Confidential

RCL Homestead Bay Ltd

Homestead Bay Fast Track Approvals Application

Transportation Analysis – Summary Report

7 April 2025

Homestead Bay Plan Change

Transportation Analysis – Summary Report

RCL Homestead Bay Ltd

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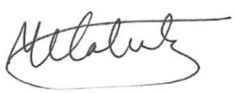
Prepared by:	Matt Gatenby	26/03/2025	
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EXECUTIVE SUMMARY

WSP has been commissioned by RCL Homestead Bay Ltd ("RCL") to complete traffic assessments for the State Highway 6 (SH6) 'Southern Corridor' network in Queenstown. This report is a summary of the previous assessment work done, relating to both the access arrangements for trips generated from the Homestead Bay development itself, but also to assess the operation of the Southern Corridor as a whole, including links to and from the adjacent centres of Frankton and Queenstown.

The proposal for the Homestead Bay area is for around 2,500 residential units in the area known as "RCL Lot 8", together with commercial uses (approximately 11,000 m2 of retail) and recreational uses. There are many other developments within the Southern Corridor area under various stages of development including Coneburn Industrial Estate (~25Ha), Park Ridge, Paterson and Woolshed Development, Hanley's Farm, Jacks Point, Jacks Point Village and other parcels of land at Homestead Bay to the west of the RCL land. It is estimated that total residential households in the Southern Corridor could be at least 7,000-8,000 by 2053.

Based on the traffic growth experienced on the SH6 Kawarau Falls bridge over the last ten years as the Southern Corridor has continued to be developed, it is expected that traffic volumes in the peak hours will:

- reach the capacity of SH6 by 2026
- result in traffic volumes around 30% higher than the capacity of SH6, once all consented and/or zoned development has become occupied

Consequently, any additional development of the Southern Corridor itself, plus outlying areas such as Kelvin Heights, Kingston and The Remarkables ski field, will generate trips that are expected to further exceed the capacity of the existing transport infrastructure. The current transport network is therefore unable to support sustainable growth of the Southern Corridor in its current form.

As a result, WSP has developed a balanced long-term programme of transport infrastructure improvements for the Southern Corridor (and associated links to Frankton) that would enable the sustainable development of the Southern Corridor. This programme would need to be delivered over the long-term, with co-ordinated funding from NZTA, QLDC and ORC, but also likely investment from Central Government and private developers/entities.

The recommended programme includes:

- A second (all-modes) road bridge across the Kawarau River, to the east (downstream) of the existing SH6 Kawarau Falls Bridge, as an alternative link to/from Frankton Flats
- Dualling of SH6 from south of the Park Ridge roundabout to a new intersection at the confluence of the two river crossing routes (in the vicinity of Boyd Road)
- A northbound bus lane on SH6 on the approach to Kawarau Falls Bridge
- Isolated intersection improvements across the SH6 Southern Corridor, and within Frankton Flats (a combination of roundabouts and signal-controlled intersections)

In addition, there are still opportunities for other "non-conventional" public transport modes to be investigated further, such as ferry services between a new wharf at Homestead Bay and Queenstown, and/or a gondola system from Homestead Bay and Hanley's Farm to Remarkables Park, linking to a similar potential gondola system through to Queenstown Airport, Frankton Hub and Queenstown.

In terms of the shorter-term requirements to mitigate the transport effects of the Homestead Bay development, RCL Homestead Bay Ltd proposes a series of isolated intersection improvements with associated trigger points. All mitigation improvements are consistent with the longer-term network-wide programme of transport infrastructure improvements.

1 INTRODUCTION

1.1 GENERAL INTRODUCTION

WSP has been commissioned by RCL Homestead Bay Ltd to undertake traffic assessments for the State Highway 6 (SH6) 'Southern Corridor' network in Queenstown. The study is in relation to a proposed resource consent application under the Fast Track Approvals Act for the Homestead Bay area at the southern end of the Jacks Point Zone, proposing a mix of residential and mixed-use development. RCL wished to gain an increased understanding of the future transport improvement needs for links between the Southern Corridor and Frankton in order to:

- help Council and its partners to advance their strategic planning; and
- make the case for future public infrastructure investment; and
- consider where RCL can best support the broader strategic investment through timely privately funded contributions.

Several iterations of transport and infrastructure improvements feasibility assessments have been previously reported, as set out below:

- **Homestead Bay Transport Effects, WSP, July 2023**
- **Homestead Bay Ferry Feasibility Report, TSA, July 2023**
- **Queenstown Southern Corridor Public Transport Provision and Priority Feasibility, WSP, October 2023**
- **Southern Corridor Gondola Feasibility, TSA, November 2023**
- **Southern Corridor Infrastructure Requirements Assessment, WSP, July 2024**

The above reports have previously been shared with Queenstown Lakes District Council (QLDC), NZ Transport Agency (NZTA) and Otago Regional Council (ORC), and presentations made to the QLDC Spatial Planning Team and the Way to Go Partnership.

This report has been produced to set out a concise summary of the previous assessment work done, relating to both the access arrangements for trips generated from the Homestead Bay development itself, and to assess the operation of the Southern Corridor as a whole, including links to and from the adjacent centres of Frankton and Queenstown.

The above previous assessments and reports have been developed over a significant period of time (since 2022), and given the continued land use development on the Southern Corridor in the intervening period, some previous assessments are out of date in terms of specific findings. This summary report does not re-evaluate and relitigate all the previous work, as the general findings and recommendations are largely still relevant, particularly for the longer-term strategic transformation of the corridor. The outcome of the analysis is to show that timely cross-organisational decision making and intervention development will be needed to ensure that development of the Southern Corridor can be delivered in a sustainable manner, and in line with the objectives and aims of the Queenstown Lakes Spatial Plan.

1.2 SCOPE OF REPORT

The scope of the report is as below:

- Set out the existing traffic levels and operation in the Southern Corridor

- Set out the proposed changes on the corridor
- Investigate the operational performance of the various existing and proposed intersections along SH6 within the study area
- Set out a high-level assessment of the longer term operational performance of the SH6 Southern Corridor road network, and the interaction with transport links to and from Frankton Flats, and the options for improving cross-Kawarau River and Homestead Bay to Queenstown Town Centre links
- Set out a programme of developer lead infrastructure works to mitigate the transport impact of the development, with relevant trigger points

1.3 APPROACH

In undertaking this assessment, we understand the complex interaction between land use development and transport provision, in particular where topographical constraints can give rise to significant impediments to the delivery of infrastructure improvements, either physically and/or financially. This can place barriers in the way of sustainable growth, and consequently the underlying analysis has considered many variables in developing an overall picture of the operation of the future transport network including:

- Rate and quantum of residential growth (both within the Southern Corridor and in adjacent areas within the District)
- The impact of non-residential growth (mixed development) to maximise the level of internal trips within the area
- The scale of uptake in public transport and active travel modes
- The level of infrastructure improvements required (across all modes) to provide economically and environmentally sustainable development within the Southern Corridor

The report is designed to advance analysis and discussion on how Homestead Bay may fit within a broader transport plan for the Southern Corridor. As such it considers:

- The pattern of traffic growth within the Southern Corridor over the last few years, and how this relates to development of the land within the area
- An assessment of how traffic levels will continue to grow, based on an analysis of the timeline of when currently consented and/or zoned land will come online (i.e. become occupied). This includes both development within the Southern Corridor, and in outlying areas such as Kelvin Heights and Kingston, plus other background related growth related to tourist-related growth and other regional growth
- An assessment of the impact of further (currently) non-zoned development within the Southern Corridor
- Analysis of the potential for different transport modes to improve links between the Southern Corridor and the adjacent commercial centres of Frankton and Queenstown – this includes:
  - extension of the existing bus network
  - extension of the existing water-based services
  - potential for a cable-based network
  - additional walking and cycling linkages
  - new road-based connections

2 BACKGROUND

2.1 SOUTHERN NETWORK

For the purposes of this report, Te Tapuae (the Southern Corridor) is defined as the area south of Kawarau Falls Bridge and the Kawarau River, heading south on SH6 to Oraka (Drift Bay). The area is a key growth node (future urban) identified in the Queenstown Lakes Spatial Plan, which was endorsed by Queenstown Lakes District Council, the New Zealand Government, Aukaha and Te Ao Mārama on 29 July 2021.

SH6 is the only existing road route through the area, running towards Kingston and Invercargill. See Figure 2-1 for a plan of the existing situation within the study area. Figure 2-2 sets out a schematic plan of the development plots within the Southern Corridor study area.

The adjacent area surrounding Kelvin Heights has an indirect influence on the operation of the Southern Corridor, as traffic joins SH6 at Peninsula Road, with the majority heading over the existing SH6 Kawarau Falls Bridge towards Frankton.

The main areas of land use currently accessing SH6 within this area are:

- Peninsula Road – access to the Kelvin Heights (predominantly) residential area
- The Remarkables Ski Field Access Road
- Jack Hanley Drive – access to the recent Hanley's Farm residential development
- Māori Jack Road – access to the Jacks Point residential development

Other minor accesses also exist along the SH6 route but largely providing access to single properties or farmland, e.g. Woolshed Road. However, an additional roundabout (and associated access roads) has been constructed to provide access to the Park Ridge (previously Coneburn) area (for residential development, north of Hanley's Farm) and to the proposed Coneburn Industrial area – more details on the existing and future land use on the corridor is provided in Section 4.

2.2 HOMESTEAD BAY

Homestead Bay lies at the south-western edge of the Southern Corridor study area, below the Jacks Point residential and recreational area (golf course). This land is currently largely undeveloped, except for the NZONE Skydive drop zone.

The proposal for the Homestead Bay area is for around 2,500 residential units in the area known as "RCL Lot 8", together with commercial uses (approximately 11,000 m2 of retail) and recreational uses.

2.3 OTHER DEVELOPMENTS

There are several other developments under various stages of completion in the remaining parts of the study area, including:

- Coneburn Industrial Estate – 25Ha site on east side of SH6 (not yet consented/occupied at 2025)
- Park Ridge – predominantly residential development of around 635 homes (consented but none completed/occupied at 2025)

- Woolbrae Developments – Woolbrae predominantly residential development of around 271 homes (none completed/occupied at 2025).
- Hanley's Farm - predominantly residential development of around 1,720 homes (over 1,200 completed/occupied at 2025)
- Jacks Point and Jacks Point Village - predominantly residential development of around 1,500 homes (over 800 completed/occupied at 2025)

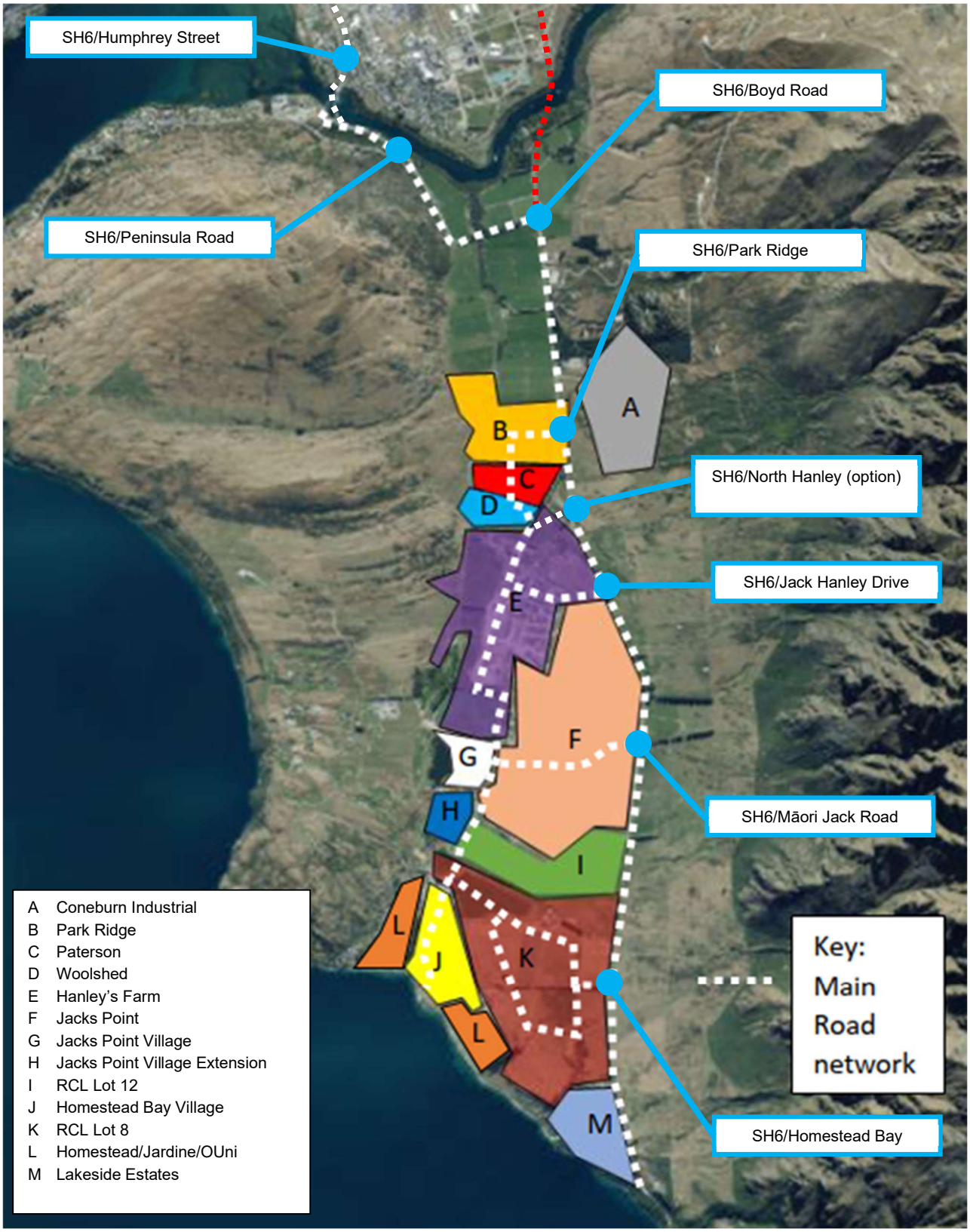
Of the remaining land within the Southern Corridor, the following future developments are anticipated based upon the existing zoning or surrounding development:

- There are no current known proposals for the Homestead Bay Jardine land and Homestead Bay Village (west of the RCL Homestead Bay land) – however under a future rezoning these could perhaps be developed for up to 1,000 residential and visitor accommodation units with associated commercial uses.
- There are no current consents for the Paterson land (between Park Ridge and Woolbrae), however based on the adjoining development there could potentially be 250-300 homes in this area.

The scope of future development has been assumed to be as shown in Figure 2-2.

