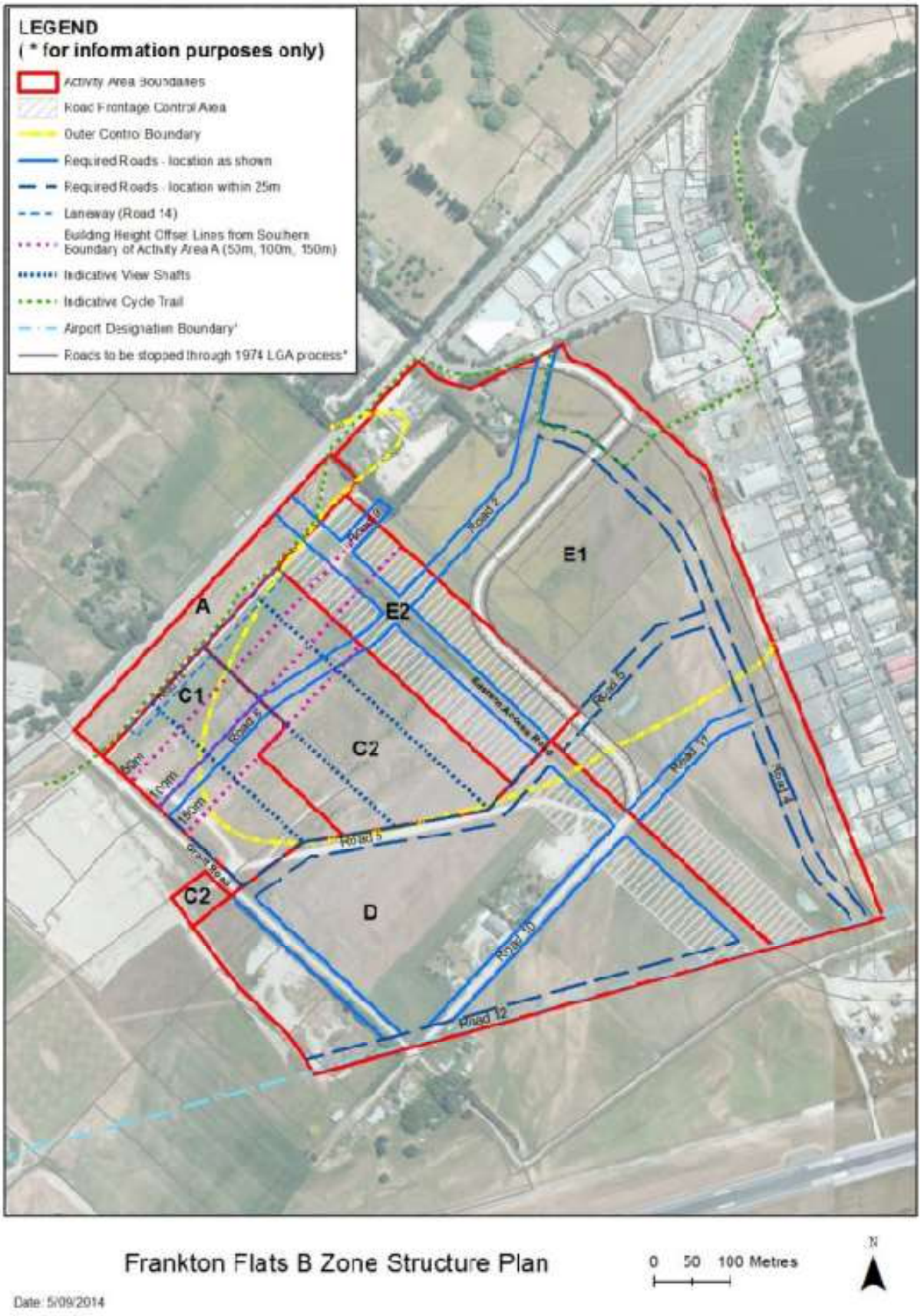


Figure 11-1: Frankton Flats B Zone Structure Plan

Table 11-4 shows the Activity Status for each of these six zones. Areas D and E1 are considered the most promising options for a bus depot.

Table 11-4: Frankton Flats B Zone Activity Status

ACTIVITY	ACTIVITY AREA					
	A	C1	C2	D	E1	E2
Industrial Activities, Service Activities (including ancillary retail activities)	PRO	N-C	N-C	PER	PER	N-C
Offices Ancillary to and Permitted or Controlled Activity	PRO	PER	PER	PER	PER	PER
Residential Activities and Home Occupations located at ground floor*	PRO	NC where adjoining road 8, otherwise PER	PER	PRO	PRO	PRO
Residential Activities and Home Occupations located on levels other than ground floor	PRO	PER	PER	PRO	N-C	N-C
Activities Sensitive to Aircraft Noise within the Outer Control Boundary (OCB) as shown on the Structure Plan	PRO	PRO	PRO	PRO	PRO	PRO

PER= permitted; N-C = noncomplying; PRO = prohibited

11.5.3 Remarkables Park Special Zone

The Remarkables Park Special Zone is split into 10 Activity Areas. Service Activities, such as a bus depot, are prohibited in each of these areas.

11.5.4 Recommendation

Frankton is the preferred location for a bus depot due to its proximity to the start/end of most proposed bus routes and workforce.

11.6 Market Capacity and Capability Assessment

11.6.1 Operation of proposed bus network

Private bus operators will continue to have responsibility for operating the bus network, including ownership of the required bus fleet and recruiting bus drivers, according to requirements set out in contracts with ORC. It is anticipated that just one operator will be required to operate Queenstown's bus network under a single contract.

There are several bus operators in New Zealand which have the experience and capabilities to operate a network of the size planned for Queenstown. Table 11-5 provides an overview of the main bus companies and the types of services that they operate.

Table 11-5: Main urban bus public transport providers in NZ

OPERATOR	EXISTING CONTRACTS	FLEET TYPE	PROPULSION TYPE
Ritchies Transport	• Auckland Transport (including Northern Express) • Otago Regional Council (including Queenstown) • Environment Canterbury	Mixture of double deck and single deck buses	Mixture of electric and diesel powered
Tranzurban (owned by Tranzit Group)	• Metlink Wellington (60% of Wellington's bus network) • Manawatu, Whanganui, and Taranaki	Mixture of double deck and single deck buses	Mixture of electric and diesel powered
Kinetic (including Go Bus)	• Auckland Transport • Environment Canterbury • Hawkes Bay Regional Council • Otago Regional Council • Metlink Wellington	Mixture of double deck and single deck buses	Mixture of electric and diesel powered

The preferred Queenstown public transport network utilises a fleet of battery electric standard and articulated buses. Articulated buses are uncommon in New Zealand. However, Metlink has committed to implementing articulated buses on Route 2 in Wellington. It is expected that additional driver training will be required to enable the operation of articulated buses to account for the greater length of the vehicle. It is recommended that the modifications to bus stop, intersections, and bus hubs are scheduled for completion at least three months before the start date of the new contracts to allow time for on-the-road driver training. All main operators are experienced in operating battery electric buses therefore it is expected that cross company knowledge sharing would aid in the transition to battery electric buses in Queenstown.