Figure 2-1: Study Area – Te Tapuae / Southern Corridor

Figure 2-2: Future Development Zones

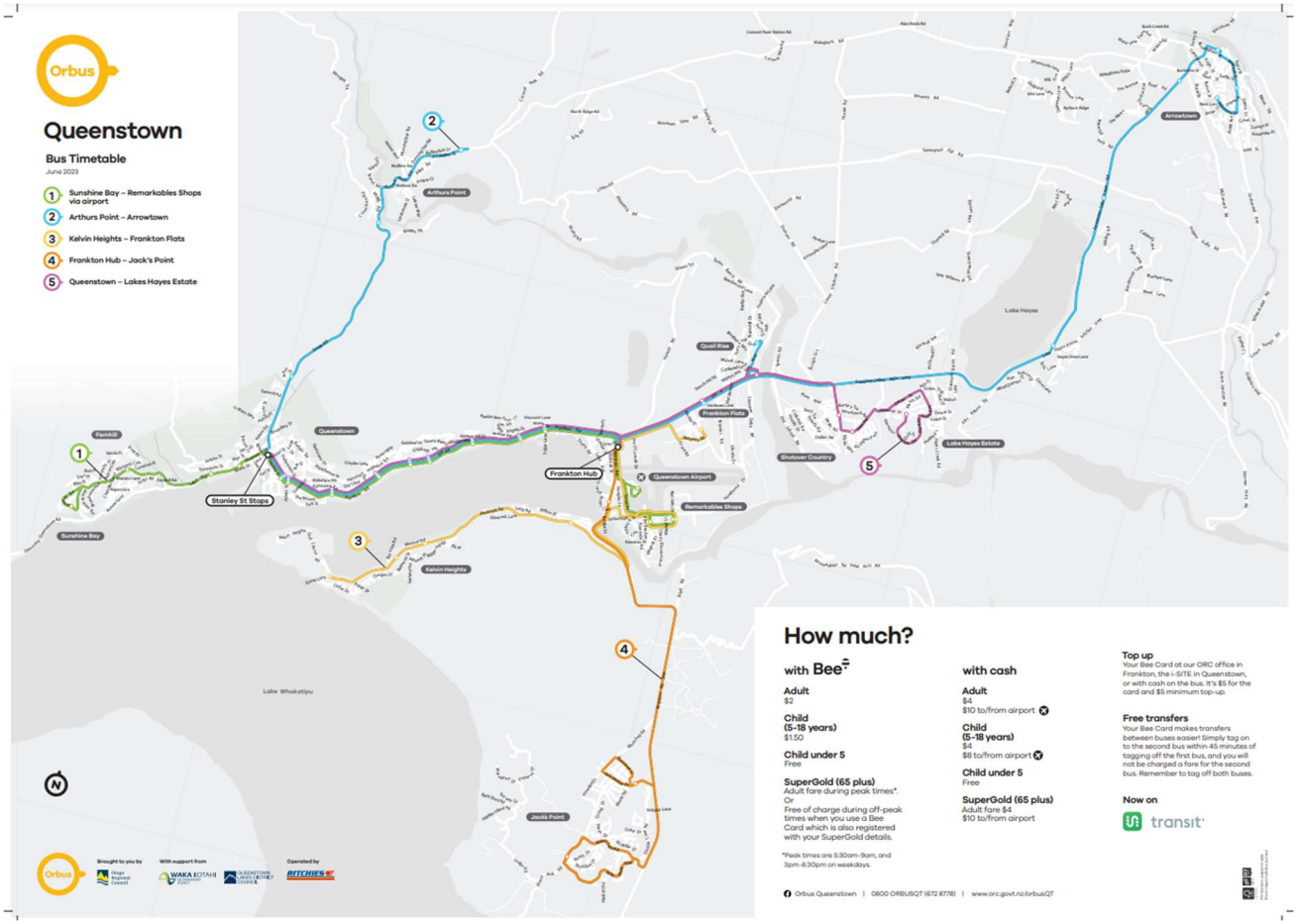


3 EXISTING NETWORK OPERATION

3.1 PUBLIC TRANSPORT

The Southern Corridor is currently served by the Orbus No.4 service Frankton Hub to Jack's Point, and Kelvin Heights is served by the No.3 service Kelvin Heights to Quail Rise. Currently the No. 4 service is hourly, but the (endorsed) Queenstown Public Transport (PT) Services Business Case proposes that the frequency is periodically increased through time (to match demand), as well as being extended through to Queenstown (to remove the need to change at Frankton hub for this through journey). This change is programmed to occur before 2027.

Figure 3-1: Orbus Queenstown bus routes



Currently the service loops in and out of SH6, to serve Hanley's Farm and Jack Point, due to the absence of internal road network within the devlopment area – the bus route is likely to change as internal roads are linked together.

3.2 ACTIVE MODES

The Whakatipu Active Travel Network SSBC (2019) identified a preferred active travel network as shown in Figure 3-2. This included a primary route through the Southern Corridor (on an alignment to the west of SH6), connecting with new primary routes:

- Route alongside SH6 to the old Kawarau Falls Bridge (for links to Queenstown via Frankton track)

- A new river crossing in the vicinity of Boyd Road and Remarkables Park town centre (for links into Frankton Flats)
- A new riverside route on the south bank of the Kawarau River, to a new river crossing at the southern end of Lake Hayes Estate (for links into the Lake Hayes Estate/Shotover Country/Ladies Mile residential area)

Figure 3-2: WATN SSBC preferred network

However, as of 2025, none of the above routes have proceeded to construction, although the Queenstown Trails Trust continues to advocate and seek funding for these projects to be implemented.

3.3 SH6 OPERATION

As part of the assessment work, 24-hour bi-directional link counts were obtained within the corridor in the week starting 16 October 2022 at four locations:

- SH6, south of the Māori Jack Road intersection
- Māori Jack Road, just west of the SH6 intersection

— Jack Hanley Drive, just west of the SH6 intersection

— SH6, north of the Jack Hanley Drive intersection

At the same time as the link counts were collected, sample 30-minute turning counts were undertaken during the AM and PM peak periods at the following intersections:

— SH6/Māori Jack Road intersection

— SH6/Jack Hanley Drive intersection

Figure 3-3 shows a track of the Average Annual Daily Traffic (AADT) in vehicles/day on SH6, just south of the Peninsula Road intersection, as recorded by the NZTA Traffic Monitoring Site (TMS). This shows significant growth between 2022 and 2025, predominantly due to continued land use development within the Southern Corridor.

Figure 3-3: AADT on SH6 (South of Peninsula Road intersection)

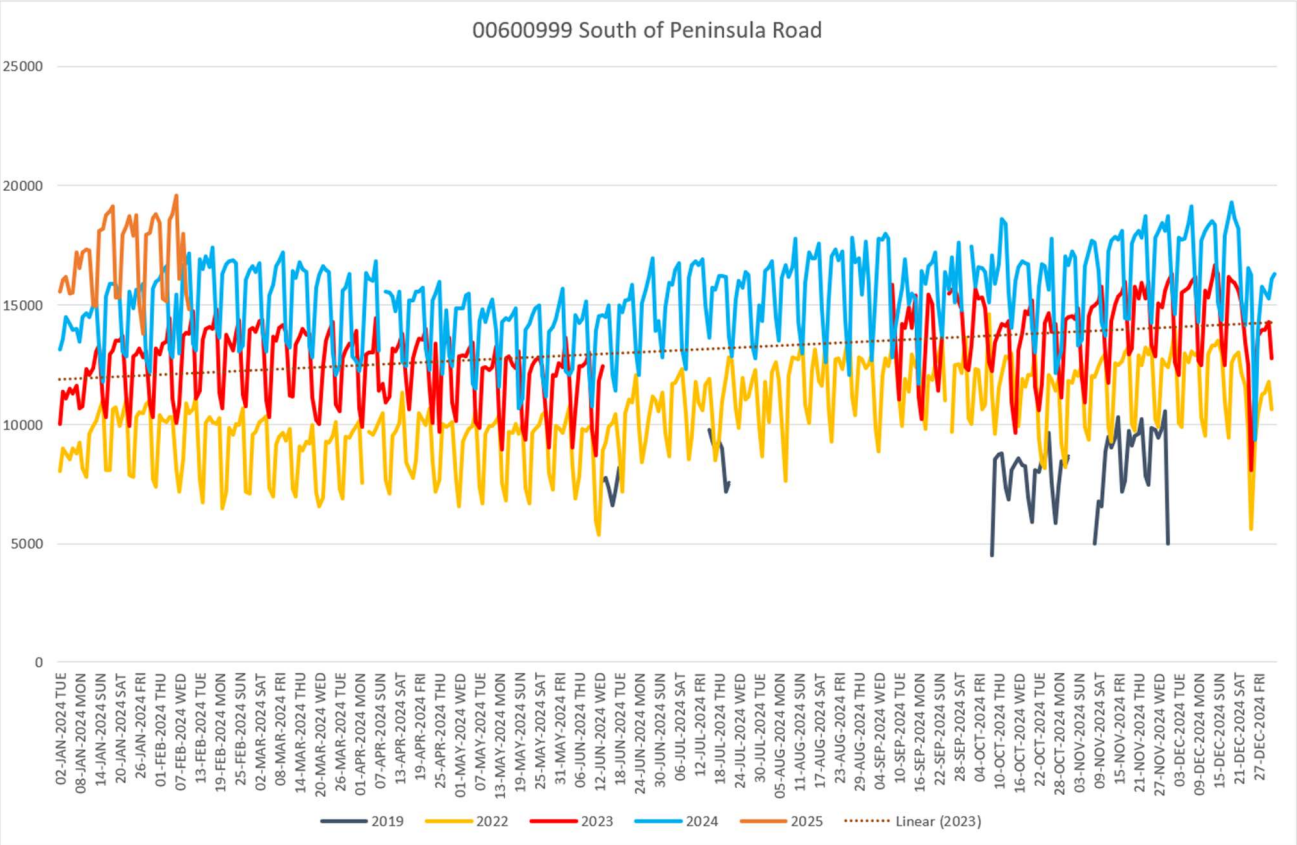
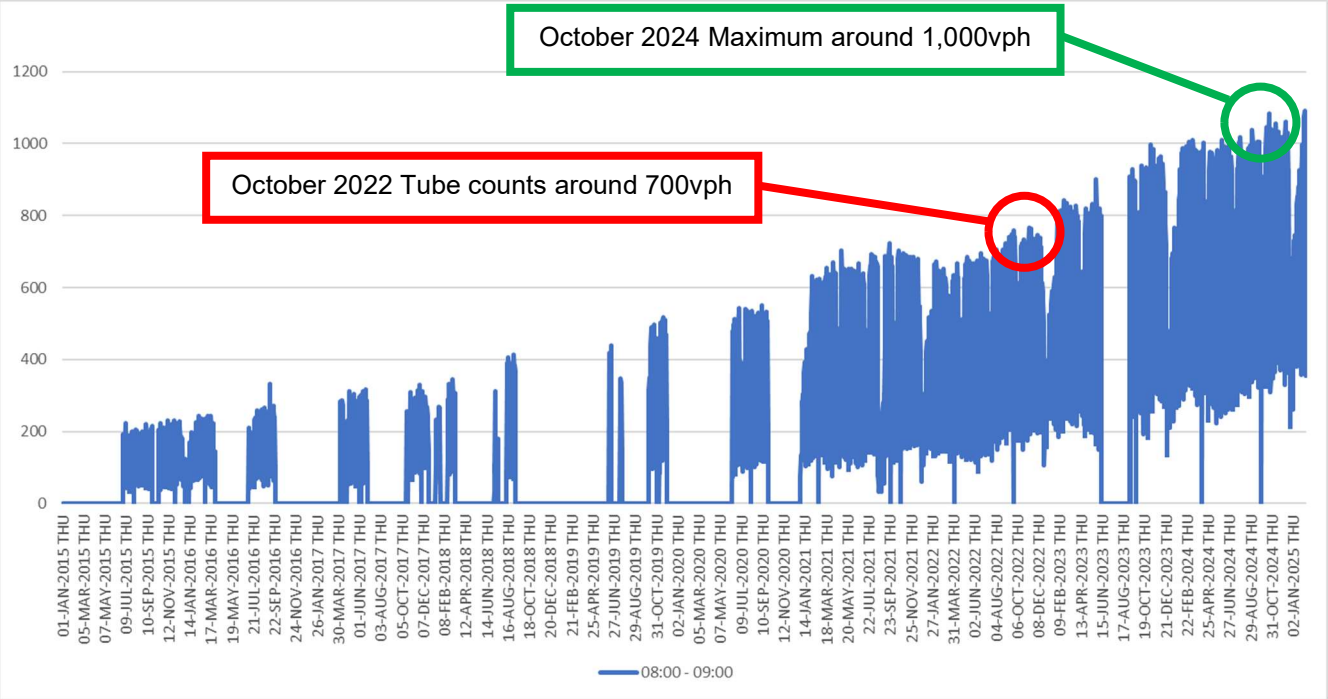


Figure 3-4 sets out the AM peak hour northbound volumes (vehicles per hour) at the same TMS site as above, against the tube counts undertaken in 2022 just north of the Jack Hanley Drive intersection – these can be directly compared as the only trip generator between the two locations is The Remarkables ski field access road, which will generate little northbound traffic in the AM peak period.

Figure 3-4: AM Peak Hour Northbound Volumes on SH6 (South of Peninsula Road intersection)

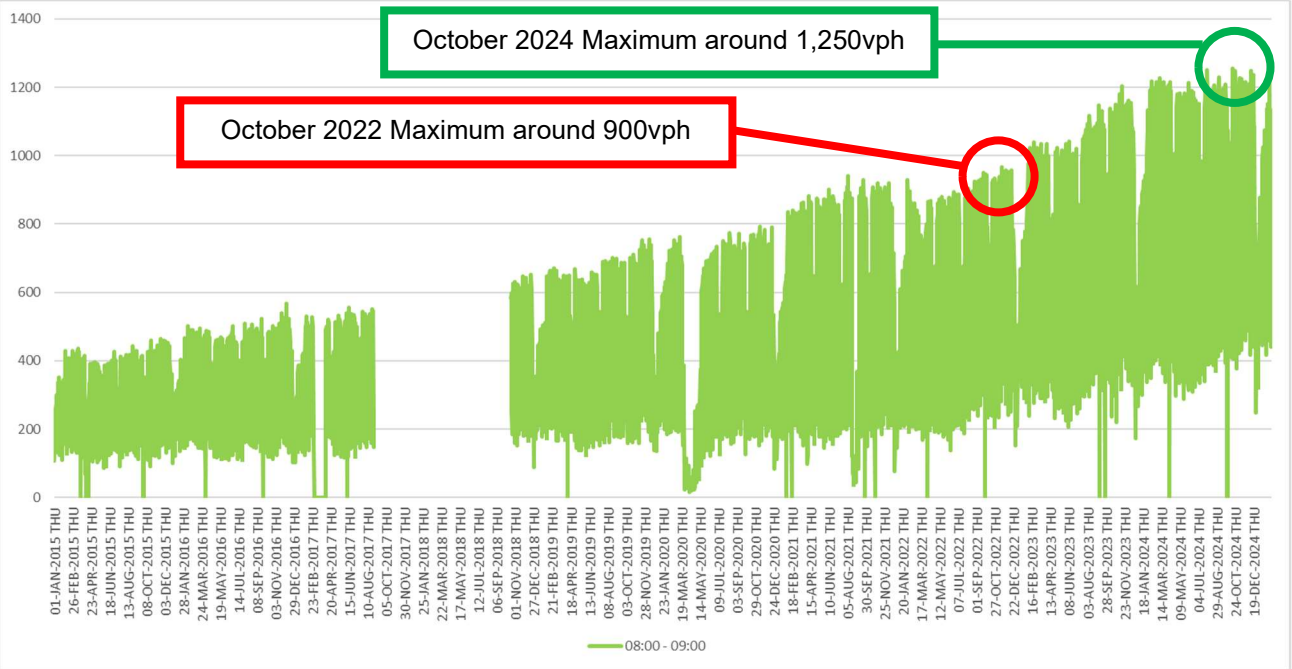


This shows around a 300 vehicles per hour (vph) increase in traffic within the 24-month period (or around 40%), representing this continued (predominantly) residential development in the Southern Corridor.

Analysis of the operation of the SH6/Peninsula Road intersection has forecast that the maximum northbound volume that can be accommodated at the intersection is in the order of 1200vph – at this point, the left and right turn movements out of Peninsula Road is forecast to reach capacity in the AM peak period. This will lead to increasing road safety issues, with drivers accepting smaller gaps to egress the side road. Based on the growth experienced in the last 24 months, this capacity could be expected to be reached by the middle of 2026 (assuming land use development in the Southern Corridor continues at a similar rate).

Figure 3-5 sets out the AM peak hour northbound volumes (vehicles per hour) at the TMS site on SH6 just south of the Humphrey Street intersection, which is representative of the volume of traffic on the SH6 Kawarau Falls Bridge.

Figure 3-5: AM Peak Hour Northbound Volumes on SH6 (South of Humphrey Street intersection)



This shows that the northbound volume has reached above 1,250vph on the approach to the Humphrey Street intersection. Analysis of the operation of the SH6/Humphrey Street intersection has forecast that the maximum northbound volume that can be accommodated at the intersection is in the order of 1500-1600vph – at this point, the right turn movement into Humphrey Street is forecast to reach capacity and queues in the right turn lane start to affect the throughput of the northbound approach. Based on the growth experienced in the last 24 months, this capacity could be expected to be reached towards the end of 2026 (assuming land use development in the Southern Corridor continues at a similar rate).

3.4 IMPACT OF CONSENTED DEVELOPMENT

As set out in Section 2, several development zones within the Southern Corridor are already consented or zoned for, but not yet constructed and/or occupied. In total, should all these residences be completed and occupied, this will add 2,100 households to the area - approximately doubling the existing number (as of 2025).

This would add a significant level of additional trips to the SH6 network, the majority travelling to/from Frankton across the Kawarau Falls Bridge. Assuming that the consented / zoned for developments generate a similar level of vehicular trips to the existing households within the area, this is likely to add 800-850 vehicles per hour in the AM peak hour to the northbound direction SH6 Kawarau Falls Bridge. Adding this to the existing observed volume, the total level of northbound trips would therefore be in the order of 2,100 vehicles per hour – this is around 30% higher than the capacity of the existing road network (the critical SH6/Humphrey Street intersection and downstream intersections within Frankton Flats). The result would be extensive queues on the northbound approach to the bridge in the AM peak hour, spreading out temporally into adjacent time periods. A similar impact would be experienced in the PM peak, in the southbound direction, as vehicles head back towards the Southern Corridor, resulting in heavy congestion within the Frankton Flats network.

It should also be noted that growth in other adjacent areas to the Southern Corridor such as Kingston and Kelvin Heights, plus extension of The Remarkables ski field, will also place added pressure onto the SH6 network, and particularly across the Kawarau River. Whilst

Consequently, it is expected that the existing road network will be unsuited to accommodate the existing plus consented growth in the Southern Corridor, and that a wider programme of infrastructure projects is required to support both the current and expected future consented growth.

3.5 INTERSECTION OPERATION

At present, there are two existing intersections that are used to access SH6 from the (largely) residential development areas within the Southern Corridor:

- SH6/Māori Jack Road intersection
- SH6/Jack Hanley Drive intersection

3.5.1 SH6/JACK HANLEY DRIVE

This intersection is a priority-controlled intersection, as shown in Figure 3-6.

Figure 3-6: Existing Layout of SH6/Jack Hanley Drive intersection (source: QLDC ArcGIS)

The operation of this existing intersection has been assessed. Originally, this assessment was undertaken directly using the traffic counts carried out in 2022. However, the assessment has been updated to an October 2024 baseline, to reflect the development growth in the adjacent areas in the intervening 2-year period. The turn counts at 2024 have been derived, based on the turn counts at 2022, and then applying growth to the counts directly from the change in SH6 volumes north of the intersection as recorded at the TMS location (south of Peninsula Road).

The SIDRA assessment tool has been used to assess the operation of the intersection, and the results are shown in Table 3-1 for the two peak hour periods (0800-0900 and 1700-1800).

Table 3-1: SH6/Jack Hanley Intersection Operation in October 2024

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
AM Peak Hour						
SH6 South	Left	67	0.04	8	A	0
	Through	470	0.26	0	A	0
SH6 North	Through	247	0.24	0	A	0
	Right	253	0.37	13	B	2
Jack Hanley Drive	Left	537	0.80	15	B	9
	Right	82	0.42	28	D	2
PM Peak Hour						
SH6 South	Left	53	0.03	8	A	0
	Through	290	0.16	0	A	0
SH6 North	Through	344	0.19	0	A	0
	Right	608	0.67	13	B	8
Jack Hanley Drive	Left	334	0.37	7	A	2
	Right	39	0.37	45	E	1

The results show:

- In the AM peak:
  - The left turn movement out of Jack Hanley Drive is nearing capacity (with a v/c ratio of 0.8), with a 95% percentile queue length of 9 vehicles – it is considered that this is a reasonable representation against observations at the intersection.
  - The right turn out of Jack Hanley Drive is also experiencing some significant average delay (of around 30 seconds) – due to the lack of stacking space for this movement, this queue can occasionally impact the throughput of the left turn movement
- In the PM peak:
  - The right turn movement into Jack Hanley Drive is nearing capacity (with a v/c ratio of 0.67), with a 95% percentile queue length of 8 vehicles, which is equivalent to around 50m – this is reaching the end of the available stacking space within the existing right turn lane on SH6. Again, it is considered that this is a reasonable representation against observations at the intersection.
  - The right turn out of Jack Hanley Drive is also experiencing delay, again with an impact on the throughput of the adjacent left turn movement

3.5.2 SH6/MĀORI JACK DRIVE

This intersection is a priority-controlled intersection, as shown in Figure 3-7.

Figure 3-7: Existing Layout of SH6/Māori Jack Drive intersection (source: QLDC ArcGIS)

An assessment of the operation of this existing intersection has been undertaken. As for SH6/Jack Hanley Drive, the 2022 counts have been factored to be a better representation of the 2024 volumes.

The SIDRA assessment tool has been used to assess the operation of the intersection, and the results are shown in Table 3-2 for the two peak hour periods (0800-0900 and 1700-1800).

Table 3-2: SH6/Māori Jack Intersection Operation in October 2024

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
AM Peak Hour						
SH6 South	Left	19	0.01	8	A	0
	Through	100	0.05	0	A	0
SH6 North	Through	132	0.07	0	A	0
	Right	215	0.17	8	A	1
Māori Jack Road	Left	465	0.39	5	A	2
	Right	6	0.01	8	A	0

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
PM Peak Hour						
SH6 South	Left	15	0.01	8	A	0
	Through	129	0.07	0	A	0
SH6 North	Through	156	0.09	0	A	0
	Right	228	0.20	9	A	1
Māori Jack Road	Left	214	0.20	5	A	1
	Right	9	0.02	10	A	0

The results show that in both peak periods the intersection has significant space capacity, with little queuing or delay.

4 EXISTING AND FUTURE CONDITIONS

4.1 STRATEGIC CONTEXT

The Queenstown Transport Business Case (November 2020) recognised that to manage Queenstown's rapid population and visitor growth with the topographical, geological, land and cost constraints of Queenstown is not feasible by solely providing further capacity for general traffic. Providing people with other travel choices, public transport, walking and cycling, that take up less space is the sustainable way forward.

The Objectives of the wider package as detailed in the Queenstown Transport Business Case (2020) are:

Provide more efficient and reliable access for people and goods that:

- Sustainably manages high growth
- Reduces reliance on private vehicle travel
- Enables enhanced land use

Is adaptable to change and disruption

Enhances the liveability and quality of the natural and built environment

Enhances safety with a goal of Vision Zero

To achieve the Objectives requires an integrated transport approach across the three investment partners: Otago Regional Council, Queenstown Lakes District Council and NZ Transport Agency. The three pillars of the Integrated Transport Approach comprise:

1. Infrastructure consisting of public transport Infrastructure and improved walking and cycling connections to public transport and the general network – to be provided by NZ Transport Agency (and by Queenstown Lakes District Council on local roads)
2. Public Transport Service Operations which are the responsibility of Otago Regional Council
3. Travel Behaviour Change measures which are the responsibility of Queenstown Lakes District Council

North of the Kawarau Falls Bridge, NZ Transport Agency's Queenstown Package (formerly NZ Upgrade Programme) commenced staged construction in April 2024, which will provide network improvement to all modes within the SH6 portion of Frankton Flats. The Otago Regional Council Queenstown Public Transport (PT) Services Business Case (endorsed 2024) has also set out a programme to improve bus services across the Whakatipu Basin. Options for introducing an additional Active Travel bridge (walking and cycling, plus utilities) from the Southern Corridor across the Kawarau River into south Frankton (Remarkables Park area) are currently being considered by NZ Transport Agency and Queenstown Lakes District Council.

The Queenstown Lakes Spatial Plan (2021)[1] identifies the Homestead Bay land as 'future urban' and includes an outcome that public transport, walking and cycling is the preferred option for daily travel through ensuring land use is concentrated, mixed and integrated with transport.

[1] https://www.qldc.govt.nz/your-council/council-documents/queenstown-lakes-spatial-plan/

4.2 EXISTING AND FUTURE DEVELOPMENT

Figure 2-2 shows a schematic of the Southern Corridor in terms of geographical scale (plus existing and potential future intersections), and Table 4-1 sets out the current RCL prediction of likely development completion by 2053 (a 30-year horizon).

Table 4-1: Predicted land use by 2053

ZONE	NAME	PREDICTED RESIDENTIAL UNITS (BY 2053)	NON-RESI LAND USE
A	Coneburn Industrial[2]	0	Industrial zone (~25Ha)
B	Park Ridge	635	Small supermarket assumed, childcare
C	Paterson[3]	300	None
D	Woolshed Dev (Woolbrae)	270	None
E	Hanley's Farm	1,720	Café, primary school, childcare
F	Jacks Point	830	Recreational (golf course and club house)
G	Jacks Point Village	300	Childcare, medical centre, local shops
H	Jacks Point Village Extension + Willow Pond + Preserve[4]	450	None
I	RCL Lot 12	0	Recreation and infrastructure only
J	Homestead Bay Village[5]	700	210 hotel rooms, schools, childcare, retail centre
K	RCL Lot 8[6]	2,500	Mixed use, quarter (retail)
L	Existing Homestead + Otago Uni + Jardine[7]	300	University camp
M	Oraka / Lakeside Estates	45	None
Total (2053)		**~7,000-8,000**	
Total (QLDC 2053 forecast)[8]		**5,735**	
Total (2024 current)		**Approx. 2,100**	

[2] Zoned for development but not yet consented
[3] Not zoned for residential development and not yet consented
[4] A mix of built, consented and zoned for
[5] Only partially zoned and not yet consented
[6] Proposed
[7] Zoned but majority not yet consented
[8] QLDC 2053 residential forecast for the Jacks Point area by (from November 2022 issue)

Note that the above predictions are an estimate, based on knowledge of land and zoning, and discussions with various parties and potential build rate – full land use capacity of the land available is dependent on many factors – but it should be noted that the total number of households (and other supporting land use) could be higher than this amount if residential development was enabled to a higher intensification level.

As set out in Table 4-1, the RCL dwelling total is higher than the previous 2053 QLDC residential forecast (at November 2022). It should be also noted that QLDC are currently developing a Structure Plan for the Southern Corridor, which is testing various land use options including scenarios with 8,000, 10,000 and 12,000 dwellings. RCL's estimates more closely align with the lower of those scenarios.

For context, Table 4-2 sets out some comparative communities in the South Island for reference.

Table 4-2: Comparative communities in the South Island

TOWN	HOUSEHOLDS[9] (2023)	POPULATION[10] (2023)	COMMENT
Rolleston	10,120	30,140	Close to larger urban centre (Christchurch)
Ashburton	8,230	20,780	Self-contained
Southern Corridor (at 2053)	~7,500	~15,000[11]	-
Mosgiel	6,460	15,230	Close to larger urban centre (Dunedin)
Wānaka	4,890	12,320	Self-contained

Mosgiel provides the closest comparison, in terms of both the number of households and the resident population at 2023, versus the projected size of community in the Southern Corridor by 2053. Mosgiel also has similarities in terms of being close to a larger urban centre, which provides an attractor of trips for employment and other services.

Note that the average population-per-household for the Southern Corridor is currently relatively low at around 2.0[12], compared to the New Zealand average household size of 2.7 (Stats NZ projection for 2023), assumed largely due to lower occupancy rates (i.e. higher proportion of holiday homes compared to the National average) – it is projected that the average-population-per-household will increase as the area develops. As is experienced for most of the District, peak day population will be much higher than the resident population due to visitor numbers during certain parts of the year.

In summary, the number of households in the Southern Corridor (not including Kelvin Heights, and Kingston) is projected to triple in the next 30 years (depending on rate of development). There is also significant potential for residential growth in both Kelvin Heights and Kingston (and surrounds), which would also generate trips between these communities and the employment, education and recreational hubs at Frankton and Queenstown. As set out in the previous sections, the existing SH6 road corridor is reaching capacity in the peak periods (AM northbound and PM southbound) – most notably at the northern end of the corridor (SH6 Kawarau Falls Bridge) which is currently the only direct link to Frankton and Queenstown for the communities south of the Kawarau River.

[9] Statistical area 2 (SA2) household/population estimates, 2023, obtained from Stats NZ June 2024

[10] Statistical area 2 (SA2) household/population estimates, 2023, obtained from Stats NZ June 2024

[11] Population calculated from QLDC estimate of persons per household at 2053 for Jacks Point SA2 (November 2022 issue)

[12] https://www.qldc.govt.nz/media/xkjbu5ua/qldc-demand-projections-2024.pdf

It is important to note that this challenge of constrained transport infrastructure options in the face of high growth pressure is not unique to the Southern Corridor but is prevalent in many other parts of the Whakatipu Basin. Some of this is due to the area's geography, which gives rise to segregated nodes of settlement connected by roads which have limited scope for capacity to be easily increased. Like much of New Zealand, development has historically been car focused and has rarely provided space for the expansion of the road network to accommodate a significant level of traffic growth. The district now faces challenges in terms of the need for large transport investments and incentivising changes in ingrained travel behaviours.

It is therefore known that significant transport infrastructure investment (across many modes) is required to prevent ever poorer condition of the existing transport links.

4.3 METHOD OF ASSESSMENT

To assess the forecast operation of the Southern Corridor network, we have utilised a "first principles" process, rather than carry out a more sophisticated and time-consuming method. This allows assumptions and parameters to be easily changed to test their effect.

Firstly, traffic flow forecasts are generated as per the summary below:

a **Determine current traffic levels** – these were taken from tube counts, undertaken in October 2022, plus NZTA Traffic Monitoring Sites (TMS) continuous data up to early 2025

b **Determine estimate of background growth** – this has been taken from the QLDC TRACKS strategic traffic model (issued November 2022, using the QLDC March 2022 release of growth projections), using the forecast growth in traffic levels south of the Southern Corridor and on Peninsula Road (i.e. to be independent of growth within the Southern Corridor itself), and applied on top of the base traffic levels from **a.** This background increase in traffic therefore accounts for forecast residential growth in Kingston and Kelvin Heights, as well as growth in other trips (including tourism related) to and from Southland**.**

c **Derive future land use development assumptions** – assumed future land use within each development zone, as provided by RCL (and compared to the QLDC residential forecasts from November 2022)

d **Establish trip generation** – we have estimated vehicle trip rates (based on the current negligible non-car mode share) from counts undertaken on Māori Jack Road and Jack Hanley Drive, and then comparing the counts with observed occupancy rates within the residential area. These rates have then been cross-checked against similar calculations and counts undertaken for Lake Hayes Estate and Shotover Country

e **Establish PT and Active mode shares** – forecast PT mode shares have been generated by the WSP developed Public Transport (PT) model used in the ORC Queenstown PT Services Business Case. Active mode shares have been estimated from first principles.

f **Derive Trip Reduction Factors** – estimate the level of car-trips that would be removed from the SH6 network for different levels of non-residential land use (commercial, retail, educational, recreational) being provided within the Southern Corridor (and therefore negating a trip to/from Frankton and Queenstown)

g **Assign Development Traffic onto the Network –** assign the resulting traffic onto the network, including assignment onto specific intersections on SH6, depending on the access arrangements

h **Final Forecast Traffic Volumes –** the total traffic at any forecast year and/or any particular development scenario is then created from **a** + **b** + **g**

Once traffic volume forecasts were established, then operational models for each existing and proposed intersection were developed to assess the operation of each part of the network, under different development scenarios.