From a service delivery perspective, there is high confidence in the capacity of the market to operate the planned services and procure the required fleet. Recruiting and retaining bus drivers in Queenstown may be more challenging and is discussed in **Advisory Paper 7 – Ownership and Operating Model**.

11.6.2 Bus depot

A new, publicly-owned, bus depot will be a large and complex project that is on the critical path for the transition to battery electric buses, the implementation of articulated buses, and the associated contracts. The steps involved are to:

- Confirm ownership approach
- Procure site
- Design and consenting
- Construction
- Establish management system

A large infrastructure project such as this is not business-as-usual for ORC. Therefore, the recommended approach to delivering the bus depot(s) is to bring in external skills and experience with ORC maintaining oversight of the project. If third party ownership of the bus depot(s) is the preferred ownership model, then a private company would be responsible for delivering the depot with ORC having a coordination role. As previously discussed, it is not considered financially viable for bus operators to establish an electric bus depot of the size necessary. At this stage of assessment, it is expected that all charging would occur at the depot and that opportunity charging on the road would not be required.

11.6.3 Timetabling and contract changes

The key steps involved in developing the new timetables are:

- Detailed timetabling (determining exact departure times, journey times, intermediate times)
- Detailed route design and installing bus stops along sections of road which do not currently have a bus service
- Public consultation on the service changes
- Incorporating the timetables and routes for both public and school services into the new contracts

This is business-as-usual for Otago Regional Council. While some consultant resources may be required to assist, there is high confidence in the capacity and capability to deliver timetable and contract changes.

11.6.4 Infrastructure changes

The next step for the proposed bus lanes on SH6 south of Kawarau Falls is a Single Stage Business Case in which further design work would be completed. NZTA has the internal expertise in managing the business case processes and there is capacity within the engineering sector to complete the design work and documentation.

Other infrastructure changes will be required to be programmed into the Low-Cost Low-Risk programmes of QLDC and NZTA. The infrastructure changes required to bus stops and to accommodate articulated buses are relatively simple for road controlling authorities.

12 FINANCIAL CASE

12.1 Purpose

The Financial Case demonstrates the project's funding implications and affordability. This includes:

- Project costs
- Funding options
- Financial risk

Further details included in **Advisory Paper 9 – Sustainable Funding Model.**

12.2 Approach and Assumptions

The CAPEX cost estimates have been developed following NZTA SM014 guidance to the Indicative Business Case (IBC) level. Costs for future stages have been provided in real terms, Quarter Three 2023 New Zealand dollars.

The scope of the QPTBC does not include design work other than concept designs for Stanley Street and Frankton bus hubs. As such, the cost estimates have been completed based on markups of the infrastructure changes and cost at a high level with large contingencies being applied:

- Cost estimates for lengthening indented bus stops were completed by costing one site and then multiplying this figure by the number of indented bus stops in Queenstown.
- The proposed intersection modifications were informed by tracking a 19m long articulated bus along the core bus routes using AutoCAD software to identify locations where turns were not possible. Since the state highway network is designed to accommodate trucks, all intersection modifications are in the local road network in Lake Hayes, Jack's Point, and Hanley's Farm.
- The SH6 southern corridor bus lane has had a further assessment, which is contained in the Queenstown Southern Corridor Public Transport Priority Feasibility report for RCL Homestead Bay Ltd.

12.2.1 Quality Assurance

An external peer review of the OPEX and CAPEX estimates was commissioned by ORC and completed in December 2023. Following the external review, the OPEX and CAPEX estimates were updated. The estimates presented in this Financial Case use the reviewed figures. Key changes following the OPEX review include:

- Reduce operating speeds to be 20km/h at peak and 25km/h off-peak, which results in an increase in the peak vehicle requirement and service hours
- Decrease the payback period for fleet to seven years rather than ten years
- Reduce the spares ratio from 20 percent to 10 percent

12.2.2 Risks and Contingencies

The cost estimation reflects the current IBC level of detail for the public transport services and supporting infrastructure. For capital expenditure, a 40 percent base estimate contingency and a further 30 percent base estimate contingency were used to provide the P95 cost estimate. This approach provides a 70 percent contingency on delivery phase CAPEX.

For the operating cost estimates, the unit prices (in service kilometres, in service hours, and peak vehicle requirement) were calibrated based on the current bus contract value. For the future year, forecasts of the in-service kilometres come from GIS map measurements and in-service hours from

typical bus operating speeds. The same unit prices from the 2023 base year were applied to the future year forecasts which is considered a conservative approach.

12.2.3 Capital Costs

Capital cost estimates are shown in Table 12-1. The largest capital cost within the programme is the new electric bus depot at $59.5M. The high capital cost is due to the cost of land, bus chargers, high voltage power connection, office building, and maintenance building. The next highest cost is the northbound bus lane on the southern corridor at $3.6M, which would be NZTA led and could attract developer contributions.

The changes to the Frankton Bus Hub to accommodate articulated buses are planned to occur as part of NZUP, with the $1.6M being incremental costs from the NZUP design. QLDC's lead capital projects would be the local bus stop modifications at $1.2M (except for stops on state highways), intersection modifications at $0.5M, and Five Mile and Remarkables Park interchanges at $1.2M. It is envisaged that the QLDC capital projects would be part of the 2024-27 LCLR Programme under the preferred staging.

Table 12-1: Capital Cost Estimates (P50), QPTBC

PROGRAMME ELEMENT	CAPITAL COST ESTIMATE	LEAD ORGANISATION
Stanley Street Bus Hub	$564,000	NZTA
Frankton Bus Hub	$1,572,000	NZTA / QLDC / ORC
Bus Stop Modifications	$1,185,000	QLDC / NZTA
Four Intersection Changes	$544,000	QLDC
Five Mile and Remarkables Interchange	$1,212,000	ORC
Bus Depot (including land)	$59,529,000	ORC
Northbound Bus Lane	$3,615,000	NZTA

12.2.4 Operating Costs

An increase in service frequencies, span, and longer routes means that the operating costs for the preferred public transport network are greater than current, as shown in Table 12-2. The use of articulated buses reduces operating costs compared to running the network with standard-sized buses, as fewer buses and drivers are required. The operating costs would fall under the public transport services NLTP activity class as there is no fixed end date for the activity.