5 FUTURE TRANSPORT OPTIONS

5.1 INTRODUCTION

Given the key constraints on the capacity of the existing road network, a number of alternative transport intervention options were investigated, falling into several following categories:

- General traffic (road) improvements
- Public transport enhancements
- Active mode enhancements
- Water mode enhancements
- Cable-based transport system (e.g. urban gondola)
- Land use changes

We did not consider other means of reducing travel, such as road user charges. Such measures would disincentivise private car use but would result in all the other measures above being required to accommodate the additional trips (in the case of mode share) or reduce trip demand (such as land use changes).

5.2 SCENARIO TESTING

A large number of scenarios were tested over many iterations of analysis, combining different levels of residential development, non-residential development, public transport infrastructure and patronage (including ferry), and road-based infrastructure – all at different forecast years. This generates a complicated picture of dependencies between various elements, as set out in previous reports.

Consequently, the following section concentrates the findings from the previous analyses into fundamental conclusions. The analysis concentrates on the operation of the network at the longer term forecast year of 2053, and the likely infrastructure requirements needed to accommodate the associated trips within the network.

Consequently, four main scenarios were assessed at 2053 as set out in Table 5-1.

Table 5-1: Key Scenarios

SCENARIO	LAND USE	PT MODE SHARE	RIVER CROSSINGS
1	Full development of Southern Corridor up to 7,500 HH (as per Table 4-1)	PT SSBC Forecast	One
2		PT Minimum	
3		PT Maximum	
4		PT SSBC Forecast	Two

In short, the scenarios can be described as below:

- **Scenario 1** – the master scenario assuming a total of ~7,500 residential units in the Southern Corridor, with PT forecast mode share from the WSP PT model (assuming no Homestead Bay ferry, but with a northbound bus lane implemented on SH6 Kingston Road between the Park Ridge roundabout and the SH6 Kawarau Falls Bridge) of around 28 per cent (peak direction). This scenario represents the most likely future scenario based on current expectations.

- **Scenario 2** – as Scenario 1 but with a lower PT share of 10% (representing continuation of the existing car-based environment)
- **Scenario 3** – as Scenario 1 but with a higher PT share of 45-50% (representing an aspirational level of public transport use)
- **Scenario 4** – as Scenario 1, but with a second all-modes Kawarau River crossing in the vicinity of Boyd Road, linking to the eastern end of Hawthorne Drive, south of Queenstown airport land (see Figure 6-1). The PT mode share is retained at the same level as that in Scenario 1 (there would be expected to be less PT share on the main SH6 route to Frankton hub and Queenstown, but improved PT share for destinations on the south, east and north sides of Frankton Flats due to the additional more direct PT routes available)

From the process set out in Section 4.3, and using assumptions derived and set out in the previous WSP report[13], Figure 5-1 shows the forecast bi-directional link flows on SH6 in vehicles per hour across the corridor from south of a new access intersection for Homestead Bay through to north of the SH6/Humphrey Street intersection.

- Cells shown in **green** indicate sections of SH6 that are predicted to be able to accommodate the forecast level of traffic indicated (with the existing single lane provision)
- Cells shown in **yellow** indicate sections of SH6 that are predicted to operate close to capacity or just above capacity with the forecast demand flow. This is somewhat subjective as the link capacity is also affected by any intermediate and downstream intersections, but this capacity value will usually be between **1400vph and 1800vph per lane in each direction**
- Cells shown in **orange** indicate sections of SH6 that are predicted to not be able to accommodate the forecast level of traffic and operate significantly beyond the capacity of the link (or downstream intersection). This is helpful in indicating where congestion would be expected, and where the dualling of the existing lane would be required to achieve within-capacity operation (in addition to related intersection upgrades)

From the operation in the AM peak, a number of key conclusions can be drawn from Figure 5-1, principally based on the critical northbound direction.

SCENARIO 1 – MASTER SCENARIO

- Operation is within capacity from the southern end of the SH6 network up to the Jack Hanley Drive intersection. This indicates that smaller scale improvements at intersections south of SH6/Jack Hanley Drive (most likely, conversion to single lane roundabouts) would be sufficient to accommodate future demand levels
- North of Jack Hanley Drive, traffic levels are considerably higher than the link capacity and therefore dualling of SH6 in both directions would be required through the whole section into Frankton Flats to accommodate these predicted traffic levels – without such dualling, the critical Kawarau Falls Bridge link would have demand flows around 60% higher than the practical capacity. This is problematic in terms of the physical, land use and cost constraints in dualling the road on the approach to the existing SH6 Kawarau Falls Bridge, as well as requiring duplication of the bridge, and taking dual traffic lanes through to the SH6/SH6A intersection.
- With the expected level of public transport share within the scenario, this equates to over 1,200 northbound passengers per hour, between the Southern Corridor and Frankton/Queenstown. This is

[13] "Homestead Bay Plan Change Preliminary Assessment of Transport Effects", WSP, July 2023

equivalent to around 25 standard single decker buses per hour crossing the Kawarau Falls Bridge, see Table 5-2.

Table 5-2: Forecast PT patronage and associated PT operations across Kawarau Falls Bridge in Scenarios 1-3

		Northbound PT - AM			Southbound PT - PM		
Scenario		Passengers	Buses (Single)	Buses (Artic)	Passengers	Buses (Single)	Buses (Artic)
1	**2053 - PT Forecast**	1260	26	13	1176	24	12
2	**2053 PT Min**	384	8	4	357	8	4
3	**2053 PT Max**	2090	42	21	1957	40	20

SCENARIO 2 – LOW PT SHARE

- For Scenario 2 with a lower PT share, Figure 5-1 shows that predicted traffic volumes are around the 3,000vph level, north of the Park Ridge roundabout, which is approximately twice the link capacity of the existing SH6. This shows dualling of the road would be required over the same section as Scenario 1, but likely require more significant intersection upgrades across the route.
- In addition, doubling of the capacity of the road system would also be required throughout the wider network (e.g. on SH6A Frankton Road and SH6 Frankton-Ladies Mile Highway) which have additional fundamental constraints to accommodate this level of traffic growth (e.g. the limited capacity of Queenstown Town Centre, Shotover Bridge, etc)

SCENARIO 3 – HIGH PT SHARE

- For Scenario 3, the level of PT patronage is extremely high. As set out in Table 5-2, the level of PT trips across the bridge in 2053 would require an articulated bus every 3 minutes, with a patronage of around 2,000 person-trips per hour. As will be discussed later in this section, other PT options to link the Southern Corridor with Frankton/Queenstown are available such as ferry and gondola which could relieve pressure on road-based PT solutions, albeit these other modes have various affordability and feasibility challenges.
- More fundamentally, a PT mode share of 45% is unprecedented in New Zealand (and is only observed in a few large cities across the world), and therefore is viewed as very unrealistic. Even with significant changes to land use within the Southern Corridor (to maximise internal trips within the Southern Corridor development area), the commercial, tourist and employment hubs are still likely to be centred in Frankton and Queenstown, and therefore trips across the Kawarau River will still be a high proportion of trips generated by, or attracted to, the Southern Corridor area.
- In conclusion, both Scenarios 2 and 3 are seen as resulting in a combination of fundamentally unrealistic and undesirable outcomes, either through non-accommodatable traffic volumes throughout the wider network (Scenario 2), or a PT system that is very unlikely to be able to capture the mode share required (Scenario 3)

SCENARIO 4 – SECOND ROAD-BASED RIVER CROSSING

- For Scenario 4, an additional road-based river crossing results in relief of the SH6 links and intersections to the north of a new intersection formed to provide access to the second Kawarau River crossing (“Boyd Road” in Figure 5-1).
- The Peninsula Road and Humphrey Street intersections on SH6 would then require more modest improvement (more for road safety and access, than capacity) than in Scenario 1, with no further improvements on SH6 Kawarau Road required (beyond those already planned through the Queenstown Package of road improvements on Frankton Flats (formerly the New Zealand Upgrade Programme)).
- Previous traffic modelling using the QLDC Strategic TRACKS model has indicated close to a 50/50 split of traffic using the existing SH6 Kawarau Falls Bridge versus a second road bridge to the east (downstream of the existing bridge) – the new route provides a more direct route for trips to Remarkables Park, the (as yet largely undeveloped) south-eastern part of Frankton Flats, Glenda Drive, Queenstown Central, Five Mile, the North Frankton development area; and an alternative through route to the SH6 Shotover Bridge

(via Hawthorne Drive). The new bridge also provides the ability to improve PT routes to/from these areas to/from the Southern Corridor, as well as for active modes.

- The new river crossing is predicted to carry around 1,100 vph in the peak direction (both AM and PM peak hours) in Scenario 4 which is within the capacity of the new bridge link (and is slightly less than the current 2024 volumes experienced on the Kawarau Falls Bridge). This would likely require intersection improvements and changes to the currently planned road layouts on the north side of the bridge to link into Hawthorne Drive, but these have not been fully investigated at this point.
- As per Scenario 1, south of the new bridge access intersection, dualling of SH6 would still be required through to the SH6/Jack Hanley Drive intersection. But this section of dualling is much less than the capacity improvements required in Scenario 1 (which requires dualling of SH6 through to, and including, the Kawarau Falls Bridge and beyond). Scenario 4a in Figure 5-1 shows the resultant operation of the SH6 corridor, with dualling between Boyd Road and Jack Hanley Drive – removing the poor operation within this intermediate section of SH6.
- Therefore, analysis of Scenario 4 provides a compelling case for further investigation of providing a second road crossing (for all modes and utility services) in the vicinity of Boyd Road.

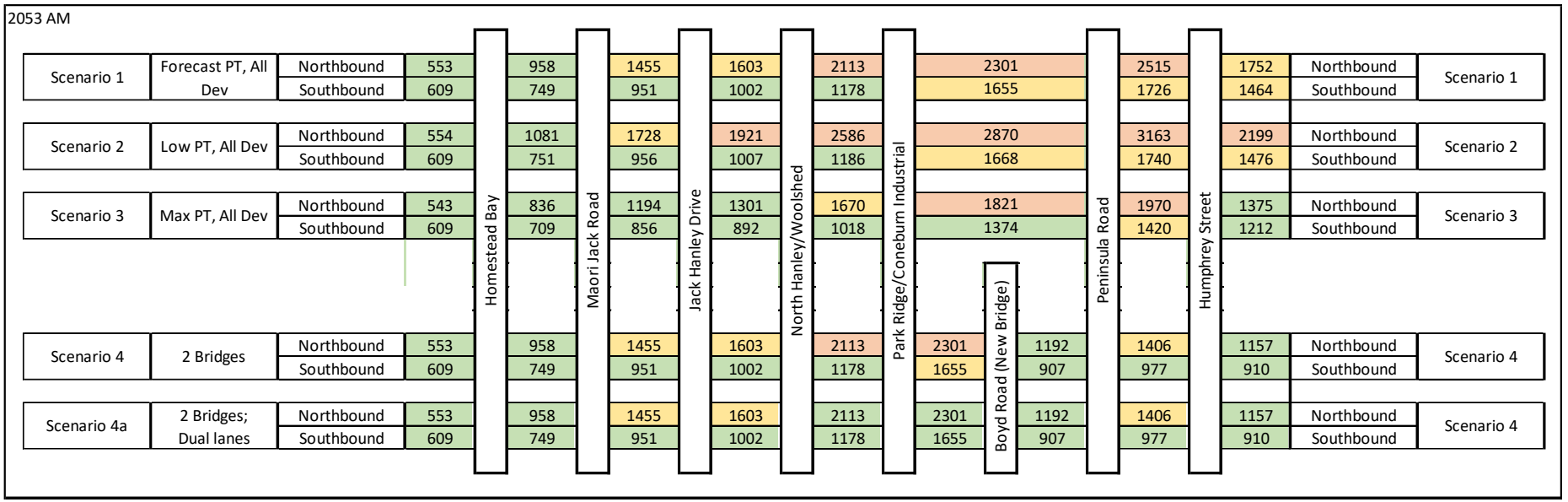
OVERALL

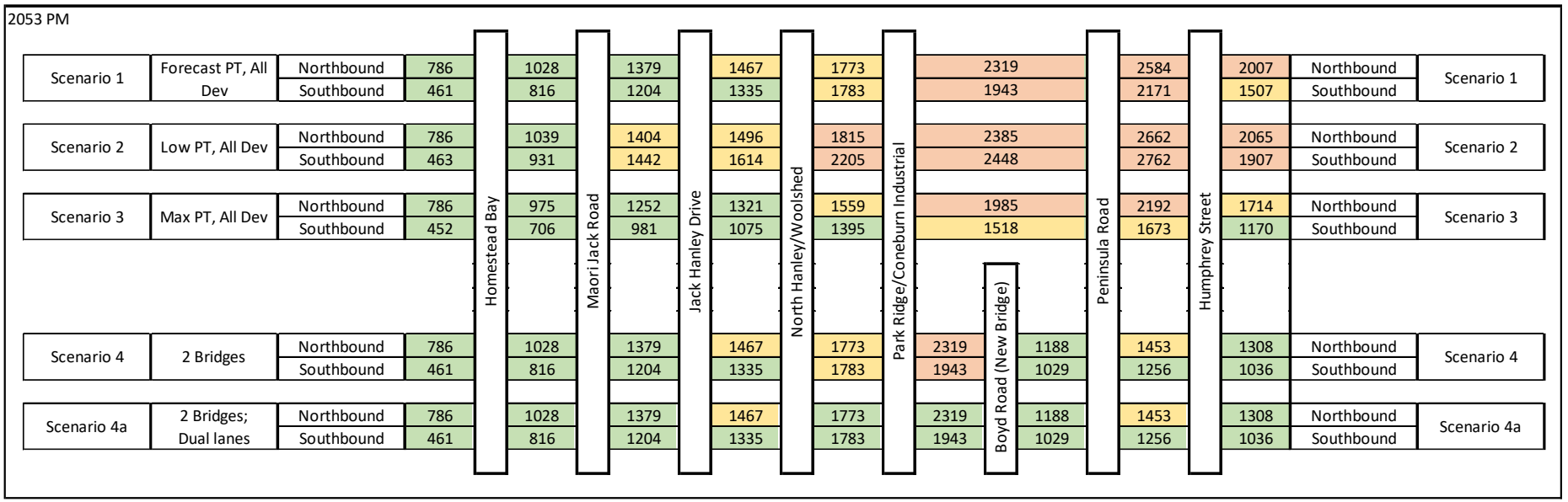
The assessment of the above scenarios shows that Scenario 4 represents the most optimal balance between land use development, PT service improvements and highway infrastructure improvements. The key conclusion is that an additional all-modes crossing of the Kawarau River is required to provide sufficient capacity to accommodate the forecast long-term level of trips travelling between the Southern Corridor and Frankton.

The outcomes and key features of the scenario are set out below:

- Ability to accommodate growth of around 7,500 residential units in the Southern Corridor, with other commercial, educational, recreational and retail land use to maximise the potential for internal trips within the Southern Corridor itself (and therefore reduce trips to/from Frankton Flats for all trip-purposes).
- A forecast PT share close to 30%, which is high in the context of the existing situation, but achievable through providing PT capacity by bus – which is easier to incrementally improve as demand increases
- A second Kawarau River (all modes) crossing providing a second route to/from Frankton Flats, which in the most part serves a different set of origins and destinations within Frankton Flats and beyond
- Requires more modest improvements on the SH6 section through Peninsula Road and along Kawarau Road towards the SH6/SH6A intersection (than in Scenario 1, without the second Kawarau River crossing).
- Requires dualling of SH6 between the (new) Boyd Road intersection through to the Jack Hanley Drive intersection.
- Requires intersection improvements/upgrades to connect the second bridge route to the internal Frankton Flats road network (particularly Hawthorne Drive), the scale of which requires further investigation.
- Further sensitivity tests have shown that up to around 8,000 residential units could be accommodated with the same infrastructure improvements. Beyond this level, the more modest improvements at the SH6 Peninsula Road and Humphrey Street intersections result in these sites operating in an over-saturated state – unless other trip reduction elements increase so as to reduce forecast traffic levels through this section (such as a higher PT mode share, higher internal trip reduction rates, increased use of the second Kawarau River crossing, etc)

Figure 5-1: Link Flows (vehicles per hour) at 2053 (AM peak hour; PM peak hour)



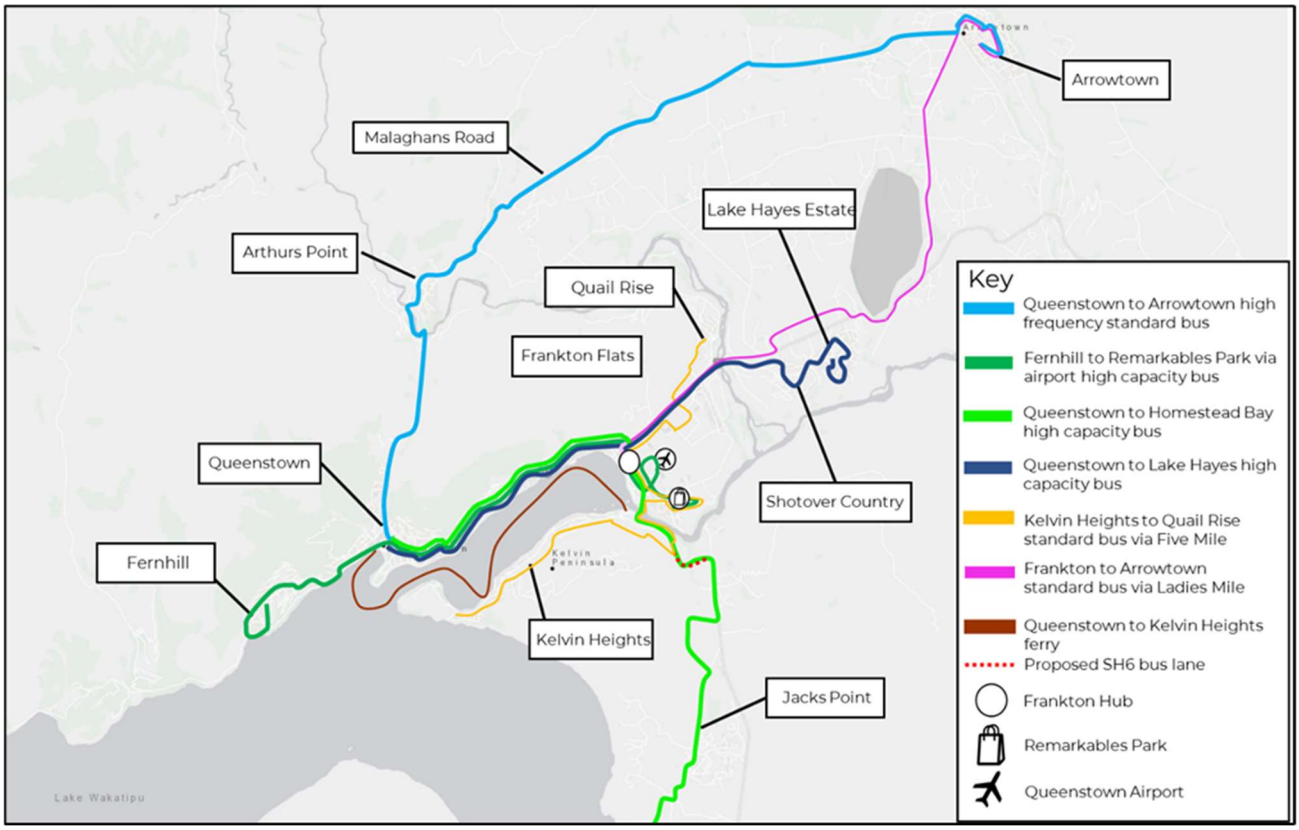


5.2.1 PUBLIC TRANSPORT (BUS)

The Queenstown Public Transport Business Case (QPTBC) for Otago Regional Council was completed by WSP in 2024 and established the case for investment in a 30-year plan for future road-based public transport investment decisions for Queenstown.

In terms of the bus network, the preferred option from the QPTBC is shown in Figure 5-2, to be implemented in stages before 2035. The preferred option also includes ancillary improvements such as migrating all vehicles to battery electric vehicles, introduction of a new service depot, improvements to the Frankton and Queenstown hubs, local road minor improvements (for future accommodation of articulated buses), bus lanes and bus stop improvements. As a result, the QPTBC emphasises that co-ordination and implementation of the full set of measures will need to be developed under the Way to Go (W2G) partnership with ORC's partners NZ Transport Agency and Queenstown Lakes District Council.

Figure 5-2: QPTBC preferred option



In terms of the Southern Corridor, the principal changes to operation would be:

- Extension of the existing Jacks Point service through to Queenstown
- SH6 northbound bus lane (approximately Kawarau Falls Bridge to William Rees Cottage, and then eventually extended through to the SH6/Park Ridge intersection)
- Conversion of the service to articulated bus vehicles as patronage dictates (projected to be from 2030)

It should also be noted that as the Southern Corridor development area progresses, the bus service provision (and specific route) could change as new link roads within the area become established.

- As set out in the previous section (and see Table 5-2), this projected investment provides sufficient bus capacity under Scenario 4 – i.e. it relies on significant other road-based capacity being implemented.

5.2.2 WATER SERVICES (FERRY)

TSA produced the Homestead Bay Ferry Feasibility Report in July 2023, investigating the proof of concept for a ferry service between Homestead Bay and Queenstown. A summary of the findings is set out below:

- Technology in the E-ferry platform is quickly developing by several manufacturers. The EV Maritime vessel (for example) is already operating in the Hauraki Gulf, which would be suitable for operation on Lake Whakatipu.
- Travel time between Queenstown and Homestead Bay is estimated to be in the order of around 27 minutes. This compares with a (uncongested) journey time by car of around 25 minutes, given that for much of the day and particularly in the future, the journey time by road would be much higher (depending on time of day)
- A preliminary design already exists for a marina at Homestead Bay. Whilst lake level fluctuation (at ~3m), wave height (up to 2.5m) and strong winds pose challenges, it is concluded that a safe harbour can be provided at the Homestead Bay end of the journey. At the Queenstown end, a suitable wharf is already in operation (O'Regan's Wharf) and is suitable for the fleet sizes investigated.
- Weather effects are unlikely to be problematic, as the vessels available can operate in sea states which exceed any conditions that would be experienced on Lake Whakatipu. Passenger comfort is likely to be a critical factor in patronage – it is expected that there would be drop off under poor weather conditions, but that sailings would be able to continue.
- Capital costs of setting up an operation (with a single vehicle) is predicted to be in the order of $25-35M (depending on vessel, at 2023 NZ$)

Previously WSP has investigated the likely patronage of a ferry service from Homestead Bay to Queenstown using the WSP PT model. This has estimated that in the (commuter) peak period, up to 200 passengers per hour (in the peak direction) could be achieved – this is with a lower build out of the Southern Corridor residential area of around 5,000 households, assumed at the time of the assessments. The ferry would require connections to bus services at Homestead Bay wharf, for links to the adjacent development areas (i.e. similar to connections in Auckland at Devonport, Half Moon Bay, etc) – this would be relatively easy, with extension of the Jacks Point to Frankton/Queenstown bus service down to the wharf as a terminus point.

This level of patronage is unlikely to result in a financially viable service (i.e. 100% fare box return would not cover the operating cost), but this is generally the case for water-based services, due to the high operating cost. However, this does not mean that the ferry service is not a viable service – and may still be an option worth investigating further, particularly in the future should road-based improvements be infeasible or max-out (in terms of network capacity).

5.2.3 CABLE-BASED TRANSPORT SYSTEM (URBAN GONDOLA)

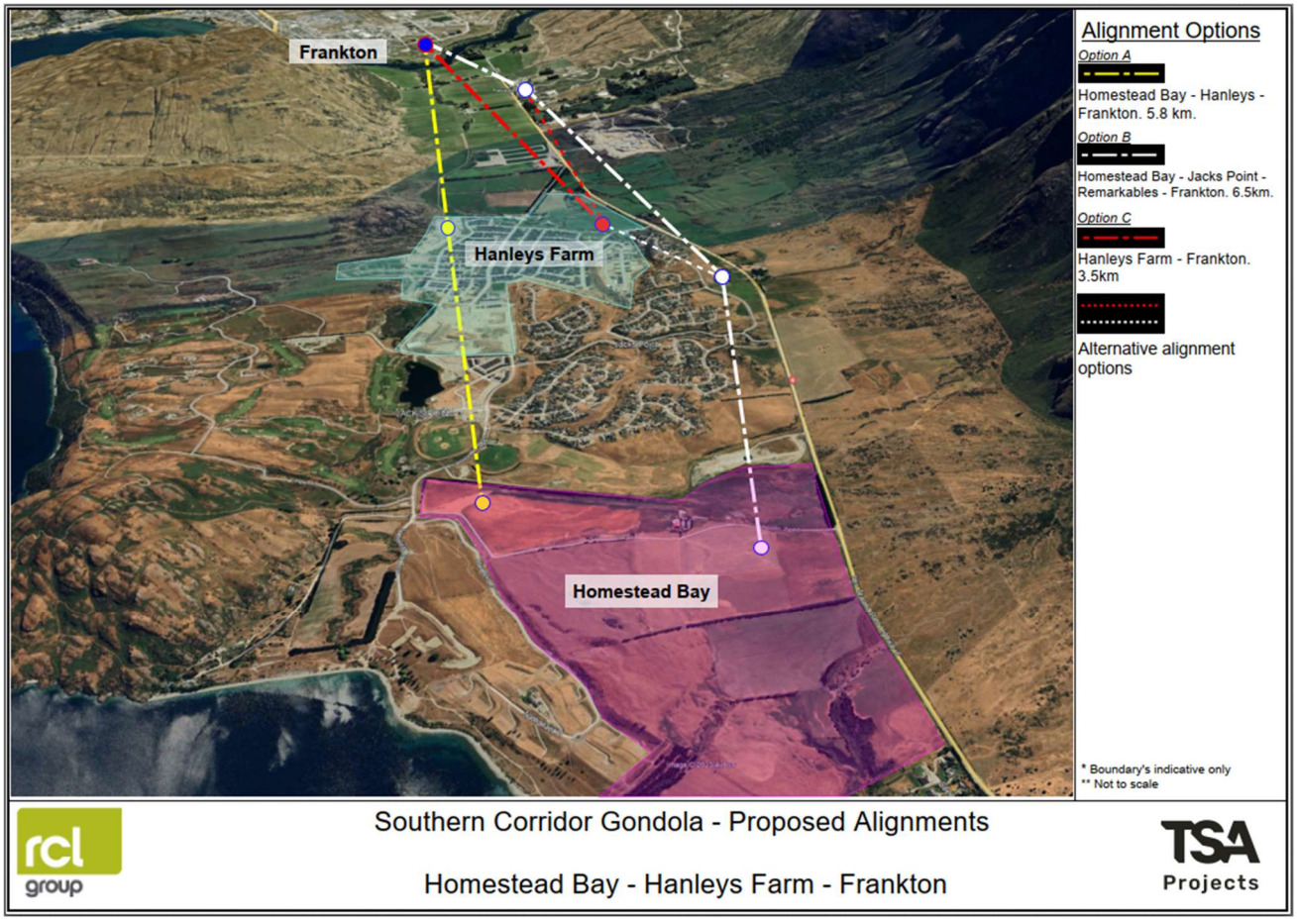
In general, the strengths of a gondola system are that it can more easily overcome topographical constraints, can generally be built offline with lesser impact on existing transport systems, is energy efficient with minimal emissions, provides a reliable and consistent travel time, and (particularly for Queenstown) offers tourism opportunities. The main disadvantages are the limited number of stations (i.e. serves hubs but not intermediate demand directly), visual impact, slow speed (particularly at stations and route alignment deflections), a lack of suppliers for a competitive market and (relatively) high capital investment costs.

In terms of capacity, a system could (in theory) provide a capacity of up to 5,000 passengers per hour (per direction), depending on cabin capacity, loading and headway – this is well above the ~1,000 passengers per hour that articulated buses could realistically achieve.

As part of the Queenstown Transport Business Case (2021), a Queenstown to Frankton gondola system was investigated to Indicative Business Case level. The proposed route ran between Queenstown Town Centre and Frankton Hub (at or close to the existing bus hub currently being upgraded as part of the Queenstown Package). The scheme would initially relieve pressure on public transport on Frankton Road (SH6A), with connecting bus services to the east and south provided at Frankton Hub – but with potential expansion of the system to Ladies Mile, Remarkables Park and the Southern Corridor. At the time of writing, it is understood that the scheme has not been investigated in detail further, although there has been renewed interest via the expression of interest by Queenstown Lakes District Council, Central Otago District Council and Otago Regional Council in a Regional Deal with Central Government.

TSA produced for RCL the Southern Corridor Ropeway Transport Report in November 2023, investigating the concept for of a cable-based transport system (gondola) between the Southern Corridor and Frankton/Queenstown. They investigated several potential routes and station locations, as shown in Figure 5-3. Whilst terminating in Frankton (Remarkables Park) would provide an anchor for the service, ideally it would continue northwards to link to Queenstown Airport and Frankton Hub.

Figure 5-3: Potential Gondola Alignments



Cost for a gondola system is generally around $20-30M per km, excluding land acquisition and other consenting requirements. Therefore, a system linking the bottom end of the Southern Corridor (Homestead Bay) and Frankton (Remarkables Park) is likely to be in the order of $150-$200M.

Patronage forecasts for a potential gondola system in the Southern Corridor have not been investigated at this time. The three main potential constraints on patronage on a gondola system are likely to be:

— Travel time – a journey from Homestead Bay to Frankton (Remarkables Park) would be in the order of 20 minutes, plus access time at either end of the journey. This is unlikely to be competitive until the road network becomes significantly congested for long periods of the day.

- Accessibility – as stations would likely be spaced >2km apart, for many potentially users, either the origin or destination (or both) of the trip would not be close to a station. This would place a significant limit on passenger capture without other changes (such as intensive land use development in the vicinity of the stations), although connecting bus services and high-quality walking and cycling routes would help maximise the use of the gondola system
- Lack of destinations – most trips generated/attracted to the Southern Corridor are spread out around Frankton Flats and Queenstown. Consequently, until a Southern Corridor gondola connected directly to another gondola system, providing a through service to both Queenstown and the north and east sides of Frankton Flats, patronage will also be limited.