Table 12-2: Economic Evaluation – Operating Cost Estimates, QPTBC

PROGRAMME ELEMENT	OPERATING COST ESTIMATE IN 2053
Current	$6,700,000
Preferred	$25,000,000

In addition, an on-demand electric bus service for Queenstown Hill and Goldfield Heights is expected to have operating costs of around $750,000 per year. This is based on the operating costs of a similar service (now discontinued) in Devonport, Auckland. Detailed investigation of an on-demand service has not been made.

12.2.5 Summary of Interventions

Table 12-3 summarises the recommended interventions from the QPTBC, which includes both the public transport programme and public transport improvements. The table includes a lead

organisation, the indicative cost, and the National Land Transport Programme (NLTP) period for implementation.

Table 12-3: Interventions, QPTBC

ELEMENT	LEAD ORGANISATION	DEPENDENCIES	TRIGGER POINT	ACTIVITY CLASS	INDICATIVE COST[57]	PROGRAMME STATUS	NLTP PERIOD FOR IMPLEMENTATION
Public Transport Services Improvements	ORC	Timing of existing PT contracts	Contract renewals. Demand triggers for PT service improvements	**Public transport services** WC 511: Passenger services - bus	Increasing to $25.0M / per year in 2035	Recommended option – funding approval required	2024-27+ / Ongoing
Stanley Street hub interim changes[58]	NZTA	Interim improvements to Stanley Street hub to accommodate articulated buses, ahead of Queenstown town centre upgrades	Needed for shift to articulated buses before 2028	**Public transport improvements** WC 532: Low-cost, low-risk public transport improvements	$0.6M	Recommended option – funding approval required	2024-27
Frankton hub changes[59]	NZTA / QLDC / ORC	Timing of NZUP improvements. Modify NZUP design to accommodate articulated buses	Needed for shift to articulated buses before 2028	**Public transport improvements** WC 532: Low-cost, low-risk public transport improvements	$1.6M	NZUP	2024-27
Remarkables Park hub	ORC	Routing of Remarkables Park to Fernhill route	Further development along Hawthorne Drive	**Public transport improvements** WC 532: Low-cost, low-risk public transport improvements	$0.8M	Recommended option – funding approval required	2027-2030
Five Miles hub	ORC	Signalisation of Grant Road as part of NZUP	Provision of bus lanes and pedestrian crossings on SH6	**Public transport improvements** WC 532: Low-cost, low-risk public transport improvements	$0.4M	Recommended option – funding approval required	2027-2030
Electric bus depot(s) Preferred option staging	ORC	Timing of existing PT services contracts. Existing depot not large enough / equipped to service electric buses	Shift to electric buses plus PT services improvements	**Public transport improvements** WC 561: Passenger facilities and infrastructure improvements – bus	$45.5M plus $14M land or lease	Recommended option – funding approval required	2024-27
Electric bus depot(s) Secondary option staging	ORC	Timing of existing PT services contracts. Existing depot not large enough / equipped to service electric buses	Shift to electric buses plus PT services improvements	**Public transport improvements** WC 561: Passenger facilities and infrastructure improvements – bus	$45.5M plus $14M land or lease	Recommended option – funding approval required	2030-33

[57] Indicative high level cost (95th percentile). Not based on design. Assumes NZUP is in place
[58] Interim option to be developed ahead of town centre upgrade, inc bay lengthening, shelters, signage
[59] Assumes incremental difference on top of NZUP design

SH6 bus lane – Kawarau Falls Bridge to William Rees Cottage	NZTA	SH6 active travel project	Demand trigger related to growth on southern corridor	**Public transport improvements** WC 561: Passenger facilities and infrastructure improvements – bus	$3.6M	Recommended option – funding approval required	TBC – 2027-30
Local road intersection[60] improvements (to accommodate articulated buses)	QLDC	Proposed PT service improvements	Needed for implementation of articulated buses	**Local road and state highway improvements** WC341: Low-cost, low-risk improvements	$0.5M	Recommended option – funding approval required	2024-27
Bus stop changes and related infrastructure on local roads	QLDC	Proposed PT service improvements	Needed for implementation of articulated buses	**Public transport improvements** WC 532: Low-cost, low-risk public transport improvements	$0.6M	Recommended option – funding approval required	2024-27
Bus stop changes and related infrastructure on state highway	NZTA	Proposed PT service improvements	Needed for implementation of articulated buses	**Public transport improvements** WC 532: Low-cost, low-risk public transport improvements	$0.6M	Recommended option – funding approval required	2024-27

[60] Sylvan/Howards, Sylvan/Hope, Rare/Acheron, Jack's Point/Maori Jack

12.2.6 Funding Forecast

The funding forecast for cashflow purposes is shown in Table 12-4. This cashflow is based on the preferred programme staging with an electric bus depot in 2028. The public transport service improvements costs are the increase from the funding in the public transport continuous programme for Queenstown. The cost escalation is the expected increase in costs for delivering the services with 4.91 percent being used for the first three years and 3.00 percent for the remaining years. Nominal public transport service improvements costs takes off the expected fare revenue which is assumed to be 37 percent which is the current farebox recovery rate. The real public transport service improvements costs are the nominal cost plus the price escalation.

Table 12-4: Funding Forecast, QPTBC

ACTIVITY CLASS	FY24/25	FY25/26	FY26/27	NLTP 2027-2030	NLTP 2030-2033
Baseline public transport continuous programme	$7.56M	$7.56M	$7.56M	$7.56M per year	$7.56M per year
Preferred programme public transport services	$11.0M	$11.0M	$11.0M	$20.5M per year	$23.25M per year
Public transport service improvements gross costs	$3.4M	$3.4M	$3.4M	$12.9M per year	$15.7M per year
Public transport service improvements escalation	$0.2M	$0.2M	$0.2M	$0.4M per year	$0.5M per year
Nominal public transport service improvements net cost	$2.2M	$2.2M	$2.2M	$8.2M per year	$9.9M per year
Real public transport service improvements net cost	$2.3M	$2.3M	$2.3M	$8.6M per year	$10.4M per year
Public transport infrastructure improvements	$7.1M	$33.5M	$21.1M	$3.6M	NA
Local road and state highway improvements	$0.1M	$0.2M	$1.5M	NA	NA
Total expected project cost for next NLTP period	$9.5M	$36.0M	$24.9M		

12.3 Funding Options

12.3.1 Current Funding Model

Public transport services are funded from a combination of fare revenue, regional council rates, and fuel excise duty. The current funding mix for ORC (including Dunedin and Queenstown) is 31 percent rates and charges, 41 percent fuel excise duty, and 28 percent from fares. Some parking revenue also supports public transport.

Public transport fares in Queenstown have a flat structure where all trips are charged the same fare regardless of distance, with concession fares available. Fares are reduced (by at least half) by using a Bee Card. Changes to fare structure and pricing is out of scope of this business case.