In summary, a gondola system provides an offline route within the transport network, that can potentially accommodate large trip numbers. However, specifically for the Southern Corridor, it is likely that a "lead infrastructure" gondola route between Queenstown and Frankton would need to be implemented first, and that a Southern Corridor leg would be a secondary or tertiary stage of any gondola system – i.e., as an independent route, it is unlikely to be attractive to sufficient patronage to be viable. It is noted that even if a gondola is built between Queenstown and Frankton, it does not necessarily follow that there would be compelling business case to extend this to the Southern Corridor, especially if efficient public transport utilising bus priority between the Southern Corridor and the Frankton Bus hub / Gondola Station is readily achievable.

An alternative cable-based system currently undergoing development is Whoosh[14] which is due to install a small trial network within Remarkables Park. This system operates differently from other urban gondolas, in that the vehicles move along fixed cables or rails, rather than the vehicles being fixed to moving cables. The system is more suited to a first-mile-last-mile service, with small vehicles (pods) being able to travel to customer selected destinations – more akin to a PRT system[15]. At present, the technology is still at a conceptual level and so is unlikely to be commercially available for several years. But in any case, it is likely to be useful as a collector system to feed into, and/or integrate with other transport systems, rather than as a stand-alone mass-transit system to carry large volumes of passengers along a single route (i.e. Southern Corridor to/from Frankton).

5.2.4 ACTIVE MODES

As shown previously in Figure 3-2, the Whakatipu Active Travel Network SSBC (2019) identified a preferred active travel network through the Southern Corridor (on an alignment to the west of SH6), connecting with new river crossings. However, it is understood that there is currently no funding allocated to progress this project.

A second all-modes Kawarau River crossing in the vicinity of Boyd Road, as assumed in Scenario 4 of the above analysis would provide a similar active modes crossing to that proposed in the Whakatipu Active Travel Network SSBC. A north-south active modes route through the Southern Corridor could then link to the existing Kawarau Falls Bridge (both original and the new 2018 bridge), and the all-modes second Kawarau River crossing. It is noted that there may be a conflict between the preferred active travel route and envisaged northbound bus lane to the south of the Kawarau Falls Bridge, and therefore an integrated design would be desirable.

It is likely the active mode share for trips to/from the Southern Corridor development area to/from Frankton and beyond is likely to be relatively small, compared to general and PT share. A trip from Homestead Bay to Remarkables Park would be around 8km, but a journey to Queenstown would be 16km, which would be an obstacle for many people.

[14] https://whoosh.solutions/

[15] https://en.wikipedia.org/wiki/Personal_rapid_transit

However, active modes would still play an important role in removing vehicle trips from the network, particularly for shorter trips within the Southern corridor itself – and especially if non-residential land use was maximised within the area (schools and recreational facilities).

5.2.5 LAND USE CHANGES

As part of the calculations used to estimate trip levels from development Southern Corridor, various assumptions around mixed-use development were investigated and tested. This included:

- Interaction with the proposed Coneburn Industrial area
- Provision of a High School, and associated recreational facilities
- Provision of other elements of mixed-use development as community hubs, such as a supermarket and small retail centre

Such non-residential elements can help to remove trips from the network that otherwise would need to travel on SH6 to/from Frankton and Queenstown. It was estimated that up to 15-20% of trips could be removed from the wider network due to such measures. The barriers to further trip reduction are largely journey-to-work-related trips – Queenstown and, in particular, Frankton are commercial centres containing the majority of the employment hubs. Although increased levels of working from home post-COVID have resulted in opportunities to remove trips from the network, most employment still requires either travel to a fixed work location, or travel for work trips to be generated.

Consequently, intensification of housing supply within mixed-use development does not necessarily result in less trips (by all modes) on the network – there is a balance between the added trips through extra housing stock, and the saving of trips through trip-reduction opportunities – particularly in the Southern Corridor, adjacent to a commercial hub (Frankton) which still has large pockets of land that could be developed further.

5.2.6 INTERNAL ROAD NETWORK

It has been assumed that several internal link roads would be in place, which provide alternative routes to SH6 through the Southern Corridor, particularly for short and/or internal trips:

- an internal link road between Park Ridge and Hanley's Farm development
- an internal link road (Howden Drive) between Hanley's Farm and Jacks Point (already opened as of 2024)
- an internal link road between RCL Lot 8 and Homestead Bay Road, as is proposed as part of the Homestead Bay development

5.3 SUMMARY OF ANALYSIS

The analysis set out above has demonstrated that significant transport infrastructure investment is required to allow the Southern Corridor to develop in a sustainable manner. Any investment programme would need to be balanced across multiple modes – maximising the use of public transport and active travel modes, but also providing sufficient road-based capacity to ensure goods and services can still move across the network in an efficient manner, in line with the aims of the Queenstown Lakes Spatial Plan (2021) to "establish an integrated, long-term, collaborative strategy that manages growth…".

The following section sets out a 30-year programme of infrastructure interventions that WSP has developed which would support the growth of the Southern Corridor.

6 OVERALL WIDER NETWORK INFRASTRUCTURE IMPROVEMENTS

6.1 DEVELOPMENT OF A PROGRAMME OF IMPROVEMENTS

Based on the transport analysis presented in the previous section, for the Southern Corridor to develop in a sustainable manner, considerable investment in the transport system is required, irrespective of development of the Homestead Bay area.

Therefore, WSP has developed a programme of interventions that would ensure that the transport network will continue to function as development comes online across the whole of the Southern Corridor. This programme is balanced – whilst it is expected that the share of trips using public transport will grow at a high rate, and that internal trips within the Southern Corridor will be maximised through the provision on non-residential elements, it is acknowledged that there will still be a significant growth in vehicular trips on SH6 to Frankton and Queenstown, as the whole Southern Corridor area develops.

Table 6-1 provides a summary of the scale of infrastructure improvements required on SH6 to enable the transport system to operate in a safe and efficient state. As set out in the next section, implementation of this wider programme of works is expected to require numerous funding streams.

In addition:

- Figure 6-1 sets out in diagrammatic form, the longer-term infrastructure improvements required in the north end of the Southern Corridor to accommodate the growth in trips (all modes) through to 2053 (and beyond)
- Figure 6-2 sets out in diagrammatic form, the infrastructure improvements required to improve access arrangements as land use development continues in the Southern Corridor.

The following provides some additional commentary on the assessment of requirements for each section of the corridor.

Section 7 sets out more detail on the improvements that are proposed to be fully funded by Homestead Bay, and the proposed trigger levels for these improvements based on intersection operation. These improvements are focussed on the southern end of the network where the impact of the specific trips from the Homestead Bay development is greatest – acknowledging that north of the Park Ridge roundabout, traffic growth is made of many different sets of traffic (background SH6 traffic, tourist growth, ski field traffic growth, Coneburn Industrial and other residential development within the Southern Corridor).

Table 6-1: Summary of Infrastructure Requirements on SH6 (North to South)

LOCATION (INTERSECTION OR LINK BETWEEN)	IMPROVEMENT REQUIRED	COMMENT
As shown in Figure 6-1, additional intersections and link upgrades are required to facilitate a satisfactory "receiving environment" for the second river crossing. Detailed assessment of the level of these upgrades has not been undertaken, but the elements shown are indicative of the likely measures required		
Humphrey Street	Signalised intersection	Conversion required in short-term to provide safe movements to/from Humphrey Street to/from SH6, including active modes crossing. Currently part of the Queenstown Package.
Intermediate Link	Northbound bus lane	Additional lane for northbound buses added from Peninsula Road to the Kawarau Falls Bridge – provides extra capacity for network prior to second river crossing
Peninsula Road	Signalised intersection	Conversion required in short-term to provide safe movements to/from Peninsula Road to/from SH6, including bus priority and active modes crossing
Intermediate Link	Northbound bus lane	Additional lane for northbound buses added – provides extra capacity for network prior to second river crossing
Boyd Road	Large roundabout or grade separated layout	Associated with provision of second river crossing. Could be incorporated into improvement for The Remarkables ski field access and/or re-alignment of the SH6 curves
Intermediate Link	Dual lanes in each direction	Required to accommodate traffic levels beyond 2033, and to tie in with wider network improvements.
Park Ridge Access	Dual lane roundabout (minimum)	Required to accommodate traffic levels beyond 2033, and to tie in with wider network improvements
Intermediate Link	Dual lanes in each direction	Required to accommodate traffic levels beyond 2033, and to tie in with wider network improvements
Jack Hanley Drive (or alternative improvement at Woolshed Road)	Single/dual lane roundabout	Single lane roundabout required to accommodate traffic growth from south, including from RCL Lot 8, above around 600 residential units in Lot 8 Longer term, dual roundabout required to tie in with wider network improvements
Intermediate Link	None	Single lane in each direction satisfactory
Māori Jack Road	Single lane roundabout	Required upgrade likely beyond 2033, above around 1,500 residential units within Lot 8. Predicted to operate within capacity beyond 2053
Intermediate Link	None	Single lane in each direction satisfactory
Homestead Bay Access	Single lane roundabout	Required for access to new development zone. Predicted to operate within capacity beyond 2053

Figure 6-1: Longer-Term Wider Network Infrastructure Improvements

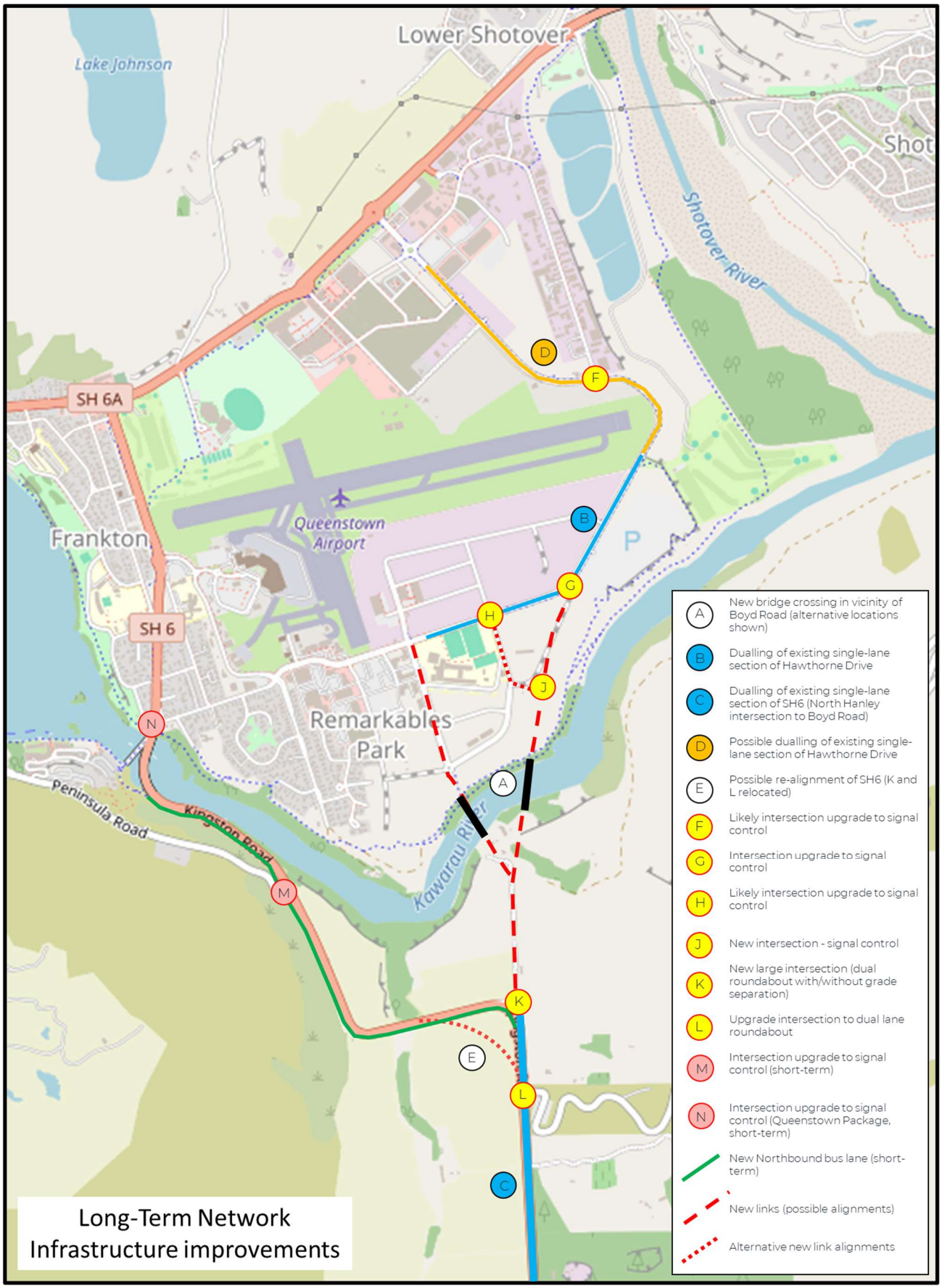
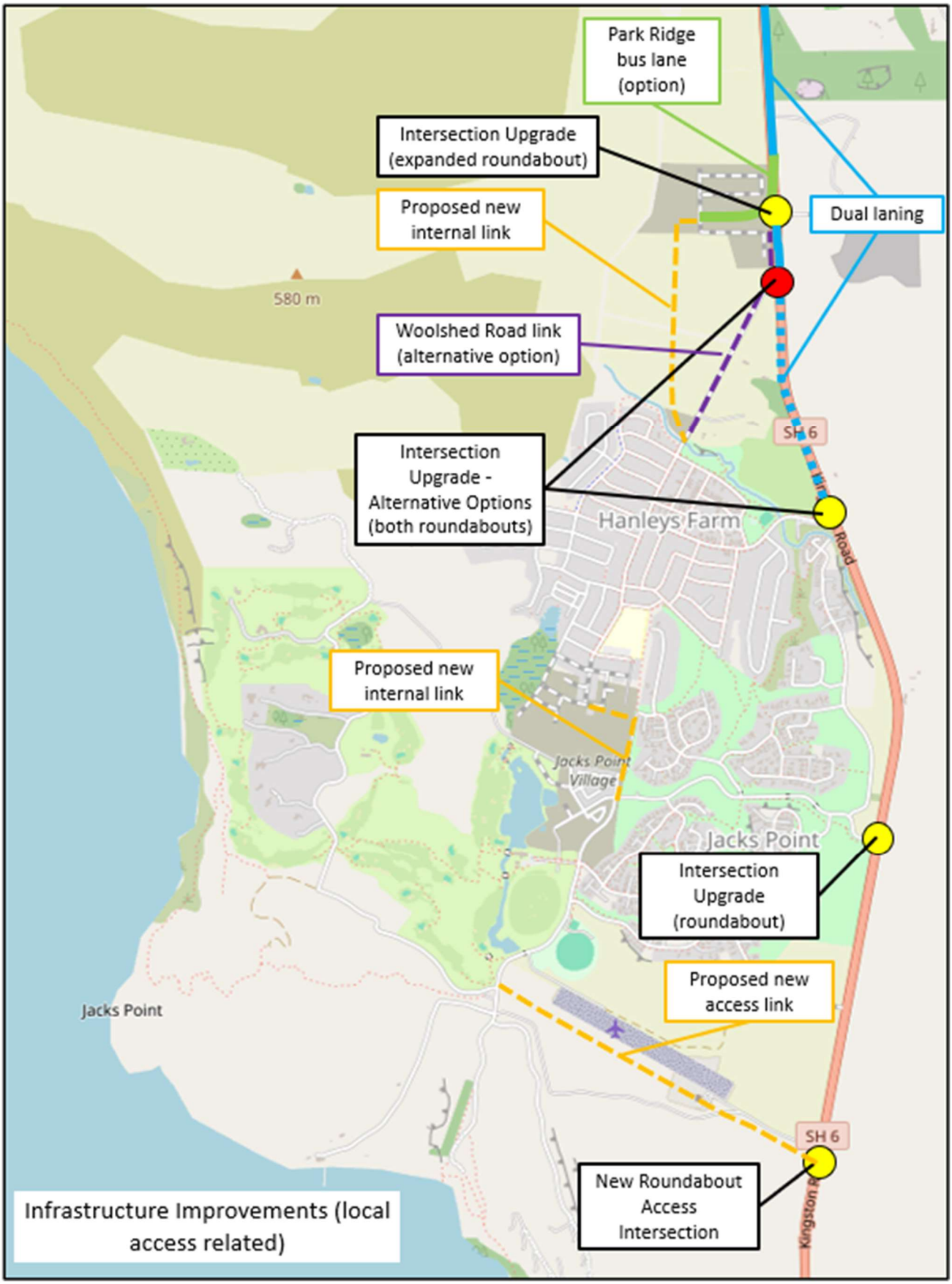


Figure 6-2: Southern Corridor Access-related Infrastructure Improvements



SECOND KAWARAU RIVER CROSSING AND CONNECTIONS WITHIN FRANKTON FLATS

As per Figure 6-1, the second Kawarau River crossing would need to join the Frankton Flats network, and Hawthorne Drive. Conceptually, a bridge alignment as far east as possible is preferred from a network sense, as it provides the more direct route towards the eastern end of the airport runway and avoids linking the river crossing into an area of partial development.

Additional assessment of the Frankton Flats network is required to further identify the impact of the additional route on traffic movements around the area and then develop the scale of any link/intersection improvements. However, is likely that:

- A new intersection with Hawthorne Drive will be required (location G on Figure 6-1), most likely as a signalised intersection to be compatible with recent intersections improvements at Cherry Blossom Avenue and Red Oaks Drive
- A new intermediate intersection between the bridge and Hawthorne Drive (location J on Figure 6-1) to provide direct access to the undeveloped areas of land on the north bank of the river. The alternative (western) bridge crossing alignment would instead require some intersection improvements on Red Oaks Drive
- Upgrade of the Hawthorne/Mountain Ash Drive intersection to signals, to be compatible with the signalised intersections on either side on Hawthorne Drive
- Possible extension of the sections of dual lane on Hawthorne Drive, both north and south of the airport, to provide additional road capacity to accommodate the extra traffic on the second river crossing, including other upgrades at existing intersections

SH6/HUMPHREY STREET INTERSECTION

This site is currently in the form of priority-controlled intersection. The NZ Transport Agency Queenstown Package project is proposing to signalise the intersection, to provide safer access to/from Humphrey Street for traffic, and a safer means for active modes to cross SH6 at this location.

Whilst signalising this intersection does not provide much additional capacity, it would re-balance the priority given to all traffic movements at the intersection. The longer-term intervention is that the second river crossing provides an alternative route across the Kawarau River, and therefore reduced traffic volumes on SH6 through the intersection.

SH6/PENINSULA ROAD INTERSECTION

This site is currently in the form of priority-controlled intersection. Assessments have shown that it is likely to be operating at capacity (for traffic egressing Peninsula Road) within the next 2 years. Therefore, signalising the intersection is the proposed intervention, incorporating the northbound bus lane and a crossing for walking and cycling movements, that can be integrated into an interim walking and cycling connection from the Southern Corridor to Frankton via the existing SH6 Kawarau Falls Bridge.

Similarly to the SH6/Humphrey Street intersection, this improvement does not provide much additional capacity, and longer term the second river crossing would be the recommended intervention to reduce traffic volumes on SH6.

SH6 BOYD ROAD TO KAWARAU FALLS BRIDGE

In the short term, a northbound bus lane would provide significant benefits in terms of person-trip capacity for the Southern Corridor and encourage the mode shift required going forward. The addition of a northbound traffic lane does not provide additional capacity, due to the existing constraint of the single northbound lane on the existing SH6 Kawarau Falls Bridge.

SH6/BOYD ROAD INTERSECTION (AND THE REMARKABLES SKI FIELD ACCESS)

As shown in Figure 6-1, a new intersection on SH6 would be required to provide access to the proposed second river crossing. Assessments have shown that this intersection would need to be substantial in size, either a dual lane roundabout with slip lanes for some movements, or a grade-separated solution.

Considering the scale of this intersection, there are likely to be additional benefits in incorporating additional improvements in the form of:

- An improved access intersection for The Remarkables ski field access road (although not included in the analysis, there will be increased issues for traffic egressing from the access road, given the predicted increase in traffic levels on SH6)
- A re-alignment of SH6 to remove (or relieve) the curves on SH6 at the existing Boyd Road intersection and adjacent to the William Rees Cottage

SH6 PARK RIDGE TO BOYD ROAD (AND THE REMARKABLES SKI FIELD ACCESS)

As above, providing dual lanes in each direction on SH6 between these two intersections is required to provide sufficient capacity on the SH6 corridor to integrate with the additional Kawarau River crossing.

This widening of SH6 could be provided in two phases depending on timing, with a northbound bus lane provided in the initial phase (to connect to the proposed bus lane through to the SH6 Kawarau Falls Bridge). This could then be converted to a traffic lane in the longer-term, at the same time as a second southbound lane is added.

SH6/PARK RIDGE INTERSECTION

This intersection is currently in the form of a single lane roundabout, albeit both east and west approaches are site works only, pending development of the Park Ridge residential area and the Coneburn Industrial area.

However, assessments show that this roundabout form is expected to operate with a poor level of service by 2033, with only limited additional development of the Southern Corridor. Consequently, this roundabout would need to be expanded to a dual-lane facility in the medium term. An additional slip lane to aid egress from the Park Ridge access road would be required, which could be built as a bus only link in the shorter-term, depending on the timing of plots being developed, the addition of internal links roads and the optimal route combinations for bus services.

As part of the recommended longer-term programme to accommodate the predicted traffic levels beyond 2033, dual lanes are also required on SH6 both north and south of the intersection. Like the SH6/Jack Hanley Drive intersection, the expansion of this roundabout could be undertaken in two phases, depending on the rate of development in the corridor, and the timing of wider network improvements to the north.

SH6/JACK HANLEY DRIVE INTERSECTION (ALSO SEE SECTION 7)

The existing priority-controlled intersection is forecast to operate with a poor Level of Service (in both efficiency and road safety terms) for the exit movement from Jack Hanley Drive from 2033 even without the Homestead Bay Plan Change (due to other committed development in the Jack's Point and Hanley's Farm areas). In addition, it is expected that the conversion of the existing priority-controlled intersection to a single lane roundabout is required to mitigate the impact of the Homestead Bay Plan Change, and therefore is recommended to be incorporated as a condition for this development (see Section 7).

However, a single lane roundabout has a limited lifespan, due to the incremental increase in new development in the Southern Corridor (i.e. both with and without the Homestead Bay Plan Change) – and to tie-in with other more significant longer-term infrastructure improvements to the north, at some point the intersection would need to be expanded to a dual-lane roundabout.

The recent upgrade to the SH6/SH8B and SH8B/Barry Avenue intersections in Cromwell to single lane roundabouts included futureproofing the intersections to allow the addition of a second lane to the circulatory and approaches if required. Alternatively, a similar layout to the SH6/Stalker roundabout could be constructed

initially (dual lane circulatory roundabout, but with single lane approaches diverging at the roundabout) – with future widening of SH6 to a dual lane road north of the intersection to tie-in with other improvements to the north. While a higher cost initially to construct a dual lane circulatory, this would be more efficient and cost effective than adding a second lane on in the future.

If the alternative roundabout location at Woolshed Road were taken forward (as shown in Figure 6-2, then the Jack Hanley Drive intersection could be retained as a priority controlled intersection, largely in its existing form but restricted to left-in-left-out movements only – as the two right turn movements would be re-assigned to the safer roundabout form at Woolshed Road.

A third option is that roundabouts are provided at both locations (Woolshed Road and Jack Hanley Drive), which would likely provide the optimum arrangement for access to/from SH6, the safest form of intersection at both locations, and with dualling of SH6 only required north of the Woolshed Road roundabout.

SH6/MĀORI JACK ROAD INTERSECTION (ALSO SEE SECTION 7)

The existing priority-controlled intersection operates satisfactorily in the short-term. Once development of the southern end of the Southern Corridor progresses beyond around 1,500 residential units, however, the additional traffic joining SH6 to the south (at the new Homestead Bay intersection) results in a poor Level of Service for vehicles exiting Māori Jack Road, and an increased safety risk for vehicles turning right in. Consequently, an improvement to a single lane roundabout would be required (similar in form to the one recently constructed at the SH6/Park Ridge access road intersection) – this is sufficient to accommodate forecast traffic levels up to 2053 and beyond, with up to 8,000 households within the Southern Corridor.

SH6/HOMESTEAD BAY ACCESS INTERSECTION (ALSO SEE SECTION 7)

A new access intersection is required on SH6 to unlock development land at the southern end of the Southern Corridor – predominantly Zone K in Figure 2 1. Analysis shows that a single lane roundabout (similar in form to the one recently constructed at the SH6/Park Ridge access road intersection) is sufficient to accommodate forecast traffic levels up to 2053 and beyond.

6.2 FUNDING THE PROGRAMME

Implementation of the wider programme of works above is expected to require funding from three (3) organisations (noting that other funding strategies should be investigated), plus third party developer led improvements/contributions:

1. NZTA for State Highway infrastructure improvements
2. QLDC for local road infrastructure improvements (with NZTA funding assistance rates)
3. ORC for public transport service improvements (covered in the Otago Regional Council Queenstown Public Transport Services Business Case, May 2024)

Some improvements can be expected to be built or funded by developers to service new development.

There are several funding sources available for the Southern Corridor transport infrastructure:

- National Land Transport Fund/Programme
  - NZTA Road improvements (Work Category 324) which can fund general roading improvements such as intersections and dual laning.
  - NZTA Low-Cost Low-Risk (Work Category 341) which can fund safety, efficiency (and resilience) projects up to a value of $2m. Elements of the Southern Corridor transport infrastructure, such as signalising the SH6/Peninsula Road intersection, which is required in the short term, could be funded through NZTA's Low-Cost Low-Risk programme.

- NZTA Public Transport Facilities and Infrastructure Improvements – Bus (Work Category 561) which can funding bus lanes and other priority measures.

- **QLDC Long Term Plan** for local road improvements – QLDC Funding Assistance Rate (FAR) through the National Land Transport Fund/Programme (Work Category 324). As noted above the normal funding assistance rate for QLDC is 51%[16], however, the 2024-27 National Land Transport Programme says that local road improvements may be partly or fully funded by NZTA where local road improvement projects benefit State Highways[17], as is the case here with SH6.
- RCL and other developer contributions
- Other Crown funding initiatives for regional development, high growth / tourism areas such as the Regional Infrastructure Fund[18], Regional Deals[19], and increased use of Public Private Partnerships to deliver infrastructure projects.
- Under the current *Government Policy Statement on Land Transport 2024-34* (June 2024) the NZ Transport Agency is required to consider opportunities to supplement National Land Transport Funding with contributions from beneficiaries and users.

In terms of alignment with the *Government Policy Statement (GPS) on Land Transport 2024-34*[20] (June 2024):

- investment in public transport with "…up to $3.1b available for public transport infrastructure over the next three-years."
- Aligns with development of 30-year plan for transport infrastructure that will be developed through the National Infrastructure Agency and the Infrastructure Commission.
- Outcomes government expects will be achieved by the GPS is economic growth and increased productivity through:
  - "Less congestion and increased patronage on public transport."
  - "Unlocked access to greenfield land for housing development…"

It is therefore considered that the programme outlined above aligns well with the Government's policy direction. WSP is of the view that a compelling investment plan can be made to set out the benefits of an infrastructure programme, including via a public/private partnership. The approval of Homestead Bay is expected to increase demands on the transport network north of the site and make a stronger case for that investment to occur. It should also help achieve efficient use of those investments given that analysis shows that much of the transport network needs investment to accommodate anticipated growth, regardless of the effect of Homestead Bay.

It is recommended that a funding strategy and financial case be prepared by the relevant agencies for the Southern Corridor Transport Infrastructure Improvements. RCL have expressed an openness to supporting further work in making that case.

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[16] https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/2024-27-nltp-investment-requirements/2024-27-nltp-funding-assistance-rates/funding-assistance-rates-for-the-2024-27-national-land-transport-programme/normal-funding-assistance-rates/

[17] https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/2024-27-nltp-investment-requirements/2024-27-nltp-activity-classes-and-work-categories/local-road-and-state-highway-improvements-2/

[18] https://www.growregions.govt.nz/new-funding/regional-infrastructure-fund/

[19] https://www.dia.govt.nz/Regional-Deals

[20] https://www.transport.govt.nz/assets/Uploads/Government-Policy-Statement-on-land-transport-2024-FINAL.pdf

7 HOMESTEAD BAY INTERSECTION IMPROVEMENTS (DEVELOPMENT MITIGATION)

7.1 PROPOSED IMPROVEMENTS

As shown in the analysis set out in Section 5, the Southern Corridor requires significant investment in the wider transport network to accommodate both the existing consented development as well as the forecast growth in the area – and Section 6 outlines a recommended balanced infrastructure programme to provide a future network that can operate efficiently and safely beyond 2053.

In terms of the development of Homestead Bay, it is acknowledged that the trips generated by this development will impact on the operation of the network as a whole, and therefore there should be some contribution on the part of the developer to mitigate this impact – albeit, it is also clear that the individual developer alone is unable to fund the full scale of works set out in Table 6-1.

Consequently, it is proposed that the Homestead Bay developer would contribute to the following works to mitigate traffic impact, with associated trigger points as the development progresses – this is set out in Table 7-1.

Table 7-1: Homestead Bay - Proposed Developer Funding

	TRANSPORT INVESTMENT	PROPOSED TRIGGER
1	New roundabout provided on SH6 at new access road	Prior to any titled lots
2a	Conversion of SH6/Jack Hanley Drive to single-lane roundabout;	Occurs before 600 titled lots
OR		
2b	Conversion of SH6/Woolshed Road to single-lane roundabout	
3	Connecting internal road between Homestead Bay Road and the Plan Change zone	Occurs before 1,200 titled lots
4	Conversion of SH6/Māori Jack Road to single-lane roundabout	Occurs before 1,400 titled lots
5	Bus stops added within site, in line with future bus routes	At locations to be agreed with QLDC/ORC

The following operational analysis sets out the operational characteristics and level of mitigation provided by each investment (except Intervention #5 which is not related to any traffic impact trigger analysis). For this analysis, we have assumed no other traffic growth (either background trips to/from Kingston, or generated by other developments within the Southern Corridor) – this allows analysis of the impact of the Homestead Bay development independently, and therefore the appropriate level of mitigation required.

In reality, other growth will result in the operational performance of each intersection deteriorating in future years – however, the transport investments proposed to mitigate Homestead Bay are consistent with the wider network interventions as set out in Section 6 (i.e. they have not been developed in isolation).