Public transport infrastructure such as bus stops and shelters are usually funded through the territorial authority. In Queenstown, $0.5–$1M per year is budgeted for bus infrastructure improvements. Transport capital works are normally funded through a 49 percent local share and 51 percent from the NLTP.

12.3.2 Proposed Services Funding Requirements

The operating costs would continue to be ORC's responsibility. By 2035, the operating cost estimate is expected to be $25.0M per year. The new network is expected to increase revenue share through increasing patronage, increasing the share of operating costs covered by fares. It is assumed that fares will increase with inflation over time.

12.3.3 Capital Costs

A suitably-sized electric bus depot in Queenstown will likely be beyond bus operators' financial means. The ownership of the depot(s) could either be public (ORC) or private (bus operator), a decision to be made in the next phase of work.

If public ownership of the bus depot is decided, the depot(s), like most other infrastructure projects, could be funded through debt with there being a saving on contract values compared to if the debt was privately owned. Another approach is for ORC to partner with a private infrastructure investor (such as a Kiwisaver funds) who would develop the depot(s) and lease it to bus operators.

Capital costs relating to the upgrade of infrastructure on local roads borne lead by QLDC and is eligible for funding assistance through the Low-Cost Low-Risk activity class. The bus lane south of the Kawarau Falls bridge could be funded by NZTA through the NLTP and developer contributions from the southern growth area.

12.3.4 Potential Alternative Funding Models

The business case also considered alternative funding models which are documented in the **Advisory Paper 9 – Sustainable Funding Model**. These options are summarised in Table 12-5. The alternative funding sources with the most potential are congestion charging and developer contributions. Congestion charging would help to achieve the mode shift target required to maintain a functional strategic road network and provide an additional funding stream. This funding could be used to increase public transport service levels further and provide the capacity needed for the uplift in patronage.

Table 12-5: Potential funding options for Queenstown public transport

POTENTIAL ALTERNATIVE FUNDING	DISCUSSION
Parking charging	A portion of parking charges is already passed on to ORC to support public transport. Parking charges could be increased to generate additional revenue.
Congestion charging	A change in legislation is required to allow congestion charging. If implemented it could generate a significant amount of ongoing revenue.
Visitor levy	The QLDC 10-year plan includes a visitor levy from 2024 onwards, which is 5% of the accommodation cost. Revenue generated is expected to fund general infrastructure needs and would not be available to fund public transport infrastructure costs.
Tourism Infrastructure Fund	This fund is not available for projects that receive NZTA funding.
Climate Emergency Response Fund (CERF)	In 2023, CERF funding has been used to decarbonise bus fleets and retain and recruit drivers in other parts of the country. Due to uncertainty of the future of CERF funding, it cannot be relied upon for this Business Case.
Developer contributions	It is considered that higher developer contributions from developments along the Southern Growth corridor could be warranted due to the high growth forecast in the area and its limited transport connections.

Note: Reform of the funding model across the subregional transport system was agreed as out of scope for this business case.

13 MANAGEMENT CASE

13.1 Purpose

The Management Case provides an overview of the project arrangements that will be put in place to achieve successful delivery of the outcomes sought from investment. This includes:

- Assurance and acceptance
- Project management and governance framework
- Roles and responsibilities
- Project risks and opportunities
- Stakeholder engagement, and
- Post-implementation monitoring.

The Management Case considers the project's staging in the medium to long term and sequencing of activities in the short term.

13.2 Assurance and Acceptance

Table 13-1 outlines the assurances and acceptances adopted to progress this Business Case.

Table 13-1: Assurance and acceptance, QPTBC

ITEM	DESCRIPTION
Independent peer review of QPTBC and cost estimates	Feedback from independent experts, with feedback incorporated into final versions.
Feedback from ORC officers	Feedback and comments from ORC officers on the Business Case and Advisory Papers. Feedback considered and incorporated into final versions.
Feedback from QLDC	Feedback and comments from QLDC officers on the Business Case and Advisory Papers. Feedback considered and incorporated into final versions.
Feedback from NZTA	Feedback and comments from NZTA officers on the Business Case and Advisory Papers. Feedback considered and incorporated into final versions.
Way to Go Board	Final versions sent to Way to Go Board for endorsement. Following endorsement, it will go to ORC Councillors for approval and confirmation of ownership model.
QLDC Long-Term Plan	Inclusion of local infrastructure items in QLDC's Long-Term Plan
NZTA	Endorsement of business case and inclusion of items in Public Transport Infrastructure and Public Transport activity classes

13.3 Management Framework

The recommended management strategy for the next phases of the public transport services is based on the following considerations:

- The services and related infrastructure are expected to be delivered as part of a long-term programme, which will be developed and implemented in stages to manage uncertainties, constraints, and interdependencies over the life of the programme.
- The programme is complex, being in a fast-growing urban area with several partners. Examples of complexity include:
    - Roles of multiple programme partners, including ORC, NZTA, and QLDC
    - Interrelationship of local road and state highway networks and infrastructure
    - A mix of public transport service improvements, local road and state highway network improvements, and NZUP improvements
    - Procurement and development of a new electric bus depot
    - Multiple funding sources
    - Working closely with bus operators
    - Urgent need for delivery
- Governance and management strategies will need to be flexible and structured to maximise collaboration.

13.3.1 Dependencies

NZUP

The delivery of bus lanes and signal optimisation on SH6 as part of NZUP is critical to delivering on the objectives of the business case. This is because the bus lanes will enable a fast and reliable public transport network to be delivered that would in turn increase patronage. The QPTBC would provide the enhanced bus services to fully utilise the investment in public transport priority measures as part of NZUP.

Queenstown Town Centre Arterial Road

The Queenstown Town Centre Arterials project aims to deliver additional route around the town centre from Frankton Road to Glenorchy – Queenstown Road. Stage 1 of the project Melbourne Street to Henry Street is currently underway. There is currently funding uncertainty around Stages 2 and 3 which is the sections between Henry Street and Fernhill roundabout.

Delivery of the Arterials project is not critical to delivering on the QPTBC objectives in the short-term, but without this project it would make bus services from Sunshine Bay less reliable and affect the circulation of buses within the town centre. With the absence of Aerials stages 2 and 3 it would not be possible to extend the Jack's Point and Lake Hayes buses to One Mile via the new road. This would mean that the planned extension of the town centre as part of the Lakeview project would not be accessible to public transport. These interdependencies reflect the need for an agile approach to providing public transport in the Whakatipu Basin that can respond to growth (when developments come online).

Queenstown Town Centre Street Upgrades

The Queenstown Town Centre Street Upgrades prioritise pedestrians within the town centre by implementing shared streets and restricting vehicle access. This project also significantly improves circulation of buses in the town centre.

The first stage of the street upgrades has been completed. An upgrade of Stanley Street including the bus hub is planned to align with Project Manawa which is the development of a new cultural and

civic centre for the district. There are currently funding commitment and timeframe uncertainty for Project Manawa, and this has the potential to delay the next stages of the street upgrades.