7.2 INTERVENTION 1 – NEW ACCESS ROUNDABOUT

This new single-lane access roundabout would be built during the first stage of construction and would be operational prior to any titled lots. The design layout would be similar to the SH6/Park Ridge roundabout, with single lane approaches on all arms, and around a 44 metre inscribed circle diameter.

Previous analysis[21] has indicated that this new roundabout would be able to accommodate full development of the site, including future background growth beyond the year 2053, with Level of Service B in both peak periods – using the worst case analysis of all development traffic using SH6 and not the future internal link via Homestead Bay Road and Howden Drive. Consequently, it is assumed that this new intersection would be sufficient to provide a safe and efficient means to access the development.

7.3 INTERVENTION 2 – UPGRADE OF SH6/JACK HANLEY DRIVE

As shown in Table 3-1, the SH6/Jack Hanley Drive intersection is approaching at-capacity operation in the existing situation, particularly in the AM peak period.

However, it is expected that an internal link road between Park Ridge and Hanley's Farm development would be completed prior to any lots being established at Homestead Bay (or shortly thereafter).[22] This link would provide relief for the SH6/Jack Hanley Drive intersection, particularly for the left turn and right turn out, and right turn in.

Consequently, we have assumed this link is operational in our analysis. In addition, we have estimated that around 40 per cent of existing trips to/from Hanley's Farm would then use the new link road (in both directions), and therefore re-assign via the Park Ridge access road – it is difficult to establish an accurate prediction of this diversion as it will depend on operational conditions.

We tested the performance of the existing SH6/Jack Hanley Drive intersection through a range of developed lots at Homestead Bay. Table 7-2 shows the results with 600 lots.

[21] Homestead Bay Transport Effects, WSP, July 2023

[22] Condition 21 of QLDC consent RM200615 requires this link to be achieved within 5 years of the consent date (2/10/23) or prior to Stage 6 of that consent

Table 7-2: SH6/Jack Hanley Intersection Operation with 600 Households in Homestead Bay – existing layout

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
AM Peak Hour						
SH6 South	Left	67	0.04	8	A	0
	Through	724	0.40	0	A	0
SH6 North	Through	368	0.21	0	A	0
	Right	152	0.34	16	C	2
Jack Hanley Drive	Left	322	0.72	18	C	5
	Right	49	0.53	59	F	2
PM Peak Hour						
SH6 South	Left	53	0.03	8	A	0
	Through	427	0.24	0	A	0
SH6 North	Through	598	0.37	0	A	0
	Right	365	0.49	13	B	3
Jack Hanley Drive	Left	200	0.27	8	A	1
	Right	23	0.29	54	F	1

The results show (compared to the existing situation in Table 3-1).

- In the AM peak hour period:
  - The critical left turn out of Jack Hanley Drive is predicted to operate with a v/c of 0.72 (compared to 0.80 in the existing situation), and LOS C (compared to LOS B in the existing situation)
  - The critical right turn out of Jack Hanley Drive is predicted to operate with a v/c of 0.53 (compared to 0.42 in the existing situation), and LOS F (compared to LOS D in the existing situation)
- In the PM peak hour period:
  - The critical right turn into Jack Hanley Drive is predicted to operate with a v/c of 0.49 (compared to 0.67 in the existing situation), and LOS B (same as the existing situation), and a 95% percentile queue length of 3 vehicles (compared to 8 vehicles in the existing situation)
  - The critical right turn out of Jack Hanley Drive is predicted to operate with a v/c of 0.29 (compared to 0.37 in the existing situation), and LOS F (compared to LOS E in the existing situation)

This level of operation is slightly better than the existing situation – the drop in v/c shows some additional capacity available, with the deterioration of LOS due to the additional traffic passing through on SH6 so is to be expected.

This demonstrates that adding around 600HH 600 households in Homestead Bay with the internal link road in operation within Park Ridge, results in network operation similar to the existing situation – and therefore the intersection at SH6/Jack Hanley Drive should be upgraded to a single lane roundabout at this time.

Table 7-3 sets out an analysis of a single lane roundabout at SH6/Jack Hanley Drive. The design layout would be similar to the SH6/Park Ridge roundabout, with single lane approaches on all arms, and around a 44m inscribed circle diameter.

Table 7-3: SH6/Jack Hanley Drive Intersection Operation with 600 HH in Homestead Bay – single lane roundabout

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
AM Peak Hour						
SH6 South	Left + Through	791	0.61	8	A	6
SH6 North	Through + Right	520	0.36	9	A	3
Jack Hanley Drive	Left + Right	371	0.55	12	B	6
PM Peak Hour						
SH6 South	Left + Through	480	0.47	10	A	4
SH6 North	Through + Right	963	0.61	10	A	8
Jack Hanley Drive	Left + Right	223	0.24	5	A	2

Operation is improved, with a maximum v/c of 0.61 in both peak hour periods, with LOS A/B. It is therefore considered that this improvement is suitable as mitigation for the Homestead Bay development. However, a single lane roundabout has a limited lifespan, due to the incremental increase in new development in the Southern Corridor (i.e. both with and without the Homestead Bay development) – and to tie-in with other more significant longer-term infrastructure improvements to the north, the intersection may need to be expanded to a dual-lane roundabout. This is dependant on whether an additional intersection (roundabout) is added at Woolshed Road – in which case, the single-lane roundabout may still be sufficient at Jack Hanley Drive – with dual lanes provided north of Woolshed Road as part of the longer-term infrastructure programme.

7.4 INTERVENTION 2A – UPGRADE OF SH6/WOOLSHED ROAD

As shown in Figure 6-2, an alternative to improving the SH6/Jack Hanley Drive intersection is to introduce a new roundabout at the current location of SH6/Woolshed Road. This essentially replaces Jack Hanley Drive as the principal access point to Hanley's Farm (to/from the north) with a fully formed Woolshed Road link to SH6 – and therefore the improvement works are pushed northwards.

In this arrangement, as set out in Figure 6-1, the longer term dualling of SH6 to the north would then end at this newly formed roundabout, and therefore potentially reduce cost of the full programmes of works.

In both interventions 2 and 2A, the new roundabout would need to be upgraded in the future to provide additional capacity – sufficient to accommodate the dual lanes from the north – most likely expanded to a dual lane circulatory on the roundabout, and dual lanes on the approach lanes. A similar approach to that taken at the SH6/SH8B roundabout in Cromwell could be taken, with land designated for the longer-term layout, but not implemented until required.

7.5 INTERVENTION 3 – CONNECTING INTERNAL ROAD BETWEEN HOMESTEAD BAY ROAD AND LOT 8

This new link road is (largely) not related to transport impacts, but to the construction phasing of the development – although it does offer an alternative route for some internal trips between Homestead Bay and Jacks Point and Hanley's Farm, and could provide some (minimal) relief for the SH6 intersections. Therefore, no further assessment is provided on this intervention.

7.6 INTERVENTION 4 – UPGRADE OF SH6/MĀORI JACK ROAD

As shown in Table 3-2, the SH6/Māori Jack Road intersection is operating with significant space capacity in the existing situation, in both peak hour periods.

We tested the performance of the existing SH6/Jack Hanley Drive intersection through a range of developed lots at Homestead Bay. Table 7-4 shows the results with 1500 lots.

The results show that in the AM peak period, the left turn out of Māori Jack Road has reached at capacity operation. Note that in this assessment we have assumed that no traffic would re-route to other intersections further north using the internal road network to gain access to SH6 – this re-assignment is likely to happen (particularly as Intervention 2 or 2A will provide more capacity for the left turn out of the development area).

However, it does indicate that the existing intersection form is reaching the end of its practical life, and therefore would need to be converted to a single lane roundabout before 1,500 titled lots at Homestead Bay.

Table 7-5 sets out an analysis of a single lane roundabout at SH6/Māori Jack Road (with 1,500 titled lots). The design layout would be similar to the SH6/Park Ridge roundabout, with single lane approaches on all arms, and around a 44-metre inscribed circle diameter. The results show comfortable operation of the intersection with 1,500 titled lots in Homestead Bay – note that the trigger proposed is at the 1,400 lot level, to be more consistent with the phased development of the site. Previous analysis[23] has shown that this roundabout layout is able to accommodate full development of Homestead Bay as is currently proposed up to a future year of 2053.

[23] Homestead Bay Transport Effects, WSP, July 2023

Table 7-4: SH6/Māori Jack Intersection Operation with 1500 HH in Homestead Bay – existing layout

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
AM Peak Hour						
SH6 South	Left	18	0.01	8	A	0
	Through	732	0.41	0	A	0
SH6 North	Through	346	0.19	0	A	0
	Right	204	0.44	17	C	2
Māori Jack Road	Left	442	1.01	63	F	22
	Right	6	0.06	41	E	0
PM Peak Hour						
SH6 South	Left	15	0.01	8	A	0
	Through	482	0.27	0	A	0
SH6 North	Through	771	0.43	0	A	0
	Right	228	0.32	12	B	2
Māori Jack Road	Left	214	0.31	9	A	1
	Right	9	0.16	64	F	0

Table 7-5: SH6/Māori Jack Intersection Operation with 1,500 HH in Homestead Bay – single lane roundabout

ARM	MOVEMENT	VOLUME (VEH/HOUR)	VOLUME / CAPACITY (V/C)	AVERAGE DELAY (SECONDS)	LEVEL OF SERVICE (LOS)	95th PERCENTILE QUEUE (VEH)
AM Peak Hour						
SH6 South	Left + Through	750	0.61	9	A	6
SH6 North	Through + Right	550	0.33	10	A	3
Māori Jack Road	Left + Right	448	0.69	16	B	9
PM Peak Hour						
SH6 South	Left + Through	497	0.42	9	A	3
SH6 North	Through + Right	999	0.61	9	A	8
Māori Jack Road	Left + Right	223	0.25	8	A	2

8 SUMMARY

WSP has been commissioned by RCL Homestead Bay Ltd to complete traffic assessments for the State Highway 6 (SH6) 'Southern Corridor' network in Queenstown. The study is in relation to planning proposals for the Homestead Bay area at the southern end of the Jacks Point Zone, proposing a mix of residential and mixed-use development. This report is a summary of the previous assessment work done, relating to both the access arrangements for trips generated from the Homestead Bay development itself, but also to assess the operation of the Southern Corridor as a whole, including links to and from the adjacent centres of Frankton and Queenstown.

Homestead Bay lies at the south-western edge of the Southern Corridor study area, below the Jacks Point residential and recreational area (golf course). This land is currently largely undeveloped, except for the NZONE Skydive airfield and drop zone.

The proposal for the Homestead Bay area is for around 2,500 residential units in the area known as "RCL Lot 8", together with commercial uses (approximately 11,000 m2 of retail) and recreational uses.

There are many other developments within the Southern Corridor area under various stages of development including Coneburn Industrial Estate (~25Ha), Park Ridge, Paterson and Woolshed Development, Hanley's Farm, Jacks Point, Jacks Point Village and other parcels of land at Homestead Bay to the west of the RCL land. It is estimated that total residential households in the Southern Corridor could be at least 7,000-8,000 by 2053. This is exclusive of any additional residential growth in Kelvin Heights or Kingston.

NZ Transport Agency traffic monitoring data shows that the October 2024 northbound AM peak hour traffic volumes are around 1,000vph (vehicles per hour) south of the SH6/Peninsula Road intersection, with over 1,200vph on the Kawarau Falls Bridge. Based on the growth experienced in the last 24 months, traffic volumes in the peak hours will reach the capacity of SH6 by 2026 (assuming land use development in the Southern Corridor continues at a similar rate), with increasing delays expected for highway users. Assuming the currently consented developments generate a similar level of vehicular trips to the existing households within the area, the total level of northbound trips would therefore be in the order of 2,100 vehicles per hour – this is around 30% higher than the capacity of the existing road network (the critical SH6/Humphrey Street intersection and downstream intersections within Frankton Flats). In addition, analysis of the operation of the SH6/Jack Hanley Drive intersection shows that there is limited capacity remaining at this location.

Consequently, any additional development of the Southern Corridor will generate trips that are expected to further exceed the capacity of the existing transport infrastructure. Analysis has shown that a balanced programme of transport system upgrades is required to support both the current and expected future consented growth:

- A solely private vehicle focussed programme would encourage continued traffic growth, and require substantial (and largely infeasible) road improvements across the Whakatipu Basin
- A solely public transport focussed programme is unlikely to be able to achieve the mode share required to maintain satisfactory operation of the road network, due to the dispersed communities across the wider area

As a result, a balanced long-term programme of transport infrastructure improvements has been identified for the Southern Corridor and associated links to Frankton that would enable the sustainable development of the Southern Corridor. This programme would need to be delivered over the long-term, with co-ordinated funding from NZTA, QLDC and ORC, but also likely investment from Central Government and private developers. From a future planning perspective, the initial steps would be to seek inclusion of elements of the balanced programme into the State Highway Investment Proposal (SHIP), as an input into the National Land Transport Plan (NLTP).

The recommended programme includes:

- A second (all-modes) road bridge across the Kawarau River, to the east (downstream) of the existing SH6 Kawarau Falls Bridge, as an alternative link to/from Frankton Flats
- Dualling of SH6 from south of the Park Ridge roundabout to a new intersection at the confluence of the two river crossing routes (in the vicinity of Boyd Road)
- A northbound bus lane on SH6 on the approach to Kawarau Falls Bridge
- Isolated intersection improvements across the SH6 Southern Corridor, and within Frankton Flats (a combination of roundabouts and signal-controlled intersections)

In addition, there are still opportunities for other "non-conventional" public transport modes to be investigated further, such as:

- Ferry services between a new wharf at Homestead Bay and Queenstown
- A gondola system from Homestead Bay and Hanley's Farm to Remarkables Park, linking to a similar potential gondola system through to Queenstown Airport, Frankton Hub and Queenstown

In terms of the shorter-term requirements to mitigate the transport effects of the Homestead Bay development, RCL Homestead Bay Ltd proposes a series of infrastructure improvements as shown below. Triggers for the improvements have been established through an operational assessment for each intersection. All mitigation improvements are consistent with the longer-term network-wide programme of transport infrastructure improvements.

Homestead Bay - Proposed Developer Funding

	TRANSPORT INVESTMENT	PROPOSED TRIGGER
1	New roundabout provided on SH6 at new access road to Homestead Bay development	Prior to any titled lots
2a	Conversion of SH6/Jack Hanley Drive to single-lane roundabout;	Occurs before 600 titled lots
OR		
2b	Conversion of SH6/Woolshed Road to single-lane roundabout	
3	Connecting internal road between Homestead Bay Road and the Homestead Bay development	Occurs before 1,200 titled lots
4	Conversion of SH6/Māori Jack Road to single-lane roundabout	Occurs before 1,400 titled lots
5	Bus stops added within site, in line with future bus routes	At locations to be agreed with QLDC/ORC

9 LIMITATIONS

This report ('Report') has been prepared by WSP exclusively for RCL Homestead Bay Ltd ('Client') in relation to transportation assessments for the SH6 Southern Corridor ('Purpose') and in accordance with the Short Form Agreement with the Client dated 29 September 2022. The findings in this Report are based on and are subject to the assumptions specified in the Report. WSP accepts no liability whatsoever for any reliance on or use of this Report, in whole or in part, for any use or purpose other than the Purpose or any use or reliance on the Report by any third party.

In preparing this Report, WSP has relied upon data, surveys, analyses, designs, plans and other information ('Client Data') provided by or on behalf of the Client. Except as otherwise stated in this Report, WSP has not verified the accuracy or completeness of the Client Data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this Report are based in whole or part on the Client Data, those conclusions are contingent upon the accuracy and completeness of the Client Data. WSP will not be liable for any incorrect conclusions or findings in the Report should any Client Data be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.