The street upgrades are not critical to delivering QPTBC with buses able to use current dead run routes until the street upgrades occur. As part this business case a concept design for an interim bus hub on Stanley Street which can accommodate articulated buses has been completed.

In the longer term, the new transport hub was envisaged by the QBC to act as the principal gateway into the town centre. This will require a cross-organisation integrated approach, as noted in the QBC, to achieve efficient bus operations, improvements to user experience and better active mode connectivity to the town centre.

13.4 Roles and Responsibilities

13.4.1 Way to Go Partnership

Table 13-2 describes the proposed role of each Partner, under the current W2G framework. Given the complexities of delivering the proposed public transport services, the existing arrangement between the W2G partners should be reconfirmed and reframed to maximise collaboration. There needs to be a commitment from all partners to deliver the programme as all parties are responsible for essential components of the programme. This includes a commitment to prioritise public transport in the operation of traffic signals and the enforcement of bus lanes.

It is envisaged that, being the partner with the most invested, ORC will appoint a Project Sponsor/ Project Director to oversee the programme. This will need to be approved by the W2G board.

Table 13-2. Proposed roles and functions for next stages of QPTBC

ORGANISATION	ROLE	FUNCTIONS
Otago Regional Council	Procuring organisation	• Developing a new electric bus depot • Detailed timetabling of new services • Developing new contracts and managing the tendering process • Developing specifications for the new bus and ferry fleet
Queenstown Lakes District Council	Road controlling authority	• Leading the modifications to bus stops on the local road network • Leading the intersection changes needed to accommodate articulated buses • Provision of wharf and jetty assets to support ferry services
NZTA Waka Kotahi	Road controlling authority and regulator	• Leading the modifications to bus stops on the state highway network • Managing the changes to the Stanley Street and Frankton Bus Hubs • Developing a business case for the SH6 bus lane south of Kawarau Falls Bridge

13.5 Project Risks and Opportunities

Table 13-3 summarises key risks to benefits realisation for the next phase of the project. None of these risks are considered to prevent the project from proceeding to the next phase. However, part of the W2G partnership's role will be to make sure that these (and other identified project risks) are managed.

Table 13-3: Risk Summary, QPTBC

RISK DESCRIPTION	LIKELIHOOD	CONSEQUENCE	RISK TREATMENT / MITIGATION	RISK OWNING ORGANISATION
Sufficient power is not available to provide for charging of electric buses due to limited network capacity	Unlikely	Severe	Engagement with power suppliers. Power availability is a key criterion for the selection of a bus depot site.	ORC
The public transport service improvements programme (or parts thereof) is not implemented due to the programme exceeding available funding	Possible	Severe	Staging of the programme. Engagement with NZTA Waka Kotahi.	ORC
Town centre is more congested than forecast due to factors such as higher parking availability which makes it more difficult to circulate buses through the town centre	Possible	Severe	Alignment of land use and parking policy with the goal of reducing vehicle trips into the town centre. Investigation of travel demand management measures.	QLDC
NZUP SH6 bus lane delayed or not implemented, resulting in no bus priority	Possible	Moderate	Engagement with NZTA Waka Kotahi. Staging of PT improvements on the southern corridor	NZTA
Full PT service improvements are not able to be realised due to a shortage of bus drivers	Possible	Moderate	Consideration of accommodation support as per System Management Advisory Paper	ORC
Uncertainty on whether electric buses can operate on Malaghans Route due to weight limitations on Edith Cavell Bridge	Possible	Minor	Staged implementation of the route/vehicles. Engagement with QLDC	ORC / QLDC
Growth happens faster / slower than planned, affecting patronage and operating costs.	Likely	Moderate	Monitor residential and employment growth and reforecast expenditure	ORC
Local road/ intersection improvements (to accommodate articulated buses) are delayed or not progressed (e.g. due to lack of funding)	Possible	Minor	Engagement with QLDC. Consider staging of services and smaller vehicle types.	QLDC
Travel demand management measures (such as parking costs) are not strong enough to 'push' for mode shift	Possible	Major	Recommend W2G partnership directs partners to develop TDM implementation plans that support this Business Case.	All W2G partners (led by ORC)

Decision makers are not aligned or not prepared to commit to significant changes.	Possible	Severe	Maintain contact appropriate levels within partner organisations. Communications and Engagement Plan engaging with public and decision makers.	All W2G partners (led by ORC)
Misalignment between Way to Go project partners.	Unlikely	Severe	Robust agreement amongst W2G partners through an MoU or similar for this specific project to be incorporated into partnership.	All W2G partners (led by ORC)

13.5.1 Government Policies

This business case has relied upon local, regional, and central government policies for the development and staging of the preferred programme. At the time of writing New Zealand was in a transition period between governments and central government policies are expected to change. However, government policy will not change the need for a significant improvement in the Queenstown public transport network. There is limited ability to expand the strategic road network due to topographic and property constraints. Queenstown is growing rapidly which puts further pressure on existing transport infrastructure. The preferred public transport network will reduce vehicle volumes thereby improving the economic efficiency of the road network for freight, trades people and tourists.

13.6 Stakeholder Communication and Engagement

Stakeholder and public engagement completed to date is documented in the Economic Case and the Short List Options Engagement Report.

In summary, drop-in events were scheduled in the Queenstown area for residents and visitors to learn about the Business Case and discuss the Short List options with the project team. An option to provide online feedback was also made available. Feedback received was considered during the short list option assessment. Themes expressed from public engagement indicate that the Preferred Option is supported.

13.7 Post-Implementation Monitoring

Table 13-4 shows the proposed Benefits Management Framework for the new public transport network. More information about the Investment Logic Mapping (ILM) and Key Performance Indicators (KPIs) can be found in the Strategic Case.

As the lead organisation, ORC will be responsible for benefits realisation. It is recommended that the Way to Go partnership prioritise public transport, and regularly monitor progress against benefits. If benefits are not on track to be met, the partnership will consider adjustment of the programme and services as necessary.

Table 13-4: Benefits Management Framework

MEASURE	KPI	METHOD	TIME OF MEASUREMENT	BASELINE	OWNERSHIP
8.1.2 Mode shift from single occupancy vehicles	Increased mode share/mode shift from single occupancy private vehicles	Use ORC boarding data/ Bee Card data and census population data	With Census (5-yearly Census)	Current census and network data	ORC
5.1.3 Travel time delay	More reliable journey times for public transport	Real-time data comparison against timetable	As part of the RPTP reporting cycle	Current travel times / PT network data	ORC
8.1.1 CO_2 emissions	Reduce CO_2 emissions from public transport	Number of diesel vs electric public transport vehicles	With operating contract changes	Current size of operator diesel fleet	ORC
8.1.3 Light vehicle use impacts/ VKT	Reduce VKT by 2053	Traffic volumes on key routes	With census (5-yearly census)	Current traffic volumes on key routes	ORC
10.3.1 Access to key social destinations	Jobs and destinations accessible within a 20 and 30 minute (respectively) trip on public transport	Census and District Plan for key residential, employment areas, and social destinations	With census (5-yearly census)	Current census and network data	ORC

13.7.1 Consideration of Scenarios

The preferred programme has a long-life span and the realisation of benefits has the potential to be influenced by many external factors. The success of any public transport investment is contingent upon a multitude of factors, many of which are subject to change over time. In this section, potential scenarios that may impact the viability and execution of the Preferred Option are summarised.

Changing government policies

As stated previously, government priorities are dynamic and will shift in response to various factors, including changes in leadership, economic conditions, and societal needs over the life of the preferred programme. It is imperative to acknowledge the need for flexibility to accommodate these changes and recognise these changes may influence what investment pathway is best for the policy settings of the day. For example, an anticipated shift to delay fleet decarbonisation will impact achieving LTBF outcome 8.1.1 (public transport CO_2 emissions) in Table 13-4 but may provide financial headroom to bring forward a service frequency increase.

It is therefore important that the appointed Project Sponsor/ Project Director can be adaptable to evolving policy landscapes whilst achieving the Investment Objectives agreed for this project by the Way to Go Partners.

Demand Management tools

It is acknowledged that demand management tools, such as pricing mechanisms, will be critical to achieving the headline mode share targets for the Whakatipu Basin and will support the success of this Business Case's investment. The implementation of these tools, both in terms of timing and aggressiveness, will influence the demand for public transport services.

As such the appointed Project Sponsor/ Project Director will need to be aware of wider Way to Go programme decisions and recognise the need to scale the implementation of the preferred programme, within the constraints of contracts and resource availability. This will act to manage investment risk through both staging and sweating the asset to right size the investment.

14 NEXT STEPS

The key initial next steps for the Queenstown Public Transport programme are:

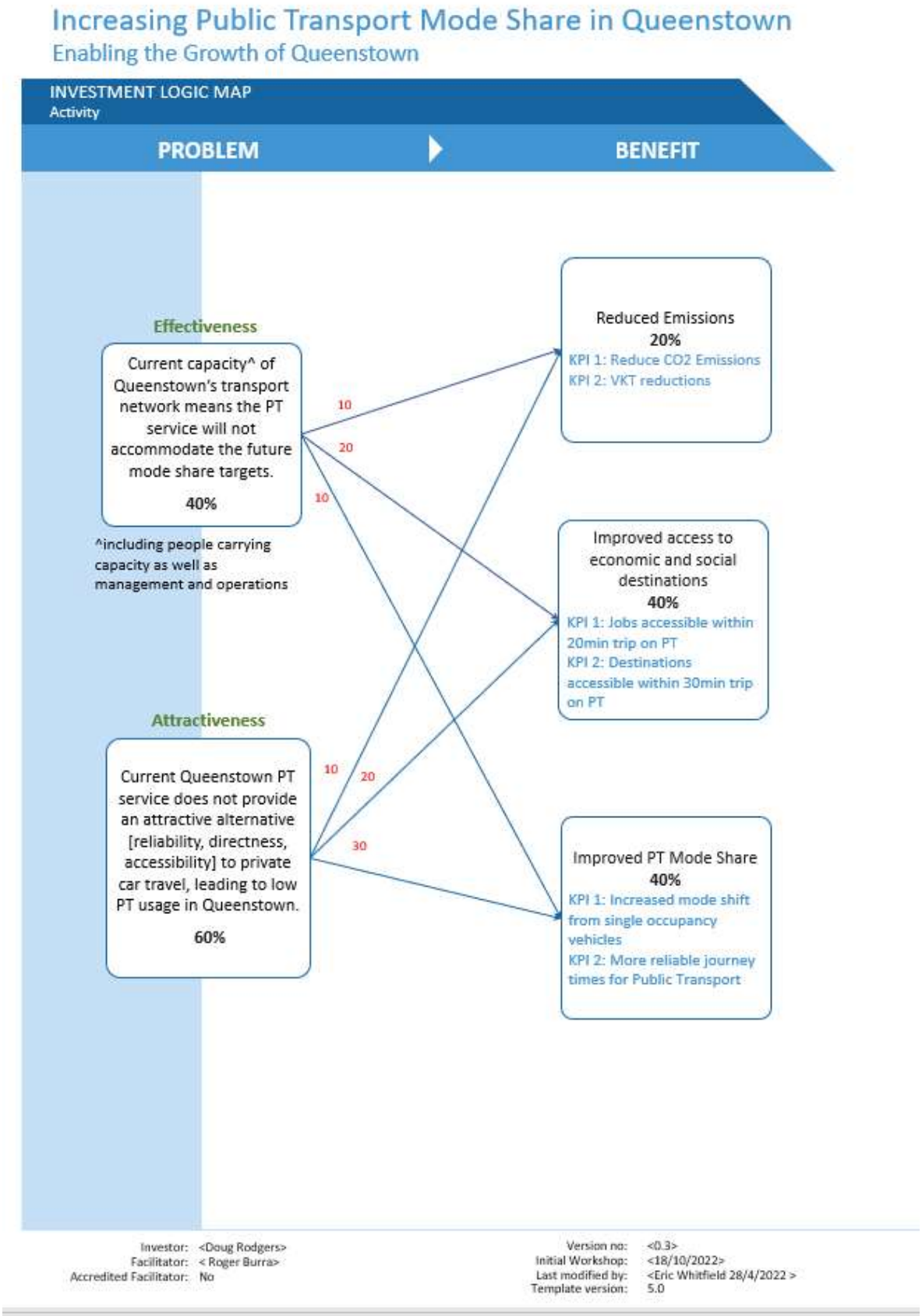
- Endorsement of this Business Case by Way to Go partners
- Reconfirmation and reframing of Way to Go partnership, which will define responsibilities and accountabilities
- Necessary funding applications from NLTP and forward-work planning
- Review of the business case at least once per NTLP period to review service levels and adjustments to meet growth, development, and changes in policies

The indicative scope for the next phase is:

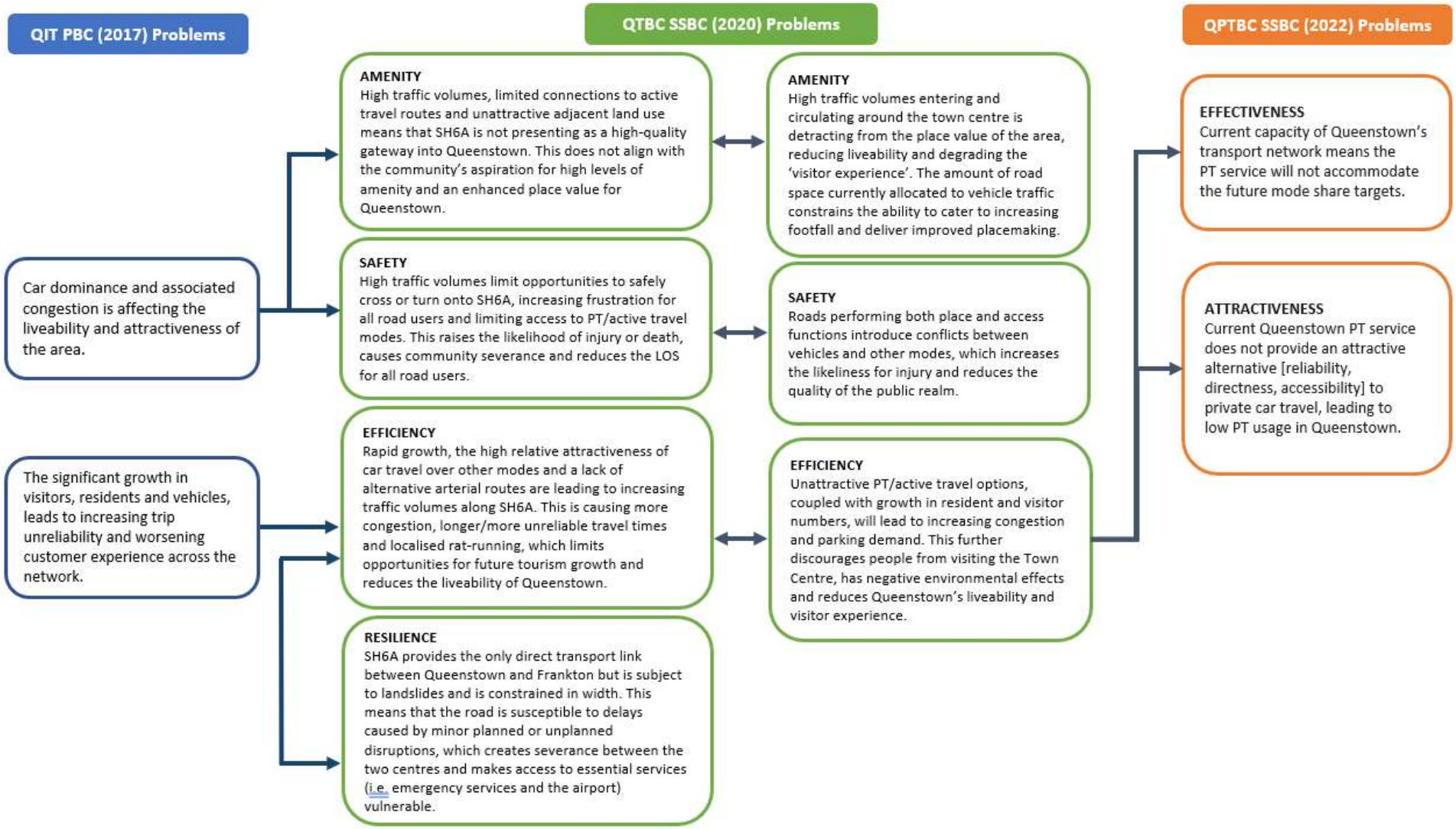
- Detail timetabling of the new public transport services
- Further detailed investigation is required on the bus depot(s), including design on a preferred site, plus property procurement
- Each of the supporting activities will require further work, e.g. design of bus lanes, local road intersections and bus stops
- Investigation of off-line public transport route to supplement the bus and ferry based public transport network

APPENDICES

Appendix A: Investment Logic Map



Evolution of statements

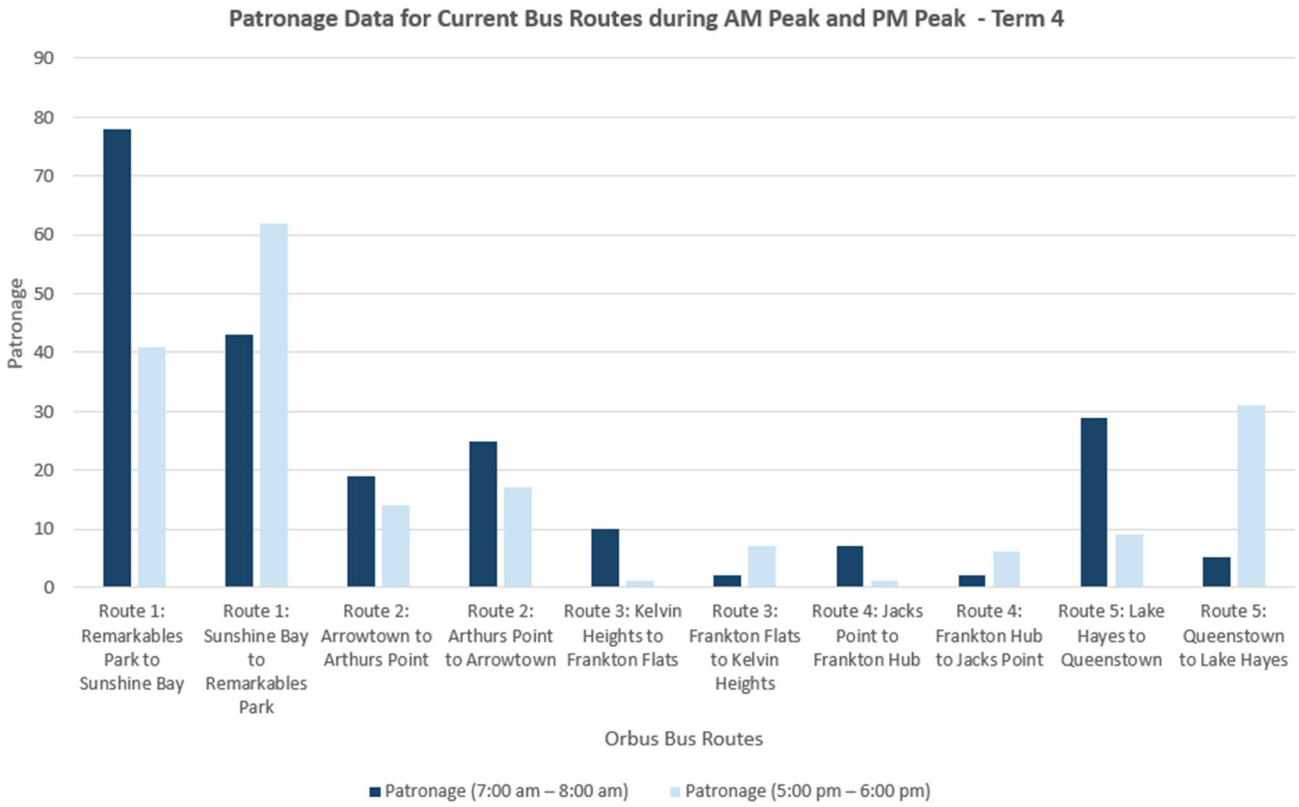


Evolution of problem statements from previous business case stages to the current QPTBC (2022)

Appendix B: Bus Patronage Data

Orbus Bus Route Patronage Data[61]

	Orbus Bus Route	Patronage (7:00 am – 8:00 am)	Patronage (5:00 pm – 6:00 pm)
Route 1	Remarkables Park to Sunshine Bay	78	41
	Sunshine Bay to Remarkables Park	43	62
Route 2	Arrowtown to Arthurs Point	19	14
	Arthurs Point to Arrowtown	25	17
Route 3	Kelvin Heights to Frankton Flats	10	1
	Frankton Flats to Kelvin Heights	2	7
Route 4	Jack's Point to Frankton Hub	7	1
	Frankton Hub to Jack's Point	2	6
Route 5	Lake Hayes to Queenstown	29	9
	Queenstown to Lake Hayes	5	31

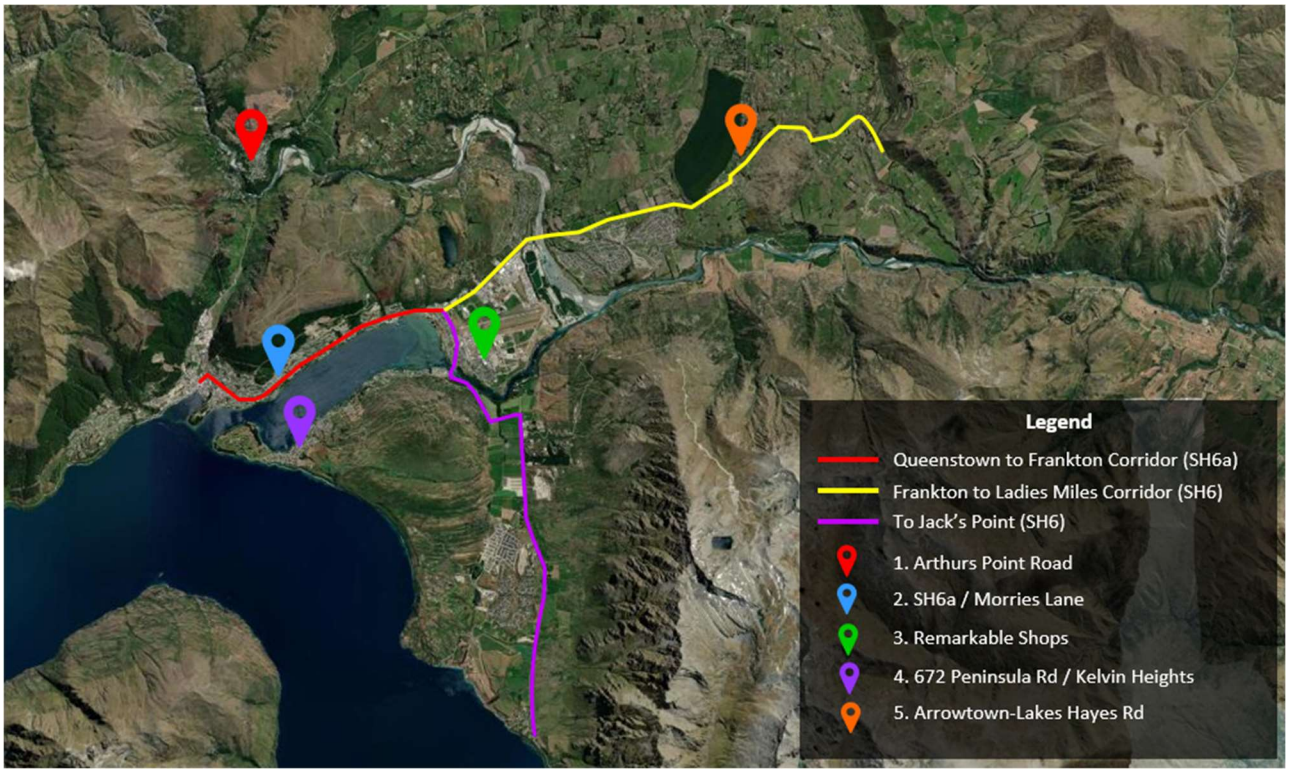


Patronage data for current bus network during morning peak (7am - 8am) and afternoon peak (5pm – 6pm) in Term 4 2021 (Source: Otago Regional Council)

[61] For more information, see Advisory Paper 3 – Service Patterns

Appendix C: Bus Shelter Study

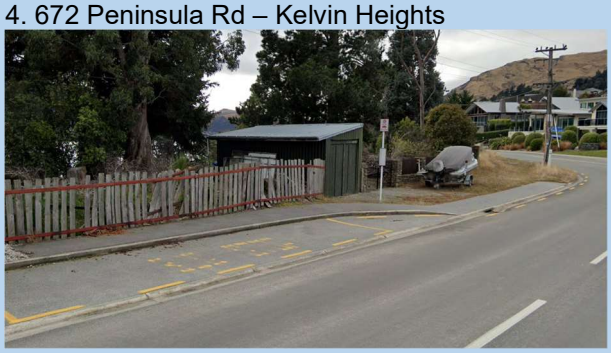
To explore the pain-point further, five bus stop locations were chosen for a sample desktop study.



Map showing the 5 bus stops selected for the mini study. (Base Map Source: QLDC Operative and Proposed District Plan Map Viewer)

Results of the Bus Stop Desktop Study

Bus Stop Location	Facilities Present	Facilities Missing
1. Arthurs Point Road – near Morning Star Terrace 	• Bus stop signage • 2x shelter • Bus timetable • Near a streetlight	• No seats present • Mid-block crossing near bus stop • No real-time information timetable • No dedicated bus stop lighting
2. SH6A / Morries Lane 	• Bus stop signage • Near a streetlight	• No static/ real-time bus timetables • No seating • No shelter • No nearby pedestrian crossing facilities • No dedicated bus stop lighting

3. Remarkable Shops 	• Pedestrian zebra crossings on both ends of the bus stop • Static bus timetable • Lighting present	• No bus seats • No bus shelters • No bus stop sign • No real-time bus timetable
4. 672 Peninsula Rd – Kelvin Heights 	• Bus stop signage • Static bus timetable	• No bus seats • No bus shelters • No safe pedestrian crossing • No lighting • No real-time bus timetable
5. Arrowtown Lakes Hayes Road 		• No bus stop signage • No bus shelters • No seating • No static/real-time bus timetable • No nearby safe pedestrian crossing facilities • No lighting